Chapter 4 Securing Property Rights from the Grabbing Hand of the State: The Merchant Guild

One of the central questions about the institutional foundations of markets concerns the power of the state. The simplest economic view of the state—as an entity that enforces contracts and property rights and provides public goods—poses the following problem: a state with sufficient coercive power to do these things also has the power to withhold protection or confiscate private wealth, undermining the foundations of the market economy.

In the medieval era before a trading center was established, a ruler might pledge that foreign merchants would be secure and their rights respected. Once trade was established, however, the ruler faced the temptation to renege on his pledge—by failing to provide the promised protection or by using his coercive power to abuse the merchants' property rights.[1] Before the emergence of the nation-state, foreign merchants could expect little military or political aid from their countrymen. Without something tangible to secure the ruler's pledge, foreign merchants were therefore not likely to frequent a trading center—an outcome that could be costly for both the ruler and the merchants. What institutions, if any, mitigated this problem?

Trade relationships between a particular merchant and ruler consist of a potentially long sequence of trading visits, during each of which the merchant may pay tax to the ruler. Intuitively, one might conjecture that a particular reputation-based institution could have enabled the ruler to commit. Central to this institution is an intertemporal linkage of the central transaction of respecting rights with the auxiliary transaction of tax payment. The belief that the ruler will respect a trader's property rights could be supported by conditioning future trade—and hence tax payments—of the trader on the ruler's past conduct. The Folk theorem of repeated games (presented in Appendix A) lends support to this conjecture. It suggests that if the ruler sufficiently values gains from future trade relative to his gains from abusing rights, such a reputation mechanism can mitigate this commitment problem.

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[1] Unlike in Chapters 3 and 9, in this chapter I use the terms *merchants* and *traders* interchangeably.

Yet the historical record indicates that, by and large, ruler-merchant relations were governed by neither bilateral reputation mechanism (in which a merchant whose rights were abused ceases trading) nor informal multilateral reputation mechanism (in which the cheated merchant and his close associates cease trading). The records reflect the importance of formal organizations— administrative bodies rooted outside the ruler's territory. These organizations held certain regulatory powers over member merchants in their own territory, supervised the operation of these merchants in foreign lands, and coordinated their responses to a ruler's conduct. What roles could these organizations—and the associated intertransactional linkages—theoretically play in overcoming the ruler's commitment problem? What roles did they actually play?

The thesis advanced here is that these organizations—merchant guilds—were manifestations of and a means for creating additional intertransactional links to change the set of self-enforcing beliefs in the ruler-trader transaction. Such intertransactional linkages were necessary because the intertemporal linkage of the central transaction of respecting rights with the auxiliary transaction of tax payment between each merchant and the ruler, enabled the ruler to commit to respect rights only when the volume of trade was low. These organizations and the intertransactional linkages they reflect were responses to the failure of the simple reputation mechanism modeled as an exchange of protection in return for tax payment by each merchant and his close associates.

This failure reflects two interrelated factors. First, the ruler could discriminate among merchants. Because protection of rights was a private good rather than a public one, a ruler could respect the rights of some merchants but not others. Second, unless merchants could credibly commit to retaliate collectively, it was optimal for the ruler to abuse the rights of some merchants once trade had expanded, because expansion reduced the value of the future tax payment of each individual merchant. Securing merchants' rights based on a reputation mechanism, therefore, required that the threat of collective retaliation following a transgression against any merchant be credible.

In the absence of appropriate organization and the implied intertransactional linkages, this threat, however, could not have been credible at the efficient level of trade for two reasons. First,

collective punishment requires coordination. Second, rendering a threat of collective punishment credible required that all (or sufficiently many) merchants must be motivated to participate. Providing such motivation, however, presented a problem. Paradoxically, abusing the rights of some merchants fostered the ruler's ability to commit to respect the rights of the remaining merchants, whose future tax payments became more valuable to him. The enhanced ability of the ruler to commit undercut the credibility of the threat of collective punishment. Fostering this credibility required that merchants be able to motivate one another to participate in collective punishment. The linkage of information-sharing and coercive transactions among them was necessary. The intertransactional linkages that the merchant guild organization reflects rendered the threat of collective retaliation credible.

The merchant guild organizations linked information-sharing and coercive transactions between merchants in order to render credible their threat to retaliate collectively following transgression against any merchant. These organizations provided the monitoring, coordination, and internal enforcement required to credibly commit to retaliate collectively following an abuse. The merchant guild organizations exhibited a range of administrative forms, from a subdivision of a city administration to an intercity organization.[2] All of these forms served the same function: they linked each transaction between the ruler and merchant (the central transaction) with the information-sharing and coercive transactions of all the merchants (the auxiliary transactions). By enabling coordination and motivating each merchant to participate in collective retaliation, the merchant guild organizations changed the set of self-enforcing behavioral beliefs in the transaction between each individual merchant and the ruler. The merchant guild organizations rendered self-enforcing the belief that rulers would respect merchants' rights as trade expanded.

The merchant guild organization was thus an institutional element in the merchant guild institution that was based on a multilateral reputation mechanism, mitigated the ruler's commitment problem and facilitated the expansion of trade. These merchant guild organizations,

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[2] This definition of merchant guild organizations is based on their function and applies to a wider range of merchant organizations than those usually labeled *merchant guilds*. The argument does not concern craft guilds, which economists have long associated with the monopolization of a given craft within a particular town. For a recent economic analysis of craft guilds, see Gustafsson (1987), Hickson and Thompson (1991), S.A. Epstein (1991), S.R. Epstein (1998), and Richardson (2002).

the associated rules that coordinated actions and specified those that were abusive, as well as the associated self-enforcing behavioral beliefs together constituted a system of institutional elements: the merchant guild institution. (To simplify the presentation, I use merchant guild to refer to the merchant guild *organization* and merchant guild institution to refer to the *institution*.)

Viewing merchant guilds as supporting trade is complementary to the more common view among economic historians that they emerged to reduce negotiation costs, administer trade and taxation, extract privileges from foreign cities, and redistribute rents in their own cities (Gross 1890; Thrupp 1965; North and Thomas 1973). While the existence of merchant guilds could affect the distribution of rents in addition to enhancing the security of agreements, the unadorned theory of merchant guilds as cartels presents a puzzle: if the purpose of the guilds was to create monopoly power for the merchants and increase their bargaining power with the rulers, why did powerful rulers during the late medieval period cooperate with foreign merchants to establish guilds in the first place? What offsetting advantages did the rulers enjoy? The puzzle is resolved if the power of the implied merchant guild institution enabled trade to expand to the benefit of merchants and rulers alike.[3]

To present this argument, section 4.1 describes the problem faced by trading centers and merchants in providing security for merchants and their goods and demonstrates that the guild organization had the features theoretically required to resolve the problem. It then recounts milestones in the evolution of the guild among German traders and the related expansion of trade. Section 4.2 formalizes the analysis, presenting a game-theoretic model that allows us to explore the incentives of traders and cities and to explain why a guild organization was sometimes able to support an efficient level of trading activity when a simple reputation mechanism could not. Section 4.3 concludes by considering the transformation and decline of the merchant guild associated with the rise of the state and suggests other applications of the theoretical framework.

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[3] de Roover (1965, p. 111) asserts that the guild's role "was, of course, to provide collective protection in foreign lands, to secure trade privileges, if possible, and to watch over the strict observance of those already in effect." He did not explain how the guilds could provide protection and ensure the observance of rights by local rulers in foreign lands in which the ruler had a preponderance of military force.

4.1   The Commitment Problem and the Role of Merchant Guilds

This section not only presents the historical evidence on the merchant guild institution but intuitively introduces the main theoretical assertions. The historical evidence reveals the concern of medieval merchants with protecting their property rights abroad. Theory suggests the possible role played by the merchant guild institution in fostering trade. Historical analysis supports the conjecture that this institution prevailed.

4.1.1   Institutions and Commitment

Long-distance trade in late medieval Europe was based on the exchange of goods brought from different parts of the world to central cities or fairs located in geographically or politically favorable places. The combination of the gains from trade and of suitable locations for conducting exchange does not necessarily imply that exchange could occur without institutions securing foreign traders' property. Rulers' concerns about providing such security is reflected in the words of King Edward I, who noticed in 1283 that because foreign merchants' property rights were not well protected in England, "many merchants are put off from coming to this land with their merchandise, to the detriment of merchants and of the whole kingdom".[4]

His words must be understood against the background of events such as the one that occurred in Boston, England, in or shortly before 1241. A Flemish merchant accused an English trader of not repaying a commercial loan. The result was

> an uproar on all sides and the English merchants assembled to attack the
> Flemings, who retired to their lodging in the churchyard. The English threw down
> the pailings, broke the doors and windows and dragged out [the lender] and five
> others, whom they foully beat and wounded and then set in the stocks. All the
> other Flemings they beat, ill-treated and robbed, and pierced their cloths with
> swords and knives. Their silver cups were carried off as they sat at table, their

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[4] *English Historical Documents*, 3:420. The recognition that unprotected foreign merchants would not come to England is also expressed in the Carta Mercatoria of 1303 (see ibid, 3:515).

purses cut and the money in them stolen, their chests broken open and money and goods, to an unknown extent, taken away.[5]

Such incidents were not peculiar to England; they mark the history of long-distance medieval trade.[6] During the twelfth century, insecurity often hindered commercial relations between the Byzantine Empire and the Italian city-states. Pisans attacked the Genoese quarter in Constantinople in 1162, killing at least one merchant and forcing the others to flee to their ship, leaving all their valuables behind. In 1171 the Venetians attacked and destroyed the same Genoese quarter. About ten years later, a mob destroyed all the Italian quarters in Constantinople during the "Latin massacre" of 1182 (Day 1988).[7] Merchants abroad needed protection from coercive power.

In light of the theory of repeated games, one might conjecture that a ruler's commitment problem could be solved by a bilateral reputation mechanism in which individual merchants whose person and property were not protected by a local ruler would refuse to return with their goods in the future. The ruler might reap short-run gains by ignoring a merchant's rights, but he stood to lose the future stream of rents from the cheated merchant's trade. Beliefs linking conduct in the central transaction (protection of rights of a particular merchant's security) with behavior in an auxiliary one (future tax payments by that merchant) can support the beliefs that rights will be secured.

As section 4.2 demonstrates formally, this intuition omits some important considerations. In particular, at the level of trade that maximizes the total net value of trade—the efficient volume of trade—a bilateral reputation mechanism cannot resolve the commitment problem. At the efficient volume of trade, the value of the stream of future rents collected by the ruler from an individual marginal merchant is almost zero—less than the value of goods that can be seized or

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[5] Curia Regis, 121, m.6, published by Salzamn (1928).

[6] In all of the cases described here, abuses took place despite the relatively high level of ability of the ruler to secure rights.

[7] For other examples, see Kedar (1976, pp. 26 ff.); Lane (1973, p. 34); and de Roover (1963, p. 61).

the cost of services that can be withheld. The same conclusion holds even at lower volumes of trade if the frequency of visits by an individual trader is low. As long as ruler-merchant relations are governed only by a bilateral reputation mechanism, theory holds that trading volume cannot expand to its efficient level.

This discussion and the formal model presented in section 4.2 allow only one kind of sanction for cheated merchants: withdrawal of trade and hence tax payment. Military action against a polity or a town in response to abuses, although sometimes used, was not generally a viable option. In the late medieval period defensive technology was superior to offensive technology, and the costs and risks of offensive military action at distant ports limited the credibility of threats of military action in response to trade violations.[8]

A multilateral response by all merchants to transgressions against any subgroup of merchants is a possible means of increasing the punishment and hence deterring abuses. Conditioning behavior in many ruler-merchant transactions on the ruler's conduct in any such transaction increases the punishment following an abuse. Beliefs in such a linkage can therefore render self-enforcing the belief that a ruler will not abuse rights in a wider set of circumstances.

Indeed, the history of relations between trade centers and foreign merchants presents several examples of multilateral retaliations against rulers who reneged on their contractual obligations. Around 1050 the Muslim ruler of Sicily imposed a 10 percent tariff (instead of the 5 percent tariff specified by Islamic law) on goods imported to Sicily by the Maghribi traders. The traders responded by imposing an embargo and sending their goods to the rival trade center, Tunisia. The embargo was effective: after a year the Sicilian ruler removed the extra tariff.[9]

Incidents like this one suggest the relevance of a *multilateral reputation mechanism* in which the ruler is deterred from abusing the rights of any merchant by the threat that many others

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[8]As Parker (1990, p. 9) notes, "After the proliferation of stone-built castles in western Europe, which began in the eleventh century [in] the military balance between defense and offense, the former had clearly become predominant." This situation changed only during the "military revolution" of the fifteenth century. Military sanctions did sometimes occur, however, particularly among commercial entities in the Mediterranean Sea.

[9] DK 22, a, lines 29–31, b, lines 3–5, Gil (1983a, pp. 97–106); TS 10 J 12, f. 26, a, lines 18-20, Michael (1965, 2:85).

will cease trading following such an abuse. Conditioning future transactions between the ruler and many merchants on his conduct toward a particular merchant may be able to surmount the commitment problem without the aid of any formal organization. In Sicily, as in the other examples cited merchants imposed collective punishment on the city that included participation by merchants who had not been directly injured. The offenses reflected in these cases were often against an entire group of merchants. But rulers could also discriminate among merchants, abusing or not protecting them selectively, by confiscating the belongings of or withholding legal protection from some merchants without directly harming other merchants. Indeed, the Sicilian ruler increased the tariff only on Jewish traders; and in Constantinople during two attacks on the Genoese quarter, other Italian merchants were not harmed.

These examples suggest two interconnected reasons why, without a supporting organization, a multilateral reputation mechanism may be insufficient to surmount the commitment problem at the efficient level of trade. The first involves contractual ambiguities and asymmetric information. The second reflects the distinct incentives among different merchants generated by a multilateral response.

Long-distance premodern trade took place in a highly complex and uncertain environment. Unanticipated events and multiple interpretations of existing agreements were always possible under these circumstances, implying that the definition of a "contract violation" was often ambiguous. Different interpretations of facts by merchants, information asymmetry, and slow communication implied that without an organization that coordinated responses, merchants as a whole were not likely to respond effectively to the abuse of any group of merchants. Section 4.2 demonstrates formally that if the fraction of merchants who detect and react to an abuse against any group of merchants is only proportionate to the number abused, then a multilateral reputation mechanism is ineffective at the efficient volume of trade for the same reason that a bilateral reputation mechanism is ineffective: a threat by a group of marginal traders to withdraw their trade is barely significant once trade has expanded to its efficient level.

Expanding trade to the efficient level in the medieval environment required an organization that supplemented the operation of a multilateral reputation mechanism by *coordinating* the responses of a large fraction of the merchants. Only when a coordinating

organization exists—when it links the ruler-merchant transactions with information-sharing transactions among merchants—can the multilateral reputation mechanism potentially overcome the commitment problem. Formally, when a coordinating organization exists, there is a perfect equilibrium in which traders come to the city (at the efficient level of trade) as long as an embargo has never been announced and do not come if an embargo has been announced.[10] The ruler respects merchants' rights as long as an embargo has never been announced but abuses their rights otherwise. Thus, when a coordinating institution exists, trade may expand to its efficient level.

Although these strategies correspond to a perfect equilibrium, the theory in this form remains unconvincing. According to the equilibrium strategies, when a coordinating institution organizes an embargo, merchants are deterred from disregarding it because they expect the ruler to abuse violators' trading rights. But are these expectations reasonable? Why would a city not *encourage* rather than punish embargo breakers? Section 4.2 verifies that this encouragement is potentially credible, in the sense that beliefs that embargo breakers' rights will be protected are self-enforcing. During an effective embargo, the volume of trade shrinks and the value of the marginal trader increases; it is then possible for bilateral reputation mechanisms to become effective. That is, there may exist mutually profitable terms between the city and the traders that the city will credibly respect. This possibility limits the potential severity of an embargo and, correspondingly, potentially hinders the ability of any coordinating organization to support efficient trade.

To support the efficient level of trade, a multilateral reputation mechanism may need to be supplemented by an organization with the ability both to *coordinate* embargo decisions and to *enforce* them, by applying sanctions on its own members. In other words, such an organization links information-sharing and coercive transactions among the merchants themselves. This organization and its expected actions are beyond the control of the ruler; his best response to them

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[10] More precisely, the equilibrium is a Markov perfect equilibrium. In studying complex environments, as is done here, it is sometimes useful to restrict attention to equilibria in a smaller class of "Markov" or "state space" strategies, in which the past influences current play only through its effect on a state variable that summarizes the direct effect of the past on the current environment. Hence in the preceding equilibrium, players condition their actions on the state "embargo." Every Markov perfect equilibrium is also a subgame perfect equilibrium (see Fudenberg and Tirole 1991, pp. 501–2 regarding Markov equilibrium and see Appendix A regarding subgame perfect equilibrium).

is to respect traders' rights. Traders will therefore correctly believe that their rights will be protected and hence trade. These beliefs, however, critically depend on the fact that the actions of the guild organization are beyond the control of each trader. This is exactly why the traders can credibly commit to respond to abuses collectively.

4.1.2 Evidence of the Role of Formal Organizations

The discussion has so far focused on showing that guaranteeing the security of foreign merchants and their goods was problematic in medieval Europe and that both historical evidence and theoretical reasoning suggest that a simple reputation mechanism could not completely resolve the problem. This subsection provides direct evidence to support the claim that the merchant guild institution secured rights. It provides evidence that merchants and rulers recognized the need to provide believable assurances of security for traders and their goods and negotiated trading arrangements that often included a role for formal organizations. The subsection also presents evidence regarding the coordination and enforcement roles that these organizations played, the strategies they adopted, and the expansion of trade in cities that negotiated these agreements with merchant guilds.

The historical record repeatedly bears out the fact that medieval rulers and merchants recognized the need to secure foreign merchants' property rights before trade could expand. Christian traders, for example, did not dare to trade in the Muslim world unless they received appropriate assurances of security. Within Europe, merchants did not trade in locations in which security agreements were not in place. The Italians began traveling to other European cities and to the Champagne fairs, and the Germans began traveling to Flanders, England, and the Slavic East, only after negotiating appropriate security agreements.[11]

Security agreements and the associated formal organizations appear to have been crucial to trade expansion. The trade of Catalan merchants expanded "within only a few months" after 1286, when they received privileges and the right to have a consul in Sicily (Abulafia 1985, pp. 226–7). The trade of German merchants in Bruges expanded after they received privileges and the right to

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[11] See, for example, de Roover (1965); de Roover (1948, p. 13); and Dollinger (1970).

have a *Kontor* (establishment or office) (Dollinger 1970, p. 41). Italian trade with Flanders flourished only after merchants were allowed to establish local organizations, called *nations* (de Roover 1948, p. 13.)

Genoese trade with North Africa provides an instructive illustration of the relative importance of security agreements in contributing to trade expansion. In 1161 the Genoese legate, Otobonus d'Albericis, and the local ruler of North Africa, Abd alMumin, signed a fifteen-year agreement securing the property rights of the Genoese. The agreement specified a 2 percent reduction in the 10 percent customs fee, a rather negligible reduction given that the average expected gain from goods that reached North Africa was more than 26 percent. Nevertheless, trade expanded dramatically after the agreement. Before 1160 Genoese trade with North Africa never exceeded 500 lire a year. After the agreement it more than doubled, to 1,057 lire per year, and remained at this higher level in later years. The central feature of the agreement seems to have been provision of security.[12]

Indirect evidence also suggests that the parties recognized the importance of an *institutionalized commitment* to security rather than mere promises. Muslim rulers provided European traders with *aman*—a religious obligation to secure the merchants' rights. Some cities in England went so far as to elect a foreign merchant as mayor.

Yet it seems that a specific institution, the merchant guild, was the most common success. The core of this institution was an administrative body, the merchant guild organization, which supervised the overseas operation of merchant residents of a territorial area and held certain regulatory powers within that area.[13] In England, for example, the merchants of a town were granted the right to establish a society of merchants that retained specific commercial privileges in the internal and external trade of the town and usually had representation in the trade centers in

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[12] Krueger (1933, pp. 379–480); Krueger (1932, pp. 81–2). The agreement was self-enforcing because Genoa and the North African ruler were political allies.

[13] This is not to argue that guilds were always established to secure property rights abroad. On the contrary, they were often established for other purposes, such as imposing taxes, governing the city, and organizing commerce. As emphasized in Chapter 7, organizations that were established or emerged in the context of one institution provide the initial conditions in processes leading to new institutions and often are integrated in them.

which its members traded. On the European continent, many towns were controlled by the mercantile elite, who organized a merchant guild to advance their interests. In some Italian and German towns, the merchant guild organizations were virtually identical with the town's government, while in some Italian cities, the merchants' operations were supervised by the city (Gross 1890; Rorig 1967; Rashdal 1936, pp. 150–3).

Guilds provided merchants with the leadership and the information-transmission mechanisms required for coordinated action. The guild decided when to impose a trade embargo and when to cancel it. The trade center usually provided the guild with the right to obtain information about disputes between its members and the center's authorities or between its members and other traders. The guild's regulations facilitated the collection and transmission of information among its members.[14]

The Italian cities often performed the functions of a merchant guild on behalf of their resident merchants. The city's role in coordinating embargo decisions is well reflected in the relationship between Genoa and Tabriz, a vital city on the trade route to the Persian Gulf and the Far East. In 1340 Tabriz's ruler confiscated the goods of many Genoese traders. Genoa responded by declaring a commercial embargo (*devetum*) against Tabriz. In 1344 Tabriz's ruler sent ambassadors to Genoa promising to indemnify the traders for everything that had been taken from them and to provide favorable treatment in the future. As a consequence, the *devetum* was removed and Genoese traders flocked to Iran. But the ruler of Tabriz did not keep his promise to protect their rights—the Genoese traders were robbed, and many of them were killed. Material damage reached 200,000 lire, an immense sum. When a subsequent ruler of Tabriz invited the Venetians and Genoese to trade, he "could not give them the guarantees they required, [hence] the Italian merchants, eager as they were to recover their prosperous trade in Persia and to reopen the routs to India and China, felt it was unsafe to trust a mere promise" (Lopez 1943, pp. 183–4).

An incident that occurred during the Genoese embargo of Tabriz confirms the historical importance of enforcement within the merchant group and shows that merchant guilds assumed

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[14] Guild members were required to travel together, to live and store their goods throughout their stay in quarters that belonged to the guild, to examine the quality of one another's goods, and to witness on another's sales (see, e.g., Moore 1985, pp. 63ff.). As de Roover (1948) notes, the "main purpose of the consular organization [of the Italians in Bruges] was to facilitate the exchange of information" (p. 20).

this enforcement role. In 1343, during the *devetum* against Tabriz, a Genoese merchant named Tommaso Gentile was en route from Hormuz to China. Somewhere in the Pamir plateau, he became sick and had to entrust his goods to his companions and head back to Genoa along the shortest route, which passed through Tabriz. When knowledge of his journey through Tabriz reached Genoa, Tommaso's father had to justify this transgression with the "Eight Wisemen of Navigation and the Major [Black] Sea", that is, Genoa's board of overseas trade. These officers accepted the father's claim that Gentile had been forced to travel through Tabriz by an act of God and acquitted him, inasmuch as he had traveled through Tabriz without merchandise (Lopez 1943, pp. 181–3.)

The merchant guild's strategy of conditioning future trade on adequate past protection, its use of ostracism to achieve security (rather than to achieve privileges or low prices), and the relationship between acquiring information, coordinating action, and being able to boycott are reflected in the agreement made in 1261 between Flemish merchants from Ghent, Ypres, Douai, Cambrai, and Dixmude who purchased English wool. "For the good of the trade" they decided that "if it should happen that any cleric or any other merchant anywhere in England who deals with sales of wool deals falsely with any merchant in this alliance by giving false weight or false dressing of the wool or a false product and if they do not wish to make amends, we have decided that no present or future member of this alliance will be so bold as to trade with them." To make their threat of an embargo functional, they "decided that there will be in each of these cities one man to view and judge the grievances, and to persuade the wrongdoers to make amends" (Moore 1985, p. 301).

The credibility and force of a coordinating organization's threat to impose an embargo crucially depended on curtailing the ruler's ability to undermine an embargo by offering special terms to violators. Theoretically, because the marginal gains from additional trade rise during an embargo, a bilateral reputation mechanism can potentially enable a ruler to commit to these terms. The fact that guild organizations needed to take special measures to prevent shipments to the embargoed city are confirmed by the historical evidence. In 1284 Norwegians attacked and pillaged a German trading ship. In response, the German towns imposed an embargo on Norway, prohibiting the export of grain, flour, vegetables, and beer. To prevent German merchants from

smuggling food to Norway, the German towns posted ships in the Danish Straits. According to the chronicler Detmar, "There broke out a famine so great that [the Norwegians] were forced to make atonement." The particular geographical situation of Norway seems to have made the embargo particularly effective. (Dollinger 1970, p. 49).[15]

The fact that the success of a trade embargo depended crucially on obtaining the support of virtually all merchants involved was clear to the cities on which the embargo was imposed. When, in 1358, the German towns imposed an embargo on Bruges, the city attempted to defeat the embargo by offering extensive trade privileges to merchants from Cologne (Dollinger 1970, pp. 65–6).

Physically preventing ships from entering a strait and imposing fines were two ways of countering a merchant's temptation to break an embargo. The evidence, however, suggests that the credibility of the threat to carry out an embargo was often sustained by a different means. Credibility was established by endowing guilds with the ability to impose commercial sanctions on their member merchants. In England and elsewhere in Europe, a local guild usually had exclusive trade privileges in its own town. These privileges typically included monopoly rights over retail trade within the town; exclusive exemption from tolls; and the right, under certain circumstances, to exclude members from the guild (Gross 1890, pp. 19–20, 38ff., 65; de Roover 1948, pp. 18–19).[16] These guild organizations were therefore able to provide their members with streams of rents in their hometowns. Receiving these rents, however, could have been made conditional on following the recommendations, rules, and directives of the guild organization.

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[15] See also Dollinger's description (1970, p. 48) of the embargo on Novgorod. The punishment for breaking the embargo was death and the confiscation of the smuggled goods.

[16] Exclusive commercial rights for the guild organization should not be confused with monopoly rights. Entry into the organization was permitted during the period under consideration. The German *Kontore* were established by the merchants who traveled abroad to trade. In England even individuals who did not live in a particular town could join its merchant guild, and each member had to pay an entry fee (see, e.g., Dollinger 1970 and Gross 1890). By imposing a cost for entry and providing rents subsequently, such a system motivates each merchant to adhere to the guild rules, including honoring guild-sponsored embargoes. As shown later, this permits a higher volume of trade than would be possible without the entry restrictions.

These rents could therefore tie a member to the guild by making change of residence costly and ensuring solidarity among the guild's members.[17]

The argument advanced here suggests that the guild's monopoly rights in its home locality may have been instrumental in advancing trade with other localities. These monopoly rights generated a stream of rents that depended on the support of other members and so served as a bond, allowing members to commit themselves to collective action in response to a ruler's transgressions.[18]

The Flemish regulations of 1240 illustrate the role of rents in providing the appropriate incentives. A merchant who ignored the ban imposed by the guild on another town was expelled, losing his rent stream:

> "If any man of Ypres or Daouai shall go against those decisions [made by the guild] for the common good, regarding fines or anything else, that man shall be excluded from selling, lodging, eating, or depositing his wool or cloth in ships with the rest of the merchants. And if anyone violates this ostracism, he shall be fined 5 shillings." (Moore 1985, p. 298).

4.1.3   The Evolution of Guild Organizations

The evolution and operation of the institution that governed relations between German merchants, their towns, and the foreign towns with which they traded may provide the best example of the guild's contribution to fostering the growth of trade. Because of the relatively small size of the German towns, to achieve the necessary coordination and enforcement for the reputation mechanism to operate effectively, a means was needed to influence the behavior of merchants from different towns. This led to the rise of an interesting form of guild organization known as the German Hansa.[19]

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[17] This is not to claim that this was the chief role of these rents. The analysis examines the role of the merchant guild in the expansion of trade between, not within, political units.

[18] This is not to argue, however, that this function was necessarily the main reason for these local monopoly rights. These were often given for taxation reasons.

[19] The Hansa is not usually referred to as a guild. I refer to it as one here, because the discussion is concerned with the function of the organization rather than its official name. I do not claim that the efficiency attributes of the Hansa were sufficient for its emergence.

Several extensive studies have mined the abundant historical records of the Hansa (such as Weiner 1932; Dollinger 1970; Lloyd 1991). They enable us to examine its evolution in light of the theoretical analysis. These analyses emphasize episodes in which conflict occurred and trade was affected. In purely theoretical terms, conflict can be explained as an equilibrium phenomenon when information about the behavior of the parties is imperfect, as it surely was in this period. The historical episodes examined here, however, are ones in which conflict was followed by organizational and hence institutional change. It seems implausible to model these as equilibrium outcomes. Instead, the episodes can be considered as disequilibrium outcomes and the resulting changes adaptations to changing circumstances or improvements based on accumulated experience.[20]

For historical reasons, membership in the basic organizational unit that coordinated the activities of German merchants abroad—the *Kontor*—was not conditional on residency in a particular town. Any German merchant who arrived in a non-German city could join the local *Kontor*. A *Kontor* had the same function as the guild organization in coordinating the responses of German merchants in disputes with the town. It lacked the ability to punish merchants in the towns in which they resided, however, weakening its ability to enforce sanctions against its members. If this theory is correct, the difference between the German *Kontore* and other guild organizations should have made the *Kontore* less effective and led to changes in or the dissolution of that form of merchant organization.

The history of the contractual relations between the city of Bruges, the local *Kontor*, and the German towns provides a clear illustration of this evolution. In 1252 a *Kontor* of German merchants obtained extensive trading privileges from Bruges, and a permanent settlement followed (Weiner 1932, p. 218). The *Kontor* was led by six aldermen elected by the German merchants present in the town. Two of the aldermen were from Rhenish towns, two from Westphalian-Wendish towns, and two from Prussian-Baltic towns, reflecting the range of origins of the participating German merchants (de Roover 1965, p. 114; Dollinger 1970, p. 86).

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[20] Chapter 7 refers to such changes as "institutional refinements."

The trading privileges given to the foreign merchants in Bruges were continually abused, eventually causing riots. A document dated 1280 reported that "it is unfortunately only too well known that merchants traveling in Flanders have been the objects of all kinds of maltreatment in the town of Bruges and have not been able to protect themselves from this."[21] Together with most of the other foreign traders who operated in Bruges, the German merchants retaliated in 1280 by transferring their trade to Aardenburg. After two years of negotiation, a new agreement was reached and the *Kontor* returned to Bruges.

Seemingly successful, the embargo failed to guarantee the property rights of the German merchants, as Bruges simply ignored its agreement with them (Dollinger 1970, pp. 48–51). Bruges did respect the rights of other foreign merchants who frequented the city, however. The present analysis points to the reason for that discrimination. The embargo was not imposed by the German merchants alone but by all foreign merchants in Bruges, including the important and well-organized Italian and Spanish *nations*. While the lesson for Bruges from that episode was to respect the rights of those well-organized groups, it became clear to the city that the German merchant organizations were different. The *Kontor* proved incapable of imposing its decisions on its members. Because the *Kontor* encompassed only the German merchants actually present in Bruges—rather than all the potential German traders who might want to trade during an embargo—its threat of sanctions was not credible. As a result, for a time, German merchants had to accept inferior treatment.

Another embargo, from 1307 to 1309, was required to force Bruges to respect its contractual agreements with the Germans. In this embargo, only they participated. What had changed between 1280 and 1307 was the ability of German traders from different towns to coordinate their responses and enforce their embargo. A milestone was passed in 1284, when the Wendish German towns imposed an embargo on Norway. After merchants from Bremen refused to cooperate in the embargo, the other German towns excluded Bremen's merchants from all German *Kontore*. The German towns had achieved the coordination needed to expel one of their

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[21] Urkundenbuch der Stadt Lubeck, I, no. 156, p. 371, translated by Dollinger (1970, p. 383).

members. The act of expelling a city came to be referred to by a special word, *Verhansung*, indicating the importance of this achievement.[22]

After 1307 the ability of the German merchants to commit themselves to coordinate their actions and to enforce their decisions on individual merchants and towns was rather advanced, thus guaranteeing Bruges's adherence to its contractual obligations. The belief that Bruges would respect property rights became self-enforcing. Indeed, Bruges respected the charters agreed upon in 1307 and 1309. As a result, Flanders's trade flourished, expanding for the next fifty years (Dollinger 1970, p. 51). As the theoretical analysis indicates, once the ability of the German *Kontor* to coordinate and impose their decisions on their members was well developed, the contract enforcement problem could be resolved and trade expanded.

It was not until the middle of the century, when the cost of providing security around Bruges rose drastically, that a new level of cooperation among the German towns was needed to force Bruges to provide the security required to support efficient trade. The Hansa's relations with Bruges deteriorated around 1350, mainly because Bruges was not ready to compensate the Germans for their damages in Flanders from the war between England and France. The Hansa responded by strengthening its internal organization. In 1356 the German Hansa held its first Diet, which determined that the *Kontor* of Bruges should be operated according to the Diet's decisions. Apparently recognizing the need for coordination among towns, the *Kontor* accepted this decision. Dollinger, the prominent historian of the Hansa, emphasizes the importance of this change. "In law, and not only in fact," he writes, "the towns, acting through the general Diet were establishing their authority over their merchants in foreign ports" (Dollinger 1970, p. 63).

A Hanseatic embargo of Bruges followed in 1358. Any disobedience, by a town or an individual, was to be punished by perpetual exclusion from the Hansa. Bruges attempted to defeat the embargo by offering trade privileges to individual cities, including both non-Hanseatic ones, such as Kampen, and a Hanseatic one, Cologne. The theory suggests that by offering these privileges it hoped to undermine the effectiveness of the new leadership. Although the non-Hanseatic cities accepted Bruges's terms, Cologne refused to cooperate. The embargo proved a

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[22] Dollinger (1970, p. 49); Weiner (1932, p. 219).

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success, and in 1360 Bruges came to terms with the Hansa. This time, reflecting the parties' more complete understanding of the range of circumstances in which the city would have to provide services, the privileges were written "in much detail as to prevent any one-sided interpretations."[23]

The institution of the German Hansa was now crystallized. It was a system of institutional elements—rules, beliefs, and organizations—that linked various transactions among merchants, their towns, and foreign cities to advance exchange. The Hansa's organizational structure provided the coordination and enforcement between German merchants and their towns that were required to alter the set of self-enforcing beliefs in the relationship between each merchant and foreign cities.

Trade in Northern Europe prospered for generations under the supremacy of the Hansa. Although the trade embargo of 1360 was not the last, later trade disputes seemed to center on distributive issues, such as the provision of trade privileges. Commitment for security was no longer an issue.

It is illuminating to contrast the development of the Hansa among German towns with the rather different organization among the Italian merchants. The solid internal political and commercial organization of the Italian cities and their prominence in trade enabled them to overcome the coordination and internal enforcement problems. Collective action among the merchants from Italian cities was ensured. Because they were sufficiently large—none of the cities was a marginal player in the ports in which they traded—coordination among the cities was unnecessary.[24] In contrast, the German *Kontor* was a local organization lacking the ability to impose its decisions on its members, who came from various German towns. The German towns were small, and before the establishment of the German Hansa, most were relatively insignificant in large trading centers like Bruges.

Interestingly, size matters here, just as it did for the Maghribis. Among the Maghribis too small a coalition would have reduced the credibility of the punishment by increasing the cost of

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[23] See Dollinger (1970, pp. 63–6) and Weiner (1932, p. 220).

[24] Bairoch, Batou, and Chevre (1988) contains information on the relative sizes of Italian and German cities. Some intercity cooperation was practiced in Italy, with smaller cities "affiliating" themselves with larger ones.

inflicting it, whereas too large a coalition would have undermined the information flows required for the credibility of the punishment. Similarly, for the Hansa to be effective, it had be sufficiently large to ensure that the German merchants would not be marginal.

The timing of the emergence of guilds was therefore related therefore to population growth and the processes that lead to the formation and internal organization of cities. In Southern Europe the major Italian city-states grew large because of social and political events around the Mediterranean. Italian trade expanded because each city functioned as a merchant guild of sufficient size that its traders were not marginal. Their property rights were hence secured.

Although the potential gains from trade in the Baltic Sea were substantial as well, that region's settlement pattern—influenced by the Germanic military expansion eastward—produced small towns that could not ensure the safety of their traders abroad. Only after a long process of urban expansion and institutional evolution were these towns incorporated into an intercity merchant guild, the German Hansa, that enabled Baltic trade to prosper.

Although the guild was a precondition for trade expansion, its rise in Europe was not caused by the new gains from trade. Rather, its rise in various localities reflects the nature of institutional dynamics as a historical process. The ways in which the various guilds were organized and the timing of their rise—and hence of trade expansion—were determined by social, economic, and political processes through which institutional elements and other conditions required for a guild's functioning were crystallized.

This historical analysis supports the hypothesis that the merchant guild organization was at the center of an institution that overcame the ruler's commitment problem and facilitated trade expansion. Although these organizations exhibited a range of administrative forms—from subdivision of a city administration (such as that of the Italian city-states) to the intercity organization of the Hansa—their functions were the same: to provide the coordination and internal enforcement required to enable the beliefs required to surmount the commitment problem. The actions taken by rulers and traders, their strategies as reflected in their regulations, and the expansion of trade that followed the establishment of guild organizations all confirm the importance of this role of the guild organization.

4.2   The Formal Model

The theoretical modeling is kept simple and directed to analyzing the potential of various plausible mechanisms for overcoming the ruler's commitment problem.[25] Each of the mechanisms examined explicitly captures a particular intertransactional linkage and might feasibly permit commitment by the ruler at some level of trade. The focus is on the growing need for more sophisticated mechanisms as the level of trade rises and approaches the efficient level.

The environment in which trade takes place has two kinds of players, a city and individual merchants. The merchants, identical and large in number, are identified with the points on the interval $[0, \bar{x}]$. The city—a potential trading center—has the following trading technology: if the number of traders passing through the city in a single period is x, the gross value of trade in that period is $f(x)$. In addition, suppose that there is a cost of $c > 0$ per unit of value traded incurred by the city for the services it provides and a cost $\kappa > 0$ per unit of value incurred by each trader, so that the net value of trade is $f(x)(1-c-\kappa)$. Assume that trade is profitable, that is, $c + \kappa < 1$. Also assume that f is nonnegative and differentiable, that $f(0) = 0$, and that f achieves a maximum at some unique value $x^* > 0$, which is referred to as the *efficient volume of trade*. In this model the city funds its services and earns additional revenues by charging a toll or tax of $\tau \geq c$ per unit of value passing through its ports, so that its total tax revenues are $\tau f(x)$. If it provides the services contracted for, its net revenue for the period is $f(x)(\tau-c)$. If the city breaches its contract by failing to provide services to a fraction ϵ of the traders, it saves $\epsilon c f(x)$, so its payoff for the trading period is $f(x)(\tau-c(1-\epsilon))$.[26] Traders who are not cheated each earn profits, net of costs, tolls, and taxes, of $(1-\tau-\kappa)f(x)/x$. Traders who are cheated pay taxes and incur costs κ but receive no revenues; each earns $-(\tau+\kappa)f(x)/x$.

This game is repeated period after period. The players' payoffs from the repeated game are the discounted sum of the periodic payoffs using a discount factor of δ. Thus the city's payoff when the trading volume is x_t in period t is given by:

$$\Sigma_{t=0}^{\infty} \delta^t f(x_t)(\tau - c(1 - \epsilon_t)). \tag{1}$$

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[25] This game is a version of the one-sided prisoner's dilemma game.

[26] This formulation captures the gains to the ruler from either abusing rights directly or neglecting to provide merchants with costly protection.

The payoffs of the individual traders are determined similarly, as the discounted sum of their periodic payoffs.

The specification of the model captures the idea that merchants are substitutes as far as the ruler is concerned and each merchant is relatively "small."[27] The historical observation that rulers could discriminate between traders is captured through the specification of the ruler's strategy. In discussing the Maghribis embargo on Sicily, we have seen that competition among alternative centers can sometime constrain abuses. Yet, abstracting from the issue of competition among alternative trade centers in general seems appropriate. The essence of medieval trade was that it was based on exchange of goods brought by traders from several regions to a particular trading place. Thus, by and large, without the cooperation of traders from other regions, the threat by a group of traders from a particular region to switch permanently to an alternative potential trade center was not credible.

The specification of the merchants' payoffs is based on the historical observation that merchants were most likely to trade abroad when they perceived that their rights were secure. The specification of the ruler's payoff reflects the fact that a ruler could gain from abusing rights or allowing his subjects to do so. Although the model equates the gains from abusing rights to the protection costs saved, one can think of gains from abuse as reflecting the gain from the ruler's confiscation of merchants' goods. The ruler's and the merchants' payoffs are specified to allow a conceptual and analytical distinction between distribution and efficiency. This specification treats the tax rate as given and hence refrains from examining the process through which the gains from trade are allocated. Any losses to the merchants above the agreed-upon rate of taxation are defined as abuse.

Analytically, this specification implies that any first-best outcome is characterized by the level of trade x^* in every period and the absence of cheating by the city. Different first-best utility allocations are achieved by setting different tax rates τ. Technically, this conclusion reflects the assumption that some value is lost when the ruler fails to provide protection. This is consistent with events such as those described earlier, in which failure to provide protection led to the

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[27] Each merchant is small in the sense that it can be considered as marginal in the model.

destruction of goods and loss of value. Whatever the merchants were willing to pay the ruler—that is, all issues of transfer—are modeled here as part of the tax.

Game 1: Informationally Isolated Traders: Bilateral Reputation Mechanism. The first model represents the situation of merchants who travel alone or in small groups with no social or economic organization. The traders remain unaware of how the city has treated other merchants. Only intertemporal linkages between each ruler-merchant transaction are considered. Although this model is surely too extreme to be fully descriptive, it highlights the difficulties faced by individual merchants negotiating with the city on their own but able to condition their future transactions on past conduct.

In this game, knowing only the history of his own decisions and his own past treatment by the city, a trader must decide whether to bring his goods to the city in each period. A strategy for the trader is a sequence of functions mapping this history into decisions about whether to offer his goods for trade in that period. Similarly, the city must decide the property of which traders to abuse under various conditions. A strategy for the city is a sequence of functions identifying a (measurable) subset of the current traders for the city to abuse as a function of who shows up to trade currently and the full past history of the game.

Readers familiar with either the economics of reputations or the theory of repeated games will recognize that the repetition of the interactions between the city and the individual traders creates the possibility for reputations to be created that enforce good behavior by the city. The idea is that a trader who is abused once might refuse to return to the city, reducing the city's profits. The effectiveness of this threat depends on both the frequency of trade and the periodic value of the individual merchant's trade in the city. If the frequency of trade is sufficiently high and the volume sufficiently low so that the value of the repeat business of any individual trader to the city is high, the simple reputation mechanism can be effective in providing the city with incentives to protect individual rights. In the analysis, however, when the volume of trade rises to the efficient level the value of repeat business falls to zero, so the usual conclusions of the Folk theorem of repeated games do not apply at the efficient level.

Proposition 4.1: No Nash equilibrium of game 1 can support honest trade ($\epsilon_t \equiv 0$) at the efficient level ($x_t \equiv x^*$), regardless of the levels of c, τ, κ, or δ.

Proof: Suppose there were such an equilibrium and consider the payoff to the city if it deviates from the equilibrium strategy and cheats a fraction ϵ of the first-period traders. In the initial period its payoff is $f(x^*)(\tau - c[1-\epsilon])$. In subsequent periods the informational assumptions of the model imply that the play of at most ϵ traders is affected. Consequently, at least $1-\epsilon$ traders come to the city in each future period, and the city's payoff from treating them honestly is, in present value terms, at least $\gamma(\tau - c)f(x(1-\epsilon))$ (for convenience define $\gamma = \delta/(1-\delta)$). So the city's total payoff from cheating a fraction ϵ of the traders in the first period and adhering to the purported equilibrium thereafter is at least

$$f(x)(\tau - c(1-\epsilon)) + \gamma(\tau - c)f(x(1-\epsilon)), \tag{2}$$

and this expression coincides exactly with the actual payoff when $\epsilon = 0$, that is, when the city adheres to the purported equilibrium. The derivative of expression 2 with respect to ϵ at $\epsilon = 0$ and $x = x^*$ is

$$cf(x^*) - \gamma(\tau - c)x^*f'(x^*) = cf(x^*) > 0, \tag{3}$$

because $f'(x^*) = 0$. This establishes that the city has a profitable deviation, that is, the specified behavior is not a Nash equilibrium. Q.E.D.

No mechanism based only on sanctions by those who are cheated can support honest trading at the efficient level, x^*, because when trading is conducted at that level, the marginal trader has zero net value to the city. By cheating a few marginal traders, the city loses nothing in terms of future profits but saves a positive expense in the present period. There is no institution in which the ruler's belief in a merchant's retaliation enables him to commit at the efficient level of trade. The belief that the ruler will respect rights at the efficient level of trade is not self-enforcing. To support the efficient level of trading, some kind of collective action among merchants is

needed.[28] Rendering collective action feasible, in turn, requires additional intertransactional linkages.

The proposition is stated in terms of the Nash equilibrium because it is a negative result: even with the most inclusive of noncooperative equilibrium concepts, the efficient volume of trade cannot be supported. For positive results, stronger, more convincing equilibrium concepts are used.

Game 2: Informationally Isolated Small Groups of Traders: An Uncoordinated Multilateral Reputation Mechanism. Information in medieval times was slow to spread by modern standards, but it was available. If a merchant was abused, even in the absence of any organization for diffusing information, some of his peers were likely to learn of it. Can this limited, uncoordinated diffusion of information reflecting informal linking of information transactions among merchants enable the ruler to commit not to abuse merchants at the efficient level of trade?

Suppose that an incident in which the city cheats a group of traders always becomes known to a larger group of traders. Formally, whenever a set T of traders is cheated, there is a set of traders $\hat{T} \supset T$, each of whom learns of the event. Assume that there is some constant K ($1 \leq K < \infty$) such that if the number of traders cheated is $\mu(T)$, then the number who learn about the event, $\mu(\hat{T})$, is no more than $K\mu(T)$: if few traders are cheated, then proportionately few discover that the event has occurred. Each trader makes his decisions to bring goods based on history of his actions and relationships with the city and the behavior of the city known to him toward other merchants. Cheating could then lead to a withdrawal of trade by a group many times larger than the group that was cheated. Even if this could be realized, however, it would not suffice to support an efficient volume of trade.

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[28] This result is not an artifact of the specification of costs. If the costs borne by the city include some fixed costs per trader (possibly in addition to the proportional costs), the city would have an even stronger incentive to reduce the number of traders, because it bears only a fraction τ of the resulting loss of value but saves all of the service costs. Making costs proportional to value minimizes the distortion in the city's incentives, but it still leaves the city tempted to seek short-term gains by cutting services at the expense of individual traders when only the bilateral reputation mechanism is at work.

Proposition 4.2: No Nash equilibrium of game 2 can support honest trade ($\epsilon_t \equiv 0$) at the efficient level ($x_t \equiv x^*$), regardless of the levels of c, τ, κ, or δ.

The proof is essentially the same as for the first proposition, except that the bound on the number of traders who decline to trade in the future is multiplied by K. Expression (3) is replaced by $c f(x^*) - \gamma K(\tau - c)x^* f'(x^*) = c f(x^*) > 0$.

Violations against a few merchants that are noticed only by proportionally few merchants cannot be deterred by a threat of retaliation by those with first hand knowledge.

The real situation faced by traders is considerably more complicated than that modeled in games 1 and 2. One important missing element concerns informal and word-of-mouth communication. Although game 2 allows that some traders are informed when the city cheats any trader, it also assumes that traders know nothing about who else is currently trading. This assumption is a device to rule out endogenous communication among the traders in the game, by which one trader may infer that another was cheated because he did not show up to trade. In theory, this kind of communication can be significant (Kandori 1992). Both word-of-mouth communication and some inferences of this kind could take place, but the model disallows them on the assumption that they were of minor importance for enforcing contract compliance. To the extent that informal communications and indirect inferences could provide effective information, the need for organized communication and coordination is reduced.

Game 3: Guild Organization with Coordinating Ability. We have seen that it is impossible for the city and traders to sustain an efficient level of trade based only on sanctions applied by small groups. Given the historical evidence of the existence of organizations that governed the relationships between traders and the city, it is natural to examine whether these could contribute to trade expansion. If these organizations, as conjectured here, linked information sharing transactions among *all* merchants, could they have supported the efficient level of trade? Could they have rendered self-enforcing the beliefs that no right will be abused in the efficient level of trade?

A crucial characteristic that separates formal organizations such as guilds from informal codes of behavior is the creation of specialized roles (positions), such as those of the guild's

aldermen to make decisions on behalf of the guilds' members. Determining how the guild organization selects its aldermen, identifying the private interests those merchants may have, and modeling how the guild organization manages the principal-agent problem of controlling the aldermen are complex issues that merit close analysis. Modeling the guild organization in this manner implies explicitly considering it as an institution in addition to an institutional element. Doing so and including these issues in the model here would only obscure the main point, however. For this reason these issues are set aside for future research, and the guild organization is modeled as a mere automaton. By considering different intertransactional linkages and hence assigning information and capabilities to the guild, it is possible to evaluate its contribution to trade expansion.

This subsection examines the role of the guild as an *organization* for communication and coordination. Assume that if the city cheats a set of traders, T, the guild discovers the event and announces an embargo with probability $\alpha(T) \geq \mu(T)$. This specification means that the more merchants were cheated, the more likely the guild organization is to realize that cheating had occurred. It does not imply, however, that the guild organization has better information than that which was available to merchants under the uncoordinated reputation mechanism examined in game 2. It implies only that if the guild discovers cheating, it can communicate it to all merchants.

In this game, the guild organization makes an embargo announcements mechanically and without any means of enforcement. Traders learn of the guild's announcement each period, but they are not forced to heed it. The announcement simply becomes part of the information available to them and to the city. In all other respects, the game is the same as game 1. Despite the guild organization's lack of enforcement ability, the mere change in information alters the set of equilibria.

Proposition 4.3: Suppose that $\tau + \kappa \leq 1$ and

$$c \leq \gamma(\tau - c) .\tag{4}$$

Then the following strategies form a Markov perfect equilibrium of game 3: The city does not cheat unless an embargo is announced by the guild organization leader; after an embargo is

announced, it cheats any trader who offers to trade. Traders offer to trade in a given period if and only if no embargo has been announced.[29]

The formal proof is by direct verification. Condition 4 implies that what the city stands to gain by cheating a trader, which is proportional to $cf(x^*)$, is less than the average future profits from each trader, which is $\gamma(\tau-c)f(x^*)$. With group enforcement, average trading profits rather than marginal profits determine the city's incentives. This accounts for the continued effectiveness of group sanctions even at the efficient level of trade.

In the institution captured in this equilibrium analysis, the city's behavior is motivated by the beliefs that abuse will lead to an embargo while respecting rights after an embargo is announced will not cause the resumption of trade. The expectation that their rights will be respected motivates traders to trade; the expectation of being abused motivates them not to trade after an embargo is announced. As these beliefs are commonly known, each side takes the other side's expected behavior as given, and each merchant and the city find it optimal to act as expected of them.

The equilibrium strategies contain a counterintuitive element: the city cheats any trader who offers to trade during an embargo. Traders' unanimous expectations that the city will behave this way cause all of them to honor the embargo. But why should the city not welcome traders during the embargo rather than cheat them? In a Markov perfect equilibrium, the city can be expected to cheat embargo-breaking traders only if it is in the city's interest to do so once the embargo has been announced. Given the specified strategies, if y traders violate the embargo and offer their goods, the city expects a payoff of $(\tau-c)f(y)$ in the current period and zero in future periods if it acts honestly. If it cheats, it expects $\tau f(y)$ in the current period and zero in the future. Cheating is therefore optimal.

Although the strategies described in proposition 4.3 constitute an equilibrium, the expectations and behavior that they entail seem implausible. The equilibrium requires, for example, that, no matter how desperate the city may be for renewed trade relationships, once an

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[29] This is a Nash equilibrium of the game with the properties that the player's strategies at any period depend only on whether an embargo was announced and each player's strategy at each period maximizes his payoff from that time onward, given the equilibrium strategies of the other players.

embargo has been announced, it nevertheless cheats anyone who trades with it. In addition, traders expect that behavior. By the equilibrium logic, the city behaves in this manner because it expects the embargo to take full hold in the next round whatever it does, so it anticipates that any cooperation it offers will be fruitless.

This equilibrium behavior does not match the historical facts very well, and it is of doubtful merit even as theory, because it supposes that the city and potential embargo breakers play the equilibrium with the lowest possible value for themselves. Scholars—notably Farrell and Maskin (1989), Bernheim and Ray (1989), and Pearce (1987)—have leveled similar criticisms at the equilibria of other repeated-game models.

None of the alternative concepts that these authors suggest applies directly to the model presented here, but all suggest that it is more reasonable to suppose that some cooperation may be achieved between traders and the city even after an embargo is announced. As an example, consider the possibility that mutually profitable *bilateral* agreements between the city and individual traders may be reached even during an embargo. It will be apparent from the logic of the arguments that any other kind of cooperation would lead to qualitatively similar conclusions.

Suppose that if some traders agree to trade with the city despite the embargo, they cannot rely on the threat of a group embargo to enforce their own claims against the city. What, then, can enforce honest behavior by the city during the embargo? A cheated trader can, for example, threaten to withdraw his own future trade. Proposition 4.1 established that the efficient level of trade, x^*, cannot be supported by such an equilibrium, but it leaves open the possibility that some inefficiently low level of trade can be supported. It is thus natural to ask: What is the highest level of exchange, x', that can be supported in this way?

Proposition 4.4: Assume that f is concave. Consider the strategies in which the city cooperates in each period only with traders whom it has never cheated and each trader offers to trade in each period if and only if he has not been cheated before. These strategies constitute a subgame perfect equilibrium of game 1 when the volume of traders is x and the taxes are τ if and only if for all $y \leq x$

$$0 \geq cf(y) - \gamma(\tau-c)yf'(y) . \tag{6}$$

A sufficient condition is that $0 \geq cf(x) - \gamma(\tau-c)xf'(x)$ and the elasticity $e(x) = d\ell nf(x)/d\ell n(x)$ is a decreasing function of x.

Proof: The traders' strategies are obviously best replies to the strategy of the city from any point in the history of the game, so only the optimality of the city's strategy needs to be proved. Beginning with x current traders, consider the subgame achieved after $x-y$ traders depart, when $y \leq x$ traders remain. By cheating a fraction ϵ of the y current traders, the city's payoff will be $g(\epsilon;y) = (\tau-[1-\epsilon]c)f(y) + \gamma f(y[1-\epsilon])(\tau-c)$. A necessary condition for the optimality of $\epsilon = 0$ is $\partial g(\epsilon;y)/\partial \epsilon \leq 0$ at $\epsilon = 0$. An easy calculation verifies that this is the same as condition 6, so the latter condition is necessary for all y.

By the optimality principle of dynamic programming, it is sufficient to show that there is no subgame in which the city would do strictly better by setting $\epsilon > 0$ in the initial period and then adhering to its equilibrium strategy thereafter, given the strategies of the others. If f is concave, then for all y, $g(\epsilon;y)$ is concave in ϵ, so a sufficient condition is that for all y, $\partial g(\epsilon;y)/\partial \epsilon \leq 0$ at $\epsilon = 0$, which is again equivalent to condition 6, proving sufficiency.

The elasticity can be rewritten as $e(x) = xf'(x)/f(x)$. Condition 6 is that $e(y) \geq c/[\gamma(\tau-c)]$ for all $y \leq x$, which follows from $e(x) \geq c/[\gamma(\tau-c)]$ and the hypothesis that $e(\cdot)$ is decreasing. Q.E.D.

Let x' be the largest solution to condition 6. The equilibrium described by proposition 4.4 suggests an interesting interpretation of the levels of trade, x', observed during boycotts, and it explains why some merchants continued to trade and others did not. According to the theory, additional traders, beyond the number x', would be cheated by the city and would be unable to exact retribution for their losses. Alternatively, if one thinks of the level of trade $x < x^*$ during the embargo as being determined by factors outside the model (such as existing alliances or other interests), then condition 6 implies that the minimum tax rate necessary to deter cheating is lower the lower x is. This confirms the intuition that an embargo breaker may be able to negotiate an unusually attractive deal, both because the value of trade per trader $(f(x)/x)$ is higher when x is small and because the minimum tax rate τ necessary to prevent cheating is lower for small x.

Proposition 4.4 implies that in the absence of a strong guild organization—one that can impose the embargo on its members—the guild cannot credibly threaten to reduce the city's

income to less than $f(x')$. This threat may or may not be sufficient to support honest trade, depending on the parameters γ, τ, and c. That is, an embargo that leaks may or may not be enough to deter the city from violating its agreement. If this kind of embargo is not sufficient, mutual gains may be achievable by strengthening the guild organization and enabling it to make a more powerful threat. The force of any potential embargo depends not only on $f(x')$ and $f(x^*)$ but also on the net rate of profit, $\tau - c$, earned by the city. Incentives for honest behavior by the city are stronger when taxes and tolls are high, because the city then has more to lose from an embargo. A strong guild organization can make it feasible to offer lower taxes and tolls while still promoting honest behavior by the city that, in a richer model, could lead to additional advantages in terms of increased value of trade.

A guild with coordination and enforcement abilities may be central to enabling trade expansion. It creates and reflects intertransactional linkages among all ruler-merchant transactions and the ruler's conduct in each transaction. The guild links information-sharing and coercive (and sometimes also economic) transactions by merchants with the ruler-merchant transaction. By also linking economic and coercive transactions, the resulting institution mitigates the deficiency of the institution described in game 3. The power of the guild enables it to render credible the belief that an embargo by all merchants will follow cheating.

Game 4: The Guild with Coordination and Enforcement Abilities. The last variant is a game in which the guild has the ability to force individual traders to comply. No formal analysis of this case is presented, because the only role of enforcement by the guild against member merchants in the formal model is to prevent trade during boycotts. Accordingly, the results are the same as in proposition 4.3, but traders participate in the boycott because they are required to do so, rather than because they expect participation to serve their individual interests.

4.3 Concluding Comments
Like all models in economics, the model presented here is stylized, abstracting from inessential details in order to highlight particular points. It enables us to capture a historically derived conjecture about the importance of particular intertransactional linkages and how they enabled

securing foreign merchants' property rights. The central transaction between a ruler and a merchant—in which the ruler provided protection in return for taxation—was linked to other transactions, namely, information-sharing and coercive transactions among the merchants themselves and transactions between the ruler and all merchants. This linkage—which manifested itself in, and was created by, the merchant guild organization—changed the set of self-enforcing beliefs in the central transaction in a way that rendered credible the ruler's commitment to respect rights as trade expanded.

Several inter-related social factors - rules, beliefs, and organizations - constituted the merchant guild institution. Together, these institutional elements enabled, guided and motivated a particular regularity of behavior: tax payment and respect of property rights. Rules provided the cognition, coordination, and information that enabled and guided behavior in the related transactions. They enabled merchants and rulers to make informed decisions by providing the micro-foundations of behavior. Rules specified, for example, the structure of the situation, who held membership in the guild, who was the legitimate tax collector, which actions constituted an abuse of rights, and how one went about filing a complaint against abuse. They also defined who had the authority to announce an embargo, what was expected of merchants during one, and the consequences of failing to adhere to expected embargo behavior.

Beliefs motivated individuals to comply with behavioral instructions provided by these rules. It was common knowledge that the prevailing internalized and behavioral beliefs were that merchants would pay tax and rulers would respect property rights. The merchant guild organizations produced and disseminated the rules, perpetuated the associated beliefs, and increased the set situations in which the beliefs supporting trade were self-enforcing. These organizations increased the set of self-enforcing beliefs by verifying actions, disseminating information, providing coordination, and credibly threatening to punish embargo-breakers.

Unlike the theory of the merchant guild organization as an instrument of monopoly by a local ruler, the theory presented here predicts that rulers will *encourage* the establishment of merchant guild organizations of foreign traders with specific rights and an effective organization. Such encouragement would not be expected if the sole purpose of guild organizations was to shift some of the fixed gains from trade from rulers to merchants, unless the encouragement itself

reflected the merchants' ability to coerce rulers to shift rent in merchants' favor. The historical evidence reveals that even when merchants could not coerce rulers by the threat of an embargo and even when the privileges provided to merchants did not entail any shift in rent, rulers did grant merchants various rights, including the rights to organize, hold courts and assemblies, elect their own consuls, and serve on juries when merchants were being tried.[30]

Unlike a cartel theory of guilds, which suggests that guilds form to reduce trade in goods in order to drive up relative prices, this analysis predicts that establishment of these guild organization rights expands trade. At least during the late medieval period, the historical evidence is consistent with this prediction. Although it is likely that the merchant guild organizations sought to advance the merchants' interests in many ways, including negotiating for rights to control prices, these rent-seeking activities cannot account for the patterns identified here.

As centuries passed and trade gave impetus to political integration, larger political units emerged, taking upon themselves the functions that the merchant guilds had performed. The political, commercial, and military relations among rulers enabled all rulers to commit to ensuring the safety of the foreign merchants frequenting their realms. Illustrative are such acts as those of the English kings, who made agreements and enforced embargoes to provide the English Merchants of the Staple and the Merchant Adventurers with security in their dealings with the Hanseatic League. As states evolved, the need for the merchant guild institution to secure merchants' rights declined.[31]

Merchant guild organizations did not disappear, however. Some became fiscal instruments that hindered trade expansion. Others consolidated their political power and, after securing their members' rights, turned to limiting the rights of their competitors. For example, although the establishment of the German Hansa enabled Northern European trade to flourish, once organized the Hansa's concern was not efficiency but profitability. In its constant efforts to preserve trade rights and supremacy, the Hansa crushed other traders' groups, without consideration of their

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[30]See also Carus-Wilson (1967, p. xviii) and *English Historical Documents*, 3:515–16. In Bruges the role of the guild in securing rights rather than achieving privileges is suggested by the city policy to provide all nations with the same rights (see de Roover 1948, p. 15).

[31] On the later relations between the Hansa and England, see Colvin (1971) and Postan (1973).

comparative efficiencies (Greif 1992). Thus a merchant guild that had facilitated trade in the late medieval period was transformed into a monopolistic organization that hindered trade expansion during the premodern period.

Although this chapter focuses exclusively on the role of the merchant guild institution at a particular time and place, the principles that applied then may help explain the emergence of other organizations and institutions in other places and times. The analysis explains why a powerful party might find it advantageous to help weaker powers organize themselves into entities that can exert countervailing power, in order to allow itself to commit to certain mutually beneficial arrangements. This explanation seems relevant and warranted regarding other issues. For example, French kings developed an elaborate system to help secure their borrowing and thereby enhance their ability to borrow.[32] The features of this system—which used the officer corps to aggregate loans and help borrowers coordinate and relied on the parliament to authorize the legality of royal edicts—suggests that the kings were trying to create organizations capable of collective action to enforce their fiscal promises.

The analysis also highlights the need to examine protection of property rights as private goods. At least since the time of Hobbes, scholars have considered the security of property rights as public goods provided to all or none. But protection can and often is a private good, as in the case of the merchant guild (Greif et. al.1994). In contemporary economies without the rule of law, protection is often awarded by the politically powerful to some—those who can reciprocate through their economic activity or political support—but not to others (Haber, Razo, and Mauer 2003).

More generally, this chapter highlights the fact that in order to understand whose property rights protection matters to economic prosperity, knowledge of the particularities of the economy is required. Understanding whether, how, and why such protection will or will not be forthcoming requires going beyond the prevailing political economy framework, which considers protection provided by such means as the division of power and constitutional protection. This chapter illustrates the need to examine the extent and the ways in which property rights are secured from

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[32] For details, see Root (1989) and P. Hoffman (1990).

coercion by institutions based on countervailing economic, political, social, and military powers (Greif 2004b).