The Economic Impact of the Craft Guilds

A Quantitative Analysis for Dutch and Italian Cities, 1200-1800

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Abstract

Drawing on long-term evidence for Italian and Dutch cities, this paper aims to shed some light on the long-standing debate about the nature and consequences of the craft guild system by analyzing the effect that craft guilds could have had in the economic performance of the pre-industrial city. In order to assess this impact, this paper exploits variation across a sample of 61 Italian and Dutch cities between the 12th and the 19th centuries in the number of craft guilds per one thousand inhabitants, or *guild density*, a variable which roughly captures the intensity of craft guilds control over the local manufacturing industry. Our proxy for local economic development is growth in city size. Our preliminary results do not suggest the existence of a significant link, either positive or negative, between craft guilds and pre-industrial economic performance at the city level.

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"Trois cents hommes, tous simples, tous pauvres, presque tous illetrés, et qui, pourtant, avaiaent su devenir la corporation la plus respectée de la ville, la plus solidaire, la mieux organisée."

— Amin Maalouf, *Léon l'Africain.*

1 Introduction

Departing from the writings of the Enlightenment social reformers, a solid historiographical strand has traditionally regarded craft guilds as an institution established to further the private interests of masters at the expense of apprentices, suppliers and consumers, as well as the society as a whole (Smith, 2008 [1776]; Ogilvie, 2004, 2008; Desmet and Parente, 2011). Unjustifiable lengthy apprenticeship terms, enforcement of arbitrary quality standards, as well as outright opposition to product and process innovation would have constrained market forces and technical change, eventually leading to economic stagnation (Ogilvie, 2008). In recent years, however, a growing body of literature has casted doubts on this negative view (Epstein, 1998, 2008; Lucassen *et al.*, 2008). Craft guilds, according to these authors, would have been an efficient institutional response in the face of pervasive market failures. Information asymmetries would have pushed masters to design and enforce a set of rules aimed at reducing uncertainty in transactions by establishing minimum quality standards (Richardson, 2008). Similarly, the tacit nature of the knowledge involved in craftwork as well as the existence of positive externalities in training would have encouraged the establishment of a complex apprenticeship system (Epstein, 1998).[1] As a re-

[1]Despite being the most relevant ones, information asymmetries in final markets and positive spillovers in tacit knowledge are not the only *raisons d'être* that this more benevolent strand of literature has put forward regarding the emergence of craft guilds. Expla-

sult, craft guilds would have allowed for the accumulation of human capital, technical innovation and diffusion, as well as the expansion of the market.

Building upon long-term evidence for a number of Italian and Dutch cities, this paper aims to shed some light on this long-standing debate by analyzing the impact that craft guilds could have had in the economic performance of the pre-industrial city. Craft guilds were a key component of the urban centers of pre-industrial Europe and, in particular, of Italy and the Low Countries. As **Figure 1** shows, craft guilds emerged in Italy at the beginning of the 13th century. Despite regional disparities, with the Northern manufacturing centers (Milano, Venice, Verona, Padua, Bologna, Mantua) taking the lead, the number of Italian guilds experienced sustained growth until their abolishment in the 19th century. Their emergence in the Netherlands took place more than one century later **(Figure 2)**. However, they soon caught up: rapidly until the mid-17th century, at a slower pace afterwards. By the early 19th century, as was the case in much of Europe, most of them had disappeared.[2]

The cities of Italy and the Netherlands, for their part, were the focal points of the period of economic prosperity which, starting in the late Middle Ages, is known as the commercial revolution (López, 1976). Despite persistence in urban patterns from Roman times, urbanization in Italy experienced an increase between the years 900 and 1300 (Malanima, 1998). A

nations based on credit provision (Pfister, 1998), fiscal functions (Hickson and Thompson, 1991) or welfare activities (Persson, 1988) would also allow for the reconciliation between masters' private interests and societal welfare.

[2]For the sake of curiosity, according to our datasets, the first documented craft guild which appeared in Italy was the *calzolai* guild (shoemakers) of Ferrara, Emilia-Romagna, established in 1112 and abolished in 1797. In the Netherlands, it was the *lakenkopersgilde* (drapers) of Dordrecht, Zuid-Hollland, established in 1201 and abolished in 1811.

more sustained process took place in the Low Countries, which, during the 16th and 17th centuries and contrasting with economic decline in Italy, witnessed the Golden Age of the Dutch Republic (de Vries and van der Woude, 1997).

The decline of the Italian manufacturing centers during the 17th century would endorse the claims of those stressing the harmful consequences of craft guilds (Cipolla, 1968). The paths followed by certain areas of southern Germany in the early modern period would represent similar examples of economic stagnation induced by the rent-seeking nature of the guilds (Ogilvie, 2004). In stark contrast, several scholars have turned to the historical experiences of the Dutch Republic or England to defend the positive contribution of guilds to the economic performance of the pre-industrial economy (Epstein, 1998; de Vries and van der Woude, 1997).[3] Making general claims departing from case-studies drawn from disparate regions and time periods, however, makes it difficult to reach consensus. In this sense, a broader geographical scope and longer time horizons could well contribute to advance this debate.

In order to test the impact that craft guilds could have had on local economic performance, this paper exploits variation across a sample of Italian and Dutch cities between the 12th and the 19th centuries in the number of craft guilds per one thousand inhabitants, or *guild density*, a

[3]In more general terms, in recent years, some scholars have stressed the role played by different forms of corporate collective action (craft guilds but also merchant guilds, communes or commons) in contributing to the emergence of distinctive 'vertical institutions', solving the 'fundamental problem of exchange', expanding the scope of the market and contributing to the early emergence of a commercial economy in Western Europe from the late Middle Ages onwards. See Greif, 2006; de Moor; 2008 and van Zanden, 2008

variable which roughly captures the intensity of craft guilds' control over the local manufacturing industry. Our proxy for economic development in pre-industrial times, in line with recent works, is growth in city size (Acemoglu *et al.*, 2005; Bosker *et al.*, 2008; Bosker *et al.*, forthcoming; Cantoni, 2010; Dittmar, 2011; van Zanden *et al.*, 2012). Our preliminary empirical analysis shows that guild density is not correlated, either positively or negatively, with pre-industrial economic performance at the city level. The rest of the paper is organized as follows. The next section discusses the literature on the nature and economic impact of craft guilds, in particular the recent revisionist hypotheses. Section 3 presents the data and methodology employed to test the hypothesis of this revisionist literature whereas section 4 reports the results of the empirical analysis. Finally, the last section presents some concluding remarks.

2 Craft Guilds and Economic Performance

From the late Middle Ages onwards, associations of craftsmen started to blossom all around Western Europe (de Moor, 2008; van Zanden, 2009). Although private associations of artisans have been also documented during Roman times, the disappearance of these *collegia* after the barbarian invasions provides medieval guilds with an independent origin away from institutional continuities (S. A. Epstein, 1991).[4] Additionally, despite the

[4]Dependence on slaves as the dominant source of labour as well as the close intertwining, especially during late imperial times, with state structures have prevented scholars from establishing a direct link between these Roman *collegia* and medieval craft guilds. S. A. Epstein (1991) is categorical on this point: "The medieval guild had developed its own structure and rules without the benefit of Roman example" (p. 26). In the Eastern half, however, survival of Roman law and much of the socio-political apparatus of the Empire

existence of craft guilds in neighboring regions such as the Byzantine and Ottoman Empires or the Islamic world, both their number as well as their economic and socio-political impact seem to have never matched the Western European record. The craft guild seems, therefore, to have been an institutional arrangement fo organizing the manufacturing activities particularly present in Western Europe until its abolishment in the early 19th century.

The widespread view that, since the late 18th century, has regarded them as rent-seeking institutions has been challenged in recent years by a number of scholars (Epstein, 1998, 2008; Richardson, 2008; Lucassen *et al.*, 2008; Epstein and Prak, 2008). In a context of fragmentation of public authority such as post-Carolingian Western Europe, the uncertainty associated with the production and distribution of goods and services hampered the establishment of mutually beneficial relationships (Greif, 2006; van Zanden, 2008). The realization of gains from trade and production would have pushed craftsmen, in the absence of an appropriate public system of contract enforcement and conflict settlement, to develop these much needed institutions by themselves. Providing security and law to commercial and manufacturing activities would have been, therefore, the main purpose of craft guilds (Prak, 2006).[5]

did allow for the continuation of the *collegia*. For an overview of guilds in the Byzantine Empire, see, for example, Marinatis, 2001.

[5]And not only of them: as indicated, this more benevolent view on late-medieval institutions also extends to merchants guilds, communes and commons. Despite the dangers of drawing parallels between past and present, it is unavoidable to read this positive reasessment under the light of the contemporary developments that, both in academia and outside it, stress the role of non-market institutions, built upon local knowledge and experimentation, in mitigating market and government failures in developing and less developed countries. See, among others, Ostrom, 1990 or Rodrik, 2000.

The role played by craft guilds in the provision of skills has been highlighted by S. R. Epstein (1998, 2004, 2008). The tacit, experience-based nature of technical knowledge in pre-industrial Europe would have encouraged its provision by master themselves rather than its acquisition by prospective apprentices (Epstein, 1998; Belfanti, 2004).[6] The realization of this investment by masters, or at least of optimal levels of it, would have required, however, their ability to appropriate future returns on human capital. Cooperation by masters, formalized in the craft guild, would have had as main objective the enforcement of apprenticeship rules in order to reduce free-riding (Epstein, 2004, which nicely links with the role played by labour-market imperfections in Stevens, 1994; Acemoglu, 1997; and Acemoglu and Pischke, 1998). By means of mitigating positive knowledge spillovers, craft guilds would have been one of the main institutional arrangements contributing to human capital accumulation in pre-industrial Europe (Epstein, 1998).

Additionally, the quality monitoring and enforcement mechanisms collectively implemented by craft guilds would have been addressed at mitigating the adverse selection problems that plagued medieval markets, particularly in cases of long-distance trade (Richardson, 2008, which builds upon Akerlof, 1970; Mocarelli, 2008). In the absence of alternative mechanisms for consumer protection, a long-standing reputation regarding the effectiveness, durability and/or safety of the products would have proved decisive

[6] Experience-based knowledge presents, by definition, high information and reproduction costs. Low income per capita levels together with market failures in capital markets can prevent the acquisition by individuals of a, nevertheless, socially profitable investment even when skills are transferable across firms or sectors (Epstein, 2004; Acemoglu, 1997; Becker, 1964).

in order to reassure prospective buyers and facilitate market exchange. For medieval craftsmen, quality controls and conspicuous characteristics represented, then, a competitive advantage (Richardson, 2008).[7] Given the limitations of other arrangements, collective monitoring at the craft level must have represented an efficient way of implementing quality standards. Apart from the increase in the sales of the individual craftsmen, the expansion of the market size brought about by these reputation mechanisms must have fostered opportunities for specialization and efficiency gains.

Innovation seems to have been also closely intertwined with the set of rules embedded in the guild system (Epstein, 1998, 2008, Lucassen *et al.*, 2008). In his earlier work on guilds, S. R. Epstein went so far as to claim that "the main direct source of pre-modern technical innovation was the craft guild" (1998, 695). This statement builds, as is the case regarding apprenticeship and quality monitoring, upon the notion of market failure. When it comes to innovation, the public good nature of knowledge would require the development of a set of institutions in order to make knowledge excludable (Stiglitz, 1999).[8] Guilds rules regarding trade secrecy not only would have benefited masters but, by means of providing them with

[7]The assertion that craft guilds pursued, via quality certification and appropriate apprenticeship, consumer protection (as Mocarelli, 2008 seems to suggest) should be then qualified. Richardson's view (2008) appears far more convicing: guilds protected consumers as long as this allowed them to gain a competitive edge and increase the sales of their members.

[8]The definition and enforcement of transferable private property rights over the outcomes of innovation (i. e. patents) or government intervention (either through direct involvement in R+D activities or by means of selective incentives to private innovators) would be alternative mechanisms to mitigate the problems posed by the non-excludable nature of knowledge. In fact, contrasting with the stress on craft guilds, the development of a solid patent system has been put forward as one of the main forces behind the Industrial Revolution. See MacLeod, 1988.

monopoly rents, would have also encouraged a socially beneficial process of product and process innovation. Additionally, clustering of craftsmen in the space of the pre-industrial city would have resulted into spillover effects and agglomeration economies. A weaker interpretation of the link between guilds and innovation focuses, however, on their role in the accumulation and transmission of technical know-how (Epstein, 2008; Belfanti, 2004).

Beyond its direct impact on economic performance, craft guilds could also have well contributed to the emergence of a political environment more beneficial to economic dynamism. In a context of revival and expansion of city-based activities, corporate interests seem to have actively intervened in the political process in order to provide themselves with a set of institutions better suited to the new needs of commerce and manufacturing than the existing ones (Hohenberg and Lees, 1995; Blockmans, 2007).[9][10] Eventually, the success of these groups gave way to the emergence of an autonomous territorial jurisdiction, the commune (Weber, 1922 [1978]; Hohenberg and Lees, 1995). The autonomy, corporate control and relative inclusiveness of the commune would have contributed to the economic expansion of the late

[9]Despite being a common place, it is illuminating to bring here Weber's definition of the medieval Western city as "an act of usurpation of legitimate (feudal) power by groups of burghers who acted collectively to establish their free status – that is, subject to a special and autonomous law" (in Epstein, 1994, 9).

[10]In the case of Florence, the elevation of corporate principles (autonomy and equality among members) to the communal government gave birth to a peculiar urban ideology, the guild republicanism (Najemy, 1979). Becker (1960) has also stressed the politically innovative role of the guilds as well as the inclusiveness that seems to have characterized Florentine republicanism.

medieval and early modern city (Van Zanden *et al.*, 2012).[11][12] In addition to the consolidation of distinctive political institutions, patterns of repeated social interaction, as embedded in the guild system, in religious brotherhoods or in civic militias, would have resulted in a set of informal norms and levels of trust which, in turn, would have facilitated mutually beneficial cooperation wherever social dilemmas had been present (Putnam, 1993; 1994).[13]

In the end, the revisionist literature exhibits a strong view of guilds as individually rational and socially efficient institutions. The production and distribution of goods in pre-industrial Europe was held back by information asymmetries, externalities, non-excludable goods and agency dilemmas. Buyers in Troyes did not know the quality of the swords brought from the Damascus. Clock-making apprentices in Calw could leave before the end of

[11] Epstein (2000), however, rejects this idea, putting forward the political instability that commune frequently exhibited. Communes, according to him, were open communities but "that extreme openness created conditions of permanent revolution that threatened the city-states survival."

[12] Apart from its direct impact, the pro-growth nature of the medieval and early modern commune could have also worked via the emergence and consolidation of less absolutist institutions at the supra-local level (van Zanden *et al.*, 2012). On the one hand, the link between representative political institutions and positive economic performance in pre-industrial Europe seems well established, both theoretically and empirically (North and Weingast, 1989; DeLong and Shleifer, 1994; Acemoglu *et al.*, 2005; Van Zanden *et al.*, 2012). For a criticism of this hypothesis, see Epstein, 2000). On the other, the defining feature of the parliaments that started to flourish in Western Europe from the late Middle Ages onwards was, precisely, the presence of representatives from the newly-born autonomous cities.

[13] Putnam, writing on the Italian communes in the late Middle Ages and Early Modern period, is categorical when he asserts that "these communities did not become civic simply because they were rich (...) They have become rich because they were civic" (Putnam, 1994, 3). Similarly, van Zanden and Prak (2006) depict the Dutch Republic as "a political community based on trust, participation and commitment" (p.15), resorting to the idea of citizenship to explain the superiority of its financial system, with its subsequent expanded supply of public goods. See Axelrod (1984) for a study of the conditions leading to mutually beneficial cooperation in the presence of social dilemmas.

their apprenticeship term. Further refinement of Murano glass would have been impaired by open access to the productive process. In the absence of an externally provided system of well-defined property rights, contract enforcement and conflict settlement, transaction costs (i.e. the price of using the market) would have been high enough as to prevent craftsmen, apprentices, merchants and consumers from realizing mutually beneficial market exchanges. As long as the costs of designing and implementing new rules remained low, craftsmen had much to gain from the development of alternative ways of governing their manufacturing and commercial activities. Craft guilds would have been, then, a widespread solution for these problems. By means of solving these market failures, craftsmen, however, were not only guaranteeing themselves a skilled workforce, increased sales in faraway markets and future competitive advantages in products or production processes. From the other parties' view, they were also facilitating skill provision, expanding purchases and reassuring better quality-price pairs. They all won. As unintended effect, higher-skilled craftsmen, larger markets and incremental innovation would have resulted into expanded possibilities for specialization, efficiency gains in the use of labour and better economic performance. To Smith's surprise, private vices and public virtues once again.

However, "viewing institutions as invariably good solutions to economic problems is too optimistic" (Ogilvie, 2007, 651). This optimism cools down when confronted with the conventional wisdom on the craft guild system. According to a historiographical tradition that dates back, at least, to the work by Adam Smith, craft guilds have been regarded as rent-seeking institutions redistributing resources to the masters at the expense of apprentices,

consumers and the society as a whole. The widespread presence and power of craft guilds would have impaired prospects for prosperity, and precisely their earlier weakening and abolishment would have allowed economic growth to take place.[14]

Admittedly, the debate over craft guilds is open to more nuanced visions. First of all, weaker efficiency considerations allow the adoption of a more dynamic view. Provided that craft guilds were in place for more than six centuries, it is almost certain that their impact on economic performance varied over time, maybe emerging as institutions contributing to social welfare but progressively mutating, victims of their own success, into constraints on further increases in the size of the pie. Secondly, variation across territories is also plausible. In those regions, such as the United Provinces in the 17th century, where alternative solutions to market failures (e.g. a well-developed patent system, supervision of the products by city authorities or merchant guilds) were widely available, the role of craft guilds would have certainly been less important than in areas in which the institutional offer was far less diversfied (Davids, 2003). Finally, the multi-functionality of institutions in general and craft guilds in particular has to be stressed. Institutions deploy their activities in many spheres and efficiency gains in one of them may come at the expense of efficiency loses in another, with the overall impact being not that easy to identify (Ogilvie, 2007; Gelderblom and

[14]Contrasting with the positive role that, according to some authors, craft guilds would have played in regions such as England or the Low Countries (Epstein, 1998; de Vries and van der Woude, 1997), scholars as Ogilvie offer an inverse, dismal interpretation: the exceptional economic performance around the North Sea region would be strongly correlated with the absence of strong craft guilds. Her statement is clear: "Industry flourished where guilds decayed" (Ogilvie, 2008, 175).

Grafe, 2010). However, even bearing all this in mind, the main claim of the revisionist literature ("What would have happened to economic growth and technological innovation if craft guilds had not existed?" as S. R. Epstein rethorically asked in 1998) remains to be tested.

3 Data and Methodology

In order to assess the impact that craft guilds could have had on the economic performance of pre-industrial cities, we have made use of a panel data at the city level for the period 1200-1800 (centennial observations). Economic performance at the city level is proxied by growth in city population. Although other indicators (per capita income, urban wages) would be preferable, their widespread unavailability for our sample of cities during most of the pre-industrial period requires the use of a second-best variable. In this sense, however, we are in line with recent works in the field looking at urban development as a proxy for economic development (DeLong and Shleifer, 1994; Acemoglu *et al.*, 2005; Bosker *et al.*, 2008; Cantoni, 2010; Dittmar, 2011; van Zanden *et al.*, 2012; Bosker *et al.*, forthcoming). In particular, that the size of the pre-industrial city is an accurate reflection of their economic vitality has been stressed elsewhere (de Vries, 1984; Bairoch, 1988). Moreover, the link between city size and technological progress is clear: in contexts of unlimited agricultural labour supply *à la Lewis* or demographic fluctuations *à la Malthus*, an increase in the productivity of urban labour will translate into city growth (Cantoni, 2010; Dittmar, 2011). Since, as already discussed, the causal link between the presence of craft guilds in

the manufacturing sector and local economic growth is presumed to have eventually gone through labour productivity improvements, the use of city growth as our dependent variable is justified. Data on growth in the size of Italian and Dutch cities in the pre-industrial period, as well as on the control variables, come from the urbanization dataset originally presented in Bosker *et al.*, forthcoming.[15] Unless otherwise indicated, our focus is on cities with at least 5,000 inhabitants.

Ideally, capturing the degree of craft guilds' control over the local manufacturing industry would require us to know the ratio of artisans (masters, journeymen, apprentices) enjoying membership in a craft guild to the total number of artisans in the local industry.[16] As we have argued, despite being a widespread institutional arrangement in manufacturing activities, other alternatives were also available in the pre-industrial city for skill transmission and quality monitoring, with similar positive spillovers in terms of technical innovation (Davids, 2003). The revisionist literature, however, stresses the paramount role of the craft guild with regard to these functions. Cities with a higher number of artisans under the direct regulation and monitoring of the craft guild system would have differentiated themselves in terms of hu-

[15]These authors have built a large, city-level dataset, including a number of time-invariant (i.e. geographical) and time-varying (i.e. institutional) city-specific variables for Europe, North Africa and the Middle East between 800 and 1800. For data on European city sizes, they build upon centennial estimates from Bairoch *et al.*, 1988, considering only cities with at least 5,000 inhabitants. So far, their dataset has been used in Bosker *et al.*, 2008; Bosker *et al.*, forthcoming; and van Zanden *et al.*, 2012.

[16]We are aware that falling nominally under the direct control of a craft guild did not necessarily equal the effective subjection to their regulations. In this sense, as some authors have stressed, it is important to acknowledge the limitations of deriving conclusions from explicit, formal written regulations without taking into account the more elusive daily, informal practices (Davids, 2003). Additionally, that many guilds were simply ineffective in, or just did not care about, enforcing their policies has been also stressed by other scholars overtly dismissing their role (Ogilvie, 2008).

man capital accumulation, size of the market and technical innovation, from those cities in which the scope of the craft guilds was smaller. Measuring the proportion of local artisans under the umbrella of the craft guilds is, however, an impossible task. To the best of our knowledge, figures are simply unavailable.[17] In order to circumvent this problem, the number of craft guilds per one thousand inhabitants in a specific city at a given century, or *guild density*, has been computed on the basis of the data available.

Two datasets provide us with the number of craft guilds present in Italian and Dutch cities during the pre-industrial period (see **Appendix** for details on computation). We are then able to track the long-term evolution of the craft guilds in these two regions as well as to compare them at the city-level. **Figure 3** shows the absolute number of craft guilds present in a set of Italian and Dutch cities at different centuries between 1000 and 1850. As observed, in most cities the number of guilds remained well below fifty for most of the pre-industrial period. Only during the seventeenth century, after four centuries of an almost general upward trend, some cities approached, even slightly surpassed, that number (Milano, Amsterdam, Utrecht, Rotterdam). In that sense, Venice and Napoli appear as clear exceptions to the general rule. The absolute number of guilds at a city at a particular point of time, however, does not tell us anything about the degree of control that craft guilds had relative to other institutional alternatives. If, instead of taking absolute figures, we focus on the number of guilds per one thousand

[17] In our datasets of Dutch and Italian craft guilds, the number of members of certain guilds is available just at certain years. This scattered evidence is not enough, however, in order to reconstruct our preferred measure of craft guilds' relative power over the local industry

inhabitants (*guild density*), it is possible to get a better sense of the relative power enjoyed by the craft guild system.

Figure 4 shows the evolution of guild density over time for the same set of cities. Important changes are observed with respect to Figure 3. Despite a dramatic decrease during the 15th and the 16th centuries as a consequence of population growth, Dutch cities, in comparison with their Italian counterparts, constantly exhibit higher values. Despite its exceptional behaviour within the Italian context, even Venice lies below much smaller Dutch cities such Utrecht or s-Hertogenbosch. Guild density seems, then, to have greatly differed between both Western European regions. According to the revisionist literature, we should expect that in those cities in which guild density was higher, the relative control exercised by craft guilds over the local manufacturing industry was more intense, leading then to more effective skill transmission and quality monitoring as well as increased possibilities for technical innovation. Eventually, human capital accumulation, an increased market size and processes of incremental innovation would have translated into labour productivity gains and subsequent city growth.

We are well aware that guild density presents certain limitations regarding its ability to accurately capture the effective control that craft guilds could have exercised over the local industry. As indicated, unavailability of detailed figures regarding guild membership and artisan population at the city level prevents the construction of a more accurate measure. Even in that case, however, nominal membership could substantially differ from effective submission to the guild's control.

Moreover, contrasting with our focus on *quantity* of guilds, causal mech-

anisms linking craft guilds with a positive economic performance at the city level could have well run through *quality* channels. Simply focusing on the number of guilds conceals the differences in economic impact between craft guilds characterized by capital- or knowledge-intensive production processes and less sophisticated crafts. After all, certain trades (e.g. export-oriented craft guilds) certainly benefited overall economic activity, through cross-trade linkages and positive spillovers, much more than others.[18]

Given data limitations, the number of craft guilds per one thousand inhabitants is, however, a reasonable way to approach craft guild's control over local industry. A higher number of craft guilds at the city level, with independence of their number of members, seems to be indicative of a local environment more favorable to the establishment of intra-trade coordination. When the size of the city population was smaller, higher numbers of guilds meant an environment where the scope for the collective regulation of manufacturing activities was, at least potentially, larger than in more populated cities.

The panel data collected allows us to carry out an econometric analysis to assess the impact of craft guilds on the economic performance of Italian and Dutch cities during the pre-industrial period. In the next section, a random-effects estimation is presented. This specification, as it allows for the inclusion of time-invariant observed factors, makes possible to draw some conclusions regarding the role played by geographical features (such as ac-

[18] Although the analyses have not been performed yet, the information contained in the datasets on Dutch and Italian craft guilds (guild's name or economic activity) would allow us to identify different types of craft guilds as well as to delve in patterns of craft specialization at the city level

cess to navigable water or elevation) in the process of urban development.[19] Moreover, findings from previous work recommend their inclusion (Bosker *et al.*, 2008; Bosker *et al.*, forthcoming; van Zanden *et al.*, 2012). Century dummies are included to account both for the process of economic change during the pre-industrial period as well as for time-specific events (e.g. the Black Death) impacting on city population. Finally, in order to account for alternative hypotheses, a host of control variables is included. Access to water-based trade networks stands out as one of the main hypothesis behind Western European rise (López, 1976; Sachs *et al.*, 2001; Acemoglu *et al.*, 2005; Greif, 2006). Dummies indicating coastal location or access to a navigable river are then included. The possible role played by overland trade is measured through dummies indicating location of the city on a former Roman road or on an intersection of them, variable which additionally partly captures the potential impact of Roman heritage (Jones, 1981; Landes, 1998; Wickham; 2009). A final geographical variable indicating altitude above the sea level is also included. Dummy variables indicating the presence of a bishopric, archbishopric or university in the city as well as its capital status are aimed at capturing the economic impact of socio-political, bureaucratic centrality (Hohenberg and Lees, 1995; Cantoni and Yuchtman, 2012; Glaeser, 2011). Finally, the beneficial effects that constraints on power, either at the local or at supra-local level, might have had on economic performance are captured by two variables indicating, respectively, the existence of an

[19] The joint significance of the 61 city dummies in a pooled OLS regression recommends the use of panel data estimation methods. As indicated, given the time-invariant nature of some of the control variables, random-effects specifications are preferred. Although not presented here, fixed-effects estimations and Hausman tests have also been performed. The results, available upon request, do not change our main conclusions.

autonomous local government or a supra-local representative assembly (DeLong and Shleifer, 1993; Acemoglu *et al.*, 2005; Greif, 2006; Guiso *et al.*, 2008; Jacob, 2010). Summary statistics of all our variables are presented in **Table 6**.

4 Results

Table 1 reports the results of random-effects regressions estimating the impact of craft guild density on growth of city size. The dependent variable is the first difference in the logarithm of the city size at a given century. Our independent variable of interest is the logarithm of guild density at the same century. Additionally, in all our regressions we have also included the squared term of the main independent variable in order to allow for a quadratic relationship. **Column (1)** presents the bivariate regression whereas **columns (2)** and **(3)** incorporate, respectively, century dummies and control variables. The results show that guild density, our proxy for the control that craft guilds exercised over the local manufacturing industry, hardly lacks any explanatory power regarding variation in city growth. When the century dummies are included in column (2), guild density is statistically significant at the 10 per cent: an increase of 1 per cent in guild density during century t is associated with a decrease of 9 percentage points in city growth at the same century. However, omitted variable bias seems to be behind this statistical significance. As soon as our control variables are included in column (3) , guild density loses its significance. The possibility that the relationship between our dependent and independent variables

may be driven by the way guild density has been constructed is a concern in our empirical analysis. However, estimations for alternative specifications in **Tables 4** and **5**, where the logarithm of the number of guilds is used as independent variable, confirm our previous results.

The results obtained for the control variables in our sample of Italian and Dutch cities support previous findings for the whole of Europe and even also the Islamic world (Bosker *et al.*, forthcoming, and van Zanden *et al.*, 2012). Being a capital is statistically associated with higher city growth. In particular, capital cities experience a growth around 20 percentage points higher than non-capital ones.[20] This result, as stressed in previous works, seems to point to two possible causal mechanisms: seats of power as privileged spaces for economic activity and/or as a 'parasites' extracting surplus from surrounding cities and the countryside, especially in the case of absolutist regimes (Ades and Glaeser, 1995; Bosker *et al.*, forthcoming).[21] More importance should be attached, we think, to the statistical significance of the parliament variable. In line with previous works (DeLong and Shleifer, 1993; Acemoglu *et al.*, 2005; van Zanden *et al.*, 2012, Bosker *et al.*, forthcoming), falling under a supra-local parliament with city representation is positively linked with higher city growth, which seems to point to the beneficial effects that increased constraints on the monarch could have had on economic dynamism. Finally, being located on a hub of former Roman roads

[20] Capital cities in our sample are: Amsterdam (from 1600 onwards), Firenze, Genoa (from 1300 onwards), Milano, Napoli, Palermo, Roma, Siena (until 1500), Torino (from 1500 onwards) and Venezia.

[21] Reverse causality problems (cities with higher economic dynamism being selected as seats of power) are discussed in the mentioned works, so we refer to them. In any case, there seems to be enough evidence as to support the hypothesis that causality is running from capital or archbishopric status to city growth.

is associated with a rate of city growth 15 percentage points higher.[22] As **Tables 4** and **5** show, these results are robust to alternative specifications.

Century-dummies show strong and persistent joint statistical significance in all the specifications. In line with the demographic and urban evolution in pre-industrial Europe, their coefficients inform us about time-specific developments not captured by the other independent variables impacting across both Dutch and Italian cities. The urban expansion of the late Middle Ages is clearly appreciated as well as the impact of the Black. Similarly, stagnation during the 'General Crisis' of the 17th century, with widespread political conflict and instability, is also observed.

Tables 2 and **3** present the same estimates for the Dutch and the Italian subsamples respectively. In general terms, our findings are confirmed. Our main independent variables, despite being significant in the specifications of **columns (1)** and **(2)**, lose their significance as soon as the control variables are included. Interestingly enough, the main drivers of city growth diverge between regions. First, a coastal location and subsequent access to water-based long-distance trade, larger and more diversified markets and expanded possibilities for specialization, seems to have been particularly important for the growth of Italian cities. Surprisingly, in the Netherlands, this is not the case. In fact, the variable sea is associated with lower rates

[22] As shown by Table 2, the importance of location on a hub of former Roman Road or alongside a Roman road seems to be driven by the sub-sample of Dutch cities. Whereas in Italy location on a hub seems to be the rule (although 13 out of 39 cities are not located on a former Roman hub, all of them , except Chioggia, Ferrara, Treviso and Venezia, are alongside a Roman road), in present-day Netherlands, situated in the Northern border of the Roman Empire, only Maastricht (*Mosae Trajectum* in latin) enjoyed this advantage (with Leiden – *Lugdunum Batavorum* –, Nijmegen – *Noviomagus* – and Utrecht – *Trajectum ad Rhenum* — being located alongside a Roman road). The Roman road premium is, therefore, much more visible in the Netherlands.

of city growth, which could be indicative of smaller opportunities for city expansion in those urban centers already enjoying a favorable geographical location. Secondly, the existence of a parliament seems to have brought about beneficial effects in both regions, despite its higher magnitude in the Dutch subsample. Third, the overland network of Roman roads seems to have mattered most in territories located on the edges of the Roman Empire, where only a relatively small number of cities enjoyed this comparative advantage. In areas of generalized access to it, such as the Italian peninsula, higher growth in city size would have laid in other differential factors.

5 Concluding Remarks

Craft guilds, one of the defining institutional features of the economic activity in pre-industrial Europe, occupy a prominent place in the historiography. Since the late Middle Ages, and until their abolishment at the turn of the 19th century, key aspects of the manufacturing activity fell under the decision-making processes and monitoring of the guild rather than left to the individual initiative of the craftsman. From Adam Smith to Mancur Olson, this coordination has been indistinctly regarded both as 'a conspiracy against the public' and as the masked imposition of the interests of wealthier masters over smaller ones, with harmful consequences for the prospects of economic progress. In recent decades, however, several scholars have shed new light on what had turned to be conventional wisdom among historians. According to them, it would be possible to draw a link between the craft guild system and increased social welfare. In an underdeveloped institu-

tional environment, guilds would have satisfactorily replaced the workings of a still clumsy invisible hand in a diversity of realms, from skill transmission to producers reputation building.

Our preliminary analysis does not show, however, the existence of a statistically significant link, either positive or negative, between craft guilds and city growth at the aggregate level in the long run. This inconclusiveness contrasts with the solid claims frequently exhibited by both the orthodox and the revisionist front. In that sense, it could be tempting to suggest that the significance of the craft guild system for social welfare in pre-industrial times has been frequently overstated. After all, as studies on other forms of pre-industrial collective action also suggest, its process of abolishment seems to have been frequently driven by considerations far beyond social efficiency-based ones (Allen, 1982; de Moor, 2008). Similarly, this line of reasoning could continue, in recent decades, economic historians, energized by debates about the institutional foundations of economic prosperity and the impact of rent-seeking institutions (Acemoglu and Robinson, 2012; Murphy, Shleifer and Vishny, 1993; North and Thomas, 1973; Olson, 1982), would have come to attach much importance to the craft guild system.

That craft guilds mattered in the path followed by European urban economies seems, however, beyond doubt. Why, then, does not the link become visible, in one way or the other, in our empirical analysis? On the one hand, the aggregate level of analysis might leave it out of focus. The bottom line of an institution, such as the craft guild, which was in place for more than six centuries all over Europe, may result very elusive to a long-term, European-wide analysis as the one presented here. Craft guilds

mattered for the economic performance of pre-industrial Europe but their impact probably differed both over time and across regions. Focusing on a small number of cities or regions to uncover the internal workings and distinctive impact of guilds could be, as case studies show, more fruitful as a research strategy.

On the other hand, however, a clear relationship between craft guilds and the performance of the urban economy may still exist at the aggregate level despite not being captured by our analysis. Several issues could have overshadowed this link. First of all, it is important to stress that present-day Netherlands and Italy were, during the pre-industrial period, the most advanced economies of Western Europe, characterized by an institutional environment much more developed that in anywhere else at that time. By including less developed regions as well as cities below 5,000 inhabitants in our analysis, we would be able to capture what appears as a truly plausible hypothesis: that the coordination mechanism provided by the craft guild system mattered most in economies where the availability of alternative institutional mechanisms was considerably smaller. Second, and as already commented, the number of guilds per capita may be a too rough measure as to accurately capture craft guilds control over the local industry.

In relation with this last point, more importance should be attached, we think, to the different nature of the manufacturing activities performed by guilds in the Netherlands and Italy. Northwestern Europe became characterized by labour-saving production processes already in the late Middle Ages (Lindert *et al.*, 2002). The capital- and technology-intensive nature of manufacturing activities in the Netherlands would have represented an

important comparative advantage, especially in face of the institutional and productive requirements brought about by the Industrial Revolution (van Zanden, 2008). Manufacturing activities in large areas of Italy, in contrast, would have never housed such a beneficial potential. The datasets on Dutch and Italian craft guilds offer us then the opportunity to track the emergence and consolidation of a divergence in manufacturing processes with decisive consequences for the long-term economic paths of both regions.

Figures

(See Appendix for computations)

FIGURE 1.ABSOLUTE NUMBER OF CRAFT GUILDS IN ITALY, 1100-1850

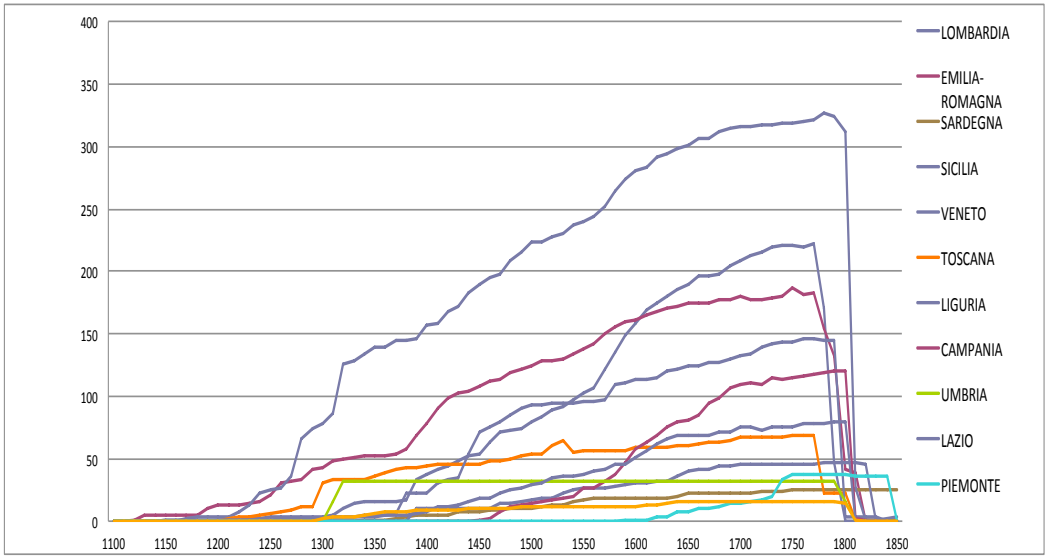


FIGURE 2.ABSOLUTE NUMBER OF CRAFT GUILDS IN THE NETHERLANDS, 1100-1850

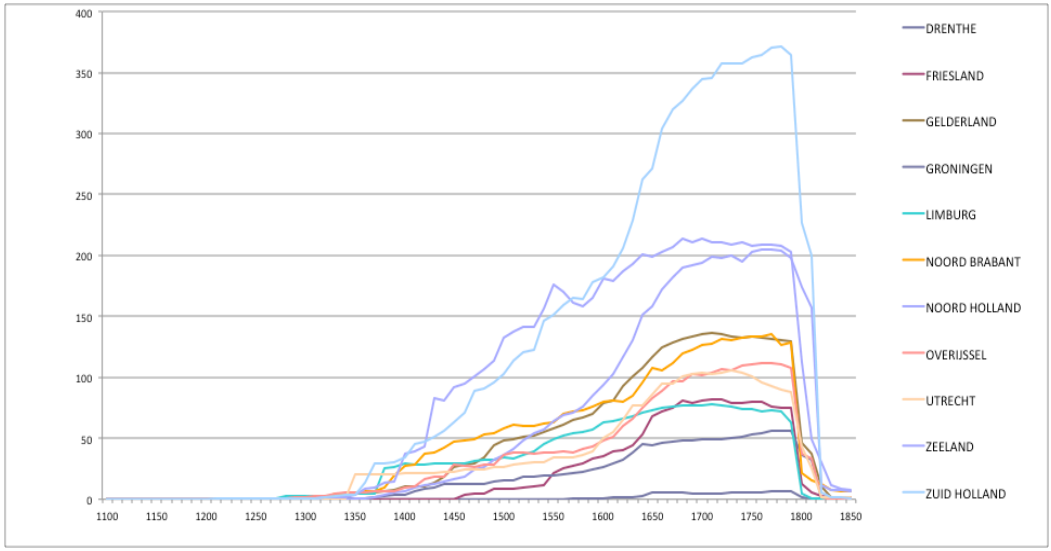


FIGURE 3. ABSOLUTE NUMBER OF CRAFT GUILDS IN A SET OF ITALIAN AND DUTCH CITIES, 1000-1850

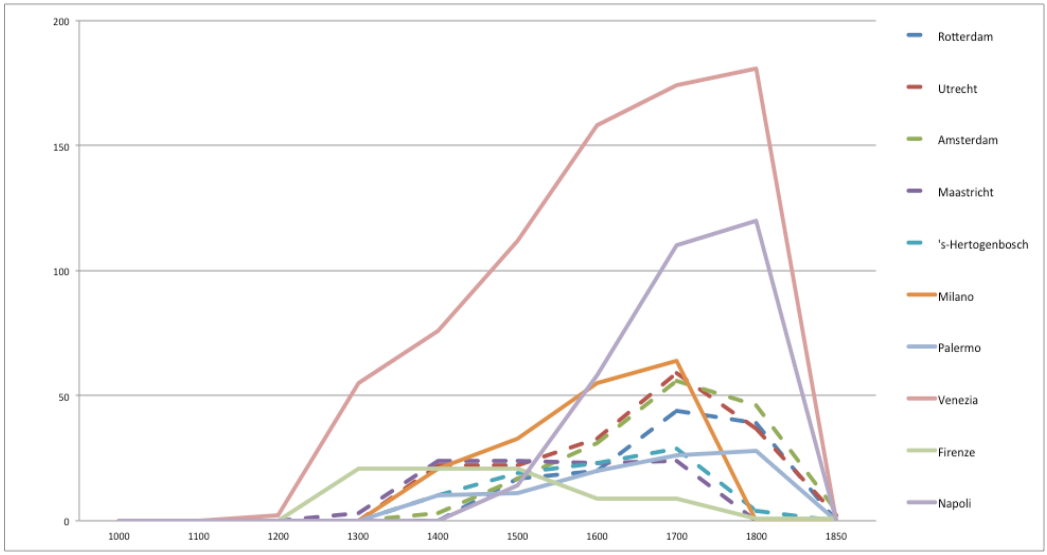
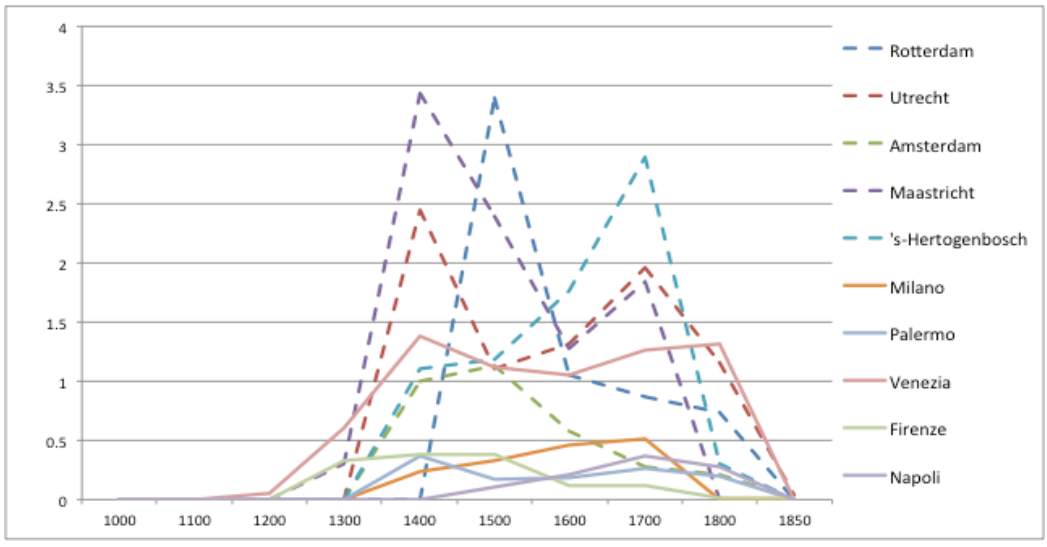


FIGURE 4. GUILD DENSITY IN A SET OF ITALIAN AND DUTCH CITIES, 1000-1850



Tables

TABLE 1. GUILD DENSITY AND CITY GROWTH

Dependent variable: Δ ln(city size)

Independent variable	**(1)**	**(2)**	**(3)**
Ln(guild density)	-0.07	-0.09*	-0.03
	(0.04)	(0.5)	(0.05)
Ln^2(guild density)	0.00	0.00	0.00
	(0.02)	(0.01)	(0.02)
Bishop			-0.02
			(0.09)
Archbishop			-0.17
			(0.13)
Capital			0.19*
			(0.10)
University			-0.07
			(0.05)
Commune			-0.05
			(0.05)
Parliament			0.18**
			(0.08)
Sea			-0.04
			(0.11)
River			-0.01
			(0.06)
Roman hub			0.15*
			(0.09)
Roman road			0.07
			(0.10)
Ln(elevation)			-0.03
			(0.2)
Century dummies	NO	YES	YES
[p-value F-test]		[0.00]	[0.00]
Observations	228	228	195
Overall R^2	0.02	0.21	0.27

TABLE 2. GUILD DENSITY AND CITY GROWTH IN THE NETHERLANDS

Dependent variable: Δ ln(city size)

Independent variable	**(1)**	**(2)**	**(3)**
Ln(guild density)	-0.17	-0.21*	0.02
	(0.13)	(0.11)	(0.12)
Ln^2(guild density)	-0.15*	-0.04	0.01
	(0.08)	(0.05)	(0.05)
Bishop			-0.22
			(0.17)
Archbishop			-0.74***
			(0.24)
Capital			
University			0.01
			(0.12)
Commune			-0.41**
			(0.17)
Parliament			0.45*
			(0.27)
Sea			-0.41**
			(0.19)
River			0.31*
			(0.16)
Roman hub			0.31*
			(0.16)
Roman road			0.40***
			(0.12)
Ln(elevation)			-0.18***
			(0.06)
Century dummies	NO	YES	YES
[p-value F-test]		[0.00]	[0.00]
Observations	78	78	52
Overall R^2	0.06	0.44	0.49

TABLE 3. GUILD DENSITY AND CITY GROWTH IN ITALY

Dependent variable: Δ ln(city size)

Independent variable	**(1)**	**(2)**	**(3)**
Ln(guild density)	-0.13**	-0.16***	-0.09
	(0.05)	(0.05)	(0.06)
Ln^2(guild density)	-0.01	-0.02	-0.01
	(0.01)	(0.02)	(0.02)
Bishop			0.09
			(0.09)
Archbishop			
Capital			0.09
			(0.10)
University			0.00
			(0.05)
Commune			-0.04
			(0.05)
Parliament			0.12*
			(0.06)
Sea			0.23*
			(0.12)
River			0.01
			(0.06)
Roman hub			0.05
			(0.06)
Roman road			-0.06
			(0.06)
Ln(elevation)			0.02
			(0.01)
Century dummies	NO	YES	YES
[p-value F-test]		[0.00]	[0.01]
Observations	150	150	143
Overall R^2	0.09	0.27	0.31

TABLE 4. NUMBER OF GUILDS AND CITY GROWTH

Dependent variable: Δ ln(city size)

Independent variable	**(1)**	**(2)**	**(3)**
Ln(nr guilds)	0.10	0.08	0.08
	(0.09)	(0.07)	(0.08)
Ln^2(nr guilds)	-0.01	-0.01	0.00
	(0.01)	(0.01)	(0.01)
Bishop			-0.01
			(0.08)
Archbishop			-0.19
			(0.12)
Capital			0.21**
			(0.09)
University			-0.07
			(0.05)
Commune			-0.05
			(0.05)
Parliament			0.20***
			(0.07)
Sea			-0.02
			(0.10)
River			0.00
			(0.05)
Roman hub			0.10**
			(0.07)
Roman road			0.10
			(0.08)
Ln(elevation)			-0.02
			(0.02)
Century dummies	NO	YES	YES
[p-value F-test]		[0.00]	[0.00]
Observations	228	228	195
Overall R^2	0.00	0.19	0.27

TABLE 5. NUMBER OF GUILDS AND CITY SIZE

Dependent variable: ln(city size)

Independent variable	**(1)**	**(2)**	**(3)**
Ln(nr guilds)	-0.03	0.00	0.02
	(0.08)	(0.08)	(0.08)
Ln^2(nr guilds)	0.02	0.01	0.01
	(0.01)	(0.01)	(0.01)
Ln(city size$_{t-1}$)	0.70***	0.78***	0.64***
	(0.05)	(0.05)	(0.05)
Bishop			0.13
			(0.10)
Archbishop			0.08
			(0.14)
Capital			0.41***
			(0.10)
University			-0.07
			(0.06)
Commune			-0.09*
			(0.06)
Parliament			0.13*
			(0.08)
Sea			0.05
			(0.11)
River			-0.03
			(0.05)
Roman hub			0.30***
			(0.10)
Roman road			0.13
			(0.08)
Ln(elevation)			-0.02
			(0.02)
Century dummies	NO	YES	YES
[p-value F-test]		[0.00]	[0.01]
Observations	228	228	195
Overall R^2	0.77	0.81	0.87

TABLE 6. SUMMARY STATISTICS

All Cities

Variable	N. Obs	Mean	Std. dev.	Min	Max
Δ ln(city size)	264	0.13	0.42	-1.07	1.42
Number guilds	427	14.66	22.49	0	181
Guild density	335	0.72	0.81	0	5.57
Bishop	427	0.58	0.49	0	1
Archbishop	427	0.10	0.30	0	1
Capital	427	0.12	0.33	0	1
University	427	0.23	0.42	0	1
Commune	427	0.59	0.49	0	1
Parliament	427	0.37	0.48	0	1
Sea	427	0.26	0.44	0	1
River	427	0.63	0.48	0	1
Roman hub	427	0.44	0.49	0	1
Roman road	427	0.19	0.39	0	1
Ln(elevation)	343	2.95	1.94	0	5.97

Dutch Cities

Variable	N. Obs	Mean	Std. dev.	Min	Max
Δ ln(city size)	82	0.19	0.51	-0.95	1.33
Number guilds	154	13.46	15.70	0	68
Guild density	106	1.21	0.87	0	3.57
Bishop	154	0.12	0.32	0	1
Archbishop	154	0.01	0.13	0	1
Capital	154	0.01	0.13	0	1
University	154	0.05	0.23	0	1
Commune	154	0.72	0.45	0	1
Parliament	154	0.56	0.49	0	1
Sea	154	0.27	0.44	0	1
River	154	0.81	0.39	0	1
Roman hub	154	0.04	0.20	0	1
Roman road	154	0.13	0.34	0	1
Ln(elevation)	98	1.00	1.43	0	3.98

Italian Cities

Variable	N. Obs	Mean	Std. dev.	Min	Max
Δ ln(city size)	182	0.10	0.37	-1.07	1.42
Number guilds	273	15.33	25.53	0	181
Guild density	229	0.49	0.66	0	5.57
Bishop	273	0.84	0.36	0	1
Archbishop	273	0.15	0.36	0	1
Capital	273	0.19	0.39	0	1
University	273	0.33	0.47	0	1
Commune	273	0.52	0.50	0	1
Parliament	273	0.26	0.43	0	1
Sea	273	0.25	0.43	0	1
River	273	0.53	0.49	0	1
Roman hub	273	0.66	0.47	0	1
Roman road	273	0.23	0.42	0	1
Ln(elevation)	273	3.73	1.53	0	5.97

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Appendix

Data on **Italian guilds** come from the dataset compiled by profs. Luca Mocarelli and Andrea Caracausi (Università di Milano Bicocca) under the umbrella of the NWO-Project "Data Infrastructures for the Study of the Guilds and other Forms of Collective Action" (2007-2011). The dataset is available at www.collective-action.info. This dataset contains information on 1,395 craft guilds (name, city, activity, dates of establishment and abolishment). In order to re-construct the number of craft guilds present in each Dutch city over time, several adjustments have been made:

- In case of two origin dates (e.g. a explicit one and one derived from a split process), I usually have taken the explicit one when the difference of years between them not high. In case it was, I have taken the other one (e.g. the one according to the split process).
- In case of lack of information about the abolishment date but indication of a date of merger with another craft guild, I have taken the latter one as the disappearance date of the guild.
- In case of no abolishment date and no other date indicative of the disappearance of the guild, I have taken as abolishment date the most common abolishment date for the city in which the guild is located. When there were few dates for that city in order to perform this extrapolation, I have looked for information on different sources, which are refered in the dataset. In some cities, the date of abolishment of guilds from cities in the same supra-local political entity have been used (e.g. date of guilds' abolishment in Rome for the Orvieto's or Viterbo's ones).
- In case of two disappearance dates (e.g. a explicit one and one derived from a merger process), I have taken the explicit one except to avoid duplications.
- In case of a split into a new guild not explicitly listed in the dataset, I have created the guild taking as establishment date the date of split from the pre-existent guild.
- In case of split from or merger with a guild whose explicit establishment date was latter in time to the date of split o merger, I have taken as date of establishment the date of split or merger.
- In case of no origin date, I have taken the average establishment date of the city in which the guild is located.
- For guilds which transformed themselves during the second half of the 19th century into other kinds of associations, I have assumed that they were effectively abolished, re-emerging in the indicated transformation date.

Data on **Dutch guilds** come from the original dataset composed by Piet Lourens and Jan Lucassen (International Institute for Social History) and further elaborated by Lotte van der Vleuten (Utrecht University), under the umbrella of the NWO-Project "Data Infrastructures for the Study of the Guilds and other Forms of Collective Action" (2007-2011). The dataset is available at www.collective-action.info. This dataset contains information on 2,105 craft guilds (name, city, activity, dates of establishment and abolishment). For most of them, a start year and an end date are presented. In some cases, the start year refers to the year in which first regulations are available, which means that the guild had been created earlier on. In those cases, we have kept the first date. Similarly, in many cases, the end date indicates the date for which the last reference is conserved and not necessarily the abolishment date. In those cases, we have also kept this date as the abolishment date.