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Origins of Political Change—The Case of Late Medieval Guild Revolts

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Abstract

This study investigates the origins of the guild revolts in late medieval central Europe. At first, using newly compiled city level data, their temporal evolution and spatial distribution is discussed. Afterwards, the paper provides a historical discussion and empirical analysis of their origins. The results show that pre-existing city-level political institutions and location in a large territorial state were important for the emergence of late medieval guild revolts. Furthermore, the agricultural productivity of the region around a city matters in a negative way confirming the role of the late medieval agricultural crisis in the outbreak of the revolts. Other important factors are a city's urban environment and market potential, its degree of autonomy and its commercial, industrial as well as political importance. This suggests that economic change can trigger political changes. I also found evidence for the existence of spatial spillovers from the developments in neighboring cities implying that rational strategic considerations played a role in the spread of the revolts.

JEL classification: N44, N94, O10, R11, H11, D72

Keywords: Late Medieval, Early-Modern Period, Political Institutions, Political Change, Guild Revolts, Cities

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1 Introduction

In the last decades there has been an increasing interest in the role institutional innovations in the later medieval and early modern period played in the so called "Rise of the West" and the "Great Divergence" between the Western countries and the rest of the world. Within this literature, many papers have dealt with the consequences of the changes that occurred in this period in national or communal level political institutions and regimes (e.g. Allen 2003, Bosker et al. 2013, De Long and Shleifer 1993, Greif 2006, Stasavage 2007,2011,2013 or Van Zanden et al. 2012).

Most of these studies focus on the growth of cities and commerce in this period. Nevertheless, these studies rarely provide a systematic empirical analysis of the origins of these institutional innovations. Yet, uncovering the roots of participative (or inclusive) institutions in later medieval central Europe is essential for understanding the medieval roots of the "Great Divergence"(Van Zanden 2008) and the origins of political change.[1] Furthermore, it can also be informative about the relationship between economic and political changes as the political change of this period paralleled a notable economic recovery, the so called "commercial revolution" (Lopez 1976).

By investigating the origins of the late medieval guild revolts this study seeks to shed light on these issues. It is supposed that the guild revolts constituted an important trigger for the turn towards more inclusive political institutions documented for the later medieval period as they often resulted in craftsmen and other groups of citizens gaining political rights to have a say in the city council and in election procedures that gave more groups of citizens the right to vote. Therefore, the study of their causes is also informative about the origins of the "institutional revolution" in late medieval cities. Furthermore, while there is a vast historical literature on the causes and consequences

[1] During the later medieval period many other institutional, social, economic and educational innovations emerged that contributed to a renewal of prosperity and growth. Among those innovations are the rise of Protestantism (Cantoni 2012), the invention of the printing press (Dittmar 2011) and the foundation of universities (Cantoni and Yuchtman 2014).

of the late medieval guild revolts (e.g., Dumolyn and Hamers 2005 or Luther 1966) there is no quantitative empirical assessment of their causes. Hence, this study also provides an empirical test of the existing qualitative historical arguments.

The study is based on uniquely large and systematic data on the prevalence and outcomes of guild revolts in 104 cities in Germany, Austria, the German-speaking area of Switzerland (plus Geneva), Alsace-Lorraine and the Low Countries for every hundred year period between 800 and 1800 AD (i.e., it covers the German-speaking parts of the Holy Roman Empire (HRE) and the institutionally and culturally similar Low Countries). This data is part of the "Participative Political Institutions in Medieval Europe Database" created by the author and also contain information about other types of political institutions in central European cities (Wahl 2014). To construct this database, I carefully reviewed more than 100 historical sources to compile the data and to ensure that the created variables cover as much of the universe of participative political institutions in later medieval cities as possible. The collected data is the most comprehensive and detailed collection of information about the late medieval guild revolts that the author is aware of. Furthermore, it is the first data set on political institutions or regime types that is systematically defined on city-level and thus making it possible to exploit variation in political institutions between cities.[2]

Based on this data set the article first provides an overview of the temporal evolution and spatial distribution of successful guild revolts. Afterwards, I conduct an empirical analysis of the origins of the guild revolts. This empirical analysis is based on a review of the historical debate about the causes of these revolts. For the empirical analysis I supplement the database on participative political institutions with the rich city level panel data set used in Bosker et al. (2013) and further variables coded by making use

[2]The predominant De Long and Shleifer "Free-Prince" variable is defined for countries or relatively large regions. This holds also true for the more recently introduced variable of Stasavage (2011) and the Parliamentary activity index of Van Zanden et al. (2012) that is defined for larger territorial units. This is unfortunate as most of the important institutional innovations actually emerged in late medieval cities. Recently, however, Bosker et al. (2013) developed a city-level variables measuring the existence of "local participative government" showing whether a city had a city council or not.

of other sources and the participative political institutions database. I conduct cross-sectional regressions, accounting for endogeneity by regressing pre-treatment values of the explanatory variables on the guild revolts/participation measures. Thus, this study is the first to provide systematic, empirical evidence on the origins of guild revolts, the factors determining their success and the determinants of their spread.

Important results of the study are that pre-existing city-level political institutions and being located in a large territorial state are important factors for explaining the outbreak of a revolt. This shows that state capacity, political fragmentation and the overall institutional environment are decisive factors for understanding political change. Other significant determinants are a city's position in the urban network and its relation to the surrounding area, its degree of autonomy, agricultural productivity and strategic importance. This confirms the arguments of historians as it highlights the importance of the later medieval agrarian crisis and the Black Death for the subsequent institutional development. I also found a significant impact of commercial and particularly industrial importance of a city. This underlines the role of economic developments and opportunities as important triggers and prerequisites of political change. I also find evidence for the existence of strategic spatial spillovers from institutional developments in the neighboring cities. Therefore, I show the importance of strategic considerations in the spread of the guild revolts.[3]

The paper proceeds as follows: In section two, an overview of the temporal evolution and spatial distribution of successful guild revolts is given. Then, the causes of guild revolts identified by the historical literature are reviewed and connected to arguments from the theoretical economic literature on regime types and political institutions. In section four, I conduct the empirical analysis of the causes of the guild revolts and discuss their implications. Finally, section five concludes.

[3]This is in accordance with the findings of Cantoni (2012) who found that the diffusion of Protestantism was primarily determined by such strategic spatial spillovers.

2 Distribution and Evolution of Guild Revolts

2.1 Data on Guild Revolts

The data on guild revolts and other types of political institutions in cities stems from the "Participative Political Institutions in Early Modern Europe Database" created by the author (Wahl 2014). Among others, the database includes information on the occurrence and outcome of guild revolts for the German-speaking area (i.e., Germany, Austria and Switzerland) as well as the Netherlands, Belgium and three cities located in the Alsace-Lorraine region of today's France (Colmar, Metz and Strasbourg) but historically belonging largely to the Holy Roman Empire (for reasons of simplicity, in the following I will call this area "central Europe").[4] The inclusion of the Netherlands and Belgium is justified because parts of those countries belonged to the Holy Roman Empire throughout the later medieval period. The institutional environment and economic and social developments in these countries were comparatively similar to that in the German-speaking area as, for example, there were also guild revolts and there also existed imperial cities and cities of the Hanseatic League. In including the territory of today's Belgium and the Netherlands I follow other historians, like Luther (1968), who have previously studied the guild revolts.

The starting point for the collection of data was the city level panel data set on European and Muslim cities assembled by Bosker et al. (2013). Each of the variables in this data set has a value at the beginning of each 100 year period from 800 AD to 1800 AD (i.e. there is data for 800, 900, 1000, 1100 and so on). The rationale for choosing this data set was that the variables it contains are used to conduct the empirical investigation on the origins of participative political institutions later on. For each city in the sampling area described above and included in the Bosker et al. (2013) data set I tried to find

[4] Furthermore, I include Flensburg in the dataset. Flensburg was Danish until it became Prussian in 1846. Nevertheless, it is contained in the "Deutsche Städtebuch" and its history and development is closely connected with Germany and e.g., the Hanseatic League. Due to this I decided to include Flensburg.

information on whether and when each of the different types of participative political institution existed.

My main source for the coding of the variables was the "Deutsche Städtebuch" (Handbook of German Cities) edited by Keyser and Stoob (1939–1974) an eleven volume encyclopedia with systematic information on various aspects of the history of all German cities within the 1937 border of the German Empire. I coded the cities in Austria primarily according to a similar handbook for Austria, the "Österreichisches Städtebuch", or from monographs about city history. The cities in Belgium and the Netherlands were coded primarily according to Prak (2006a,b), Lis and Soly (2006), the second volume of Hegel (1892), Dumolyn and Hamers (2005), Van Zanden and Prak (2006) and various other sources.

Since the coding requires comparatively detailed data and because there is a considerable amount of uncertainty in information about developments and institutions in the medieval and early modern period I additionally consulted sources about the history of each individual city (e.g., Borst 1968 or Csendes and Opll 2001) and about their historical constitutions, guilds or political institutions (such as Blaschke 2002, Endres 1994 or Jecht 1908). Overall, I consulted more than 100 sources for the coding of the variables. The city specific sources on which the coding is based are reported city-wise in Table A.1. In Wahl (2014) I elaborate on the data and discuss its construction in more detail. There I also report the complete coding of the three variables as well as their exact definitions.

However, even when using such a large amount of sources, I was unable to find reliable information for each of the cities considered in Belgium and the Netherlands. Overall, I was able to collect information on participative political institutions in 104 cities.

2.1.1 The Spatial Distribution of Guild Revolts and Participation

To get an overview of the distribution of guild revolts and guild participation in the city council and to discover potentially existing spatial patterns that could contribute to the understanding of their origins it is useful to look at maps showing the spatial distribution of these revolts in the considered countries and across different waves.

Figure 1 therefore maps the distribution of cities with successful revolts in the 13th and 14th century, i.e. in the first two waves of the revolts. Cities that had at least some participation of craftsmen in the council for any period are blue colored and cities with a guild constitution (i.e., where the guilds were a major political force) are red.

The maps show that the first wave of guild revolts was concentrated in western and northern Germany, i.e. in the later Upper Rhenish Circle of the HRE and in the Lower Saxon Circle. The Upper Rhenish Circle in particular was highly politically fragmented and thus lacked a strong central authority that could probably prevent successful revolts. This first wave is perhaps also connected with a lack of central power and the anarchic situation after the collapse of the Staufer dynasty and the subsequent "great interregnum". It is also visible that in this first wave the guilds were only able to gain some participation in city government but not to become the dominant political force.

More than half of all revolts took place in the second wave of the revolts in the 14th century. This time, the geographic focus was more in the south of the empire (i.e., in the Swabian Circle and in today's Switzerland as well as in the Westphalic and Burgundian Circle). Contrary to previous revolts, this time the guilds succeeded in a complete take over of the city government in many cases. The newly gained strength of the Southern and Western German imperial and trade cities as well as the outbreak of the Black Death were likely to have been responsible for this wave of revolts.

[Figure 1 about here]

Figure 2 maps the third and last wave of the revolts (the upper map) and also visu-

alizes the overall picture of guild participation in 1500 AD, a date after which no new successful guild revolts are recorded (the lower map). The last wave of the revolts in the 15th century saw only a few revolts, mainly in the Low Countries (Burgundic Circle) and in the Franconian Circle. In general, the shift of the revolts to the South and in particular to the north mirrors the regional economic and social development patterns in this period. Again, none of the revolts in the third wave resulted in a complete takeover of the city government. In Table B.1 in Appendix B, I conducted OLS regressions to predict the occurrence of a revolt in a respective wave by the geographic coordinates of the cities and Imperial Circle dummies. These regressions broadly confirm the conclusion drawn from the visual inspection of the data. However, since the number of revolts was low in the first and in the third wave those regressions are probably not very significant.

[Figure 2 about here]

Finally, the overall picture of guild participation after the end of the revolts in 1500 AD is depicted in the lower map of Figure 2. When looking at this map one can infer that there were almost no cities with guild participation in the north of Germany and the Netherlands, i.e. in core area of the Hanseatic League (Dollinger 1966). This is in line with historical evidence that the Hansetic League often successfully suppressed guild revolts and defended the ruling merchant elite in its member cities (e.g. Luther 1968). I also see that guild participation was mainly concentrated in south-west Germany, today's Alsace-Lorraine and Belgium (the duchies of Flanders and Brabant). In central Germany there is a medium frequency of guild participation and there are only a few cities with a guild constitution (Brunswick, Goslar and Magdeburg) all of which were members of the Hanseatic league and important political, commercial or ecclesiastical centers and therefore probably predestined for the outbreak of a guild revolt. In those cities the guilds succeeded in their attempts to gain political power despite the

opposition of the Hanseatic League. There are almost no cities with guild participation in Bavaria which could be due the comparatively strong position of the Bavarian ruler and to the fact that bishops there (e.g. in Passau) were often successful in suppressing the guilds.

2.1.2 The Temporal Evolution of Guild Participation

It could be instructive to look at the temporal evolution of the guild participation and the spread of guild revolts. Thus, the temporal evolution of the share of cities with guild participation and with a guild constitution is depicted in Figures 3a and 3b.[5] The general temporal evolution pattern is the same for both kinds of revolt outcomes. Their spread began after 1200 AD and their diffusion continued until the end of the 15th century (consistent with e.g., Pirenne 1964 or van Werveke 1963). From the 16th century onward their prevalence declines remarkably (e.g., the share of cities with guild participation declined from around 50 % to around 30 %). Both types of participative institutions were abolished, often in the early modern period when local rulers or the emperors became strong again or when the cities lost their commercial and strategic importance.

[Figure 3 about here]

[5] It has not been possible to include unsuccessful revolts in this picture as in most cases there were many uprisings in different centuries sometimes even resulting in a guild participation that lasted only a few weeks or months. Thus, I cannot meaningfully attribute these events to one of the observation years. Furthermore, I am primarily interested in the triggers of economic change and therefore in successful guild revolts.

3 Origins of Guild Revolts—Historical Discussion and Theoretical Considerations

There is little historical research discussing the possible causes of the guild revolts in the German-speaking area and the Low Countries. An overview of this literature and the causes/ predictors of guild revolts that have been identified are is given in Table 1.

Allmost all of the reported studies have pointed to the stark contrast between the economic importance of the craftsmen and their non-existent political rights as major cause of the revolts. Thus, the most important of the endogenous reasons for the guild revolts, i.e. endogenously arising from the revival of trade, commerce and the institutional innovations connected with them, can best be understood in the framework of Acemoglu et al. (2005) and Acemoglu and Robinson (2006). While the de jure political power was concentrated in the hand of the patriciate, the de facto political power shifted to the craft guilds and non-patriciate merchants. This shift was the outcome of the economic institutions, which allocated more and more resources to the guilds. This was true not only for economic resources but also for military resources, as the guilds often also provided the city's military. Consequently, guilds gained de jure political power. This story also fits with a second often- mentioned reason for guild or burgher uprisings: the decline or degeneration of the elite. What began as the rule of economically successful and sometimes even philanthropic merchants engaged in long-distance trade activities usually ended-up in an enclosed, oligarchic rule of a few families. This oligarchic rule increased inequality, which is a major cause of revolts and revolutions (Acemoglu and Robinson 2001, 2006). Furthermore, this degeneration had various other effects giving rise to the occurrence of a revolt.

[Table 1 about here]

At first the families often fought against each other often resulting in the deaths of

important members of such dynasties (Luther 1968) leaving both a vacuum of power and a rational reason —the restoration of peace— for the guilds and burghers to take over government. Second, corruption, misgovernment and wars led by the elites resulted in financial problems and tax increases not for the elite but for the majority of people without political rights. This increased inequality and the likelihood of revolt. Last, the elites lost their economic and educational advantages since they stopped being engaged in long-distance trade and lived as gentlemen of leisure or pensioners. The degeneration of patrician and oligarchic rule is in line with the theoretical considerations of Acemoglu (2008),the empirical findings on that matter for a cross-section of European cities (e.g. Epstein 2000 or Stasavage 2011, 2013) for particular cases like e.g. Venice (Puga and Trefler 2014) and classical ideas about a "political" or "regime cycle" going back to Plato and Aristotle. More generally, this picture underlines that economic opportunities and institutions are essential prerequisites for political change and the emergence of participative political institutions. If this is true, the guild revolts can be seen as a phenomenon similar to the increase of Atlantic trade in the early modern period that laid the ground for further institutional improvements (Acemoglu et al. 2005). However, whether the outcome of these revolts persisted or was positive for the development of the city is not investigated in this paper and therefore these thoughts are speculative.

Apart from these endogenous causes of guild revolts according to which the patricians became the victims of the prosperity, economic and social complexity it had generated by itself, Table 1 mentions several exogenous factors that led to guild revolts and burgher uprisings. First, the outbreak of the Black Death in the 14th century was connected to the occurrence of guild revolts in various way. Most prominently, it lead —together with climatic changes— to a severe agrarian crisis resulting in a decline in the prices of agricultural goods and a corresponding increase in the prices of industrial commodities and real wages in cities. This divergence of living standards between

rural and urban areas led to massive migration movements of people from the countryside to the cities. This influx of people, especially craftsmen, resulted in a conflict about the restrictiveness of migration policy between the urban craftsmen and the city council controlled by the merchant elite (Luther 1968). Second, the persecution of Jews was often connected with an upheaval of the old elites (Luther 1968) and was also connected with the Black Death epidemics. Third, the double-election of the German King in 1314 AD was a source of intra-city conflicts as the guilds and the elite were often loyal to other kings and were strategically supported by the king to which they were loyal. Sometimes the guilds used this conflict to revolt against the elites and to come to power themselves.

Historians also emphasize the role of structural differences between different geographic areas. There is a consensus that the merchant elites of the leading cities of the Hanseatic League were most often successful in preventing or suppressing guild revolts. However, (as reported in Figure 1) guild participation was less widespread in the northern part of the Holy Roman Empire due to the fact that most of the cities there engaged exclusively in trade and lacked significant crafts or production. Therefore, the guilds were in a less powerful position in these cities. And if a city was important as a industrial center and a trade center, like Brunswick, there were guild revolts.

There is also a consensus that while guild revolts broke out in all types of cities they were primarily concentrated in large and medium sized cities of outstanding commercial, strategic or political importance. Additionally, a city had to have a relatively large degree of autonomy for a guild revolt to occur. Due to this, imperial cities should have a high probability of a guild revolt. Complementary, a residence city of a secular ruler might have a lower probability for a revolt since the autonomy of such cities was usually limited —although kings in general had a relatively pragmatic attitude toward guild participation. A special case are the residences of archbishops. While archbishops were sometimes on the side of the guilds, supporting them to regain power in the city,

they sometimes fought against the attempts of the guilds. Thus, it is not a priori certain what the effect of the presence of an archbishop should be. The effect of archbishops is also unclear because their military strength was more limited than those of secular rulers. Moreover, their relationship with local secular rulers was often conflicting. These aspects strengthen the arguments for a positive effect of archbishops on the occurrence of guild revolts. It is also possible that negative and positive effects offset each other leading to no detectable effect of archbishops. Finally, Kluge (2009) mentions that successful revolts inspired revolts in neighbor cities, although the revolts in general remained a local phenomenon. This gives rise to the conjecture that spatial spillovers and strategic considerations played a certain role in the diffusion of guild revolts similar to, for example, the case of the spread of Protestantism (Cantoni 2012).

I base the empirical analysis of the origins of guild revolts on insights of this historical research. However, not all of the presented concepts can be operationalized in a adequate way given the existing data limitations. For instance, there exists information on the persecution of Jews in the "Deutsche Städtebuch" but I cannot consider these persecutions as (i) I do not have information about the intensity of the persecution and (ii) I only have data for every one hundred year period and therefore cannot take into account such temporary historical events (especially since the Jewish communities were often re-installed some years after the persecutions).[6]

4 Explaining the Guild Revolts—Empirical Evidence

4.1 Variables

To explore the roots of the guild revolts in the 14th and 15th century I make use of three different dummy variables acting as dependent variables.

[6]For instance, there is no systematic account on the financial situation, public debt or taxation policy of the cities at the onset of the revolts.

The first dependent variable is a dummy variable equal to one if a city experienced a successful guild revolt and the guilds participated in the city council ("Guild Participation Dummy"). Second, I use a dummy variable reporting the occurrence of guild revolts in a city, i.e. it is equal to one if the sources indicate a guild upraising, regardless of whether it was successful (i.e. the guilds participated in the city government after the revolt) or not ("Guild Revolt" Dummy). Third, a dummy variable serves as dependent variable indicating cities with a guild constitution, i.e. cities in which the guilds not only participate in the city council but also had the majority or all of the seats ("Guild Constitution Dummy").

The three different guild revolt measures are chosen because using only one of them would potentially lead to erroneous conclusions. This is because focusing only on successful revolts could give a wrong picture of the underlying reasons for the guild revolts. This is especially true, if it there were systematic reasons for why some revolts failed. The choice to consider separately those cities under full political control of the guilds is justified for several reasons. First, the influence of guilds on the actual politics of a city was much lower when they only had e.g., one third of the representatives in the city council instead of the majority. Even if the guilds held half of the seats the actual influence of those representatives was often limited (Maschke 1959). Hence, the effect of successful guild revolts is expected to be lower in those cities than in cities where the triumph of craftsmen was absolute and they became the dominant political force.[7]

The independent variables can be grouped into three broad categories following the

[7]Some historians, e.g. Luther (1968) argue for the necessity of a even more fine-grained categorization scheme of the political influence of guilds. He distinguishes between five categories of cities: (i) Cities where the majority of the seats in the city council is held by the patriciate, (ii) cities in which guilds and the patriciate have half of the seats respectively, (iii) cities where the guilds provide the majority of the representatives in the city council, (iv) cities where the guilds have all seats in the city council and (v) cities that remain under the complete control of the patriciate. However, it is not obvious what the difference between e.g. category (iii) and (iv) actually is. In conclusion, these five categories seem to be much more arbitrary than necessary. Moreover, for many cities the information provided by the sources is not detailed enough to code the cities according to such a categorization scheme. This is why I follow e.g. Fuhrmann (1939) and stick to a three category scheme (i.e., (i) no guild participation, (ii) some guild participation and (iii) guilds are the major political force).

historical and theoretical discussion above. Each of the included variables is intended to empirically represent one of the historical reasons for the guild revolts discussed above.

First, I take into account the pre-existing political institutions in cities and territorial states. I include dummy variables that indicate the existence of institutionalized burgher representation and participative election of city government. These variables also originate from the "Participative Political Institutions in Medieval Europe Database". They should account for the pre-existing institutional environment in the city. Furthermore, they consider the fact that the outbreak of a revolt is less likely if the political institutions in a city are already relatively inclusive. Additionally, to those two variables I add a "Large State" dummy in this set of controls. This should capture the fact that rulers of large territorial states may have had more political and military strength than small states which may have prevented the outbreak of a revolt. Furthermore, the political regime in territorial states could have been more oppressive. Due to this, for example, inequality was probably higher in large territorial states. Hence, the effect of this variable on the guild revolt probability is a priori ambiguous.

Second, I incorporate time-invariant variables capturing a city's second-nature geography and economic characteristic. First, I include a variable reporting the suitability of a city's area for agriculture. Agricultural suitability serves as a proxy for the agricultural productivity of a city's hinterland which could be decisive for the outbreak of guild revolts because of the agrarian crisis. Furthermore, I consider a measure of a city's urban potential, i.e. the distance-weighted sum of the population of all other cities in the data set of Bosker et al. (2013). "Urban Potential" serves as a measure for the centrality of a city within the European city network and therefore as a proxy of e.g. the size of its potential markets but also of the characteristics of its surrounding hinterland (Bosker et al. 2013). These aspects are related to many of the other variables (e.g., being an important trade center). However, they could also have a direct effect running

through e.g., competition between different cities, which probably had an ambiguous effect on city development and the probability of guild uprisings. Furthermore, it also proxies for the importance of a city relative to its hinterland. This, in turn, is related to the extent to which a city was affected by the agricultural crisis, the Black Death and migration from rural areas.

Furthermore, I include dummy variables indicating whether a city was an important supra-regional center of trade, or a member of the Hanseatic League. Being an important trade center could raise the probability of a guild revolt since medieval trade and commerce created the economic opportunities and high inequality that were conductive for guild uprisings. On the other hand, the local merchant elite had a strong incentive to suppress these revolts and to defend its power by all available means. This is especially true for the leading member cities of the Hanseatic League where the elites managed to successfully suppress revolts on many occasions. Moreover, many member cities of the Hanseatic League differed from most other trade cities in that they were not also centers of production but solely engaged in trading of commodities. In consequence, the guilds were in a weaker position in such cities. This is also why including both a trade city dummy and a Hanseatic League dummy can be justified.

Finally, I include several other variables that proxy for the political and ecclesiastical importance of a city. Among them are variables indicating the presence of a bishop or archbishop, whether a city had the status of a free or imperial city or was a residence of a secular ruler. It is not clear for every variable whether they rais or lower the probability of a guild revolt/ guild participation.

Some specifications include the natural logarithm of a city's population. City population is an accepted proxy for economic development in the pre-industrial era (e.g Cantoni 2014, Nunn and Qian 2011) and is both important as an explanatory variable and correlated with many of the other variables. Its inclusion prevents us from attributing effects to variables that are actually caused by the positive impact of economic

development and city size on revolt probability. Because I lose around 20 % of the observations due to the restricted availability of city population data, I show specification both including city population and without.

All these variables with the exception of the imperial, residence and trade city and Hanseatic League dummies originate from the Bosker et al. (2013) data set. The other four variables are coded by the author. Appendix A provides an overview of all variables, their sources and definitions.[8]

4.2 Empirical Approach and Results

To unravel the origins of guild revolts and the political change connected with successful ones, a straightforward strategy consists in running probit regressions where the above mentioned independent variables are regressed on one of the dependent variables. Such estimates are probably biased by reverse causality since the dependent variable are likely to influence some of the included regressors. A first approach to avoid these kind of endogeneity problem is to use pre-treatment values of the regressors in the estimation. To achieve this I created, based on the panel data set, a cross-sectional data set containing the values of the regressors in the period before a (successful) guild revolt broke out in a city. Thus, if a city is coded as having guild participation from 1300 AD onward, I keep the values in 1200 AD and so on.[9] For cities that did not experience guild revolts I keep the observations in the year 1500 AD. This is because after 1500 AD

[8] For a detailed description of the variables originating from Bosker et al. (2013) the reader is referred to their data appendix, available online at this url `http://www.mitpressjournals.org/doi/suppl/10.1162/REST_a_00284/suppl_file/REST_a_00284_data_appendix.pdf`; accessed on March 12th, 2014.

[9] Some cities had guild participation in 1300 AD but not in 1400 AD and then again in 1500 AD. In this case I also keep the values in the period before the first revolt. As the date of the revolt is most often known fairly exactly (i.e., the exact day or at least year) it is checked whether the coding of the variable in the pre-treatment period (e.g. 1200 AD) is correct also in the immediate period before the revolt. That is, if a city is coded as having guild participation in 1300 AD and it was an Imperial city in 1200 AD it is examined whether it was also an Imperial city in the years before the actual revolt happened, (e.g. whether Zurich was an Imperial city in the years prior to the revolt in 1336. If this was not the case, a city would be coded as not being an Imperial city prior to the revolt despite the fact that it was one in 1200 AD.

no new guild revolts occurred and the treatment period ended (probability of a new revolt becomes zero after 1500 AD). A descriptive overview of this cross-sectional data set is given in Table A.1..

I investigate which pre-treatment characteristics of cities determined the occurrence and success of guild revolts by estimating variants of the following equation:

$$Pr(GUILDREVOLTci, t|\mathbf{POLINST}_{ci,Pre-Treatment}, \mathbf{ECONGEO}_{ci}, \mathbf{CITYIMP}_{ci,Pre-Treatment}) = \Phi(\alpha + \beta'\mathbf{POLINST}_{ci,Pre-Treatment} + \gamma'\mathbf{ECONGEO}_{ci,Pre-Treatment} + \delta'\mathbf{CITYIMP}_{ci,Pre-Treatment} + \lambda_c + \epsilon_{ci}) \quad (1)$$

Where $GUILDREVOLT_{ci}$ represents the three dummy variables measuring guild revolts and guild participation in the city council and $\mathbf{POLINST}_{ci,Pre-Treatment}$, $\mathbf{ECONGEO}_{ci,Pre-Treatment}$, and $\mathbf{CITYIMP}_{i,Pre-Treatment}$ represent the three sets of independent variables described above. λ_c are imperial circle fixed effects and electorate fixed effects and ϵ_{ci} is the error term capturing unobserved factors.[10] I choose to estimate this equation using probit estimation. For each of the three dependent variable the results are presented in a separate Table. First, each of the three set of controls is added separately to the regression and then all jointly. Finally, in the last column of each table, the ln of a city's population is added to all other regressors.

The results for the successful guild revolts dummy are depicted in Table 2. Overall, I see that concerning other types of participative political institutions a clear picture emerges. Institutionalized burgher representation has a robust and negative effect on the probability of a successful guild revolt in all specifications while participative election procedures are always insignificant. What is more, the large state dummy always has a significant positive effect on the outbreak of a revolt. This shows that revolts

[10]Imperial circles were established as administrative units in the Holy Roman Empire in 1512—that is shortly after the period of the revolts. Nevertheless, they could capture much of the heterogeneity between the areas of the Holy Roman Empire in the previous centuries. Furthermore, as the 104 cities in the data set are located in 73 territories it is no alternative to use territory fixed effects instead.

were more likely to occur in large territorial states with a possibly higher degree of centralization and strong, more authoritarian rulers that suppressed the development of cities. Alternatively, it could also be interpreted as showing the positive effect of better economic opportunities (as a consequence of larger internal markets and better protected trade routes etc.). However, as I include a trade city dummy in the regression it is supposed that these aspects are captured by its coefficient.

Furthermore, urban potential —as a measure of a city's second nature geography— has a robust and negative effect. Hence, cities with low urban potential had a high probability of a guild revolt, i.e. the typical city subject to a guild revolt was characterized by a sparsely populated hinterland. Thus, it were cities dominating rural areas in which the revolts are more likely occurred. This result fits with Bosker and Buringh's (2012) finding that before 1600 AD large, pre-existing cities close to another city prohibited the development of the latter city ("urban shadow effect").

[Table 2 about here]

Among the other included variables, the imperial city dummy and the bishop and archbishop dummies are significant and show a positive sign. These confirm the conjectures of historians about the role of city autonomy and the role of archbishops in the occurrence of revolts. The insignificant impact of residences of secular rulers indicates that secular and ecclesiastical reign were differently connected to guild revolts. It is likely hat because bishops and archbishops had a weaker military and political position when compared to secular rulers of larger territories, they were relatively less successful in the prevention or suppression of a guild revolt.

The insignificance of city population is an unexpected result as most historians highlight the role of economic and social development for the occurrence of guild revolts. It is quite clear from the historical evidence that guild revolts did occur primarily in medium sized and large cities. However, as city population data is available more fre-

quently for larger cities and smaller towns are not included in the data set I might not have enough variance to capture these effects.[11]

Next, I consider not only successful revolts but also unsuccessful revolts, i.e. revolts that did not result in the participation of guilds in the city council. The results for this dependent variable are reported in Table 3. In general, the results are fairly similar to those I found when I focused on successful revolts only. However, archbishops loose their significance, when added jointly with all the other variables. Another differences is that now, at least when included together with the other variables (as in columns (4) and (5)), the existence of participative election procedures significantly lowers the probability of a guild revolt (with a sizable average marginal effect). City population is again not significant.[12]

[Table 3 about here]

Finally, I focus on cities where the guilds took over the majority or all of the seats in the city council, i.e., the cities with a guild constitution. In general, there are again only a few diverging results when compared with the other dependent variables. The estimated coefficients employing this dependent variable are reported in Table 4. Being an imperial city again has a robustly positive effect and urban potential has a negative effect although it is less pronounced than before and the variable becomes insignificant when city population is included in the regression model. Moreover, the trade city dummy shows a significantly negative coefficient once city population is controlled for. This is an interesting result as it suggests that in trade cities (while they are on average

[11] Another possibility is that one of the other variables (e.g., the archbishop and bishops or the imperial city dummy) are significantly correlated with city population and hence capture parts of its effects. However, even if I would only include city population and the imperial circle dummies it would not be significant. (regression not shown but available from the author upon request). Furthermore, the Hanseatic League dummy becomes significant when city population is included. However, this is only due to the different sample and hence, this result is not generalizable but maybe the result of sample selection bias.

[12] Contrary to before, city population would become significant if the imperial city dummy is removed from the model. This tells us that a large part of the effect of imperial cities on the probability of guild revolts might in fact be due to the fact that they are larger than other cities.

larger, as indicated by a bivariate correlation of both variables of around 0.3) the success of guild revolts was more limited. Thus, I can confirm historical evidence about the importance of economic development and the endogenous nature of the guild revolts at least for those cities in which the guild revolts succeeded in becoming the dominant political force.

The most important difference is that now agricultural productivity is significant, at least when all variables are included jointly. This provides evidence for Luther's (1968) or Blickle's (1988) claim that the agrarian crisis of the early 14th century and the migration movements from the rural area —along with a severe decrease in the price of agrarian goods following the Black Death— did matter for the outbreaks of guild revolts. It is supposed that areas with better soils showed a higher agricultural productivity and were not so severely affected by the crisis and its consequences.

[Table 4 about here]

4.3 The Spread of Guild Revolts— Neighborhood Spillovers

A decisive factor that has been neglected so far is the possibility that the institutional arrangments of neighboring cities could have influenced the introduction of participative political institutions and the occurrence of guild revolts. Cantoni (2012), for instance, discovered such spatial spillovers in the case of the spread of Protestantism in the 16th century and Kluge (2009) suggests that some revolts maybe have been inspired by revolts in neighboring cities.

There are plenty of reasons to suppose the existence of strategic neighborhood spillover effects. Yet, it is not clear in which direction these spillovers worked. On the one hand, a guild revolt in a neighbor city may have increased the probability of a successful guild revolt, e.g. because the guilds, craftsmen and other burghers saw higher chances of success or found support from their neighbor city in their revolutionary attempts. On the other hand, the elites of a city that saw a successful guild revolt

in a neighbor city could try to prevent it by forming an alliance with the elites of other cities. If this was the case, I expect negative neighborhood spillovers. Such negative neighborhood spillovers will also occur when the elite, in order to prevent a likely revolt, introduce some kind of institutions giving the citizens a right to have a say in the political matters of the city.

It is worthwhile to assess the existence of spillover effects in a panel framework by estimating the following equation using the probit estimator:

$$
\begin{aligned}
&Pr(GUILDREVOLTci,t|\mathbf{GUILDNEIGHBOR}_{ci,t},\mathbf{POLINST}_{ci,t},\mathbf{ECONGEO}_{ci,t},\mathbf{CITYIMP}_{ci,t}) \\
&= \Phi(\alpha + \beta'\mathbf{GUILDNEIGHBOR}_{ci,t} + \gamma'\mathbf{POLINST}_{ci,t} + \delta'\mathbf{ECONGEO}_{ci,t} + \theta'\mathbf{CITYIMP}_{ci,t} \\
&+ \lambda_c + \epsilon_{ci,t})
\end{aligned}
\tag{2}
$$

Where $GUILDREVOLT_{ci,t}$ are the guild participation and constitution dummies. $\mathbf{GUILDNEIGHBOR}_{ci,t}$ is a set of three variables containing the share of neighbor cities with guild participation 50, 50–150 and 150–250km away from the city under consideration. I choose to operationalize the neighborhood spillovers in this way because Bosker and Buringh (2012) found that distance has a non-linear impact on a city. Furthermore, as mentioned by Kluge (2009) neighborhood spillovers occurred but guild revolts were a local phenomenon. This implies, that it did not matter what happened in cities further away than a certain threshold.[13]

I estimate equation (2) using a a cross-sectional data set, created similarly to the one used in the previous estimations. However, it is not meaningful to use the share of neighbor cities with guild revolts 100 years earlier as neighborhood spillover variable. The period of 100 years between events in the neighborhood and events in the consid-

[13]Note that a distance of 250km roughly corresponds to a two-week round-trip. I experimented with including a a fourth distance band for cities 250—450km away but it turned out to be insignificant. Regressions not shown but available from the author.

ered city is too long to provide meaningful results. In consequence, to assess the impact of neighborhood spillovers I use a similar cross-sectional data set as before but this time I keep a variable's value in the period when a guild revolt occurred in a city.

The results of estimating equation (2) using this data set are depicted in Table 5. There, I first deal with the impact of neighborhood spillovers on successful guild revolts (columns (1) and (2)). In column (1) I consider the share of neighbor cities(within the three distance bands) with guild participation at the time when a city experienced a guild revolt (and perhaps already in the periods before) or—if it did not experience a guild revolt—in 1500 AD as neighborhood spillover variable. In column (2) I redefine the neighborhood spillover variable as so that it only measures the number of neighborhood cities (within the three distance bands) that experienced a guild revolt at the time when a city experienced a guild revolt or—if it did not experience a guild revolt—in 1500 AD as neighborhood spillover variable. This distinction is justified as it enables me to separate two different potential sources of neighborhood spillovers, namely the revolt event as such and on the other hand the possibility that cities with pre-existing guild participation supported revolt attempts in neighboring cities.

[Table 5 about here]

I see that the results are different depending on which version of the spillover variables is used. Nevertheless, the general pattern is that revolts—or existing participation—of guilds in the close neighborhood have a negative influence on the probability of successful guild revolts. That is, the city rulers react with successful preventive measures. Revolts or participation further away, by contrast, seem to have positive effects, i.e., they encouraged the guilds in the city to initiate an uprising too. In general, the significance and the size of the average marginal effects is larger where I consider spillovers from revolts and not from pre-existing participation. Consequently,

an F-test of the joint significance of all neighborhood spillovers can reject their joint insignificance only in the case of spillovers from revolts in the neighbor cities.

The same holds true when the dependent variable is the guild constitution dummy (in columns (3) and (4)). However, in this case, none of the guild participation neighborhood spillover variables is significant (column (3)) and there seem to be only positive spillovers from neighbor cities 50km or more away from the city under consideration.

In sum, the results suggest that only revolts in the same period lead to spatial spillovers in neighboring regions. They also show that—in the case of all successful guild revolts—revolts in nearby cities lowered the probability of a guild revolt in a city as they alarmed the elites there and lead them to take preventive measures. Conversely, revolts in more distant cities raised the probability of a revolt as knowledge of a successful revolt might have encouraged a city's guilds to begin an uprising themselves.

4.4 Testing the Impact of Proto-Industry

The historical discussion emphasizes that the guild revolts endogenously emerged as a byproduct of the commercial revolution and the societal and technological advancements of the late medieval period. In the previous estimates I accounted for this by including city population (as a general proxy for economic development) and dummy variables for important medieval trade centers and members of the Hanseatic League. However, it might be that the decisive factor for the outbreaks of the revolt was not the general level of economic development or commercial activities, but the extent to which a city was a center of proto-industry. It can be assumed that the power of guilds was higher in industrial centers than in commercial centers primarily engaged in trade but not production.[14]

[14] This for example could explain why in Brunswick—that was a notable center of production—there was a successful guild revolt despite the fact that it was a member of the Hanseatic League. Actually, many of the important members of the Hanseatic League were only engaged in large-scale trade and not production activities. In effect, the craft guilds were not that powerful in these cities. Hence, it was easier for the merchant elites to prevent a revolt of the craft guilds there.

To test this, I collected data about important centers of proto-industry in the HRE. To be certain, I constructed a dummy variable reporting important centers of textile industry and additionally a "Proto-Industry" dummy that is equal to zero if a city was not an important center of proto-industry, one if it was a center of textile *or* metal industry and two if it was a center of both industries.[15] I add these variables to the set of explanatory variables and remove the Hanseatic League and residence city dummy, as they were never significant in Tables 2–4. I then regress the three previously used guild revolt measures on these explanatory variables and the imperial circle and electorate dummies. The results of the probit estimations are shown in Table 6. I consider the textile industry dummy in columns (1)–(3) I consider the textile industry dummy and the proto-industry dummy in columns (4)–(6).

The textile industry dummy is significant and relatively large in magnitude (between 0.2 and 0.3) in the cases where the guild revolt and the guild constitution dummies are the dependent variables. It is insignificant for guild participation (successful revolts). This suggests that in centers of the textile industry the likelihood of an outbreak of a guild revolt was significantly higher. Moreover, it implies that the guilds were especially powerful in centers of the textile industry and hence the proto-industry dummy (i.e., also considering centers of metal industry) is only significant for the case of guild constitutions and its coefficient is smaller in size. Hence, the effect of proto-industry seems to be concentrated largely on the textile industry and not on the metal industry.[16] Furthermore, it seems that the effect of economic development on the type of outcome of a revolt was larger than on the success of a revolt as such. Finally, it is important to mention that the inclusion of these proto-industry variables leaves the magnitude and

[15] Details about the construction of these variables (sources etc.) is provided in the Data Appendix.

[16] An individual dummy for centers of the metal industry would be insignificant in all regressions (estimations not shown but available from the author). This might be due to the fact that the metal industry was not as important as the textile industry in most of the considered cities or —at least—the metal guilds were not that powerful. Moreover, many important centers of metallurgy were located outside of the sampling area (e.g., in Eastern Europe) which could also contribute to the insignificant effect of the metal industry.

significance of the other variables virtually unchanged. The only exception is the trade city dummy which becomes insignificant in the case of guild constitution as dependent variable. Therefore, the significant effect of trade cities can actually be attributed to a group of trade cities that were also centers of the textile industry and not on trade activities.

[Table 6 about here]

5 Concluding Remarks

The main question I wanted to investigate in this study was: What were the causes of the later medieval guild revolts? To put it a different way, what did a typical city in which a (successful) guild revolt occurred look like?

The typical city subject to a successful guild revolt had a certain degree of autonomy, was located in a large territorial state, was in an area with low urban potential and suitability for agriculture, i.e. it dominated a rural area with relatively low agricultural productivity. Furthermore, it did not have any pre-existing participative political institutions (like e.g., a city council elected by the citizens) and was a center of the textile industry. It had many neighboring cities located at a medium and large distance (between 50 and 250km away) that also experienced guild revolts, but not many in its direct vicinity that witnessed revolts. The significance and different signs of neighborhood spillovers shows how the guild revolts were determined by strategic considerations as well as chance and risk expectations.

In conclusion, a city's urban potential, i.e. its relative position to other cities and the degree to which it dominates the region surrounding it, as well as its agricultural productivity were important. This confirms the importance of the agrarian crisis and the Black Death for the occurrence of guild revolts.

Being a commercial and especially an industrial center also played a certain role

for the revolts that resulted in a complete success for the guilds. This points to the existence of a virtuous cycle of economic and political opportunities (e.g., Acemoglu and Robinson 2012) where political change endogenously emerges from preceding economic changes. Yet, one should be aware that the presented results could be biased by endogeneity problems and do not establish causality. In additiojn, it is not directly investigated whether guild participation fostered city development. This is an urgent task for follow up papers to this study. In consequence, I have to be careful in drawing any definite conclusions on this matter.

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Figures and Tables

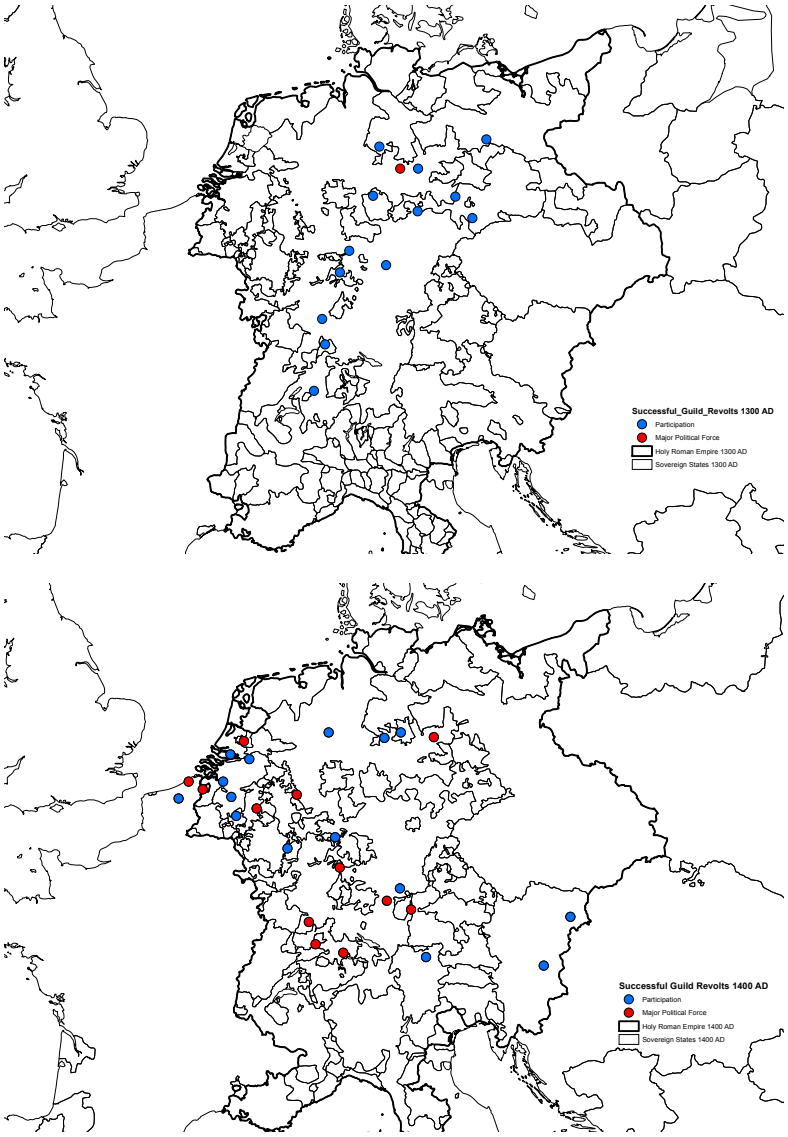

Figure 1: Spatial Distribution of the First Two Waves of Guild Revolts

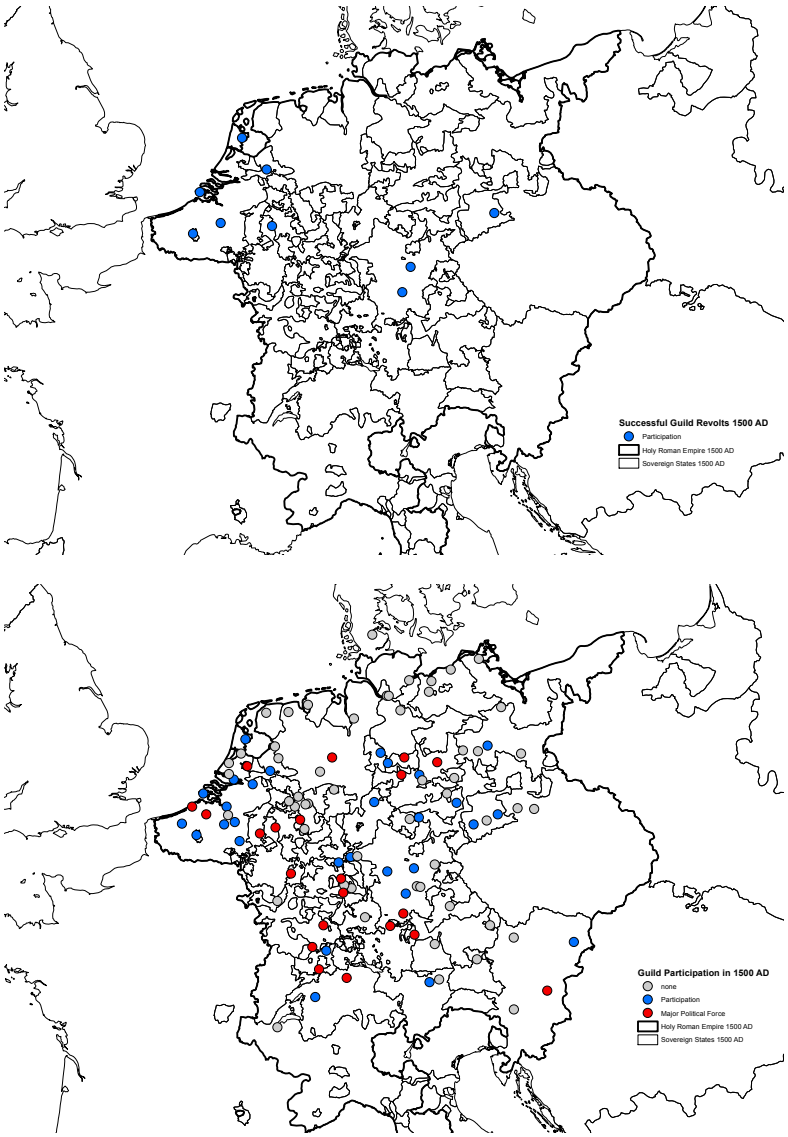

Figure 2: Spatial Distribution of the Guild Revolts and Their Third Wave

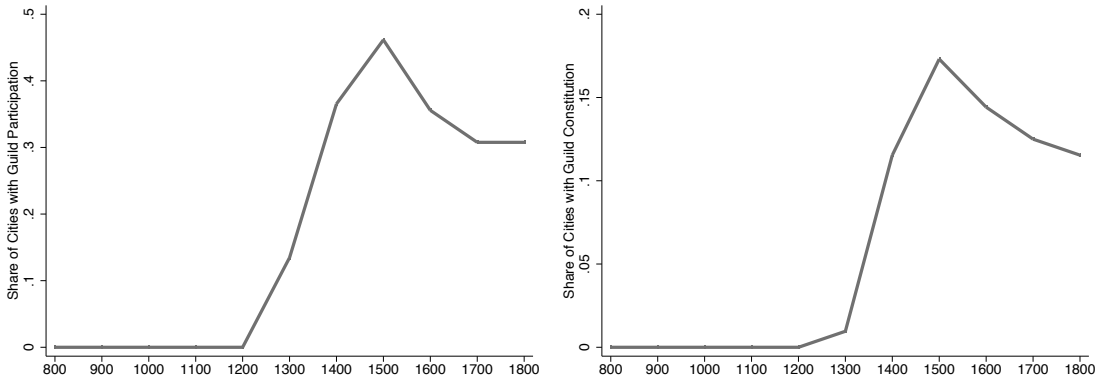

Figure 3: The Temporal Evolution of Guild Participation in City Government

Table 1: Causes of Guild and Burgher Revolts Identified by the Historical Literature

Study	Identified Causes/ Predictors
Blickle (1988)	• Having a certain degree of political autonomy (i.e., being a Imperial city or a large city under the rule of a territorial lord) • Difference in economic strength of guilds and craftsmen and political rights • Misgovernment, corruption and bankruptcy of the elite ruled state often leading to tax increases • Later medieval agrarian crisis
Czok (1966)	• Change in the urban economic and social structure; relatively more poor and bourgeois people. • Advancing division of labour and differentiation in economic and technical respect
Isenmann (1988)	• Occurrence of guild revolts exclusively in larger and medium sized commercial and economic centers • Rise and Richness of the Guilds • Special role of bishops: sometimes they supported the guilds to regain control of the city, sometimes they fought against revolting guilds and burghers (but they often did not have the same military resources as territorial rulers). Pragmatic attitude towards the revolts by kings and emperors.
Kluge (2009)	• Guild or burgher revolts as internal power struggle • Occurred in all types of cities and in cities of all sizes (Imperial cities, cities ruled by a territorial lord, trade and industry cities as well as mining cities). Primarily occurred in imperial cities and in larger cities • The revolts remained locally restricted. Sometimes, uprisings in a city inspired revolts in the neighboring area
Luther (1966)	• Change in the social structure of urban society. Craftsmen and non-patrician merchants gained economic power and became rich due to the rise of long-distance trade. • Flanders: Craftsmen not that powerful but in a precarious situation and gained quantitative importance • Economic importance vs. political rights. Guilds must pay taxes and make war but did not have any political rights; "Disequilibrium of Social and Political Order" • Decline/ Freezing of the ruling elite/ patriciate. Rivalry between the member families of the patriciate. Degeneration of economic activities and power; members of elite lived as gentlemen of leisure from their land and capital rents. The educational gap between the elite and the crafts decreased • Black Death and the structural agrarian crises caused by it. Resulting rural-urban migration movements created conflicts between the ruling elite and the crafts. • Persecution of Jews • Double-election of the German King in 1314 AD
Maschke (1959)	• Constitutional norm vs. constitutional reality • Lower probability of revolts in northern Germany because there were fewer cities with actual industries and crafts but primarily pure trade cities. • Financial policy of the patrician ruled council
Planitz (1966)	• Enclosed, degenerated patriciate • Famines and the Black Death epidemics, high unemployment in the cities and thus impoverishment of the masses
Pirenne (1963)	• Oppression of craftsmen and other burghers by a degenerated and ruling elite. Turn from Plutocracy to Oligarchy.
Van Zanden and Prak (2006)	• Economic rise of the guilds due to the rise of trade
Wissell (1971)	• Rise of the crafts • Tax increases and financial problems of the cities

Table 2: Explaining Successful Guild Revolts

Dep. Var.	Guild Participation (Successful Revolt)				
	(1)	(2)	(3)	(4)	(5)
Institutionalized Burgher Representation	**-0.206* (0.106)**			**-0.183** (0.081)**	**-0.283*** (0.100)**
Participative Election	-0.070 (0.114)			-0.135 (0.104)	-0.122 (0.120)
Large State	**0.576*** (0.122)**			**0.475*** (0.116)**	**0.401*** (0.110)**
Urban Potential		**-0.035*** (0.010)**		**-0.033*** (0.010)**	**-0.030*** (0.008)**
Hanseatic League		-0.173 (0.164)		-0.164 (0.128)	**-0.371*** (0.122)**
Agricultural Productivity		0.119 (0.222)		0.138 (0.206)	0.244 (0.200)
Trade City		-0.040 (0.116)		-0.025 (0.110)	0.007 (0.104)
Imperial City			0.050 (0.171)	**0.276** (0.111)**	**0.455*** (0.115)**
Bishop			**0.204* (0.117)**	**0.229** (0.090)**	0.072 (0.097)
Archbishop			**0.338* (0.200)**	**0.417*** (0.142)**	**0.366** (0.148)**
Residence City			0.005 (0.131)	0.050 (0.127)	0.164 (0.121)
ln(Population)					-0.038 (0.065)
Imperial Circle Dummies	Yes	Yes	Yes	Yes	Yes
Electorate Dummy	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.258	0.173	0.103	0.435	0.452
Obs.	104	104	104	104	77

Notes. Robust standard errors are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. Each regression includes a constant not reported.

Table 3: Explaining Guild Revolts

Dep. Var.	Guild Revolt				
	(1)	(2)	(3)	(4)	(5)
Institutionalized Burgher Representation	-0.079 (0.115)			**-0.169*** (0.099)	-0.123 (0.111)
Participative Election	-0.191 (0.117)			**-0.283*** (0.107)**	**-0.248** (0.126)**
Large State	**0.401*** (0.121)**			**0.403*** (0.115)**	**0.248* (0.132)**
Urban Potential		**-0.030*** (0.008)**		**-0.025*** (0.008)**	**-0.023*** (0.008)**
Hanseatic League		-0.049 (0.170)		-0.002 (0.145)	-0.125 (0.166)
Agricultural Productivity		-0.054 (0.235)		0.055 (0.217)	0.105 (0.243)
Trade City		0.148 (0.127)		0.071 (0.122)	0.006 (0.125)
Imperial City			**0.457** (0.189)**	**0.534*** (0.131)**	**0.443*** (0.155)**
Bishop			0.190 (0.120)	**0.245** (0.102)**	0.141 (0.138)
Archbishop			0.349 (0.236)	**0.460*** (0.166)**	**0.373** (0.186)**
Residence City			-0.098 (0.118)	-0.075 (0.109)	-0.128 (0.119)
ln(Population)					0.056 (0.063)
Imperial Circle Dummies	Yes	Yes	Yes	Yes	Yes
Electorate Dummy	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.16	0.123	0.155	0.4	0.387
Obs.	104	104	104	104	77

Notes. Robust standard errors are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. Each regression includes a constant not reported.

Table 4: Explaining Guild Constitutions

Dep. Var.	Guild Constitution				
	(1)	(2)	(3)	(4)	(5)
Institutionalized Burgher	**-0.246****			**-0.256*****	**-0.253*****
Representation	**(0.104)**			**(0.090)**	**(0.092)**
Participative Election	-0.112			-0.113	
	(0.116)			(0.097)	
Large State	**0.170****			**0.171****	0.065
	(0.078)			**(0.076)**	(0.108)
Urban Potential		-0.001		-0.003	-0.006
		(0.007)		(0.007)	(0.009)
Hanseatic League		0.001		-0.026	-0.084
		(0.135)		(0.123)	(0.141)
Agricultural Productivity		0.191		0.180	**0.339***
		(0.188)		(0.166)	**(0.183)**
Trade City		-0.026		-0.036	**-0.212***
		(0.101)		(0.099)	**(0.114)**
Imperial City			0.163	**0.249****	**0.272****
			(0.103)	**(0.102)**	**(0.131)**
Bishop			**0.149***	0.115	0.030
			(0.085)	(0.086)	(0.126)
Archbishop			0.222	0.206	0.133
			(0.150)	(0.174)	(0.178)
Residence			0.029	-0.018	-0.109
			(0.103)	(0.107)	(0.122)
ln(Population)					0.069
					(0.066)
Imperial Circle Dummies	Yes	Yes	Yes	Yes	Yes
Electorate Dummy	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.216	0.127	0.19	0.337	0.331
Obs.	104	104	104	104	77

Notes. Robust standard errors are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. Each regression includes a constant not reported.

Table 5: The Guild Revolts and Neighborhood Effects

Dep. Var.	Successful Guild Revolt		Guild Constitution	
	(1)	(2)	(3)	(4)
% of Neighbor Cities with	Guild Participation	Successful Revolt	Guild Participation	Successful Revolt
0–50km	-0.085	**-0.287*** **	0.018	0.083
	(0.106)	**(0.095)**	(0.082)	(0.131)
50–150km	**-0.409***	**0.974*** **	-0.047	**0.385*** **
	(0.230)	**(0.164)**	(0.166)	**(0.150)**
150–250km	**0.699** **	**3.292*** **	0.262	**0.742*** **
	(0.335)	**(0.723)**	(0.238)	**(0.256)**
All Neighborhood Effects=0 (p-value)	0.105	**0**	0.638	**0**
Pseudo-R^2	0.319	0.778	0.38	0.515
Obs.	104	104	104	104

Notes. Robust standard errors are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. In all columns average marginal effects (AME) are reported. The unit of observation is a city. In addition to the variables reported each regression includes imperial circle and electorate fixed effects and the same variables as in Tables 1,2 and 3 column (4). Each regression includes a constant not reported.

Table 6: The Impact of Proto-Industry on the Guild Revolts

Dep. Var.	Guild Participation	Guild Revolt	Guild Constitution	Guild Participation	Guild Revolt	Guild Constitution
	(1)	(2)	(3)	(4)	(5)	(6)
Institutionalized	**-0.157****	**-0.163***	**-0.218****	**-0.158****	**-0.159***	**-0.207****
Burgher Representation	**(0.077)**	**(0.090)**	**(0.092)**	**(0.077)**	**(0.092)**	**(0.090)**
Participative Election	-0.053	**-0.200***	-0.082	-0.083	**-0.228****	-0.083
	(0.096)	**(0.107)**	(0.105)	(0.099)	**(0.109)**	(0.099)
Large State	**0.452*****	**0.369*****	**0.153****	**0.456*****	**0.375*****	**0.149****
	(0.111)	**(0.112)**	**(0.066)**	**(0.110)**	**(0.111)**	**(0.064)**
Urban Potential	**-0.033*****	**-0.026*****	-0.005	**-0.031*****	**-0.025*****	-0.003
	(0.011)	**(0.009)**	(0.008)	**(0.010)**	**(0.009)**	(0.007)
Agricultural Productivity	0.194	-0.039	0.050	0.219	-0.005	0.076
	(0.199)	(0.196)	(0.145)	(0.194)	(0.192)	(0.136)
Trade City	-0.076	0.111	-0.015	-0.086	0.096	-0.012
	(0.088)	(0.094)	(0.086)	(0.085)	(0.092)	(0.084)
Imperial	**0.200***	**0.486*****	**0.194***	0.197	**0.478*****	**0.169***
	(0.121)	**(0.138)**	**(0.100)**	(0.128)	**(0.140)**	**(0.101)**
Bishop	**0.159****	**0.197****	0.124	**0.171****	**0.208****	0.124
	(0.079)	**(0.095)**	(0.084)	**(0.080)**	**(0.098)**	(0.083)
Archbishop	**0.410*****	**0.367****	0.170	**0.420*****	**0.396****	0.178
	(0.147)	**(0.155)**	(0.161)	**(0.151)**	**(0.156)**	(0.157)
Textile Industry	0.247	**0.295***	**0.211****			
	(0.156)	**(0.167)**	**(0.093)**			
Proto-Industry				0.123	0.168	**0.149*****
				(0.083)	(0.105)	**(0.050)**
Imperial Circle Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Electorate Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.443	0.424	0.369	0.435	0.416	0.378
Obs.	104	104	104	104	104	104

Notes. Robust standard errors are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. Each regression includes a constant not reported.

A. Data Appendix

A.1. Guild Revolt and Participative Political Institutions Variables

The following variables originate from the "Participative Political Institutions in Medieval Europe Database" introduced and discussed in Wahl (2014). The exact construction and coding procedure as well as all the sources used for the coding of the variables are available therein.

Participative Election. A dummy variable indicating whether the citizens of a town could elect all or some parts of the city government (i.e., councils, magistrates, judges etc.) either directly or indirectly (through a community assembly or through an electoral college. In Germany, Austria and Switzerland the citizens most often participated in the election of the city council (or one of them, usually the so called "Großer Rat" [great council]). In Belgium and the Netherlands, conversely, the burghers would usually elect the magistrate of the city via a sworn council (in the German lands the magistrate was most often elected by the council or appointed by the ruler of the city). Following cities are coded as having such participative election procedures (the period in which it existed is in parentheses):

Burgher Representation. Dummy variable equal to one if there existed some form of institutionalized burgher representation in a city. "Institutionalized" means that it is not enough, that —as seems to be the case in many cities— the citizens are sometimes (i.e., not on a regular basis) given the possibility to voice their opinion in a meeting of the council or that representatives of the citizens could give advice or meet with the government of the town in specific situations (crisis, new constitution etc.). Instead there should be a community assembly, or e.g., a "Großer Rat" ("Great Council") or "Äußerer Rat" ("Outer Council") that meets regularly and that has at least constitutionally guaranteed the citizens a voice in some matters of city politics.

Guild Participation Index. A categorical variable equal to zero if (craft) guilds were not

allowed to participate in the city council (the "Kleine Rat" ("Small Council"/ "Inner Council") which was normally the most important and powerful political institution of the city. The variable is equal to one if the guilds participate in the council, i.e., have a constitutionally guaranteed number of council members, but do not have the right to send more than half of the members. The variable is equal to two in cities with a so-called "Zunftverfassung" ("guild constitution"), that is where the majority or even all members of the city council were representatives (masters, members) of a guild. The guild participation dummy used in the main text is created by recoding as one the cities for which the guild participation index is two. The guild constitution dummy additionally used in the empirical analysis in the present paper is equal to one only if the guild participation index is equal to two.

Share of Cities with Guild Participation (within a certain radius around a city). This set of variables reports the share of cities with guild participation (i.e., for which the guild participation variable is greater than 0) within a radius of 0–50, 50–150 and 150–250km around the respective city. The variable is calculated using the Stata command nearstat. It should capture the possible existence of neighborhood or spillover effects of the guild revolutions for the nearby cities.

A.2 Explanatory Variables

A.2.1 Variables from the Bosker et al. (2013) Data Set

The majority of the control variables I employed here originate from the uniquely rich city-level panel data set constructed by Bosker et al. (2013) (and for example also used in Dincecco and Gaetano Onorato 2013). Therefore the reader is referred to the Data Appendix of the study of Bosker et al. (2013), which provides a detailed and extensive description and discussion of each variable. The data appendix is available

here: http://www.mitpressjournals.org/doi/suppl/10.1162/REST_a_00284/suppl_file/REST_a_00284_data_appendix.pdf (accessed on February 9th, 2014). Thus, in what follows only ashort definition of each variable from this data set will be provided.

Agricultural Productivity. Dummy variable reporting the soil quality of the fields surrounding a city. It combines information about climate (e.g., temperature, precipitation...) and soil quality (carbon density, water holding capacity etc.) in an index indicating the probability that a certain location will be cultivated.

Archbishop. Dummy variable equal to one if a city was the official residence of an archbishop.

Bishop. Dummy variable equal to one if a city was official residence of a bishop (but not an archbishop).

Large State. Dummy variable indicating whether or not a city falls under the rule of a large state (i.e., political entities with a large surface area such as the Austrian Monarchy, The Kingdom of France, Prussia or Burgundy).

ln(Population). Reports the natural logarithm of a city's population in thousands of people in a particular year. City population figures are taken from Bosker et al. (2013). They are based on updated population figures from Bairoch et al. (1984) and other sources (see the Data Appendix of Bosker et al. (2013) available at http://www.mitpressjournals.org/doi/suppl/10.1162/REST_a_00284/suppl_file/REST_a_00284_data_appendix.pdf; accessed on February 9th, 2014) However, because Bosker et al. (2013) only report city population values above 5000 inhabitants I supplement smaller values by resorting to Bairoch et al. (1988) and De Vries (1984), both commonly used sources for historical city populations (used — among others— in Cantoni 2013, Acemoglu et al. 2002, Acemoglu et al. 2005, Dittmar 2011 and Nunn and Qian 2011). In some estimations I also use the interpolated figures for missing values between 1500 and 1800 from the University

of Utrecht's Centre of Global Economic History (CGEH) City Population Database (available from http://www.cgeh.nl/sites/default/files/def%20europe.xls; accessed on February 9th, 2014). Details about the interpolation procedure are provided here: http://www.cgeh.nl/sites/default/files/Data%20appendix%20of%20the%20Clio-infra%20database.doc; accessed on February 9th, 2014). *Urban Potential*. Following De Vries' (1984) concept of "Urban Potential", the variable represents a city's (Christian) urban potential as the distance weighted sum of the size of all other Christian cities with a least 10000 inhabitants in the sample of Bosker et al. (2013) and taking into account whether or not one or both of two considered cities is located at a place favorable for long-distance trade (i.e, is located at sea or at a river). (For details of the construction the reader is referred to section 3.2.3 of the paper of Bosker et al. (2013) and to Table A.5 in the supplementary appendix available here: http://www.mitpressjournals.org/doi/suppl/10.1162/REST_a_00284/suppl_file/REST_a_00284_esupp.pdf; accessed on Feburary 9th, 2014).

A.2.2 Other Explanatory Variables

Hanseatic League. Binary variable equal to one if a city was a member of the Hanseatic League. Coded according to Dollinger (1966). In most cases, information about when a city became a member of the Hanseatic League (as well as when the city left the League) is also provided in Dollinger (1966). If there was no information in Dollinger (1966), reliable information about the city's history was sought (e.g., form the official webpage of the city or the monographs about the history of the city reported in Table A.1).

Imperial City. A Dummy Variable equal to one if a city was an imperial city in the Holy Roman Empire. The variable is coded following Oestreich and Holzer (1970a). They provide an annotated list of cities mentioned as imperial cities ("Reichsstädte") in

the Reichsmatrikel of 1521 (sometimes called the "Wormser Matrikel"). This variable takes into account the available information about when a city took on the status of an imperial city (the so-called "Reichsunmittelbarkeit"). Such information suffers from a marked amount of uncertainty. However, the German version of Wikipedia provides a list of imperial cities including information about the approximate date they bacome imperial cities. This information is often based on corresponding decrees of kings or emperors of the Holy Roman Empire available in the Regesta Imperii, an archive of all documentary and historiographic documents of the Roman-German kings until Maximilian I (`http://www.regesta-imperii.de/startseite.html`). This archive is maintained by the "Akademie der Wissenschaften und der Literatur Mainz" and is a reliable source of historical information.

Still, not all the dates in the list are validated by these sources. In these cases, I rely on available information from city history or other sources to assign a date. Despite these efforts, sometimes sources mention different dates or rely on other criteria. In such cases, I may proceed by assuming the date seems most plausible from what I infer from the city's history. Where it was impossible to find satisfactory information, the city is coded as an imperial city from 1500 AD onward.

Residence City. Dummy Variable equal to one if a city was the official residence (capital) of a secular or ecclesiastical ruler (an earl, a prince, a duke, an archbishop etc.). The variable is coded according to the information provided in the "Deutsche Städtebuch" and the various other sources listed in Table A.1. For robustness, a list of important residence cities in today's Germany is also consulted, available at the German wikipedia (`http://de.wikipedia.org/wiki/Residenzstadt` (accessed February, 24th 2013).

Proto-Industry. The variable is equal to one if a city can considered to be an important center of textile production *or* of metallurgy and equal to two if both industries were present. Otherwise it is equal to zero. The information on textile centers originates from Carus-Wilson (1952), Escher and Hirschmann (2005) and Gutmann (1988). Information

on centers of the metal industry are from Escher and Hirschmann (2005), Gutmann (1988), Nef (1952) and Sprandel (1968).

Trade City. Dummy variable equal to one if a city is considered to be an important (i.e., international or over-regional) trade center in the pre-modern period. The variable is coded according to various different sources (e.g., historical trade route maps, and monographs about medieval trade activities). The exact construction and the sources used are extensively discussed in Wahl (2013) and the accompanying Data Appendix.

Textile Industry. Dummy variable equal to one if a city is considered to be an important (i.e., international or over-regional) center of textile production. The variable is coded based on the qualitative information available in Carus-Wilson (1952), Escher and Hirschmann (2005) and Gutmann (1988).

Table A.1: Descriptive Overview of the Pre-Treatment Values Data Set (Tables 2–4)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Agricultural Productivity	104	0.611	0.211	0.02	0.978
Archbishop	104	0.058	0.234	0	1
Bishop	104	0.202	0.403	0	1
Guild Constitution	104	0.212	0.410	0	1
Guild Participation	104	0.490	0.502	0	1
Guild Revolt	104	0.596	0.493	0	1
Hanseatic League	104	0.173	0.380	0	1
Imperial City	104	0.135	0.343	0	1
Institutionalized Burgher Representation	104	0.212	0.410	0	1
Large State	104	0.202	0.403	0	1
ln(Population)	77	2.252	0.807	0.693	4.007
Participative Election	104	0.163	0.372	0	1
Proto-Industry	104	0.221	0.502	0	2
Residence City	104	0.144	0.353	0	1
Trade City	104	0.260	0.441	0	1
Textile Industry	104	0.154	0.363	0	1
Urban Potential	104	13.056	5.637	4.915	36.857

Table A.2: Descriptive Overview of the Contemporary Values Data Set (Table 5)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Agricultural Productivity	104	0.611	0.211	0.02	0.978
Archbishop	104	0.058	0.234	0	1
Bishop	104	0.202	0.403	0	1
Guild Constitution	104	0.212	0.410	0	1
Guild Participation	104	0.490	0.502	0	1
Guild Revolt	104	0.596	0.493	0	1
Hanseatic League	104	0.192	0.396	0	1
Imperial City	104	0.173	0.380	0	1
Institutionalized Burgher Representation	104	0.288	0.455	0	1
Large State	104	0.077	0.268	0	1
ln(Population)	87	2.280	0.742	0.693	4.043
Participative Election	104	0.231	0.423	0	1
Residence City	104	0.173	0.380	0	1
Share of Neighbor Cities with Guild Participation (0–50km)	104	0.284	0.382	0	1
Share of Neighbor Cities with Guild Participation (50–150km)	104	0.443	0.249	0	1
Share of Neighbor Cities with Guild Participation (150–250km)	104	0.267	0.197	0	0.923
Share of Neighbor Cities with Successful Revolt (0–50km)	104	0.121	0.257	0	1
Share of Neighbor Cities with Successful Revolt (50–150km)	104	0.193	0.192	0	1
Share of Neighbor Cities with Successful Revolt (150–250km)	104	0.137	0.122	0	0.5
Trade City	104	0.308	0.464	0	1
Urban Potential	104	13.245	5.126	6.317	36.857

B. Additional Results

The linear probability models in Table B.1. complement the visualization of the evolution of guild revolts in Figure 1. They confirm that the first wave of revolts in the 13th century were concentrated in the upper Rhenish circle while the subsequent wave in the 14th century primarily took place in the south west of the sampling area (in low latitudes and longitudes) especially in the Swabian circle (probability of a successful guild revolt is around 50 % higher than for the Bavarian circle constituting the base group). But the second wave seems to have had another north-eastern regional core in the Saxon Circle (later separated into the lower and upper Saxon circles). Finally, the last wave of revolts in the 15th century was geographically concentrated in the Low Countries (i.e., the Burgundian Circle) and in the Francian Circle (nowadays in Hesse and the north of Bavaria) although the significant negative coefficient of Longitude in column (5) indicates that the main center of revolts was in the Low Countries.

Table B.1: Geographic Evolution of the Guild Revolts

Dependent Variable	Successful Revolt in 13th century		Successful Revolt in 14th century		Successful Revolt in 15th century	
	(1)	(2)	(3)	(4)	(5)	(6)
Latitude	-0.012	-0.011	**-0.059*** **	**-0.093** **	-0.004	-0.024
	(0.017)	(0.030)	**(0.022)**	**(0.036)**	(0.009)	(0.020)
Longitude	0.011	-0.008	**-0.034** **	-0.024	**-0.018***	0.008
	(0.008)	(0.025)	**(0.013)**	(0.029)	**(0.010)**	(0.013)
Electorate		0.138		0.200		0.104
		(0.136)		(0.154)		(0.086)
Upper Rhenish Circle		**0.393***		0.057		0.160
		(0.227)		(0.224)		(0.138)
Saxon Circle		0.150		**0.377***		0.094
		(0.184)		**(0.220)**		(0.086)
Swabian Circle		-0.100		**0.521***		-0.003
		(0.096)		**(0.265)**		(0.018)
Franconian Circle		0.083		-0.119		**0.349***
		(0.178)		(0.119)		**(0.205)**
Westphalic Circle		-0.095		0.149		0.183
		(0.175)		(0.252)		(0.138)
Austrian Circle		0.055		0.167		-0.052
		(0.222)		(0.250)		(0.051)
Burgundic Circle		-0.112		0.335		**0.341** **
		(0.231)		(0.300)		**(0.158)**
No. of Revolts	14		27		10	
Obs.	104	104	104	104	104	104
R^2	0.017	0.163	0.115	0.212	0.037	0.129

Notes. Heteroskedasdicity robust are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. The base group for the Imperial Circle dummies is the Bavarian circle. Each regression includes a constant not reported.

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