Was Weber Right?

City Autonomy, Political Oligarchy, and the Rise of Europe

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Abstract

What are the implications of an oligarchic political regime for economic development? This is a question of current relevance, and it is also one where historical precedent may provide important insight. Since at least the time of Max Weber, scholars have claimed that the presence of politically autonomous cities, controlled by merchant oligarchies, helped lead to Europe’s economic rise. But others suggest that autonomous cities were a hindrance to growth because oligarchic rule resulted in restrictions that stifled innovation and trade. These contrasting views mirror the positions in more general debates about oligarchy and growth. I present new evidence and a new interpretation that reconcile the two opposing views of city autonomy. I show that politically autonomous cities tended to initially have higher population growth rates than non-autonomous cities, but over time this situation reversed itself as politically autonomous cities became stagnant. This may have important implications for the time path for growth in oligarchies more generally. My evidence also suggests why autonomous cities eventually died out as a form of political organization. Instead of military weakness, it may have been their oligarchic governance that condemned them to become obsolete.

JEL Codes: H11, N43, 040, P48
1 Introduction

The presence of politically autonomous cities was a distinctive feature of European political development in the medieval and early modern eras. It was a feature that many see as having been critical to Europe’s economic rise, because it allowed for the provision of secure property rights free from the dynastic ambitions of princely rulers.\textsuperscript{1} Ultimately, this interpretation can be traced back to Max Weber (1921 [1958]). Scholars have further argued that the absence of autonomous cities in the Islamic world and China hindered development.\textsuperscript{2} More recently, Paul Romer has even suggested that Europe’s experience with autonomous cities can and should be imitated in developing countries today.\textsuperscript{3} But if there are reasons to believe that city autonomy favored European economic development, there is also an opposite claim. According to this view, the merchant guilds (and in some cases craft guilds) that controlled the governing institutions of autonomous cities established firm property rights for themselves, but they also created barriers to entry into professions, something that stifled innovation and trade.\textsuperscript{4} In this paper I provide evidence and an interpretation that reconcile these differing views. I first suggest why oligarchic rule may initially have been favorable to growth while eventually leading to economic stagnation. I then show econometrically that after a century of initial auton-

\textsuperscript{1}See Blockmans (1994), Mokyr (1995, 1994, 1990), Hicks (1969), DeLong and Shleifer (1993), Bosker, Buringh, and van Zanden (2010), Weber ([1921] 1958) and Cantoni and Yuchtman (2010). Many of the ideas for why autonomous cities might enjoy faster economic growth are also consistent with the work of Avner Greif (2006). Finally, we should also mention the related idea that political autonomy for a city helped to foster social capital (Putnam, 1993; Jacob 2010; Guiso, Sapienza, and Zingales, 2009).

\textsuperscript{2}See Kuran (2010) for this argument with regard to the Islamic world and Elvin (1978) with regard to the lack of autonomous cities in China. See also Weber (1921 [1958]). See Blockmans and ’t Hart (2011) for a survey of urban development, and in particular the conditions for autonomous city development in Europe, China, and the Islamic World.

\textsuperscript{3}See www.chartercities.org and in particular the entry on Lubeck as the first charter city http://chartercities.org/blog/144/luebeck-as-the-first-charter-city.

\textsuperscript{4}The recent scholar most closely associated with this view is Stephan Epstein (2000). The negative effects of autonomy on growth have also been emphasized by some of the same authors who also refer to the positive effects, including Pirenne (1915), Mokyr (1995, 1994, 1990) and Hicks (1969). The idea that the oligarchic regimes of city-states were a hindrance to economic growth can also be supported by referring to the recent work of Sheilagh Ogilvie (2011) on guilds. We can also point to the important work by Mark Dincecco (2011) as well as Dincecco and Katz (2011) on the way in which political and fiscal fragmentation in early modern Europe (of which autonomous cities were a characteristic) was a hindrance to state development and economic activity.
omy, an autonomous city would be expected to grow more slowly than one subject to princely domination. This conclusion has implications for broad debates about oligarchy, institutions, and economic development.

The motivation for my idea about the changing value of oligarchic rule comes from observations by Joel Mokyr (1995, 1994, 1990) and Daron Acemoglu (2008). Mokyr suggests that politically autonomous cities may have been favorable environments for growth not only because of security of property rights for those engaged in trade, but also because they were favorable environments for innovation. However, over time innovation inevitably moved from one location to the next, a phenomenon that Mokyr refers to as Cardwell’s Law. Complementary to this, Acemoglu (2008) presents a theoretical model, a core result of which is that an oligarchic regime may initially enjoy a high rate of growth, but oligarchies also establish barriers to entry. As long as comparative advantage in entrepreneurship changes over time, so that members of a sitting oligarchy do not remain the most capable entrepreneurs, then the prediction is that oligarchies will eventually stagnate.

My specific empirical findings may have broad implications for the time path for growth in oligarchies in other places at other times. As such, this paper has implications for general debates about oligarchy as well as concerning property rights, institutions, and growth. There is little doubt that Europe’s autonomous cities were most often ruled by oligarchies. In their initial phase of development it was most common for members of a city’s merchants guild, those engaged in trade and in particular long distance trade, to establish firm control of the representative institutions of an autonomous city. This is often said to have favored innovation and trade. Beginning in the 14th century, a number of

Europe’s autonomous cities experienced political turmoil in which members of craft guilds demanded representation on city councils.\footnote{The best and most accessible summary of this process is provided by van Werveke (1963) in his article entitled “The Rise of the Towns.”} However, in almost all instances, even when craft guilds were granted some representation, city politics remained inherently oligarchic. Moreover, both merchant and craft guilds by their very nature had the simultaneous effect of creating property rights for members while also creating barriers to entry for newcomers. This doubled edged nature of oligarchic rule in Europe’s city states may be characteristic of oligarchies more generally.

My findings also have implications for a second question; why did the autonomous city eventually die out as a form of state organization in Europe? One could even generalize this question by asking why autonomous cities are such a rarity in other regions today. In the European case the conventional explanation is that autonomous cities may have been economic powerhouses, but they died out because they could not compete militarily against larger states. It is suggested that this was particularly the case after technological change lead to increased fixed costs in war fighting.\footnote{See Tilly (1992) and Bean (1973). A prominent critic of this view is Spruyt (1996) who argues that the disappearance of city-states was a much more contingent affair.} A problem with this argument is that autonomous cities long held a financial advantage over larger territorial states when it came to fighting wars. The autonomous cities found it easier to gain access to credit and at lower rates of interest, a feature that undoubtedly helped aid in their survival.\footnote{See the evidence in Stasavage (2011) on access to credit by city-states and territorial states.}

My findings in this paper point to a more simple reason why autonomous cities may have died out; the political institutions that initially fostered growth ultimately led to economic stagnation.

In order to examine the effect of political autonomy on city population growth between 1000AD and 1800, I consider a sample of all cities in continental Western Europe that are recorded in the Bairoch, Batou and Chevre (1988) data set and which by the year 1500 reached a size of at least 10,000 inhabitants. This results in a total of 169 cities.
choice to focus on this sample was dictated in part by the fact that it allowed for compiling more detailed information on city autonomy, including both the date at which autonomy was achieved as well as the date at which it was lost. Sample choice was also dictated by the fact that this allows a comparison of similar cities. Within this sample, it is more likely that we are comparing autonomous cities with cities that were sufficiently large to have become politically autonomous but which did not succeed in becoming autonomous. Taking this sample of 169 cities, I then used a number of different sources to construct an indicator variable denoting whether a city was politically autonomous, with autonomous defined as there being clear evidence of institutions for self governance and evidence of the exercise of prerogatives with regard to taxation, judicial affairs, and defence. I also record the date at which a city is judged to have become politically autonomous, in addition to the date at which it lost its autonomy.

To consider the potential effect of city autonomy I report results of estimates using pooled OLS regression with time period dummies as well as fixed effects estimates that consider only within variation for each city, supplemented by time period dummies. The results are quite clear. Based on the specifications that do not allow the effect of city autonomy to vary over time, there is no evidence that autonomous cities on average grew more quickly than did non-autonomous cities, and the average effect may actually have been negative. However, once we distinguish between cities that have been autonomous for less than one hundred years and cities that have been autonomous for longer, we observe that in its first century of independence we would expect a city to have its population grow by substantially more than would be the case for a non-autonomous city. In strong contrast, autonomous cities after their first century of independence are estimated to either grow at a rate no different from non-autonomous cities or in some cases to grow more slowly. Finally, based on a more flexible specification that includes a constant effect of independence, a linear trend for the number of years that a city had been autonomous, and a quadratic term for the same, we observe another consistent result. Taking the fixed
effects specification, after 110 years of independence, an autonomous city would begin to grow more slowly than would a non-autonomous city. Results of pooled OLS estimates that do not include city fixed effects suggest a similar conclusion, although a slightly slower decay in the growth rate.

We can be confident that my estimation results are robust to controls for unobserved time period effects as well as unobserved and constant effects at the city level. But there are certainly several further reasons why the estimation results may not reflect a causal effect of political autonomy on growth. The first and most obvious problem could be that the results simply reflect the fact that a city grew quickly prior to becoming independent, that this was necessary for it to be able to become independent, and that growth during the first century of independence simply reflected this underlying trend. Failure to account for this fact would lead to a biased inference about the effect of political autonomy on growth. In order to assess this possibility I also report results of a placebo test. Instead of setting the city autonomy variable in my regressions equal to one in the year that a city first became independent, I recoded the variable to take a value of 1 beginning one hundred years prior to the establishment of political autonomy. I did the same with a variable measuring the number of years that a city had been autonomous. I then repeated my quadratic trend specifications using these recoded variables. To the extent that my core results are biased by the presence of an underlying growth trend, we should expect this change to result in either an increased estimated effect of political autonomy, or at a minimum there would be no attenuation of the estimated effect. However, in almost all cases substitution of the placebo for the actual political autonomy variable resulted in coefficients that were much smaller in magnitude and that were not statistically significant.

In addition to the possibility of bias from an underlying growth trend, I also consider several other factors that might bias inferences including a changing external environment, non-classical measurement error, as well as spatial correlation in the data, and finally the question whether my results are produced by time varying unobservables leading to a
pattern of fast growth followed by reversion to mean levels of growth.

The remainder of the paper is organized as follows. The next section considers the debate on city-states, oligarchy, and growth in greater detail, followed by a section providing three motivating examples. This is followed by a description of the data that I have compiled on city autonomy and its relevant characteristics involving when cities became independent, how long they tended to maintain this independence, and when they lost their independence. In the subsequent section I then present the empirical strategy that I will use to estimate the effect of political autonomy on population growth over time, followed by the core estimation results. The following section then considers the robustness of results involving several threats to inference, followed by the conclusion to the paper.

2 City Autonomy, Oligarchy, and Growth

A common interpretation of how autonomous cities emerged in Europe is that they began as acts of usurpation of authority by groups located in a specific place engaging in a specific type of activity who sought to manage their own affairs rather than having them be managed by a feudal ruler. Max Weber referred to this more specifically as a regime of "Non-legitimate domination". Illegitimate here implies the absence of any legitimacy that a prince might have, though it is certainly the case that oligarchs in at least some city republics made attempts to legitimate their rule. If many merchant dominated cities were initially based on informal, oath-based associations, a feature that facilitated new entrants, over time the need to establish property rights amongst a larger number of individuals led to the creation of more formal institutions of rule, and Wim Blockmans (2010) suggests that this led inexorably to an oligarchic form of rule.

\[\text{Weber ([1921] 1958) and (1978). See Abrams (1978) for further discussion and interpretation of Weber's intent. Following the more recent typology of oligarchies offered by Winters (2011), I would argue that the autonomous cities considered in this category should be characterized as either "ruling" oligarchies or "civil" oligarchies.}\]

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\[\text{See, for example, the well known essay by Skinner (1987) on Siena under the Rule of the Nine (1287-1355), as well as the foundational work by Bowsky (1981).}\]
There is good reason to believe that oligarchic rule of the sort referred to above could bring economic benefits, at least in the short run. Governance of a city council by merchants and consequent insulation from the whim of an outside monarch may have made for a more stable legal environment in which to conduct business (Mokyr 1995, 1990). In addition, governance by a group of individuals meeting regularly face to face may have facilitated the sort of commitment mechanisms described by Avner Greif (2006). These political conditions may have provided an environment both for increased trade and increased innovation. Therefore, in the period after establishing its autonomy we might expect an autonomous city to grow more quickly than before and also to grow more quickly than did non-autonomous cities. This would fit in with a more general pattern suggested by DeLong and Shleifer (1993) and more recently by Acemoglu, Johnson, and Robinson (2005) whereby political institutions in medieval Europe that gave merchant oligarchs protection from sovereigns were favorable to economic growth.

But precisely because the establishment of an autonomous city involved the usurpation of authority, it also involved the creation of barriers to entry as the merchant, and later, craft guilds that dominated a city’s political institutions strictly regulated commerce and the right to enter certain professions. Henri Pirenne described this particular view of the economic effects of guild control in the following terms

The corporate spirit, henceforth freed from restrictions, showed itself in all its fullness, and worked itself to its logical conclusions. The lesser burghers, being now in a position to conduct their own administration in their own way, became uncompromising adherents of that policy of protection which was the guarantee of their survival. We see them continually drawing closer the network of industrial regulation, surrounding the preserves of each calling with higher and stronger barricades, and watching more carefully to prevent any competition from the local market (Pirenne 1915 p.163).
This negative view of the combined effect of guild control with political control has recently been emphasized by Epstein (2000) in similar terms. He distinguishes, however, between a more positive effect when guilds are kept in check by a higher political authority, such as a territorial prince, as opposed to the negative effects when a city is autonomous and the guilds control a city’s political institutions. In another contribution, Wim Blockmans (2010) also emphasizes how a territorial prince could serve as a check on guilds in this manner, restricting the creation of barriers to entry.

The above discussion suggests reasons why autonomous cities might prosper or stagnate relative to non-autonomous cities, but it says nothing about the time path for growth within an autonomous city. In fact, there are reasons to believe that in an initial phase of development, the first of the above two effects might dominate but then in later stages the second would dominate. One reason we might expect an autonomous city to first prosper and then stagnate is if we refer to the work of Mancur Olson (1982) and suggest that over time economic stagnation would have been produced by a progressive accretion of rent seeking vested interests. But it appears that in most cases, vested interests and barriers to entry were an important feature of Europe’s autonomous cities right from the start. This is inconsistent with an Olsonian account in which such vested interests and barriers to entry would emerge only gradually over time.

A more convincing reason why we might expect autonomous cities to initially prosper and subsequently stagnate can be derived from the work of Daron Acemoglu (2008). In his model of oligarchic versus democratic societies, Acemoglu suggests that oligarchies in which members of the oligarchy are themselves entrepreneurs may initially have higher rates of growth than democracies because of better protection of property rights and a lower risk of expropriation. However, if it is necessary to have "churning" in the identity of entrepreneurs to maintain a rate of economic growth, then oligarchies will eventually stagnate. He suggests that this could be the case if the entrepreneurial skill of an individual, or of a family dynasty, changes over time, necessitating new entrants. It
could also be if the entrepreneurial skill of an individual or dynasty is constant over time but comparative advantage in entrepreneurship changes over time as the type of economic activities in an economy evolves. Either of these two possibilities could clearly apply to the economies of medieval and early modern cities.

The fit between Acemoglu’s model and the empirical context I consider is not perfect. In his case the counterfactual for oligarchy is democracy. In my case the counterfactual for oligarchy is not democracy but a city that is subject to a princely overlord. But if we substitute the threat of expropriation by a prince for the possibility of redistribution voted by a democratic majority, then we see that the two contexts may not be that different in the end.\textsuperscript{11} Therefore, it is still possible to see how the predictions of his model regarding the growth trajectory over time under oligarchy could be applied to the case of an autonomous city in medieval or early modern Europe.

A further possible mechanism leading to stagnation of an oligarchic autonomous city would be for the policy preferences of an oligarchy to change over time as a result of diversification out of high risk commercial and industrial activities. The fortunes of many great merchants in autonomous European cities were made in the area of long distance trade, a high risk activity. Once a merchant had accumulated wealth in this sort of activity, there would be a logical incentive to diversify a portfolio by investing in lower risk activities, such as land rents and public debt. Michael Postan (1952 p.217) went further, suggesting that many great merchants completely divested themselves from trading activities and became rentiers, leading to what he called a "process of financial degeneration."\textsuperscript{12} Under any political regime this shifting of resources from high risk to low risk activities would have potential implications for growth. Under an oligarchic regime this might be magnified if members of an oligarchy had already divested out of high risk activities, and they therefore sought to orient a city’s policies away from those actions

\textsuperscript{11}More specifically, the outcome would be identical if one assumes a non-productive monarch who can levy a distortionary tax on subjects. The monarch would not have an incentive to establish barriers to entry. I would like to thank Daron Acemoglu for this point.

\textsuperscript{12}See also Rotz (1977) for an illustration of this phenomenon from the city of Lubeck.
most favorable to trade and innovation.

3 Three Motivating Examples

Before moving to the empirical analysis on growth in city populations, it may be useful to first use several examples to illustrate the logic of my argument regarding growth in trade and innovation under an oligarchic regime of autonomous cities, as opposed to a monarchical regime where cities lack autonomy. The first example involves differential outcomes in the textile industry in Lombardy and Tuscany during the fourteenth and fifteenth centuries. The second example involves a comparison between the textile industry in Flanders during two time periods. The third of these involves the Hanseatic League’s fourteenth century response to encroachment by other trading groups.

In his book Freedom and Growth, Stephan Epstein (2000) made use of a comparison between the evolution of the textile industry in Lombardy and Tuscany during the fourteenth century. While both of these regions during the twelfth and thirteenth centuries consisted of numerous autonomous cities, during the first decades of the fourteenth century Lombardy was transformed into a territorial principality ruled by the Visconti family in which city autonomy was essentially abolished. A similar fate would eventually befall most of Tuscany’s independent cities, although not till considerably later under the domination of the Medici. A priori neither of these two regions shared any great natural advantage over the other as the site for a prosperous textile industry. What happened in practice was that after an initial period of prosperity, the Tuscan textile industry declined relative to that of its northern neighbor. The proximate explanation Epstein offers for this divergence is that this was an industry where innovation took place when artisans could move from one city to another, and in Lombardy under the Visconti there were few restrictions on this movement, whereas in Tuscany there were very serious restrictions on movement of artisans from one locale to the next. However, Epstein also emphasizes a
more fundamental political explanation. If both Lombardy and Tuscany had craft guilds during this period, in Tuscany the guilds exercised direct political control through the councils of autonomous cities that controlled their own economic policy, whereas in Lombardy this was not the case. As an example for Tuscany, the work by Bowsky (1980 p.219-223) provides a particularly vivid illustration of the extent to which Siena’s wool guild, or Arte della Lana, succeeded in establishing firm barriers to entry into this industry. The situation in Lombardy could not have been more different. Under the Visconti, as early as 1346 Lombard towns lost the right to create such restrictions. Therefore, monarchical control was associated with lower barriers to entry.

The second motivating example to which I will refer also involves the textile industry during the fourteenth century, although in this case in Flanders, as opposed to Italy. The Flemish towns developed a textile industry even earlier than the Italian cities, supported by both locally produced wool as well as imports from England. Flanders was dominated by three principal cities: Bruges, Ghent, and Ypres, each of which had a substantial textile industry and where guild involvement in politics resulted in the establishment of very significant barriers to entry for new artisans. These three cities also constituted the main members of the Estates of Flanders, an early representative assembly. However, political autonomy for these three principal cities was not as complete as in the case of the Tuscan communes of the fourteenth century. Each city was still subject to at least nominal overlordship by the Count of Flanders. One consequence was that the effective degree of autonomy often varied depending on who exactly was count. During the initial decades of the fourteenth century the three great cities enjoyed very substantial autonomy and they used this autonomy not only to maintain barriers to entry but also to ensure that no competing producers established themselves in the smaller surrounding towns and countryside. However, after 1349 under a new Count of Flanders there was a very substantial shift in power back to the Count’s institutions and away from the guilds in

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13See Nicholas (1971) for a discussion of the Flemish case.
the autonomous cities. One consequence of this reassertion of princely authority was that Bruges, Ghent, and Ypres no longer found it possible to exercise influence over the development of the textile industry in the surrounding towns and countryside. Once again, princely control over cities led to lower barriers to entry.

A third and final motivating example to which I will refer involves the implementation of barriers to entry in trade as opposed to industrial production. As is very well known, the autonomous cities of what would eventually be called the "Hanseatic League" established a primacy over long distance commerce in Northern Europe during the Commercial Revolution of the Middle Ages. The best and most extensive survey of the league, its institutions, and its policies remains that of Dollinger (1970), and this can be supplemented with work on individual cities, such as that by Rotz (1977) on political tensions in Lubeck leading to the uprising of 1408. Dollinger suggests that during the years of League’s initial expansion, that is up to about 1350, it was relatively easy for non-Hanseatic merchants to invest in enterprises that also involved those from Hanseatic towns. However, after this date the merchants of the Hanseatic League experienced increased competition from networks of English, Dutch, and South German merchants. As Dollinger recounts, the reaction of cities within the League was to begin to restrict trading rights to merchants from Hansa towns only. In 1366 it was established that offices in a Kontor could only be held by a Hansa merchant. Then, in 1417 a ban was placed on establishing nominal citizenship of a Hansa town. Finally, in 1434 trading privileges were restricted exclusively to citizens born in a Hansa town. The effect of these numerous restrictions was clearly to protect existing traders, but numerous scholars have also seen it as one of the principal reasons for the League’s eventual stagnation.

In sum, all three of the above motivating examples suggest that if political autonomy for a city may have produced more secure property rights for trade, innovation, and investment, this also often went hand in hand with the establishment of significant barriers to entry. Moreover, princely control was actually associated with lower barriers to entry.
4 What Was an Autonomous City?

For purposes of simplicity I refer to city autonomy in this paper and in my empirical tests as if autonomy was a binary indicator. In practice, it is important to realize that the situation was considerably more complex. Autonomy was certainly a question of degree with some cities, such as Venice, having essentially complete autonomy over their affairs while with others, such as the city of Ghent, enjoying a substantial degree of autonomy for certain periods despite still being subject to a degree of princely intervention. In addition, autonomy in many cases certainly also varied according to policy domain. If one can think of the right to raise taxes, the right to regulate its own judicial and economic affairs, and the right to organize its own defence as key characteristics of an autonomous city, then some cities might have strong prerogatives in all three of these areas, some might have them in none, and some in a mix of the three. In addition to having prerogatives in at least some of the above areas, the final crucial characteristic of an autonomous city was that it had institutions for self governance, and the members of these institutions were chosen by inhabitants of the city itself and not by outside rulers. For the purposes of this paper I have defined an "autonomous city" as being one in which there is clear evidence that such institutions of self governance existed, and in addition there is also clear evidence of exercise of prerogatives in at least one of the policy areas referred to above. Below I will describe the sources used to code the dates at which city autonomy was established as well as the dates at which it ended, but it will first be useful to briefly review the history of Europe’s autonomous cities.

The historical development of Europe’s autonomous cities can be thought of in three phases. The first phase was with the reemergence of urban settlements after the Dark Ages, a phenomenon that Henri Pirenne thought to be associated with the reemergence of long distance trade but that other authors have contested, as they suggest that cities

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14 For further information see van Werveke (1963), the two collected volumes produced by the Societe Jean Bodin (1954, 1955).
actually formed because they were sites for proto-industry before engaging in long distance trade.\textsuperscript{15}

Irrespective of the sequence of events, both Pirenne and his critics are in agreement on the second phase of development which was that cities initially contained informal associations of merchants for self-protection, that these associations subsequently became formalized, and that the associations then demanded recognition of special privileges for the city from princely rulers. This was often referred to as the establishment of a commune. The communal movement occurred at a specific time in Western Europe with the first communes emerging at the very end of the eleventh century and the vast majority of communes emerging during the twelfth and thirteenth centuries, a period that is known to have been one of strong economic growth under the medieval commercial revolution. Though the institutions of governance within autonomous cities varied considerably, without doing too much violence to the evidence, it is possible to describe a relatively common pattern of governance that emerged in which there would be a broad city council that met with varying frequency as well as a smaller body composed of a group of magistrates chosen by lot, by election, or by cooptation. In addition, membership on the city council, and especially the governing body of magistrates, was limited by law to certain social groups, a feature that almost invariably reinforced the political dominance of the city’s merchant guild.

In the third phase of autonomous city development during the fourteenth century a number of cities experienced revolts in which members of craft guilds demanded greater representation on key city bodies. In a number of cases these revolts were successful in weakening at least the de jure, if not necessarily the de facto, power of a city’s merchant guild. The most important point with respect to this paper, however, is that even when these revolts did succeed, autonomous cities continued to have oligarchic regimes in which guilds held political control and established substantial barriers to entry. It is true that

\textsuperscript{15}See Pirenne (1925) and then Verhulst (1999, 1989) for the critique.
cities that lacked political autonomy also had guilds that established barriers to entry, but the key difference of course was that in an autonomous city, guild control of the economy was much more complete, precisely because the guilds also controlled the institutions of political power.

The process through which autonomous cities lost their independence was a varied one. In some cases, most notably in Italy, autonomous cities were conquered by neighboring autonomous cities. The most common pattern though was for an autonomous city to be conquered by the prince of a territorial state who sought to use the city’s riches in order to engage in warfare. This is the pattern suggested by Charles Tilly (1992) in his work as well as by Wim Blockmans in his well known article entitled "Voracious States and Obstructing Cities." However, while some authors have spoken of the period after 1500 as the age of the territorial state, it is important to recognize that while autonomous cities emerged during a particular historical period, they lost their autonomy over a course of numerous centuries. Some autonomous cities did not lose their autonomy until the period of Napoleonic conquest, or even later, as was the case with several German cities.

I have used a number of sources to record the dates at which city autonomy began and ended for each of the 169 cities in the data set. Autonomy (if it ever existed) is coded as having begun at the first date for which there is evidence that the above definition of an autonomous city is satisfied; that is there were institutions of self rule and evidence of exercise of prerogatives in at least one area of policy. Autonomy is coded as having ended when there is a clear evidence that an outside intervention put a durable end to self-rule. The ideal way to code the above dates would be to refer to extensive individual histories for each city in the data set, something that was not feasible for this project. As a

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16 More specifically, on page 243 of this article he sums up the pattern by suggesting “My central argument is that the requirements and pressures of monarchical states suffocated the metropoles of the European economy. The competition within the state system pushed all political unities toward increasing military expenditure and more extensive bureaucratic control – developments that violated the conditions favorable to early commercial capitalism.”

17 See, for example, de Lagarde (1973) on the idea of an age of the city-state and an age of the territorial state.
second best strategy, I have used several high quality reference sources that record detailed information for cities in the data set. The first of the three principal sources used was the *Dictionary of the Middle Ages* edited by Joseph Strayer, a thirteen volume work published between 1982 and 1989. The second main source was the *Lexikon des Mittelalters* a nine volume German language work that provides very detailed information on city histories. The third principal source was the Eleventh Edition of the *Encyclopedia Britannica*, a version of this popular encyclopedia that contains vastly more detailed information on medieval cities than does the contemporary edition of the work. In addition to the above three sources, I also used the work on French communes by Charles Petit-Dutaillis (1947), the information provided on Italian communes in Guiso, Sapienza, and Zingales (2009), and several further sources on individual cities.

The data set produced from the above sources inevitably contains a very substantial degree of measurement error, but it innovates on previous data sets in providing information on both when city autonomy began, as well as when it ended. The data set produced by Stasavage (2011) recorded whether a city ever became independent, but not the date at which autonomy was acquired, nor the date at which it ended. The data set produced by Bosker, Buringh, and van Zanden (2010) is more comprehensive than the current in that it covers a much broader set of cities. They adopt a somewhat different definition of city autonomy. They do not consider whether the "value" of city autonomy for growth depended on how long a city had been autonomous.¹⁸

Table 1 provides a tabulation of the number of cities that became autonomous and which lost their autonomy by historical period. This reaffirms the claim made above. The overwhelming majority of cities that succeeded in establishing their autonomy did so during the twelfth and thirteenth centuries, the height of the medieval Commercial Revolution. So, at least in terms of gaining autonomy, it does make sense to say that this was

¹⁸They create a variable "commune" that takes a value of 1 if there is indication of the presence of a local urban participative organization that decided on local urban affairs. This is a less restrictive definition of autonomy than the one that I adopt.
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<td>1100-1199</td>
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<td>1</td>
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<td>1200-1299</td>
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<td>16</td>
</tr>
<tr>
<td>1300-1399</td>
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<td>13</td>
</tr>
<tr>
<td>1400-1499</td>
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<td>2</td>
</tr>
<tr>
<td>1700-1799</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>After 1799</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 1: Tracking City Autonomy Over Time. Each entry represents a count of the number of cities that gained or lost autonomy during the period in question.

the era of the city state in European history. However, what is less commonly recognized is that if the period after 1500AD may have been associated with increasing dominance of large territorial states, a number of cities succeeded in retaining their autonomy for a considerable amount of time. Based on the evidence in Table 1, the hazard rate for a city losing its autonomy was essentially flat and was for the most part not higher in some periods than in others.

As a further step, we can also consider characteristics of cities that became autonomous, as opposed to those that did not. Table 2 lists mean values, as well as results of difference in means tests, for five different city characteristics distinguishing between the 81 cities in the sample that became autonomous at least for some time, as opposed to the 88 cities that never became autonomous. The variables included are whether the city was an oceanic port, whether it was located on a navigable river, whether it was the seat of a bishop in the year 1100, whether it had been a significant Roman settlement, and finally how distant the city was from the Meersen line, which was the longitudinal line agreed to at Meersen in 870AD that split the former Carolingian Empire into two parts.\textsuperscript{19} In work elsewhere I have argued, with supporting statistical evidence, that cities located near to this line in the center of Europe subsequently found themselves in a zone of politi-

\textsuperscript{19}Full definitions and sources for these variables are offered in the estimation results section.
cal fragmentation where it was easier to establish independence from territorial princes.\(^{20}\)

This tendency for autonomous cities to be clustered in a specific geographic location may also reflect a phenomenon of spatial correlation and interdependence suggested by Rokkan (1975, 1973). As can be seen in Table 2, the only two variables for which we can see a significant difference between autonomous and non-autonomous cities are the presence of a bishop and distance from the Meersen partition line.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Ever</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanic Port</td>
<td>0.18</td>
<td>0.23</td>
<td>p=0.40</td>
</tr>
<tr>
<td>Riverine Port</td>
<td>0.28</td>
<td>0.32</td>
<td>p=0.60</td>
</tr>
<tr>
<td>Bishop’s Seat</td>
<td>0.49</td>
<td>0.68</td>
<td>p=0.01</td>
</tr>
<tr>
<td>Roman Settlement</td>
<td>0.45</td>
<td>0.56</td>
<td>p=0.19</td>
</tr>
<tr>
<td>Meersen Distance (km)</td>
<td>580</td>
<td>290</td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2: Characteristics of Cities That Became Autonomous At Least For Some Time and Those That Did Not. The variable "Meersen Distance" refers to the distance from the partition line of the Treaty of Meersen signed in 870AD. T-test refers to p-value from a difference in means test.

<table>
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<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanic Port</td>
<td>14.3</td>
<td>(53.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverine Port</td>
<td>101.9</td>
<td>(38.9)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bishop’s Seat</td>
<td>-51.6</td>
<td>(40.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roman Settlement</td>
<td>-26.8</td>
<td>(39.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meersen Distance (km)</td>
<td>-0.229</td>
<td>(.114)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: OLS Estimates of Duration of Autonomy. Dependent variable is the number of years that a city remained autonomous. N=81 The variable "Meersen Distance" refers to the distance from the partition line of the Treaty of Meersen signed in 870AD. Robust standard errors in parentheses.

\(^{20}\)See Stasavage (2011, ch.5)
We can also consider several statistics on how long cities tended to remain autonomous once they gained this privilege. The sample median for duration of autonomy is 317 years (mean of 336 years). Within the group of 81 cities that became autonomous, a quarter of the cities lost their autonomy by the end of the second century of autonomy, but a quarter were able to maintain their autonomy for more than 500 years. In other words, their experience was quite varied. If we consider the factors correlated with duration of autonomy, we see that among cities that became independent, those closer to the Meersen line also tended to stay independent for substantially longer. Table 3 reports the results of a set of bivariate OLS regressions where the sample is the 81 cities that became autonomous at least for a time, and the dependent variable is the number of years of autonomy. As can be seen, only location on a navigable river and proximity to the Meersen line are significantly correlated with the duration of autonomy.

As a final step, before proceeding with the empirics it is useful to consider how the strategy I adopted for coding city autonomy might lead to any bias in my estimates of the effect of city autonomy on population growth. There are a number of cases in which information on a city was not sufficient to code it as being autonomous, and so I coded it as not being autonomous, but this may simply reflect a lack of information about a city that was truly autonomous. If this is the case, if there is a true effect of city autonomy on growth, then this form of measurement error would bias me in favor of finding a null result, a result that I do indeed find for the average difference between autonomous and non-autonomous cities in my pooled specifications. However, this form of measurement error would presumably also bias me against finding that autonomous cities at any point in their history were any different from non-autonomous cities. In other words, it would make me less likely to find any evidence of a growth pattern whereby autonomous cities first grew quickly and subsequently more slowly than non-autonomous cities. In contrast, there is no particular reason to think that this form of measurement error would lead me to find evidence in favor of such a growth pattern. The principal reason why I might find
such a growth pattern, even if one did not exist, is if there is in fact a positive average effect of city autonomy on growth, but I have inaccurately coded a number of cities as remaining autonomous long after they had in fact lost their autonomy.

5 Empirical Strategy

The primary objective of this paper is to investigate whether and when autonomous cities grew more quickly than non-autonomous cities. One empirical approach to address this would be to proceed as follows. If there are some reasons to believe that political autonomy for a city would be good for growth and other reasons to believe that it would be bad for growth, then we could attempt to investigate which one of these effects dominates by examining whether autonomous cities grew more quickly on average. In a number of political economy papers authors have used rates of urbanization or city size as proxies for economic growth during the medieval and early modern eras, even if it is recognized that growth of the urban population does not necessarily equate with economic growth more generally or growth in per capita income more specifically. This choice is dictated by the absence of better proxies for economic growth, at least if one is going to conduct a broad study across multiple regions. This approach is also facilitated by the existence of the data set compiled by Bairoch, Batou, and Chevre (1988). In a recent paper, Bosker, Buringh, and van Zanden (2010) build on the Bairoch data set to provide the first broad empirical assessment of this question. Using a definition of city autonomy less restrictive than that in this paper, they find that autonomous cities were on average 12% larger than cities that lacked political autonomy (their dependent variable is population rather than growth rates). They do not consider whether the effect of city autonomy depended on how long a city had been autonomous.

For my own investigation I ask not only whether autonomous cities grew more quickly on average, but also whether their pattern of growth followed a particular trend over time.
I have proposed that we can expect autonomous cities to have initially grown more quickly than non-autonomous cities but that eventually this situation would be expected to reverse itself. To investigate this possibility, I will estimate an equation in which the effect of city autonomy on population growth is allowed to vary over time in several different ways. The general equation I seek to estimate is as follows

\[
growth_{it} = \alpha + \beta (Autonomy)_{it} + \gamma (Autonomy)_{it} \cdot F(Years\,Autonomous)_{it} + \zeta pop_{it} + \mu_t + \eta_i + \varepsilon_{it}
\]

(1)

In this equation the rate of population growth in percentage terms between time \(t\) and time \(t+1\), \(\frac{\text{pop}_{t+1} - \text{pop}_t}{\text{pop}_t}\) is estimated as a function of the following variables all taken at time \(t\).\(^{21}\) Each period of time represents a century with the year 1000AD as the beginning point in the sample and the year 1800 as the end point.\(^{22}\) Missing values in the data set were linearly interpolated, but no values were extrapolated. Population growth is modeled first as a function of political autonomy. The variable \(Autonomy\) takes a value between zero and one representing the fraction of the period for which a city was politically autonomous. I consider three alternatives for estimating equation (1).

1. In the first the effect of \(Autonomy\) is not allowed to vary over time, and so the difference between autonomous and non-autonomous cities is captured only by the \(\beta\) coefficient.

2. In the second alternative the effect of political autonomy is modeled as a function of \(\beta\) as well as \(\gamma\) in which the function \(F()\) takes a value of one if \(Years\,Autonomous<\)

\(^{21}\)I also repeated all estimations in the paper using log growth=ln(pop_{t+1}/pop_t) as the depending variable. The substantive results of the estimates reported in Tables 3, 4, and 5 were the same when using this alternative dependent variable.

\(^{22}\)In fact, the Bairoch data reports populations at century frequencies from 1000AD to 1700 (skipping the year 1100) after which populations are reported at half century frequencies up until 1850. In order to have each time period in my estimation be of the same length, I have omitted the Bairoch data for the years 1750 and 1850. I also considered the alternative of conducting an estimation based on century long periods to 1700 and then half century periods after that point, while adjusting the population growth rates for the half centuries by a factor of 2. The results were not substantively different from those that I report here.
100 and zero otherwise.\footnote{The variable Years Autonomous was constructed by first taking the data set with each time period representing a century and artificially expanding it into an annual data set. Based on the dates at which autonomy was established and when it was lost, I then constructed the variable Years Autonomous that had an annual frequency. The final step in the procedure was then to collapse the data set back into century time periods. What Years Autonomous therefore represents is the average value for this underlying variable across the century. So, for example, if a city became autonomous in the first year of a century, and it remained autonomous for the entire century, then the corresponding value for Years Autonomous would be 50.}

3. In the third alternative the effect of city autonomy is modeled as a function of $\beta$, in addition to $\gamma_1$ in which $F()$ simply represents Years Autonomous and $\gamma_2$ in which $F()$ represents Years Autonomous squared.

In addition to estimating the rate of population growth as a function of Autonomy and Years Autonomous, in some specifications I also include the level of a city’s population at time $t$ in order to capture the effect identified by Dittmar (2011) whereby if there were constraints on the ability of obtaining foodstuffs for the population, then as a city grew in size we might expect it to grow more slowly. All specifications also include a full set of time period dummies, and in some specifications I control for city-specific fixed effects, or as an alternative, I include several control variables designed to capture fixed features of a city as described below. Finally, in all specifications I cluster standard errors at the city level to take account of any within city correlation in the error term that might bias the estimates.

The specifications above that include city fixed effects are identified under the standard assumptions of a difference in differences design. The estimates of $\beta$ and $\gamma$ are robust to the presence of unobserved heterogeneity that is constant within a time period. They are also robust to the presence of unobserved heterogeneity that is constant for each city. Yet there still remain a number of reasons why the estimates of $\beta$ and $\gamma$ might be biased, and following the presentation of the main estimation results, I will consider in particular the possibility that the estimates are biased by the presence of an underlying growth trend.
6 Estimation Results

Before considering the core estimation results of the paper, it is first useful to review some descriptive statistics regarding rates of population growth in autonomous and non-autonomous cities. The mean for the growth rate across the entire sample is 28 percentage points with a median of 12.5 percentage points, and a standard deviation of 82. The mean growth rate for periods in which a city was autonomous for at least part of the century is 27.1 percentage points, as opposed to 28.4 percentage points for cities that were not autonomous at all during the century. So, at first glance there is very little evidence of a difference in growth rates between autonomous and non-autonomous cities.

When we consider the sample of autonomous cities and break it down by considering how long a city has been autonomous, we see a somewhat different story. The evidence in Table 4 suggests that as long as the value for Years Autonomous is less than 200, then city-states enjoyed higher growth rates than did non-autonomous cities, but after this point they experienced lower growth rates than the non-autonomous cities. The descriptive statistics in Table 4 do not of course control for unobserved period-specific effects, and this is an important consideration given that we know that most autonomous cities gained their autonomy during a specific historical period, as shown in Table 1. They also of course do not control for city fixed effects. Finally, these statistics take no account of the fact that the vast majority of city-states became independent during a particular historical period, and it may have been the case that the broader European environment was favorable to autonomous city growth in this earlier period, but in later centuries external conditions changed. All of these possibilities will be considered below.

Table 5 reports OLS estimates of city population growth with twelve different specifications considered. In the first six specifications the effect of city autonomy is modelled as being constant over time. In the remaining six specifications a variable is added that allows for distinguishing between the effect of autonomy when Years Autonomous < 100
### Table 4: Population Growth Rates for Autonomous and Non-Autonomous Cities

This is based on the sample of 169 cities with time periods running from 1000 to 1800. Growth is measured in percentage growth.

<table>
<thead>
<tr>
<th>Category</th>
<th>Obs</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not autonomous</td>
<td>742</td>
<td>28.4</td>
<td>12.8</td>
<td>85.0</td>
</tr>
<tr>
<td>Autonomous for at least part of century</td>
<td>278</td>
<td>27.1</td>
<td>9.1</td>
<td>75.6</td>
</tr>
<tr>
<td>Years Autonomous &lt; 100</td>
<td>65</td>
<td>28</td>
<td>20</td>
<td>74.9</td>
</tr>
<tr>
<td>Years Autonomous between 100 and 200</td>
<td>68</td>
<td>42.0</td>
<td>11.2</td>
<td>100.5</td>
</tr>
<tr>
<td>Years Autonomous between 200 and 300</td>
<td>54</td>
<td>15.3</td>
<td>-0.89</td>
<td>63.8</td>
</tr>
<tr>
<td>Years Autonomous between 300 and 400 years</td>
<td>33</td>
<td>17.5</td>
<td>0</td>
<td>62.9</td>
</tr>
<tr>
<td>Years Autonomous between 400 and 500 years</td>
<td>24</td>
<td>7.4</td>
<td>0</td>
<td>38.7</td>
</tr>
</tbody>
</table>
and the effect of autonomy subsequent to this date. Some specifications include a variable for the city’s initial population at the beginning of the period.\footnote{An alternative specification whereby Initial Population was interacted with a dummy for periods prior to 1500 did not result in different substantive conclusions regarding city autonomy. One might prefer this alternative specification because Dittmar (2011) finds that initial population is correlated with the growth rate for periods prior to 1500 but not afterwards, presumably because of improvements in transportation.} Finally, I control for time-constant confounders at the city level using two alternative strategies: (1) a fixed effects specification, (2) a specification that adds four variables for time invariant features of a city that might have been expected to have an effect on both population growth and the likelihood of becoming autonomous. The first two of these are dummy variables for cities that were oceanic ports or which were located on navigable rivers (with navigability proxied for by including all cities on a river the width of which exceeded fifty meters).\footnote{River width was measured using Google Earth.} I then also included a dummy variable for whether a city was the seat of a bishop at the outset of the period considered here. Guiso, Sapienza, and Zingales (2009) have suggested that Italian cities that had bishops were more likely to become independent communes. However, in Germany it was often the case that to gain its autonomy, a city had to establish independence from a bishop. The fourth and final control variable is a dummy variable for all cities that were significant Roman settlements.\footnote{This is a dummy variable taking a value of 1 if the city is listed (under its Roman name) in the Princeton Encyclopedia of Classical Sites.} During the Roman Empire, it was common for towns to be given the status of civitas which implied a substantial degree of self-government. It is plausible that such cities may have found it easier to re-establish their autonomy during the Middle Ages, and Roman heritage may also have had implications for economic growth.

Considering the first six specifications in Table 5, in the OLS estimates there is no evidence that on average, autonomous cities had a different rate of population growth than did cities that lacked autonomy. Moreover, in the fixed effects estimates the coefficient on Autonomous is actually negative, of sizeable magnitude, and statistically significant. On the face of it then, there is no evidence in columns (1) through (6) that autonomous
cities on average grew more quickly than non-autonomous cities.

Consider next the results of the estimates in columns (6) through (12). In the case of a city that became autonomous in the first year of a period, the estimated "effect" of autonomy is given by the sum of the coefficients on the Autonomous and Autonomous·(Years Autonomous<100) variables. In the case of a city that had been autonomous for at least 100 years at the beginning of the period, the estimated effect of autonomy is given only by the coefficient on Autonomous. Across the six specifications we see that the coefficient on Autonomous·(Years Autonomous<100) is positive, large in magnitude, and statistically significant. In the OLS specifications the coefficient on Autonomous is negative but imprecisely estimated. In the fixed effects specifications the coefficient on Autonomous is negative and statistically significant. Based on the estimate in columns (11) and (12), a city that became independent in the first year of the period and which remained autonomous for the entire period would be expected to experience a rate of population growth of either 27 or 15 percentage points higher than would other cities. In contrast, a city that had been autonomous for at least one hundred years at the beginning of the century and which remained autonomous for the entire period would be expected to grow at a rate of either 8 or 24 percentage points lower than would other cities.

A further feature of all specifications in Table 5, and in fact all specifications in this paper, is the relatively low values for the r-squared statistics. As the Bairoch population data is composed of population estimates from heterogeneous sources that are known to vary in quality, the low values for this goodness of fit statistic may primarily reflect measurement error in the dependent variable. In any case, the low values for the r-squared statistics are not a result of the choice to use percentage growth rather than log growth \( \ln \left( \frac{\text{pop}_t}{\text{pop}_{t-1}} + 1 \right) \) as dependent variable. When log growth was used as an alternative dependent variable overall goodness of fit of the estimates did not improve.

As a next step, Table 6 reports the results of a more flexible specification in which the effect of city autonomy is modelled as a function of both an intercept shift represented
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<th>(12)</th>
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</thead>
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<tr>
<td></td>
<td>OLS</td>
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<td>OLS</td>
<td>OLS</td>
<td>FE</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
<td>OLS</td>
</tr>
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<td><strong>Autonomous</strong></td>
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<td>-22.9</td>
<td>-1.07</td>
<td>-3.25</td>
<td>-17.7</td>
<td>-6.56</td>
<td>-8.21</td>
<td>-30.1</td>
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<td></td>
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<td>(6.10)</td>
<td>(10.3)</td>
<td>(7.10)</td>
<td>(6.49)</td>
<td>(11.7)</td>
</tr>
<tr>
<td><strong>Autonomous- (Years Autonomous &lt; 100)</strong></td>
<td>39.5</td>
<td>39.4</td>
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<td>35.0</td>
<td>35.1</td>
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<td>(15.2)</td>
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<td>(15.2)</td>
<td>(15.1)</td>
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<td>-.657</td>
<td>-.261</td>
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<td>-.641</td>
<td>-.261</td>
<td>-.304</td>
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<td>(.116)</td>
<td>(.177)</td>
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<td></td>
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<td>(.169)</td>
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<td>29.5</td>
<td>34.4</td>
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<td></td>
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<td>(9.7)</td>
<td>(9.0)</td>
<td>(9.6)</td>
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<tr>
<td><strong>Riverine Port</strong></td>
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<tr>
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<td>(4.40)</td>
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<td>(4.41)</td>
<td>(4.56)</td>
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<td><strong>Bishop's Seat</strong></td>
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<td>-15.8</td>
<td>-12.1</td>
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<td>(5.28)</td>
<td>(5.5)</td>
<td>(5.3)</td>
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<tr>
<td><strong>Roman settlement</strong></td>
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<td>5.88</td>
<td>5.27</td>
<td>6.07</td>
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<td>(4.61)</td>
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<td>0.05</td>
<td>0.08</td>
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<td>0.06</td>
<td>0.05</td>
<td>0.08</td>
<td>0.11</td>
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</tr>
</tbody>
</table>

Table 5: OLS and Fixed Effects Estimates for City Population Growth. Dependent Variable in all specifications is the percentage change in city population. All specifications include time period dummies and all standard errors are clustered by city.
Table 6: Pooled OLS and Fixed Effects Estimates for City Population Growth: Quadratic Trend Specification. Dependent Variable in all specifications is the percentage change in city population. All specifications include time period dummies and all standard errors are clustered by city.
by the coefficient on Autonomous, a linear trend represented by the coefficient on \textit{Years Autonomous}, and a quadratic trend represented by the coefficient on \textit{Years Autonomous} squared. In Table 6 if a city became autonomous at the beginning of a century and remained autonomous for the entire century, then the estimated "effect" of autonomy would be given by $\beta + \gamma_1 50 + \gamma_2 50^2$, since 50 would be the average value for years independent across the century. The estimation results from the OLS and Fixed Effects specifications are clear. In all but one case, all three autonomy terms are statistically significant, and in most cases highly so.

Now take the OLS estimate in column (5) and consider what inference we would draw if we applied these estimates to an annual data set in which we took the sum of growth rates over one hundred years. During its first century of autonomy, an autonomous city would be expected to have its population increase by 23.9 percentage points more than would a non-autonomous city. But according to these same estimates, in its second century of independence, an autonomous city would be expected to have its population increase by only 0.9 percentage points more than a non-autonomous city. The fixed effects estimate in column (6) suggests a similar initial growth rate for an autonomous city as compared to a non-autonomous city. However, it also suggests a more rapid decline in this rate of growth. Based on column (6), during its first century of independence, an autonomous city could expect to have its population increase by 16.5 percentage points more than a non-autonomous city. In its second century of independence, however, an autonomous city would grow by 9 percentage points less than a non-autonomous city. If we considered the estimates as if they were being applied to annual data, then based on the OLS estimate in column (5) an autonomous city would begin to grow more slowly than a non-autonomous city after 174 years of autonomy. The fixed effects estimate in column (6) suggests that the autonomy "effect" would become negative after 110 years.\footnote{In both of these sets of specifications the positive coefficient on the \textit{(Years Autonomous)} squared variable implies that an autonomous city that survived for sufficiently long would be estimated to eventually again begin to grow more quickly than a non-autonomous city. However, the point of inflection is well beyond that observed for any city in the sample.}
In addition to the above specifications, I also considered a fixed effects specification in which the fixed control variables (oceanic, riverine, bishop, roman) were interacted with time period dummies. The results for my autonomy variables were very similar, and none of the coefficients on these interaction terms was statistically significant.

To summarize, in this section I have presented three types of evidence to suggest that autonomous cities initially grew more quickly than did cities subject to princely rule, but this situation eventually reversed itself. First, simple descriptive statistics suggest that autonomous cities in the early phase of their independence grew more quickly than non-autonomous cities, but that subsequently this pattern reversed itself. Next, in Pooled OLS regressions and Fixed Effects regressions, both of which control for common time period effects, we see no indication that autonomous cities on average grew either more or less quickly than did other cities. Finally, I have explored several different ways of estimating an effect of city autonomy that is allowed to vary over time. The results strongly suggest that autonomous cities had an initial burst of growth followed by much slower growth in subsequent centuries. One final caveat to the above conclusions is that we should of course remember that the above conclusions apply to population growth and that, as is common in the literature for this period, population growth is being used as a proxy for growth in the size of an economy. I have not directly demonstrated that autonomous cities initially saw an expansion of trade or innovation relative to non-autonomous cities.

7 Robustness

Though the estimation results reported in the previous section control for unobserved time period effects as well as unobserved heterogeneity at the city level, there remain several important reasons why we might still be cautious about interpreting them as reflecting a causal effect of city autonomy on growth. Here I will consider five such possibilities. The first is that rapid population growth actually preceded political autonomy, and it was
this factor that permitted a city to become independent. Continuing growth in the initial phase of a city’s autonomy then may have simply reflected this underlying trend, and not a causal effect of autonomy. The second possibility involves contemporaneous time varying unobservables leading to a pattern of mean reversion in the data. In particular, the observed pattern of city growth may simply be attributable to patterns of leadership turnover. The third possibility I consider is that the declining growth rate of autonomous cities reflects the fact that they emerged at a particular point in time and that their declining growth rates are attributable to changes in the external environment they faced, and not to their institutional structure. The fourth possibility involves non-classical measurement error in the growth variable, and the final possibility involves spatial correlation in city growth rates.

7.1 Placebo Test for Pre-Autonomy Growth

I consider the possibility that rapid growth for autonomous cities reflected an underlying trend by conducting a variant of a placebo test. Taking the specifications in Table 6, I re-coded each of the three autonomy variables by setting a placebo date for the establishment of autonomy equivalent to 100 years prior to the actual date. I then re-estimated each of the six specifications using these recoded variables. As can be seen in Table 7, the results are fairly unambiguous. In only two of the six specifications are any of the autonomy terms statistically significant and the magnitude of the Autonomy constant term is much smaller than in the Table 6 results. The exceptions here are the linear trend terms in the fixed effects specifications, but though these are statistically significant, they are actually considerably smaller in magnitude when compared with the Table 6 results. This is strong evidence that the fact autonomous cities grew more quickly than non-autonomous cities does not reflect an underlying trend that commenced prior to the establishment of autonomy. The possible implication then is that cities were able to establish their political autonomy not because of a strong period of prior growth, but for idiosyncratic
reasons such as geographic isolation from the capitals of princely rulers. As I have noted above, there is robust evidence that the manner in which the Carolingian Empire fragmented made it easier for some cities to subsequently establish their autonomy. This interpretation is also supported by the difference in means and regression tests in Tables 2 & 3.

7.2 Contemporaneous Time-Varying Unobservables

I have proposed a causal mechanism that might explain why autonomous cities at first grew more quickly than other cities and subsequently more slowly. A further robustness issue to consider is whether my results might be biased by the presence of contemporaneous time-varying unobservables that lead to a pattern of mean reversion in growth rates for autonomous cities. For example, it might be the case that when a particularly effective leader or leadership assumes control of a city, they would seek to simultaneously establish autonomy and also take actions favorable to growth. If a current leader or leadership is particularly competent, in expectations a subsequent leadership would be less competent, creating the possibility of mean reversion in population growth rates driven by nothing other than leader turnover. In this case I might find a pattern whereby autonomous cities initially grew quickly and then more slowly but for reasons that have nothing to do with the effect of autonomy itself.

One way to rule out the above possibility could be to identify a suitable instrumental variable for city autonomy, but this is not an easy task. As shown in a previous section, proximity with the Meersen partition line established at the end of the Carolingian Empire is a very strong predictor of city autonomy as well as its duration. However, my estimates include multiple endogenous autonomy variables, so the model cannot be identified with a single instrument. Moreover, proximity to the Meersen line is likely to be correlated with multiple factors that might influence economic growth, and so it is very uncertain that the exclusion restriction for this instrument would be satisfied. Both of these problems
Table 7: Placebo Test using OLS and Fixed Effects Estimates for City Population Growth. Dependent Variable in all specifications is the percentage change in city population. All autonomy variables are recoded as if city autonomy began 100 years prior to the actual date. All specifications include time period dummies and all standard errors are clustered by city.
could potentially be solved by instrumenting with the Meersen distance interacted with some function of time, or alternatively with a set of period dummies. Unfortunately, this instrumenting strategy resulted in very imprecise estimates.

If the possibility of time-varying unobservables as confounders cannot be ruled out by econometric means, there may still be other reasons to believe that they are unlikely to be creating bias in my estimates. The reason for this is that if my estimates show a pattern whereby autonomous cities first grew more quickly than others, with a subsequent decline in this growth advantage, they also show that a little more than a century after establishing autonomy (110 years according to the fixed effects estimates), an autonomous city would actually be expected to grow more slowly than a non-autonomous city. Moreover, we know that among those cities that did become autonomous, over 80% remained autonomous for more than 110 years, so this pattern is actually common in the sample. In the case of mean reversion being explained by leadership turnover, this would then imply that a particularly competent leadership would on average be expected to be followed by a particularly incompetent leadership. One would need to provide a theoretical reason for such an expectation as standard properties of mean reversion could not account for it. More generally, the fact that autonomous cities eventually grew substantially more slowly than non-autonomous cities suggests that only a substantially more restricted set of time-varying unobservables could possibly be producing the observed pattern in the data.\textsuperscript{28}

\textsuperscript{28}It is also worth noting that in addition to the above, I also investigated the general degree of serial correlation in the residuals of my regression specifications. I did this using specifications (6) and (7) in Table 6. In specification (6) the regression of the current residual on the lagged residual resulted in a statistically significant and positive coefficient, albeit one that was small in magnitude (0.05) and the r-squared for this regression was extremely low (0.005). In other words, the errors appear to be very close to a white noise process. Not surprisingly given these results, when I re-estimated specification (6) including a lagged dependent variable, the coefficient on the lagged dependent variable was not statistically significant. As far as specification (7) was concerned (which includes city fixed effects) there was again a statistically significant correlation between current and lagged residuals, and in this case with a negative coefficient of -0.09, but the r-squared from this regression was again quite low (0.015). Re-estimation of specification (7) with a lagged dependent variable resulted in a coefficient on the lagged dependent variable that was not statistically significant.
7.3 External Conditions as Explanation for the Growth Trend

A third threat to inference that I consider involves the possibility that the observed growth trend for autonomous cities is attributable to changing external conditions, and not their political institutions. This possibility exists because, as was shown above, most cities that established their autonomy did so at a specific moment in time. A number of authors have suggested that the external environment in Europe prior to 1500 was favorable to city-states developing and prospering whereas after 1500, Europe shifted into a new age of the "territorial" state. This is an empirical observation rather than a theoretical explanation. One theory for this shift refers to the way in which changes in military technology after 1500 led to their being greater fixed costs in defense provision, and therefore an increase in the optimal size of states.\(^{29}\)

I considered several possible tests to determine whether the results from Table 6 are attributable to a changing external environment for city-states, as opposed to the fact that oligarchy provided for fast initial growth followed by subsequent stagnation. These consisted of allowing the $\beta$ coefficient in equation (1) to vary over time. As a first test, I estimated the following equation with Autonomy interacted with a dummy variable 1500 for periods beginning in 1500.

\[
growth_{it} = \alpha + \beta_1(Autonomy)_{it} + \beta_2(Autonomy \cdot 1500)_{it} \\
+ \gamma_1(Years\ Autonomous)_{it} + \gamma_2(Years\ Autonomous)^2_{it} + \zeta pop_{it} + \mu_i + \eta_t + \varepsilon_{it} \tag{2}
\]

If the growth trend observed in the Table 5 results is attributable to the fact that autonomous cities after 1500AD experienced slower population growth, then we should expect to see that the $\beta_2$ coefficient is negative and that the $\gamma_1$ coefficient on the linear time trend term should no longer be negative. In fact, the $\beta_2$ coefficient was positive across

\[^{29}\text{See Bean (1973).}\]
the six specifications, and it was sometimes statistically significant. In addition, the coefficient on the linear time trend for Years Autonomous remained negative, statistically significant, and of a comparable magnitude to that observed in the Table 6 specifications. This is strong evidence that my results regarding the growth trend for autonomous cities are not driven principally by the fact that cities became autonomous at a particular point in time during European history. As a further test, I also considered a more flexible specification than that used in equation (2) by interacting the Autonomy term with a set of period dummies. There was no evidence in this specification that later periods were associated with lower rates of growth for autonomous cities, although it was also the case that most of the coefficients in this specification were not statistically significant.

7.4 Measurement Error in the Dependent Variable

I have already referred to the issue of measurement error in the population growth rates used in this paper. The Bairoch, Batou, and Chevre (1988) data base consists for the most part of individual observations from a plethora of different sources, with individual values often consisting of educated guesses. In other words, we should expect there to be very considerable measurement error in the dependent variable for my population growth regressions. Beyond this, we might be concerned about bias in my estimates due to two specific forms of non-classical measurement error in the dependent variable. A first possibility is that errors in population figures are larger for earlier periods where written sources are few and far between. A second possibility is that errors in population figures are larger for cities with smaller populations. The reason for this would be that many of the sources used by Bairoch, Batou, and Chevre appear to round population figures to the nearest five thousand. This would imply a larger degree of induced error for cities with smaller populations.

Both of the above possibilities may be controlled for to some extent by the fact that my specifications include a full set of time period dummies as well as the initial level of
population as an independent variable. In order to consider this issue further I examined whether the squared residuals from my core specifications appeared to have been correlated with time. This was not the case, suggesting that one should not be concerned about this particular source of bias. However, there were clear indications that the squared residuals from the regressions were negatively correlated with the initial level of city population. Given this, to further consider the robustness of my results I then re-estimated specifications (6) and (7) from Table 6 using a maximum likelihood routine for heteroskedastic regression in which the error variance was modelled as a function of the initial population in each period as well as the square of the initial population. In both cases the results continued to suggest a pattern for autonomous city growth very similar to that observed in the Table 6 estimates.

7.5 Spatial Correlation

It is well known that growth in groups of cities may tend to exhibit patterns of spatial correlation. In the case of medieval and early modern Europe, it is of course known that urbanization initially advanced most quickly in two clusters centered around northern Italy and the Low Countries. Failure to take account of any spatial correlation in the residuals of my regression estimates could result in biased estimates of the standard errors. The form of spatial dependence in city growth rates could potentially be quite complex, as there are plausible reasons for growth in a given city to be either positively or negatively correlated with that of its neighbors. To take account of the potential effect of spatial dependence, I pursued two approaches.

The first approach was to directly test for spatial correlation of errors using a test appropriate for panel data proposed by Pesaran (2004). This is a test based on averages of pairwise correlation coefficients of regression residuals. Importantly, it is also a test that does not require a priori specification of a spatial weighting matrix. This is ideal for the task at hand, as it is not obvious ex ante what the most appropriate spatial
weighting matrix for European cities would be. Based on this test, in each of the fixed effects specifications in Table 6 the test statistic indicated that we could not reject the null hypothesis of no spatial correlation. Interestingly, when I repeated the test while removing the three autonomy variables from the regression specifications, the test statistic indicated that we could no longer reject the null of no spatial correlation. It would therefore appear that any spatial correlation in growth rates is dealt with by controlling for city autonomy, and the latter phenomenon may in fact have been spatially correlated. Further tests in which I regressed Autonomy on a set of city dummies and then performed the Pesaran (2004) test suggested that there is in fact substantial spatial correlation in this variable, a fact that is also apparent from the strong correlation of city autonomy with distance from the Meersen partition line. It should also be noted that while the test results suggest that once city autonomy is controlled for, there is no spatial correlation in population growth rates, this in no way contradicts the existing understanding that large cities first emerged in clusters. Application of the Pesaran (2004) test to city population sizes in levels suggests that there is indeed very substantial spatial correlation involved.30

The second approach I pursued for considering spatial correlation was to reestimate the fixed effects specifications from Table 6 while using the standard errors first proposed by Driscoll and Kraay (1998) that are robust to spatial dependence in the residuals and which do not require prior specification of a spatial weighting matrix. These reestimates produced standard errors that were very similar to the standard errors reported in Table 6. This is further evidence that my results are not biased by the failure to take account of spatial dependence in the data.

8 Conclusion

The history of Europe’s autonomous cities provides us with an important opportunity to examine the implications of political oligarchy for economic growth, a question that is

30A fact that is extensively explored in the ongoing work of Abramson and Boix (2012).
every bit as relevant in parts of today’s world as it was in medieval and early modern Europe. Europe’s autonomous cities have long been seen as one of a set of political institutions, along with national representative assemblies, that were distinct from the institutions found in other world regions and which may have helped lead to Europe’s economic rise. At the same time, it has also long been recognized that the policies adopted by the merchant oligarchs controlling autonomous cities involved the applications of barriers to entry into markets and professions, something that may have stifled trade, innovation, and therefore growth. Following recent theoretical work, I have examined whether the establishment of political autonomy for a city may have initially led to a high rate of growth followed by a subsequent period of stagnation as barriers to entry prevented the entry of entrepreneurs. Based on a sample of 169 cities, I have presented several forms of evidence to support this proposition, using growth in population as a proxy for economic growth. The first type of evidence came in the form of simple descriptive statistics. The second comes from both pooled OLS regressions with time period dummies as well as fixed effects regressions with time period dummies. These suggest that once we control for several observable city characteristics as well as common time period effects and unobserved city effects, we continue to observe that autonomous cities initially grew more quickly than did non-autonomous cities, but sometime during their second century of autonomy this pattern reversed itself. We can be confident that the observed results do not simply reflect the presence of an underlying growth trend in which growth led to autonomy, or that the growth trend I observe is due above all to changing external conditions.

The principal implication of my results is to provide support for the notion that oligarchy is a double edged sword when it comes to economic development. In addition, my results may also serve as a corrective to a common view of European history. Europe’s representative institutions, of which city state assemblies were a prime example, may have had a more ambiguous effect on Europe’s economic rise than is commonly believed. A
representative assembly could help secure property rights, but it could also entrench the power of an oligarchy that would ultimately pursue policies unfavorable to growth.
References


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