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Abstract

This study investigates the effect of participative political institutions (PPIs) that emerged in many central European cities from the late 13th century. The empirical analysis of the paper is based on newly compiled long-run data for the existence of different types of PPIs in 104 cities in the Holy Roman Empire. The effect of both an overall index of participativeness of political institutions as well as of the individual PPIs is tested empirically. When pooled over all periods and observations, there seems to be a significant positive overall effect of PPIs in the German-speaking area but not in the Low Countries. The study founds considerable spatial and temporal heterogeneity in the effect of PPIs. Furthermore, the effect of different types of PPIs differs substantially and in general seems to be short-lived. That is, the results show that the positive initial effect of some PPIs declined the longer they existed and over time.

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

Keywords: Medieval Period, Early-Modern Period, Central Europe, City Development, Political Institutions, Early Democracy, Guilds

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1 Introduction

Does the "Great Divergence" between the West and the rest of the world have medieval roots? Numerous studies suggest that the institutional, educational and technical innovations connected with the commercial revolution in the late medieval laid the ground for the later European Industrial Revolution. Among the innovations studied are the foundation of universities (Cantoni and Yuchtman 2014), the invention of the printing press (Dittmar 2011), the impact of effective institutions to secure property rights and contracts (Greif 2006, Van Zanden 2008), and the persistent impact of late medieval trade and commercial activities on city development and regional growth processes (Wahl 2013).

However, the late middle ages also saw another institutional innovation, namely the emergence of participative political institutions in cities that have not been systematically analyzed until now. The development of these institutions marked the first turn towards more inclusive institutions since the ancient world.[1] The rise of city states in the political vacuum of power created by the "Great Interregnum", the significant political fragmentation of the Holy Roman Empire (HRE), the agricultural crisis of the 14th century, the Black Death, increased inequality, a degenerated, quarreling patriciate and the renewed economic prosperity during the "commercial revolution" all promoted revolts of craftsmen and other group of burghers (e.g., Blickle 1988 or Luther 1968). When such revolts were successful, craftsmen and other groups of burghers gained political rights and sometimes even completely took over the government of cities. As a result

[1] The term "participative political institutions" refers to "political institutions that are open to one or more group of citizens. Alternatively, participative political institutions can constitute rules or constitutional procedures (like e.g. electoral procedures) ensuring that one or more group of citizens have an influence on the composition and/or political decisions of the government" (Wahl 2014, pp. forms, their there characteristics and history. However, participative political institutions in late medieval cities are not to be confused with "democratic" institutions, at least not in the way we conceive of democracies today. Even if in the cities with the highest degree of participativeness of political institutions (e.g, in cities where all citizens had to be members of a guild) only a minority of the inhabitants of a city actually had a political rights or were represented by the guilds (women, foreigners and the poor—i.e. those denied citizenship—were not allowed to join guilds).

of those revolts—but also due to other factors, e.g. political fragmentation—other types of participative political institutions emerged, such as burgher assemblies and participative election of the city government.

This study seeks to understand the consequences of this gradual shift of political institutions towards the participation of larger groups of citizens for the development of cities in subsequent centuries.

Existing studies in this area are most often concerned with investigating the performance of oligarchic city-states in comparison to princely ruled cities or territorial states (e.g., Stasavage 2011) or the impact of different types of national level political regimes (e.g., De Long and Shleifer 1993). The first study primarily focusing on cities and their institutions is Bosker et al. (2013), however this only considers the extensive margin of political institutions in cities, e.g. the existence of a city council and hence of an at least partly autonomous city government. Nevertheless, there was a remarkable degree of heterogeneity in the participativeness of political institutions in the cities of the HRE in the later medieval and early modern period. In exploiting this heterogeneity, the present study is the first to be primarily concerned with systematically investigating the different effects that the participativeness of a city's political institutions had on its development.

As I collected data on the existence of all the important types of participative political institutions I am able to analyze whether these diverse kinds of institutions had different effects on the development of cities. As the overall effect of the universe of participative political institutions is of interest in its own right I also develop a single variable representing the overall impact of those institutions. This variable is obtained by conducting a factor analysis with the individual measures of participative political institutions. Furthermore, I make use of the comprehensive city level panel data set of Bosker et al. (2013) to supplement my data on participative political institutions. As this data set covers the 1000 years between 800 AD and 1800 AD it allows many impor-

tant covariates of city development and participative political institutions to be taken into account, as well as but to assess their long-run, dynamic effects. It also offers new insights into the temporal evolution patterns of political regimes and institutions over a longer period of time and in a society at an early stage of development. For example, the study could underpin results from related empirical and theoretical research (e.g., Acemoglu 2008, Puga and Trefler 2014 or Stasavage 2013) showing that the effect of more participative political institutions might be short-lived due to processes of oligarchisation and political enclosure. What is more, I am able to split the sample along different geographic areas and time periods. This allows me to assess whether the impact of participative political institutions differs among time and space, e.g. is different in the medieval and the early modern period. Finally, the study can add to the ongoing debate about the impact of guilds on economic development.

I attempt to investigate these questions by means of panel data regressions using city fixed effects to account for time-invariant heterogeneity. Additionally, I will include a rich set of relevant covariates to account for time-variant heterogeneity and to prevent omitted variables bias (OVB). I also include lagged and future values of the participative political institution variables to ensure that the results are not driven by reverse causality. Another important finding is that there is a positive overall effect of participative political institutions in the German-speaking area but not in the Low Countries. When considering the individual participative political institutions only the extensive margin of these institutions and guild participation always have a significant positive impact. However, in the German-speaking area participative elections show a positive effect on city development. Furthermore, I found a no significant impact of guild participation and a declining positive impact of participative election procedures over time. In general, the impact of those institutions seems not to vary between the medieval and the early-modern period. The overall impact of participative political institutions is positively significant in 1200 AD but insignificant afterwards. This provides

evidence either for the notion of a process of institutional degeneration as analyzed by e.g. Puga and Trefler (2014) for Venice or for the smaller effect of such institutions in the increasingly centralized and authoritarian political environment of the Ancien Régime. Nevertheless, these results underline the significance of participative political institutions in the later medieval revival of trade and commerce that is considered to be decisive for the later economic success of the European countries. Additionally, I found that in the German-speaking area, participative political institutions remain significant until 1600 AD (with the exception of 1400 AD), what can probably be explained by the fact that these areas remained politically fragmented over a longer period than the Low Countries. Hence, the results also shed light on the effect of political fragmentation and fiscal decentralization (e.g., Dincecco 2009a,b or Stasavage 2010).

The paper is structured as follows: Section 2 reviews the relevant theoretical, empirical and historical literature and explicitly formulates the research questions this study seeks to answer. Section 3 proceeds by describing the data used and the setting of the empirical analysis. In Section 4, I conduct the empirical analysis and interpret the results. Finally, Section 5 concludes.

2 Participative Political Institutions and City Development

There is huge literature investigating the institutional advantages that early-modern city-states had compared to cities under the rule of a prince and the institutions of large territorial states. Guiso et al. (2013) for example found that medieval Italian city states today have a higher level of civic capital. Jacob (2010) documents the same for German Free and Imperial cities, although the evidence is weaker in this case. Furthermore, Stasavage (2007, 2011) argues for an advantage of city-states over territorial states concerning access to credit and financing of government. City-states were usually ruled by a merchant elite, who ensured solid financial policy out of its own interest. Moreover,

in comparison to both territorial states and other city-states, Stasavage finds an additional advantage for those city state with constitutional constraints on the elites. This view is challenged by Epstein (2000) who finds that city-states or oligarchic regimes are not generally any better for economic development and fiscal outcomes than absolutist states with unbounded government. He considers the rise of centralized states and the decrease of political fragmentation after the later medieval crisis in the 14th century as a major cause of the later "Rise of the West". Finally, Greif et al. (e.g., Greif et al. 1994 or Greif 2006) used a game theoretic framework of analysis combined with historical case studies to show the role that newly developed and sophisticated political and economic institutions played in fostering long-distance trade and impersonal exchange in general. The institutional innovations in later medieval cities thus have to be considered as important factors driving the commercial revolution and the renewal of long-distance trade activities during this period.

There is also a more general discussion about the impact of different regime types (e.g., oligarchy, absolutist rule or monarchy with some kind of constraints on the king, prince etc.) on the development of states and cities. Here, the case study of the Glorious Revolution and the resulting constitutional changes by North and Weingast (1989) can be considered as the starting point. They argue that these constitutional changes increased property rights and established political checks and balances as they limited the power of the king and thus the harmful effect of arbitrary and confiscatory government actions. In consequence, the English government could credibly commit to maintaining property rights and a less arbitrary fiscal policy.

In this context, De Long and Shleifer (1993) evidence that suggested regions under non-absolutist ("free") rule (i.e., city-states ruled by a merchant elite or territorial states with limited power of the prince and political voice given to the estates) experienced better economic and social development during the medieval and early-modern period. De Long and Shleifer trace this development advantage back to a better tax policy

of merchant ruled oligarchies (i.e., lower and less destructive taxes). In line with the findings of Stasavage, Dincecco (2009a,b) analyzed European territorial states between the 17th and early 20th centuries and showed that states with limited government had a higher credit-worthiness and were able to collect more taxes. However, he additionally highlights the positive impact of fiscal and political centralization on tax revenues and sovereign credit risk. Thus, his research confirms the view held by Epstein (2000) that the decisive factor for long-run economic development was not the type of regime or limited government but the decreasing political and fiscal centralization. Moreover, Allen (2003) and Bosker et al. (2013) both included the Free-Prince Dummy variable constructed by De Long and Shleifer (1993) and find it not to be a significant predictor of long-run city development. Instead, Bosker et al. (2013) highlight the positive effect of local participative government, i.e. of city councils and magistrates controlled by a ruling elite or other groups of burghers like guildmasters. Finally, Bosker et al. (2013) and Van Zanden et al. (2012) additionally emphasize the role played by active parliaments at national level for city development.

In sum, the evidence on the impact of different types of political institutions or regimes on the economic and social development of cities remains inconclusive.

This inconclusiveness is buttressed by the ongoing debate about the impact of guilds for economic prosperity. As city councils with participation of guild representatives besides the patriciate represent one of the important type of participative political institutions in pre-modern cities, the question about the impact of guilds and the nature of their actual policy (rent-seeking for their members vs. policy that helped to overcome market failures to the benefit of the guilds and the rest of the burghers) is important for the direction of the impact of participative political institutions on development. One view, primarily associated with Epstein (e.g., Epstein 1998, 2004) argues for a positive effect of guilds on economic development as, among others, they fostered the adoption of useful innovations and blocked that of harmful ones, ensured high quality of prod-

ucts, provided standardized and high-quality training of new craftsmen and increased social capital within the city. The other view is connected to several studies by Ogilvie (e.g. Ogilvie 2004, 2008, 2011) and is distinctively negative about the idea of positive impacts of guilds on all these aspects and economic development in general and hence rejects the idea that they were efficient institutions helping to resolve market failures. According to this line of thought, they were inefficient rent-seeking institutions, upheld by a small group of powerful members to enforce their political and economic interests. They erected market entry barriers and monopolies, restricted migration and blocked innovations. The debate is still ongoing and there is no consensus view of guilds. In consequence, the impact of guild representatives participating in the city council on the development of the city is a priori unclear.

One possibility to explain this inconclusive evidence can be found in the theoretical and empirical insights of, for example, Acemoglu (2008), Puga and Trefler (2014) and Stasavage (2013). These papers are concerned with the temporal evolution of the impact of oligarchic rule. They outline theoretically and confirm empirically that oligarchic rule initially had a positive effect on city development as, e.g., a merchant elite created growth-promoting economic and political institutions and in general made an economy-friendly policy. After some time, however, oligarchic city-states tended to become stagnant or even economically declining. This could be explained by some process of elite degeneration as the initially active long-distance merchants in the elite end up becoming pensioners or gentlemen of leisure. Alternatively, it could be that the prosperity generated by the virtuous circle of growth, enhancing political and economic institutions carried the germs of decline within itself from the beginning. The latter would fit with the case of Venice as analyzed by Puga and Trefler (2014) where newly enriched craftsmen posed a danger to the power of the old elites. To prevent a revolt and preserve their power, the elites first gave the most powerful craftsmen a political voice and afterwards restricted the level of participation of political institutions.

As a result, a larger but enclosed patriciate emerged. Participation in long-distance trade was monopolized by the most influential families and the access to the city council became hereditary. Thus, overall inequality and social stratification increased and production activities replaced long-distance trade as the most important economic activity. If this or similar processes following this logic were typical for the development of political institutions in cities, I would observe an initial positive impact of participative political institutions on city development that declines as time elapses and at some point in time becomes insignificant or even negative.

Such logic could also be valid if the participative political institutions maintain their level of inclusiveness de jure but not de facto, as it often seems to be the case when looking at historical descriptions of, for example, the development of guild regimes in cities where they gained the complete control over the government (e.g., in Basel).[2]

Alternatively, temporal heterogeneity of the participative political institution's effect could arise from a typical "Olson effect" (Olson 1982), i.e. the positive initial effect vanishes the longer the same institutions exist because they become increasingly vulnerable to rent-seeking and the special interest of powerful but small groups of citizens. As a consequence, the city stagnates as its institutions are no longer oriented on the welfare of all citizens. Monopolies, cartels and regulations in favor of specific lobby groups (i.e., powerful guilds or families) will lead to a degeneration of perhaps de jure still inclusive political institutions, resulting in the same, or even a worse policy as in cities with no government controlled by the guilds only.[3]

[2] Puga and Trefler (2014) implicitly assume that participative political institutions emerged endogenously as reactions to the problems that accompanied increasing long-distance trade. However, the causality between economic and political institutions is not clear as, e.g., Acemoglu et al. (2005) argue for the reverse causality.

[3] There were almost always stronger and more powerful guilds with richer members and more political influence than others. On the one hand this could have led to oligarchisation and thus, no difference to cities under elite control. On the other hand, as argued by e.g. Luther (1968), there were often conflicts between the guilds, i.e. between stronger and weaker guilds, between the guilds and the old elites or the prince that controls the area around the city. Thus, government by the guilds—-initially more inclusive than elite rule—soon led to a situation that was even more conflictive, unequal and harmful for growth than the previous elite rule.

Finally, it is also possible that the effect of participative political institutions differs between the medieval and the early modern period. The medieval period saw the rise of city states, political fragmentation and a period of renewed and increasing economic prosperity. In contrast, the early-modern period was characterized by the rise of centralized states, absolutism and a decrease in city autonomy. The prevalence of participative political institutions declined in the period of the Ancien Régime and the remaining participative institutions were probably less powerful as city autonomy was often limited by stronger territorial rulers. Furthermore, with the rise of overseas trade following the discovery of the New World, the old city states in Italy and southern Germany as well as trading alliances like the Hanseatic League lost their importance. The commercial center of gravity shifted to the north-west and the south of Europe. These structural changes in the political and economic framework probably worked against participative political institutions.

In all these cases, one would observe a decline in the temporal evolution pattern of the effect of participative political institutions.If not accounted for in the empirical analysis, this declining impact could hide the existing short-run positive effect of participative political institutions, as one might observe a positive effect in the medieval period and insignificant or negative effects in subsequent periods.

An inverse relationship between political fragmentation, state capacity and the effect of participative political institutions in cities could also give rise to widening differences in the effect of those institutions in different areas. In the Low Countries for example, the emergence of large territorial units with fully developed national level institutions and complex checks and balances between powerful cities and the national level government (as e.g. in the Dutch Republic) emerged earlier than in the German-speaking area that remained strongly politically fragmented for a longer period of time.

A final consideration concerns the heterogeneous effect different types of participative political institutions had on the development of cities. The effect of e.g. guild

participation in the city council is expected to be ambiguous—according to the above debate on the impact of guilds on economic development. This is not the case for other participative political institutions like, e.g., institutionalized burgher representation or a participative election mode of the city government. Additionally, Bosker et al. (2013) show that the mere existence of communal institutions and an at least partly autonomous city government had a positive impact on the development of cities. As there is no extensive literature on other forms of participative political institutions and their effects the naive exception from existing research is to expect a positive effect. This is because participative political institutions are associated with limited government, increased checks and balances, better fiscal and economic policy, a more credible commitment to property rights, less inequality and more civic capital. Because of the probable different effects of the various types of participative political institutions, the overall effect of the universe of existing political institutions of a city is a question in its own right and has to be considered separately.

To sum up, an empirical analysis of differences in the participativeness of political institutions between cities has to investigate the following questions in more detail:
(i) Was the average effect of participative political institutions on city development over all the considered countries and the whole observation period positive, negative, or insignificant?
(ii) Do different types of participative political institutions have different effects on city development and what is the overall effect of the universe of all existing participative political institutions?
(iii) Is there temporal heterogeneity (i.e., an increasingly smaller/ less positive effect) of the effect of participative political institutions on city development resulting from political enclosure of the elites as a reaction to the danger arising from groups of burghers that became rich and economically powerful due to the virtuous circle created by the interaction of participative political institutions and economic growth? Or, alternatively,

does temporal heterogeneity arise from the existence of an "Olson effect" resulting in an increasing prevalence of rent-seeking and particularization of interests?
(iv) Is there a heterogeneous temporal evolution of the effect of participative political institutions resulting from structural changes in the economic and political framework in the pre-modern period (i.e., political centralization and Atlantic trade)? Or does the effect of participative political institutions differ between regions because of the different timings of the political centralization process in different areas?

3 Data and Empirical Setting

3.1 Dependent Variable and Observation Period

As I am interested in the effects of participative political institutions on city development and economic prosperity, the most suitable—and the only systematically available—dependent variable is city population. Thanks to the work of Bairoch et al. (1988), De Vries (1984) and others, city population figures for European cities in more than 20 European countries are available from 800 AD onward and for all cities that have had more than 5,000 inhabitants at one point in their history. City Population serves as an accepted proxy for economic development in the pre-industrial economy (e.g., Bosker et al. 2013, Cantoni 2015, Dittmar 2011, O'Rourke and Fernihough 2014 or Nunn and Qian 2011). For the present paper I rely on the city population figures provided by Bosker et al. (2013). These city population data is an updated version of the Bairoch et al. (1988) data. It includes all cities in Bairoch et al. (1988) that reached a population threshold of 10,000 inhabitants.[4]

The Bosker et al. (2013) data set includes centennial population figures for every in-

[4] As they only include population figures larger than 5,000 inhabitants I supplement lower figures from Bairoch et al. (1988). On the one hand, this is done to increase the number of observations. On the other hand, there is no reason to exclude lower population figures from my analysis as I am also interested in the effect that participative political institutions had on the development of cities at an early stage of their development before they had passed the 5,000 inhabitants threshold.

cluded city starting with 800 and ending in 1800 (i.e., there is data for 800, 900, 1000, 1100,...,1800).[5] I chose to consider the whole observation period for the analysis, beginning with 800 AD. By also considering the centuries before the introduction of participative political institutions in the 13th century I diminish endogeneity concerns arising from omitted variables. The institutional and political setting relevant in the later medieval period was created with the Carolingian Empire and later the foundation of the HRE in the 10th century. Thus, the most institutional and political features existing before 800 AD are probably of less importance for later developments. And because the Bosker et al. (2013) data set also offers variables that account for the potentially still important Roman roots of medieval developments (i.e., a variable reporting whether a city is located a Roman road or, additionally a hub of a Roman road), omitted variables bias (OVB) arising from pre-determined historical characteristics is unlikely. Furthermore, ending the analysis at 1800 AD makes sense because after 1800 the modern era began—with its altered political and economic framework. Moreover, after the Napoleonic Wars and the congress of Vienna the independence of the remaining city-states ended, existing city constitutions were abolished, and e.g. the guilds lost the last remnants of their former political power.

3.2 Independent Variables and Sampling Area

The main explanatory variables representing measures of the different kinds of participative political institutions that I use are three different variables originating from the "Participative Political Institutions in Medieval Europe Database" (Wahl 2014).[6]

First, I use a binary variable indicating the existence of institutionalized burgher rep-

[5] The population figures for 1100 AD are interpolated by Bosker et al. (2013) as for this year no estimates from Bairoch et al. (1988) are available.

[6] Wahl (2014) gives an overview of the concept of participative political institutions, introduces and discusses each of the different types of these institutions and their measurement in detail. This study also provides a comprehensive descriptive overview of the spatial distribution and temporal evolution of the different participative political institutions.

resentation, i.e. equal to one if there existed some form of institutionalized burgher representation in a city.[7]

Second, a dummy variable reporting the existence of a participative election mode of the city government is considered. In other words, the variable indicates whether citizens of a town could elect all or parts of the city government either directly or indirectly (through a community assembly or through an electoral college.

Third, I employ a categorical variable called guild participation index equal to zero if guilds were not allowed to participate in the city council, which was normally the most important and powerful political institution of the city. The variable is equal to one if the guilds participate at 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 of a guild.

Finally, I include a variable coded by Bosker et al. (2013) and documenting the existence of communal institutions per se (i.e., the existence of a city council or the existence of a town hall) as explanatory variable. Thus, this variable is the most general and "rough" measure of participative political institutions (as it represents the extensive margin of participative political institutions but does not say anything about their exact characteristics). However, Bosker et al. (2013) found it to be one of the most important determinants of city development in Europe throughout the pre-modern period. Hence, its inclusion is justified as it could provide valuable insights.

These variables represent the universe of participative political institutions in the medieval city and should therefore offer a complete picture of their effects on city devel-

[7] "Institutionalized" means that it is not enough that the burghers sometimes (i.e. not on a regular basis) had the possibility to voice their opinions 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 rights to have a say in some matters of city politics.

opment.[8] I collected information for the coding of the first three variables from the available historical sources. The relevant information is primarily provided by the "Deutsche Städtebuch" (Handbook of German Cities) edited by Keyeser and Stoob (1939–1974), which is an eleven-volume encyclopedia providing systematic and detailed overviews of various aspects of the history of all cities in Germany (within the German borders of 1937). However, especially for the Low Countries I draw on other sources of information (e.g., Dumolyn and Hamers 2005, Prak 2006a,b or Van Zanden and Prak 2006). To account for the uncertain nature of the (often limited) information I additionally consulted primary sources (e.g., official documents, charters, etc., as collected by, for example, Gengler 1867) and monographs about the history of individual cities or their constitutions and political institutions (e.g., Borst 1986, Csendes and Opll 2001, Dopsch and Lipburger 1983 or Endres 1994). Overall, I consulted more than one hundred sources for the coding of the variables.[9]

I code these variables for cities in today's Germany, Austria and the German-speaking part of Switzerland (but including Geneva) as well as Alsace-Lorraine, Belgium and the Netherlands. The consulted sources provide information for 104 of the cities located in these countries and included in the Bosker et al. (2013) data set.[10] I chose to limit the analysis to this area for several reasons. First and foremost, this area was relatively homogeneous with respect to the institutional, political and economic framework as all of the considered countries and regions were part of the HRE in the period in question.[11] Furthermore, they are subject to more or less the same temporal shocks and were affected by the same developments (e.g., the revival of trade until the

[8] This point is further discussed in Wahl (2014) which also provides an overview of the relevant literature on which this judgment is based.

[9] All these sources, a detailed description of the construction procedure and an overview of the coding of each variable are provided in Wahl (2014).

[10] I was able to find information for all cities included in the Bosker et al. (2013) data set and located in Germany, Austria and Switzerland. However, I was not able to find information for every city in Belgium, Alsace-Lorraine and the Netherlands.

[11] However, I also included Flensburg—although it was not a part of the Holy Roman Empire in the 15th century.

High Middle Ages). In consequence, they are more comparable than if one were to additionally include other parts of Europe.[12] Second, I do not have access to sources that provide information about participative political institutions in other parts of Europe in the necessary degree of detail.

In addition to focusing on separate measures for the different kinds of participative political institutions it could be of interest to have a measure representing the overall effect of participative political institutions. To put it differently, it is necessary to have one measure that reflects the universe of participative political institutions in a respective city at a respective date. To create such a variable I conduct a factor analysis using the four individual measures of participative political institutions and predict their first principle factor. I call this factor the "Participative Institutions Index', and it reflects the common aspects of the four different types of participative political institutions and serves as a condensed, single measure of the overall participativeness of political institutions in a city.[13] Figure 1 shows a map visualizing the spatial pattern of participativeness of political institutions in the sampling area. To be precise, the maps shows which city belongs to which quantile of the Participative Institutions Index distribution. Thus, larger circles indicate that a city belongs to a larger quantile (i.e. larger circles indicate a higher participativeness of the city's institutions). The highest degree of participativeness is shown by the institutions in cities located in the western part and middle part of Germany, while in the Low Countries, the east, south-east and north of the sampling area (corresponding to Austria, Bavaria, large parts of Saxony and the territory of the Hanseatic League) participativeness is not so pronounced. The area with the most participative political institutions thus approximately corresponds to the area

[12] Other historians, like e.g. Luther (1966) also study participative political institutions in this area.

[13] I choose to retain only the first factor based on the Kaiser criterion, i.e. the first factor was the only one with an eigenvalue above one (1.111). The factor loadings were 0.5336 for the guild participation index, 0.427 for institutionalized burgher representation, 0.4168 for the participative elections dummy and 0.6861 for the communal institutions variable. All the loadings are above the commonly accepted critical value of 0.4. The overall Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.6323 indicating that the data is suitable for a factor analysis.

of the highest political fragmentation, the area were the most free and imperial cities are located and were many important trade and production centers are located.[14]

[Figure 1 about here]

Figure 2 depicts the temporal evolution of the prevalence of different kinds of participative political institutions (Figure 2a-d), institutions of communal self-government per se (Figure 2e) and the average of the Participative Institutions Index over time (Figure 2f). The spread of all these institutions began in the high medieval period and their diffusion continued until the end of the 15th century. From the 16th century onward their prevalence remains roughly constant. But particularly the share of cities with guild participation, guild constitutions and with participative elections declined significantly in the early modern period. These types of participative institutions were often abolished after the 16th century when local rulers or the emperors became strong again or the cities lost their commercial and strategic importance. Institutionalized Burgher Representation, on the contrary, prevailed at almost the same level of roughly 30 % after 1500 AD. And the share of cities with communal institutions even increased a little after 1500 AD.

[Figure 2 about here]

4 Empirical Analysis

4.1 Baseline Results

A straightforward strategy to empirically investigate the impact of participative political institutions on city development would be to regress the four measures of par-

[14] The latter especially applies to the cities in the northern part of Germany such as Brunswick or Magdeburg, which show comparatively participative political institutions despite the fact that they were members of the Hanseatic League (which were usually controlled by a merchant elite). Nevertheless, they had comparatively participative political institutions due to the significant crafts they had as they where also centers of proto-industry.

ticipative political institutions on the natural logarithm of city population and control variables using Ordinary Least Squares (OLS). However, OLS estimates are likely to be biased by unobserved heterogeneity and by the fact that the historical evidence and economic theory discussed in Section 2 suggest that the effect of participative political institutions differed between time periods and countries. A first attempt to address these issues is to include city and century fixed effects in the regression specification. Including city fixed effects enables to account for time-invariant city-specific heterogeneity. Therefore, I estimate the following equation by means of a fixed effect (FE) or within estimator:

$$\begin{aligned} ln(POP)_{ci,t} = \alpha + \beta' \mathbf{CITYINST}_{ci,t} + \gamma' \mathbf{NATIONINST}_{ci,t} + \theta' \mathbf{CITYCHAR}_{ci,t} \\ + \delta_i + \pi_t + \rho_{c,t} + \epsilon_{ci,t} \end{aligned} \tag{1}$$

Where $ln(POP)_{ci,t}$ is the natural logarithm of the population of city i, in country c, in year t ($t = 800, 900, ..., 1800$)). $\mathbf{CITYINST}_{ci,t}$ represents one or all of four measures of participative political institutions.$\mathbf{NATIONINST}_{ci,t}$ represents a set of control variables capturing the effect of national-level political institutions on political institutions in cities. This set incorporates the Free-Prince dummy of DeLong and Shleifer (1993), a dummy variable reporting the existence of an active parliament and dummy variable indicating whether a city is located in a large territorial state (according to the definition of Bosker et al. 2013). $\mathbf{CITYCHAR}_{ci,t}$ is a vector of control variables capturing specific city characteristics potentially important for both the existence of participative political institutions (Wahl 2013, 2014) and city development (e.g. Bosker et al. 2013, Bosker and Buringh 2012). Among them are dummy variables equal to one if a city served as capital, as residence of a bishop or archbishop, dummy variables indicating whether a city was an imperial city or an important trade center, a member of the Hanseatic League, had a university or adopted printing technology before 1500 AD. Additionally, it includes a variable reporting the number of times a city was plundered in the previous

century and the urban potential of a city (according to the definition of DeVries 1984).[15] δ_i and π_t are city and century fixed effects, respectively, $\rho_{c,t}$ are interacted country and century fixed effects and $\epsilon_{ci,t}$ is the error term capturing unobserved factors. These controls should capture factors relevant for both the existence of participative political institutions and city development and thus are meant to reduce omitted variables bias (OVB). They are selected according to insights from previous literature (Bosker and Buringh 2012, Bosker et al. 2013, Cantoni and Yuchtman 2014, Dittmar 2011, Wahl 2014). I also ran OLS and fixed effects (FE) regressions for more than 20 variables included in the Bosker et al. (2013) data set on the Participative Institutions Index and looked for significant determinants of it to select relevant control variables.[16]

The results of estimating equation (1) are shown in Table 1. First, each of the four participative political institutions measures is regressed separately on city population and the control variables. Only the communal institutions dummy shows a significant positive coefficient. In columns (5) and (6) I include all four political institutions variables jointly. In column (6) all control variables insignificant in column (5) are removed and also those becoming insignificant after this removal (i.e., only significant control variables are kept in column (6)). These are the capital, Hanseatic League and plundered as well as the residence city variables and the urban potential measure. I remove the non-robust covariates to reduce white noise and to keep the regression as parsimonious as possible. The communal institutions dummy remains highly significant and its coefficient is virtually unchanged. All other variables continue to show insignificant

[15] For the exact definition of this variable consult the Bosker et al. (2013) study and their Data Appendix available here: `http://www.mitpressjournals.org/doi/suppl/10.1162/REST_a_00284/suppl_file/REST_a_00284_esupp.pdf`; accessed on April 14th, 2014). It shows the population of a cities in the data set of Bosker et al. (2013) apart from the city under consideration inversely weighted by the distance from the considered city to the other cities. Additionally, it takes into account (by assigning lower weights) whether cities are located at sea or a navigable river.

[16] The following six variables turned out to be relevant time-variant predictors of participative political institutions: Presence of a bishop or archbishop, being a capital city, having a university, being located in a state with an active national level parliament, and urban potential of a city. Regressions not shown but available upon request.

and comparatively small coefficients. The only exception is are participative elections that seem to have a sizeable, yet only marignally significant positive effect in column (3). These results imply that the kind and degree of participativeness of political institutions had only limited relevance for the development of cities. The only relevant thing seems to be the mere existence of communal institutions (e.g. the existence of a city council but not who is represented there).

[Table 1 about here]

4.2 Testing for Spatial and Temporal Heterogeneity

Furthermore, I estimate equation (2) for eleven different relevant sub samples, e.g. I estimate it separately for the medieval period (800–1500 AD) and the early modern period (1600–1800 AD), with and without the Low Countries and for Germany only. The estimation results are depicted in Table 2.

[Table 2 about here]

As in Table 1, the communal institutions dummy is always significant (with the exception of the regression in column (5)). However, when the Low Countries are excluded from the regression, participative elections are additionally positively significant (column (4)) and when only the Low Countries are included institutionalized burgher representation and participative elections have a significant positive impact on city development although their impact is considerably lower than that of communal institutions. Participative elections also have a significantly positive effect without the Low Countries(i.e., in the German-speaking area) and in Germany during the medieval period (columns (6) and (8)). And in Germany in the early modern period, guild participation has a positive effect supplementary to that of communal institutions per se. Finally, institutionalized burgher representation enters with a significant and large negative coefficient in the Low Countries. However, as there are only two cities (Bruges

and Ypres) with institutionalized burgher representation, this negative effect probably does not reflect a general rule but is largely due to the particularities of these two cities.

In conclusion, the effect of participative political institutions on city development differs notably between different groups of countries and over time. Without the Low Countries, participative elections and communal institutions had a significant positive effect over the entire observation period and during the medieval era. In today's Germany, the area where most of the successful 14th century guild revolts took place guild participation also exerted a positive effect on city growth—although this effect is only present in the early modern period, implying that the effect of guild representation in the city council needed sometime to unfold. This finding is in contrast to what might have been expected from reading the historical literature. Historical studies usually emphasize that the power of the guilds dramatically declined in the early-modern period and that their rule was increasingly characterized by oligarchic tendencies and by harmful economic policy as they e.g. created severe market entry and immigration restrictions to protect the interests of their members (e.g. Ogilvie 2004,2007, Epstein 1998 or Haupt (ed.) 2002). This results thus lend support to the positive view of guild rule associated with Epstein.

Surprisingly, the estimates in Table 2 suggest that there is no difference in the effect of participative political institutions between the medieval and the early modern period. Despite the fact that theoretical and historical considerations indicate that the effect of these institutions should differ among those periods. However, it could be possible that the temporal evolution of their effect is non-linear or that there are only particular centuries for which their effect differs. To explore this possibility I estimate the temporal evolution of the effects using a more flexible empirical approach. That is, I interact each of the participative political institutions measures with dummy variables for each century. Due to this, equation (1) becomes:

$$ln(POP)_{ci,t} = \alpha + \sum_{\tau \in \Gamma} \beta'_{\tau} CITYINST_{ci,\tau} \cdot \pi_{\tau} + \gamma' \mathbf{X}_{ci,t} + \delta_i + \pi_t + \rho_{c,t} + \epsilon_{ci,t} \qquad (2)$$

With $\tau = 1200, 1300, 1400, ..., 1800$ and $\mathbf{X}_{ci,t}$ representing the set of robust time-varying controls as used in Table 2. Hence, I estimate equation (2) separately for the medieval and early-modern periods assuming non-linear time trends within the two periods. Furthermore, I estimate equation (2) using one of the participative institutions variables each time. The results are reported in Table 3. For guild participation a more or less insignificant, yet declining time pattern emerges with insignificant coefficients of the interaction terms in all cases apart from the interaction of the variable with the 1800 AD dummy. The declining temporal pattern might indicate that the guild representatives indeed became part of the oligarchy themselves. For institutionalized burgher representation, all interactions are insignificant, suggesting that there is no temporal heterogeneity in its influence.

[Table 3 about here]

Participative elections mattered for city development if they were present very early, i.e. in the 12th and 13th centuries (an F-test of joint significance of the interactions in the two periods rejects the null hypothesis of joint insignificance at 1% level). This is in line with historical evidence as the emergence of political institutions in cities in these earlier days was conducive to the development of the city. Simultaneously, in most cities there was no enclosed elite at this earlier stage of development and, in consequence, the election of city representatives was often done by the citizens. In the early modern period, their positive influence continuously declined and became insignificant in 1800. This is not surprising as the political and economic environment did change dramatically during the early modern period. Beginning with the 15th century, the coefficients became insignificant which is probably caused by cities in which participative elections had already existed for a long-time and where they had obviously lost the positive ef-

fect of the beginning (e.g., because they only existed de jure but not de facto anymore). Finally, communal institutions are significant in 1200 and 1300 AD confirming that in the early phase of central European city development the emergence of city councils and burgher assemblies constituted enormous institutional improvements positively influencing particularly trade and commercial activities (Wahl 2013). Contrary to the previous cases, they continue to have a significant and large impact in the early modern period (beginning with 1600 AD). However, in this period only five cities did not have communal institutions. Thus, the coefficient estimate is prone to be affected by observations with high leverage. Consequently, the significant positive effect is largely due to two cities (Mannheim and Potsdam) only developing communal institutions in the 18th century. Therefore, this result should not be taken as evidence of a general trend. In general, three of the four measures of participative political institutions show a significant effect in the later middle ages (i.e., the 12th until the 14th century) before their effects begin to vanish and eventually become insignificant.

Another theoretical hypothesis discussed in Section 2 and to be tested empirically is whether a positive effect of participative political institutions becomes increasingly negative as time elapses (the "Olson effect"). I test this by interacting the four participative institutions measures with dummy variables indicating whether a certain type of participative political institution had already existed for one, two, three, four, five or six centuries in a city in a certain century.[17] In consequence, equation (2) is transformed into:

$$ln(POP)_{ci,t} = \alpha + \sum_{\tau \in \Gamma} \beta'_{\tau} CITYINST_{ci,\tau} \cdot CENT_INST_{ci,\tau} + \gamma' \mathbf{X}_{ci,t} + \delta_i + \pi_t + \rho_{c,t} + \epsilon_{ci,t} \tag{3}$$

[17] There is no institution in my data set that existed for more than six centuries. If an institution was installed, abandoned and later re-installed, I begin to re-count from one beginning with the re-implementation of the institution.

With $CENT_INST_{ci,\tau}$ being dummy variables equal to one if a participative political institution was in place one, two, three, four, five or six centuries in city i in period τ with $\tau = 1, 2, ..., 6$. The other terms in equation (4) are similar to equation (2). I estimate equation (3) using separate dummy variables for cities with guild participation and for cities with guild constitution, i.e. I assume that with respect to the "Olson effect", the effect of some political voice of guilds is different from the effect of a city government dominated by the guilds. What is more, I do not consider the communal institutions dummy in this case as this argument probably does not apply to the mere existence of a communal government. The results of estimating equation (4) are reported in Table 4.

I see no significant interaction terms for guild participation. This implies that the policy of city councils with guild participation was not worse than that of councils without guild participation and that a possible process of "elite degeneration" or "oligarchisation" was not more harmful than in the reference group of cities. The same holds true for institutionalized burgher representation. This result is unsurprising given the fact that burgher assemblies and other forms of institutionalized burgher representation were actually composed of the highest number and the broadest cross-section of citizens, and additionally they were often less politically powerful than the guild council. I see an interesting pattern in the case of participative elections with significant interaction terms in the first and sixth centuries. The significant interaction in the two first centuries indicates that a positive effect of participative elections is there only for a limited period of time before it vanishes. However, the insignificant coefficients for the later periods indicate that the effect of those elections did not become increasingly negative when they persisted but remains insignificant. The significant interaction term in the sixth century of existence is due to only three cities having participative elections for such a long period of time (e.g. Deventer, Basel and Soest), therefore it is more a result of the particularities of those cities than of a structural relationship.

[Table 4 about here]

Finally, I observe the predicted pattern of an increasingly negative effect only in the case of guild constitutions that show increasingly negative interaction terms until the fourth century of existence. While the group of cities with guild constitutions is limited in general, only the last significant interaction term is solely due to one city (Goslar) that experienced a guild constitution for six centuries. Nevertheless, the results suggest that at least for cities ruled by guilds there is an increasingly negative effect of their rule the longer they ruled the city. As guild participation was most often connected with only limited actual political influence it is not unexpected that I find this pattern only in the case of guild constitution cities. This increasingly negative effect provides evidence for arguments that the guilds implemented an increasingly economically harmful policy in the cities they controlled the longer they ruled, i.e. they erected market entry barriers or favored a restrictive migration policy (e.g. Ogilvie 2004, 2007).

4.3 Results Using the Participative Institutions Index

In the preceding analysis I focused on the effect of different kinds of participative political institutions and found a considerable amount of heterogeneity in their effects on city development. Therefore, it is worthwhile to investigate the overall effect of the universe of participative political institutions on city development. Based on the results of previous estimates it is not clear what to expect regarding the overall effect because the different types of participative political institutions had varying effects in different periods and countries.

I investigate the overall effect of participative political institutions by using the Participative Institutions Index developed in Section 3 as a measure reflecting aspects common to all the different types of participative political institutions used until now. In a first step, I re-estimate equation (1) with the Participative Institutions Index as variable of interest, i.e. I estimate the following modified version of equation (1):

$$ln(POP)_{ci,t} = \alpha + \beta PARTINST_{ci,t} + \gamma' \mathbf{X}_{ci,t} + \delta_i + \pi_t + \rho_{c,t} + \epsilon_{ci,t} \quad (4)$$

Where $PARTINST_{ci,t}$ is the Participative Institutions Index and the coefficient of interest is β and $\mathbf{X}_{ci,t}$ representing the set of robust controls. The other parts of the equation are identical to equation (1). I estimate equation (4) with contemporary values and with first lags of the regressors to account for reverse causality issues. The results of estimating equation (4) are depicted in Table 5. The Participative Institutions only Index becomes significant when all covariates are added jointly to the model (column (3)) and it remains marginally significant although the effect is comparatively large in absolute size. If I use lagged values of the regressors in the estimation, the index remains insignificant. The same pattern holds true when I only use the robust controls instead of all controls (columns (5) and (6)).[18] Thus, there is at least some evidence for the existence of a positive effect of participative political institutions on city development although it could be that the marginally significant coefficient is due to reverse causality as the lagged values are insignificant. However, this is not likely, as I test the existence of reverse causality in Table B.1 in Appendix B by including future values (leads) of the Participative Institutions Index to the specifications. All the first leads turned out to be insignificant, while the contemporary Participative Institutions Index becomes even significant more often and shows larger coefficients.

[Table 5 about here]

However, bearing in mind the results of Table 2 it is likely that the unclear results in Table 5 are due to the temporal and spatial heterogeneity in the effect of participative political institutions on city development. Therefore, I re-run the regressions in Table 5 for the different sub samples and periods in Table 2. The resulting coefficients and

[18] This also holds true if onl lagged values of the Participative Institutions Index are used instead of lagging all regressors. Regressions not shown but available from the author.

standard errors are reported in Table 6, where Panel A shows the estimation results with contemporary values and Panel B reports results with lagged regressors.

If I only consider effects to be robust if the contemporary and the lagged Participative Institutions Index are significant the results indicate that participative political institutions had a positive effect on city population in the area of today's Germany (column (3)), in the German-speaking area of the HRE (column (4)), in Germany in the early modern period (column (7)), and in the German-speaking area in the medieval period. Hence, participative political institutions only mattered in Germany and the German-speaking area and they seem to matter in both the medieval and the early modern period although an effect in medieval Germany only appears when contemporary values are used in the regression. Why there is no significant impact of participative political institutions in the Netherlands and Belgium is not obvious.[19] Obviously, the insignificance of participative political institutions in the Low Countries could result from the positive effect of communal institutions and the negative effect of institutionalized burgher representation and participative elections offsetting each other. As in the case of Table 5, I re-estimated Panel A of Table 6 including first leads of the Participative Institutions Index. The results are reported in Table B.2 in Appendix B. Apart from one exception (column (7)) the future values are always insignificant, suggesting that reverse causality is not a major issue.

[Table 6 about here]

A last informative empirical test consists in investigating the temporal evolution of the impact of participative political institutions for the different considered sub sam-

[19] The significant lagged Participative Institutions Index in column (10) showing a negative sign is especially interesting as it is the only case where the use of lagged values results in a change of the coefficients' sign. Perhaps this is just a statistical artifact caused by the observations lost due to lagging the variable. Alternatively, the significant negative sign can be traced back to the negative impact of institutionalized burgher representation observed already in Table 2. Indeed, if the institutionalized burgher representation dummy is added to the model, the Participative Institutions Index becomes insignificant.

ples. This can be done by re-running equation (2), this time using the Participative Institutions Index and interacting it with dummy variables for each 100-year period, i.e. I estimate equation (5):

$$ln(POP)_{ci,t} = \alpha + \sum_{\tau \in \Gamma} \beta'_{\tau} PARTINST_{ci,\tau} \cdot \pi_{\tau} + \gamma' \mathbf{X}_{ci,t} + \delta_i + \pi_t + \rho_{c,t} + \epsilon_{ci,t} \qquad (5)$$

With $\tau = 1200, 1300, ..., 1800$ and the other terms being equal to equation (3). The results of this estimation are depicted in Table 7 and visualized in Figure 3, which depicts the coefficient of every interaction term and the respective 95 % confidence intervals for each of the four specifications in Table 7 separately in one graph. Results show a more or less equal temporal evolution pattern for each of the considered sub-samples. The initially largely positive effect declines until 1400 AD and the rises again slowly until 1600 AD before it declines again and becomes negative in the end. The only exception to this pattern are the Low Countries (column (4) and sub-figure 4). In the Low Countries, the effect of participative political institutions shows a continuous decline, with the effect becoming negative until 1500 AD and showing significantly negative coefficients of the interaction terms in 1700 and 1800 AD. With respect to the significance of the interaction terms, when including all observations in the regression, there is only a significant positive effect in the first base year (1200 AD) implying that there was a positive effect of participative political institutions in the High Middle Ages. And despite the fact that the effect becomes more positive again in 1500 AD and 1600 AD it remains insignificant afterwards. This pattern is similar in Germany and also in the German-speaking area, although the initial decline in the German-speaking area is steeper and the increase from 1500 to 1600 AD is large resulting in a significant positive effect. For Germany alone, the coefficients in 1500 and in 1600 AD are both significant and larger than in the other two sub-samples and in consequence, there are significant positive interaction terms in 1500 and 1600 AD.

The question is what explains these different temporal evolution patterns. The initially positive effect in the first and sometimes the second base year exists in all of the sub samples. This indicates that participative political institutions importantly contribute to the rise of cities and commerce in the high medieval period. The more or less stark decline of their effect in the 14th century is probably due to the disruptions caused by the Black Death and related shocks (famines etc.). The further decline throughout the late medieval and the early modern period is probably explained by the "Olson effect", orby the rise of territorial states (Dutch Republic) with important national level institutions leading to political centralization or absolutist rulers suppressing city autonomy.

What remains to be explained however is, the second increase of the effect in late 15th century and during the 16th century, especially in Germany. On the one hand, this second rise could be due to the fact that the core area of the Holy Roman Empire, especially the area of today's Germany, remained much more politically fragmented than the Low Countries, Austria and Switzerland and that the autonomy of cities thus still mattered and could give cities with more inclusive institutions a development advantage over the others. However, when considering all observations, one has to keep in mind, that the interaction terms are all insignificant apart from the first. Thus, the only thing that can be concluded from the temporal evolution patterns in column (1) is that participative political institutions did not matter for the development of cities apart from the higher medieval period where they constituted remarkable institutional innovations promoting the rise of cities and commerce. However, these estimates cannot considered to be causal as I cannot fully circumvent endogeneity issues by introducing city fixed effects and using lagged regressors. To fully account for endogeneity I would need a valid time-variant instrument and I am not aware of such an instrument.[20]

[20] I tried several instruments suggested by historical evidence and other studies. For instance, following Jacob (2010) or Stasavage (2011)I tested dummy variables identifying cities in the territory or sphere of influence of the Staufer dynasty or indicating if a city is located in the former territory of Lotharingia.

[Table 7 about here]

[Figure 3 about here]

4.4 Additional Robustness Checks

In addition to the already mentioned robustness checks we re-estimated the regressions in Tables 1,3,4,5 and 7 including interactions of time-invariant variables (terrain ruggedness, soil quality and the sea and river dummies) with century dummies to ensure that not these variables and their potentially time-varying effects drive the results. These estimates are reported in Appendix B Tables B.3-B.7. All results are virtually identical to those in the main text and thus, the presented results are not caused by omitting these variables.

5 Concluding Remarks

This study was concerned with the impact of participative political institutions on medieval and early-modern city development. When considering the effects of the different types of participative political institutions individually and pooled over all cities and periods, I found that primarily extensive margin, i.e. the existence of communal institutions like city councils, had a robust and positively significant effect on city population. However, in the German-speaking area the existence of participative elections and hence political rights rights of a comparatively broad cross-section of citizens had positive effects on city growth. Thus, recent studies like Bosker et al. (2013) or Puga and Trefler (2014) and the broader economic literature on the virtues of inclusive institutions is confirmed by this evidence, at least for Germany.

In general, I do not find a different temporal evolution pattern of the effect of participative political institutions in the medieval and early modern period. In both periods,

However, none of these measures could act as a valid instrument because they were either not significant at the first stage or at the reduced form.

the positive effect of those elections declined over the centuries and became insignificant in 1500 AD and 1800 AD, respectively. However, guild participation only mattered in the period after 1500 AD and in general it does not have a robust positive effect and its effect does not vary much over time or between periods. The same holds true for institutionalized burgher representation which shows an insignificant temporal evolution pattern both in the medieval and the early modern period. In the Low Countries, institutionalized burgher representation even had a negative effect that has to be closer investigated in future studies.

Regarding the notion that existing political institutions and regimes are subject to a process of degeneration and increasingly egoistic, rent-seeking policy I only found a pattern of an increasingly negative effect the longer an institution existed, in the case of cities with guild constitutions. In addition, participative elections only had a significant positive impact in the first century of their existence and afterwards the effect became insignificant. This highlights the short-lived character of the positive impact of participative political institutions in pre-modern cities. When considering the Participative Institutions Index as measure of the overall impact of the different types of participative political institutions, there is only weak empirical evidence for a significant positive impact. However, in the German-speaking area there is a positive effect while in the medieval Low Countries there is a negative effect that, however, only shows up with lagged values of the Participative Institutions Index.

Finally, I investigated the temporal evolution of the impact of participative political institutions from their first occurrence in 1200 AD until 1800 AD. For all observations I detected significant positive effects in 1200 but insignificant effects in the other centuries. This implies that while these institutions contributed to the commercial revolution and the rise of cities, their later impact was limited. This probably was due to a similar process as Puga and Trefler (2014) describe for Venice. This would be in line with the fact that the participativeness of political institutions generally declined in the

early-modern period (as in Venice) but it could also be that while they existed de jure, they did not succeed in preserving their participative character due to oligarchisation, elite degeneration or the lose of city autonomy. In the Low Countries I see a similar picture but the effect there became even more negative than in the whole sample in 1700 and 1800 AD. In the German-speaking area I observed a recovery of the impact of participative political institutions in the 15th and 16th century after their decline in the centuries before. The difference between the Low Countries and the German-speaking area probably did arise because the German-speaking area remains highly politically fragmented in that period while in the Netherlands and Belgium larger territorial states were founded, which shifted political power to the national level and restricted city autonomy.[21]

All in all, the effect of participative political institutions shows a remarkable degree of heterogeneity with respect to the short and long-run, particular regions and the respective type of participative political institutions considered. Much remains to be done for future research to investigate further the outlined results and their underlying causes in more detail.

[21] Additionally, the Eighty Years' War resulting in the Dutch Republic may have played a role as a severe shock affecting only the Netherlands and not the rest of the sampled region.

Figures and Tables

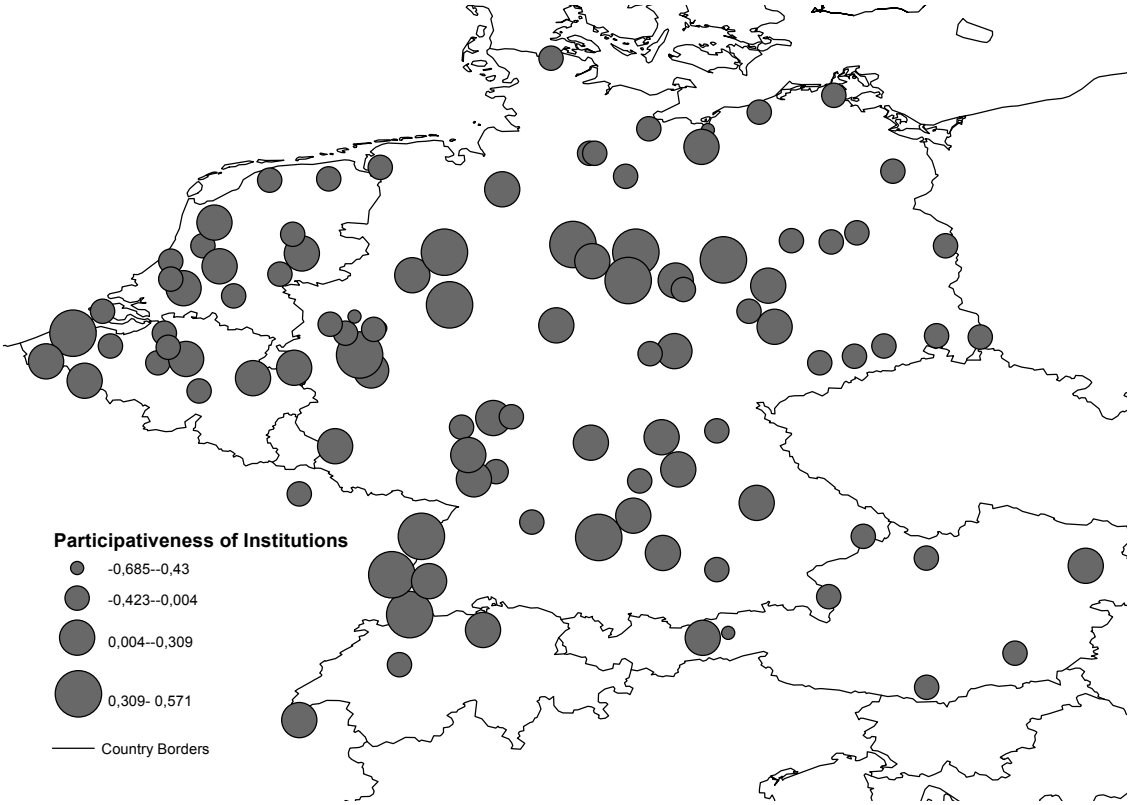
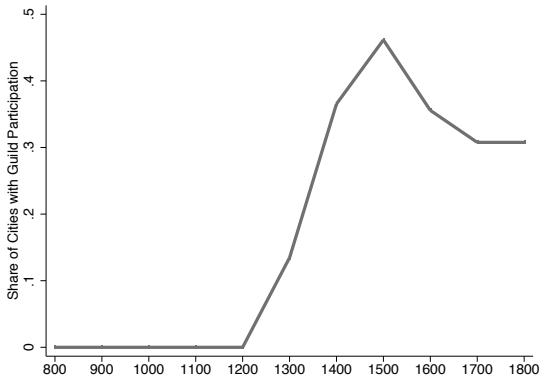
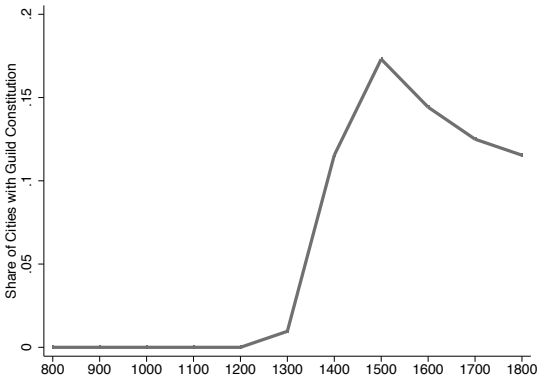


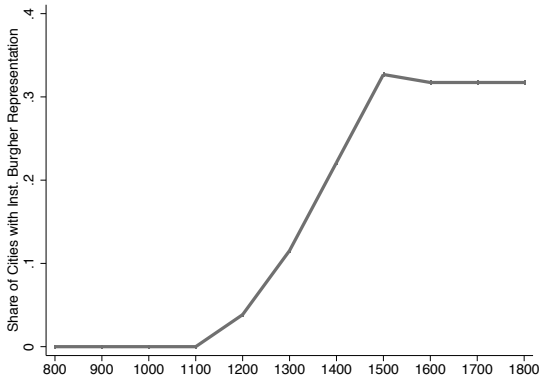
Figure 1: Average Index of Participative Political Institutions



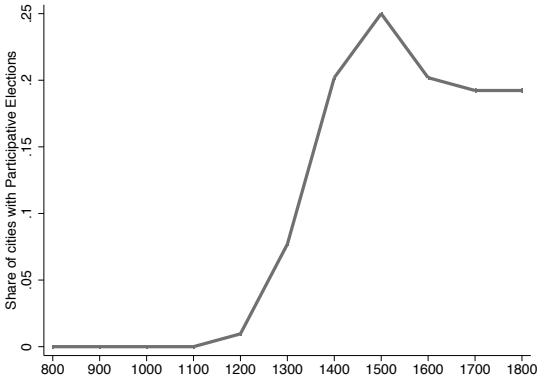
(a) Share of Cities with Guild Participation



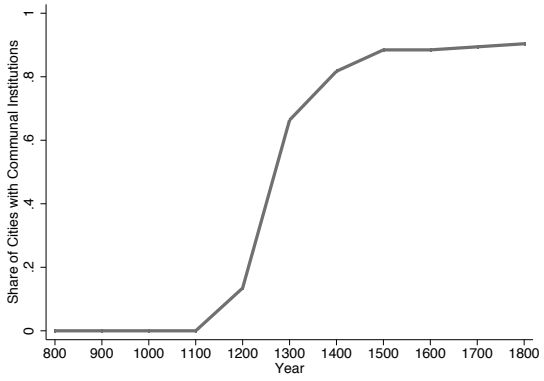
(b) Share of Cities with Guild Constitution



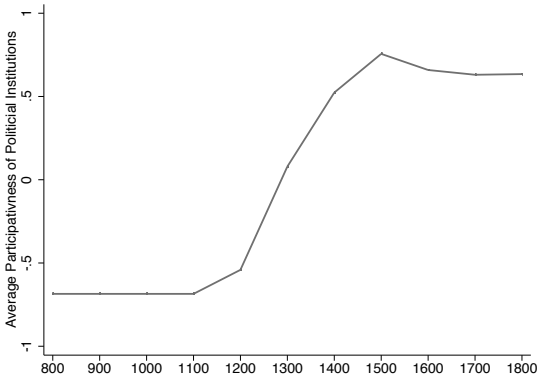
(c) Share of Cities with Institutionalized Burgher Representation



(d) Share of Cities with Participative Election

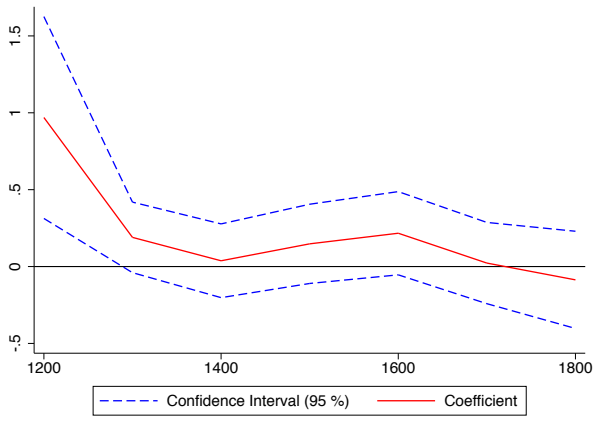


(e) Share of Cities with Communal Institutions

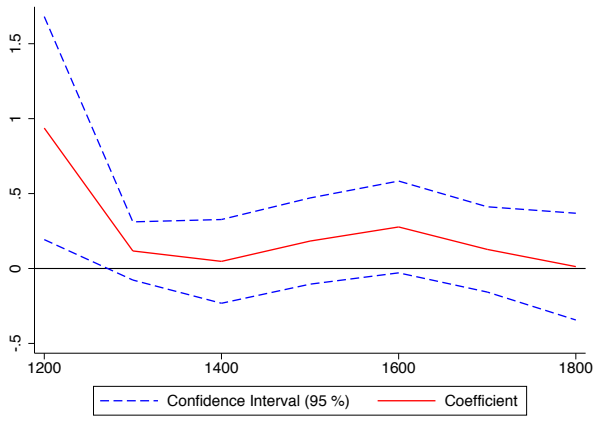


(f) Temporal Evolution of Average Participativeness of City Institutions Index

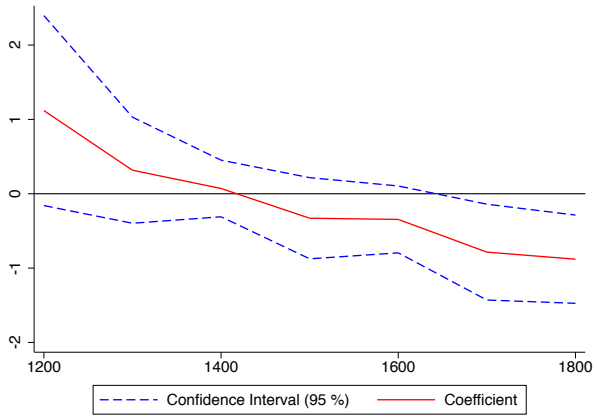
Figure 2: The Evolution of Participative Political Institutions



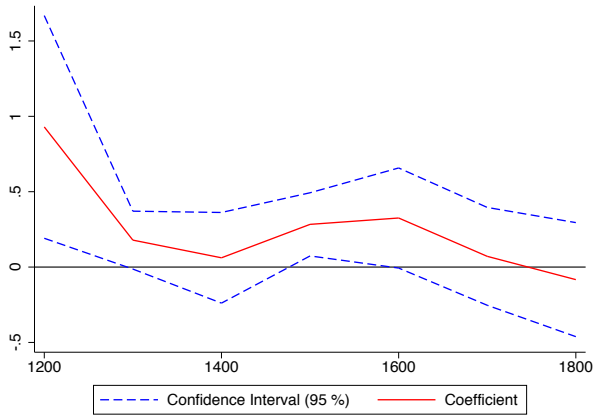
(a) Temporal Evolution of the Impact of Participative Institutions—All Observations



(b) Temporal Evolution of the Impact of Participative Institutions—Without Low Countries



(c) Temporal Evolution of the Impact of Participative Institutions—Germany



(d) Temporal Evolution of the Impact of Participative Institutions—Low Countries

Figure 3: Temporal Evolution of the Impact of Participative Institutions

Table 1: Early-Modern Participative Political Institutions and City Development

Dep. Var.	ln(Population)					
	(1)	(2)	(3)	(4)	(5)	(6)
Guild Participation Index	-0.029				-0.039	-0.045
	(0.08)				(0.086)	(0.087)
Institutionalized Burgher		-0.025			-0.046	-0.009
Representation		(0.099)			(0.095)	(0.089)
Participative Elections			**0.193***		0.166	0.188
			(0.109)		(0.13)	(0.132)
Communal Institutions				**0.511*****	**0.484*****	**0.479*****
				(0.171)	**(0.175)**	**(0.172)**
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
National Political Institutions	Yes	Yes	Yes	Yes	Yes	No
City Characteristics	Yes	Yes	Yes	Yes	Yes	No
Robust Controls	No	No	No	No	No	Yes
Obs.	596	596	596	596	596	596
Within R^2	0.484	0.484	0.488	0.503	0.506	0.493

Notes. Standard errors clustered on city level 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 set of control variables "National Political Institutions" controls for the Free-Prince variable from De Long and Shleifer (1993), parliamentary activity (according to Van Zanden et al. 2012), and a dummy variable indicating that a city is located in a political entity with a large territory. All these variables originate from the Bosker et al. (2013) data set. The set "City Characteristics" includes dummy variables indicating capital cities of sovereign political entities, residences of bishops and archbishops, cities that have a university, cities that were plundered in the previous century and a variable controlling for the urban potential of each city. Again these variables stem from the Bosker et al. (2013) data set. This set of variables further consists of dummy variables reporting whether a city was an imperial city, a member of the Hanseatic League, adopted printing technology before 1500 AD or was an important medieval/ early modern trade center. Finally, the set of "Robust Controls" includes every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly. These are the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. Each regression includes a constant not reported.

Table 2: Early-Modern Participative Political Institutions and City Development—Sub Samples

Dep. Var.	ln(Population)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sub-Sample	Before 1500	After 1500	Germany	without Low Countries	Low Countries	Germany before 1500	Germany after 1500	without Low Countries before 1500	without Low Countries after 1500	Low Countries before 1500	Low Countries after 1500
Guild Participation Index	0.023	0.030	-0.055	-0.075	-0.006	-0.000	**0.304*** **	0.013	0.030	0.047	0.116
	(0.076)	(0.079)	(0.126)	(0.108)	(0.083)	(0.083)	**(0.089)**	(0.074)	(0.107)	(0.148)	(0.108)
Institutionalized Burgher	-0.008	0.034	0.022	0.019	**-0.838*** **	-0.025	0.035	0.033	0.041	-0.42	
Representation	(0.140)	(0.109)	(0.088)	(0.087)	**(0.219)**	(0.158)	(0.133)	(0.149)	(0.110)	(0.259)	
Participative Elections	0.233	0.101	0.261	**0.323** **	-0.214	**0.319***	0.162	**0.356** **	0.105	0.199	0.054
	(0.160)	(0.145)	(0.157)	**(0.134)**	(0.299)	**(0.188)**	(0.164)	**(0.166)**	(0.134)	(0.315)	(0.360)
Communal Institutions	**0.338*** **	**1.919*** **	**0.639*** **	**0.582*** **	0.201	**0.365*** **	**1.900*** **	**0.327** **	**1.926*** **	**0.515** **	
	(0.123)	**(0.127)**	**(0.194)**	**(0.195)**	(0.299)	**(0.128)**	**(0.121)**	**(0.130)**	**(0.135)**	**(0.242)**	
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	307	378	378	457	139	195	183	235	288	72	90
Within R^2	0.351	0.542	0.371	0.435	0.702	0.211	0.543	0.295	0.530	0.615	0.639

Notes. Standard errors clustered on city level 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 set of "Robust Controls" includes the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. Each regression includes a constant not reported.

Table 3: Temporal Heterogeneity in the Impact of Participative Political Institutions—Flexible Specification

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Interacted Variable	Guild Part. Index	Inst. Burgher Representation	Participative Election	Communal Institutions
1200 × Variable		0.094		**0.904*** **
		(0.225)		**(0.268)**
1300 × Variable	0.210	-0.203	**0.703*** **	0.281
	(0.138)	(0.176)	**(0.255)**	(0.179)
1400 × Variable	0.017	0.040	**0.284** **	-0.046
	(0.074)	(0.133)	**(0.136)**	(0.365)
1500 × Variable	0.058	0.017	**0.229***	0.244
	(0.072)	(0.112)	**(0.130)**	(0.642)
1600 × Variable	-0.006	0.080	0.175	**1.433*** **
	(0.094)	(0.132)	(0.151)	**(0.446)**
1700 × Variable	-0.138	0.122	0.058	**1.120** **
	(0.127)	(0.166)	(0.178)	**(0.429)**
1800 × Variable	**-0.226***	-0.023	0.040	1.117
	(0.124)	(0.179)	(0.175)	(0.684)
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Obs.	596	596	596	596
Within R^2	0.484	0.473	0.482	0.517

Notes. Standard errors clustered on city level 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 set of "Robust Controls" includes the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. Each regression includes a constant not reported.

Table 4: The Longer, the Worse? The Impact of Length of Existence

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Variable	Guild Participation	Guild Constitution	Inst. Burgher Representation	Participative Election
Variable × 1. Century	0.034	-0.026	0.056	**0.388*** **
	(0.103)	(0.118)	(0.125)	**(0.109)**
Variable × 2. Century	0.099	-0.041	0.022	**0.237***
	(0.132)	(0.141)	(0.119)	**(0.136)**
Variable × 3. Century	0.036	-0.209	0.061	0.160
	(0.145)	(0.196)	(0.142)	(0.125)
Variable × 4. Century	-0.049	**-0.432***	-0.079	0.129
	(0.183)	**(0.255)**	(0.181)	(0.163)
Variable × 5. Century	-0.272	**-0.816****	-0.028	-0.144
	(0.224)	**(0.365)**	(0.204)	(0.175)
Variable × 6. Century	-0.012	**-1.324*****	-0.137	**-0.593*****
	(0.416)	**(0.201)**	(0.313)	**(0.213)**
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Obs.	596	596	596	596
Within R^2	0.476	0.491	0.472	0.487

Notes. Standard errors clustered on city level 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 set of "Robust Controls" includes the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. Each regression includes a constant not reported.

Table 5: The Impact of Participative Political Institutions on City Development

Dep. Var.	ln(Population)					
	(1)	(2)	(3)	(4)	(5)	(6)
Participative Institutions	0.117	0.116	**0.128***		**0.142***	
	(0.082)	(0.081)	**(0.076)**		**(0.077)**	
L1. Participative Institutions				0.074		0.068
				(0.074)		(0.069)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
National Political Institutions	No	Yes	Yes	Yes	No	No
City Characteristics	No	No	Yes	Yes	No	No
Robust Controls	No	No	No	No	Yes	Yes
Obs.	596	596	596	587	596	587
Within R^2	0.281	0.318	0.420	0.427	0.414	0.413

Notes. Standard errors clustered on city level 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 set of control variables "National Political Institutions" controls for the Free-Prince variable from De Long and Shleifer (1993), parliamentary activity (according to Van Zanden et al. 2012), and a dummy variable indicating that a city is located in a political entity with a large territory. All these variables originate from the Bosker et al. (2013) data set. The set "City Characteristics" includes dummy variables indicating capital cities of sovereign political entities, residences of bishops and archbishops, cities that have a university, cities that were plundered in the previous century, a variable controlling for the urban potential of each city and a dummy indicating whether a city is located at sea or not. Again, these variables stem from the Bosker et al. (2013) data set. Finally, the set of "Robust Controls" includes every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly. These are the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. Each regression includes a constant not reported.

Table 6: The Impact of Participative Political Institutions on City Development—Sub Samples

Dep. Var.	ln(Population)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sub Sample	Before 1500	After 1500	Germany	without Low Countries	Low Countries	Germany before 1500	Germany after 1500	without Low Countries before 1500	without Low Countries after 1500	Low Countries before 1500	Low Countries after 1500
					Panel A: Contemporary Values						
Participative Institutions	**0.218*** **	0.18	**0.201** **	**0.181***	-0.091	**0.239** **	**0.589** **	**0.258*** **	0.204	0.286	0.211
	(0.084)	(0.119)	**(0.089)**	**(0.086)**	(0.145)	**(0.087)**	**(0.269)**	**(0.082)**	(0.134)	(0.201)	(0.219)
Obs.	307	378	378	457	139	195	183	235	288	72	90
Within R^2	0.337	0.491	0.339	0.407	0.674	0.179	0.463	0.271	0.469	0.568	0.638
					Panel B: Lagged Values						
L1. Participative Institutions	0.057	0.076	**0.157***	**0.161** **	**-0.274** **	0.145	**0.256** **	**0.186** **	0.147	**-0.342***	-0.142
	(0.091)	(0.082)	**(0.086)**	**(0.081)**	**(0.120)**	(0.098)	**(0.127)**	**(0.091)**	(0.097)	**(0.186)**	(0.122)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	298	378	370	448	139	187	183	226	288	72	90
Within R^2	0.308	0.49	0.349	0.416	0.673	0.115	0.498	0.231	0.480	0.561	0.62

Notes. Standard errors clustered on city level 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 set of "Robust Controls" is incorporates the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. Each regression includes a constant not reported.

Table 7: Temporal Evolution of the Impact of Participative Political Institutions

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Sub-Sample	All Observations	without Low countries	Germany	Low Countries
Participative Institutions ×1200	**0.969*** **	**0.937** **	**0.930** **	**1.119***
	(0.331)	**(0.374)**	**(0.370)**	**(0.616)**
Participative Institutions ×1300	0.190	0.117	**0.179***	0.316
	(0.116)	(0.098)	(0.096)	(0.344)
Participative Institutions ×1400	0.038	0.048	0.062	0.071
	(0.121)	(0.140)	(0.151)	(0.184)
Participative Institutions ×1500	0.148	0.183	**0.283*** **	-0.329
	(0.130)	(0.145)	**(0.105)**	(0.263)
Participative Institutions ×1600	0.217	**0.277***	**0.326***	-0.345
	(0.136)	**(0.154)**	**(0.166)**	(0.217)
Participative Institutions ×1700	0.023	0.127	0.071	**-0.785** **
	(0.133)	(0.143)	(0.163)	**(0.311)**
Participative Institutions ×1800	-0.086	0.013	-0.083	**-0.880*** **
	(0.159)	(0.179)	(0.189)	**(0.286)**
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Obs.	596	457	378	139
Within R^2	0.507	0.437	0.388	0.744
All interactions=0 (F-Test)	2.244	1.459	3.322	2.420
p-value	0.036	0.194	0.004	0.053

Notes. Standard errors clustered on city level 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 century fixed effects and city fixed effects (FE estimation). The set of "Robust Controls" is incorporates the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. Each regression includes a constant not reported.

A. Descriptive Statistics and Data Set

The data set used for the empirical analysis in this paper is described in detail in the Data Appendix in Wahl (2014) (available here) and the Data Appendix to the Bosker et al. (2013) study which is available online 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). Therefore the data set is not described in detail here. However, I provide descriptive statistics for all the variables used in the analysis in Table A.1.

Table A.1: Descriptive Overview of Panel Data Set

Variable	Obs	Mean	Std. Dev.	Min	Max
Agricultural Suitability	1144	0.611	0.21	0.02	0.978
Archbishop	1144	0.063	0.243	0	1
Bishop	1144	0.212	0.409	0	1
Capital City	1144	0.017	0.128	0	1
Centuries of Guild Constitution	1144	0.158	0.705	0	6
Centuries of Guild Participation	1144	0.470	1.178	0	6
Centuries of Inst. Burgher Representation	1144	0.283	0.904	0	6
Centuries of Participative Election	1144	0.275	0.934	0	6
Communal Institutions	1144	0.492	0.5	0	1
Free-Prince	1144	0.469	0.499	0	1
Guild Constitution	1144	0.062	0.241	0	1
Guild Participation	1144	0.176	0.381	0	1
Guild Participation Index	1144	0.242	0.563	0	2
Hanseatic League	1144	0.070	0.255	0	1
Imperial City	1144	0.087	0.281	0	1
Institutionalized Burgher Representation	1144	0.150	0.358	0	1
Large State	1144	0.466	0.499	0	1
ln(Population)	596	2.537	0.812	0.693	5.513
Parliament	1144	0.163	0.369	0	1
Participative Election	1144	0.102	0.303	0	1
Participative Institutions	1144	0	0.773	-0.685	2.256
Plundered	1144	0.024	0.168	0	2
Printingpress before 1500 AD	1144	0.143	0.351	0	1
Residence City	1144	0.099	0.298	0	1
Sea	1144	0.125	0.331	0	1
Trade City	1144	0.194	0.396	0	1
University	1144	0.063	0.243	0	1
Urban Potential	1144	14.749	17.611	0.839	198.62

B. Additional Results and Robustness Checks

In Tables B.1 and B.2 I present the regression of Tables 5 and 6 (only Panel A) additionally including future values of the Participative Institutions Index. According to Angrist and Pischke (2009) this enables to test for the presence of reverse causality. One can see from the results reported in both tables that reverse causality seems not to be an issue here, as only one time do the lead values show a significant coefficient (Table B.2 column (7)). When leads are included the resulting coefficients are often even larger and more significant. However, in the specification with leads and lags jointly included to the regression, none of them are significant. This result may be due to the high collinearity between leads and lags. If the contemporary values were also be added to the leads and lags in columns (4) and (6) of Table B.1 these would show up with a highly significant coefficient of around 0.18 (Regressions not shown but available from the author upon request). This might be the result of collinearity issues again or, alternatively, points towards the possibility that there is only a contemporaneous relationship between city development and participative political institutions. In face of the fact that 100 years lie between the dependent variable and leads and lags this is not an unlikely possibility.

In Tables B.3 to B.7 I re-estimate Tables 1,3,4,5 and 7 including time-invariant variables, i.e. terrain ruggedness, soil quality and location at a river or at a sea that are interacted with century dummies to be used in a fix effects regression. We do not include these interacted variables in the regressions in Tables 2 and 6 as we have some sub-samples there with a number of obervations that is to small to meaningfully conduct such a robustness check there.

However, to include this variables ensures that these time-invariant characteristics of cities—and their possibly time-varying effects— do not cause the results obtained in the regressions in the main text. The results obtained with these interaction terms included

are virtually identical to those in the main text, if anything the results are even stronger and the observed tendencies are more pronounced. In Table B.7, for example, that mirrors Table 7 in the main text, the effect of PPIs in 1500 AD is not only significant in Germany, but also in the German-speaking area (what was not the case in the original Table 7). Thus, the results are robust to the inclusion of this variables.

Table B.1: The Impact of Participative Political Institutions on City Development-Including Leads

Dep. Var.	ln(Population)					
	(1)	(2)	(3)	(4)	(5)	(6)
F1. Participative Institutions	-0.041	-0.037	-0.063	-0.001	-0.060	-0.004
	(0.090)	(0.091)	(0.091)	(0.096)	(0.088)	(0.092)
Participative Institutions	**0.121***	0.114	**0.134***		**0.155****	
	(0.070)	(0.069)	**(0.072)**		**(0.071)**	
L1. Participative Institutions				0.040		0.028
				(0.081)		(0.073)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
National Political Institutions	No	Yes	Yes	Yes	No	No
City Characteristics	No	No	Yes	Yes	No	No
Robust Controls	No	No	No	No	Yes	Yes
Obs.	492	492	492	483	492	483
Overall R^2	0.342	0.353	0.447	0.441	0.43	0.408

Notes. Standard errors clustered on city level 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 set of control variables "National Political Institutions" controls for the Free-Prince variable from De Long and Shleifer (1993), parliamentary activity (according to Van Zanden et al. 2012), and a dummy variable indicating that a city is located in a political entity with a large territory. All these variables originate from the Bosker et al. (2013) data set. The set "City Characteristics" includes dummy variables indicating capital cities of sovereign political entities, residences of bishops and archbishops, cities that have a university, cities that were plundered in the previous century, a variable controlling for the urban potential of each city and a dummy indicating whether a city is located at sea or not. Again, these variables stem from the Bosker et al. (2013) data set. Finally, the set of "Robust Controls" includes every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly. These ar the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. Each regression includes a constant not reported.

Table B.2: The Impact of Participative Political Institutions on City Development—Sub Samples with Leads Included

Dep. Var.	ln(Population)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sub Sample	Before 1500	After 1500	Germany	without Low Countries	Low Countries	Germany before 1500	Germany after 1500	without Low Countries before 1500	without Low Countries after 1500	Low Countries before 1500	Low Countries after 1500
F1. Participative Institutions	-0.041	0.069	-0.115	-0.085	-0.066	-0.099	**-0.358****	-0.056	0.032	0.083	0.214
	(0.108)	(0.144)	(0.098)	(0.096)	(0.275)	(0.123)	**(0.170)**	(0.115)	(0.149)	(0.231)	(0.453)
Participative Institutions	**0.218****	0.160	**0.214*****	**0.193****	-0.044	**0.234****	**0.692****	**0.257*****	0.154	0.289	0.366
	(0.085)	(0.117)	**(0.077)**	**(0.073)**	(0.174)	**(0.089)**	**(0.291)**	**(0.082)**	(0.135)	(0.194)	(0.234)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	307	274	311	376	116	195	116	235	207	72	67
Overall R^2	0.338	0.398	0.209	0.296	0.664	0.186	0.258	0.273	0.274	0.569	0.689

Notes. Standard errors clustered on city level are reported in parentheses. Coefficient is statistically different from zero at the ***1 %, **5 % and *10 % level. The unit of observation is a city. In all regressions the set of "Robust Controls" is included, incorporating every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly (Table 5 column (3)). These are the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. Each regression includes a constant not reported.

Table B.3: Early-Modern Participative Political Institutions and City Development—With Interacted Time-Invariant Controls

Dep. Var.	ln(Population)					
	(1)	(2)	(3)	(4)	(5)	(6)
Guild Participation Index	-0.025				-0.042	-0.048
	(0.081)				(0.083)	(0.089)
Institutionalized Burgher		0.001			-0.012	0.030
Representation		(0.094)			(0.087)	(0.085)
Participative Elections			**0.215***		0.188	0.217
			(0.114)		(0.127)	(0.133)
Communal Institutions				**0.532*** **	**0.499*** **	**0.480*** **
				(0.175)	**(0.176)**	**(0.171)**
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
National Political Institutions	Yes	Yes	Yes	Yes	Yes	No
City Characteristics	Yes	Yes	Yes	Yes	Yes	No
Robust Controls	No	No	No	No	No	Yes
Time-Invariant Controls*Century FEs	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	596	596	596	596	596	596
Within R^2	0.552	0.551	0.556	0.570	0.573	0.556

Notes. Standard errors clustered on city level 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 set of control variables "National Political Institutions" controls for the Free-Prince variable from De Long and Shleifer (1993), parliamentary activity (according to Van Zanden et al. 2012), and a dummy variable indicating that a city is located in a political entity with a large territory. All these variables originate from the Bosker et al. (2013) data set. The set "City Characteristics" includes dummy variables indicating capital cities of sovereign political entities, residences of bishops and archbishops, cities that have a university, cities that were plundered in the previous century and a variable controlling for the urban potential of each city. Again these variables stem from the Bosker et al. (2013) data set. This set of variables further consists of dummy variables reporting whether a city was an imperial city, a member of the Hanseatic League, adopted printing technology before 1500 AD or was an important medieval / early modern trade center. Finally, the set of "Robust Controls" includes every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly. These are the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. The time-invariant controls that are interacted with century dummies are terrain ruggedness, soil quality and the sea and river dummies. Each regression includes a constant not reported.

Table B.4: Temporal Heterogeneity in the Impact of Participative Political Institutions—Flexible Specification with Interacted Time-Invariant Controls

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Interacted Variable	Guild Part. Index	Inst. Burgher Representation	Participative Election	Communal Institutions
1200 × Variable		0.006		**1.014*** **
		(0.372)		**(0.282)**
1300 × Variable	0.204	-0.169	**0.778*** **	0.301
	(0.176)	(0.202)	**(0.276)**	(0.185)
1400 × Variable	-0.021	0.005	**0.285***	-0.135
	(0.083)	(0.119)	**(0.154)**	(0.383)
1500 × Variable	0.062	0.034	**0.272****	0.364
	(0.078)	(0.110)	**(0.133)**	(0.497)
1600 × Variable	0.011	0.101	0.192	**1.355*** **
	(0.095)	(0.138)	(0.160)	**(0.473)**
1700 × Variable	-0.107	0.180	0.116	**1.008****
	(0.134)	(0.160)	(0.185)	**(0.439)**
1800 × Variable	-0.198	0.052	0.031	0.912
	(0.129)	(0.174)	(0.175)	(0.650)
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Time-Invariant Controls*Century FEs	Yes	Yes	Yes	Yes
Obs.	596	596	596	596
Within R^2	0.545	0.537	0.548	0.576

Notes. Standard errors clustered on city level 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 set of "Robust Controls" includes the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. The time-invariant controls that are interacted with century dummies are terrain ruggedness, soil quality and the sea and river dummies. Each regression includes a constant not reported.

Table B.5: The Longer, the Worse? The Impact of Length of Existence—With Interacted Time-Invariant Controls

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Variable	Guild Participation	Guild Constitution	Inst. Burgher Representation	Participative Election
Variable × 1. Century	0.059	-0.066	0.038	**0.410*** **
	(0.112)	(0.124)	(0.120)	**(0.116)**
Variable × 2. Century	0.127	-0.016	0.079	**0.265***
	(0.133)	(0.148)	(0.114)	**(0.144)**
Variable × 3. Century	0.024	-0.219	0.145	0.179
	(0.153)	(0.220)	(0.145)	(0.143)
Variable × 4. Century	-0.068	-0.446	0.047	0.165
	(0.188)	(0.292)	(0.187)	(0.161)
Variable × 5. Century	-0.205	**-0.869****	0.077	-0.143
	(0.230)	**(0.426)**	(0.183)	(0.180)
Variable × 6. Century	0.058	**-1.058*****	-0.044	**-0.635*****
	(0.365)	**(0.294)**	(0.307)	**(0.176)**
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Time-Invariant Controls*Century FEs	Yes	Yes	Yes	Yes
Obs.	596	596	596	596
Within R^2	0.542	0.552	0.536	0.553

Notes. Standard errors clustered on city level 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 set of "Robust Controls" includes the residence city dummy, the capital, Hanseatic League, and plundered dummies as well as the urban potential measure. The time-invariant controls that are interacted with century dummies are terrain ruggedness, soil quality and the sea and river dummies. Each regression includes a constant not reported.

Table B.6: The Impact of Participative Political Institutions on City Development—With Interacted Time-Invariant Covariates

Dep. Var.	ln(Population)					
	(1)	(2)	(3)	(4)	(5)	(6)
Participative Institutions	0.118	0.116	**0.144***		**0.156***	
	(0.090)	(0.090)	**(0.080)**		**(0.081)**	
L1. Participative Institutions				0.099		0.100
				(0.080)		(0.076)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
National Political Institutions	No	Yes	Yes	Yes	No	No
City Characteristics	No	No	Yes	Yes	No	No
Robust Controls	No	No	No	No	Yes	Yes
Time-Invariant Controls*Century FEs	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	596	596	596	587	596	587
Within R^2	0.470	0.474	0.557	0.569	0.545	0.538

Notes. Standard errors clustered on city level 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 set of control variables "National Political Institutions" controls for the Free-Prince variable from De Long and Shleifer (1993), parliamentary activity (according to Van Zanden et al. 2012), and a dummy variable indicating that a city is located in a political entity with a large territory. All these variables originate from the Bosker et al. (2013) data set. The set "City Characteristics" includes dummy variables indicating capital cities of sovereign political entities, residences of bishops and archbishops, cities that have a university, cities that were plundered in the previous century, a variable controlling for the urban potential of each city and a dummy indicating whether a city is located at sea or not. Again, these variables stem from the Bosker et al. (2013) data set. Finally, the set of "Robust Controls" includes every variable that was significant (at 10 % level at least) in the regression including all sets of covariates jointly. These are the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. The time-invariant controls that are interacted with century dummies are terrain ruggedness, soil quality and the sea and river dummies. Each regression includes a constant not reported.

Table B.7: Temporal Evolution of the Impact of Participative Political Institutions—With Interacted Time Invariant Controls

Dep. Var.	ln(Population)			
	(1)	(2)	(3)	(4)
Sub-Sample	All Observations	without Low countries	Germany	Low Countries
Participative Institutions ×1200	**1.261*** **	**1.173** **	**1.160** **	-0.000
	(0.334)	**(0.506)**	**(0.502)**	(0.269)
Participative Institutions ×1300	**0.235***	0.111	0.126	0.572*
	(0.121)	(0.112)	(0.114)	(0.299)
Participative Institutions ×1400	0.015	0.088	0.090	0.098
	(0.140)	(0.187)	(0.220)	(0.187)
Participative Institutions ×1500	0.180	**0.245***	**0.321*** **	-0.366
	(0.114)	**(0.124)**	**(0.115)**	(0.265)
Participative Institutions ×1600	0.227	**0.321** **	**0.364** **	**-0.513***
	(0.138)	**(0.156)**	**(0.175)**	**(0.253)**
Participative Institutions ×1700	0.067	0.198	0.141	**-0.742** **
	(0.139)	(0.152)	(0.186)	**(0.266)**
Participative Institutions ×1800	-0.061	0.050	-0.057	**-0.591** **
	(0.158)	(0.178)	(0.197)	**(0.243)**
City Fixed Effects	Yes	Yes	Yes	Yes
Century Fixed Effects	Yes	Yes	Yes	Yes
Century*Country Fixed Effects	Yes	Yes	Yes	Yes
Robust Controls	Yes	Yes	Yes	Yes
Time-Invariant Controls*Century FEs	Yes	Yes	Yes	Yes
Obs.	596	457	378	139
Within R^2	0.565	0.518	0.472	0.851
All interactions=0 (F-Test)	3.666	1.521	2.781	2.959
p-value	0.001	0.172	0.014	0.024

Notes. Standard errors clustered on city level 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 century fixed effects and city fixed effects (FE estimation). The set of "Robust Controls" is incorporates the capital, Hanseatic League, residence city, plundered and sea dummies and the urban potential variable. The time-invariant controls that are interacted with century dummies are terrain ruggedness, soil quality and the sea and river dummies. Each regression includes a constant not reported.

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