Long-term Persistence[1]

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Abstract

We study whether historical shocks can generate long term persistence in development by fostering a better culture. We show that Italian cities that experienced self-government in the Middle Ages have higher level of civic capital today than similar cities that did not. Not only the occurrence of a free city state, but also the length of this experience and its intensity seems to impact civic capital positively.

Although history holds examples of spectacular catch-ups, relative national levels of economic development tend to be quite persistent over time. The per capita income of European countries at the end of the twentieth century had a 0.56 correlation with their per capita income at the beginning of the century. Even over the 300-year span from the eighteenth to the twenty-first century the correlation is 0.23.[2] This correlation persists despite the massive destruction of physical and human capital in Europe's recurrent warfare. Why are these differences in economic development so persistent?

In an influential paper, Acemoglu et al. (2001) attribute the phenomenon to the long-lasting effect of formal institutions, such as protection of property rights and limitations on the power of the executive. Ingrained into a country's legal rules, these institutions tend to endure over the centuries. Consistent with this view, they find that countries inhospitable to white men still suffer of low property rights protection and excessive executive power because the European colonizers, who did not intend to stay, designed legal institutions aimed at extracting rather than creating value.

This influential explanation faces three objections. First, how can we differentiate the role of legal institutions from that of the culture and the human capital that the colonizers brought to the colonies (Glaeser et al. 2004)?   Second, if persistence depends on legal institutions, why should these be so persistent themselves? After all, they are designed to be changeable. Even constitutions, the least flexible of legal institutions, are often changed: Argentina, which has had four different constitutions in the last 60 years, is a case in point. Finally, can we completely reject the hypothesis that persistence depends on geographical factors?[3]

An alternative interpretation, going back to Putnam et al. (1993), attributes the persistence of economic development to culture. Williamson (2000) claims that culture is the most persistent of all institutions and, unlike legal institutions, has no explicit mechanisms for amendment. Yet even Williamson (2000) is not clear *why* and *when* culture is so persistent. Putnam (2000) himself documents an example of the rapid deterioration of social capital in America. Does culture persist only when it is optimal, or does it tend to outlive its usefulness and the environment that generated it?

To address these questions we revisit Putnam's hypothesis. He conjectures that civic capital differences across Italian regions are due to a different incidence of free city states

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[2] These results are obtained using Maddison (2001).

[3] Acemoglu et al. (2001) discuss this challenge and argue that the diseases that were once a serious problem (yellow fever and malaria) no longer represent a major source of comparative disadvantage today. Still, other geographical factors impeding economic development could be at the origin of this persistence.

(Communes) during the late Middle Ages. In addition to positing a clear logical link, Putnam's conjecture has several advantages to study the persistence of culture. First, it traces the origin to an historical event whose formal institutions have long disappeared, facilitating the identification of the cultural effect. Second, his distinction is not just North-South. While free-cities were concentrated in the Center-North, they did not include all cities in this area.[4] Thus, we can exploit regional variation within the Center-North to test Putnam's hypothesis. Finally, it considers a temporal span of several centuries, whereas an experience in the Middle Age created a culture of cooperation that has lasted till our times.

We compare current levels of civic capital in different cities within the Center-North of Italy using three alternative measures. Following Putnam et al. (1993), our first measure of civic capital is the number of non-profit organizations per capita. We complement this with two new measures. As we observe in Guiso, Sapienza, and Zingales (2011), for an outcome-based measure to qualify as a good gauge of civic capital, the relationship between the input (civic capital) and the output measure should be stable and unaffected by other factors, such as legal enforcement. One such output is donation of blood or organs. So as a second measure of civic capital we use the existence of an organ donation organization. Finally, in the spirit of Fisman and Miguel (2007), we use frequency of children's cheating on a national examination.

Consistent with Putnam's conjecture, we find that the Center-North cities that experienced a period of independence in the Middle Ages have significantly higher levels of civic capital today as measured by all three measures. For example, the number of voluntary associations is 25% higher in cities that were once free city-states.

These results are obtained while controlling for general geographical conditions by inserting area dummies and other geographical characteristics such as closeness to the sea or elevation. Furthermore, they are robust to excluding larger cities, province capitals, or controlling for income levels and for inequality in the distribution of land.

Besides relying on the free-city state identifier, we also exploit variation in the intensity of the experience as free city for cities that gained independence at some point around the 12th century CE. We find that free cities that retained self-government longer have more civic capital today. One standard deviation increase in the length of independence increases the number of non-profit associations by 2.5%, raises the probability of having an organ donation organization by 4.5%, and lowers cheating in math by 2.75%. Furthermore, cities that were able to retain traits

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[4] In this paper we use a customary definition of Center-North: all the regions North of Lazio, including Lazio. In this definition the South coincides with the territory ruled by the Normans at the beginning of the second millennium. This customary definition is still in usage today.

of the free cities by evolving into "Signorie" (cities administered by a "Lord" but in people's name as in free cities) have a higher level of civic capital today. Finally, the quality and degree of autonomy of the free institutions differed greatly. Some cities were independent, but under the protection of the emperor; others were so independent to fight and win against the emperor. We find that former free cities that in 1158 participated in a league to fight the Emperor (the Lombard League) today exhibit more civic capital than free cities that at the time chose to remain neutral, which in turn exhibit more civic capital than cities that chose to be allied with the emperor.

Our results are consistent with the idea that a distant historical experience can affect individual behavior many years later. Because the institutions set up by the free cities are long gone, this persistence cannot be due to any formal institution. Yet, there could be some geographical characteristics not controlled for that are correlated both to the emergence of free city states in the Middle Ages and to higher level of civic capital today. To assess this possibility, we investigate the factors that facilitated the creation of free city states and look at the differences in correlations between these factors and civic capital in the Center- North and the South. At the beginning of the second millennium, the South of Italy was more developed and prosperous than the Center- North (see also De Long and Shleifer, 1993), yet free city states could not develop there because of the strong central power exerted by the Normans (Putnam, 1993). We find that a factor that historians (among others, Reynolds, 1997; Milani, 2005; Jones, 1997; Tabacco, 1987; Pirenne, 1956) claim has fostered the formation of free city-states is correlated with higher civic capital only in the Center- North, where city states could develop, and not in the South, where free city-states could not. While these findings do not completely rule out the geography hypothesis, they provide further evidence that civic capital is correlated with some pre-existent conditions that facilitated independence only when these conditions actually led to the transformative experience of the free city state.

Overall, these correlations suggest that the free city states experience fostered the formation of a different culture, which persisted through this day. There is a growing literature on the persistence of cultural attitudes over long periods of time.[5] Nunn and Wanchekon (2011), for instance, show the long-term persistence of the effects of the slave trade on Africa's level of trust today. Similarly, Voigtländer and Voth (2012) document a very strong correlation between the level of German anti-Semitism in 1350 and its level in the 1920s and 1930s. Other work demonstrates how cultures functional to a given technology may survive many centuries after that

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[5] There is also a growing literature on cultural persistence over shorter periods of time; see Algan and Cahuc (2010), Giuliano (2007), Guiso, Sapienza and Zingales (2006), Fernandez et al. (2004), Fisman and Miguel (2007), and Tabellini (2010).

technology's disappearance. Grosjean (2011), for instance, studies a culture of violence functional to a pastoral society; Alesina et al. (2013) examine the diffusion of the plow in agriculture (which gave a comparative advantage to men over women).

We provide novel evidence for this long-term persistence highlighting the interplay between an important historical episode, the new formal institutions it gives rise to, and the culture these institutions created, which outlived the institutions themselves for centuries.

The rest of the paper proceeds as follows. Section 1 provides a brief primer on Italian medieval history, illustrating the logical connection between the conquest of political independence and the development of civic capital. Section 2 describes the data. Section 3 analyses of the effect of the free city-state experience within the Center- North. Section 4 concludes.

1. A primer in Italian medieval history

1.1 Civic capital and the free city-state experience

The term "social capital" has been used to indicate several often quite divergent concepts. Following Putnam et al. (1993) and Fukuyama (1995), we focus on "civic capital" and define it as "those persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities" (Guiso, Sapienza and Zingales, 2011).

The question is how these values and beliefs arise and how they are transmitted over time. The Italian free city-state experience offers an interesting natural experiment. As we explain below, a number of historical conditions (the presence of a religious authority, strategic location, and distance from the imperial army's headquarters) determined some towns to achieve successful cooperation in defending themselves, while others did not. And since these historical conditions and the corresponding resulting formal institutions are long gone, this setting allows us to study whether an experience of cooperation may leave a legacy of values and beliefs that survive the circumstances that originally determined them.

1.2 The rise of the free city-states

At the end of the first millennium the Center-North Italian regions were part of the Holy Roman Empire, which was on the way to disintegration. Between 1061 and 1091 the Normans invaded the Southern part of Italy and formed a strong state, which guaranteed order and stability.

By contrast, in the Center-North the vacuum created by the demise of the imperial authority led to the emergence of a number of independent city-states.[6]

The first nucleus in the emergence of these city-states was the establishment of a "sworn pact" (*patto giurato*) in which a town's inhabitants agreed to provide mutual help and collaborate to solve problems of common interest (Prodi, 1992). In some cases these pacts were enforced by the threat of exclusion from trade (Milani, 2005), a very costly punishment at a time when trade opportunities were very profitable. In others (e.g. Pisa), a third party – the city bishop – was assigned to act as guarantor. His presence added an enforcement mechanism otherwise not available: the threat of exclusion from religious communion (Tabacco, 1987), facilitating coordination.

The pre-eminent common interest was defense against the Emperor's claim to exert power over the city. This battle culminated in 1176 when a league of free cities (communes) in the North of Italy, the Lombard League, defeated Emperor Fredrick I in the Battle of Legnano.

Unlike the Norman kingdom, located in South of Italy, the communes made their rules, laws, and formal decisions in the name of the people, because political power was said to derive from the people, not from some religious authority or divine right. While the medieval communes should not be equated with modern democracies, they did introduce many aspects of the system that today goes under the name of "rule of law." For example, government officials' actions were subjected to the control of new institutions, including courts of law to which citizens could appeal (Galizia, 1951).

1.3. *From the Commune to the Signoria: evolution and dissolution of the Italian city-states*

In the course of the fifteenth century, Italian communes began to confer life-long power on a single person – the Lord or *Signore,* hence the name *Signoria*. In several cases the Signoria retained the fundamental institutions of the commune, including the principle that power originated from the people and was to be exercised in the people's name. In cities such as Florence and Genoa, the Signoria also preserved the political institutions and the personal liberties that had characterized the commune period. In this sense the Signoria was a continuation and transformation of the commune (as is maintained by Prezzolini, 1948 and Chittolini, 1999), which might have allowed the civic culture to become deeply rooted, especially by comparison with the cities that were conquered and subjugated by other towns or foreign powers.

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[6] Within the Center North the only region in which free cities did not develop is Lazio where the Papal influence prevented independence.

If, as conjectured by Putnam, the regional differences in civic capital are due to the free city state experience, then civic capital today should be higher in cities that were free cities in the Middle Ages. Furthermore, this difference should be more pronounced the longer the independence of the city lasted.

2. The Data

In this section we describe how we collected the data. A synthetic description of each variable is contained in Table 1, while the Online Appendix contains a more detailed description of the sources and methodologies used. In total, our sample contains 5,372 cities located in the Center North. For a small part of the analysis we will compare the Center-North and the South. Our sample of southern cities contains 2,175 observations.

2.1 *Identifying the communes*

As observed above, free cities could emerge only in the parts of Italy that were under the Empire at the beginning of the second millennium (see Figure A1 in the Online Appendix). We focus on this area, which comprises twelve of Italy's present-day regions.[7]

Historians appear to agree that a commune, properly so called, needs to meet four criteria: it should have consuls as part of its institutions; it should have its own institutions to administer justice; it should have some military power and military activity; and finally, it should have its own rural territory (the *contado*) to administer (Milani, 2005). As far as we know, there is no comprehensive history of Italian communes. Thus, verifying these conditions in all the Italian cities existing today during three centuries is extremely difficult.

We chose instead to start from the sample of free cities identified by a prominent historical atlas (*De Agostini, 2007*). To validate this source we also consulted several additional historical sources (see Online Appendix) to verify that the towns identified as communes by the Atlas met the four historical criteria. None of the city states in the map have been eliminated. This procedure may underestimate the number of free cities, biasing against finding any effect. Using several historical sources we also constructed a measure of duration of independence and an indicator for whether or not a Commune evolved into a Signoria (see the Online Appendix for more details).

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[7]Piedmont, Valle D'Aosta, Liguria, Lombardy, Trentino, Veneto, Friuli-Venezia Giulia, Emilia-Romagna, Tuscany, Umbria, Marche, and Lazio. Since Sardinia was neither part of the Holy Roman Empire, nor under Norman domination, we have excluded it from the sample altogether. We also excluded Rome, given its truly unique history, as an exceptional case.

Since the status of independence changes over time, we chose to focus on two historical moments: the first, 1176, is when the northern communes organized into the Lombard League defeated Emperor Frederick I (see Figure A1 in the Online Appendix); the second is 1300 CE, when the free city-state movement was at its height before the emergence of the Signoria (Figure A2). Our first definition of free cities includes all the cities that were independent in 1176. Our second definition includes cities that were listed as independent at least one time according to the historical documents, either in 1176 or in 1300.

As we can see, communes were spread all over the Center-North, but the phenomenon was more intense in certain regions (Tuscany and Emilia) than in others (such as Lazio or Marche). One controversial case is Venice. While clearly independent, Venice is not classified as a commune because it was an oligarchy, with a different set of institutions. To be consistent with our criterion, we classified Venice as a "non-city-state," but our results are robust to treating it as a commune (unreported regressions).

2.2. *Measures of Civic Capital*

Putnam et al. (1993) takes the presence of non-profit associations as the main indicator of civic capital. We follow suit and, as first measure, we use a town's total number of non-profit associations in 2000. Since this information comes from the 2001 census, it has the great advantage of counting *all* non-profit organizations (excluding Church-based voluntary organizations).[8] On average, there are 6.4 non-profit associations per thousand people (Table 2A for the Center North and Table 2G for the South).

As we noted in Guiso et al. (2011), for an outcome-based measure to qualify as a reliable indicator of civic capital, the relationship between the input (civic capital) and the measured output should be stable and not affected by other factors, such as legal enforcement. These conditions are not generally found, but there are some particular situations in which they are likely to be met.

One such instance is donation of blood or organs. Since there is no economic payoff to either type of donation and no legal obligation to donate, the decision to donate can be seen as a direct measure of individuals' internalization of the common good. Donating organs and/or blood provides insurance to others, with no direct compensation for the person providing it. Guiso, Sapienza and Zingales (2004) use blood donation data at the provincial level. But at town level these data are subject to some problems. First, in some regions (e.g. Tuscany) there are several

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[8] This feature is particularly important in smaller towns where, given fixed costs of establishment, only certain types of organization might be present.

voluntary organizations of blood donors, which do not keep the same quality records as Italy's principal donors' organization, Associazione Volontari Italiani Sangue (AVIS). Their activity is negligible at the provincial level, but not at the municipal level, particularly in smaller towns where they compete with AVIS. Second, people may donate blood where they work and not necessarily where they live, which clouds the town-level measure. Accordingly, we have replaced this measure with an indicator for the existence in the town of an organ donation association (AIDO, 2014). This measure has the same virtue as blood donation but is less subject to errors since in Italy there is only one organ donation association, Associazione Italiana Donatori Organi (AIDO). The Online Appendix provides additional details on how these variables are constructed and their sources. There is an organ donor association in 4.4% of Italian Center-North municipalities and 4.2% in the South.

Another example of a legitimate outcome-based measure of civic capital is Fisman and Miguel's (2007) number of parking violations by United Nations officials in Manhattan. Until 2002, diplomatic immunity protected U.N. diplomats from enforcement, so only cultural norms prevented them from parking illegally. Building on this idea, we use the pervasiveness of cheating on a national math test. Since 2008 Italian eighth-graders have taken a national standardized test in reading and math conducted by Istituto Nazionale per la Valutazione del Sistema educativo di Istruzione e formazione (INVALSI). The test is administered to more than half a million students in 6,000 schools in 3,400 cities. The data released by INVALSI include a measure of cheating: the estimated probability that an observed score is due to cheating.[9] We average the 2008-2009 INVALSI measure at the city level and divide it by its standard deviation to obtain a standardized measure of cheating. On average this measure is in the Center- North cities is 2.1.[10]

2.3 *Other historical variables and city controls*

We have also gathered a number of additional historical variables that we use as controls in our regressions. First, we use data from Bairoch et al. (1988) for city size. Since population data for 1000 CE are very scarce, we use those for 1300 CE – earliest data available for a large enough number of towns.

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[9] This estimate is based on the concentration of similar wrong answers in a class in the presence of very low variation across answers and very high average scores. The actual method used is a fuzzy c-means clustering (Dunn 1973; Bezdek 1981). For details see INVALSI (2014).

[10] We focus on the level of cheating in math because on average it is higher, but the results we obtain using cheating in reading tests are similar.

Other important historical characteristics are whether a town was a colony of ancient Rome and whether it was located at a Roman crossroad. We identified former Roman colonies from Brill's New Pauly (2003). Roman roads are identified from the Touring Club Historical Atlas of Italy and the "Reference Map of Ancient Italy". We then map ancient cities into today location by using Google Maps. We use the *Treccani* (2007) to identify the cities with a bishop seat and the cities where Emperor Henry IV passed through when in 1083 he came down to Italy to assert his imperial power. These cities became strongholds of his army. We use the same source to identify the presence of a marquis. At the time of Charlemagne the Center-North of Italy was divided into marches, so the survival of strong marches represents the persistence of imperial power.

Finally, all the other variables (including the average elevation, other geographic controls, population, per capita income and per capita wealth) are from Ancitel (2014), a database assembled by the association of municipal administrations, which reports over 320 variables at municipal level for the period 2003-04.

Table 2 shows summary statistics for all our variables.

3. Empirical analysis

3.1 Basic specification

Our first measure of civic capital is the number of non-profit organizations divided by the 2001 population (Table 3, Panel A). In column 1, we regress this measure on a simple indicator of whether a town was a free city in 1176 and several geographical controls. To control for mountain location we insert the average elevation. To control for geographically-driven differences in the cost of interaction, we insert the maximum elevation difference within the municipality's territory. We also control for coastal location (i.e. within five kilometers of the sea). Finally, as a measure of size, we control for the number of inhabitants (thousands of people) in 2001. Since we are unsure how population affects civic capital, we insert both population and population squared. Since the measures of civic capital tend to be noisier for smaller towns, we use the weighted least squared method, weighted by the population in 2001.

The impact of the free city-state experience is large and statistically significant at the 1% level. Towns that were communes have two more associations per thousand inhabitants (30% more than the average). Though this estimate is obtained using only variation within the Center-North, its magnitude is half of the difference in civic capital between Center-North and South.

Another known determinant of civic capital (Alesina and La Ferrara, 2002) is income inequality. For this reason, column 2 adds two Gini measures of inequality: in land ownership

and in pre-tax income. These additions run the risk of overcontrolling, since inequality could be an effect rather than a cause of persistently low civic capital. Surprisingly, greater income inequality leads to more civic capital, as measured by the number of non-profit associations per capita, but this effect is due to the lack of a control for per capita income. When we introduce this control (column 5) the effect vanishes. Regardless, the impact of once having been a commune remains unchanged.

While we control for population and population squared, it is still possible that our estimated effect may only reflect some non-linearity between city size and civic capital. For this reason, in column 3 we exclude from the sample the largest towns (more than 120,000 inhabitants in 2001). The effect of the free city-state experience remains unchanged.

Two thirds of the medieval city-states are provincial capitals today. This administrative role could confer a different status on the city, possibly affecting the level of civic capital. For example, associations might find it convenient to be located near the local administration. For this reason, in column 4 we exclude from the sample all provincial capitals from the regression. The effect of the commune experience is undiminished.

Glaeser et al. (2002) show that individual investment in social interaction increases with per capita income. Since towns that became independent in the Middle Ages were likely to be richer, the free city-state experience might be a proxy for unobserved characteristics that make for prosperity.[11] To address this issue we would like to be able to factor in per capita income in 1100 CE. Unfortunately, no such measure is available, so we have to resort to today's per capita income. This specification will clearly underestimate the impact of the free city-state experience because, as Knack and Keefer (1997) show, civic capital itself fosters growth, so that the greater civic capital generated by the city-state experience translates into higher per capita income.

As column 5 shows, wealthier towns do in fact display a higher level of civic capital, so, as expected, the insertion of this variable reduces the impact of the free city-state experience on today's level of civic capital. The effect of the communal experience, however, remains positive and economically and statistically significant. In addition, in an unreported regression we control also for a city level measure of human capital: the average math score of the pupils. Since Italy has a national curriculum, this score reflects the average quality of local schools and teachers and thus the average level of human capital in the area. This control does not have any effect on our first two measures of civic capital. It does have an effect on the third, reducing the coefficient and

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[11] Of course the fact that some very wealthy towns in the South, such as Salerno and Palermo, even richer than Center-Northern towns, did not become free cities suggests that what was driving independence was not linked to unobserved economic prosperity.

reducing the statistical significance just above the 10% level (p=10.6). Yet, this is hardly surprising, since in places where scores are naturally high it is more difficult to detect cheating

Finally, in column 6 we add four area dummies to capture possible unobserved heterogeneity in civic capital across regions in our sample (Northeast, Northwest, Center-North, and Center) due to other historical factors. These dummies (not reported) are all statistically significant, but inserting them does not change the impact of the free city-state experience on civic capital.

In the first three columns of Table 3, Panel B, we repeat the estimation using our second measure of civic capital, the presence of an organ donation association. Again the effect of the city-state experience is positive and statistically significant in all the specifications. Having been an independent city-state increases the probability of having an organ donation association by 41%.

In the last three columns of Table 3B, we estimate the same specification by using our measure of cheating as left hand side variable. Here the effect is negative and statistically significant in all specifications. Having been a free city-state decreases our standardized measure of cheating by 13% of the mean.[12]

The concentration of free city-states among the larger cities suggests the possibility that our sample is too heterogeneous and that even controlling for size and size squared, the coefficient of our explanatory variable might be a spurious effect. Accordingly, we select the 400 largest cities. To minimize possible survivorship bias we select them according to the earliest Census data available (immediately after national unification in 1861). Table 4, Panel A, shows the results using this smaller sample. The first three columns of Table 4A show the results using the controls in the specification in the second column of Table 3 (the other specifications are reported in the Online Appendix – Table A1, Panel A). The effect is roughly halved when the sample is restricted to these cities, but it still remains both quantitatively meaningful and statistically significant. The advantage of this reduced sample is the availability of more sophisticated controls for the towns' history: a dummy for being located at an ancient Roman crossroads, one for being along the itinerary of Emperor Henry IV, one for having been a Roman colony, one for having belonged to a marquis and, finally, two dummies for medium and large size in 1300. When we introduce these controls, the effect of the free city-state variable on all three measures of civic capital is unchanged.

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[12] The estimated coefficient is significant also in all the other specifications reported in Table 3A except that in which we drop the largest towns. While this sample eliminates only 19 observations, 17 represent former city-states, reducing the sample of these by 26%.

As an additional robustness test (Table 4, Panel B), we report the main specification for each measure of civic capital estimated by Ordinary rather than Weighted Least Squares. The results are substantially the same, except that the city-state experience is not statistically significant for the civic capital measure based on cheating. This difference in significance is probably due to the large amount of noise in this measure (especially for small towns).

In Table 4, Panel C, we check the robustness of the result to the definition of the set of free cities using our second definition of free city states. The results are substantially unchanged.

Finally, in Table 4 Panel D, we look at the earliest measure of civic capital at the city level we could find: the level of participation to the Resistance against the Nazi-Fascist at the end of World War II. While we do not have any official statistics, the towns that distinguished themselves for heroism during this period were awarded a Medal of Honor (the exact name in Italian is "Medaglia d'Oro alla Resistenza" or Resistance Gold Medal). In the Center-North, 20 towns received this award. When we regress the probability of receiving the medal on the free city state dummy, we find that this has a positive and statistically significant effect, even after controlling for our standard set of variables (see Table 4, Panel D).

3.2 More detailed history

Thus far, we have treated all the free city-state experiences as similar. For a number of reasons, however, this approach is inadequate. First, the length of the period of independence varied considerably. Second, the towns' history after the end of the city-state differed: some were dominated by neighboring towns; others were transformed from commune into Signoria, a political structure that retained the fundamental characteristics of the commune, including the principle that power originated from the people and was to be exercised in the people's name. Finally, the quality and degree of autonomy of the free institutions were very different from place to place. In this section, we explore whether these variations in the quality and length of independence affect the various municipalities' civic capital many centuries later.

Table 5 starts by analyzing the effect of the duration of independence (Panel A). This measure is very noisy, insofar as the exact date of independence is often a matter of judgment. Since many of the factors that determined the formation of the city-states also determined the duration of independence, in order to isolate the effect of the latter we use a two-step Heckman estimator. As we shall explain in section 3.3, the local presence of a bishop helped to overcome the initial coordination problem (and thus the transformation into a free city-state). Thus, assuming that the bishop presence affects only the probability of becoming a free city state and its ability to remain independent, we use it as our identifying restriction.

The first column shows the results of the estimates when the measure of civic capital is the number of non-profit organizations. The duration of independence has a positive and statistically significant effect on the number of non-profit organizations. However, the effect is small: starting with 206 years of independence (the sample mean) and increasing it by one standard deviation (about additional 100 years) raises the number of non-profit organizations by 2.3% of the average among the formerly independent cities. Given that this measure is quite noisy, it is possible that our estimates are biased downwards and are actually a lower bound of the true effect.

The second column uses organ donation as a measure civic capital. The length of independence has a positive and statistically significant effect on the probability of having an organ donation: 100 year more of independence raises the probability by 4.5 percentage points. The duration of independence also predicts the probability that students will cheat: 100 year more of independence decreases the probability of cheating by 2.75% of the sample mean.

In Panel B we study the effect of having become a Signoria after being a free commune. The cities that did not evolve into a Signoria were more likely to lose their independence to another commune or Signoria, which entailed the demolition of the local communal institutions and the abrogation of many of the associated rights. We therefore expect the communes that did not evolve into a Signoria to show lower persistence of civic capital.

Having experienced a period of Signoria adds to the level of civic capital (column 1). Ex-Signoria towns have 1.2 more associations per thousand inhabitants than other former free city-states, practically doubling the effect of the latter. The same holds when civic capital is measured by organ donation (column 2), but we do not find a significant impact on cheating on the math test (column 3).

In Panel C the variable considered is the *degree* of independence, notoriously hard to measure. As a proxy we use the side that a city took in the struggle against Emperor Frederick I in the middle of the twelfth century. In 1158 Frederick claimed direct Imperial control over Italy. Twenty-four cities in the North formed the Lombard League to challenge him. We take active participation in the Lombard League as an indicator of the strength of a city's independence. This comparison is especially meaningful when is done with other free city-states located in the North that chose to ally with the Emperor. Finally, twenty-five city-states (mostly located towards the center of Italy and thus somewhat more sheltered from the Imperial threat) chose to remain neutral. Panel C decomposes the free city-states in these three groups.

When we measure civic capital as number of non-profit organizations (column 1), the positive effect of the free city is strongest for Lombard League towns, second for neutral towns,

14

third for Imperial allies. When using organ donations as LHS variable the pattern is similar (column 2). In fact, the effect of cities that were part of the Lombard League is 28% larger than that of neutral city-states and almost twice as large as that of the Emperor's allied states. However, when we measure civic capital with cheating (column 3) the largest effect is produced by the neutral cities.

So far, our results indicate that free city states were a transforming experience for some areas of the Center-North and that those areas today are characterized by high civic capital. Because the free city states are long gone and these cities now have the same formal institutions, these correlations lend support to Putnam's conjecture that the setup of those cities fostered a new culture that has persisted until today and it is captured by our measures of civic capital.

3.3 The origin of free city states

Our geographical controls mitigate the concern that we are capturing a spurious correlation between the free city experience and civic capital. Yet, it is still possible that the free city state experience, since it is not random, is correlated with some characteristics (other than cultural) that persists to this day and sustain a greater level of civic capital.

To address this concern we resort to the historians' analysis of the origins of free city states. Since the strong central power exerted by the Norman Kingdom in the South did not allow the formation of free cities, we can design a counterfactual. If the free city state experience is the result of a spurious correlation driven by some characteristics of free city states, then these characteristics should have the same correlation with civic capital in the South, where free city states could not emerge. Vice versa, if it is the specific free city state experience to drive the correlation, then these factors should not be correlated with civic capital in the South, where this experience did not (and could not) occur.

One of the obstacles to the formation of a free city is the cost of coordination. Historians (Reynolds (1997), Milani (2005), Jones (1997), Tabacco (1987), and Pirenne (1956)) suggest that bishops reduced this cost, providing moral sanctioning to the citizens' agreements. According to this view, the existence of a bishop seat in the city in year 1000 is a good proxy for the ease of coordination and is correlated with the creation of communes in Italy. In unreported regressions, we find indeed that this variable is highly predictive of the probability that a town became a free city state.

The first three columns of Table 6, Panel A, present the correlation between this historical determinant of free city states and civic capital. The results show that the presence of a bishop has a positive and significant correlation with the level of civic capital, measured by our

three proxies, in the North. To verify that this effect is not capturing some alternative reason for higher civic capital in free city states, we investigate the correlation between the presence of a bishop in the South and the level of civic capital. In the last three columns of Table 6 Panel A, we estimate the same specification in the South. Differently than in the North sample, the presence of a bishop has an insignificant correlation with the presence of non-profit organizations and with frequency of children's cheating on a national math tests. In other words, when the presence of a bishop cannot foster the formation of free city states, the presence of a diocese is not associated with higher levels of civic capital, as measured by these two proxies, suggesting the correlations observed in Tables 2 to 4 are not spurious. Instead, the presence of a bishop in the South has a positive relation, albeit smaller than in the North sample, with the presence of an organ donor association.

In order to provide one further validity check against the presence of spurious correlations, we study the correlation between dioceses created after the period in which the free city state experience took place (i.e., towns that were assigned a bishop seat after 1400) and civic capital. Sixty-three cities in the Center-North became dioceses after 1400. As Table 6, Panel B shows, the assignment of a bishop seat after 1400 has a negative and significant correlation with civic capital, measured by the presence of non-profit organization. This result rules out that the presence of a bishop, in itself, is conducive to greater civic capital. Columns two and three of Table 6B show that there is no correlation with dioceses formed after 1400 and the presence of organ donor associations and the frequency of cheating in math tests.

This evidence suggests that, while the free city state is not a random occurrence, the initial characteristics that facilitated independence are linked to higher civic capital only through the transformative city state experience. In other regions in Italy, where the same initial conditions existed but could not deliver free city states, or in subsequent periods where the initial conditions could not spur independence, we do not find a positive correlation with civic capital.

4. Conclusion

Acemoglu and Robinson (2012) claim that shocks to institutions can affect outcomes over prolonged periods of time. Yet, they do not distinguish whether this impact is the direct effect of formal institutions' persistence or the indirect effect produced by institutional shocks on people's psyche and culture. In other terms is culture or are formal institutions the source of long term persistence?

In this paper we try to disentangle the two by looking at an institutional change whose formal institutions have long gone: Italian free-city states. We examine the different levels of

civic capital today between the towns that during the Middle Ages were free city-states and those that were not. Not only the establishment but also the duration and degree of independence of the historical free city states affect today's civic capital positively.

Our evidence highlights the existence of cultural persistence where attitudes developed during an important historical event are passed from generation to generation. These attitudes may be transmitted from parents to children, as in Bisin and Verdier (2000, 2001) (see also Tabellini (2008) and Guiso, Sapienza and Zingales (2008b) for other models of intergenerational transmission). This mechanism is particularly credible in Italy, where many centuries-old customs and traditions still survive today.

This paper does not identify the mechanism through which this very long-term persistence takes place. One possibility (Putnam, 2000 and Ostrom, 1990) is that direct participation to public life (like in the commune) trains people to cooperate and somehow this attitude is transmitted through generations even when this participations cannot take place anymore. Another, advanced by Tabellini (2008) and Rothstein (2011), is that transparent and democratic institutions affect citizens' beliefs about trustworthiness and fairness (and similarly these beliefs are transmitted through generations). A third hypothesis is that historical events affect a nation's psyche, changing the attitudes of its citizens through a socialization process very clearly identified by Banfield (1958).

We will try to distinguish among these hypotheses in future work.

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Table 1. Variables description

The table provides a summary description of the variables. Details on the definitions and sources are available in the online Appendix.

Variable name	Description	Source
Number of non-profit organizations	Total number of non-profit organizations (sum of voluntary associations, social cooperatives and foundations, excluding church based organizations) in the city scaled by population in the city.	*ISTAT* (National Statistical Institute), 2001 census
Cheating in math	Mean index of cheating in the city standardized with its standard deviation. Based on the city-level indicator of cheating in math computed by INVALSI (a government agency for the evaluation of public schools) for the 2009 INVALSI test among the population of grade 8 Italian students.	*INVALSI (2014)*, 2009 grade 8 test
Presence of an organ donation organization	Indicator of existence of an organ donation organization in the city	*Ministero del Lavoro* (2005).
Medal of honor	Indicator = 1 if the city has been awarded a gold medal for the heroism of its population in fighting against the Nazi-Fascists in the 1943-1945 period.	*ANPI, Resistenzaitaliana.it,* http://www.storiaxxisecolo.it/documenti/documenti12.html
Commune (free city state)	Indicator variable equal to 1 if the town was a commune based on two maps (see Online Appendix, Figures A1 and A2). The first reports the list of communes, around the time of the war between the communal cities and Emperor Frederick I (year 1167), the second around year 1300, at the pick of the communal experience.	*De Agostini* (2007)
Length of independence	Difference between the year independence was lost and the year it was first acquired.	*Treccani (1949);* when not available, we relied on the Touring Club Italiano (2000) and the historical summary on the official web page of the various cities.
City belonged to the Lombard League	Identifier = 1 for a commune that belonged to the Lombard League; see Figure A1	*De Agostini* (2007)
City belonged to the Lombard League	Identifier = 1 for a commune that was allied to the Emperor Frederick I; see Figure A1	*De Agostini* (2007)
Ease of coordination	Indicator = 1 when the city was a seat of a Bishop before 1000 C.E.	Treccani (2007), Volume I, maps n. 152, 153, 154, 155
New seat of a Bishop after 1400 C.E.	This variable is equal to 1 if a city has become a bishop city after year 1400, roughly after the end of the communal experience.	Identified from the full list of the Italian Bishop cities as listed in the following link http://it.wikipedia.org/wiki/Elenco_delle_diocesi_italiane
Size of city in year 1300 C.E.	Indicators for city size around year 1300; *Large* is a dummy equal to 1 if the city population exceeds 10,000 people; *Medium* is a dummy variable equal to 1 if the city population is between 1,000 and 10,000 people.	Bairoch, Batou and Chevre (1988, pp. 40-49)
City located at an intersection of Roman roads	Indicator equal to 1 if the city is located on a relevant Roman road or at the intersection between two or more Roman roads.	Authors calculations. Roman roads are identified from the *Touring Club Italiano (1994)* Current location of Roman cities is obtained comparing today location of the city using *Google Maps* with the map of the Roman cities.

Roman Colony	Identifier = 1 if the city was a Roman colony	Brill's New Pauly(2003)
City was on the itinerary of the emperor	Indicator equal =1 if the city was one where Emperor Henry IV passed through when in 1083 when he went down to Italy to assert his imperial power.	*Treccani* (2007)
City belonged to a marches	Indicator =1 if city was part of a marches –Center- North Italy regional organization at the time of Charlemagne.	*Treccani* (2007)
City elevation	Measured in meters from the sea level.	Ancitel (2003).
Max difference in elevation	Difference between the altitude of highest and lowest point in the city territory, in meters.	Ancitel (2003).
Current Population:	Number of inhabitants in the city according to the 2001 census	Ancitel (2003).
Gross per capita disposable income	Disposable income per capita: euros in year 2000.	Ancitel (2003).
Gini land ownership inequality index	Computed using data on the size distribution of agricultural firms in year 2000 based on information from the 2001 census.	Ancitel (2003).
Gini land ownership inequality index	Computed using data on the size distribution of agricultural firms in year 2000 based on information from the 2001 census.	Ancitel (2003).

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Table 2: Summary Statistics

The table shows summary statistics for the variables used in the estimation. For the definitions of these variables see Table 1

Panel A. Civic capital measures (Center-North sample; N = 5,372)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Number of non-profit organizations (per 1,000 people)	6.39	4.82	14.15	1.30	26.60
City has an organ donation association? (Yes = 1)	0.044	0	0.20	0	1
Cheating in math	2.05	1.22	7.50	0.36	11.47
Medal of honor	0.0036	0	0.06	0	1

Panel B. Historical variables (Center-North sample; N = 5,372)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Commune at time of war against Frederick I (1167 C.E.)	0.012	0	0.11	0	1
Commune: combined definition	0.014	0	0.12	0	1
City was an independent Signoria	0.011	0	0.105	0	1
Year independence was acquired (only for communes)	1,130	1,150	62	950	1,300
Year independence was lost (only for communes)	1,327	1,315	79	1,216	1,650
Length of independence (# of years – only for communes)	196	175	100	47	488
Log Length of independence (only for communes)	0.73	0	1.81	0	5.91
Free cities belonged to the Lombard League (only for communes)	0.34	0	0.48	0	1
Free cities allied to the Emperor Frederick I (only for communes)	0.22	0	0.42	0	1

Panel C. City geography (Center-North sample; N = 5,372)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Elevation (thousand meters)	0.34	0.27	0.30	0.003	1.36
Max difference in elevation within city territory (thousand meters)	0.66	0.34	0.72	0.004	2.74
Province capital (indicator)	0.012	0	0.11	0	1
City located on the coast	0.03	0	0.18	0	1

	Mean	Median	Standard deviation	1st percentile	99th percentile
City located more than 5 kilometers from the sea	0.03	0	0.14	0	1
Population after unification in 1871 (in millions)	0.002	0.003	0.009	0.0003	0.026
Current Population 2001 (in millions)	0.0062	0.0023	0.027	0.00013	0.061

Panel D. Economic Variables (Center-North sample; N = 5,372)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Disposable income per capita ('000 euros)	13.26	13.24	2.30	8.05	18.95
Gini land ownership inequality index	0.56	0.58	0.18	0.12	0.94
Gini income inequality index	0.38	0.38	0.04	0.30	0.50

Panel E. Historical variables that predict Commune (Center-North sample; N = 5,372)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Ease of coordination	0.033	0	0.18	0	1
City population above 10,000 in 1300 C.E.? (Yes = 1)	0.006	0	0.08	0	0
City population btw 1,000 and 10,000 in 1300 C.E.? (Yes = 1)	0.004	0	0.06	0	0
New seat of a Bishop after 1400 C.E. (Yes = 1)	0.006	0	0.08	0	0

Panel F. Summary statistics for then sample of largest Center-North 400 cities at unifications (N = 400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Number of non-profit organizations (per 1,000 people)	5.58	4.29	11.86	0.95	22.3
City has an organ donation association? (Yes = 1)	0.04	0	0.20	0	1
Cheating in math	2.34	1.22	9.00	0.37	21.2
Free city	0.15	0	0.35	0	1
Altitude	0.35	0.29	0.30	0.004	2.63
City located on the coast	0.08	0.0	0.27	0	1
City located more than 5 kilometers from the sea	0.03	0	1.18	0	1
City located at intersection of Roman roads	0.108	0	0..31	0	1
Current Population 2001 (million people)	0.007	0.002	0.028	0.00014	0.068

	Mean	Median	Standard deviation	1st percentile	99th percentile
Gini land ownership inequality index	0.60	0.60	0.17	0.15	0.94
Gini income inequality index	0.38	0.37	0.04	0.28	0.49
City was a Roman colony	0.05	0	0.22	0	1
City was on the itinerary of the emperor	0.06	0	0.23	0	1
City belonged to a marches	0.21	0	0.09	0	1
City population above 10,000 in 1300 C.E.? (Yes = 1)	0.006	0	0.076	0	0
City population between 1,000 and 10,000 people in 1300 C.E.? (Yes=1)	0.006	0	0.08	0	0

Panel G. The South sample (N = 2,175)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Number of non-profit organizations (per 1,000 people)	3.49	3.08	2.02	0.64	10.38
City has organ donation association? (Yes = 1)	0.042	0.00	0.20	0.00	1.0
Cheating in math	2.58	1.14	10.87	0.43	24.16
Elevation	0.40	0.39	0.28	0.004	1.17
Max difference in elevation within city territory	0.70	0.62	0.51	0.013	2.29
Ease of coordination	0.07	0	0.25	0	1
City population above 10K in 1300 C.E.? (Yes = 1)	0.006	0	0.08	0	0
City population btw 1,000 and 10,000 in 1300 C.E.? (Yes = 1)	0.019	0	0.14	0	1
City is on the coast	0.177		0.38	0	1
City is more than 5 km from the coast					
Current population 2001 (million people)	0.008		0.03	0.00	0.08
Gini income inequality index	0.366		0.04	0.27	0.45
Gini inequality index of land ownership	0.635		0.15	0.24	0.94

Table 3. Effect of communal history on civic capital

The table shows OLS estimates of the effect of having been an independent city on measures of civic capital in the sample of all Italian cities in the Center-North. In Panel A the left hand side variable is the number of non-profit organizations per inhabitant in the city; in Panel B it is an indicator of cheating in math among the grade 8 students in the city; in Panel C it is a dummy for the existence of an organ donation organization (AIDO) in the city. Regressions are weighted using city population. Regressions are run on the whole sample of cities located in the Center-North of Italy. ***significant at less than 1%; ** significant at 5%; * significant at 10%. Robust standard errors are reported in parentheses.

Panel A: Number of non-profit organizations

	Whole sample	Whole sample	No large towns	No provincial capitals	Whole sample	Whole sample
Commune	2.04***	1.84***	1.77***	1.86***	1.53***	1.84***
	(0.34)	(0.33)	(0.37)	(0.42)	(0.28)	(0.26)
Elevation	1.94***	1.97***	1.65***	1.64***	2.36***	3.21***
	(0.51)	(0.50)	(0.51)	(0.55)	(0.45)	(0.54)
Max difference in elevation	1.43***	1.39***	1.54***	1.51***	1.35***	1.19***
	(0.24)	(0.24)	(0.21)	(0.24)	(0.22)	(0.23)
City is on the coast	0.34	0.25	0.35	0.69***	0.61**	0.60**
	(0.33)	(0.31)	(0.24)	(0.23)	(0.24)	(0.27)
City is more than 5km from the coast	0.96	1.08*	1.22**	1.34**	1.50**	0.97
	(0.63)	(0.64)	(0.62)	(0.61)	(0.62)	(0.64)
Current Population 2001	-3.49	-4.22*	-59.86***	-63.42***	-6.93***	-4.10**
	(2.73)	(2.47)	(9.85)	(8.25)	(1.84)	(1.88)
Current Population squared	1.43	1.41	622.40***	441.95***	3.11**	1.73
	(2.05)	(1.83)	(110.56)	(90.54)	(1.37)	(1.39)
Gini inequality index of Land ownership		0.65	0.34	0.23	1.22**	-0.01
		(0.55)	(0.38)	(0.33)	(0.48)	(0.46)
Gini income inequality index		10.02***	9.61***	7.63***	0.56	9.58***
		(2.22)	(1.75)	(1.50)	(2.24)	(1.91)
Income per capita					0.35***	
					(0.04)	
Area dummies	NO	NO	NO	NO	NO	YES
R-squared	0.08	0.08	0.09	0.08	0.10	0.10
Observations	5,360	5,360	5,341	5,298	5,360	5,360

Panel B: Existence of organ donation organization and Cheating in math

	Existence of organ donation organization			Cheating in math		
	Whole sample	Whole sample	Whole sample	Whole sample	Whole sample	Whole sample
Commune	0.41***	0.37***	0.39***	-0.23***	-0.19**	-0.30***
	(0.06)	(0.06)	(0.06)	(0.085)	(0.10)	(0.10)
Elevation	-0.28***	-0.23***	-0.25***	0.97**	0.90**	1.33**
	(0.07)	(0.07)	(0.08)	(0.453)	(0.45)	(0.60)
Max difference in elevation	0.03	0.03	0.03	0.22	0.23	0.20
	(0.03)	(0.03)	(0.03)	(0.148)	(0.15)	(0.16)
City is on the coast	0.04	0.09	0.04	-0.09	-0.16	-0.05
	(0.06)	(0.05)	(0.06)	(0.133)	(0.15)	(0.18)
City more than 5km from the coast	0.05	0.10	0.05	-0.16	-0.24	-0.16
	(0.07)	(0.07)	(0.07)	(0.217)	(0.24)	(0.23)
Current Population	1.60***	1.26***	1.65***	-2.66***	-2.24***	-2.38***
	(0.46)	(0.40)	(0.44)	(0.715)	(0.63)	(0.72)
Current Population squared	-1.25***	-1.03***	-1.26***	2.48***	2.20***	2.41***
	(0.34)	(0.30)	(0.33)	(0.620)	(0.54)	(0.59)
Gini inequality index of land own.	0.20*	0.27***	0.15	-0.15	-0.27	-0.48
	(0.10)	(0.09)	(0.10)	(0.451)	(0.41)	(0.47)
Gini income inequality index	2.48***	1.27***	2.51***	-9.80***	-8.02***	-9.59***
	(0.42)	(0.34)	(0.42)	(2.52)	(1.82)	(2.47)
Income per capita		0.04***			-0.06	
		(0.01)			(0.04)	
Areas dummies	NO	NO	YES	NO	NO	YES
R-squared	0.53	0.56	0.53	0.02	0.02	0.02
Observations	5,372	5,372	5,372	1,890	1,890	1,890

Table 4: Robustness

Panel A reports regressions of the effects of free cities on civic capital on the sample of the largest 400 cities in the Center- North of Italy (as of 1871) using standard controls (first three columns) and expanding the set of historical controls (remaining columns); Panel B shows non-weighted OLS estimates of the effect of having been an independent city on measures of civic capital today. Panel C shows the estimates on the total sample of Center-North cities for a Commune identifier obtained as the union of the free cities in 1167 C.E. and in 1300 C.E. Panel C shows the estimates using as a historical measure of civic capital: an indicator =1 if the city has been awarded a honor medal during the resistance war against Fascism. "Standard controls" are those used in Table 3A, second column. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

A. Sample of 400 largest northern cities

	Non-profit org.	Organ donation org.	Cheating in math	Non-profit org	Organ donation org.	Cheating in math
Commune	1.10**	0.13**	-0.21***	1.17***	0.13**	-0.15***
	(0.33)	(0.06)	(0.05)	(0.387)	(0.060)	(0.055)
At cross with roman roads				1.34*	-0.19	0.30
				(0.780)	(0.182)	(0.212)
Roman colony				0.14	0.02	-0.09*
				(0.286)	(0.047)	(0.050)
City on the itinerary of emperor Henry IV				-0.06	-0.05	-0.00
				(0.342)	(0.064)	(0.066)
City belongs to a marquis				1.18***	0.10*	0.03
				(0.297)	(0.058)	(0.060)
City size in 1300: medium				0.39	0.16	-0.13**
				(0.444)	(0.105)	(0.062)
City size in 1300: large				0.17	0.03	-0.05
				(0.391)	(0.052)	(0.041)
STANDARD CONTROLS	YES	YES	YES	YES	YES	YES
Observations	400	400	379	400	400	379
R-squared	0.27	0.25	0.21	0.38	0.27	0.22

B. OLS non-weighted regressions

	Non-profit organizations	Organ donation organization	Cheating in math
Commune	2.91**	0.31***	0.01
	(0.44)	(0.07)	(0.20)
STANDARD CONTROLS	YES	YES	YES
	(2.30)	(0.01)	(0.99)
Observations	5,360	5,538	1,912
R-squared	0.04	0.30	0.01

C. Alternative definition of commune (combined definition)

	Non-profit organizations	Organ donation organization	Cheating in math
Commune: combined definition	2.18***	0.45***	-0.31***
	(0.27)	(0.06)	(0.08)
STANDARD CONTROLS	YES	YES	YES
Observations	5,360	5,372	1,890
R-squared	0.09	0.55	0.02

D. Historical measure of civic capital: medal of honor to the city

	Whole Center-North sample	Whole Center-North Sample, No province capitals	Sample 400 largest northern cities
Commune	0.24***	0.16**	0.22***
	(0.075)	(0.083)	(0.075)
STANDARD CONTROLS	YES	YES	YES
Observations	5,372	5,310	403
R-squared	0.724	0.167	0.724

Table 5: Digging deeper into history

Panel A shows the second stage results of a two-step Heckman estimates of the effect of the length of independence of free cities on civic capital today. The first stage uses an indicator for whether the city was the seat of a bishop and whether it was founded by the Etruscans to achieve identification. The Mill's ratio is obtained from the first-step probit regression. In Panel B we insert an indicator variable for whether the city evolved into an independent Signoria as an additional regressor. In Panel C we decompose the commune indicator variable depending on whether the commune was "neutral," "allied with the Emperor" or "belonging to the Lombard League" in the war for independence against Emperor Frederick I. Regressions are run on the sample of all cities located in the Center-North. All regressions include the standard controls of Table 2, second column. For brevity they are not reported. The regressions with all controls are reported in Appendix, Table A2. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Panel A. Effect of the length of independence on civic capital

	Non-profit organiz.	Organ donation organiz.	Cheating in math
Log of length of independence	0.23**	0.09***	-0.11***
	(0.09)	(0.02)	(0.03)
STANDARD CONTROLS	YES	YES	YES
	(1.57)	(0.35)	(0.53)
Mill's ratio	-0.89***	0.01	0.12
	(0.29)	(0 .07)	(0.10)
F-test for the exclusion restriction in selection equation	99.8	100.8	95.7
Observations	5,353	5,519	5,519

Panel B: The role of Signoria

	Non-profit organiz.	Organ donation organiz.	Cheating in math
Commune	1.48***	0.36***	-0.19**
	(0.32)	(0.07)	(0.08)
Signoria	1.21***	0.14**	0.01
	(0.31)	(0.07)	(0.11)
STANDARD CONTROLS	YES	YES	YES
Observations	5,344	5,538	1,911
R-squared	0.09	0.54	0.02

Panel C: The role of the Lombard League

	Non-profit organiz.	Organ donation organiz.	Cheating in math
Neutral city	1.62***	0.39***	-0.41**
	(0.41)	(0.08)	(0.18)
Part of the Lombard League	2.48***	0.50***	-0.10
	(0.33)	(0.06)	(0.16)
Allied to Emperor Fredrick I	1.11**	0.27**	-0.09
	(0.49)	(0.12)	(0.17)
STANDARD CONTROLS	YES	YES	YES
Observations	5,360	5,538	1,912
R-squared	0.09	0.55	0.02

Table 6: Running a counterfactual

Panel A shows regressions of social capital in the Center-North (first three columns) and in the South (last four columns) controlling for a proxy for ease of coordination (cities with a bishop seat at the time of the communes); Panel B reports estimates of social capital in the Center-North sample controlling for cities that became seat of a bishop after 1400 C.E. In Panel A, columns (1) and (6) and in Panel B columns (1)-(3) social capital is measured with the number of non-profit organizations per 1000 inhabitants. Columns (2) and (5) of panel A and (4)-(6) of Panel B measure the referenda turnout and columns (3) and (6) of Panel A and (7)-(9) of Panel B with the existence of an organ donation organizations. Post medieval bishop city is equal to 1 if a bishop city was created after 1400 C.E. and zero otherwise. Robust standard errors in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

A. Regressions of social capital in the Center-North and in the South

	Center-North sample			South sample		
	(1)	(2)	(3)	(4)	(5)	(6)
	Non-profit org.	Organ donation org.	Cheating in math	Non-profit org.	Organ donation org.	Cheating in math:
Ease of coordination	1.61**	0.47***	-0.62***	0.18	0.19***	-0.04
	(0.219)	(0.047)	(0.097)	(0.137)	(0.065)	(0.309)
Elevation	1.93***	-0.25***	0.92**	1.43***	-0.04	0.72
	(0.475)	(0.062)	(0.433)	(0.257)	(0.083)	(0.541)
Max difference in elevation	1.35***	0.01	0.26*	-0.08	-0.05*	0.06
within city territory	(0.219)	(0.026)	(0.144)	(0.084)	(0.029)	(0.145)
City is on the coast	-0.27	-0.08*	0.02	0.23**	-0.02	0.13
	(0.264)	(0.046)	(0.118)	(0.115)	(0.044)	(0.108)
City is more than 5km	1.10*	0.07	-0.21	0.02	-0.03	1.46
from the coast	(0.634)	(0.072)	(0.228)	(0.143)	(0.048)	(1.098)
Current Population	-3.38***	1.48***	-1.68***	-9.11***	1.10*	-3.50
	(1.886)	(0.290)	(0.454)	(2.242)	(0.582)	(2.849)
Current Populations squared	1.03	-1.12***	1.75***	6.23***	-0.86*	4.47
	(1.423)	(0.218)	(0.418)	(1.924)	(0.469)	(2.816)
Gini income inequality index	0.08	0.04	0.04	3.49**	2.05***	-21.66***
	(0.449)	(0.076)	(0.437)	(1.505)	(0.547)	(5.646)
Gini inequality index of	9.83***	2.17***	-8.51***	1.61***	0.35***	1.75
land ownership	(1.883)	(0.377)	(2.305)	(0.351)	(0.098)	(1.330)
Observations	5,357	5,535	1,911	2,175	2,178	1,210
R-squared	0.083	0.587	0.023	0.329	0.574	0.027

B. Regressions in the Center-North controlling for bishop cities established after 1400 C.E.

	Non-profit organizations: North sample	Organ donation organization: North sample	Cheating in math: North sample
Ease of coordination	1.62***	0.46***	-0.59***
	(0.234)	(0.050)	(0.091)
New seat of a Bishop after 1400 C.E.	-1.19***	-0.02	-0.11
	(0.391)	(0.074)	(0.081)
Elevation	1.68***	-0.29***	0.84**
	(0.474)	(0.065)	(0.396)
Max difference in elevation within city territory	1.40***	0.02	0.26*
	(0.221)	(0.027)	(0.143)
City is on the coast	-0.30	-0.07	0.03
	(0.259)	(0.045)	(0.110)
City is more than 5km from the sea	0.66	-0.02	-0.22
	(0.600)	(0.082)	(0.199)
Population (million people)	-3.57*	1.52***	-1.84***
	(1.905)	(0.306)	(0.474)
Population squared	1.17	-1.15***	1.87***
	(1.428)	(0.228)	(0.430)
Gini land inequality index	0.27	0.05	0.06
	(0.451)	(0.076)	(0.440)
Gini income inequality index	9.65***	2.19***	-8.54***
	(1.883)	(0.375)	(2.270)
Observations	5,382	5,560	1,935
R-squared	0.080	0.579	0.024