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On the Enforcement of Trade Embargoes by the Merchant Guilds*

Nils-Henrik von der Fehr[†] David Harbord[‡]

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Abstract

Compensation from rulers of trading centres to merchants whose property rights had been violated was a notable feature of early European international trade. We demonstrate in a formal model that demands for compensation made threats by merchant guilds to impose trade boycotts self-enforcing for individual merchants, thus removing incentives for embargo breaking that could otherwise have rendered guilds powerless. Long-distance merchants were thus protected from predation by medieval city rulers, possibly providing a foundation for the trade expansion of the ‘Commercial Revolution’. We also address the frequently neglected issue of whether the guilds and cities would have agreed on the level of trade which they wished to support.

Keywords: International trade, institutions, noncooperative games, merchant guilds

JEL Classifications: C72, D02, N43

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I. Introduction

The revival of long-distance trade in Europe, from the 10th through 14th centuries, coincided with the expansion of urban areas, and the merchant guilds are often viewed as having provided an institutional foundation for this ‘Commercial Revolution’ (Lopez 1976).¹ The guilds, which operated in commercial centers everywhere in late medieval and early modern Europe, were organizations of merchants involved in long-distance commerce and local wholesale trade, clearly distinguished by contemporaries from craft guilds and guilds of local retailers that organized the interests of regional and local traders.² The largest and most influential merchant guilds, such as the German Hansa, participated in international commerce and politics and established colonies in foreign cities.^{3,4} In many cases, the guilds evolved into or became inextricably intertwined with the governments of their home towns. Merchant guilds tended to be wealthier and of higher social status than craft guilds.⁵

Debate still rages about why the guilds existed and the economic impact they exerted. As Gelderblom and Grafe (2010) point out, surprisingly little is known about how merchant guilds originated or what they actually did, and the precise role that they played in the expansion of trade during the Commercial Revolution remains controversial. The ‘traditionalist’ view is that the guilds were institutions designed to enhance the market power of particular merchant groups. By controlling trade, the guilds increased the bargaining power of merchants with the rulers of medieval cities, enabling them to shift some of the fixed gains from trade from rulers to merchants via the extraction of monopoly trading privileges and higher

¹See Gelderblom (2013), *‘the history of European trade between 1000 and 1800 is a history of urban competition’*. Richardson (2008), Greif, Milgrom and Weingast (1994), Greif (2006, Ch. 4), Gelderblom and Grafe (2010) and Kohn (2006) are modern exponents of the view that the guilds supported and facilitated the expansion of international trade in this period.

²See Gelderblom and Grafe (2010) and Gelderblom (2013). Ogilvie (2011) provides a wealth of information on both types of guild and emphasizes that most merchants only traded locally, hence most guilds were also local. Merchant guilds (or ‘alien merchant guilds’ in Ogilvie’s nomenclature) were often ‘colonies’ of merchants trading in foreign cities who were all members of the same local guild.

³The German Hansa (or ‘Hanseatic League’, as it was known in England), originated with the founding of Lubeck in 1159 and persisted roughly from the middle of the twelfth century until the middle of the seventeenth century (Weiner, 1932, Dollinger, 1970, and Lloyd, 1991). Section V and the appendix contain more detailed descriptions of the Hansa.

⁴According to Kohn (2003), alien merchants first established colonies in the early 12th century in the East—such as Acre, Antioch, Alexandria, and Constantinople—and soon after that in Rome, Naples, and Palermo. But by the end of the 13th century, colonies of alien merchants were to be found in cities throughout Europe. See also Coornaert (1967).

⁵See Richardson (2008). According to Kohn (2003), the *‘guilds were entirely an urban phenomenon, and they usually had a close connection with city government. In northern Europe, where cities were initially subject to local rulers, merchant guilds provided a form of governance and representation for those involved in commerce.’*

rents.⁶ More recently, a variety of authors have argued that merchant guilds were efficiency-enhancing institutions solving one or another of the incentives problems which beset early medieval trade, such as commercial insecurity, contract enforcement, social capital formation and information exchange.⁷ A more general version of this view regards guilds as social networks that generated beneficial social capital by sustaining shared norms, punishing violators of these norms, effectively transmitting information and successfully undertaking collective action.⁸

Gelderblom and Grafe (2010), for example, argue that the guilds helped long-distance traders solve two fundamental problems of exchange: protection against crime, warfare and arbitrary confiscation on the one hand, and the enforcement of contracts on the other.⁹ And in a much-cited article, Greif, Milgrom and Weingast (1994) argued that the guilds arose in response to the commercial insecurity of European merchants trading in foreign countries¹⁰, a view presaged earlier by De Roover (1965) and others (see Ogilvie 2011, pp. 193-5). According to this thesis, individual merchants engaging in long-distance trade faced high risks resulting from general commercial insecurity and arbitrary confiscations by medieval city rulers. Before a trading center was established, a city's rulers could promise to protect the rights of foreign merchants, but once trade had commenced, the rulers faced the temptation to renege on this pledge, by failing to provide the promised protection or by using their coercive power to confiscate merchants' property.¹¹ Without a credible commitment by the rulers of a trading center to provide a secure environment, alien merchants would have been deterred from trading there – an outcome that was inefficient for both the cities and the merchants. Reducing commercial insecurity and enhancing opportunities for expanding trade meant that the cities and the merchants needed a means to overcome the medieval cities' 'commitment problem'. A key role of the merchant guilds, according to Greif, Milgrom and Weingast, was to coordinate merchants' responses to cheating by city rulers, by enforcing trade

⁶Thrupp (1965) and North and Thomas (1973) provide the standard treatment of the guilds as cartels. Hickson and Thompson (1991) thoroughly review and critique the monopoly view of the guilds. Dessi and Ogilvie (2004) provide a more recent review of the historical literature.

⁷See Ogilvie (2011), Ch.1.

⁸Dasgupta (2000) refers to merchant guilds as social networks whose social capital facilitated commercial growth in Europe.

⁹Also Gelderblom (2013) who argues that *'the growth of European trade depended on the efforts of individual cities to protect merchants...because they expected to gain from trade'*. See also Hickson and Thompson (1991).

¹⁰See also Greif (2006), Ch. 4.

¹¹According to Kohn (2003), merchants in this period were subject to two types of predation. The first was the forcible seizure of property and persons; the second was the exaction of payment under threat of forcible seizure - tolls, taxes, fines, and the 'royal prise'. Much of the forcible seizure was either carried out by city governments or authorized by them.

embargoes against cities which failed to protect merchants' property rights. The guilds thus allowed mutually beneficial trade to occur at higher levels than would have otherwise been possible.¹²

More recently still, Ogilvie (2011) has devoted an entire book to refuting these claims. She argues that all of the efficiency interpretations of guilds are fanciful, and forcefully reasserts the view that the merchant guilds were efficiency-reducing monopolies which existed and survived for so long because they served the mutual interests of powerful merchants and city rulers, providing a mechanism whereby merchants and rulers could collaborate to extract more resources for themselves at the expense of the rest of the economy. *'Merchant guilds existed in so many economies for such a long time'* she argues, *'not because they were efficient in solving commercial problems in ways that benefited everyone, but because they were effective in enabling influential social groups to transfer resources to their own members, at the expense of society as a whole'*.

Whatever their interpretation of the function and role of the guilds¹³, however, all authors emphasize the fundamental importance of the guilds' economic power, specifically to launch and sustain trade embargoes against recalcitrant city rulers which failed to protect their rights and privileges. This power in turn depended upon the coercive power of guilds to enforce the participation of individual merchants in trade embargoes, typically via the threat of expulsion, when it may not have been in their individual interests to do so.

Ogilvie (2011, p. 83) observes that everywhere in Europe merchant guilds invested in systems to detect and penalize guild members who violated cartel rules and policies (see also Ogilvie 2011, p. 139). Gelderblom and Grafe (2010) suggest that the ability of a mercantile organization to prevent 'free-riding' by being able to exclude members for violating guild policies *'was an important and distinctive development in the organization of the guilds'*. Sachs (2006) tells us that *'boycotts could be maintained by punishing guild members who violated the rules of the cartel'*, citing the ostracism in 1281 of Jakemin of Liège from the guild of Leicester (although

¹²As Grief *et al.* summarize their argument: *'It is our thesis that merchant guilds emerged with the encouragement of the rulers of trading centers to be a countervailing power, enhancing the ruler's ability to commit to the security of alien merchants, and laying an important institutional foundation for the growing trade of that period.'*

¹³We do not enter into this historical controversy in this paper, but note that the thesis that the guilds were primarily concerned with extracting and maintaining monopoly trading privileges is not entirely inconsistent with the view that their activities may also have permitted trade to expand beyond levels which otherwise would have occurred. Greif (2006, p. 94) for example argues that, *'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.'* Ogilvie (2011) rejects all such claims, however.

not for failing to participate in a trade embargo in this instance). And Kohn (2003, p.13) is very explicit on this score:

‘To be effective, an embargo had to be total: all the members of the association had to participate. This was a problem, because an individual member could do better for himself by ignoring the embargo, even though this undermined the position of the group as a whole. So it was important that a merchant association was able to impose discipline on its members: an effective system of internal order was indispensable.’

Greif, Milgrom and Weingast (1994) (also Grief 2006, Ch. 4) also rely entirely on the power of the guilds to enforce compliance to trade embargoes to explain their ability to sustain more efficient levels of trade. They argue that neither bilateral reputation mechanisms (in which a merchant whose rights were abused ceases trading), nor ‘informal’ multilateral reputation mechanisms (in which the cheated merchant and his close associates cease trading) would have been sufficient to overcome medieval cities’ commitment problem, creating the need for an institution which could coordinate the responses of a large fraction of merchants to offenses against merchant property, and enforce them by imposing sanctions on individual merchants. Efficient trade would not have been possible if the guilds lacked the ability to enforce compliance to trade embargoes (for example, by expelling merchants who refused to comply with trade boycotts), as credible incentives for ‘embargo breaking’ would have rendered the guilds powerless.¹⁴

Our purpose in this paper is to provide a different characterization of how the guilds overcame a medieval city’s incentives to cheat foreign merchants, or the ‘commitment problem’, which does not rely on the coercive power of guilds to enforce the participation of individual merchants in trade embargoes. Using a more general model than that of Grief *et al.*, we show that sustaining more efficient levels of trade implied an ability on the part of the guilds to restrict their membership and to condition their punishment strategies accordingly (i.e. by only threatening trade embargoes when guild members rights were violated), but that no internal enforcement mechanism was necessary. Our formulation of the guilds’ equilibrium strategies – based on an extensive review of the historical evidence – makes the threat to impose a trade boycott self-enforcing in the absence of other enforcement mechanisms, thus resolving the credibility issue and allowing higher levels of trade to be achieved.

¹⁴As Greif, Milgrom and Weingast put it, ‘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 enforce them, by applying sanctions on its own members’.

This matters because the ultimate sanction a guild could impose on its members was expulsion, or exclusion, from the guild and its trading privileges.¹⁵ This sanction is unlikely to have been effective against embargo breaking, however, and presumably for this reason was rarely, if ever, used for such purposes. While Greif, Milgrom and Weingast (1994) attribute much of the success of the German Hansa to its increased ability, after 1307, to enforce trade boycotts by making use of the threat of expulsion, the historical evidence does not support their thesis.¹⁶ Although the Hansa used the economic weapon of the trade embargo successfully, and repeatedly, from the thirteenth to fifteenth centuries in numerous countries, it is clear from Dollinger's (1970) account that German towns only participated in these when it was in their self-interest to do so and the threat of sanctions and exclusion, although present, was almost never used. The unique case of the expulsion of Bremen in 1284 (for refusing to support a trade embargo against Norway), which is described in Greif, Milgrom and Weingast (1994, p. 760) as a 'milestone' in Hansa organization, more accurately illustrated the limited power of this threat, as Bremen's merchants traded successfully outside of the Hansa for the subsequent 74 years.¹⁷ As Dollinger (1970, pp. 108-109) observed, exclusion was a 'two-edged weapon' since excluded merchants could carry on trading outside of the guild, at the expense of guild members. Examples of exclusion or expulsion of individual merchants for refusing to participate in trade embargoes are also essentially absent from the historical literature.¹⁸

The key insight of our analysis is that the guilds' universal practice of demanding compensation from city rulers when their rights were violated changed the incentives of city rulers and hence of individual guild members, making participation in trade embargoes individually advantageous, and thus self enforcing, for merchants (i.e. a Nash equilibrium). While earlier analyses have concentrated on the effectiveness of trade embargoes to obtain protection and negotiate trading privileges for the merchant guilds, the historical evidence makes clear that this threat was only used when cities refused to pay compensation to merchants whose property rights had been violated. The resumption of trade after an embargo had been implemented

¹⁵Greif, Milgrom and Weingast (1994, p.757) and Greif (2006, p.104) state the traditional view that the guilds' ultimate sanction against individual merchants was exclusion from their monopoly trading privileges and rents. See also Gelderblom and Grafe (2010) for a strong restatement of this view.

¹⁶As we show in Section V below.

¹⁷Dollinger (1970, p. 66-67).

¹⁸Recall the case cited by Sachs (2006) mentioned immediately above which did not concern a trade embargo. In Section V below and in the appendix we describe the historical evidence on this score in more detail, particularly noting the largely unsuccessful attempts of the German Hansa to use the threat of exclusion to impose discipline on Hansa towns.

also typically depended upon merchants first being indemnified for past losses.¹⁹

We reformulate the guilds' equilibrium strategies to include a demand for compensation, and show that this can make the threat to impose a trade boycott self-enforcing for individual merchants. We thus resolve the enforcement problem and show how the guilds could credibly threaten to impose trade embargoes via their ability to '*curtail a city ruler's ability to undermine an embargo by offering special terms to violators*' (Greif, Milgrom and Weingast, 1994, p. 757). The guilds did not need the power to coerce individual merchants to take part in the punishment of cities, since they could rely on their private equilibrium incentives to do so.

It is worth noting that the expectation of the payment of compensation by cities is not the reason that individual merchants' incentives are more closely aligned with those of the guild under the equilibrium strategies posited in this paper. Compensation was typically only paid to guild members whose rights had been violated, or goods robbed or confiscated. Hence most merchants would not have expected to receive any payment for participating in trade boycotts. Rather, the demand for compensation made it in the cities' interest to cheat embargo breakers and resume trade with the guild at the first opportunity, whenever an embargo was called. This made offering to trade during embargoes unprofitable for individual merchants and hence participation in trade boycotts in their individual interest.

Our theory of how the guilds' overcame the enforcement problem is firmly based in the historical literature and allows us to provide a richer picture of how the guilds may have facilitated trade expansion by controlling merchant trading activities. It does not tell us, however, whether merchants and the cities would have agreed on the level of trade that they wished to support. If the guilds had the power to restrict the equilibrium volume of trade, they would likely have wished to impose a sub-optimal level of trade from the cities' point of view. The same ability to restrict trade could also have been used to negotiate favorable tax treatment for guild members in return for an agreement to expand trade towards levels preferred by city rulers level, however. As such, our reformulation can be seen as at least partially reconciling the two opposing views of the function of the guilds discussed above.

In the remainder of this paper we provide a new formulation of the theory of guilds to address these issues. Section II describes the model. Section III explains how compensation payments could credibly sustain trade via bilateral punishment strategies. Section IV analyses the introduction of demand for compensation into the guilds' equilibrium strategies, and we demonstrate that these would have been sufficient to sustain efficient trade even in the absence of formal enforcement mech-

¹⁹We provide the historical evidence for these claims in Section V below.

anisms, or sanctions, to deter embargo breaking. Section V discusses some of the relevant historical evidence. Section VI discusses what levels of trade may actually have been achieved and Section VII concludes.

II. A Formal Model

We begin by specifying an infinite horizon repeated-game model of trade between merchants and a city. In a given period, if the number of merchants is $m > 0$ the gross value of trade is given by the function $v(m)$. The city's costs of providing protection to merchants is given by the function $c(m)$, where $c(m)$ can depend on the number of merchants m or the value of trade $v(m)$. We assume that both v and c are non negative and continuously differentiable over the relevant range, that c is convex and that $v(0) = c(0) = 0$. We also assume that the net value of trade $v(m) - c(m)$ is concave, positive somewhere and achieves a unique maximum at m^* , which we denote as the 'efficient' level of trade, defined by the condition $v'(m^*) = c'(m^*)$.

Medieval cities benefited from trade in a variety of ways, including by selling monopoly rights and directly taxing merchants.²⁰ We denote the city's benefit function by $\tau(m)$, which can depend on the number of merchants m or the value of trade $v(m)$. We assume that $\tau(m)$ is non negative and continuously differentiable and that $\tau(0) = 0$. We also assume that the city extracts only part of the gross value of trade, specifically that $\tau(m) < v(m)$ and $\tau'(m) < v'(m)$ for all relevant m . The city's payoff from protecting m traders is thus $\tau(m) - c(m)$, which we assume to be concave and positive for relevant m and achieve a unique maximum at m^C , the city's preferred level of trade, defined by the condition $\tau'(m^C) = c'(m^C)$. Note that by the assumption that $\tau'(m) < v'(m)$, the city's preferred level of trade is less than the optimal, i.e. $m^C < m^*$. If the city fails to protect a fraction $0 < \epsilon \leq 1$ of merchants, its net payoff is $\tau(m) - c((1 - \epsilon)m)$. The city may offer to pay a compensation $\epsilon k(m)$ to the ϵm merchants whom it failed to protect in the past.

An individual merchant's payoff when protected by the city is $\frac{1}{m}(v(m) - \tau(m))$. Merchants who are not protected collect no revenues and so earn $-\frac{1}{m}\tau(m)$.²¹ Mer-

²⁰According to Gelderblom (2008), medieval cities benefited from long-distance trade in numerous ways: (i) by directly levying monopoly fees or customs duties, or through excises on consumer goods or impositions on the income and wealth of merchants; (ii) the mercantile community was a principle source of credit for city rulers; (iii) as suppliers of ships, weapons and ammunition; and (iv) early modern rulers attached great value to the role of trade in supplementing the state's stock of gold and silver. In return, merchants expected the government to protect their person and goods against theft and robbery, and to refrain from arbitrary confiscation and imprisonment.

²¹The natural interpretation is that unprotected merchants suffer losses post trade, i.e. after the

chants who are compensated receive an additional payoff of $\frac{1}{m}k(m)$.

Each player – the city and the merchants – discounts future payoffs at rate $\delta \in (0, 1)$. We define $\gamma = \frac{\delta}{1-\delta}$ to be the present value of an infinite annuity of 1 with payment starting in the next period.

We consider subgame perfect equilibria of this game. We restrict attention to equilibria in which the city deals with the same group of m merchants over time and compensation plays an active part in the strategies. In particular, at equilibrium the m merchants offer to trade in each period until cheated, and then to refuse to trade further until the compensation $\frac{1}{m}k(m)$ is paid to them (other merchants do not offer to trade). Furthermore, the city provides protection to the m trading merchants (and leave all other merchants unprotected), and, if the city has failed to protect a fraction ϵ of the m merchants in any period, pay the compensation $\epsilon k(m)$ to them at the first opportunity (and never pay compensation to other merchants).

III. Compensation To Support Bilateral Punishment

We first consider the case in which merchants' responses to being cheated or unprotected by the city are uncoordinated. Then neither the efficient, nor the city's preferred, level of trade can be supported as repeated game equilibria.

Proposition 1. *Define \hat{m} to be the largest m such that $\delta\tau'(m) \geq c'(m)$. Then, when merchants behave independently, trade with at most \hat{m} merchants can be sustained at equilibrium, where $\hat{m} < m^C < m^*$.*

In any equilibrium, if the city cheats a fraction ϵ of merchants in some period t and pays the compensation $\epsilon k(m)$ at the first opportunity (i.e. in period $t + 1$), trade at m is resumed immediately, while if the city refuses to pay compensation it trades with the remaining $(1 - \epsilon)m$ merchants.²²The city's payoff from cheating and then refusing to pay compensation indefinitely is

$$\tau(m) - c((1 - \epsilon)m) + \gamma(\tau((1 - \epsilon)m) - c((1 - \epsilon)m)), \quad (0.1)$$

whereas if it pays the compensation $\epsilon k(m)$ in period $t + 1$ and behaves honestly

value of trade $v(m)$ has been realized, rather than pre trade.

²²We envisage the following order of moves in any period: first, the city has the opportunity to pay compensation to any merchant it has cheated in the past; second, merchants decide whether or not to trade; third, the city decides whether to cheat any of the current traders; and finally, payoffs are realized.

thereafter it receives

$$\tau(m) - c((1 - \epsilon)m) - \delta\epsilon k(m) + \gamma(\tau(m) - c(m)). \quad (0.2)$$

Hence a necessary condition for compensation to be paid in period $t + 1$ is

$$\delta k(m) \leq \frac{\gamma[(\tau(m) - \tau((1 - \epsilon)m)) - (c(m) - c((1 - \epsilon)m))]}{\epsilon}. \quad (0.3)$$

For the city to prefer playing the honest strategy in period t over cheating a fraction ϵ of merchants and then paying compensation $\epsilon k(m)$ in period $t + 1$ requires

$$(1 + \gamma)(\tau(m) - c(m)) \geq \tau(m) - c((1 - \epsilon)m) - \delta\epsilon k(m) + \gamma(\tau(m) - c(m)), \quad (0.4)$$

which yields

$$\delta k(m) \geq \frac{c(m) - c((1 - \epsilon)m)}{\epsilon} \quad (0.5)$$

We thus have

$$\frac{c(m) - c((1 - \epsilon)m)}{\epsilon} \leq \delta k(m) \leq \frac{\gamma[(\tau(m) - \tau((1 - \epsilon)m)) - (c(m) - c((1 - \epsilon)m))]}{\epsilon}, \quad (0.6)$$

and taking limits (i.e. letting $\epsilon \rightarrow 0$),

$$(1 + \gamma)c'(m) \leq \gamma\tau'(m), \quad (0.7)$$

or

$$\delta\tau'(m) \geq c'(m). \quad (0.8)$$

Finally, from $\delta\tau'(m^*) < \delta v'(m^*) < v'(m^*) = c'(m^*)$ and $\delta\tau'(m^C) < \tau'(m^C) = c'(m^C)$, as well as the convexity of c and the concavity of $\tau - c$, it follows that $\hat{m} < m^C < m^*$.

Note that the limit on trade, \hat{m} , that may be achieved when merchants behave independently is the same as that in the model of Greif, Milgrom and Weingast (1994), that is the condition defining \hat{m} is the same. This condition says that, at the margin (i.e. for a single merchant), the loss of future tax revenue must exceed the cost saving from not protecting merchants and this trade-off is present in both models. The nature of the equilibria are different, however. Here compensation ensures that equilibrium is renegotiation proof, in that merchants are unwilling to renegotiate and resume trade immediately after being cheated because they expect

to be paid compensation.^{23,24} In other words, compensation credibly sustains punishment strategies for failing to protect trade. In particular, we have the following result:

Proposition 2. *Suppose that (0.3) and (0.5) are satisfied for all $m \leq \hat{m}$ and $0 < \epsilon \leq 1$. Then trade with $m \leq \hat{m}$ merchants may be sustained as an equilibrium if $\tau(m) \geq (1 - \delta)v(m) + \delta c(m)$.*

From the argument above, we already know that the city's strategy is a best response to merchants' strategies. Consider next the merchants' incentives. A cheated merchant's demand that the city pay compensation is credible if: (i) the merchant expects to receive the compensation in period $t+n$ if it was refused in period $t+n-1$; and (ii) refusing to renegotiate (i.e. by returning to the level of trade m without first receiving compensation) is preferable to renegotiation. The first condition requires that in any period $t+n$, $n = 1, 2, \dots$, the city prefers to pay compensation immediately rather than waiting one period, which is guaranteed by the condition (0.3). The second condition requires that merchants who have been cheated prefer to wait to obtain compensation over renegotiation, i.e.

$$\delta k(m) + \gamma(v(m) - \tau(m)) \geq (1 + \gamma)(v(m) - \tau(m)), \quad (0.9)$$

or

$$\delta k(m) \geq v(m) - \tau(m). \quad (0.10)$$

Combining with (0.3), we require

$$v(m) - \tau(m) \leq \gamma(\tau(m) - c(m)), \quad (0.11)$$

or

$$\tau(m) \geq (1 - \delta)v(m) + \delta c(m). \quad (0.12)$$

²³We are following Farrell's (2000) definition of a 'quasi-symmetrically weakly renegotiation-proof equilibrium' here.

²⁴In the absence of compensation payments the posited bilateral punishment strategies would not be credible. Why should merchants refuse to trade with a city which has cheated them in the past when mutually profitable trade is possible on terms which the city would credibly respect? Suppose, for example, that a subgame is reached in which the city has cheated $m-n$ of traders, with $n < \hat{m}$. Then a merchant who was cheated in the past will know that the city's incentives, under the specified strategies, is not to cheat on additional trade agreements until $n = \hat{m}$. The specified strategies are not renegotiation-proof, as both merchants and the city will, in some subgames, prefer to return to the equilibrium path of play rather than carry out the required punishments.

IV. Compensation To Support Embargoes

In the preceding section compensation payments were used to credibly sustain trade via bilateral punishment strategies, i.e. punishment strategies in which only traders who have been cheated refuse to trade until compensation has been paid. But demands for compensation can also be used to sustain higher levels of trade, by making a merchant guild's threat to impose a trade boycott self-enforcing for individual merchants. They thus resolve the enforcement problem noted by Greif, Milgrom and Weingast (1994).

To demonstrate this, we consider a guild with m members and specify the following strategies in any trading period. The guild's strategy is to announce a trade boycott until the compensation $\epsilon k(m)$ has been paid if the city ever cheats a fraction ϵ of guild members, with $0 < \epsilon \leq 1$. Merchants who are guild members offer to trade if and only if no boycott has been announced by the guild. Merchants who are not guild members do not offer to trade with the city. The city's strategy is: (i) to protect trade with m guild members unless a boycott has been announced by the guild; (ii) to cheat any merchant who offers to trade that is not a guild member; (iii) if a boycott is announced by the guild at the end of period t , pay the demanded compensation $\epsilon k(m)$ at the first opportunity (i.e. the beginning of period $t + 1$); and (iv) cheat any merchant that offers to trade during a boycott before compensation has been paid.²⁵ We then have the following result:

Proposition 3. *Assume $\delta(\tau(m) - \tau(\hat{m})) \geq c(m) - c(\hat{m})$ for all $m \in (\hat{m}, m^*]$. Then any level of trade $m \in (\hat{m}, m^*]$ can be sustained by the strategies described above and a compensation payment of $\delta k(m) = c(m)$.*

In the previous section, we saw that the city prefers playing honestly over cheating a fraction ϵ of traders and paying compensation ϵk at the first opportunity if the condition (0.5) is satisfied. For the city to prefer paying compensation ϵk at the first opportunity when a boycott has been announced, to facing an indefinite trade embargo requires

$$-\delta \epsilon k(m) + \gamma(\tau(m) - c(m)) \geq 0, \quad (0.13)$$

²⁵That is, we assume the following order of moves in any period t . **If no boycott is in force at the beginning of period t :** first, individual merchants decide whether to offer to trade; second, the city decides whether to cheat any of the current traders; third, the guild decides whether to announce a trade boycott; and finally, payoffs are realized. **If a boycott is in force at the beginning of period t :** first, the city has the opportunity to pay the compensation demanded by the guild; second, the guild decides whether to discontinue the boycott; third individual merchants decide whether to offer to trade; fourth, the city decides whether to cheat any of the current traders; fifth, the guild decides whether to announce a trade boycott; and finally, payoffs are realized.

or

$$\delta \epsilon k(m) \leq \gamma(\tau(m) - c(m)), \quad (0.14)$$

for all $0 < \epsilon \leq 1$. These two conditions together require

$$(1 + \gamma)c(m) \leq \gamma\tau(m), \quad (0.15)$$

or

$$\delta\tau(m) \geq c(m). \quad (0.16)$$

Clearly guild members will wish to offer to trade under these circumstances. Non-guild members will not offer to trade under a bilateral trade agreement, however, since the city's 'threat' to cheat them is credible when $m > \hat{m}$ (remember that \hat{m} is the highest level of trade that can be supported by bilateral punishment strategies). Thus trade at m can be sustained by these strategies so long as the guild's threat to impose a trade boycott when compensation is not paid is credible, i.e. not subject to embargo breaking by individual merchants.

For a boycott to be credible in this sense, we need to show that individual merchants will not profit from breaking a guild-imposed trade embargo, because they expect the city to cheat them. That is, we need to show that the city will prefer to follow its equilibrium strategy of paying compensation over reverting to bilateral trade agreements with embargo breakers.²⁶ We adopt the natural assumption that the guild does not protect embargo breakers by imposing a further trade boycott when they are cheated by the city.²⁷

Three types of embargo breaking can be considered. First, embargo breaking by individual merchants who do not coordinate their trading strategies; second, embargo breaking by 'coalitions' of individual merchants who coordinate on their offers to trade, but not on their punishment strategies; and finally, embargo breaking by alternative guilds. To keep things simple, it is easiest to think of the set of non-guild merchants as being 'large' relative to the size of the original guild, so that

²⁶In other words, we need to resolve the conundrum pointed out by Greif, Milgrom and Weingast (1994) in their model without compensation, that the specified strategies lack credibility in that *'the expectations and behavior that they entail seem implausible'*. Why should the city cheat all merchants who offer to trade during a trade embargo when *'mutually profitable trade is possible on terms which the city would credibly respect'*, that is, when mutually profitable bilateral trade agreements between the city and individual merchants ('embargo breakers') may be reached up to the level \hat{m} . Similarly, why should merchants (i.e. embargo breakers) refuse to trade with a city which has cheated others in the past? In the literature on renegotiation-proofness, similar criticisms have been leveled at the equilibria of other repeated game models, see e.g. Bernheim and Ray (1989) and Farrell and Maskin (1989), and more recently by sociobiologists, e.g. McElreath and Boyd (2007) and Gintis (2004).

²⁷As Kohn (2003) notes, a guild *'provided its members with protection against predation'*, and ignoring a trade embargo meant *'becoming an outlaw, with no such protection'*.

coalitions of any size can form.

Given that the guild has announced a boycott, an offer of a bilateral trade agreement by an individual merchant is of no value to the city, since $v(0) = 0$. If, on the other hand, the city pays the compensation ϵk demanded by the guild at the next opportunity and resumes trade at m , its payoff is given by (0.13).²⁸ Assuming that (0.14) is satisfied, the city is better off cheating any such merchant and paying the required compensation. Therefore, when (0.15) is satisfied, a compensation level $\delta \epsilon k \leq \gamma(\tau(m) - c(m))$ is sufficient to ensure that the city will always prefer to cheat an individual embargo breaker and return to the equilibrium level of trade m . This is sufficient to deter embargo breaking because individual merchants expect every other merchant to follow the equilibrium strategy, and not offer to trade. Incentives for embargo breaking are alleviated, and any volume of trade $\hat{m} \leq m \leq m^*$ can be supported as an equilibrium.²⁹

A stronger condition on the equilibrium strategies would require that they be immune to ‘renegotiation’ by coalitions of individual embargo breakers and the city. We assume that the embargo breakers do not form an alternative guild, however, i.e. they do not coordinate their strategies in response to cheating by the city. So the maximum size of an embargo-breaking coalition is \hat{m} as defined above, since this is the maximum volume of trade that be sustained by purely bilateral trade agreements.

To see that the level of trade m can still be supported as an equilibrium, assume there are $\tilde{m} \leq \hat{m}$ embargo breakers, i.e. merchants who collectively offer to trade under bilateral trade agreements with the city during a boycott. For the city to prefer to cheat them, pay the compensation ϵk demanded by the guild, and then resume trade at m requires

$$\tau v(\tilde{m}) - \delta \epsilon k + \gamma(\tau(m) - c(m)) \geq (1 + \gamma)(\tau(\tilde{m}) - c(\tilde{m})), \quad (0.17)$$

or

$$\delta \epsilon k \leq (1 + \gamma)c(\tilde{m}) - \gamma\tau(\tilde{m}) + \gamma(\tau(m) - c(m)). \quad (0.18)$$

Under condition (0.7), the right-hand side of (0.18) is minimized for $\tilde{m} = \hat{m}$.

²⁸That is, we are considering the subgame in which in period t , the city has cheated in some period $t-n$, $n \geq 1$, has not yet offered to pay compensation, and receives an offer to trade from an individual merchant. It is only necessary to consider individual offers of embargo breaking because each merchant expects all other merchants to adhere to their equilibrium strategies. But see below.

²⁹If the guild attempted to enforce a volume of trade m less than \hat{m} , the part of the city’s strategy which calls on it to cheat any merchant who is not a guild member would not be sustainable, since it can credibly and profitably enter into bilateral trade agreements with a further $\hat{m} - m$ traders.

Combining (0.5) and (0.18) we thus have the condition

$$c(m) \leq \delta \epsilon k \leq \gamma (\tau(m) - c(m)) - [\gamma \tau(\hat{m}) - (1 + \gamma) c(\hat{m})], \quad (0.19)$$

implying

$$(1 + \gamma) (c(m) - c(\hat{m})) \leq \gamma (\tau(m) - \tau(\hat{m})), \quad (0.20)$$

or

$$\delta (\tau(m) - \tau(\hat{m})) \geq c(m) - c(\hat{m}). \quad (0.21)$$

The above condition can only be satisfied if the additional value of trade to the city $\tau(m) - \tau(\hat{m})$ increases rapidly enough above \hat{m} to offset the increase in protection costs $c(m) - c(\hat{m})$, so that the city's losses from reducing the value of trade to \hat{m} by trading with embargo breakers are large enough. Otherwise, the city would prefer to cheat guild members and revert to trading under bilateral trading agreements at \hat{m} .³⁰ The condition will always be satisfied if protection costs are constant (i.e. independent of the number of traders or the value of trade, as some authors suggest), or proportional to the value of trade as assumed in Greif, Milgrom and Weingast (1994)³¹

Finally, what if alternative guilds can form and offer to trade under the strategies specified above after a boycott has been announced? Under condition (0.15), it is easy to see from the immediately preceding argument that the original guild must then contain exactly m^C members. Otherwise, an alternative guild containing m^C members can form during a boycott and replace the original guild by offering to trade at the city's preferred level. Competition between alternative guilds thus restricts the levels of trade which any particular guild can implement.

V. Sustaining Equilibrium Trade: Trade Embargoes And Compensation

We have shown that sustaining more efficient trade implied an ability on the part of the guilds to restrict their membership, and to condition their punishment strategies

³⁰It is worth observing, however, that assuming that there are \hat{m} embargo breakers is the worst possible case for the guild, and the necessary condition is significantly relaxed as the number of embargo breakers is reduced.

³¹Greif, Milgrom and Weingast assumed that the city's protection costs were equal to $c \cdot v(m)$ and its benefits from trade equal to $\tau \cdot v(m)$, with $0 < c < \tau < 1$. Under these assumptions condition (29) is always satisfied, for any level of trade, from condition (??) (which corresponds to condition (4) in Greif, Milgrom and Weingast). Our model thus entirely resolves the enforcement problem, and hence the "commitment problem", in the special case considered by Greif, Milgrom and Weingast

accordingly (i.e. by only threatening trade embargoes when guild members rights were violated), but that no internal enforcement mechanism was necessary. By including a demand for compensation in their equilibrium strategies, the guilds would have been able to resolve the enforcement problem, and hence ‘commitment problem’ noted in Greif, Milgrom and Weingast (1994), by making trade embargoes (or multilateral punishments) self-enforcing. They would thus have been able to support trade at higher levels than otherwise, even in the absence of an internal enforcement mechanism to punish ‘embargo breakers’.³²

Our analysis is based on two important assumptions. First, we assume that medieval cities could elicit trade from specified subgroups of traders, and could condition their strategies accordingly. That is, cities could offer protection to just those merchants in a specified subgroup, and leave all other merchants unprotected. This assumption is in accord with the historical evidence. It was not unusual for the rulers of medieval cities to guarantee safe passage to particular merchants, or groups of merchants, traveling through their territories for trade. Gelderblom (2005) details many such instances,³³ and Greif, Milgrom and Weingast (1994, p. 752) note that ‘*in medieval trade ... a city could discriminate among merchants, abusing or not protecting them selectively*’.³⁴ Gelderblom and Grafe (2010), noting the ability of the English Company of Merchant Adventurers in Antwerp and Middelburg to exclude merchants from participation in the cloth trade, suggest that ‘*the ability of a mercantile organization to prevent free-riding, and reserve the economic benefits of its operations to the membership*’ was an important and distinctive development in the organization of the guilds.³⁵ Finally, Ogilvie (2011, pp. 214-215) points out that merchant guild trade embargoes were never aimed at enhancing general security for commerce, but rather to expand the privileges of the members of that particular guild, which included privileges related to security as well as other issues (e.g. taxes).

Second, we resolve the ‘credibility’ issues raised above (i.e. renegotiation-proofness)

³²Although as noted in the introduction, we remain agnostic as to whether the value of trade supported was equal to the monopoly level (as advocated by Ogilvie 2011) or the ‘efficient’ level (as advocated by Greif, Milgrom and Weingast (1994)).

³³Gelderblom (2005) tells us, for example, that: “*In 1243 – ten years earlier than in Flanders – merchants from Lübeck and Hamburg already received letters of safe-conduct from the Count of Holland, who hoped they would use Dutch inland waterways to reach Bruges.*” See also Lopez et. al. (2001).

³⁴And Greif (2006) p. 92) tells us that ‘*...the ruler could discriminate among merchants respecting the rights of some but not others. Protection of rights was a private good rather than a public one, as a ruler could respect the rights of some merchants but not others*’.

³⁵Gelderblom and Grafe describe this as the ‘*power of exclusion*’ and consider it the highest form of control, defined by an ability to exclude non-members (and members who infringed on their own rules) from a particular market.

by including demands for compensation in merchants' strategies. The historical evidence suggests that medieval merchants only attempted to enforce trade embargoes on cities after they had refused to pay compensation to traders whose property had not been protected. The resumption of trade also typically depended upon merchants first being indemnified for past losses. Gelderblom (2005) tells us:

'Besides defense and deterrence, protection also implied the ability of traders to get compensation if their person and goods are damaged. In medieval Europe merchant guilds took to collective action, often with the support of their home government, to claim damages from host rulers. Soon enough host rulers set up a court system to allow local and foreign traders to recoup losses from privateering, wrongful arrests, corruption, and commercial disputes.'

Examples of successful demands for compensation, backed by the threat of embargoes, abound in the historical literature. In 1340, Tabriz's ruler confiscated the goods of many Genoese traders, and Genoa responded by declaring a commercial embargo (a devetum). In 1344, Tabriz's ruler sent ambassadors to Genoa promising to indemnify the traders for everything that had been taken from them. As a consequence, the devetum was removed and Genoese traders flocked to Iran.³⁶ In 1407, the government of England was forced to negotiate compensation for the losses of Hanseatic merchants in the hands of English pirates, to prevent a potentially devastating trade embargo which would have *'closed the continent to English cloth'* (Pedersen 2006, p. 169). The guilds' strategy of conditioning future trade on receiving compensation for past violations is also reflected in the agreement made in 1261 between Flemish merchants from Ghent, Ypres, Douai, Cambrai, and Dixmude who purchased English wool.³⁷ And Kohn (2003, p. 36) observes that *'by the middle of the 13th century some maritime cities were imposing a tax on goods moving through their ports to pay compensation to foreigners who might otherwise have taken reprisals'*, and that, *'Genoa established a Robbery Office to compensate foreigners who had been robbed by a Genoese (usually at sea)'*.

The German Hansa was particularly successful during the fourteenth and fif-

³⁶See Greif, Milgrom and Weingast (1994, pp. 755-756), Ogilvie (2011, p. 150).

³⁷*'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 a boycott 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; Greif, 2006, Ch. 4; Greif, Milgrom and Weingast 1994, p. 756).

teenth centuries in protecting the interests of German merchants in medieval trading centers, using the threat of embargoes to extract privileges and compensation when merchants rights were violated. Table 1 below, taken from Gelderblom (2005, p. 30), details payments made to German merchants from 1358-1498 by the city of Bruges either for failure to protect Hansa merchants, or for the confiscation of goods.³⁸

Date	Motivation	Pounds Flem.
1360	Various complaints	4,111
1392	Confiscation of German goods	11,100
1397	Damage done in local hostel	107
1405	Attack by pirates from Nieuwpoort	703
1430	Damage done by local moneychanger	267
1431-2	Attack by pirates from Scotland	2151
1438	Murder of Germans in Sluis	8,000
1438	Attack of two German hostellers	108
1457	Various complaints	2,000
1498	Piracy & damages to Florentine merchant	18,000

Gelderblom (2005, p. 29-30) observes:

‘The collective organization of merchants offered another means to get compensation for damages, and that was through collective action. If host rulers highly valued the presence of foreign merchants their threat to boycott trade or leave could secure the payment of damages. Notably the German Hansa relied on this strategy between 1250 and 1500, though it did not always come to a collective departure.’

The German Hansa’s success at securing compensation hinged on its ability to coordinate collective action, and it is not surprising that, as Gelderblom puts it, *‘it did not always come to a collective departure’* since an important purpose of demanding compensation was presumably to avoid such an inefficient outcome. Other examples of demands for compensation to avoid, or end, trade embargoes can be found

³⁸See also Gelderblom (2013, p. 173). Dollinger (1970, pp 89-90) details a number of earlier instances. He notes that Bruges’s account books reveal three payments of damages to the German Hansa: in 1357-1358 for 1,800 pounds flemish; in 1359-1360, 1,547 pounds flemish to two German traders for an outstanding claim on the Bruges citizen Laureins van der Buerze, and for Scottish merchandise that had been arrested on their behalf by the city of Bruges; and in 1360-1361, 5590 pounds flemish as part of the damages awarded by Flanders to the Hansa.

in Greif, Milgrom and Weingast and elsewhere.³⁹

As we observed in the Introduction, the expectation of the payment of compensation by cities is not the reason that individual merchants' incentives are more closely aligned with those of the guild under the equilibrium strategies posited in this paper. Most merchants would not have expected to receive any payment for participating in trade embargoes, as compensation was only paid to those individuals whose rights had been violated or goods robbed or confiscated. Rather, the demand for compensation made it in the cities' interest to cheat embargo breakers and resume trade with the guild at the first opportunity whenever an embargo was called. This made trading during embargoes unprofitable for individual merchants, and hence participation in trade boycotts in their individual interest. As Greif, Milgrom and Weingast (1994, p. 757) observed, *'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'*. According to our theory, however, the mechanism used did not, strictly speaking, curtail the cities' ability to trade with embargo breakers; rather, the opportunity to pay compensation in return for ending an embargo made it in the cities' interests not to do so.

This is an important issue because the ultimate sanction a guild could impose on its members was expulsion, or exclusion, from the guild and its trading privileges. This sanction was unlikely to have been effective against embargo breaking, however, and presumably for this reason was rarely, if ever, used for such purposes. Ogilvie (2011, p. 269-70), for example, argues that there is little or no evidence of guilds effectively using ostracism or exclusion – what she terms 'peer pressure' – to discipline their members:

*'While some guild ordinances certainly threatened ostracism for any guild member who violated guild rules, ... those cases that are recorded contain intriguing indications of the limited effectiveness of the peer pressure that could be exercised by even the most powerful merchant guilds against members. ...Empirically, we have little evidence that merchant guilds did exercise successful peer pressure.'*⁴⁰

³⁹Greif, Milgrom and Weingast (1994, p. 756; p. 757; p. 760; p. 761). See also Postel (1996) and Kohn (2003).

⁴⁰Ogilvie (2011, p. 324) also observes that *'Some merchant groupings did penalize deviant agents ... though how effective these sanctions were is hard to gauge. The evidence ... is not all that one would desire. It consists almost exclusively of formal rules and contracts, with little or no evidence of practical implementation. Postan and Dollinger rely wholly on charters and ordinances, which show that medieval merchant guilds and the German Hanse formulated regulations to try to control agency problems. But these scholars do not provide evidence of how – if at all – these rules were*

Sachs' (2006) extensive study of the surviving court rolls of the fair of St. Ives between 1270 and 1324 finds no evidence of '*the threat of ostracism by the merchant community at large*' to discipline cheats or debtors, nor any evidence of their use by merchant guilds.⁴¹ Sachs (2006, pp. 707-708) mentions two factors which caution against viewing the threat of ostracism as a significant mechanism of enforcement. First, it is not clear how effective or credible such threats were, and second, they were '*a blunt instrument which could be far more costly to their organizers than to those whom they targeted*'.

The often-cited case of the German Hansa is of particular interest in this regard. While Greif, Milgrom and Weingast (1994, pp. 758-762) attribute much of the success of the German Hansa to its increased ability, after 1307, to enforce trade boycotts by making use of the threat of exclusion, the historical evidence does not directly support their thesis.⁴² Although the Hansa used the economic weapon of the trade embargo successfully and repeatedly from the thirteenth to fifteenth centuries against numerous countries, including Poland, Russia, Norway, England, Scotland, Flanders, France, Castile and Venice,⁴³ it is clear from Dollinger's account that German towns only participated in these when self-interest dictated and the threat of sanctions and exclusion, although present, was almost never used. The unique case of the expulsion of Bremen in 1284 for its refusal to participate in a trade embargo against Norway – described in Greif, Milgrom and Weingast (1994, p. 760) as a 'milestone' in Hansa organization – illustrated the limited power of this threat. Bremen's merchants traded successfully outside of the Hansa for the subsequent 74 years, relying on their long-standing trade connections with Scandinavia, Flanders and England and the special privileges accorded to them there,⁴⁴ and did not apply for readmission to the Hansa until 1358. As this is the only instance of a German town being expelled from the Hansa for refusing to participate in a blockade,⁴⁵ it is far from clear that it marked the point where the sanction of exclusion became a viable or effective weapon in enforcing trade embargoes.

Indeed, the ineffectiveness of the expulsion of Bremen in 1284 meant that this penalty was deliberately not invoked in 1388 against the Prussian towns when they

enforced'.

⁴¹See also Ogilvie (2011, p. 269-70).

⁴²In the appendix we describe the history of Hansa trade embargoes in more detail.

⁴³See Ogilvie (2011, pp. 148-152) and Dollinger (1970, p. 110). See Gelderblom (2005, Annex 2) for a detailed account of the various commercial disputes between the Hansa and Bruges between 1250 and 1500.

⁴⁴Dollinger (1970, p. 66-67).

⁴⁵Towns were occasionally subject to temporary exclusion from the Hansa over other issues, such as Brunswick (1375), Bremen (1427, 1563) and Cologne (1471). See Dollinger (1970, p. 108, p.336).

refused to participate in an embargo against Flanders,⁴⁶ and these events were repeated in the subsequent centuries. In 1438, a blockade against the Low Countries failed to gain the support of the Prussian towns, forcing the Wendish Hansa towns to capitulate by signing the Treaty of Copenhagen in 1441 (Dollinger, p. 300). In 1451, an attempt to move the Kontor from Bruges to Dewenter was also thwarted by the Prussian towns who did not approve of the move, joined by Cologne which openly defied the embargo and continued to trade wine with Flanders in defiance of Hansa staple regulations. The Hansa backed down and modified the blockade to apply to Flanders and Flemish cloth only, meaning that *'the blockade's chances of success were seriously reduced'* (Dollinger 1970, p. 301). Dollinger (1970, p. 111) notes that the Prussian and Wendish towns participated, or not, in embargoes in the 14th and 15th centuries, *'showing varying degrees of enthusiasm'* and Hansa disunity over the implementation of trade embargoes facilitated Dutch advances into Eastern Europe (p. 195).

Dollinger (1970, pp. 108-109) also tells us that *'exclusion, of course, could be used against individuals'* for transgressing *'the law of the common merchant'*, but that it was a *'two-edged weapon'* since excluded merchants could carry on trading outside of the guild, at the expense of guild members. Only a single instance of the Hansa expelling an individual merchant, in this case for bypassing Hansa regulations on the payment of excise duties in England, is cited by Dollinger, the same example cited by Ogilvie (2011, p. 127). The merchant in question, one Christian Kolmer, quickly obtained English nationality, continued trading and subsequently took every opportunity to *'make trouble for his former compatriots'*.⁴⁷

If the threat of expulsion or exclusion was not a credible or effective means of enforcing trade embargoes, the guilds needed another mechanism to make coordinated, or multilateral, punishment of cities self-enforcing. According to the historical evidence, the mechanism they used was to demand compensation when merchants' rights were violated, thus making it profitable for cities to cheat embargo breakers, and hence making participation in embargoes self-enforcing for individual merchants.

⁴⁶Dollinger (1970, p. 76). The Prussian towns were granted special concessions and continued trading in Flanders throughout the embargo.

⁴⁷Ogilvie (2011, pp. 262-63) also relates a case of exclusion reported in De Roover (1948, p. 172), although again it did not concern a trade embargo. *'In 1350, the Cologne merchant Tideman Bloumeroot sued the elders of the German Hanse in the local Bruges town court, thereby violating Hanse regulations claiming exclusive jurisdiction over disputes among Hanse members in Bruges. As a result, Bloumeroot was expelled from the Hanse and deprived of guild privileges. Henceforth, no Hanseatic merchant was permitted to enter into a partnership with him nor to ship goods in the same vessel.'*

VI. What Level Of Trade?

In the preceding sections we have shown that by demanding compensation when their rights were violated, and only ending trade embargoes once compensation had been paid, the guilds would have been able to resolve the enforcement problem, making trade embargoes (or multilateral punishments) self-enforcing. They would thus have been able to support trade at higher levels than otherwise. A question so far neglected, however, is whether the merchants and the cities would have agreed on the level of trade which they wished to support. We address this issue in this section.

We have already seen that the city would prefer a level of trade m^C , exceeding that which can be supported by bilateral punishment strategies, but nevertheless falling below the efficient level, i.e. $\hat{m} < m^C < m^*$. But what level of trade m^G would the guild prefer? Would it wish to control entry so as to maximize the total value of trade to its members, $v(m) - \tau(m)$? Or would it want to further limit trade to increase the payoff of individual guild members, $\frac{1}{m}(v(m) - \tau(m))$?

Certainly individual merchants within a guild would have had strong incentives to restrict further membership so as to limit trade and increase their own profits. There is some historical evidence in favor of this view. Lane (1973), for example, tells us that the ‘*frankly avowed purpose*’ of the guild of the merchant nobles of Venice was ‘*to help Venetian merchants make profits*’. And Postel (1996) notes that ‘*from the middle of the 14th century ... the Hanseatic meetings had to decide on formal applications; their decision depended on whether admission was advantageous to the Hansa or not*’. Writing on merchant associations in pre-industrial Europe, Kohn (2003) summarizes the evidence as follows:

‘Some guilds, especially earlier on, were very loosely defined and included all sorts of merchants, tradesmen, and artisans... Later, guilds became more exclusive, with membership limited to merchants alone or even to particular categories of merchant trading in particular types of merchandise or to particular destinations. At the same time, it became more difficult to join a guild, with membership generally descending from father to eldest son, and outsiders having to purchase entry at considerable cost. The reason for the greater exclusiveness was that over time many guilds acquired valuable rights — monopolies over particular forms of trade or exemptions from various tolls and taxes. Naturally the members wished to keep these hard-won benefits to themselves.’

A guild that wished to maximize the payoff of individual guild members would

attempt to restrict trade to the level that maximizes $\frac{1}{m} (v(m) - \tau(m))$, so that m^G is given by the condition

$$v'(m^G) - \tau'(m^G) = \frac{1}{m^G} (v(m^G) - \tau(m^G)). \quad (0.22)$$

If $m^G > \hat{m}$, the guild could enforce the level m^G by affording protection to only m^G traders. If $m^G < \hat{m}$, since $v - \tau$ is increasing the best the guild can do would be to limit the number of traders entering a city to \hat{m} , since trade below this level would provide the city with an incentive to elicit trade from non-guild members (cf. the argument underlying Proposition 3 above). In either case, a guild with the power to control its membership would want to impose an inefficient level of trade from the city's point of view, since $m^G \neq m^C$ almost surely. This may be seen as providing some support for the arguments of Ogilvie (2011), for instance, as it is no longer clear that the levels of trade supported by guilds would be superior to the levels that would arise in their absence.

One possibility is that the guilds could enter into exclusive trade arrangements with cities in order to control the overall level of trade. From the historical evidence referred to above, acquiring such exclusive trading privileges was evidently a common aim of the medieval merchant guilds.⁴⁸ This could in theory result in even lower levels of trade being supported (e.g. at $m^G < \hat{m}$), by the city agreeing not to trade with non-guild members. Since the city rulers would still prefer trade up to m^C , compensation of some kind would presumably have been required to obtain their agreement, either in the form of a higher tax rate or a lump-sum transfer. But this is ruled out in the current model since any reduction in trade below \hat{m} results in a lower net value of trade. Thus compensating the city to implement such a reduction would not be possible.

An alternative would be for the guild to agree on an expansion of trade beyond the level which could be supported by bilateral punishment strategies (i.e. $\hat{m} < m \leq m^*$), in return for favorable tax treatment from the city. This may be more consistent with the historical evidence concerning the trading privileges acquired by guilds, and also accords with the Greif, Milgrom and Weingast thesis that the establishment of guilds led to trade expansion. Indeed, as Greif, Milgrom and Weingast (1994, p. 749) argue:

'If the purpose of the guilds was to create monopoly power for the merchants and to increase their bargaining power with the rulers, why did powerful rulers during the late medieval period cooperate with alien mer-

⁴⁸As Ogilvie (2011, Ch. 6) puts it, a 'universal shared purpose of merchant guilds was to get monopoly privileges for their members'. See also Dollinger (1970, p. 187).

chants to establish guilds in the first place? What offsetting advantages did the rulers enjoy? The puzzle is resolved if the guild's power enabled trade to expand to the benefit of the merchants and rulers alike.'

As we have pointed out above, however, a guild whose role was merely to coordinate merchant responses to cheating would not have been in a position to negotiate trade expansion and tax privileges with medieval city rulers. For this, the guilds needed to be able to control the number of merchants trading with a city. Analyzing the bargaining game between cities and guilds over tax privileges and exclusive levels of trade takes us beyond the scope of the current paper.⁴⁹

VII. Conclusion

The role played by the merchant guilds in the development of European trade and commerce from the 10th to the 18th centuries is still widely debated. While numerous authors have argued that they facilitated economic growth and trade expansion by resolving problems of commercial security, contract enforcement and principal agent problems (e.g. Gelderblom and Grafe, 2010; Gelderblom, 2010; Greif, Milgrom and Weingast, 1994; Ewert and Selzer, 2005, Hicks and Thompson, 1991), Ogilvie (2011) has forcefully reasserted the more 'traditionalist' view of the guilds as inefficient monopoly institutions supported by powerful economic and political elites who operated at the expense of society as a whole. All authors agree that the guilds wielded considerable economic power, however, particularly through the use of trade embargoes against medieval towns, and that this power relied upon the guilds' ability to enforce participation in trade embargoes by individual merchants (or towns) via the threat of exclusion or expulsion. In the much-cited Greif, Milgrom and Weingast (1994) analysis, the guilds evolved as institutions capable of supporting efficient trade between alien merchants and medieval city-states, but this depended entirely upon the guilds' ability to coordinate merchant responses to cheating by enforcing compliance to trade boycotts by individual traders. Credible incentives for embargo breaking would otherwise have rendered the guilds ineffectual.

⁴⁹Such an analysis would need to specify what the city and the guild were bargaining over (e.g. levels of trade, tax rates, lump-sum transfers or compensation), and the parties' 'inside' and 'outside' options (see Muthoo 1999 for the definitions of these terms). For instance, would the city continue to benefit from trade at level \hat{m} while bargaining was taking place (making it an 'inside' option)? Would this trade occur with potential guild members, or with 'outsiders'? And so on. Dessi and Ogilvie (2004) consider a game in which the guild makes lump-sum transfers to city rulers in exchange for exclusive trading privileges. They assume that the city makes take-it-or-leave-it offers to the guild however, which simplifies the bargaining problem.

As we have demonstrated in this paper, once the guilds' demands for compensation are taken into account, no such internal enforcement mechanism would have been necessary. Our formulation of the guilds' equilibrium strategies, based on our review of the historical evidence, makes the threat to impose a trade boycott self-enforcing, and resolves the enforcement problem noted by Greif, Milgrom and Weingast (1994). The guilds did not need the power to coerce individual merchants into taking part in the punishment of cities in order to support efficient trade, since they could rely on traders' private equilibrium incentives to do so.

By demanding compensation when their rights were violated (and only ending trade embargoes once compensation had been paid), the guilds would thus have been able to solve the enforcement problem and support trade at higher levels than would have otherwise occurred. The guilds did not need the power to coerce individual merchants into taking part in the punishment of cities in order to support efficient trade, since they could rely on traders' private equilibrium incentives to do so. Implementing particular levels of trade would have required that guilds did more than merely coordinate merchant responses to cheating, however. In the absence of any ability to control the number of merchants trading with a city, the incentives of individual traders could easily have led to volumes of trade well above the levels desired by either cities or guilds. An ability to control their own membership (and to only punish cities when they violated the rights of guild members), gave the guilds the power to restrict the equilibrium level of trade. A guild which aimed to maximize the average profits of its members might then have wished to implement a sub-optimal level of trade from the city's point of view. But the same ability to restrict trade could also have been used to negotiate favorable treatment for guild members, in return for an agreement to expand trade towards the levels desired by cities. This may provide some support for the Greif, Milgrom and Weingast (1994) thesis that the establishment of the merchant guilds led to trade expansion in the late middle ages.

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Appendix: The German Hansa

The German Hansa (or ‘Hanseatic League’, as it was known in England), which originated with the founding of Lubeck in 1159 and persisted roughly from the middle of the twelfth century until the middle of the seventeenth century (Weiner 1932; Dollinger 1970; Lloyd 1991), provides perhaps the best example of the phenomena of interest to our analysis . Originally an association of traveling merchants open to all German merchants who traded overseas (Lloyd, 1991, p. 2), by the middle of the fifteenth century it had become a loose federation of some 200 towns from the northern Low Countries (towns like Deventer and Zwolle) in the west, via the North Sea and Baltic shores to today’s Finland in the east. Its character as an association, or alliance, of mercantile interests remained unchanged, however, and it lacked a centralized governing structure (Dollinger 1970; Stabel 2004). It created trade settlements, the so-called kontore, in Bruges, London, Novgorod and Bergen (Norway), and it was present in the major markets of medieval Europe. In the twelfth century, German merchants actively traded all over the Baltic and participated in the founding of towns dedicated to trade. By the middle of the thirteenth century they held a near-monopoly of trade around the Baltic and North Seas, and their commerce was organized around the axis of Novogorod-Lubeck-Hamburg-Bruges-London (Dollinger, 1970, p. xviii). By the fourteenth century they had expanded their activities to southern Germany and Italy by land, and France, Spain and Portugal by sea. Dollinger (1970) dates the dissolution of the Hansa as 1630 when a closer alliance of Lubeck, Bremen and Hamburg took its place.

The remainder of this appendix documents the history of Hansa trade embargoes and shows that exclusion as a punishment for embargo breaking was rarely used, and was probably ineffective in this regard.

In the last quarter of the 13th century the Hansa began to actively intervene abroad to protect the trading privileges of its merchants. Its chosen weapon, according to Dollinger (1970, p. 47), was the blockade or suspension of all trade. In 1252, a Kontor of German merchants had obtained extensive trading privileges in Bruges, and a permanent settlement followed (Weiner 1932, p. 218).⁵⁰ The trading privileges given to the foreign merchants led to mounting discontent in Bruges, eventually causing riots (Dollinger 1970, p. 48). 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*

⁵⁰The 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).

not been able to protect themselves from this' (Urkundenbuch der Stadt Lubeck, I, no. 156, p. 371, translated by Dollinger, 1970, p. 383). 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 in which the Hansa not only reaffirmed their former privileges but obtained new concessions regarding weights and measures and the right to trade directly with other foreigner merchants, and the Kontor returned to Bruges. As Dollinger (1970, p. 49) observes, *'the economic weapon in the form of the transfer of the Kontor had shown itself to be very effective'*.

In 1284, following the success of its embargo against Bruges, the Hansa imposed a blockade on Norway where local discontent with its trading privileges had resulted in an attack on a German ship. Export of grain, flour, vegetables and beer to Norway were prohibited. In this case however, the city of Bremen refused to cooperate in the embargo, and the other German towns retaliated by excluding Bremen's merchants from all Hanseatic trading privileges. Although according to Greif, Milgrom and Weingast (1994, p. 760; also Greif 2006, Ch. 4) this marked a 'milestone' in Hansa organization in that *'the German towns had achieved the coordination needed to expel one of their members'*, Dollinger (1970, p. 66-67) notes that Bremen's merchants did not apply for readmission to the Hansa until 74 years later in 1358. This was because the merchants of Bremen could rely on their own long-standing connections with Scandinavia, Flanders and England and the special privileges accorded to them there. Hence they saw no point in rejoining the Hansa. As this is the only instance of a German town being expelled from the Hansa for refusing to participate in a blockade,⁵¹ it is far from clear that it marked the point where the sanction of exclusion became a viable or effective weapon in enforcing trade embargoes, as argued by Greif, Milgrom and Weingast (1994).

In 1307, the Hansa once again moved its Kontor from Bruges to Aardenburg where it remained until 1309. Only the German towns participated in this embargo, and its aim was to force Bruges to respect the agreements with the Hansa reached in 1280. As a result of a new agreement to respect German traders' privileges, Dollinger (1970, p. 51) argues that Flanders' trade flourished for the next 50 years.

The Hansa's relations with Bruges deteriorated again around 1350, however, mainly because Bruges was not ready to compensate the Germans for their damages

⁵¹ According to Dollinger (1970, p. 90), in most other instances towns were excluded temporarily due to civil disorders and revolutions. An exception was Cologne, which was expelled in 1471 for obtaining special trading privileges with England (see also Pederson, 2006). Bremen was briefly expelled again during 1427-1432 over a political dispute with the Hansa (Dollinger 1970, p. 290) and in 1563 for adopting Calvinism (Dollinger 1970, p. 336).

in Flanders from the war between England and France.⁵² A Hanseatic embargo of Bruges and the whole of Flanders followed in 1358. According to Dollinger (1970, p. 65) *‘any disobedience, whether by a town or an individual, was to be punished by perpetual exclusion from the Hansa’*. Bruges attempted to defeat the embargo by offering trading privileges to individual cities, including both non-Hanseatic ones, such as Kampen, and a Hanseatic one, Cologne. While the non-Hanseatic cities accepted Bruges’ terms, Cologne refused to cooperate. The embargo proved a success and, in 1360, Bruges came to terms with the Hansa, including agreement on the provision of indemnities of 1,800 pounds Flemish (see above).

Despite the consolidation of the Hansa organization, and the success of its latest embargo, the situation remained ‘precarious’ (Dollinger, p. 67) and the Hanseatics were *‘condemned to a perpetual struggle in order to maintain their privileged status’*. Conflict with Denmark followed (1367-1370) and embargoes against England, Flanders and Russia in 1388 (Dollinger, p. 72). In 1377-78, the Kontor instructed German merchants to leave Bruges, following numerous complaints of violations of privileges. Upon learning of this, the Bruges authorities arrested German merchants and confiscated their goods, resulting in a humiliating climb-down by the Kontor. Subsequent protracted negotiations by the Hanseatic Diet for compensation came to nothing (Dollinger 1970, p. 75), and a new embargo was decreed in 1388. This time, however, the Hansa’s internal divisions led to non participation in the blockade by the Teutonic Order and the Prussian towns who had no direct stake in the dispute (p. 76). They were subsequently granted special concessions to continue trading.⁵³ Four years of negotiations ensued in which the now weakened Hansa abandoned many of its original demands. They did, however, obtain compensation for the events of 1378 equal to 11,100 Flemish pounds (see Table 1 above). But divisions within the Hansa, and strains that embargoes placed on Hanseatic solidarity (Dollinger 1970, p. 111), meant that 1388 marked *‘the last great Hanseatic victory in the Low Countries’* (Dollinger 1970, p. 77).

Although the Hansa used the economic weapon of the trade embargo successfully and repeatedly from the thirteenth to fifteenth centuries against numerous countries, including Poland, Russia, Norway, England, Scotland, Flanders, France, Castile and Venice,⁵⁴ it is clear from Dollinger’s account that German towns only participated in

⁵²According to Greif (2006, Ch. 4, p. 107), the Hansa responded by strengthening its internal organization. In 1356, the Hansa held its first Diet, which determined that the Kontor of Bruges, hitherto independent, should be subordinate to the Diet’s decisions. The German towns, via the Diet, were imposing their authority over merchants in foreign cities. This authority was subsequently extended to Novgorod, Bergen, and London (Dollinger 1970, pp. 62-64).

⁵³Non-Hansa towns such as Kampen also refused to respect the embargo.

⁵⁴Dollinger (1970, p. 110). See Gelderblom (2005, Annex 2) for a detailed account of the various

these when self-interest dictated and the threat of sanctions and exclusion, although present, was almost never used. The unique case of the expulsion of Bremen in 1284 illustrated the limited power of this threat. Bremen rationally chose not to participate in a blockade it deemed to be against its own economic interests, and was able to continue trading profitably outside of the Hansa for the following 74 years.

While Greif, Milgrom and Weingast (1994, pp. 758-762) attribute much of the success of the German Hansa to its increased ability, after 1284, to enforce trade boycotts by making use of the threat of exclusion, the historical evidence does not really support this thesis. Hansa embargoes prior to the expulsion of Bremen in 1284 seemed to have been at least as effective as subsequent embargoes, and their success seemed to depend more on the economic interests of individual Hansa towns to participate than upon any threatened punishments. Indeed, the expulsion of Bremen was evidently ineffective in 1284, and this penalty was deliberately not invoked in 1388 against the Prussian towns when they refused to participate in the embargo against Bruges. These events were repeated in the subsequent centuries. In 1438, a blockade against the Low Countries failed to gain the support of the Prussian towns, forcing the Wendish Hansa towns to capitulate by signing the Treaty of Copenhagen in 1441 (Dollinger, p. 300). In 1451, an attempt to move the Kontor from Bruges to Dewenter was also thwarted by the Prussian towns who did not approve of the move, joined by Cologne which openly defied the embargo and continued to trade wine with Flanders in defiance of Hansa staple regulations. The Hansa, led from Lubeck, backed down and modified the blockade to apply to Flanders and Flemish cloth only, meaning that *'the blockade's chances of success were seriously reduced'* (Dollinger, 1970, p. 301).

Dollinger (1970, pp. 108-109) points out that *'exclusion, of course, could be used against individuals'* for transgressing *'the law of the common merchant'*, but notes that it was a *'two-edged weapon'* since excluded merchants could carry on trading outside of the guild, at the expense of guild members. Dollinger cites only a single instance of the German Hansa expelling a member merchant, in this case for bypassing Hansa regulations on the payment of excise duties in England. The merchant in question quickly obtained English nationality, continued trading and subsequently took every opportunity to *'make trouble for his former compatriots'*. Ogilvie (2011, pp. 262-63) also relates a case of exclusion reported in De Roover (1948, p. 172), although again it did not concern a trade embargo.⁵⁵

commercial disputes between the Hansa and Bruges between 1250 and 1500.

⁵⁵ *In 1350, the Cologne merchant Tideman Bloumeroot sued the elders of the German Hanse in the local Bruges town court, thereby violating Hanse regulations claiming exclusive jurisdiction*

Pederson (2006) on the Hansa Embargo of England in 1435:

‘In May, 1435, Henry VI sent a delegation to Bruges where the Hanseatic delegation – which by now was reduced to two members: the mayors of Danzig and Hamburg, Heinrich Vorrath and Heinrich Hoyer – had set up permanent quarters. But since the English delegation wanted to negotiate the position of the English in Hanseatic areas as well as the Hanseatic charters in England, and since the Hanseatic delegation had no authority to treat these matters, negotiations were broken off pending consultations between the delegation and the Hanseatic diet.

The Hanseatic diet decided on a hard line in the confrontation with the English. Danzig refused to negotiate about the position of the English and the diet decided to implement the strongest weapon short of war against the English merchants. The Steelyard was closed and its members moved to Bruges, and an official trade embargo was initiated. But a trade embargo was difficult to enforce and afforded an entrance for middlemen, a situation which was more likely to harm the Hanseatic position on the continental markets than the loss of their privileges in England. The embargo was also not very efficient among the Hanseatic towns themselves: Cologne ignored the decision of the diet and even contemplated a separate treaty with the English, the Zuider Zee towns who had always been the unruly corner of the Hanse also ignored the embargo, and even the grand master of the order of the Teutonic Knights authorised the entry into his area of six large English ships to trade there in April, 1436. Accepting defeat, Danzig furnished the delegation in Bruges with a set of more moderate claims in July,

1436, but they still refused to authorise Vorrath and Hoyer to negotiate the position of the English in Prussia. Vorrath, who knew that it was impossible to reach an agreement with the English unless the Prussian problem was solved and that the Hanseatic unity would soon break unless an agreement was reached, resolved to take the matter into his own hands. He admitted that the issue should be dealt with and assumed the responsibility for the consequences of a transgression of his mandate. He offered to negotiate the English position in Prussia.’

over disputes among Hanse members in Bruges. As a result, Bloumeroot was expelled from the Hanse and deprived of guild privileges: Henceforth, no Hanseatic merchant was permitted to enter into a partnership with him nor to ship goods in the same vessel.’