Craft Guilds and Christianity

The Impact of Changes in Religious Doctrines on the Prevalence of Craft Guilds in the Late-Medieval Low Countries

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Abstract

This study provides a first empirical test of the link between craft guilds and religious traditions such as the belief in purgatory put forth by Richardson and McBride (2009). For this purpose, we investigate the relationship between the diffusion of the Brethren of the Common Life (BCL), a spiritual group that, while not explicitly opposing the doctrine of purgatory, called into question certain religious traditions that might convincingly be included into the framework of Richardson and McBride (2009). In line with the theory, we find that there is a negative and significant relationship between the number of guilds per capita in existence in 1560 and BCL presence in the city. Using the distance to Deventer, the birthplace of the BCL, as a source of exogenous variation for the spread of the BCL, we present evidence that causality ran from the BCL to the density of craft guilds, a finding that we show to be robust to a large number of alternative explanations. Furthermore, we exploit this reduction in the number of guilds per capita in an attempt to estimate the causal effect of craft guilds on economic growth. Since this analysis is complicated by issues of underidentification, we only present some tentative results which do not reveal a clear pattern as to the sign and magnitude of the relationship. Our estimates do, however, suggest that the growth impact of the BCL through guilds was small relative to the other effects that have been identified in previous work.

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1. Introduction

In the search for the deep determinants of differences in economic growth, institutions have long taken a prominent role in the research agenda. In their seminal study on the rise of the Western world, North and Thomas (1973) put an efficient economic organization at the core of their analysis, arguing that economic growth can only occur with such an organization in place. Subsequent analyses of cross-country differences in institutions have developed sophisticated strategies to overcome the endogeneity problems inherent in the analysis of institutions and unraveled a strong positive link between institutional quality and growth (Hall and Jones, 1999; Acemoglu et al., 2001). While these studies provide important insights into the causes underlying the great divergence of incomes between Western Europe and the rest of the world, they are unable to address the role of institutions in the 'Little Divergence' (van Zanden, 2009) between Northwestern Europe and the rest of Europe. An investigation of this phenomenon is complicated by the fact that the aggregate measures of institutions as well as the instruments employed in the studies referred to above do not exhibit sufficient variation to explain economic growth in the inter-European context. More recent research has therefore focused on specific elements of historical Europe's institutional landscape, such as the emergence of a strong merchant class with a desire for political representation as a result of the Atlantic Trade (Acemoglu et al., 2005), or the rise of parliaments (Bosker et al., 2012).

Another institution that has received ample attention in the recent economic history literature is the craft guild, a type of organization whose origins can be traced back to the Roman Empire and which played a prominent role in the organization of labor in most medieval European societies (Epstein, 1991). For a long time, the conventional wisdom viewed craft guilds as detrimental to economic growth, as exemplified in Adam Smith's assertion of craft guilds being a 'conspiracy against the public' (Smith, 1776). In recent times, this view has been forcefully challenged, with authors emphasizing the important contribution of guilds in the spread of human capital and in overcoming informational asymmetries (Epstein, 1998). Due to the lack of conclusive empirical evidence on the growth impact of guilds, the topic remains contentious.

In this paper, we intend to first take a step back from the question of whether craft guilds were conducive or detrimental to economic growth and investigate the factors driving the emergence of guilds in the Low Countries. In this, we build on the work of Richardson (2005) and Richardson and McBride (2009), who analyze the link between craft guilds and religious beliefs in medieval England and develop a game-theoretical model outlining how changes in religious beliefs and mortality rates affected the incentives for cooperation and thus the

emergence of craft guilds. We put their theoretical predictions to the test by analyzing the spread of craft guilds in the Northern Low Countries during the period from 1400 to 1560, which marks a period of considerable religious change and the emergence of new religious organizations, finally culminating in the Reformation. Specifically, this paper focuses on the Brethren of the Common Life (BCL), a religious group that, founded in the late 14th century in Deventer by Geert Groote, quickly diffused through the Low Countries and the western parts of Germany. The BCL, having its roots within the Catholic church, criticized current developments within the religious community and emphasized the value of internal rather than external spirituality, while contributing to the spread of religious texts in the vernacular (van Engen, 2008) and to the education of the public (Akçomak et al., 2016).

In line with the theoretical model of Richardson and McBride (2009), we argue that the changes in religious attitudes towards internal spirituality, combined with an increased accessibility of religious scripture in the vernacular and higher rates of literacy brought about by the spread of the BCL rendered coordination between individuals more difficult and hence contributed to the slower spread of craft guilds in the Northern Netherlands as compared to the Southern Netherlands (De Munck et al., 2006).

An intriguing feature of our research setting is that it represents a junction between two competing strands of the literature on economic growth, namely the above-mentioned literature focusing on the growth effect of institutions and that considering human capital as a 'deep determinant' of growth (Glaeser et al., 2004). In previous work, Akçomak et al. (2016) have identified a positive effect of the spread of the BCL on human capital accumulation and have linked this to the early economic development of the Northern Low Countries. Our research adds a new dimension to their findings by showing that, aside from the effect on human capital accumulation, the BCL also had an effect on the early institutional landscape of the Northern Low Countries.

The remainder of this paper proceeds as follows. Section 2 presents the historical background of our study, reviewing the literature on the spread of craft guilds, as well as their economic and non-economic motives and the theoretical arguments linking craft guilds to economic growth. Further, the section provides a brief overview of the edifice of beliefs of the BCL and the theory postulated by Richardson and McBride (2009) that links religious doctrines to the prevalence of craft guilds. Subsequently, in section 3, we present our empirical strategy with special emphasis on the specific kinds of biases potentially plaguing our analysis and our strategy in overcoming them. Section 4 describes the dataset used in the main analysis and

provides a first look at the spatial distribution of both guilds and the BCL across the Northern Low Countries. Building on these preliminary insights, section 5 presents the heart of our empirical analysis, showing the link between the BCL and craft guilds and investigating its robustness in detail. Finally, section 6 analyzes the importance of the guilds channel relative to the other elements of BCL influence and provides some tentative evidence on the link between craft guilds and economic growth. Section 7 summarizes and concludes.

2. Historical background

2.1 Craft guilds in the late-medieval era

While the spread of craft guilds is fairly well documented from around the 13th century onwards, relatively little is known about the origin of the first ever craft guilds. Economic historians have proposed several theories to explain the first emergence of craft guilds in the Western world, some suggesting that craft guilds are remnants of feudal manors, with the feudal lords allocating craftsmen to certain quarters of the town on the basis of their trade (Eberstadt, 1897), while others trace the emergence of craft guilds back to town magistrates interested in securing tax payments (Keutgen, 1903).

Although these theories are able to rationalize the emergence of craft guilds in certain historical settings, they are not suited to account for the fact that guilds of different forms emerged in almost all Western societies during the middle ages. As outlined in Epstein (1991), guilds have already been ubiquitous in ancient Rome, where Plutarch attributed their first emergence to Numa, the second king of Rome, who was said to have organized a number of artisan trades into colleges, the ancient Roman equivalent of craft guilds. Epstein rejects this hypothesis in favor of the notion of a spontaneous emergence of the first colleges at some early point in the Roman republic, although he notes that evidence for either hypothesis is scarce. Overall, the evidence therefore points toward a general spirit for coordination and cooperation among merchants and artisans that inspired them to convene (Kieser, 1989).

Modern day economic historians ascribe a plethora of both economic and non-economic motives to medieval craft guilds.[1] First and foremost, guilds engaged in economic protection

[1] For the purpose of this paper, it is important to distinguish clearly between the different types of guilds in existence and their specific properties. As outlined in the introduction, our focus here is on craft guilds, hence we exclude organizations such as journeymen's guilds, as well as institutions that did not primarily serve economic goals such as political guilds (Pfister, 2006). Following the definition outlined in De Munck et al. (2006), craft guilds are officially recognized associations composed of artisans of certain trades that convened in an attempt to further their economic interests as a group. While we therefore only consider as craft guilds

for their members by restricting market access to guild members and imposing fines on those trying to circumvent these regulations (North, 1981).[2] By segmenting the market, craft guilds were able to impose quality controls on their members, which took the form of tests for the quality of the inputs used in the production process as well as checks on the aptness of the artisans as exemplified by the requirement to produce a masterpiece in order to become a master of the trade (Epstein, 2008). It is often argued that the combination of these two elements played an important role in reducing informational asymmetries, since it guaranteed a certain degree of quality to consumers in the domestic market, and allowed groups of artisans to build a reputation for their goods in foreign markets (Gustafsson, 1987). Another important element of the guilds' involvement in the market was the control over apprenticeship. As argued by Epstein (1998), guilds' regulations often involved rules stipulating the length of apprenticeship, as well as rules against 'stealing' another master's apprentices. In the author's view, these regulations served the purpose of allowing a master to employ an apprentice for a longer period than necessarily required for his training, thus enabling the master to exploit this comparatively cheap labor in order to make up for his large initial investment in the apprentice's training. In the absence of guilds, any master would have had an incentive to hire another master's apprentice as soon as he had reached a certain level of training, while not training apprentices of his own. As a result, Epstein (1998) views guilds mainly as cost-sharing organizations and ascribes to them an important role in the spread of the largely tacit knowledge necessary for medieval craftsmanship.[3] Other authors have also emphasized the role of guilds in other economically relevant activities such as the provision of credit, insurance, and intertemporal transfers as well as in representing a bargaining unit against powerful agents (Lucassen, 1995; Pfister, 1998; Persson, 1988).

Based on this array of opinions about the activities of craft guilds, it does not come as a surprise that their overall relationship with economic growth remains subject to fierce debate. As outlined in the introduction, the traditional view, held by Smith, Turgot, and many other authors following their tradition, considers craft guilds as primarily interested in their personal

such organizations that focus on economic motives, it should be stressed that this does not preclude any secondary goals, be it of religious, military, or political nature.

[2] It should be noted, however, that the view of craft guilds as 'monopolists' in their respective markets might be exaggerated. As argued by Richardson (2001), this interpretation, derived from extant guild statutes, might be the result of a misinterpretation of the word 'monopoly', which only obtained its current meaning during the twentieth century and might have referred to a more modest degree of market power in medieval times.

[3] For the Netherlands, however, Davids (2007) argues that guild control over apprenticeship was in fact quite limited, as exemplified by the fact that guild statutes generally did not regulate the exact content of what an apprentice should be obliged to learn during his apprenticeship. Moreover, he cites evidence that a large number of extant apprenticeship contracts relates to vocations not organized in guilds at that time.

gain, seeking rents and preferential treatment for their members and thereby hurting economic progress. The most vocal proponent of this view in current times is Ogilvie (1997, 2004, 2007, 2008), who, based on detailed evidence from a case study of the worsted industry in Germany, argues that guilds were strongly opposed to innovation, had only weak command over quality control and were not necessarily required for the spread of tacit knowledge. In particular, Ogilvie (2007) takes umbrage at the notion that guilds' longevity should be interpreted as a sign of their efficiency, frequently asserted by proponents of the revisionist view.[4] Adherents to this opposing view cite not only the positive effects of the guild system on apprenticeship and quality control, but have also begun to attribute a positive effect on innovation to these institutions.[5] This argument is based in part on the idea that craft secrecy provided a mechanism to exploit the rents from innovation in absence of a strong patent system, as exemplified by institutional arrangements such as the internal reward system for inventors in the Lyon silk industry outlined by Pérez (2008). On top of these considerations about the direction of the effect of guilds on growth, the magnitude of the relationship is equally unclear (Davids, 2003), which further highlights the need for additional empirical work on the topic.[6]

Aside from these economic notions, many craft guilds were involved in political, military, and religious activities, whereby the political and military aspects were often closely intertwined. The first emergence of craft guilds in the Low Countries coincided with the trend toward higher levels of urbanization in the 13th century and, in this environment of shifting political power, was accompanied by a desire for greater political representation by artisans. These attitudes contributed to the period of 'guild revolutions' in the Southern Low countries, culminating in the Battle of the Spurs in 1302, in which French armies were defeated by Flemish artisans in the town of Courtrai (Prak, 2006). Around this time, guilds in the cities of Bruges,

[4] Acemoglu (2003) makes the point that such a 'political Coase theorem' is unlikely to hold in reality due to the fact that enforcement is infeasible for contracts involving the executive power, leading to the rise (and preservation) of policies and institutions that benefit a narrow group of powerful individuals at the expense of society as a whole.

[5] The evidence provided in favor of or against the view that craft guilds were harmful to innovation often comes in the form of case studies, citing specific incidents of craft guilds opposing or accepting certain inventions (see e.g. Pfister (2008) for a discussion of the diffusion of the engine loom, Trivellato (2008) for an overview of the attitude toward innovation of the silk and glass manufacturing trades in Early Modern Venice, and Ogilvie (2004) for an analysis of the German worsted industry). In his discussion of the impact of guilds on growth in the Dutch Republic, Davids (2003) goes beyond these case studies and argues that, while acknowledging the potentially positive effect of guilds to growth, their contribution was modest in magnitude and could have also been fulfilled by other institutions.

[6] Empirical analyses of the impact of craft guilds on economic development are scarce. Recently, Laborda-Pemán (2013), exploiting the same source of guilds information we are working with, has investigated the relationship between the number of guilds per capita and economic development in a panel dataset of 61 large Dutch and Italian cities spanning seven centuries. His estimates do not suggest any clear relationship between guilds and growth and, moreover, merely reflect a correlation and cannot unequivocally be interpreted as causal.

Ghent, Louvain, and Brussels, as well as in some smaller cities in the Southern Low countries and in Utrecht in the Northern parts, fought for their political influence and in many cases succeeded (Boone and Prak, 1995). Aside from the early case of Utrecht, the spiritual center of the region in that time, and some other temporary forms of representation granted to guilds in the cities of Groningen, Zwolle, Zutphen and others at later points in time, guilds in the Northern Low Countries generally did not achieve the same degree of political representation as those in the South (Lis and Soly, 2006). De Munck et al. (2006) explain this fact through the later onset of urbanization in the Northern Low Countries, which allowed rulers to observe the guild-induced political turbulences in the South, thus rendering them less willing to empower the guilds by giving them widespread representation.

Despite these geographical differences in political representation, a common theme for guilds in both regions was their engagement in religious activities. These ranged from setting up an altar in the church to holding masses honoring their respective patron saints, praying for the salvation of their deceased members or organizing pilgrimages (Bergsma, 1995). Thijs (2006) notes that prior to the spread of the Reformation, these religious events were of considerable importance for the regular members, since those were often unable to afford the services of a priest and hence had to rely on the collective masses for their salvation. Notably, this attitude appears to have changed with the spread of the Reformation in the Northern Low Countries. Dambruyne (2006) argues that investment in guild altars and pompous religious ceremonies stopped after the Dutch Revolt since it was considered more worthy to use the funds for the support of needy members than to spend them on religious causes. In the same period, although attendance to guild funerals remained mandatory and fines were imposed for absence, Thijs (2006) reports a progressive drop in attendance to these events, indicating the diminished value attached to these ceremonies by guild members.

For a long period in the academic discourse on the role of guilds not much research had been devoted to the question of why it would be beneficial for craft guilds to combine these activities under the umbrella of a single institution, although guilds' active role in the different sectors of society was acknowledged. Research in the tradition of Greif (1992, 1993) and Greif et al. (1994) has analyzed medieval institutions as coordination devices enabling economic actors to overcome free-rider problems. In his early study on Maghribi traders, Greif (1993) argues that these traders' coalitions helped merchants in overcoming commitment issues with their overseas agents in charge of handling their goods by employing a reputation mechanism among traders. Greif et al. (1994) extend this line of thinking to the institution of the merchant guild, which, in their analysis, served as a commitment device for rulers not to exploit the foreign

merchants, thus contributing to the rise of overseas trade in the middle ages. A closely related line of thinking underlies Epstein (1998)'s analysis of the control of apprenticeship through craft guilds, as well as the notion of quality control through guilds. Both cases are subject to a standard free-rider problem, with masters shirking on each other's apprentices or secretly employing lower-quality production inputs, thus free-riding on the quality standards established by the fellow guildsmen.

Craft guilds had numerous mechanisms in place to prevent their members from exploiting these free-riding opportunities, usually ranging from fines and exhortations to expulsion from the guild (Ogilvie, 2014). As argued by Kieser (1989), the lives of guild members were deeply connected with their guild, rendering the threat of expulsion to be of considerable import, depriving expellees not only of their main source of income but also of their social networks. Some authors have noted, however, that guilds' control mechanisms, especially in terms of quality control, were not very sophisticated, calling into question how well these would be suited to prevent free-riding (Ogilvie, 2004)

In an innovative paper, Richardson (2005) identifies religious activities as a crucial component in guilds' attempts to deter shirking among their members. [7] His theory is based on the idea of religious activities as a club good, first proposed by Iannaccone (1992), which implies that the utility one derives from participation in religious rituals such as masses depends not only on one's own piety, but on that of all other participants as well. Accordingly, religious groups are subject to the same free-rider problems as those outlined above, with members having an incentive to exert lower effort than their fellows in pursuit of their personal advantage. This leads Iannaccone (1994) to conclude that churches, especially the smaller and more obscure ones, need to rely on strict rules and rituals to prevent free-riding within their communities. In Richardson (2005)'s narrative, bundling of religious and economic interests within a single institution presents a mutually reinforcing solution to both the religious and the economic free-rider problem by increasing the disciplinary effect of the threat of expulsion. Specifically, by combining religious and economic activities, a free-rider now faces the threat of losing not only his economic benefits, but also his eternal salvation. Formally, Richardson

[7] The notion of religion as a cooperation-enhancing device has long been a central tenet of the analysis of the spread of religious ideas. Bering (2006) provides experimental evidence suggesting that the belief in a supernatural policing agent helps in enforcing moral norms and thereby deters cheating. According to Shariff et al. (2011), the spread of religious beliefs involving a 'moralizing high-god' was crucial in ensuring cooperation among groups of individuals not related through kinship and was thus one of the main factors in allowing humans to live in societies of larger population. They argue that the trend towards such types of deities was a result of cultural evolution favoring gods who were deemed to be omniscient and deliver judgement to those disrupting harmony and cooperation.

and McBride (2009) show that the sustainability of cooperation in a repeated game between guild members depends on the mortality rate – with higher mortality rendering it more difficult to sustain cooperation – and the strength of beliefs in purgatory, which determine the potential utility loss incurred through expulsion. They conclude that guilds combining religious and economic motives have a strong incentive to employ religious rather than economic threats to sustain cooperation and argue that when mortality rates are high, virtually all organizations must have a religious basis.

2.2 The role of the BCL in the late-medieval Low Countries

A corollary of the theory put forth by Richardson (2005) and Richardson and McBride (2009) is the prediction that certain changes in religious beliefs should alter the nature of cooperation and hence affect the distribution of guilds. While the authors focus on the belief in purgatory, which was only openly challenged with the emergence of Protestantism, we argue that other, more subtle, changes in religious beliefs might have had a similar effect on the nature of cooperation within guilds. In particular, the doctrine of the Modern Devotion, especially in its original manifestation, the so-called Brethren of the Common Life, shaped religious beliefs away from 'external spirituality', a form of spirituality that relies to a large extent on the institutions of the church, toward the internalization of spirituality and achieving inner justice. We postulate that this, in combination with the spread of religious literature in the vernacular, allowed individuals to pursue salvation without the need to attend collective masses or to rely on the prayers of their fellows, thus reducing the demand for religious events in the guild-context and thereby diminishing the bearing of the threat of expulsion. According to the theory, this change in religious beliefs should therefore have led to a decrease of cooperation in the context of craft guilds.

Since the BCL takes a central role in our hypothesis, it is important to outline its emergence and spread, as well as the beliefs held by its members and supporters.

The BCL was founded around 1374 in the city of Deventer by Geert Groote, sole heir to patrician parents fallen victim to the Plague, who, after pursuing an academic education in Paris with the initial goal of entering a clerical career, became dissatisfied with current church practices, particularly the charge of a dowry on entering a monastery – which he viewed as a case of simony – and the existence of so-called *propretarii*, i.e. monks who received private incomes (Post, 1968). To Groote, it was necessary to return to the values derived directly from the scriptures, including poverty, chastity, and the pursuit of a virtuous life, even if this meant

a certain disregard for the established authoritative structures within the church.[8] Notably, however, Groote never had the intention to create a separate religious community outside of the Roman Catholic Church, but merely aimed at reforming certain aspects of contemporary church practice that he viewed to be in violation of ecclesiastical law, and the BCL remained within the confines of the Roman Catholic Church at all times.

For this purpose, Groote drew up reading-lists, collected books, and transformed his parental home in Deventer into a semi-religious house, providing shelter and care for a group of poor and pious women under his oversight (King, 1992). Members of the house lived together as a community, relinquishing all their belongings upon entering the house and subsequently living off the fruits of their labor. In the same spirit as this sisterhood, the BCL was created as a semi-religious organization combining religious and daily activities in a strict regime. Like the sisters, the brothers committed themselves to a life of poverty and piety, spending several hours every day working and the remaining hours studying religious literature and reflecting on their spirituality (Post, 1968). Unlike most other religious communities, membership in the BCL did not require taking any vows, since it was believed that the absence of vows would make their commitment to poverty and chastity more venerable due to it being effectively renewed on a daily basis (Post, 1968). The brethren were also exceptional in that their work consisted mostly of translating and copying books whereas members of other religious groups at the time mainly relied on agriculture to make a living.[9]

Groote himself was a well-educated scholar, who was initially viewed in high regard in religious circles, as exemplified by him being invited to hold a sermon at the synodal assembly at Utrecht in 1383, in which Groote exhorted the clergy to punish priests living as married men (Post, 1968). This sermon, which was initially not well-received in clerical circles and presumably led to the bishop of Utrecht banning all deacons, including Groote, from preaching, was the continuation of a long history as a preacher, with Groote reportedly having preached in the majority of large cities in the Northern Low Countries by 1380 (Hyma, 1950). Groote's successors, struggling with the recognition of their organization within the church, refrained

[8] An example for this can be found in a letter of Groote's in which he discusses his opinions on the papal schism and makes a clear distinction between Christ and the pope as head of the church. Interpreting this piece of evidence as indicating a general tendency for Groote to be a non-conformist might be too strong, but, as argued by Post (1968: p.162), 'the danger for the integrity of the Catholic concept of the Church is clearly inherent in this idea'.

[9] In later times, the brothers in some cities engaged in printing books and undertook the spiritual education of schoolchildren (van Engen, 2008). Some authors also argue that the brothers themselves were engaged in teaching activities, while others proclaim that they merely operated the school without having their members teach there (Hyma, 1924; Post, 1968).

from preaching openly and rather resorted to a kind of preaching that was 'deliberately personalized in method' (van Engen, 2008: p.284), focusing on personal conversations, readings in the vernacular, and the deliverance of collations and admonitions. Van Engen (2008) argues that this kind of preaching was a key part of the lives of the Brethren and cites contemporary evidence indicating the high demand for the Brothers' spiritual guidance among the lay citizens of Deventer.

The spread of the BCL across cities in the Northern Low Countries occurred gradually and usually took the form of a group of Brothers from the brotherhouses in Deventer or Zwolle being sent to other nearby cities to establish new houses, sometimes by request of local clerics or as a result of being gifted a building (Post, 1968).[10] Its spread continued until about 1490, when the organization reached its peak in terms of members and geographic expansion, and declined subsequently (van Engen, 2008). The organization also spread out toward regions located in current-day Germany, although most strands of the Devotio Moderna to the East were represented by the so-called congregation of Windesheim, which was a monastic order that arose from the BCL and then took a life of its own, although the two groups shared large parts of their body of thought and remained in contact throughout.

The BCL's edifice of ideas is fairly well-documented in the extant writings of some Devotionists, among them John Pupper, Thomas of Kempen, Wessel Gansfort, Gabriel Biel and others.[11] While all of these authors focused their writings around different topics and disagreed on certain nuances of each other's writings, the common themes of the Modern Devotion clearly permeate their writing.[12]

The most widespread spiritual work produced by the Modern Devotion is 'The Imitation of Christ' by Thomas of Kempen, which has reportedly been published in 59 editions of 1000 copies each until the year 1500, making it one of the most widely spread religious books of the time (Leibell, 1924). In this work, Thomas of Kempen stresses the importance of turning inwards and exhorts the reader to make peace with themselves and with others:

[10] For a more detailed account on the spread of the BCL, the reader is referred to the discussion in Akçomak et al. (2016).

[11] The question whether all of these authors were directly involved with the BCL remains disputed. Thomas of Kempen, for example, was an early member of the congregation of Windesheim, but received his education in the Brother's house at Deventer and his writings reflect the values of the BCL as well as those of the congregation. Moreover, while Post (1968) argues that John Pupper was unlikely to be strongly associated with the BCL, van Engen (2008: p.251) refers to him as 'a Brother through and through'.

[12] For the context of this paper, we choose to only give a brief overview of some of the most well-known works, which is far from exhaustive. For more detailed information, the author is directed to chapter 10 of Post (1968) and the sources therein.

> Turn with your whole heart to the Lord and forsake this wretched world, and your soul will find peace. Learn to despise outward things and to give yourself to inward things, and you will see the kingdom of God come in you [Thomas, De imitatione Christi; as cited in van Engen (2008: p.80)].

John Pupper, another well-known devotionist and author of the 'Freedom of the Christian Religion', attacked the church practice of requiring vows from its members, which he viewed as being established by the church rather than by the Lord and thereby stressed the primacy of the scripture as opposed to scholastic interpretations (van Engen, 2008). Importantly, he bases this criticism on the belief in freedom of will, arguing that Gospel law is free by definition since it arises from the free will of Christ. As a result, he considered it antithetical to enforce vows, for Gospel law is the law of love and love cannot be enforced.[13]

From these writings, it becomes clear that the Devotionists shared a strong belief in the virtue of internal spirituality and felt contempt for the current state of the church, especially those practices they viewed to be in violation of ecclesiastical law. In this, they stressed the role of a free will and the attainment of absolution by means of living a life of virtue and devotion to the true teachings of Christ as represented by the scripture. In our interpretation, the combination of this new set of beliefs, spread through the Brothers' role as teachers and preachers, together with the increased accessibility of spiritual literature in the vernacular had a potentially powerful impact on the religious life of laypeople in the Low Countries and could thereby have affected the landscape of cooperation.

3. Methodology

In order to shed light on the empirical validity of the theoretical ideas outlined in the previous section, we investigate the relationship between the spread of the BCL and the emergence of guilds in a sample of 67 cities in the Northern Low Countries. The simplest estimation equation for this purpose is given by

$$Guilds_i = \alpha_2 + \beta_2 BCL_i + X\gamma_2 + \varepsilon_i, \quad (1)$$

where 'Guilds' denotes our main measure of guild presence in the year 1560, as described in the next section, 'BCL' denotes either the existence or the number of BCL houses in the city and X is a matrix including additional control variables.[14] This equation, when estimated by

[13] See the discussion of Pupper's work in chapter 7 of van Engen (2008).

[14] Except for some of our growth regressions in section 6, all regressions focus on guilds in existence in the year 1560. As outlined in more detail in the following sections, the choice of this specific year is dictated by the availability of population data, which only exists for four points in time, of which only 1400 and 1560 fall into

OLS, yields the correlation between our measure of guilds and BCL presence. There are, however, several reasons that speak against attaching a causal interpretation to the OLS estimates obtained from equation (1) which arise from the fact that the spread of the BCL through the Netherlands was not necessarily random.

First, it can be observed that the BCL was more likely to be present in larger cities. In combination with the fact observed by De Munck et al. (2006) that there appears to be an upper limit to the number of guilds in existence in a city (which corresponds to a lower number of guilds per capita in larger cities), this implies that the OLS estimate should understate the effect of BCL presence on guilds due to omitted variable bias.[15] While we can solve this specific problem by controlling directly for city size, there certainly are other unobserved factors driving the expansion of the BCL. For example, it would be conceivable that it was easier for the BCL to establish houses in cities with higher religious diversity, which would obfuscate our estimation results. Second, we cannot rule out a certain degree of reverse causality in the relationship between guilds and the BCL. While, according to our theory, the beliefs promoted by the BCL should have had an impact on the number of guilds, the literature on the BCL mentions occasional quarrels between BCL houses and local guildsmen such as in Zwolle in 1415, when guildsmen urged the city aldermen to impose rigorous regulations on the brotherhouse, leading the Brothers to beseech the bishop for help (van Engen, 2008). Although few such cases are reported, some concern about reverse causality bias affecting our results might remain. Finally, as is common when working with historical data, we expect a considerable degree of measurement error in our variables. We address this issue by weighting our estimations by initial population, since we expect measurement error to be stronger in smaller cities.

In order to overcome the problems outlined above, we follow Akçomak et al. (2016) in implementing an instrumental variable strategy, using the distance to Deventer as an instrument for BCL presence.[16] We therefore add a second equation to our model,

$$BCL_i = \alpha_1 + \beta_1 DD_i + X\gamma_1 + \omega_i, \quad (2)$$

where DD denotes the distance to Deventer.

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the time-span during which the BCL was active. Of these two time periods, use of the latter appears more reasonable, since the movement had not yet attained its full force by 1400.

[15] In our results section, we will show that the opposite appears to be the case, but choose to ignore this fact here for the sake of the argument.

[16] Other recent studies using distance instruments in comparable contexts include Becker and Woessmann (2009) and Dittmar (2011).

The validity of this instrument requires two assumptions to hold. First, the instrument must be strongly correlated with the variable that it is instrumenting. Akçomak et al. (2016) show that this first stage assumptions appears to be valid, as indicated by a first-stage F-statistic above the threshold of 10 put forth as a rule of thumb by Staiger and Stock (1997).[17] Moreover, simple eyeballing of the spatial distribution of BCL cities across the Netherlands as well as the historical account of its spread suggest that the distance to Deventer should be a strong predictor of BCL presence. This is due to the fact that, in order to establish new houses, a group of Brothers had to be sent to the new location from the central Brotherhouses in Deventer or Zwolle, which entailed considerable travel times over long distances. Moreover, the transfer of knowledge was similarly dependent on distance, thus suggesting that the distance to the intellectual sources of the movement contributed to the spread of the BCL in locations close to Deventer. The second assumption required for validity of the instrument is the exclusion restriction, which implies that the distance to Deventer should be related to the outcome variable only through its impact on BCL presence, or in other words, that the instrument is not correlated with the error term in equation (1). Importantly, as argued by Akçomak et al. (2016), the choice of Deventer as the location for founding the BCL can be considered as random, since it was merely the birthplace of Geert Groote and not deliberately chosen for its specific characteristics. Furthermore, when establishing the BCL, Groote followed purely spiritual motives and did not seem to aim at improving economic conditions.[18] Since we only have a single instrument at our disposal, our model is exactly identified and hence we cannot perform any tests on overidentifying restrictions (Sargan, 1958). We therefore need to maintain this second assumption throughout our analysis and provide extensive robustness checks to account for potential confounding factors.

Aside from establishing the link between the BCL and the number of guilds in existence in a city, we are also interested in investigating the relationship between craft guilds and economic growth. Optimally, we would therefore want to add a third equation to our model that builds on the previous two,

$$Growth_i = \alpha_3 + \beta_3\, Guilds_i + \delta_3 BCL_i + X\gamma_3 + \mu_i, \qquad (3)$$

[17] The TSLS regressions presented in section 5 reproduce these first-stage results.

[18] Importantly, we acknowledge the fact that the choice of new locations did not only depend on distance. Conditional on the distance to Deventer, it is likely that the BCL preferred cities with larger populations, since this would increase the outreach of the organization. Hence, we need to control for population in all of our TSLS models.

where 'Growth' denotes the growth rate of city population, either between 1400 and 1560, or between 1560 and 1795, depending on the specific application.[19]

Combining these equations into a single model yields a system of three equations, which regresses BCL presence on the distance to Deventer in the first stage, then relates guilds to the BCL in the second stage, and finally city growth to guilds and the BCL. Estimation of this set of equations can in theory be performed by means of three-stage least squares. In practice, however, estimating this system poses considerable problems, since the third-stage equation includes both endogenous variables. Accordingly, for the order condition to be fulfilled and identification of the separate coefficients β_3 and δ_3 to be possible, we need to instrument for both the number of guilds and BCL presence, thus requiring at least two instruments (Wooldridge, 2010).[20]

In the absence of a second instrument, we have to resort to estimating a reduced form effect, comparing the cases of cities with BCL presence and a lower number of guilds to those with no BCL presence and a larger number of guilds. This makes it impossible to disentangle the exact effect of guilds on growth, but nevertheless remains informative since it gives us an indication of how important the guilds channel was for the total effect of the BCL on growth. An alternative approach is the one implemented by Becker and Woessmann (2009), who perform a bounding analysis, in which they choose a 'reasonable' value for the coefficient on one of their endogenous right-hand side variables and deduct the whole term from the left-hand side. Applying this strategy to our case yields the following estimation equation,

$$Growth_i - \bar{\beta}\, Guilds_i = \alpha_4 + \delta_4 BCL_i + X\gamma_4 + \mu_i. \quad (4)$$

Implementing this approach reduces the number of endogenous variables to one, which allows us to estimate the resulting equation by TSLS and retrieve the effect of BCL presence on growth, adjusted for the guilds channel. A crucial difference between our setting and that of Becker and Woessmann (2009) is that, while other studies exist that reliably estimate the effect of education on economic outcomes, allowing them to draw realistic bounds around their OLS

[19] In using city growth as a proxy for economic growth, we follow a long history of empirical work on long-term economic development (see e.g. DeLong and Shleifer, 1993, Acemoglu et al., 2005, or Bosker et al., 2013). Not only are cities generally considered to be more conducive in furthering economic progress (Glaeser, 2011), but during earlier times the degree of urbanization was also indicative of a society's ability to produce an agricultural surplus required to feed the population of the cities (Wrigley, 1985). Moreover, as a consequence of slow productivity growth, an increase in city population should translate into an almost proportional increase in potential output.

[20] It is important for us to control for BCL presence in the third stage equation, since the distance to Deventer is a suitable instrument for the number of guilds only if we control for all the other channels through which BCL presence can be expected to affect economic growth. As shown by Akçomak et al. (2016), these channels include, among others, increased book production and literacy.

estimate, no such studies exist for the impact of guilds on growth. Especially important in this sense is that there is no debate whether the sign of the estimated relationship is correct – every reliable study finds either a positive or a zero impact of education on earnings and the only debate is about matters of magnitude. Hence, by applying bounds around the OLS coefficient, the authors cover the largest part of the spectrum of what economists believe to be the true impact of education on earnings. In our case, this is markedly different, with the debate focusing on the sign of the relationship as well as its magnitude. Moreover, their analysis is different in scope, since it aims at showing that the coefficient on their remaining right-hand side variable cannot be distinguished from zero, once the other variable is controlled for. For our application, however, it appears unlikely for such a result to arise, since the BCL's growth impact through the human capital channel should arguably be more important than its indirect effect through guilds. We therefore exploit this exercise mainly to show the magnitude of the contribution of the guilds channel relative to the overall growth effect of the BCL.

As a final attempt at unraveling the growth effect of guilds, we exploit the finding of Akçomak et al. (2016) that the positive impact of the BCL on growth faded out after 1560. This observation implies that the coefficient δ_3 in equation (3) should be 0 when we consider city growth between 1560 and 1795 as our left-hand side variable, hence again reducing the number of dependent variables in our third-stage equation to one, which can then be estimated with a single instrument. This approach, however, is also not without drawbacks, since it requires us to assume that, while the human capital effect of the BCL on growth faded out after 1560, the institutional changes had longer-lasting impacts. In the literature, both types of channels are generally viewed to be highly persistent (Glaeser et al. 2004), thus casting doubt on the validity of this assumption. Nevertheless, it appears a fruitful attempt to at least investigate this possibility.

4. Data

The dataset we use in this paper draws heavily on that compiled by Akçomak et al. (2016) and for a detailed discussion of the data sources and definitions, the reader is referred to their article. Their data set includes city-level data for a total of 67 medieval cities in the Northern Netherlands that exhibited a population of at least 1000 inhabitants in the year 1400.[21] The most

[21] This focus on larger cities is important for our purposes, since De Munck et al. (2006) observe that cities with less than 2500 inhabitants were rarely able to support craft guilds due to an insufficient number of artisans to warrant the creation of a guild. Although our dataset includes cities with less than 2500 inhabitants, we show in section 5.2.1 that their exclusion does not alter our main findings.

important variables for our purpose are those capturing the presence of the BCL in the city, measured as either a binary outcome variable or as the number of BCL-associated establishments in existence, the number of inhabitants at certain points in time,[22] as well as the information on the geographic location of the city, i.e. its distance to the city of Deventer and other important cities at the time and whether it is located near the sea, a river, or a Roman road/settlement. Some additional variables we take from their dataset are related to whether a city was a member of the Hanseatic League and whether a monastery of some other religious group was located in the vicinity of the city.

This information is supplemented by data on craft guilds collected from the "Institutions for Collective Action" database.[23] This database provides detailed information on craft guilds, such as their year of origin and abolition, their patron saint (if appropriate), their main purpose, and the occupations combined within the guild, spanning over 6 centuries with the earliest and latest entries for the Northern Netherlands being in 1201 and 1811, respectively.[24] The data have been compiled by the International Institute of Social History in Amsterdam and are based largely on documents referring to the abolition of guilds as well as additional documents drawn from city archives.[25] The main measure we derive from this dataset is the number of guilds in existence at a certain point in time, potentially disaggregated along different dimensions such as their religious attitudes, as indicated by the existence of a patron saint, or their occupation. In the empirical analysis that follows, we focus on the number of guilds per capita, i.e. we divide the number of guilds in existence by city population.

A few words of caution are in order. First, in using this measure of the number of guilds, we necessarily need to assume that guilds in different sectors and regions are directly comparable to each other.[26] For the purposes of testing our hypothesis, it would, of course, be optimal to have a measure of guilds at our disposal that incorporates the number of members of a guild to provide a more direct measure of the scope of guilds. In the absence of such a measure, however, the number of guilds in existence is the best proxy available and, notwithstanding its

[22] Specifically, population data for these cities is available for 1400, 1560, 1670, and 1795.

[23] This database is available at http://www.collective-action.info/datasets-various-types-institutions.

[24] The dataset includes additional information on the number of members, as well as the guilds' property. This information, however, is generally not available for the period we are interested in, since, e.g. detailed records on guilds property were only compiled when these were abolished in the beginning of the 19th century (Epstein, 1991).

[25] For detailed information about the nature of the guilds data, the reader is referred to the appendix of De Munck et al. (2006).

[26] As argued by Lis and Soly (2006), it might be problematic that craft guilds often were not limited to a specific group of artisans but consisted of a rather heterogeneous collection of occupations, thereby reducing the total number of guilds in the city as compared to the case with highly specialized guilds.

drawbacks, should allow us to investigate the development of craft guilds across space and time. Second, as noted above, the database relies on extant records of guilds' activities, which are far from comprehensive, since only a share of documents survived through the centuries. As noted by De Munck et al. (2006), this issue is exacerbated by the lack of political representation of many craft guilds in the Northern Low Countries, which eliminates political documents as a potential source on guild activities. Moreover, even the extant records tend to give only a rather inaccurate representation of the year in which a guild was established. Epstein (1991) notes that some revisions in guild statutes were so encompassing that there was no apparent need to preserve the original documents for posterity. For this reason, the variable related to the year of origin of a guild in the collective-action database is referred to as 'year of origin or earliest mentioning of the guild' and is supplemented with an indicator of whether the authors believe the actual year of origin is before the year listed. Finally, Lis and Soly (2006) note that surviving sources often do not draw a clear distinction between craft guilds and other organizations, such as purely religious or political fraternities. In order to address this issue in our analysis, we restrict the dataset to those guilds that are clearly identified as craft guilds.

Figure 1 shows the spatial distribution of the 67 cities in our dataset, where the size of the marker gives an indication of the number of guilds in existence in the city in the year 1560 and the darker dots denote cities in which the BCL was present. Several observations can be made. First, it becomes obvious that cities closer to Deventer were more likely to be linked to the BCL than those farther away, which provides the basis for our instrumental variable approach. At the same time, it can be seen that cities with similar distance to Deventer appear more likely to be chosen by the BCL if they had a higher population, as exemplified by the fact that the BCL spread to Groningen and Haarlem, but not to the smaller cities in Friesland. Second, we observe that the immediate vicinity of Deventer is characterized by a relatively low number of guilds, especially when compared to the provinces of Zeeland and Zuid-Holland in the South-West. When comparing this to the distribution of guilds per capita across the Netherlands, however, it can be seen that part of this difference is driven by the fact that the area around Deventer was simply less populous, since the number of guilds per capita seems to be more similar across the regions. Finally, figure 2, plotting the spatial distribution of the number of guilds per capita in the year 1560, shows that the province of Zeeland seems to represent a special case, since the number of guilds per capita is considerably larger than in other regions. This might prove problematic, since Zeeland is also the province with the largest distance to Deventer, which raises the concern of estimating a spurious relationship that is only driven by the exceptional nature of Zeeland. We provide extensive tests for this possibility in section 5.2.1.

In table 1, we present summary statistics for the two sub-samples of BCL and non-BCL cities, as well as the p-value of a test for the difference between the two means being different from zero. It can be seen that BCL and non-BCL cities differ in a number of respects. Most notably, BCL cities started out with a larger population in 1400 and grew considerably faster in the subsequent 160 years than non-BCL cities. Moreover, BCL cities were more likely to be located near a river and were also more likely to be part of the Hanseatic League. Interestingly, the difference between BCL and non-BCL cities is never statistically significant for any of our guild measures, although it can be seen that the number of guilds per capita is slightly smaller in BCL cities than elsewhere for all measures presented.

5 The relationship between craft guilds and the BCL

5.1 Main regressions

For the first part of our empirical analysis, we investigate the impact of BCL presence on the density of guilds in a city in the year 1560. While we have already established the fact that a naïve OLS regression of guilds on BCL presence is unlikely to reveal the true causal relationship between the two variables, these estimates might nevertheless provide a useful benchmark. Table 2 presents such a set of OLS estimates which differ with respect to the inclusion of additional control variables. It can be observed that the estimated coefficient on either BCL presence or the number of BCL houses is always negative, although usually not significantly different from zero. Furthermore, we find that population in 1400 is an important predictor of the number of guilds per capita. Somewhat surprisingly, population enters with a positive sign, which is not in accordance with the notion that there was an upper bound to the number of guilds that could exist in any city at one time (De Munck et al., 2006). The sign on this coefficient could potentially be driven by the presence of a number of small cities that are unable to support any guilds, a possibility that we will investigate further below.

Table 3 repeats this analysis but now instruments BCL presence (alternatively, in all even columns, the number of BCL houses) by the distance to Deventer. As outlined in the methodology section, for distance to Deventer to be a valid instrument, we need to control for population in 1400 to account for the BCL's preference for larger cities. The first-stage F-statistics are shown at the bottom of the table. As can be seen, the first stage is generally weaker when the number of BCL houses is considered, but the F-statistic nevertheless remains above the threshold of 10 in all specifications. All regressions show a clear negative relationship between guilds and the BCL. Especially in columns 3 to 8, which make use of a larger set of control variables, the BCL dummy is generally significant at the 5% level, although the number

of BCL houses remains significant only at the 10% level throughout. Overall, we find that the IV estimates are much larger in absolute magnitude than those obtained by OLS, suggesting that the OLS estimates are biased upwards.

5.2 Robustness checks

5.2.1 Sample composition

From the visual inspection of the spatial distribution of our data and the discussion in the previous sections, a number of concerns for the robustness of our estimates have arisen. As a first step, we will investigate whether the finding of a negative impact of BCL presence on guilds per capita is robust to the composition of our sample. For this purpose, the first two columns of table 4 exclude two cities from the sample, namely Deventer and Sluis. The rationale for this lies in the fact that Deventer has a distance of zero from itself, which might render it an influential observation, while Sluis represents an extreme outlier with a number of guilds per capita more than twice as high as the second-largest observation, as shown in figure 3. From the scatterplot presented in figure 4, it can already be observed that, although the omission of Sluis has considerable leverage on the estimated relationship, it is not its sole driver. This notion is clearly supported by the IV estimates presented in columns 1 and 2 of table 4, which yield coefficients on BCL presence and the number of BCL houses that are both negative and significant at the 1% and 5% levels, respectively. As expected, exclusion of Sluis reduces the estimated coefficient considerably by almost 50%, yet it reduces the estimated standard error even further, thus causing the increase in significance of our estimated coefficients.

Columns 3 to 6 of table 4 further restrict the sample to check whether our findings are driven by observations that are either in close proximity to or far away from Deventer and therefore have stronger leverage on the estimated linear regression. Furthermore, as displayed in figures 3 and 4, the cities close to Deventer are almost exclusively BCL-cities, while those cities very far from Deventer are invariably non-BCL-cities. It can therefore be observed that the first stage weakens considerably when the cities close to Deventer are excluded from the sample, which leads to an inflated coefficient on the number of BCL houses in column 4. Generally, however, our findings in columns 5 and 6, which exclude both cities less than 50 km as well as cities more than 180 km from Deventer, confirm the results we have obtained so far, since both the coefficient on BCL presence as well as that on the number of BCL houses are negative and remain significant at the 5% level, although the estimated coefficient on BCL presence is around half of that obtained when using the full sample.

In columns 7 and 8, we attempt to shed light on the issue raised by De Munck et al. (2006) that cities with fewer than 2,500 inhabitants might not be able to support any guilds. Accordingly, if those small cities tended to be located relatively close to Deventer, this non-linearity in the relationship between guilds and population might lead us to overstate the negative relationship between guilds and the BCL. In our sample, there are 28 cities with a population of less than 2,500 in the year 1560, out of which 14 have no guilds reported in the database. Among the remaining 14 cities, however, are Aardenburg and Sluis, two of the cities with the largest number of guilds per capita (and Sluis also being one of the cities with the largest number of guilds in total). The estimated coefficients are therefore fairly similar to those obtained in the regressions shown in columns 5 and 6, although the coefficient on the number of BCL houses is reduced further in absolute magnitude.

In our final sample adjustment we omit the province of Zeeland entirely. This is closely related to the previous exercise in which we omitted cities far from Deventer, but is even more demanding in terms of finding support for our hypothesis, since we choose to omit only those observations that are far away from Deventer and whose inclusion would support our case, while keeping those observations in the southern parts of Limburg that do not, on first sight, aid our hypothesis. While, as a result, our estimated coefficient is much smaller than the ones we have obtained so far and now ranges in the vicinity of the OLS coefficient, the estimated coefficient remains negative and significant on the 10% level.

5.2.2 Variable definition

Another dimension along which we can test the robustness of our findings relates to the definition of our main guilds variable. In our analysis so far, the only guild-related information we have taken into account was their year of origin as well as their location. As mentioned in section 4, however, there is considerable uncertainty around the true year of origin of many guilds, as indicated by an additional variable marking all those guilds for which the actual year of origin is expected to be before that reported in the database. While it is not straightforward to exploit this information in any meaningful way due to heterogeneity across guilds and sources, we nevertheless check whether small changes in the reported year of origin of those guilds have an impact on our estimated relationship. Columns 1 and 2 of table 5 therefore use as a dependent variable the number of guilds per capita, where the year of origin is reduced by 50 years for all those guilds that were marked in the database. It can be seen that the coefficient changes only slightly, while the overall negative pattern remains.

Furthermore, we exploit the fact that the database offers information on guilds' patron saints. For our theory, it is crucial that guilds actually combined economic and religious motives within a single institution, since only then may changes in religious doctrines actually have an impact on the nature of cooperation among its members. While the reviewed literature suggests that, indeed, most early craft guilds had some religious affiliation, the database unfortunately does not make a clear distinction between those craft guilds that do and do not pursue religious motives. As a proxy, we consider those guilds that had an official patron saint to be more likely to pursue religious motives than those who did not. Accordingly, in columns 3 and 4 of table 5, we use as our dependent variable a measure of guilds per capita that only takes into account those guilds that have a patron saint listed in the database. Interestingly, more than two thirds of all guilds established before 1560 have a patron saint listed, while only around one sixth of those originating in later years still make reference to a patron saint, which is likely a consequence of the spread of the Reformation after the Dutch Revolt. On the one hand, we take this as evidence that the existence of a patron saint is actually tied to religious affiliation rather than just a meaningless token. On the other hand, the ubiquity of the patron saint indicator renders our new 'religious' guilds variable to be very similar to the original guilds variable, with the result that the estimated coefficient is fairly similar, albeit a bit smaller in absolute magnitude.

5.2.3 Timing

So far, all of our estimations have revolved around using guilds per capita in the year 1560 as an outcome variable. The use of this specific year is dictated by the availability of population data, which is restricted to the years 1400, 1560, 1670, and 1795. Of these four time periods, 1560 appears the most suited for analyzing the impact of the BCL, since it covers the full period of the BCL's influence, while excluding highly disruptive events such as the Dutch Revolt. Since population data is only available at these four points in time, we cannot check how large the impact of the BCL on guilds per capita would be in other periods without making some assumption about population growth. However, for explorative purposes, the evolution of the estimated IV coefficient on the total number of guilds rather than guilds per capita might already give us an indication of how the BCL's influence on guilds developed over time. Figure 5 plots the coefficients (and corresponding confidence bands) on BCL presence obtained from TSLS

regressions of the number of guilds in 10-year intervals on a set of geographic control variables, a dummy for membership in the Hanseatic League, population in 1400, and a Zeeland dummy.[27]

The plot reveals an interesting pattern, with the estimated coefficient remaining insignificant and virtually constant until around the mid of the sixteenth century, when it slowly moves into significance (at least at the 10% level), where it remains until 1620, after which it fades out again. Accordingly, this plot suggests that the impact of the BCL on the prevalence of craft guilds was strongest towards the end of the 16th century, but faded out rather quickly afterwards. Moreover, we can conclude that our estimated relationship is not the result of some peculiarity occurring in 1560, but should be similar in surrounding time periods.

5.2.4 Placebo tests for other religious groups and cities

Of course, the BCL was not the only relevant religious order active in the late-medieval Low Countries. In particular, we can identify four other orders, namely the Tertiarians, Franciscans, Cistercians, and Beghards, who were widespread throughout the region and likely also had an influence on society. If these groups spread through the Low Countries in a way similar to the BCL, our identification strategy would be invalidated, since distance to Deventer would also have an impact on our outcome variables through these alternative channels. In order to test this, we run a set of first stage regressions, replacing BCL presence by a dummy variable capturing the presence of a monastery related to one of the above-mentioned orders within 5 km of the city. As can be seen in table 6, no significant first stage exists for either the Franciscans, Tertiarians, or Cistercians. We do, however, find a weak positive connection between the presence of a Beghard monastery and the distance to Deventer, the opposite of what we find for the BCL. This stems from the fact that the Beghards were more commonly found in cities towards the South of the Netherlands, in which the BCL was not widespread. The positive coefficient found in the second stage regression in column 4 is therefore likely to reflect merely the mirror image of the BCL effect.

As a final robustness check, we analyze whether BCL presence is related to the distances to other important cities at the time. Specifically, we test whether BCL presence is correlated with the distances to Antwerp, Amsterdam, Utrecht, Louvain, Mainz, or Haarlem. All of these cities

[27] This specification is therefore different from the one we used in the TSLS regressions shown so far. The reason for this is that the emergence of guilds (at least on the basis of the years of origin given in the database) is not a continuous process in some cities, especially for those located in Zeeland. For example, Zierikzee has around 30 guilds that are all listed with a year of origin of 1423 or 1425, thus leaving it with only one recorded guild in 1420 and around 30 in 1430. This causes the estimated pattern to be highly erratic, which leads us to introduce a separate dummy variable for Zeeland into the estimation rather than our standard set of regional dummies.

played an important role at the time, Antwerp, Louvain, and Amsterdam as important trading centers, Utrecht as the archbishopric, Haarlem as an important book-printing hub, and Mainz as the birthplace of the printing press. Table 7 shows that the Dutch cities, as well as Mainz, do not yield any meaningful first stage with F-statistics of 1 or less. The distances to both Antwerp and Louvain, however, appear to be at least weakly related to BCL presence. As already mentioned by Akçomak et al. (2016), it is interesting to note that both distances are positively related to BCL presence, which might be due to the fact that both Antwerp and Louvain are located to the South-West of Deventer so that an increase in the distance to Antwerp or Louvain simply corresponds to a decrease in the distance to Deventer.

6 The relationship between craft guilds and growth

After having shown the negative relationship between BCL presence and guilds per capita in the previous section, we now turn to estimating the effect of guilds on city growth. In this context, the timing issues we have discussed previously gain an additional dimension due to the fact that, abstracting from all other issues for the moment, we are unable to clearly identify the growth effect of guilds when regressing a growth rate between two points in time on the amount of guilds in existence at the end of the time period. If, for example, we were to regress growth between 1400 and 1560 on guilds per capita in 1560, we are facing a severe reverse causality issue, with both guilds and growth exerting an influence onto each other. In order to alleviate this problem, we therefore have to rely on guilds at the beginning of the period as an explanatory variable. This, however, poses an issue, since we would normally be interested in explaining city growth between 1400 and 1560, which is the period for which Akçomak et al. (2016) find a significant growth effect of the BCL. Unfortunately, as shown in figure 5, there is no strong relationship between the BCL and the number of guilds before the 16th century, which implies the lack of a significant second stage in our three-stage regression setup.

As a consequence of these concerns, we first explore how important the growth contribution of the guilds channel might have been relative to the other channels through which the BCL could have affected growth rates, such as its contribution to the accumulation of human capital. For this purpose, the first two columns of table 8 simply estimate the effect of the BCL on growth, without including any guild-related variables. The estimated coefficient is slightly larger than that obtained by Akçomak et al. (2016), which is due to our use of a different set of control variables and the application of a weighting scheme by initial population. The remaining columns of table 8 implement a variation of the Becker-Woessmann bounding approach, in which we take the estimated OLS coefficient on the guilds variable as a benchmark and subtract

it from the left-hand side variable to estimate the effect of BCL presence on city growth adjusted for the guilds effect. Columns 3 and 4 present two OLS regressions of equation (3) that differ only with respect to whether regional dummies are included. As can be seen, the estimated coefficient on guilds per capita in column 4 is virtually zero, while the one obtained in column 3 is negative, but insignificantly so. In columns 5 to 8, we use the coefficient of -46.662 from column 3 to adjust the left-hand side variable, whereby column 5 assumes that the OLS coefficient is the true causal effect of guilds on growth. Column 6 allows for a bias of 100%, by assuming that the true causal effect of guilds on growth is actually twice as large as the estimated OLS coefficient. Finally, columns 7 and 8 present the mirror image of the previous two columns, and thereby allow for a positive sign on the relationship between guilds and growth rather than the negative one estimated by OLS.

A number of observations can be made. First, due to the fact that the BCL is related negatively to guilds per capita and the OLS estimate suggests a very weak, but nonetheless negative relationship between guilds and growth, the estimates in columns 5 and 6 imply a slightly reduced effect of the BCL on the adjusted city growth variable. Nevertheless, even when we allow for a considerable bias on the OLS coefficient, the BCL coefficient is reduced only moderately and remains significant, suggesting that the guilds channel was not a large contributor to the effect the BCL had on city growth. Second, as can be seen in columns 7 and 8, if we assume that guilds had a positive impact on economic growth and the BCL suppressed their spread, this would imply that the growth effect of the BCL through channels other than guilds must have been even larger than the one estimated in column 2, since it would need to compensate for the negative growth contribution through the guilds channel.

While the exercise above allows us to gauge the importance of the guilds channel relative to the overall growth contribution of the BCL, it does not enable us to draw any reliable inferences on the magnitude and sign of the true causal effect. As outlined in the methodology section, we can exploit the fact that Akçomak et al. (2016) find the BCL effect on growth to fade out after 1560 in an attempt to estimate the causal effect of craft guilds on growth. So far, we have been unable to run a three-stage regression since the third step included both endogenous variables and hence the parameters could only be identified when at least two instruments were available. If, however, the BCL effect on growth was equal to zero, this would imply that we need not control for BCL presence in our third stage regression and could therefore identify the effect of guilds on growth using only distance to Deventer as an instrument.

Since this exercise is based on the notion of the BCL not having an effect on growth in the period from 1560 to 1795, the first two columns of table 9 present OLS and IV estimates of city growth between 1560 and 1795 on BCL presence and other additional control variables. Both the OLS and IV estimates are negative and while the OLS estimate is significant at the 10% level, the IV estimate is smaller in absolute magnitude and entirely insignificant. While the finding of a negative sign is surprising, the fact that the relationship is not statistically significant lends credence to our assumption of the BCL effect in this period being negligible. Interestingly, when guilds per capita are added as an additional control variable in the OLS regression, as shown in columns 3 and 4, the estimated coefficient on the guilds variable is now much smaller in absolute magnitude than the one we obtained in table 8 and, moreover, yields a sign that varies with the inclusion of regional dummies. Overall, it therefore appears that both the effect of the BCL as well as the effect of guilds on growth are even less clear-cut in this period than in the earlier period analyzed in table 8.

The results of our three-stage least squares regression of equations (1), (2), and (3) are shown in columns 5 to 7 of table 9, whereby the third stage assumes the effect of the BCL through all channels other than guilds to be zero. The results shown in columns 5 and 6 are comparable to those we have discovered before, with distance to Deventer being a strong predictor of BCL presence, which, in turn, is moderately related to guilds per capita in 1560. Interestingly, the third stage estimate of the effect of guilds on city growth, presented in column 7, now yields a positive sign, although the estimated coefficient remains far from being statistically significant. Unfortunately, it is not entirely clear how the insignificance of the estimated coefficient shall be interpreted. While it is in line with previous studies such as Laborda-Péman (2013), who also finds the estimated effect of guilds on growth not to be clear-cut, it might also simply be the result of the specific setting we are investigating. As outlined in section 3, the validity of this three-stage approach requires us to make some rather arbitrary assumptions about the longevity of the different components through which the BCL could have affected economic growth. The insignificance of the estimated coefficient might therefore simply be a consequence of the breakdown of these assumptions and thus need not imply that guilds had no effect on economic growth whatsoever. As it stands, future research is required to shed some more light on this elusive relationship.

7. Summary and conclusion

This study aimed at providing a first empirical test on the theoretical considerations put forth by Richardson and McBride (2009), linking the spread of craft guilds to religious traditions

such as the belief in purgatory. For this purpose, we investigated the relationship between the diffusion of the doctrine of the BCL in the late-medieval Low Countries and the prevalence of craft guilds in a sample of 67 Dutch cities. Our setting provides a unique opportunity to investigate this relationship, since the BCL called into question certain religious doctrines that might convincingly be linked to the prevalence of craft guilds in the context of the framework proposed by Richardson and McBride (2009), albeit they did not explicitly oppose the belief in purgatory.

In line with the theory, we find that there is a statistically significant negative relationship between the number of guilds per capita in existence in 1560 and BCL presence in the city. Using the distance to Deventer, the birthplace of the BCL, as a source of exogenous variation for the spread of the BCL, we show that causality ran from the BCL to the number of craft guilds. Our findings are robust to a large number of sample adjustments, among them the exclusion of outliers, small cities, the province of Zeeland, as well as cities very close or far from Deventer. Moreover, we provide evidence that the relationship is not affected by small variations in the timing of the analysis or by restrictions of the sample to craft guilds fulfilling certain criteria, such as the existence of a patron saint. Finally, we present some evidence for the validity of our identification strategy by performing a number of placebo checks for the presence of different religious groups and the distances towards other important cities at the time.

Furthermore, we move a step beyond the analysis of the relationship between guilds and the BCL, in an attempt to estimate the causal effect of craft guilds on economic growth by exploiting the reduction in the number of guilds per capita caused by the spread of the BCL. Since this analysis is complicated by issues of underidentification, we only present some tentative results which do not reveal a clear pattern as to the sign and magnitude of the relationship. Our estimates do, however, suggest that the growth effect through guilds was small relative to the other effects identified by Akçomak et al. (2016).

Overall, we can confirm our main hypothesis of there being a link between the spread of the BCL and the prevalence of craft guilds in the Northern Low Countries. While our preferred interpretation of this finding is framed along the lines of the cooperation argument described by Richardson and McBride (2009), we acknowledge the existence of other interpretations that can be reconciled with our empirical results. For example, one might be tempted to view the BCL as an organization that provided a substitute to the services craft guilds offered to their members, especially in terms of their provision of religious rituals and social networks. While

this interpretation undoubtedly deserves some consideration, it appears unlikely to account for the entirety of the effect we find, simply because membership in the BCL required a considerable degree of asceticism and was not attainable for many laypeople. Accordingly, the number of BCL members was rather small in comparison to the amount of people organized in guilds. Alternatively, the effect on guilds might be viewed as a result of the increase in human capital accumulation that Akçomak et al. (2016) have identified as one of the main channels of influence of the BCL. However, it remains unclear exactly how an increase in literacy among the populace should have exerted a negative impact on the number of craft guilds. Of the available rationalizations for our findings, that laid forth by Richardson and MacBride (2009) appears to us to be the most convincing.

Unfortunately, methodological constraints have prevented us from being able to arrive at an unambiguous estimate of the relationship between craft guilds and economic growth. Our reading of the theoretical debate surrounding the growth impact of craft guilds is that the sign and magnitude of the true causal effect will depend crucially on the specific nuances of the institutional landscape and might therefore differ not only across regions, but also across time, making it even more difficult to accurately pin down the true causal effect. Future research should therefore focus on finding alternative approaches to overcome the methodological difficulties we have encountered as well as on analyzing the relationship in different settings to show the generalizability of the findings to different institutional contexts.

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Appendix A: Data sources and definitions

This appendix gives a brief overview of the sources and methods used in creating the variables used in the main analysis. For convenience, we also list the sources of those variables taken from the Akçomak et al. (2016) paper, although the reader is referred to their paper for a more detailed discussion.

Variable	**Source and definition**
Population	All city population variables are taken from Lourens and Lucassen (1995), who provide estimates on the population of 155 cities for 1400, 1560, 1670, and 1795.
City growth	City growth is calculated as the logarithm of the ratio of population at two points in time.
BCL presence	Akçomak et al. (2016) have collected information on BCL presence as well as the number of BCL houses in one city from a number of different publications on the BCL.
Distances	Distances 'as the crow flies' between the different cities have been calculated by Akçomak et al. (2016) using the cities' latitude and longitude values. For the exact equation used in calculating these distances, the reader is referred to the data appendix in their paper.
Roman settlements	The information on Roman roads and settlements in the Netherlands stems from the Peutinger map and a list of Roman settlements available at http://www.romanaqueducts.info/romeineninnederland/rinn_bijlagen.htm. For the exact details on how the distances to these roads and settlements are calculated, the reader is again referred to the data appendix in Akçomak et al. (2016).
Monasteries	Information on the location and type of monasteries in the Netherlands are available in the 'kloosterlijst' published by the Free University of Amsterdam. The specific variable provided by Akçomak et al. (2016) matches the monasteries to one of the five orders considered and measures whether there is a monastery within 5 kilometres of a city.
Hanseatic League	Akçomak et al. (2016) collect data on membership in the Hanseatic League from Schulte Beerbühl (2011).
Guilds	The data on guilds in the Netherlands is obtained from the project 'Institutions for Collective Action', which provides datasets on institutions such as craft guilds, journeymen's boxes, and beguinages (available at http://www.collective-action.info/datasets-various-types-institutions). The dataset includes detailed information not only on the location, origin, and abolishment of a large number of craft guilds, but also on their main purpose, type, patron saint, and occupation, as well as some information on the guilds' properties and number of members, although the latter two are generally only available at later points in time than the ones we are interested in. The main variable we extract from this database is the number of guilds in existence at a specific point in time. In generating this variable, we restrict the dataset to those guilds that are explicitly tagged as 'craft guilds' and thereby omit all purely political guilds or journeymen's guilds as well as

	those with missing information.
Guilds (alt.)	As an alternative to our main guilds variable, we have tried to take into account the 'Approx' indicator given in the database, which indicates whether the true year of origin is expected to coincide with the one mentioned in the database or whether the true year of origin might precede the first mention in the literature (as indicated by the symbol '<'). For lack of a more sophisticated approach, we simply define this variable by moving the year of origin of all observations with the '<' indicator 50 years in the past and then sum up the number of craft guilds per city.
Religious guilds	We have defined this variable by restricting the sample to those craft guilds that have a patron saint specified in the database and summing up the number of these guilds per city.

Appendix B: Tables and Figures

Figure 1: Map of Dutch cities and their number of guilds in 1560

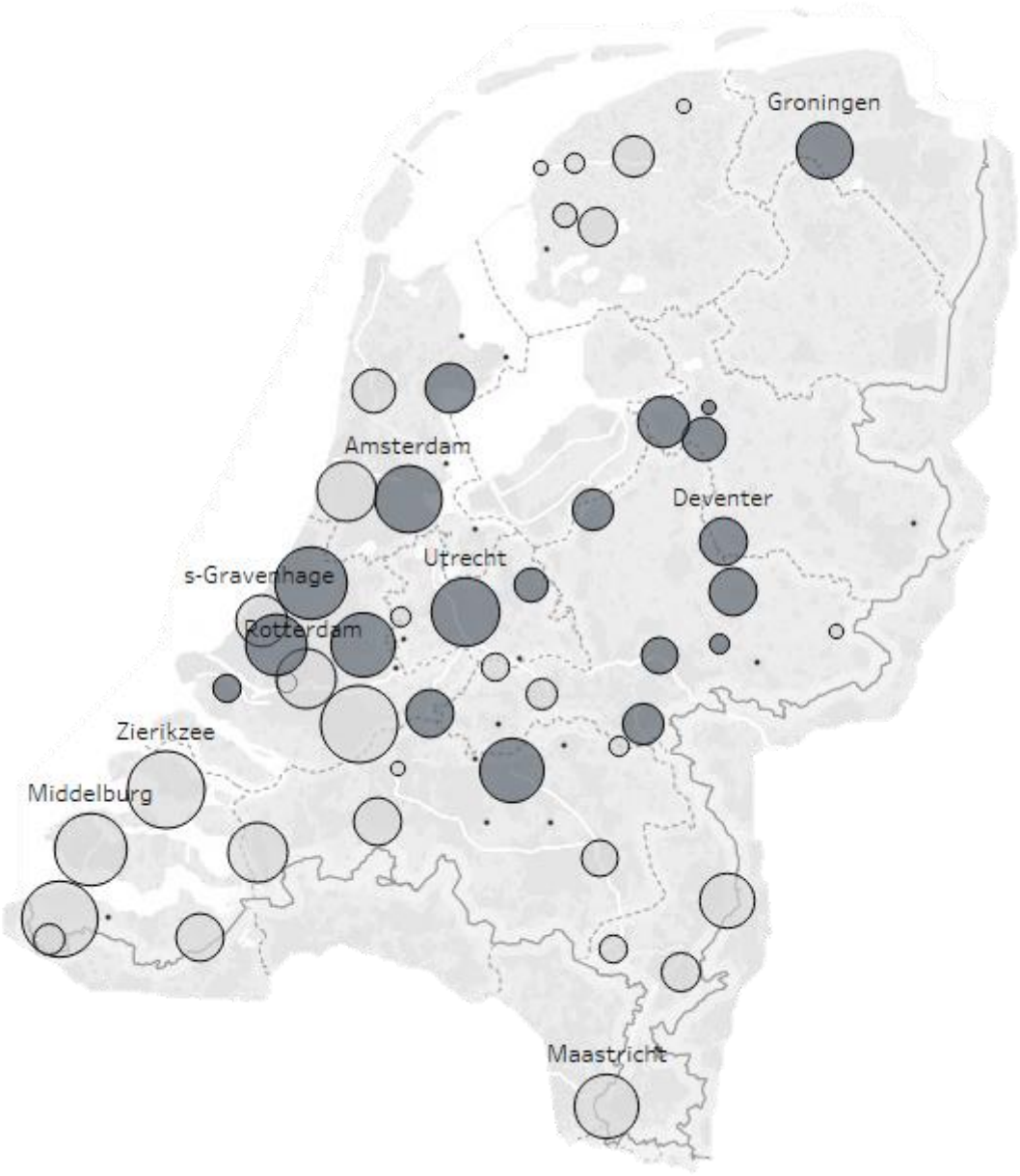


Figure 2: Map of Dutch cities and guilds per capita in 1560

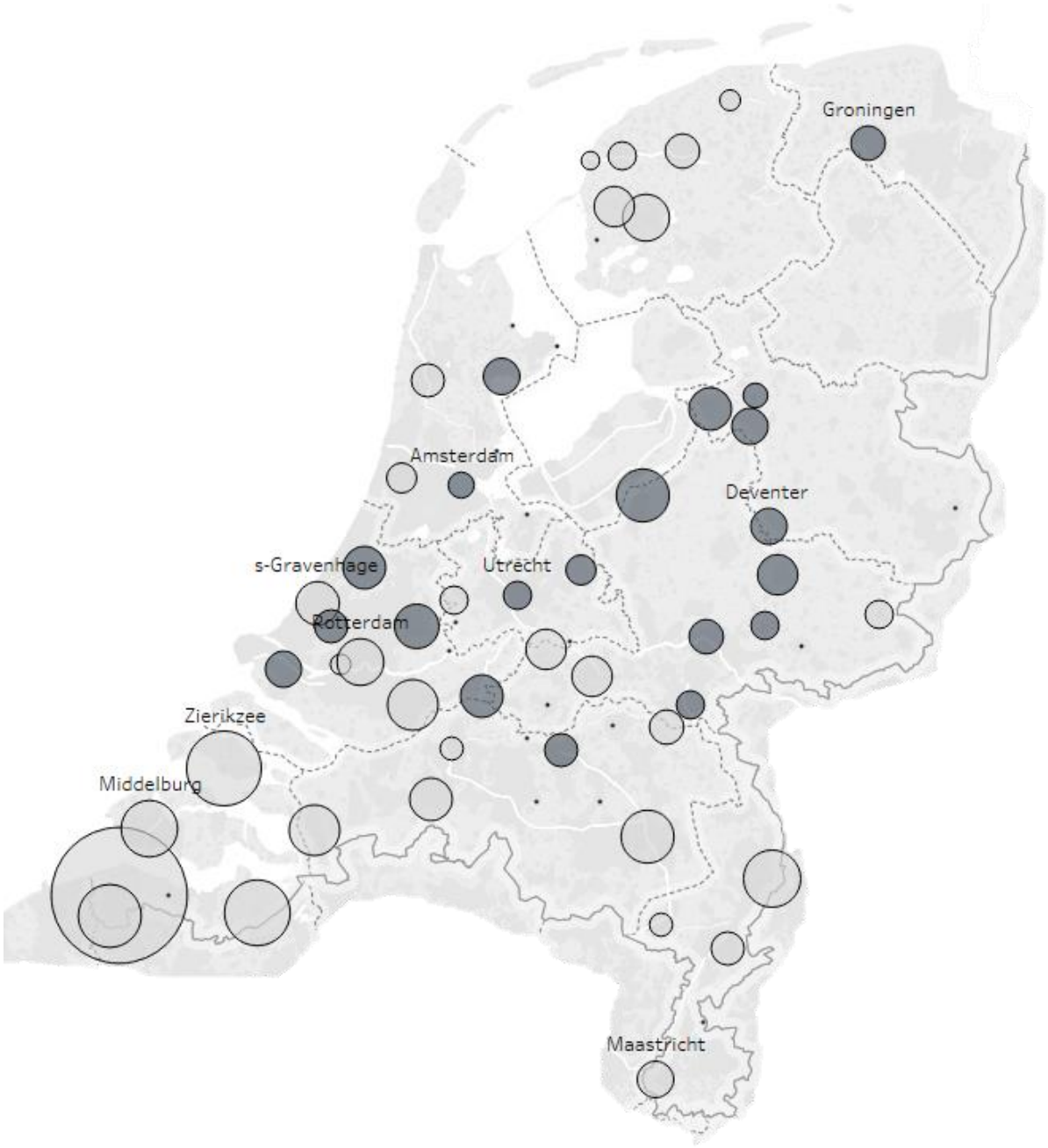


Figure 3: Scatterplot of guilds per capita against distance to Deventer

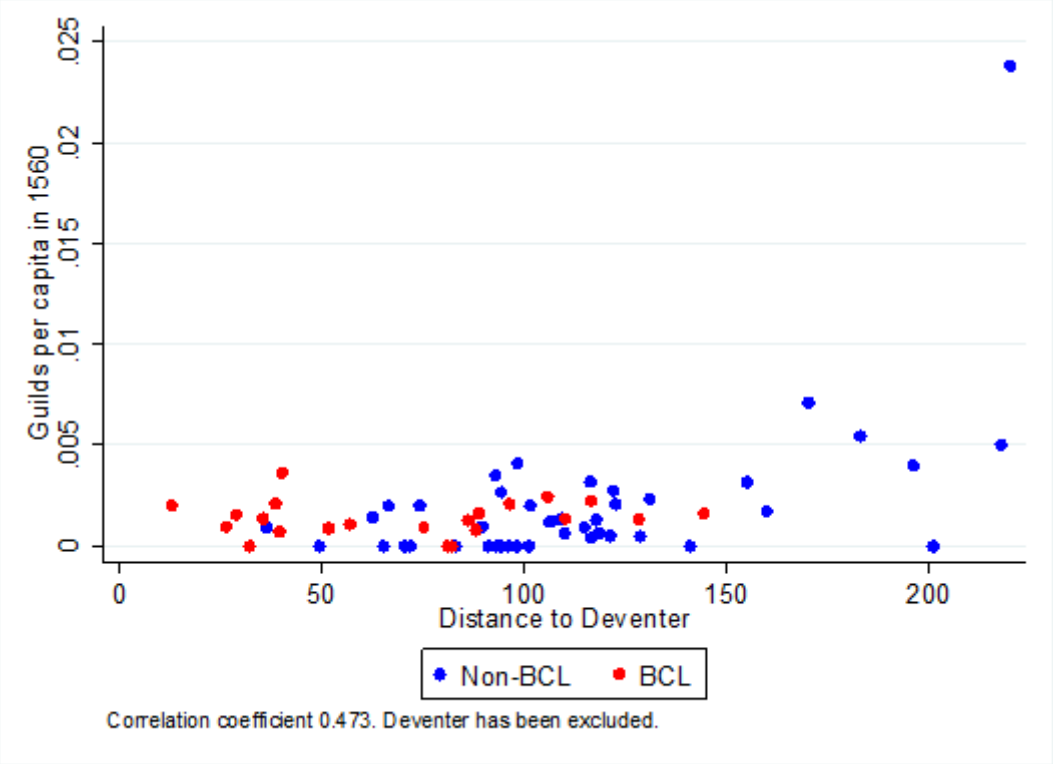


Figure 4: Scatterplot of guilds per capita on distance to Deventer, excluding Sluis

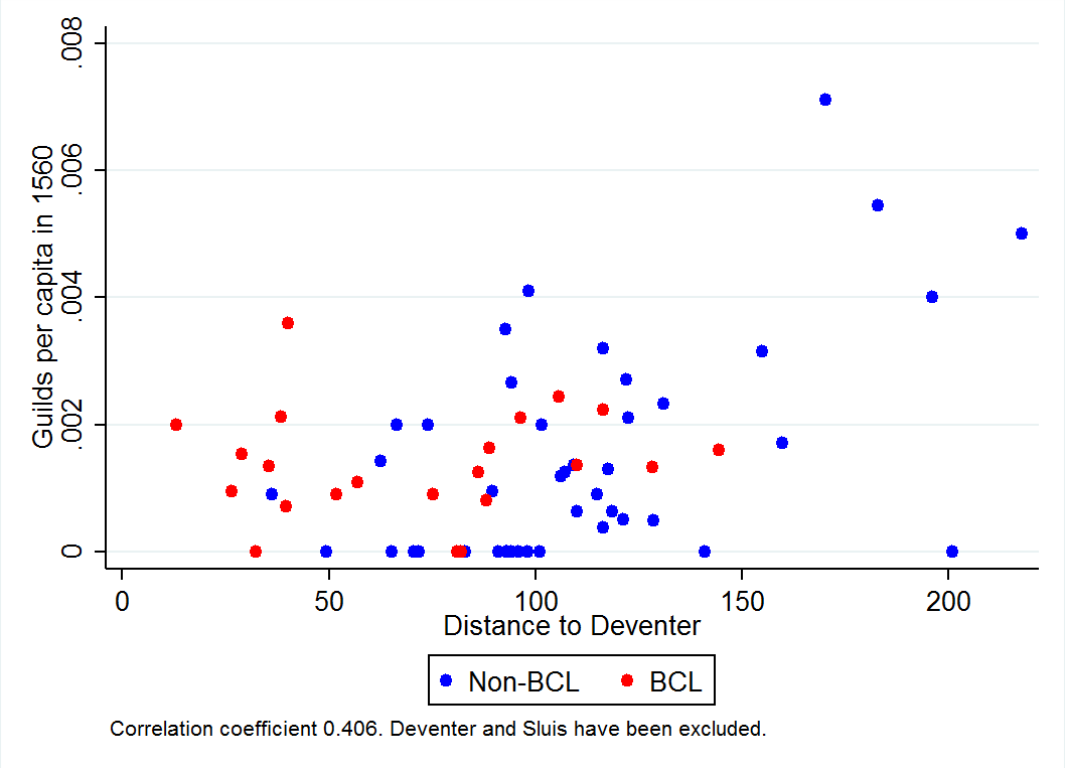
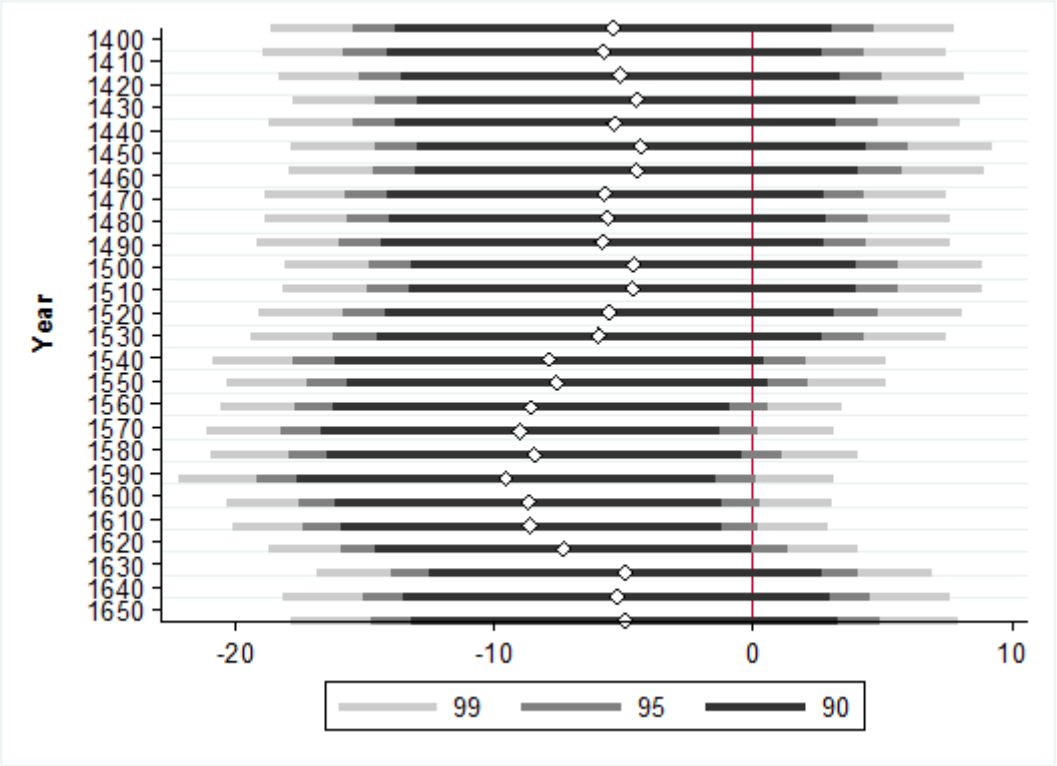


Figure 5: Estimated TSLS coefficients and confidence bands using guilds in existence (levels) at different points in time



The graph plots the estimated coefficients on BCL presence and the surrounding confidence intervals from a set of TSLS regressions of the number of guilds in 10-year intervals on a set of geographic control variables, two dummy variables indicating membership in the Hanseatic League as well as location in the province of Zeeland, and population in 1400.

Table 1: Summary statistics

	Non-BCL		BCL		
	N	Mean	N	Mean	P-value
Population 1400	44	2563.6364	23	4026.0870	0.019
Population 1560	44	3720.4545	23	8930.4348	0.000
City growth 1400-1560	44	0.3666	23	0.6837	0.009
Dummy = 1 if on the sea	44	0.2955	23	0.2609	0.770
Dummy =1 if on the river	44	0.2500	23	0.5217	0.026
Distance to Roman trade route	44	50.0748	23	33.1141	0.103
Distance to Deventer	44	113.8668	23	68.0821	0.000
Dummy = 1 if Hanse city	44	0.1818	23	0.4783	0.010
Number of BCL establishments	44	0.0000	23	2.5217	0.000
Guilds in existence in 1400	44	2.4545	23	2.6087	0.921
Guilds in existence in 1560	44	7.5227	23	11.6957	0.089
Guilds in Existence in 1400 (alt. def.)	44	3.6136	23	3.5652	0.981
Guilds in Existence in 1560 (alt. def.)	44	8.4318	23	12.6522	0.096
Guilds per capita in 1400	44	0.0007	23	0.0004	0.490
Guilds per capita in 1560	44	0.0020	23	0.0014	0.420
Guilds per capita in 1400 (alt. def.)	44	0.0009	23	0.0006	0.541
Guilds per capita in 1560 (alt. def.)	44	0.0024	23	0.0015	0.303
Religious guilds in 1560	44	5.4091	23	9.0000	0.079
Religious guilds per capita in 1560	44	0.0014	23	0.0011	0.584

Table 2: OLS estimates of guilds per capita in 1560 on BCL presence

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guilds per capita, 1560	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
BCL Presence	-0.953		-1.225*		-1.221*		-0.906	
	(0.574)		(0.649)		(0.619)		(0.617)	
Number of BCL houses		-0.186		-0.264*		-0.262**		-0.209
		(0.112)		(0.142)		(0.130)		(0.141)
Located at sea	-0.537	-0.648	-0.441	-0.593	-0.435	-0.585	-0.972	-1.076
	(1.303)	(1.347)	(1.247)	(1.304)	(1.126)	(1.166)	(1.239)	(1.269)
Located at a river	-0.287	-0.254	-0.694	-0.617	-0.684	-0.605	-0.165	-0.101
	(0.568)	(0.535)	(0.654)	(0.613)	(0.589)	(0.553)	(0.615)	(0.598)
Distance to Roman settlement/road	0.025	0.027	0.026	0.028	0.026	0.028	0.059	0.062
	(0.019)	(0.020)	(0.020)	(0.021)	(0.023)	(0.024)	(0.038)	(0.038)
Log population in 1400			1.034***	1.005**	1.035**	1.007**	0.733*	0.719*
			(0.379)	(0.386)	(0.390)	(0.393)	(0.370)	(0.368)
Hanseatic League					-0.033	-0.040	-0.343	-0.341
					(0.901)	(0.921)	(1.022)	(1.028)
Region dummy: Noord-Brabant/Limburg							5.800	6.204*
							(3.485)	(3.488)
Region dummy: Holland/Zeeland							6.980*	7.221*
							(3.976)	(3.991)
Region dummy: Overijssel/Gelderland/Utrecht							6.500	6.845
							(4.017)	(4.125)
Constant	1.909***	1.673***	-6.423**	-6.466**	-6.437**	-6.481**	-11.439**	-11.878**
	(0.610)	(0.495)	(2.943)	(3.105)	(3.025)	(3.153)	(5.361)	(5.654)
Number of Observations	67	67	67	67	67	67	67	67
R-squared	0.13	0.12	0.18	0.16	0.18	0.16	0.34	0.33
F-statistic	1.08	1.08	1.62	1.49	1.41	1.24	1.30	1.26
(p-value)	0.3726	0.3756	0.1686	0.2066	0.2242	0.2997	0.2568	0.2776

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable is guilds per capita in 1560. All regressions are weighted by population in 1400 and the estimated coefficients are scaled up by a factor of 1000. The F-statistic refers to a test of the joint significance of all included regressors.

Table 3: IV estimates of guilds per capita in 1560 on BCL presence

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guilds per capita, 1560	IV	IV	IV	IV	IV	IV	IV	IV
BCL Presence	-5.475*		-4.239**		-4.412**		-5.340**	
	(2.921)		(2.162)		(2.067)		(2.605)	
Number of BCL houses		-1.384*		-1.091*		-1.147*		-1.589*
		(0.824)		(0.609)		(0.586)		(0.860)
Log population in 1400	1.346**	1.462**	1.466**	1.467**	1.463**	1.464**	1.674**	1.899**
	(0.642)	(0.705)	(0.572)	(0.605)	(0.578)	(0.613)	(0.656)	(0.842)
Located at sea			-0.235	-0.807	-0.315	-0.936	-0.625	-1.290
			(1.127)	(1.299)	(1.079)	(1.227)	(1.136)	(1.366)
Located at a river			-0.442	-0.053	-0.578	-0.202	-0.344	0.075
			(0.958)	(0.883)	(0.987)	(0.894)	(1.147)	(1.144)
Distance to Roman settlement/road			0.020	0.025	0.017	0.022	0.042	0.059*
			(0.015)	(0.019)	(0.017)	(0.020)	(0.029)	(0.036)
Hanseatic League					0.453	0.566	-0.414	-0.421
					(0.898)	(0.882)	(1.146)	(1.106)
Region dummy: Noord-Brabant/Limburg							2.658	4.630
							(2.351)	(3.028)
Region dummy: Holland/Zeeland							4.930*	6.039*
							(2.976)	(3.403)
Region dummy: Overijssel/Gelderland/Utrecht							6.372*	8.953*
							(3.747)	(4.797)
Constant	-6.518	-8.154*	-8.561**	-9.329**	-8.444**	-9.224**	-14.915**	-19.480**
	(4.102)	(4.723)	(3.822)	(4.254)	(3.915)	(4.333)	(6.687)	(8.549)
First stage F-statistic	89.12	23.40	56.86	26.53	47.90	27.08	17.83	11.15
Number of Observations	67	67	67	67	67	67	67	67

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable is guilds per capita in 1560. BCL presence (alternatively the number of BCL establishments) is instrumented by the distance to Deventer. All regressions are weighted by population in 1400 and the estimated coefficients are scaled up by a factor of 1000. In columns 7 and 8, the omitted category is Friesland/Groningen.

Table 4: Robustness checks: sample adjustments

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Guilds per capita, 1560	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
BCL Presence	-2.828***		-6.397**		-3.151**		-2.320***		-0.779*	
	(0.990)		(3.154)		(1.266)		(0.899)		(0.423)	
Number of BCL houses		-1.105**		-3.709*		-1.408**		-0.729*		-0.179*
		(0.523)		(2.227)		(0.703)		(0.374)		(0.102)
Located at the sea	0.355	-0.018	-0.946	-1.657	0.509	0.692	0.493	0.007	0.468**	0.435**
	(0.534)	(0.596)	(1.314)	(1.713)	(0.635)	(0.707)	(0.615)	(0.716)	(0.193)	(0.193)
Located at a river	-0.333	-0.238	-1.050	-2.378	-0.797	-1.138	-0.569	-0.270	0.450	0.343
	(0.635)	(0.777)	(1.526)	(2.603)	(0.797)	(0.997)	(0.673)	(0.705)	(0.336)	(0.351)
Distance to Roman settlement/road	0.009	0.015	0.033	0.011	-0.011	-0.029	0.001	0.014	0.114	0.205
	(0.009)	(0.014)	(0.034)	(0.043)	(0.016)	(0.018)	(0.010)	(0.014)	(0.376)	(0.357)
Hanseatic League	0.585	0.390	-0.870	-2.256	0.654	0.244	0.676	0.605	-0.000	0.001
	(0.495)	(0.530)	(1.380)	(1.953)	(0.580)	(0.629)	(0.540)	(0.588)	(0.003)	(0.003)
Log population in 1400	1.102***	1.467***	2.225***	4.550*	1.475***	2.225**	0.669	0.780	0.360	0.332
	(0.326)	(0.556)	(0.851)	(2.346)	(0.488)	(0.925)	(0.471)	(0.613)	(0.335)	(0.332)
Constant	-7.793***	-11.470***	-17.270**	-31.034**	-8.022**	-11.489**	-3.463	-6.453	-2.288	-2.198
	(2.378)	(3.571)	(7.294)	(14.594)	(3.424)	(5.320)	(3.618)	(4.669)	(1.468)	(1.505)
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
First stage F-statistic	17.85	7.71	8.96	5.55	13.52	13.84	15.59	10.71	29.99	28.62
Number of Observations	65	65	56	56	51	51	39	39	61	61

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable is guilds per capita in 1560. BCL presence (alternatively the number of BCL establishments) is instrumented by the distance to Deventer. All regressions are weighted by population in 1400 and the estimated coefficients are scaled up by a factor of 1000. The omitted category is Friesland/Groningen. Columns 1 and 2 check whether our estimates are driven by the inclusion of Deventer (which has a distance of 0) or Sluis, which has an excessively large number of guilds per capita in our sample. Columns 3 and 4 test more generally whether the results are driven by cities close to Deventer (less than 50km) and columns 5 and 6 further restrict the sample by excluding cities more than 180km from Deventer. Columns 7 and 8 exclude cities with less than 2500 inhabitants in 1560, since these are unlikely to be able to support a considerable amount of guilds. Finally, columns 9 and 10 exclude all observations in the province of Zeeland.

Table 5: Robustness checks: alternative variable definitions

	(1)	(2)	(3)	(4)
	IV	IV	IV	IV
Dependent variable	Guilds per capita, adj.		'Religious' guilds per capita	
BCL Presence	-6.019**		-4.232**	
	(2.627)		(2.159)	
Number of BCL houses		-1.791**		-1.259*
		(0.885)		(0.694)
Log population in 1400	1.711***	1.964**	1.290**	1.468**
	(0.662)	(0.868)	(0.571)	(0.716)
Located at the sea	-0.805	-1.556	-0.413	-0.940
	(1.169)	(1.382)	(1.021)	(1.170)
Located at a river	-0.369	0.104	-0.334	-0.002
	(1.273)	(1.274)	(0.926)	(0.904)
Distance to Roman settlement/road	0.046	0.065*	0.026	0.039
	(0.028)	(0.034)	(0.023)	(0.029)
Hanseatic League	-0.504	-0.512	-0.093	-0.099
	(1.172)	(1.118)	(0.958)	(0.927)
Constant	-15.128**	-20.272**	-10.992*	-14.609**
	(6.561)	(8.349)	(5.662)	(7.213)
Region dummies	Yes	Yes	Yes	Yes
First stage F-statistic	17.83	11.15	17.83	11.15
Number of Observations	67	67	67	67

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable in columns 1 and 2 is guilds per capita in 1560, adjusted for the '<' indicator given in the database. Columns 3 and 4 only consider those guilds for which a patron saint is listed in the database. BCL presence (alternatively the number of BCL establishments) is instrumented by the distance to Deventer. All regressions are weighted by population in 1400 and the estimated coefficients are scaled up by a factor of 1000. The omitted category is Friesland/Groningen.

Table 6: Robustness checks: placebo tests for other religious groups

	Franciscan	Tertiarian	Beghards		Cistercian
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	IV	OLS
Beghard monastery within 5km				8.248	
				(5.807)	
Distance to Deventer	0.000	0.001	0.005**		-0.000
	(0.002)	(0.001)	(0.002)		(0.002)
Located at the sea	-0.062	0.137	0.069	-0.719	0.041
	(0.124)	(0.137)	(0.139)	(1.603)	(0.091)
Located at a river	-0.105	0.302**	-0.083	1.434	0.345**
	(0.128)	(0.127)	(0.165)	(1.806)	(0.133)
Distance to Roman settlement/road	-0.000	-0.002	-0.004	0.075	-0.000
	(0.002)	(0.002)	(0.003)	(0.054)	(0.002)
Hanseatic League	0.143	0.103	0.367***	-3.073	-0.167
	(0.089)	(0.079)	(0.112)	(2.723)	(0.177)
Log population in 1400	0.508***	0.091	0.238**	-1.915	0.115
	(0.059)	(0.056)	(0.091)	(2.025)	(0.088)
Constant	-3.291***	0.202	-1.679**	4.945	-0.562
	(0.525)	(0.543)	(0.697)	(11.108)	(0.700)
Region dummies	Yes	Yes	Yes	Yes	Yes
First stage F-statistic	0.00	0.21	4.45		0.02
Number of Observations	67	67	67	67	67

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable in column 4 is the number of guilds per capita. The columns labeled 'OLS' show the first stage regression of the presence of different religious orders on the distance to Deventer. Specifically, column 1 considers monasteries of the Franciscans, column 2 Tertiarians, column 3 Beghards, and column 5 Cistercians. All regressions are weighted by population in 1400 and the estimated coefficients in the second-stage regression are scaled up by a factor of 1000. The omitted category is Friesland/Groningen.

Table 7: Robustness checks: the relationship between BCL and the distance to other cities

	(1) Antwerp	(2) Amsterdam	(3) Utrecht	(4) Louvain	(5) Mainz	(6) Haarlem
Distance	0.003**	-0.002	-0.001	0.004**	0.000	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Located at the sea	0.051	0.086	0.129	0.010	0.139	0.121
	(0.127)	(0.144)	(0.135)	(0.133)	(0.138)	(0.144)
Located at a river	0.068	0.130	0.134	0.064	0.136	0.135
	(0.139)	(0.139)	(0.139)	(0.136)	(0.138)	(0.139)
Distance to Roman	-0.002	0.001	0.000	-0.002	-0.001	-0.000
settlement/road	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Log population in 1400	0.228***	0.222***	0.221***	0.228***	0.217***	0.218***
	(0.066)	(0.069)	(0.070)	(0.064)	(0.069)	(0.069)
Constant	-2.045***	-1.386***	-1.404***	-2.311***	-1.463*	-1.381**
	(0.661)	(0.517)	(0.527)	(0.728)	(0.827)	(0.523)
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	67	67	67	67	67	67
R-squared	0.41	0.38	0.37	0.43	0.37	0.37
F-statistic	4.19	1.14	0.47	4.92	0.01	0.21

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable in all columns is a dummy indicating the presence of the BCL in the city. All columns are estimated by OLS. The F-test statistic refers to a test of the distance coefficient being equal to zero.

Table 8: Growth regressions, city growth 1400-1560

	(1) OLS	(2) IV	(3) OLS	(4) OLS	(5) IV	(6) IV	(7) IV	(8) IV
Dependent variable	City Growth 1400-1560				City Growth 1400-1560, adjusted by(3)			
					100%	200%	-100%	-200%
BCL presence	0.442***	0.803***	0.443***	0.442***	0.733**	0.662**	0.874***	0.945***
	(0.139)	(0.296)	(0.134)	(0.148)	(0.297)	(0.306)	(0.302)	(0.316)
Guilds per capita, 1400			-46.662	-1.844				
			(70.548)	(55.755)				
Located at the sea	0.333**	0.304**	0.290	0.332**	0.289**	0.275*	0.319**	0.334**
	(0.152)	(0.143)	(0.184)	(0.153)	(0.141)	(0.142)	(0.148)	(0.156)
Located at a river	0.055	0.070	0.118	0.056	0.095	0.121	0.044	0.018
	(0.127)	(0.153)	(0.135)	(0.138)	(0.144)	(0.138)	(0.165)	(0.178)
Distance to Roman settlement/road	-0.009***	-0.007***	-0.001	-0.009***	-0.007***	-0.006***	-0.008***	-0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Hanseatic League	-0.028	-0.022	-0.123	-0.028	-0.039	-0.055	-0.005	0.011
	(0.149)	(0.134)	(0.150)	(0.150)	(0.137)	(0.144)	(0.136)	(0.142)
Log population in 1400	-0.046	-0.123	-0.034	-0.045	-0.088	-0.053	-0.157*	-0.192**
	(0.070)	(0.087)	(0.081)	(0.081)	(0.091)	(0.098)	(0.084)	(0.083)
Constant	2.074***	2.357***	0.560	2.064***	2.058***	1.759***	2.656***	2.956***
	(0.598)	(0.646)	(0.642)	(0.692)	(0.645)	(0.666)	(0.670)	(0.713)
Region dummies	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
First stage F-statistic		17.83			17.83	17.83	17.83	17.83
Number of Observations	67	67	67	67	67	67	67	67

Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively.
The dependent variable in columns 1 to 4 is city growth between 1400 and 1560. Column 5 subtracts the estimated growth effect of guilds obtained in column 3 from the left-hand side variable. Columns 6 to 8 repeat this exercise but account for a certain degree of bias in the estimated coefficient. Specifically, in column 6, we assume that the coefficient is actually twice as large as the one obtained from column 3, while columns 7 and 8 repeat the estimations from columns 5 and 6 but assume the opposing sign on the estimated coefficient of guilds on growth.

Table 9: Growth regressions, city growth 1560-1795

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	IV	OLS	OLS	Three-stage least squares		
Dependent variable:	City Growth 1560-1795				BCL Presence	Guilds per capita	City Growth
Distance to Deventer					-0.005***		
					(0.002)		
BCL presence	-0.278*	-0.169	-0.248*	-0.273*		-0.007**	
	(0.143)	(0.363)	(0.135)	(0.142)		(0.003)	
Guilds per capita, 1560			-5.065	7.043			21.921
			(9.804)	(10.781)			(49.946)
Located at the sea	0.180	0.174	0.283*	0.186	-0.018	0.000	0.187
	(0.141)	(0.130)	(0.162)	(0.144)	(0.122)	(0.001)	(0.141)
Located at a river	-0.194	-0.204*	-0.190	-0.195	-0.029	0.001	-0.181
	(0.129)	(0.123)	(0.120)	(0.130)	(0.122)	(0.001)	(0.136)
Distance to Roman settlement/road	-0.005**	-0.005**	-0.000	-0.005**	0.001	0.000**	-0.007**
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.000)	(0.003)
Hanseatic League	0.236*	0.231*	0.241*	0.236*	0.062	0.000	0.282**
	(0.127)	(0.120)	(0.130)	(0.130)	(0.110)	(0.001)	(0.130)
Log population in 1560	0.166**	0.137	0.200***	0.165**	0.248***	0.002***	-0.036
	(0.074)	(0.106)	(0.073)	(0.074)	(0.066)	(0.001)	(0.088)
Constant	-0.199	0.037	-1.351**	-0.161	-1.169**	-0.019***	1.580*
	(0.681)	(0.872)	(0.545)	(0.694)	(0.541)	(0.006)	(0.817)
Region dummies	Yes	Yes	No	Yes	Yes	Yes	Yes
First stage F-statistic		9.15					
Number of Observations	67	67	67	67	67	67	67

In columns 1 to 4, robust standard errors are in parentheses; in columns 5 to 7, conventional standard errors are displayed. *, **, and *** denote significance at the 10, 5, and 1% significance level, respectively. The dependent variable in columns 1 to 3 is city growth between 1560 and 1795. Column 5 displays the first stage regression of BCL presence on distance to Deventer. This is followed by the second stage regression of guilds per capita in 1560 on BCL presence in column 5, and the third stage regression of city growth on guilds per capita in column 7.