

# Market Power in Pre-modern Prague: Club Goods and Rent-seeking

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## Abstract

Medieval and early modern craft guilds were rent-seeking coalitions of local producers that controlled markets at the expense of society as well as market-enhancing organizations that reduced the high transaction costs associated with pre-modern industries. This article presents an economic analysis of this seemingly contradicting behavior. The proposed argument is simple. Obtaining a market privilege guaranteed guild members extra rents while increasing the cost of losing membership, which motivated greater collective action within the organization. The ability to punish free-riders and enforced cooperation was used to overcome the problems brought by the transition from kin to market economy.

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# 1 Introduction

Rent-seekers generate a myriad of economic burdens. Their action leads to higher prices, market barriers or less innovation. Historically, craft guilds are one of the most popular example of organized rent-seeking groups (Mokyr 1998). Yet their social impact is far from unambiguous. On one hand, economic historians have stressed the fact that craft guilds denied a large part of the population access to business activities and as a result increased their rents at the expense of society (North and Thomas 1976; Lindberg 2009, 2010; S. Ogilvie 2004, 2008, 2014; Ogilvie and Carus 2014; Candela and Geloso 2019; S. Ogilvie 2019). This view suggests that the existence of guilds generated market distortions. On the other hand, some researchers have suggested the positive impact of craft guilds as a response to coordination problems that plagued medieval and early modern markets. These included product reputation, skill training, industry supervision or welfare support; all desirable by local artisans but hardly obtainable in the absence of formal public institutions. In these respects, craft guilds provided communal services and enhanced markets (Gustafsson 1987; Kieser 1989; Hickson and Thompson 1991; Epstein 1998; Richardson 2001, 2008; Stabel 2004; Prak 2006; Epstein and Prak 2008; Caracausi 2017; Prak et al. 2019).

The literature on the economics of craft guilds presents the following puzzle: how is it that one of the most common and successful rent-seeking organizations in history were in many respects market-enhancing? This article addresses this puzzle using the economic theory of clubs.

My argument is simple: guilds fostered cooperation among members that led to exclusive gains, gains unavailable to nonmembers. To economists, craft guilds produced club goods. Understanding guilds as clubs yields new insights into the nature of these organizations and their activities.

The capacity of a social group to produce club goods is determined by its

ability to reduce free-riding. Since all group members share collective gains, each member has incentives to shirk in his obligation while still accessing these gains. As everyone has tendencies to follow such behavior, the production of club goods is threatened. This was also the case for pre-modern producers. To foster cooperation among local craftsmen, originally non-privileged occupational cooperatives linked market activities with membership in the cooperative. They became guilds. By obtaining the market privileges, guilds secured members with extra rents and increased the cost of losing membership, which reinforced members' incentives to contribute to the production of club goods.

However, guilds' privileges imposed costs on the society. They created legal cartels of local craftsmen, who controlled access to markets and employment in the local industry. They were simultaneously oligopolies because they restricted the number of producers and oligopsonies because they were only employers within their industries. As a result, guilds had a negative welfare impact on non-members, who had limited opportunities to trade in the city; employees, who faced lower wages; and consumers, who paid higher prices.

This article builds on Gustafsson (1987), who proposed the link between guilds' rent-seeking tendencies and public goods. My analysis goes in more detail. It extends the idea by exploiting the theory of clubs. It demonstrates how two seemingly opposite motives—obtaining economic rents and solving free rider problems—may not be in contradiction. The former may reinforce the latter but also generate costs. This insight shows that an effective response to market imperfections in the absence of strong state institutions may be counter-intuitive because it generates market distortions.

The idea to apply the economic theory of clubs on pre-modern cooperatives is not new. Lindberg (2009) examines the decline of major medieval centers of Lübeck and Danzig as a result of club restrictions imposed by local guilds. Gelderblom

and Grafe (2010) use the club-theoretic explanation for certain activities of pre-modern merchants. This article is closely linked to the work of Richardson (2005) and Richardson and McBride (2009), who investigate how combining spiritual and economic endeavors sustained cooperation among late-medieval English craftsmen. This article contributes to this literature by demonstrating how collective activities among guild members were affected by obtaining a market power.

This article also contributes to the literature that examines the origins of public goods. For example, Zandt (1993) studies the government involvement in the private provision of lighthouse services. Kuran (2001) explores how pre-modern Muslims provided social services in exchange for protections against revenue-seeking rulers. Greif et al. (2012) considers the government support for English Poor Law. This article contributes to this literature by examining the relationship between market power over local markets and provision of local public goods.

This article is also related to the growing body of literature that formally applies club theory in order to understand behavior of specific social groups. Iannaccone (1992) pioneers this line of research by applying club models to religious groups. He explains why bizarre behavioral restrictions applied by various churches and cults may in fact be absolutely rational. In this line of research, the club model helps to explain activities of the Mormon Church (McBride 2007) or ultra-orthodox Jews (Berman 2000). Other authors applied the same principles to address actions of terrorists (Berman and Laitin 2008; McBride and Richardson 2012) or members of international alliances (Murdoch and Sandler 1982; Khanna and Sandler 1996). This article extends this strand of literature on modern phenomena by examining the historical case of clubs par excellence—craft guilds.

My article uses detailed and novel historical evidence to support its theoretical assumptions. It explores the structure and functioning of pre-modern urban markets in Central Europe. The model utilizes materials regarding market orga-

nizations in the towns of Prague in the Kingdom of Bohemia during the medieval and early modern times. In particular, this article explores the micro-level evidence of selected craft guilds across multiple industries. My findings come from a variety of historical sources including guilds' chronicles, books of accounts, royal privileges or individual lists; and other primary and secondary sources.

## 2 Background: Nature of Prague Guilds

Local markets in pre-modern Central Europe were far from competitive. Trade and productions were in the domain of local guilds, who controlled the number of local producers as well as the number of their employees (S. C. Ogilvie 1995; S. Ogilvie 1996, 2004; Richardson 2001; S. Ogilvie 2019).

Prague was not an exception. From the 15th century, craft guilds became the main force of commerce in the towns of Prague. There were guilds of servicemen like barbers and drivers, manufactures like furriers and coopers, food producers like bakers and butchers and general traders such as merchants. Nevertheless, whether needle-makers or bakers, all guilds sought economic and social advantages for their members. The goal was that each guild member would always have the means to make his own living and that all members would have equal production opportunities. To achieve this goal, the guilds engaged in tow sets of activities: obtaining market power and production of club goods.

Guilds' particular concerns as exhibited in their ordinances are presented in Table 1. These ordinances served as the official government documents provided by city authorities or king himself. As such, the rules set in these ordinances were to be followed and enforced by law.<sup>1</sup>

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<sup>1</sup>Note that guilds may have additional less formal rules and customs that were not explicitly stated in their ordinances. Typically social social services and religious duties were common in guilds but often not expressed in these ordinances.

Table 1: The distribution of guild concerns as recorded in their ordinances from the 15th to 17th centuries

	Market power	Collective insurance	Quality reg.	Contract & labor reg.	Rules of conduct	Formal representation
Bakers, New Town 1444	X	-	X	X	X	-
Barbers, New Town 1477	-	-	X	X	X	-
Brewers, Prague 1456	X	-	X	X	X	X
Bricklayers & Stone-Masons, Old Town 1586	X	X	X	X	X	-
Butchers, Prague 1569	X	X	X	X	X	-
Carriers, Old Town 1576	X	X	X	X	X	-
Cobblers, Lesser Town 1631	X	X	X	X	X	-
Cobblers, Old Town 1629	X	X	X	X	X	X
Coat-makers, New Town 1448	X	-	X	X	X	-
Drapers, New Town 1447	X	-	X	-	X	-
Dyers & Bleachers, Bohemia 1596	X	X	X	X	X	-
Furriers, New Town 1486	X	-	X	X	X	-
Furriers, Old Town 1418	X	-	X	X	X	X
Goldsmiths, New Town 1478	X	-	X	X	X	-
Harness-makers, New Town 1445	X	-	X	X	X	-
Hatters, New Town 1489	X	-	X	X	X	-
Hatters, Old Town 1489	X	-	X	X	X	-
Huiliers, New Town 1452	X	-	-	-	-	-
Painters & Glaziers, Old Town 1458	X	-	-	X	X	X
Painters, Glaziers & Metalworkers, Prague 1598	X	X	X	X	X	-
Potters, New Town 1488	X	-	X	X	X	-
Rope-makers, New Town 1446	X	-	X	X	X	-
Saddlers, New Town 1451	X	X	X	X	X	-
Sawyers, Plankers & Sharpeners, New Town 1457	X	-	-	X	X	X
Smiths, New Town 1446	X	X	X	X	X	-
Soap-makers, New Town 1464	X	-	X	X	X	-
Tailors, New Town 1580	X	-	X	X	X	-
Tailors, Old Town 1580	X	-	X	X	X	-

Notes: (X) present in guild's ordinances, (-) not present in guild's ordinances. The year refers to the year of granting ordinances.

Sources: PCA, CK, s. Kožešníci 7, inv. 9, ff. 6r-8v; PCA, CK, s. Kožešníci 23b, inv. 11, ff. 1v-5v; PCA, CR, s. Řezníci 4, inv. 6, ff. 1r-5v; PCA, CS, s. Ševci 2, inv. 3; PCA, CS, s. Ševci 10, inv. 4; PCA, SP, s. AMP PGL II – 54, inv. 163; PCA, SP, s. AMP PGL II – 104, inv. 213; PCA, SR, s. 1761, ff. 12r-16v; PCA, SR, s. 3502, pp. 19-28; Chytil (1906, pp. 315-331); Melichar (1902, pp. 129-137); Tomek (1895).

## 2.1 Guilds and Market Power

Prague guilds controlled industries. They had market power. They provided their members with market privileges, which could be transferred into economical benefits. This was achieved through a government privilege known as the *cechovní přímus*. This privilege established a legal rule that made membership in a local guild a necessary condition for engaging in craft-related activities within the geographical jurisdiction of the city. All Prague guilds but one from Table 1 had this rule embodied in the formal ordinances.

Guilds' market power manifested in two forms: on the output market and on the input market. On the output market, the guilds controlled selling of goods and services. The historical record shows that exclusive access to a market for members was a part of the vast majority of the guilds' ordinances. A typical example includes the cobblers from the Lesser Town who mandated in 1631 that their master could seize goods of "traders and barterers and also Jews, who would want to trade or barter in their craft and who would be caught by doing so" (PCA, CS, s. Ševci 10, inv. 4, article 10). Another example comes from the Soap makers of the New Town who mandated in the 6th article of their ordinances from 1464 that "anyone who would sell soap should be reported by senior masters to a burgomaster who is to order that this is fairly redressed" (Tomek 1895, p. 476).<sup>2</sup>

On the input market, no one else but guild members could hire apprentices and journeymen in towns of Prague. Because only masters can engage in regular production, they effectively became also only employers in the city. They controlled the number of apprentices—students of crafts. A common guild regulation required

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<sup>2</sup>There were a several exception to guild power. During the ordinary days buying and selling new merchandises and services was permitted only through traders 'licensed' by authorities or through members of local guilds whereas during the seasonal fairs and specific market days, it was tradition that trading was free for all citizens of the empire. For exceptions, see Tomek (1871, pp. 407-410) and Mendl (1947, pp. 17-20).

“anyone who wanted to learn their craft [become apprentice] had to study under a master for three years, otherwise he could not be admitted” (Tomek 1895, p. 488, 491). They also regulated the number of journeymen. Even though journeymen were skillful craftsmen, they were not allowed to make their own livings. Furriers expressed this concern in 1428 as “no journeymen in his Town, where his master is, shall or will make fur clothes on his own a lot or little” (PCA, CK, s. Kožešníci 7, inv. 9, f. 7r). Only masters could provide journeymen with work. Hence, guild masters were the only employers of talented youngsters.

But in order to transform these restrictions on input and output markets into economically meaningful benefits, guild membership must have been exclusive. The exclusivity was guaranteed by a variety of conditions that each craftsman had to fulfill before becoming a member. An applicant was generally required to pay an entrance fee into a guild treasury, become a citizen, work for local masters, show his skills, provide a variety of documents and have a family. Only after obtaining the mastership was a producer allowed to operate on the local market and hire workers. Utilizing this option generated market power and hence economic rents for guild members. Guild members were oligopolists on output markets and oligopsonists on input markets.<sup>3</sup>

The ultimate goal was to increase members’ revenues from their profession by allowing them to capture economic rents at the expense of their competitors and the society. This rent-seeking activity alone was likely to impose overall “dead-weight losses on the economy and generated no demonstrable positive externalities” as S. Ogilvie (2008, p. 175) has suggested (see also 2004, 2014, 2019).

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<sup>3</sup>Note that guild members were not monopolists (or monopsonists) because they still faced competition. For each guild member, other guild members were competitors. Even though guild rules often limited price competition among members (e.g. Melichar 1902, p. 132), this was hardly enforceable.



## 2.2 Guilds and Club Goods

Guilds provided their members with a variety of services that were jointly produced with the organization and shared among all the members: club goods. Formal ordinances as presented in Table 1 depicts 3 most typical categories of club goods provided by Prague guilds: Collective insurance, Quality regulations; and Control and labor regulations.

First, guilds provided insurance networks against life risks. The New Town Butchers had to support members and their relatives, who were in need (PCA, CR, s. Řezníci 16, inv. 18, particularly ff. 75rv, 78v, 79r). Old butcher Mikuláš expressed this practice in his letter: “you [masters] condescend to provide a piece of meat to feed me and my children every week, without any compensation from me, just by your own choice, from your own goodness and free will and loving-kindness” (PCA, CR, s. Řezníci 16, inv. 18, f. 43v). The Barbers of Prague compelled all journeymen to regularly contribute money to the treasury for insurance purposes (PCA, SP, s. AMP PGL II - 73, inv. 182, f. 5r). The masters affiliated with the Painters, Glaziers and Metalworkers of Prague were obligated to offer support to local and even to foreign colleagues, whenever they were in need, sick or unable to make own living, but also expected them to pay back (Chytil 1906, p. 330). Another form of mutual insurance was religious and burial services. This included fund-raising for funerals, organizing masses, calling processions and holding magnificent ceremonies. The ordinance of the New Town Saddlers from 1451 can serve as an illustration stating that “if the Lord will not spare the master or his housewife from death, then all masters are to attend the funeral” and absenteeism was punished by charging a pound of wax (Tomek 1895, p. 462). Similarly, the Dyers and Bleachers of Bohemia asserted that “should the Lord call up a member of the order and craft of dyers and bleachers in the manner of an untimely death from this world, all the masters, journeymen and also apprentices of the guild are to notify

each other about the procession and the funeral of the dead, are to led themselves be found, and are to see him buried, for their own honesty and the good name of the guild” (PCA, SP, s. AMP PGL II - 54, inv. 163, f. 4r).

Second, guilds guaranteed the craft’s goodwill. Each guild set basic standards and supervised the quality of goods and services sold by their members. For example, drapers required the basic unit of woolen cloth (*postav*) to be at least “forty cubits without one” and “good and proper wool” to be used (Tomek 1895, p. 456). Cobblers prohibited the use of old soles in making new shoes (PCA, CS, s. Ševci 2, inv. 3, article 11). Goldsmiths followed strict rules about the materials used (Tomek 1895, pp. 482-483). Butchers had to sell meat by weight, not by piece and avoid “all emaciated cattle, both larger or smaller” (PCA, CR, s. Řezníci 4, inv. 6, f. 4r; PCA, SR, s. 1713, f. 63r-63v). Bakers required bread to be properly baked and paid special attention to flour, which had to be ‘pure and white’ (PCA, CP, s. Pekaři a perníkáři 12a, inv. 2, ff. 8v-9r). Maltsters discouraged pouring grain while brewers “shall work hard to brew good beer for benefits, honor and fame of the city of Prague” (Tomek 1895, pp. 467, 469). Overall, quality regulations provided basic standards that secured local masters with public confidence, which was important for accessing financial credit and maintaining craft reputation.

Third, guilds enforced contractual and labor standards. Action was taken against individuals who had defaulted on their obligations to members. For example, the New Town Smiths required that “if someone owes a master for handicraft, then no other master shall work for the debtor until he pays” (p. 451). Similarly, cobblers from the Lesser Town required that “no master shall assume another master’s work nor shall work for anyone privileged either clerical or lay as well as for any townsmen, unless he pays back to the original master what is owed for the shoes under the penalty of forfeiture of ten shocks of Meissen groschen to the senior masters” (PCA, CS, s. Ševci 10, inv. 4, article 9). Contracts within the organiza-

tions were also set. Before youngsters could start an apprenticeship, they had to be registered in a guild and honest citizens were required as their ‘patrons’, who then guaranteed under a monetary penalty the apprentice’s good manners and that he would fulfill the entire period of service. Journeymen could be hired only if they provided certificates of training, certificates of origins, and showed skills. In tailors’ workshops, journeymen were not allowed to leave their masters any later than four weeks before feasts and no sooner than three weeks after seasonal fairs, because “during these periods, the work of their craft is the most urgent” (PCA, SR, s. 3502, pp. 6, 23). Cobblers’ laborers in the Old Town were charged a pound of wax or put in prison if found idling around and not working (PCA, CS, s. Ševci 2, inv. 3, article 13). Smiths’ employees in the New Town were punished by manorial discipline for revolting at work (Tomek 1895, p. 454).

With these activities the goal was to reduce the high transaction costs that afflicted a professional’s life in pre-modern markets. In this respect, guilds mitigated coordination among members that generated a wide range of socially beneficial services such as insurance, reputation, quality standards or contract enforcement. Such activities would have suggested that craft guilds were generally market enhancing institutions as proposed by authors like Gustafsson (1987), Epstein (1998, 2008), Epstein and Prak (2008), Richardson (2008), and Caracausi (2017).

Yet, the existence of two different benefits within one organization posed a puzzle. Why should any organization bundle market-restriction with communal services? Mutual insurance networks and reputation coalitions are common especially in early stages of development, but these organizations did not aim at obtaining government privileges in particular. Craft guilds did. What was the additional benefit of focusing on market control? What were the implications for pre-modern markets? Why should the government support activities that overcame certain market issues but generated others?

### 3 The Model

This section models interactions on pre-modern markets based on historical evidence. The model shows a typical urban economy populated by consumers, local producers and foreign producers. Local and foreign producers earn their income by selling industrial goods to consumers on the local market. Contrary to foreign producers, local producers are organized in a cooperative, which provides them with the club good in exchange for a part of their income.

To explain the role of market privileges, two stages of cooperative development are compared: *the Early Stage Equilibrium* and the *Guild Stage Equilibrium*. In the former, local producers formed the religious cooperative without any power over local market. In the later stage, local craftsmen formed the craft guild that hold a market power over local industry and allowed them to exclude foreign producers. Comparing these two stages explains the logic behind combining market control with provision of social benefits and its corresponding effects.

#### 3.1 Population and Preferences

The model represents a city economy consisting of  $C$  consumers ( $c = 1, 2, \dots, C$ ),  $L$  local producers ( $l = 1, 2, \dots, L$ ), and  $F$  foreign producers ( $f = 1, 2, \dots, F$ ). Each economic group has more than one agent. There are three goods. All actors derive utility  $u$  from consumption of the numéraire (money)  $y$ . Consumers also consume the industrial good  $x$  and are exposed to a positive externality  $\delta Z$  from collective activities of local producers. Local producers are members of the craft cooperative that provides them with the club good  $Z$ . Representative preferences are captured

by the following utility functions:

$$u_c = \log(y_c) + \log(x_c) + \log(\delta Z), \quad (1)$$

$$u_l = \log(y_l) + \log(Z), \quad (2)$$

$$u_f = \log(y_f), \quad (3)$$

where  $0 \leq \delta < 1$  is the positive externality of the club good on consumers.

Notice that local producers as members of the guild have full access to the benefits of the club good in contrast to consumers who had only limit access. This is consistent with evidence which supports that all citizens of the city, not only local craftsmen, benefited from guild social activities (see discussion below).

### 3.2 Consumer's Choice

The consumer consumption is subject to a budgetary constraint. Each consumer is endowed with income  $I > 0$ , which can be either spent on the numéraire or the industrial good at price  $p_x$ . This defines a simple constraint. Namely

$$I = y_c + p_x x_c. \quad (4)$$

Each consumer maximizes (1) subject to (4). The first order conditions leads to the following optimal consumption levels

$$y_c = \frac{I}{2} \quad (5)$$

and

$$x_c = \frac{I}{2p_x}. \quad (6)$$

The derived aggregate inverse demand for the industrial good is thus

$$p_x = \frac{IC}{2X}, \quad (7)$$

where  $X = \sum_{i=1}^C x_i$  is total consumption.

### 3.3 Producers' Choice

Producers' income is his profit  $\pi$  earned on the market by selling the industrial good to consumers. Each producer observes the price of the industrial good  $p_x$  derived in (7) and produces  $x_l$ , and  $x_f$  respectively, of the industrial good at a unit cost equal to one. All products are sold on the market to consumers, so the total consumption of the industrial good  $X$  equals its production. Namely,

$$X = \sum_{i=1}^C x_i = \sum_{i=1}^{L+F} x_i. \quad (8)$$

And market interaction is characterized by imperfect (Cournot) competition.<sup>4</sup>

Given this, the profit of a given producer is:

$$\pi_i = p_x x_i - x_i, \quad i = l, f. \quad (9)$$

The profit maximising quantity supplied by each producer is then

$$x_i = \frac{IC(F + L - 1)}{2(F + L)^2}, \quad i = l, f. \quad (10)$$

Note that since the problem is symmetric, the optimal levels of production and corresponding profits are identical for either of the producers,  $x_l^* = x_f^*$  and  $\pi_l^* = \pi_f^*$ .

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<sup>4</sup>This assumption is consistent with the character of most pre-industrial markets since the number of producers was usually limited, changes in production capacities were constrained, and goods were generally produced at the same time and sold afterwards at periodical markets.

The profit is spent on producer's consumption. Local producers benefit from the club good  $Z$  but its consumption is not free. Each member 'voluntarily' provides a part of his income  $z_l > 0$  as a contribution to the cooperative in exchange for its benefits. The idea is that pre-modern cooperatives did not fully control members' participation in collective activities although minimal participation was always required and enforced.<sup>5</sup> Furthermore, collective demands such as religious piety, compliance with rules of conduct or reputation maintenance were merely impossible to oversee, allowing members to decide their contributions without any threat of being punished. The total supply of club good is the sum of all individual contributions  $z_l$ :

$$Z = \sum_{l=1}^L z_l. \quad (11)$$

After paying the membership fee, the rest of the local producer's profit is spent on the numéraire. The budget constraint is then

$$\pi_l = y_l + z_l. \quad (12)$$

Thus, there is a trade-off between private consumption of the numéraire and contribution to the collective activities. This is a key problem discussed in this model.

A local producer maximizes (2) with respect to (12) while taking the choices of other members as given (behaviour likely to be taken by group members, who are competitors). The following optimal levels of consumption of  $y$  and cooperative

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<sup>5</sup>The historical evidence suggests that guilds relied on the ability to monitor their own members and their contribution to common goals. Monitoring started inside workshops, where masters were responsible for their subordinates. Outside workshops, mutual monitoring took place as members lived and worked within the same neighborhood. Guild members also delegated trustworthy fellows in positions of overseers to supervise their craft and to make sure that everyone was following the prescribed norms. Above all were the sworn masters, who had to supervise the whole guild (Mendl 1947, p. 25; Emler 1870).

participation  $z$  are

$$y_l = \frac{\pi_l L}{L + 1} \quad (13)$$

and

$$z_l = \frac{\pi_l}{L + 1}. \quad (14)$$

A foreign producers is not a member of a local organization and therefore spends his entire profit on the numéraire. Thus the representative budget constraint of a foreign producer is simply his optimal level of consumption

$$\pi_f = y_f. \quad (15)$$

### 3.4 The Early Stage Equilibrium

This subsection defines the equilibrium for this economy in the absence of guild restrictive practices: the *Early Stage Equilibrium*. The market control is not granted. This stage refers to an initial period of craft development when local craftsmen were organized in religious fraternities that did not regulate markets.

In the *Early Stage Equilibrium*, all actors maximize their utility, foreign producers are allowed to enter the local market, all producers maximizes their profit, and the market for industrial good is cleared. The following definition captures this equilibrium.

**Definition 1.** *The Early Stage Equilibrium with the given set of exogenous variables  $(C, L, F, \delta, I)$  is defined as:*

- (i) *consumer's consumption  $y_c^*$  and  $x_c^*$  given by (5) and (6);*
- (ii) *local producer's consumption  $y_l^*$  given by (13) and cooperative participation  $z_l^*$  given by (14) ;*
- (iii) *foreign producer's consumption  $y_f^*$  given by (15);*
- (iv) *market price  $p_x^*$  given by (7);*
- (v) *local producer's profit  $\pi_l^*$  given by (9) and production  $x_l^*$  given by (10);*
- (vi) *foreign producer's profit  $\pi_f^*$  given by (9) and production  $x_f^*$  given by (10);*
- (vii) *total market production  $X^*$  given by (8);*
- (viii) *club good production of  $Z^*$  given by (11);*



Realize that in this equilibrium, each member provides  $z_i^*$  from his income on collective activities. This contribution level equals the private marginal cost of participating in group activities with the private marginal benefit. But this is ineffective from the group perspective because each member does not consider the effect of his actions on other members. If each member takes benefits of others fully into account, the Pareto-optimal allocation of member's income becomes

$$z_i^o = \frac{\pi_l}{2}, \quad (16)$$

which equates the private cost of additional contribution with its social benefit. It leads to the larger level of contribution than  $z_i^*$  as long as  $L - 1 > 0$ .<sup>6</sup>

Hence, the individually maximizing Nash behavior leads to under-provision of club goods within the cooperative and lower utility of its members. Because the inputs of cooperative activities are owned by multiple producers, there is a tendency towards free-riding. This result corresponds to standard problems of voluntary provision of public and club goods, when individual producers considered only their own benefits and not the benefits of the entire cooperative, leading to a worse situation for all. As a result, motivating a sufficient level of contributions becomes the primary goal for the cooperative. Here, obtaining market privileges and restricting foreigners may be one of the responses. The following section explains how this strategy affects the equilibrium.

### 3.5 The Guild Stage Equilibrium

The equilibrium changes as the cooperative obtains the market privilege. The cooperative becomes the guild. This subsection analyses this change and defines the corresponding equilibrium: the *Guild Stage Equilibrium*.

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<sup>6</sup>Note that Equation (16) results from the standard Samuelson condition for the optimal provision of public goods (see Samuelson 1954).

The privilege is interpreted as the ability of the guild to deny access of foreign producers to the local market. This corresponds to the craft development as originally non-licensed organizations of local craftsmen with mostly spiritual agenda started to demand market power. In the model, this is equivalent to the reduction of market participants from  $L + F$  to only  $L$ .

Market privileges alter equilibrium production behavior in two respects. First, foreign producers do not produce since they are not allowed to sell their goods on the market. Hence each foreign producer will now supply  $x_f^{**} = 0$ .

Second, local producers increase their production accordingly. Reducing the total number of producers from  $F + L$  to  $L$  spurs the reaction by local producers, who must increase their production to satisfy the demand given by (7).

As a result, the total production becomes

$$X = \sum_{i=1}^C x_i = \sum_{i=1}^L x_i. \quad (17)$$

and the corresponding profit maximizing production level of a local producer is

$$x_l = \frac{IC(L-1)}{2L^2}, \quad (18)$$

which is greater than  $x_l$  given by 10.

The following definition captures the new equilibrium:

**Definition 2.** *The Guild Stage Equilibrium with the given set of exogenous variables  $(C, L, F, \delta, I)$  is defined as:*

- (i) consumer's consumption  $y_c^{**}$  and  $x_c^{**}$  given by (5) and (6);
- (ii) local producer's consumption  $y_l^{**}$  given by (13) and guild participation  $z_l^{**}$  given by (14) ;
- (iii) foreign producer's consumption  $y_f^{**} = 0$ ;
- (iv) market price  $p_x^{**}$  given by (7);
- (v) local producer's profit  $\pi_l^{**}$  given by (9) and production  $x_l^{**}$  given by (18);
- (vi) foreign producer's profit  $\pi_f^{**} = 0$  and production  $x_f^{**} = 0$ ;
- (vii) total market production  $X^{**}$  given by (17);

(viii) *guild club good production of  $Z^{**}$  given by (11);*

### 3.6 Market power and its Effects

Establishing the effects of the guild market power is straightforward. Solving the model for each stage and comparing equilibrium values reveals how the privilege alters the behavior of individual actors and market outcomes. The relevant changes in equilibrium values are summarized in the Table 2.

Inspecting Table 2 reveals welfare effects of the market power on individual actors at the market. Each local producer is better off after receiving market privileges. His welfare improves. There are two sources of this improvement. The first source is the expansion in craftsman's available budget for consumption,  $\pi_l^* < \pi_l^{**}$ . Because cooperative members generate their profit from competing on the local market, restricting their competitors will raise their income, which in turn will increase their consumption,  $y_l^* < y_l^{**}$ , and participation  $z_l^* < z_l^{**}$ . The second source of welfare gain is the increase in the total supply of club goods available for cooperative members:  $Z^* < Z^{**}$ . Here, market restrictions motivate each member of the local cooperative to contribute more to the common goal, which results in greater production of club goods and hence greater utility for every member from their consumption. So, market control motivates club members to participate in cooperation, which increases the total supply of club goods.

Foreign producers are in an opposite situation. Each foreign producer is worse off when his local competitors received market privileges. His welfare decreases. The source of this decrease is the reduction in craftsman's available budget,  $\pi_f^* > \pi_f^{**}$ . Because of the loss of market access, a foreign producer is not able to sell goods and hence his income available for consumption is zero.

The effect on consumer's welfare is, however, ambiguous. Each consumer is

Table 2: Equilibrium values and their changes

Early Stage	Guild Stage	Effect
<b>Consumer</b>		
$y_c^* = I/2$	$y_c^{**} = I/2$	unchanged
$x_c^* = I(F + L - 1)/2(F + L)$	$x_c^{**} = I(L - 1)/2L$	$x_c^* > x_c^{**}$
<b>Local producer</b>		
$x_l^* = IC(F + L - 1)/2(F + L)^2$	$x_l^{**} = IC(L - 1)/2L^2$	$x_l^* < x_l^{**}$
$\pi_l^* = IC/2(L + F)^2$	$\pi_l^{**} = IC/2(L)^2$	$\pi_l^* < \pi_l^{**}$
$y_l^* = ICL/2(L + F)^2(L + 1)$	$y_l^{**} = IC/2L(L + 1)$	$y_l^* < y_l^{**}$
$z_l^* = IC/2(L + F)^2(L + 1)$	$z_l^{**} = IC/2L^2(L + 1)$	$z_l^* < z_l^{**}$
<b>Foreign producer</b>		
$x_f^* = IC(F + L - 1)/2(F + L)^2$	$x_f^{**} = 0$	$x_f^* > x_f^{**}$
$\pi_f^* = IC/2(L + F)^2$	$\pi_f^{**} = 0$	$\pi_f^* > \pi_f^{**}$
$y_f^* = IC/2(L + F)^2$	$y_f^{**} = 0$	$y_f^* > y_f^{**}$
<b>Market</b>		
$p_x^* = (F + L)/(F + L - 1)$	$p_x^{**} = L/L - 1$	$p_x^* < p_x^{**}$
$Z^* = ICL/2(L + F)^2(L + 1)$	$Z^{**} = IC/2L(L + 1)$	$Z^* < Z^{**}$
$X^* = IC(F + L - 1)/2(F + L)$	$X^{**} = IC(L - 1)/2L$	$X^* > X^{**}$

affected by the guild privileges in two ways: positive and negative. The negative impact comes from the increase in the price of the industrial good,  $p_x^* < p_x^{**}$ . Less producers means higher prices for their products. This lowers the consumption of the industrial good,  $x_c^* > x_c^{**}$ , and hence consumer's utility coming from this consumption. The positive impact comes from the greater effect of externality of the club good,  $\delta Z^* < \delta Z^{**}$ . This is because the production of the club goods and hence its spillovers are greater once local craftsmen hold the privileges and are able to better enforce cooperation among themselves.

## 4 Predictions and evidence

My theoretical analysis yields to several predictions regarding the effect of market privileges on pre-modern industries. The historical evidence from cooperatives in Prague is in support of them.

**Prediction 1.** *Craft guilds should obtain royal privileges in order to [1] increase personal profit of their members at the expense of nonmembers and [2] generate better cooperation in production of club goods.*

According to the theory, the welfare impact of guild membership on its holders was twofold. A market privilege raises members' profit  $\pi_l$  and enhances cooperation within the guild  $Z$ . The theory therefore suggests that we should observe local craftsmen to obtain a privilege in order to generate personal wealth and cooperation.

Historically, the general principle and purpose of guilds was “to first secure their master's business through a monopoly of production and trade, to secure an individual with good living” and also “to guarantee the quality of production with respect to customers, raise professional youngsters” and that “guild members should support each other under the watchword of brotherhood and faith” (Winter 1909, p. 11). Rhetoric in old articles and disputes supports this principle.

Firstly, guilds demanded market privileges to increase their members' profit at the expense of potential competitors. Their goal was to prevent nonmembers from competing with guild masters. For example, the Tailors of the New Town demanded that “the one who is not properly admitted in the order and the guild, shall not hurt or harm any master” (PCA, SR, s. 3502, p. 5). However, nonmembers did not observe such rules. They often intruded into the sphere of guild privileges and by doing so they threatened masters' profits. As a result local masters complained to local or national authorities demanding the enforcement of their market privileges. For example, in 1642 the butcher's masters complained to the city councilors “that many times *stolíři* [pedlars] and *huntýři* [nonmembers] of our honest craft make cuts and obstacles to our butcher's business by illicitly selling various kinds of meat in the Towns of Prague, in houses or on the horse market” (PCA, SR, s. 1713, ff. 2r-2v). Similarly, in 1575 the furriers complained

to the king against Jews, who harm their business by selling products of their craft (PCA, CK, s. Kožešníci 7, inv. 9, ff. 21v-24v). In 1456, the New Town councilors settled the dispute between cobblers who make new shoes and those who repair old-shoes, so that each of them has their privileges “for business and benefits of their craft” (Tomek 1895, p. 470).

Secondly, guilds demanded market privileges to maintain the production of collective benefits. Here, their goal was the production of club goods. Ordinances were generally granted by local authorities for the superior order of the profession and the common good. For example, the Old and Lesser Town councilors acknowledged the privileges of Painters, Glaziers and Metalworkers in 1598 because of “knowing how they impact and educate people and particularly townsmen in love, unity and order” (Chytil 1906, p. 315). The role of privileges in generating club goods was also stressed by guildsmen themselves. A particular example comes from the long-lasting dispute from the 16th century between the New Town Butchers and *huntýři* [nonmembers] (PCA, CR, s. Řezníci 16, inv. 18, ff. 45v-71r). In one of the supplications to royal authorities, the senior masters stressed their worries that competition from nonmembers would cause harm to their organization, so that they “would be not able to stand in the order, to provide payments to the Slav monastery and to pay or to take care of decrepit masters and orphaned widows” (PCA, CR, s. Řezníci 16, inv. 18, ff. 61v-62r).

**Prediction 2.** *Craft guilds with market privileges are expected to produce more collective goods compare to non-privileged cooperatives.*

In my model, obtaining market power increases club good production,  $Z^* < Z^{**}$ . We should then find that cooperatives holding market privileges produce a greater scope of club goods than cooperatives without such privileges.

Before craft guilds as privileged organizations appeared in Bohemia, craftsmen with the support of the Church formed local religious fraternities known

as *bratrstva*. In Prague, fraternities of Belt-makers, Painters and Shield-makers, Goldsmiths and *Institores Iuniores*, among others, were established (Winter 1906, p. 184; Pátková 2000, p. 50). However, these cooperatives of local producers did not hold government privileges and thus were not able to increase members' profit and enforce additional contribution by restricting access to local markets.

The theory predicts that under such circumstances collective activities would be limited. Evidence from Prague fraternities shows that the scope of cooperation among their members was indeed limited. They only engaged in activities of a religious and humanitarian character. Members regularly engaged in group prayers, held magnificent masses and ceremonies, participated at other member's funerals or paid into a common insurance fund. They also likely discussed trade and business issues. However, collective action in this respect was very limited unless they obtained government privileges (Winter 1904; 1906, pp. 63-65; Pátková 2000, pp. 51-69).

The scope of fraternities' collective activities was in sharp contrast with those of early guilds. Only after obtaining privileges from rulers, cooperation was further extended, especially to market-related activities. In addition to social activities, early craft guilds engaged in enforcing contracts, providing product reputation or maintaining discipline and justice within the profession.

**Prediction 3.** *The guild market power may decrease wage of journeymen and profit of nonmembers, which may lead to conflicts between the guildsmen and other craftsmen.*

My model predicts two sources of frictions on the market. First, obtaining market power increases members income,  $\pi_l^* < \pi_l^{**}$ , but has a negative effect on nonmembers income,  $\pi_f^* > \pi_f^{**}$ . Hence, economic inequality between members and non-members may increase.

Second, obtaining market power lowers wages of guildmen's employees,  $w^* > w^{**}$ . As a result, market privileges may lower economic situation of journeymen.

The history of conflicts in Prague between various classes of craftsmen supports this prediction. On one side of these conflicts were guild masters, who were full members of craft guilds and local citizens. As such they had the right to engage in any economic activity within the walls of the city. On the other side of these conflicts were all other professionals—especially journeymen and nonmembers.

Journeymen were trained craftsmen who traveled from town to town offering their services to local guilds. Because they did not hold mastership, they could work only as employees in masters' workshops for low wages with limited opportunities to earn anything above. These conditions led to conflicts between them and masters. Often journeymen stood up against the restrictive practices of their guild masters. In 1451, furriers' journeymen organized a strike against their masters because of dissatisfying labour and wage conditions. All of their demands, particularly the reduction of working hours, were denied. A few years after, a dispute among Prague armour-makers emerged, in which journeymen demanded from their masters a wage increase. After the negotiation journeymen's wages were raised, but such a success was rather rare (see, for an overview, Winter 1890b).

There were also conflicts with craftsmen who worked independently without guild membership, such as *štukverníci* and *huntýři*. These craftsmen traveled to or eventually lived in the city. They had no connection to local guilds in contrast to journeymen. They could sell products freely during the regular markets and seasonal fairs, but this was not usually enough to make a proper living. Thus, they also worked secretly on their own without guilds' allowance and against their regulations. This led to multiple disputes with local guild masters and often ended with punishment of the nonmembers such as confiscation of their goods, prohibition of any activity in a city or even imprisonment (PCA, CR, s. Řezníci 16, inv.



18; Hücke 1939, pp. 32-35).

These regular conflicts pointed out that the limited ability of nonmembers to make their living in pre-modern industries was a result of denying them access to local markets. As explained by Mendl (1947, p. 40) “obstacles in obtaining a mastership sentenced a part of craftsmen towards a life journeymanhip and deepened class differences among members of the same profession.” So, as guilds restricted competition in their favor, the welfare inequality within professions increased.

**Prediction 4.** *Having market power increases the cost of losing guild membership, and this may be used as a mechanism for enforcing cooperation.*

The theory shows that guild market power increases members’ welfare and decreases nonmembers’ welfare. An important result of this is that the value of membership and thus the cost of losing membership rise substantially. This can be used as a mechanism for enforcing compliance with guild regulations.

Historical records show that Prague guilds employed a sophisticated system of sanctions to enforce compliance with rules, in which punishment by expulsion had an important role. The initial sanctions were not intended to penalize an offender but rather to provide information to other guild members about offense and to warn the offender against future breaches of rules. In a common scenario of minor offense, like missing a meeting, the guild did not charge anything for the first time but often requested only an apology for misbehaving. But the more often a craftsman deviated the less reliable he became. So, for the second time, the guild would charge the wrongdoer a fine. The role of these initial punishments was to increase overall awareness and confidence in the system and also to ease future monitoring. But to deter unduly, serious, or systematic violations of internal rules, graduation in sanctions was applied.<sup>7</sup>

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<sup>7</sup>For several types of sanctioning see PCA, CP, s. Pekaři a perníkáři 12a, inv. 2, f. 4v.; PCA, CR, s. Řezníci 4, inv. 6, ff. 1r-5v; Tomek (1895, pp. 450-451, 454).

The highest possible sanction available was expulsion. For example, the Furriers of the Old Town in 1598 temporally expelled Jan Vejlupek from Uherský Brod for dishonouring a girl and beating another journeyman in a pub by ordering him to wander for one year and one day (PCA, CK, s. Kožešníci 8b, inv. 12, f. 2v). In 1644, Jiřík Herštík was rejected and lost his right to become a master because of his improper marriage; his wife gave birth to a child just after the wedding day (PCA, CK, s. Kožešníci 8b, inv. 12, f. 33v). In other cases just the threat of expulsion was applied. In 1653, a butcher labourer was ordered to pay 4 candles of 4 pounds of wax for “dishonouring a maid in a house of his master” with a warning that if “he would do something similar, he would loose his right to craft” (PCA, CR, s. Řezníci 5, inv. 7, f. 97v).

Expulsion meant the loss of all benefits associated with membership in the cooperative. It meant no social security, no contract backup, no religious services, no meetings in pubs, loss of friends, loss of social status, no rights for an apprentice, nor hiring journeyman, but not only that. Expulsion from the association of craftsmen also prevented any serious employment in the future, at least within the local industries. It meant complete isolation and rejection from the community. As such, the threat of expulsion was likely to be an effective device to make guild members forget about shirking and follow the rules.

**Prediction 5.** *The guild market power is likely to decrease welfare of consumers by increasing the output price which may in turn lead to government regulations.*

The theory highlights the negative impact of the guild power on consumers’ welfare through the increase of the price of the industrial good produced by guild members,  $p_x^* < p_x^{**}$ . In response to this negative welfare effect, the local authorities may take an action against guild pricing.

The historical evidence of medieval price regulations supports this prediction. Central authorities and city representatives imposed price regulations on local

trade in order to limit the power of guilds that would bring expensiveness of their goods. In this respect, Ferdinand I in 1547 intervened against guild pricing because there were numerous complaints about expensiveness of craft goods across the empire. He established a series of rules how guilds should price their goods and pay their employees (Fröhlichová-Karlová 1938). Furthermore in 1578, he issued the royal degree that set maximal prices of more than 15 crafts across the empire including tailor's, cobbler's or soap-maker's products (Melichar 1902, pp. 184-185).

Also local authorities fought against high prices of guilds. This was especially the case of food processing crafts such as bakers, butchers or brewers, where the city had a great interest in maintaining low prices to make necessities available for everyone.

**Prediction 6.** *The guild market power is likely to increase welfare of consumers by providing a substantial amount of public services.*

The model shows that obtaining the privileges generates greater positive externalities in terms of public services available beyond guild membership,  $\delta Z^* < \delta Z^{**}$ . Historical evidence is extensive in these matters.

As much as guilds served their own members, they were still government-licensed organizations. As such, their members were responsible to provide various services and perform duties beyond their narrow private interests. Guilds could, and very often did, sentence wrongdoers and resolve disputes among their own members, provide social and burial insurance, guarantee quality standards or make certain products widely available. But their public duties had a greater scope including fire and police services, tax collection or contributing to the fame of the city. The primary goal was prosperity of the city and its citizens.

First, guild members were supposed to serve military service, for which their ability to organize fit perfectly. Bohemian guilds performed the service in various

ways. This included patrols on the streets, paying for men-at-arms or taking part in defence in times of danger. Many of these duties exceed those of other citizens making it a burden specific to craft organizations (see, for example, Winter 1890a, 2nd book). Craftsmen's combat readiness was documented during the invasion of Prague by the Passau Army in 1611. Craftsmen quickly equipped and hired men, who would defend the city against the enemy with brewers raising 100, butchers 50, cobblers 40, traders 20, furriers 18 and so on. All together, local craft guilds raised an army of over 400 men-at-arms for the defense of the city, which may have amounted to a quarter of all defenders in the Old and New Town before the invasion (Pávová 1960).

Second, guild members provided fire services. Fire was a great worry for citizens living in pre-modern Prague and therefore, no matter whether young or old, men or women, everyone was expected to assist in case of emergency, but craftsmen and their organizations in particular were expected to do so. Guild provided specific services to prevent disaster. For example, the oldest fire safety order in Prague, *De Igne*, from before 1314 instructed every handicraft to have fire hooks and in case of fire, craftsmen were obligated to hurry up with these hooks and to tear houses down, which were in flames, to prevent spreading of fire. If missing the duty, the craft was fined on behalf of community (Rössler 1845, p. 4).<sup>8</sup>

Third, guild members contributed to the city presentation during the official events such as parades, festivals or royal celebrations. For example, the brewers of the Old and New Town went on streets whenever necessary to greet his majesty or for any other occasion. It was the duty of all craftsmen to attend parades just to show good habits. Anyone failing in these duties was charged a fine (Tomek 1855, p. 469).

Fourth, guilds members paid and collected taxes for local and national author-

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<sup>8</sup>The contemporary practice and extensive set of laws during fire can be found in "Prawa Městská Království Čieského" from 1579 (no. CXCI-CCVI).

ities. Guilds collected on behalf of rulers tolls from merchants coming to trade in Prague (PCA, CK, s. Kožešníci 23b, inv. 11, ff. 4v-5r). Their members were required to pay citizenship payments as an entrance condition and for obtaining royal privileges (Tomek 1895; Hücke 1939, pp. 13-23). Some professions, such as butchers, were even obligated to pay rents for their shops in a city (PCA, CR, s. Řezníci 16, inv. 18, ff. 20v-22r).

## 5 Conclusions

Market power generally has a negative connotation among economic historians because of its distorting impact on the economy. Craft guilds are without a doubt one of the most favorable examples of a historical institution whose exclusive rights to local markets harmed the industrial development in particular and the society in general. The negative implications of guilds oligopolies definitely have their justification. There were harmful implications for nonguilded producers and masters' employees, who were limited in practicing their occupation, and for consumers, who had to pay higher prices for goods and services supplied by privileged guild members. But there is also the other side of the coin.

The theory of club guilds developed in this paper provides a comprehensive explanation for the role of market power in pre-modern cooperatives, and its implications correspond with the historical records from Prague guilds. My model suggests that guild restrictive practices such as strict membership requirements, market controls or trading restrictions helped local producers reduce free-riding behavior in the production of shared goods. By prohibiting nonmembers, economic rents motivated further collective action within the cooperative. From increased profits, guild members were able to finance and generate services such as product reputation, contract enforcement, social insurance or religious support that were essential during the transition from kin to modern economy. The historical

evidence also shows that the share of economic benefits from market restrictions was surrounded in ruler's favor providing him with extra earnings from which he could finance his military and royal activities. Furthermore, in exchange for privileges craft guilds provided services to the general public such as fire-fighting, city defence and public representation.

## Appendix

Primary sources are from the Prague City Archives located at Archivní 6, 149 00 Praha 4, Czech Republic. The abbreviations by which these sources are referred to are as follows: PCA (the Prague City Archives), CK (fond Cech kožešníků), CP (fond Cech pekařů), CR (fond Cech řezníků), CS (fond Cech ševců), SP (fond Sběrka pergamenových listin), SR (fond Sběrka rukopisů), s. (signatura), inv. (inventární číslo).

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