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ABSTRACT

Is social capital long lasting? Does it affect long term economic performance? To answer these questions we test Putnam's conjecture that today marked differences in social capital between the North and South of Italy were due to the culture of independence fostered by the free city-states experience in the North of Italy at the turn of the first millennium. We show that the medieval experience of independence has an impact on social capital within the North, even when we instrument for the probability of becoming a city-state with historical factors (such as the Etruscan origin of the city and the presence of a bishop in year 1,000). More importantly, we show that the difference in social capital among towns that in the Middle Ages had the characteristics to become independent and towns that did not exists only in the North (where most of these towns became independent) and not in the South (where the power of the Norman kingdom prevented them from doing so). Our difference in difference estimates suggest that at least 50% of the North-South gap in social capital is due to the lack of a free city-state experience in the South.

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In spite of remarkable success stories like the Asian Tigers and, more recently, China, there is a very large persistence in economic development. Among European countries, there is a correlation of 0.56 between per capita income at the beginning and the end of the century. Even between the 1700s and 2000s (over a 300 year-span and with an industrial revolution in the middle) the correlation is 0.23.[2] Why are these differences so persistent?

In an influential paper Acemoglu et al. (2001) attribute this persistence to the long-lasting effect of formal institutions. Protection of property rights and limitations on the power of the executive, which – they claim – are essential to the development process, are built into the formal institution of a county and tend to persist over the centuries. For instance, in countries where settlers' mortality was very high, colonizers designed institutions aimed at extracting value, rather than creating it. In their view, these extractive institutions did not foster (and still do not foster) rule of law, thus having a negative effect on development.

An alternative view is provided by Tabellini (2007), who attributes this persistence to culture, measured by indicators of individual values and beliefs, such as trust and respect for others. He shows that regions of Europe that had more decentralized decision-making responsibilities in the XVII and XVIII centuries, today have both more "progressive values" and higher income per capita.

Both these important papers, however, cannot completely reject the alternative that the source of persistence is geographical. Colonies with a lower settler mortality might still bear a disadvantage in developing today. Acemoglu et al. (2001) are aware of this problem and argue that the diseases that were a problem then (yellow fever and malaria) no longer represent a major source of comparative disadvantage. Still other geographical factors impeding economic development could be at the origin of this persistence. Similarly, as argued by Aristotle, different geographical conditions may foster different institutions and a different set of values. The possibility that geography rather than culture explains the persistence found by Tabellini (2007), thus, remains alive, especially in light of the fact that the reasons why different institutions emerged, remain unclear.

To try and distinguish between history and geography as a source of persistence we revisit Putnam's (1993) hypothesis. In "Making Democracy Work", Putnam conjectures that regional differences in trust and social capital within Italy can be traced back to the history of independence that certain cities experienced in the first centuries of the second millennium. Besides the clear logical link, Putnam's conjecture has two other advantages. First, it traces back the origin of these differences to institutions that are long gone. Hence, it is impossible to

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

attribute any residual difference in social capital (and difference in economic outcomes associated with it) to the survival of any formal institution. Second, while concentrated in the Center North part of the country, the free-city state experience did not involve all the major cities in the Center North. It is possible, then, to look *within* the Center North to determine whether cities that experienced a period of independence as free city-states have today (more than 800 years later) a different level of social capital.

To test Putnam's conjecture we start by comparing current levels of social capital within the North-central part of Italy. Following Putnam's (1993) measures of social capital, we use the number of non-profit organizations per capita, turnout at major referenda, and the presence of an organ donation organization.

Consider for example the difference between Faenza, a town of 54,000 inhabitants, 30 miles South-East of Bologna and Senigallia, a town of 44,000 inhabitants 60 miles South of Faenza. They were both important medieval towns, in fact Senigallia used to hold one of the largest fairs in Italy, visited by merchants from all over Europe and especially the Levant. Faenza became a free city while Senigallia, which belonged to the March of Ancona and as such had a strong presence of imperial power, never did (at the end of the twelfth century was the seat of a count). Following all three measures of social capital, Faenza dominates Senigallia: the number of non-profit organizations per capita is 42% higher, participation at referenda is 89% versus 86%, and Faenza has an organ donation organization, while Senigallia does not.

To conduct this analysis in a more systematic way, we identify the largest 400 Italian towns in the Center-North in 1871 (the first Census after Italian unification) and for these we reconstruct their medieval history as well as collect several measures of social capital. We, then, relate today's social capital levels to determine whether a town had been a free city-state in the 1000-1300 period.

Consistent with Putnam's conjecture, we find that Center-Northern cities that experienced a period of independence as a free city have significantly higher levels of social capital today. For example, the number of voluntary associations is 25% higher in cities that were free city-states.

While general geographical conditions within the Center-North are similar, this test alone cannot reject the hypothesis that some more subtle geographical characteristics, such as closeness to the sea, affect both social capital and the probability that a city would become a free-city-state. In our regressions we control for several morphological characteristics, nevertheless we address this problem directly by digging into history to find some exogenous determinants of the rise of independent municipalities.

Our reading of Medieval history books (among others, Reynolds, 1997; Milani, 2005; Jones, 1997; Tabacco, 1987; Pirenne, 1956) suggests that a key factor in the formation of free cities was the coordination role played by a local religious authority. Therefore, as a predictor of becoming a free city-states, we use whether a town was the seat of a bishop before the year 1000. A second potential predictor of achieving independence is the strategic military position. A city like Orvieto, which is located on top of a cliff, was much easier to defend militarily (especially before the introduction of gunpowder), than a city in the middle of a plain. Since this advantage is not easy to identify directly, we use earlier history to help us determine it. The earliest civilization that was organized as free city-states is Etruscan (IX century B.C), which populated an area from Mantua in the North to Salerno in the South. Since the Etruscans had the first mover advantage, they chose to locate their cities in positions that were easy to defend. Hence, we use the Etruscan origin of a city as a predictor of becoming a free city-state in the Middle Ages.

Both these instruments have a strong predictive power on the likelihood of being a free city-state. The *F*-test of the exclusion restriction is 66, so we do not suffer from a weak instrument problem. Even when we instrument the existence of a free city-state with its historical determinants, we find that free city-state towns have more social capital today.

These results are supportive of Putnam's conjecture, but are not a definite rejection of the geographical alternative. It is possible that something in the morphology of the territory (not captured by our controls) drives all our results. If there is a location advantage that has lead the Etruscans to settle there, has lead the Catholic Church to elect it as a seat of its bishops, has made it easier for that city to conquer independence from the Emperor, and *also* fosters social capital today, then our instruments do not solve the problem.

To address this issue, we use a difference in difference approach, exploiting a historical counterfactual. If cities in Southern Italy did not become free city-states, it is not because they were poorer or had less opportunities to trade (in fact at the beginning of the second millennium the South of Italy was more developed and prosperous than the North) but because of the strong central power exerted by the Normans (Putnam, 1993). Under the maintained hypothesis that the determinants of location advantages are the same in the Center North and in the South, we can predict which towns would have become free city-states in the South had the Normans not been there. We then compare the difference in social capital between the towns predicted to become free city-states in the Center North (where they did become) and predicted to become free city-states in the South (where they did not). We use the difference in social capital between towns not predicted to become free city-states in the Center North and in the South as a control for generic differences between North and South. When we do so, we find that there is much less social

capital in the South regardless (an effect that could be either driven by history, as suggested by Putnam, or geography). The difference between free city-states and not *within* each macro-region, however, is present only in the North. For example, Northern free city-states have 17% more non-profit associations than similar Northern towns that were not free city-states.

Our difference in difference estimates suggest that at least half of the gap in social capital between the North and the South of Italy can be attributed to the free city-state experience. But our approach clearly underestimates the impact of political independence on social capital because it ignores local spillover effects. We cannot exclude, however, that other historical and/or geographical variables are responsible for the remaining half of the gap.

Interestingly, in the South, current levels of social capital do not differ between towns that we predicted to become free city-states and towns that are not. This lack of an effect in the difference in the South can be regarded as a test of the validity of our instruments. Besides being correlated with the variable of interest (a hypothesis easily checked), an instrument should be orthogonal to the error. This assumption is generally not testable, because normally we do not have access to a counterfactual sample. The Italian historical experience, however, allows this counterfactual. Up until the fall of the Roman Empire, the North center and the Southern regions of Italy experienced a similar history. The affirmation of the Norman Kingdom in the South, however, prevented the formation of free city-states in the South. We can then test whether our instruments (being the seat of a bishop and Etruscan city) have an effect only on the probability of becoming a free city-state, but not on social capital directly, by looking at their effect in the South, where free city-states did not occur. That these instruments have no effect in the South suggests the exclusion restriction is valid.

Having established the validity of our instruments for social capital, we can use them to estimate the impact of social capital on economic development. When we do so, we find that one standard deviation increase in social capital increases per capita income by 21%. This estimate vindicates Arrow's (1972) statement that much of economic backwardness is due to lack of trust and social capital.

Our results raise the question of how a relatively brief historical experience can leave such a long-lasting (more than 500 years) trace. We address this question in a separate work (GSZ, 2008), where we model the intergenerational transmission of beliefs. In that paper we show that even a brief positive experience of cooperation (2-3 generations) can have lasting effects on the beliefs (and hence of the social capital) of a community, even without the survival of any legal institutions.

The rest of the paper proceeds as follows. Section 1 provides a brief primer on medieval Italian history that illustrates the logical connection between the acquisition of political independence and the development of social capital. Section 2 describes our data. Section 3 presents the analysis of the effect of the free city-state experience within the North center part of Italy. Section 4 presents the difference in difference regression and discusses the validity of the instruments; Section 5 shows the effects of social capital on income and wealth and Section 5 concludes.

1. A primer in Italian medieval history

1.1 Social capital and the free city-state experience

The term social capital has been used to indicate several, often very different, concepts. We follow Putnam (1993) and identify social capital with civicness or "the collection of good behavior that tends to be simultaneously present in certain communities/countries whose inhabitants vote, obey the law, and cooperate with each other and whose leaders are honest and committed to the public good" (Putnam, 1995).

It is unclear in the literature how this social capital is formed and transmitted over time. Putnam (2000) and Costa and Kahan (2003) emphasize the role free associations play in fostering it. We follow Putnam (1993) who conjectures that the provision of public goods requires some degree of cooperation. Communities differ in their return to cooperation and in their ability to foster it. Once a certain degree of cooperation is established, however, people observe the benefits of this cooperation and tend to develop a culture (norms and beliefs) that sustains it (for ways to model this, see Tabellini (2008) and GSZ (2008)).

As we will describe below, the Italian free city-state experience is a wonderful, natural experiment, where at a certain point in history the return to cooperation rose dramatically only in a certain part of the country. As we will explain, some accidental factors (the presence of a religious authority, the strategic location, distance from the imperial army) determined why some towns achieved successful cooperation in defending themselves and organizing their political activity, while others did not. In the rest of this section we will try to describe how this process took place.

1.2 The rise of the free city-states

The rise of city-states in Northern-Central Italy is part of a broader process triggered by the collapse of the Carolingian Holy Roman Empire at the end of the first millennium. The central feature is the affirmation of self-government in cities. While spread over Northern Central and Western Europe (Reynolds, 1997; McKitterick, 2004) this development was particularly strong in Northern-Central Italy between 1100 and 1300 because of the weakness of any central authority in this part of Europe and the strong benefits arising from trade. The vacuum created by the weakening of the imperial authority lead to the emergence of local powers.

At the beginning, in some cities, the response to the lack of government was the formation of small groups of individuals who agreed with a "*patto giurato*" (literally a swore pact) to provide mutual help and collaborate to solve problems of common interest. An example is the Genovese *compagna*, an alliance among the most prominent families of the marine aristocracy who swore to collaborate to solve problems of common interest.

Enforcement of the pact was achieved by a threat of exclusion, exclusion from trade and political relations with the other members of the pact. This was a very costly punishment for people heavily engaged in trade at a time when commerce was booming. In some cities (e.g. Pisa), a third party – the city bishop – was assigned the role of guarantor of the pact. His presence added another punishment for defection: the exclusion from the sacrament and in particular from the weekly communion. In sum, the pacts were enforced by a combination of economic, political, and religious ostracism.

Slowly, more stable institutions started to emerge. The first seed of the free city is the *consulate* – a committee of a limited number of citizens, endowed with significant power that remained in office for a specified period of time (initially one year). Reliance on the counsels for the administration of the city marks the most visible sign of the rise of the free city as an independent political body (Milani, 2005, p. 23). With time, effort and wars, the free city developed fully. Over the course of the next two centuries the small assembly of the heads of the main families that were sharing powers (the participants to the pact) evolved into a formal "parliament" of elected members that allowed for a wider participation of the population in the decision making process.[3] With these changes, the independent city-state was fully developed. It

[3] The juxtaposition of two episodes – as described in Milani (2005) in which Faenza – a town near Bologna – faced a military threat two hundred years apart gives a sense of how powers shifted and how the new institutions consolidated during this period. In the fall of 1079, Faenza receives a declaration of war from the neighboring city of Ravenna. The disproportion in relative powers is huge. Faenza can gather at most 150 soldiers. In an attempt to prepare a defense, the main families, which have agreed to cooperate to govern the city, send a few representatives in search for help all over the Po river plain. After an unsuccessful start, they find a French knight - the Count of Vitry – who is willing to help them with his own army in exchange for perpetual submission. When the Faentines' representatives return to town, they

provided law and order, collected duties and tolls, took care of the walls that provided the basic protection to the citizens and was responsible for the maintenance and security of the roads, essential to guarantee trade, which was developing fast.

In the mid-twelfth century a new word came into use to describe the independent town communities and their government: "commune". As Reynolds (1997) notices "… its use in urban context may derive from *communia*, meaning common property: not only walls and streets but also cathedrals and churches were increasingly regarded as the responsibility and therefore the property of the local community. Their rights and liberties were also their common property which it was their responsibility to maintain (p. 170)". Indeed, the word *commune* is a synonym for republic (*res publica*, i.e. common property) and is used with this meaning. This sense of responsibility for the common good that citizens of independent towns developed and consolidated over two centuries of self-government is the "civicness" Putnam refers to.

The extraordinary independence enjoyed by Italian free cities did not come for free. They had to defend it from the attempts of German Emperors to exercise their authority and impose taxes; from the pretences of local lords; and from the repeated attempts of other free cities to expand their domains.

The battle for independence from the Emperor reached its peak in 1176 when a league of free cities in the North of Italy, the Lombard League, defeated Emperor Fredrick I Barbarossa who descended on Italy to try to reaffirm his powers and privileges. On that occasion not all the free cities fought the Emperor, some sided with him in exchange for concessions. That free cities were able to strike deals with the Emperor, however, shows how powerful local governments had become.

To appreciate how different an institution free cities were and how deeply they changed the political culture of the time, several aspects are worth emphasizing. First, in the commune the political entity is not identified with a single person ruling, but with the entire community (henceforth the name). Second, the source of political power and legitimacy of authority is not religious or dynastic, but comes from the people. Rules, laws, and formal decisions are always

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announce the proposed solution to the main household heads gathered in the small cloister of the cathedral. The solution offered reveals to be a successful one, as the Count of Vitry is able not only to defeat the Ravenna troops but, generously, frees the Faentines from their promise of submission. Two centuries later, in the Fall of 1275, Faenza is threatened by another free city: Bologna. Faenza is the local headquarters of Ghibellin troops in the region and is under attack from the surrounding Guelph cities. The Emperor's ambassador is received by all the city knights (now in the order of thousands) and introduced to the assembly of all the city household heads, meeting in the large city square (piazza), built for these occasions. After that, Faenza calls a general city council, whose members are elected by all citizens to have the proposal approved (see Milani, 2005 p. V). Compared to two centuries earlier, the town now has its formal political institutions and is able to negotiate as equal with the most important political authorities of the time (the Emperor and the Pope).

made in the name of the people, though in practice elites and families are very important. Third, communal life is regulated by statutes enacted by the assembly which apply to *all* citizens rather than to a group of subjects (Galizia, 1951 and Tabacco, 1987). This is in sharp contrast with the feudal society where rules and rights differ on the basis of the status of a person (noble, peasant, clergymen, etc.). Finally, the development of the commune goes hand-in-hand with that of personal freedoms: before the rise of the independent cities, townsmen were subservient to the local lord. With the commune, personal freedoms receive legal protection against abuses of government officials, whose actions are subject to control of ad hoc institutions, including courts of law to which citizens could appeal (Galizia, 1951).

In other words, the free city-states developed a system of protection of property rights and limits to the power of the executive that Acemoglu and Johnson (2005) deem necessary for development.

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

Over the course of the thirteen and fourteen centuries, the increase in social mobility associated with the sustained economic growth lead to the emergence of new, rich and powerful merchants, who claimed political power and threatened the city's political equilibrium, dominated by the older powerful families. At the same time intense competition from neighboring cities threaten their independence.

Initially the problem was addressed by inviting a third party, possibly a foreigner, called "*Podesta' forestiero*" – a foreign city mayor – to manage the city for a specified length of time. This institution slowly evolved towards one where the "podesta'" acquired more power and retained it for longer periods, ultimately forever.

As free cities started to confer life-long power into the hands of a single person – the Lord or *Signore*, communes became *Signoria* (lordly power). Interestingly, however, in several cases the *Signoria* retained the basic institutions of the commune including the principle that power originated from the people and was exercised in the people's name. In some cities, as in Florence and Genoa, the *Signoria* also preserved the political institutions and the personal freedoms present during the commune period. In this sense the Signoria is a continuation and transformation of the commune (as argued by Prezzolini, 1948 and Chittolini, 1999), which might have allowed the civic culture to root more deeply, especially with respect to other cities, which were conquered and subjected by neighboring towns or foreign powers.

1.4 The lasting legacy of communes

Having explained how the formation of communes was logically linked to the development of social capital, we now test Putnam's conjecture that these differences in the level of social capital survived to the current day. Clearly, this is no small step. We will return to the mechanisms through which differences in social capital might have persisted in the conclusions and we develop these arguments further in a companion paper (GSZ, 2008).

1.4. *Why some towns acquire independence and others do not*?

Before moving to the tests, however, we need to explain why communes (and thus the civic spirit) did not diffuse homogeneously throughout the Italian territory. Paradoxically, the reason why Southern Italy did not experience communes is because they did not *need* communes: law and order was insured by the highly autocratic and efficient Norman kingdom (Putnam (1993) and Kantorowicz (1931)). Between 1061 and 1091 the Normans invaded the part of the country south of Rome and formed a feudal monarchy, which continued in some forms or another until the Italian unification in 1861.

The Norman kingdom brought peace and prosperity to the South. By the end of the 12th century Sicily was the richest, most advanced State in Europe. But its highly hierarchical form of government inhibited the formation of independent city-states and, in doing so, they prevented the accumulation of social capital (Putnam, 1993).

The same reason – a strong local power – explains why in certain areas of the North and the Center communes were rare or non-existent. This happened, for instance, in the marches – the regions along the empire's eastern frontier (for example today the regions of Marche and Friuli) - that Charlemagne endowed with stronger military and political power to better serve their defensive role when in year 800 he reorganized the empire. The town of Senigallia, mentioned in the introduction, is an example of this. Trieste, a relatively important town in the most Eastern part of the country, is another.

There are three other factors (linked to the costs and benefits of achieving independence) that explain the heterogeneity in the Center-North. First, not all towns had the same need to secure law and order at the time when the Holy Roman Empire was losing its grip. The need for security was greater where the opportunities for commerce were greater. Since commerce took place by sea or along the old Roman road, in our empirical analysis we are going to capture this effect with the location of a town along the coast and at a crossroad of two Roman roads.

Given a certain need for a local political power, the ability to solve the coordination problem and provide security was helped by the local presence of a religious authority, such as a bishop or archbishop. This religious authority made it easier to enforce the "*patti giurati*", which

formed the first nucleus of communes (Tabacco, 1987). Empirically, we can measure this with a dummy variable equal to one if the town was the seat of a bishop by the year 1000.

Finally, the opportunity to insure the survival of an independent source of power was greatly enhanced by strategic considerations. A town like Orvieto, which is located on top of a cliff (see Figure 3), can more easily defend its autonomy (especially before the introduction of gunpowder), than a city in the middle of a plain. Since this advantage is not easily identified directly, we use earlier history to help us determine it. The earliest civilization that was organized as free city-states is Etruscan (IX century B.C), which populated an area from Mantua in the North to Salerno in the South. Since the Etruscans had the first mover advantage, they chose to locate their cities in positions that were easy to defend (not coincidentally, Orvieto was the capital of the Etruscan confederation). Hence, we use the Etruscan origin of a town as a predictor of its ability to become a commune after year 1000 C.E.

2. Data

2.1 *Sample selection*

To reduce the cost of collecting historical data at the town level, we had to limit the size of the sample to a manageable number of towns. To minimize possible survivorship biases we selected the largest 400 cities (by population) in the area that was under the Holy Roman Empire at the beginning of the second Millennium (see Figure 1). We selected the earliest day we have Census data for (i.e., right after Italian unification in 1861). At current borders this area comprises 12 regions: Piedmont, Valle D'Aosta, Liguria, Lombardy, Trentino, Veneto, Friuli, Emilia, Tuscany, Umbria, Marche and Latium.[4] Since Sardinia was not part of the Holy Roman Empire nor was it under the Normans, we have excluded it from the sample altogether. We also dropped Rome since its history is too peculiar and unique.

To run the difference in difference estimates we selected a sample of cities in the south of Italy by using the same criteria. Using today's borders this area includes 7 regions: Campania, Abruzzi, Molise, Basilicata, Calabria, Puglia, and Sicilia. When we use the 1871 population cutoff that delivered 400 cities in the Center North (6,619 inhabitants), in the South we obtain a sample of 286 towns.

[4] The 1871 census does not contain data for Trentino and Friuli (which at the time were still under the Austrian empire). For these areas we use the used the 1921 census (the first after World War I when they were liberated) and deflated their 1921 population by the average population growth in the other Center North regions during the same period.

2.2 *Identifying communes*

Historians seem to agree that a commune, to be properly identified as such, should fulfill at least four criteria. First, it should have consuls as part of its institutions. Second, it should have its own institutions to administer justice. Third, it should have some military power and military activity. Finally, it should have its own territory (the *contado*) to administer (Milani, 2005). Assessing the presence of these criteria in all the 400 cities in our sample, however, is extremely difficult and bound to errors, since a comprehensive history of communes in Italy does not exist.

We chose instead to start from the most prominent historical atlas (the *De Agostini Historical Atlas*) and checked that all the towns reported as independent in the atlas fit the four criteria above. This method tends to underestimate the number of free cities, biased against finding any effect of communes.

Since the status of independence changes over time, we chose to focus at two moments in time. The first one, 1176, is when the Northern communes organized into a league (the Lombard League) to fight against the Emperor Frederick I, also known as "Barbarossa". We then checked our results using the list of independent cities in year 1300, when the free city-state movement was at the top of its expansion and before the emergence of the Signoria.

Figure 1 shows the map of communal Italy in 1176. The red line marks the border of the Kingdom of Italy under the Holy Roman Empire. The independent cities are those marked with a black dot. The map also distinguishes which cities joined the Lombard League (labeled in red) in the war for independence against the Emperor and which were allied to the Emperor (labeled in blue). Finally, the map shows several cities that while important at the time, were not communes. As we can see, communes were spread all over Central-North Italy, but the phenomenon was more intense in certain regions (such a Tuscany and Emilia) than in others (such as Latium 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 source, we labeled Venice as a "non free city-state", but our results are robust to treating Venice as a commune.

Table 1 lists all the cities in our sample. The first column (after the names) reports whether the town was a commune in 1176 as per Figure 1. Overall, there are 67 communes. We lose five of them (Albenga, Cervia, Chiusi, Gravedona and Noli) because they did not make our cutoff for inhabitants as of 1871 and one (Bellinzona) because it is not part of Italy today. Therefore, the final sample includes 61 free cities (15% of the sample).

The second column reports whether the town was a commune in 1300 as per Figure 2. This criterion leads to 58 free cities: 45 were also present in the first list, while 13 are new. As a third definition, we use the union of the two criteria; which delivers 71 free cities (18%).

For these communes, we constructed a measure of length of independence by consulting several historical sources (see Appendix). The most controversial date is the beginning of the independence period. First, this process was gradual, from the formation of the "*patto giurato*" to the election of the first consuls, to end with the adoption of the first statute (a sort of constitution). Second, in Italy, towns are very proud of their heritage and they tend to boast about the beginning of their independence. It is generally easier to determine when the independence ended, because this corresponds to a major military defeat or invasion or the transformation of the commune into a *Signoria*. Finally, using the same sources we constructed an indicator for whether the independent city evolved into a Signoria. See the data appendix for more details.

2.3. *Social capital measures*

As main indicators of social capital, Putnam (1993) uses the presence of non-profit associations and the electoral turnout in major referenda.[5] We follow suit and as a first measure of social capital we compute the total number of non-profit associations present in a town in 2000. Since this information comes from the 2001 census, it has the great advantage of counting *all* non-profit organizations no matter their scope.[6] Another advantage of this measure is that it is readily available for all the municipalities, including those in the South of Italy, which will become useful in our difference in difference exercise in Section 5**.**

As a second measure of social capital, we use referenda turnout. Since these data are (surprisingly) not available at the town level in electronic format and difficult to reach even in paper format, we limit ourselves to three major referenda (see appendix).

Finally, we would like to integrate these measures with a measure of blood donations, as we did in GSZ (2004). Unfortunately, using blood donations at the town level has some problems. First, in some regions (e.g. Tuscany) there are several voluntary organizations of blood donors, which do not keep the same quality records as AVIS, the major one. Their activity is negligible at the provincial level, but not at the town level, particularly in smaller towns where they compete with AVIS. Second, people might donate blood where they work and not necessarily where they live, clouding the measure at the town level. For these reasons we have replaced this measure

[5] He chooses referenda over political election for fear of contamination of the so called "exchange vote", people who are paid to vote for a particular candidate in political elections.

[6] This feature is particularly important in smaller towns where, given fixes set up costs, only certain types of organization might be present.

with an indicator of the existence in the town of an organ donation association. This measure has the same desirable feature of the blood donations measure (i.e., it cannot be explained by economic motives) but it is less subject to errors, since there is only one organ donation association (AIDO). The data appendix provides additional details on how these variables are constructed and their sources.

2.4 *Other historical variables and city controls*

We have also gathered a number of additional historical variables that we use as controls or instruments in our regressions. First, we are able to determine which towns were the seat of a bishop at the time of formation of the independent city-states. In our Center-North sample we find 86 such towns. Bishop seats were mostly formed around the III and IV centuries AD, following the diffusions of the Christianity in the Roman Empire. As a result, 85 percent of these seat locations predate year 1,000.

Second, we obtained information on the Etruscan origin of a town from Antonello Montesanti, an archeologist expert on the topic. Moving from Etruria – the region corresponding approximately to Tuscany, Umbria and Northern Lazio – Etruscans founded two additional city clusters of towns, one north of Tuscany in Romagna, and one in Campania, South of Lazio. Since Etruscans believed that the number 12 had magical power, these clusters included 12 cities each. 23 out of the 24 Etruscan towns in the Center North can be mapped into current towns, while we can do the same for only 8 of the 12 in the South.

Another factor behind the achievement of independence is the size of a town. To this purpose we use data from Bairoch et al. (1988). Since data on population for the year 1,000 is very scarce, we use data for 1,300 - the first year data become available for a relatively large number of towns. By contrast, to determine whether a town was located at a crossroad of Roman roads we use the Touring Club Historical Atlas.

Finally, all the other variables (including geographic controls and data on per capita income and wealth) are from “Le Misure dei Comuni”, 2003-2004 edition, a database assembled by the association of municipal administrations, which reports over 320 variables at the city level. The data appendix provides more details about the definition and sources of the variables. Table 2 shows summary statistics.

3. The analysis within the Center-North

3.1 The weighted least square estimates

We start by analyzing the variation in social capital within the Center-North. Since the measures of social capital we use tend to be noisier for smaller towns, we weight the residuals by population in 2001.

The first measure of social capital we use is the number of non-profit organizations divided by population in 2001 (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. Consistent with Putnam (1993), having had a commune is related to 0.42 more associations per capita, which corresponds to a 8% increase in the average level of per capita association. This effect, however, is not statistically significant.

This regression does not control for any geographical difference nor for any variation in population. Morphological characteristics might affect the cost of interaction and so the level of social capital. At the same time, they might have affected the probability of becoming independent, by influencing the ability to defend the city, hence generating a possible spurious correlation or hiding an existing one.

To address these concerns, in column 2 we insert several controls. To control for whether a town is located in the mountains, we insert the average elevation (in thousand meters) of the city, measured at the location of Town Hall. To control for geographically-driven differences in the cost of interaction we insert the maximum elevation difference within the city territory. We also control for whether a town is along the coast or within five kilometers from the sea. As a measure of the trade opportunities, we insert a dummy, whether a town is located at the crossroad of two or more Roman roads. Finally, as a measure of size, we control for the number of inhabitants (thousands of people) in 2001. Since we are unsure on how population affects social capital, we insert both the level of population and its square.

Towns with steeper territories tend to have higher levels of social capital, while towns located on the coast, lower levels. Towns at the center of commerce do not exhibit higher level of social capital, while bigger towns have lower levels of social capital. After all these geographical controls are inserted, the impact of the free city-state experience is almost three times as large and statistically significant at the 1% level. Towns that have been a commune have 1.1 more associations per thousands inhabitants, equal to 21% more. This is only half of the difference in social capital between Center North and South, but it is estimated using only the within Center North variation.

Another known determinant of social capital (Alesina and La Ferrara (2002)) is the level of income inequality. For this reason, in column 3 we insert two Gini measures of inequality: in land ownership and in pre-taxed income. This addition runs the risk of overcontrolling, since income inequality could be an effect of persistent lower levels of social capital. Surprisingly, higher income inequality leads to more social capital, as measured by the number of non-profit associations per capita. This effect, however, is due to the lack of a control for income per capita. When we will introduce this control (see column 6) this effect will disappear. Regardless, the impact of having been a commune remains unchanged.

While we control for population and population square, it is still possible that our estimated effect only reflects some non-linearity between city size and social capital. For this reason, in column 4 we drop all towns with more than 120,000 inhabitants in 2001. The effect of the free city-state experience remains unchanged.

Two thirds of Medieval free city-states coincide with today's provincial capitals. This administrative role might confer a different status to the city, which might affect its level of social capital. For example, associations might find it convenient to be located in the provincial capital because of proximity to the local administration. For this reason, in column 5 we drop all provincial capitals from the regression. The effect of the commune experience is larger than before.

Glaeser et al (2002) show that individual investments 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 some unobserved characteristics that make a certain town more prosperous.[7] To address this concern we would like to insert the 1100 level of income per capita. Unfortunately, we do not have any such measure and we have to resort to today's level of income per capita. This specification will clearly underestimate the impact of the free city-state experience, because, as Knack and Keefer (1996) show, social capital promotes growth and so the higher social capital generated by the city-state experience will translate into higher per capita income. As column 6 shows, richer towns do exhibit a higher level of social capital and, as expected, the insertion of this variable does reduce the impact of the free city-state experience on today's level of social capital. The effect of the communal experience, however, is still positive and economically and statistically significant.

[7] Of course the fact that very rich towns in the South, even richer than Northern towns, such as Salerno and Palermo, did not become free cities suggests that historical accident more than unobserved prosperity was driving the acquisition of independence.

Finally, in column 7 we add to the basic specification (column 3) four area dummies to capture possible unobserved heterogeneity in the social capital across these regions (North East, North West, 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 social capital.

Since the number of non-profit organizations is available electronically for all Italian towns, when we use this measure we can check whether our results hold in the entire sample of 5,360 towns in the Center-North (Table 3b).[8] When we do so, the estimates of the free city-state experience is approximately twice as large as that estimated by using the smaller sample. This is not surprising as smaller towns were less likely to have been a commune. Hence, our focus on the largest 400 towns, if anything, provides a lower bound of the true effect of past history on social capital.

In Table 4 we estimate the same regressions by using as a measure of social capital the referenda turnout (percentage of people voting at the referenda). Interestingly, when we do not control for city size (column 1) the impact of the free city-state experience on social capital is negative though not statistically significant. When we insert such a control, however, the coefficient turns positive and statistically significant (column 3). In cities that experienced a commune, electoral participation is on average one percentage point higher (corresponding to an increase equal to 20% of the standard deviation in the sample). All the other specifications confirm this result, except when we exclude the larger towns and the provincial capitals. When we do so, the effect of the free city-state experience becomes smaller and not statistically significant.

Finally, in Table 5 we repeat the exercise by using our third measure of social capital: the presence of an organ donation association. As in the case of electoral participation the effect of the free city-state experience is positive and statistically significant in all the specifications except when we exclude the larger towns and the provincial capitals. This result is hardly surprising. Not only when we eliminate the provincial capitals are we eliminating two thirds of the free city-states, we are also eliminating one of the channels through which this effect works. Towns that became independent in the Middle Ages and have accumulated more social capital are likely to prosper more and, as a result, to be chosen as a provincial capital.

As a robustness test, in Table 6, Panel A, for each measure of social capital we report the main specification (column 3) estimated by Ordinary Least Squares, rather than Weighted Least

[8] In this specification we omit variable "location at an intersection of two Roman roads, since we have collected it only for the 400 largest towns.

Squares. The results are substantially the same, with the only exception that the free city-state experience is not statistically significant when we measure social capital as referenda turnout. This is not surprising, since in smaller towns idiosyncratic issues might increase the noisiness of the left-hand-side variable, which reduces the statistical significance.

In Table 6, Panel B we check the robustness of the result to the definition of the set of free cities; the first three columns rely on the historical map of Italy as of 1300 to identify which towns had been communes, while columns 6-8 use the union of the two definitions. In either case results are similar to the ones obtained using the first definition, except that the estimated effect on referenda turnout is lower when we use the 1300 map as the basis for classification of independent cities.

3.2 Digging more into history

Thus far, we have treated all the free city-state experiences the same. This is clearly wrong. First, the length of independence was very different. Second, the history after the end of the free city-state experience was different: some towns became dominated by neighboring towns, others experienced the transformation of the *Commune* into a *Signoria*. Finally, the quality of the free city-state institutions and their degree of autonomy was very different. In this section we explore whether these differences had an impact on the culture each city elaborated and (through it) in today's social capital.

Table 7 starts by analyzing the effect of the length of independence (Panel A). As we discussed earlier, this measure is very noisy, since the exact date when independence started as well as when it ended is somewhat subjective. Since many of the factors that determined the formation of the free city-states also determine the length of independence, to identify the effect of the latter we use a Heckman two steps estimator. As we will discuss in section 3.3, there are several variables that help predict why some cities have become independent. Except for being a bishop seat, all these variables are likely to affect the length of independence too. Therefore, our identifying restriction is that the local presence of a bishop contributed in overcoming the initial coordination problem, but did not affect a city's ability to remain independent.

The first column shows the results of the estimates for the number of non-profit organizations. The length of independence has a positive effect on this measure of social capital and the estimate is statistically significant. Economically, however, the effect is small: starting with a length of independence of 206 years (the sample mean) and increasing it by one standard deviation (about 100 years) raises the number of non-profit organizations by 2.5% of the average among the cities that have experienced independence. If one started at a lower length (50 years,

around the first percentile) effects would be four times larger but still contained. Given that this measure is quite noisy, it is quite possible that our estimates are biased downwards and they are a lower bound of the true effect.

The second column shows that when social capital is measured with referenda turnout we cannot reject the hypothesis that differences in the length of independence among free cities has no impact, possibly reflecting both the noise in this measure of social capital and the attenuation bias induced by the measurement error in the length on independence.

The length of independence helps also predict the existence of an organ donation organization in the city. Even if the estimated coefficient is statistically significant, economically the effect is small: at the sample mean a 100 year increase in the length of independence raises the probability of having an organ donation organization by only 4 percentage points (which is 10 % of the sample mean).

In Panel B we study the effect of having a period as a *Signoria* after being a commune. Free city-states that did not evolve into a *Signoria* generally lost their independence to another commune or *Signoria*. This latter outcome implied a demolition of the local communal institutions and the abolition of many of the rights associated with that. Therefore, we expect that communes that did not evolve into a Signoria exhibit a lower persistence of social capital.

As column 1 shows, experiencing a period of *Signoria* adds to the level of social capital. *Signoria* towns have 0.7 more associations per thousand inhabitants than towns that were just free city-states (almost doubling the effect of having been a free city-state). The same is true if we measure social capital as electoral participation (column 2) or organ donation (column 3).

In Panel C we analyze the effect of the degree of independence. As a proxy for this difficult-to-measure variable we use the side different cities took in the struggle against Emperor Frederick I in the middle of the 12^{th} century. In 1158 Frederick claimed direct Imperial control over Italy. Twenty-four cities in the North formed an alliance (called the Lombard League) to counter Frederick's attempt to assert his influence over Italy. We take active participation in this League as an indicator of the strength of the independence of these towns. This is especially true if we contrast these cities with other free city-states in the North, which chose to subject themselves to the Emperor and became his allies. Finally, twenty five city-states (mostly in the Center of Italy and thus farther away from the threat of the Emperor) chose to remain neutral. Panel C decomposes the free city-state effect in these three categories.

When we measure social capital as number of non-profit organizations (column 1), the positive effect of the free city experience is similar for Lombard League towns and neutral towns.

This effect, however, is almost two times bigger than the impact of free city-states allied to the Emperor.

The pattern is similar when we measure social capital as electoral participation (column 2). In fact, the effect of free city-states allied to the Emperor is statistically not different from zero, while the effect of cities which were part of the Lombard League is 60% larger than the effect of neutral free city-states. The same is true when we measure social capital as the presence of an organ donation organization (column 3).

That today's social capital is linked not only to the existence of free city-states, but also to the nature of their experience is additional evidence in favor of a causal link between these two phenomena.

3.3 The instrumental variable estimates

While general geographical conditions within the Center-North are similar (especially when we control for the four macro regions in the last column of Table 3) and we have controlled for idiosyncratic differences in our regressions, it is still possible that some more subtle geographical characteristics affect both social capital and the probability of why a city became a free-city-state. To address this concern we should be able to find an instrument that affects the probability of becoming a free city-state, but does not affect the level of social capital directly.

To find some instruments we dig into history. As we discussed in section 1.4, there are four factors that can explain heterogeneity in outcomes in the Center-North. One of these factors, being a cross-road of Roman roads, can hardly satisfy the condition for an instrument, which should be orthogonal to the error. Since Romans strategically chose the layout of roads and that of cities, being at a cross road of Roman roads could be still linked with potential trade benefits not captured by our regressions. Since trade can foster trust (as beautifully shown by Greif, 2006), we will use this indicator only as a control, not as an instrument.

The second factor (strong presence of the Imperial army) is trickier. On the one hand, we do not know whether this is a cause or an effect: at the time of Charlemagne all Center-North Italy was divided into marches. The survival of strong marches, thus, could be the effect of lack of free city-states or the cause. On the other hand, these indicators would be highly clustered and very closely correlated with our macro regions.

Hence, we are left with two determinants of variability in the probability of the formation of a city-state that we can use as instruments. The first is whether the city was the seat of a bishop. According to many historians (Reynolds, 1997; Milani, 2005; Jones, 1997; Tabacco, 1987; Pirenne, 1956) the presence of a religious authority fostered the necessary coordination to acquire

independence. The second is whether the city was founded by the Etruscans, as a proxy for its strategic location. The example of Orvieto (the capital of the Etruscan confederation) located on top of a cliff is very illustrative (see Figure 3).

A priori there is no reason to fear that these two variables might have a direct effect on today's social capital. Contrary to most situations, however, we will be able to test this assumption directly (see section 4.2)

In Table 8 we analyze the explanatory power of these historical instruments. When we regress a free city dummy variable on bishop location and Etruscan origin, we find that both instruments have the expected sign and are highly statistically significant. A town that was the seat of a bishop is 73% more likely to become a free city-state than a town that was not. This result has some independent interest. While the role played by religious authorities in the formation of commune is mentioned in many history books, we were unable to find any evidence supporting it. Similarly, a town that was founded by the Etruscans is 17% more likely to become a free city-state.

In column 2 we insert a number of geographical controls. Towns in the mountains are less likely to become free city-states, but so are towns along the coast and towns at the intersection of Roman roads. This later effect might capture the fact that Roman roads were helping not only trade, but also the Imperial army. The effect of our two instruments, however, is unchanged.

Finally, in column 3 we insert all the additional controls so to make it the first stage of our IV regression of social capital on the free city-state experience. The F-test for the excluded instruments is 66, reassuring us we do not have a weak instrument problem. While we postpone a more detailed discussion of the orthogonality of the instruments to section 4.2, it is worth noticing that having two instruments we can use the test of over-identifying restrictions to check the validity of one condition on the validity of the other.

Table 9 presents the IV estimates for our three measures of social capital. When we measure social capital as a number of non-profit organizations (column 1), the positive effect of the free city experience is virtually identical to the one estimated by using WLS and statistically significant at the 5% level. In this case, the test of over-identifying restrictions cannot reject the exogeneity of the instruments.

When we measure social capital as electoral participation (column 2) the coefficient estimated by using IV is sixty percent larger than the WLS coefficient. In this case, however, we fail to pass the test of over-identifying restrictions.

Finally, when we measure social capital as the presence of an organ donation organization (column 3) the positive effect of the free city experience doubles with respect to the WLS one. The test of over-identifying restrictions cannot reject the exogeneity of the instruments.

As a robustness exercise, in columns (4)-(6) we report the IV estimates using the definition of independent city-states based on the year 1300 classification. In spite of the different classification, results are similar to the ones obtained when the *Communes* are identified on the base on the cities independence status in 1176. We have also used a third definition that combines the other two and classifies a city as having been a Commune if either it was a commune in 1176 or in the year 1300 or both. Results (unreported) confirm the findings in Table 9. Finally, we also tried excluding Tuscany – the Etruscans mainland – to check whether results differed when Etruscan colonies rather than the Etruscan mainland are relied upon as instruments, but the results do not change.

4. The Difference in Difference Approach

Overall, our IV estimates support a causal link between the free city-state experience and the higher level of social capital today. Nevertheless, it is still possible that some unobserved (or poorly measured) morphological characteristics might drive all our results. If there is a location advantage that has lead the Etruscans to settle there, has lead the Catholic Church to elect it as a headquarters for its bishop, has made it easier for that city to conquer independence from the Emperor, and also foster social capital today, then our instruments do not solve the problem.

4.1 Difference in difference estimates

To address this issue, we use a difference in difference approach, based on an historical counterfactual. Because of the strong central power exerted by the Norman Kingdom, cities in the South of Italy could not have become free city-states regardless of their location and coordination advantage (Putnam, 1993). Under the maintained hypothesis that the determinants of location advantages are the same in the Center North and South, we can use the Center North sample to estimate a probit model and then apply it to southern cities to predict which towns would have become free city-states had the Normans not been there. We can then compare the level of social capital of free city-states in the Center-North and potential free city-states in the South, using the difference in social capital between not free city-states in the Center-North and unlikely free city-states in the South as a control for generic differences between North and South.

The first step in this approach is to predict the probability of becoming an independent city. To this purpose we use a version of the first stage regression in Table 8, restricting ourselves

to ex ante variables. As a substitute for today's population we use the earliest estimates (year 1300) of population size that we could get from Bairoch et al. (1988). Since these estimates are very imprecise, we approximate this information with two dummies: cities with at least 10,000 inhabitants (34 cities, labeled "large") and cities with between 1,000 and 10,000 inhabitants (18 cities, labeled "medium"). The omitted category is cities with less than 1000 inhabitants in 1300 or for which this information was not available.

Table 10 Panel A shows these estimates. The effects are very similar to the ones obtained in the first stage regression. The pseudo R-squared of the regression is 0.61, reflecting the high explanatory power of our regression.

In Panel B we show the summary statistics of the predicted probability divided between cities that experienced the *Commune* and cities that did not. For free city-states the predicted probability has a median of 0.88 and an interquartile range from 0.35 to 0.99. For non free city-states the predicted probability has a median of 0.012 and an interquartile range from 0.012 to 0.13. If we choose as a threshold level 0.35 we misclassify less than 8% of the observations: 17 towns out of 339 as having had a *Commune*, while they did not, while 15 towns as not having had a *Commune* while they did. We then use the coefficient of this probit to predict the probability of becoming a free city-state for towns in the South.[9]

Panel C reports the summary statistic of this predicted probability. When we apply the same threshold used for Center-North regions to southern cities we obtain that there would have been 31 free city-states in the South, out of the 286 towns that made our threshold of population in 1871. The interquartile range of the predicted probability for cities that we classify as potential free city-states in the South is between 0.36 to 0.87. For non potential free city-states in the South the interquartile range is 0.01 to 0.028. Both are very similar to the ones observed in the Center-North for the corresponding categories. This reassures us that the actual matches are good ones.

Table 11 Panel A reports the averages of social capital in the four groups for the number of non-profit organizations over population and for the other two measures. In the Center-North, the average number of non-profit organizations for predicted communes is 6.2 versus an average of 5.1 for non predicted communes. This difference of 1.1 is statistically significant at the 2% level. To control for other potential differences between North and South we compute the difference between social capital in predicted communes (3.5) and non predicted communes (3.1) in the South. This difference 0.35 is not statistically different from zero (second column, third row). Finally, we compute the difference in difference estimation by subtracting this latter

[9] We exclude from the Southern cities those located in the island of Sardinia because this island had a very different history, with some partial autonomy that did not take the form of free city-states.

estimate from the earlier one; this yields a difference of 0.75, which is statistically significant at the 5% level. The other columns repeat the exercise for referenda turnout and for the existence of a organ donation organization.

Table 11 Panel B reports the difference in difference estimation in a regression format. Our measures of social capital are regressed on a dummy for the South, a dummy for potential free city-states, and an interaction dummy between potential free city-states and a Northern dummy.

In column 1 we report estimates for the number of non profit organizations per capita without adding any other control. The Southern dummy is negative (-1.98) and highly statistically significant: a town located in the South has 36% less social capital than a similar town in the Center-North. By contrast, the predicted commune dummy by itself is economically and statistically insignificant. It is only when interacted with the Northern dummy that this variable becomes significant. The actual free city-state experience increases social capital by 15%. This effect is statistically significant at the 1% level. This result suggests that having the conditions to become free city-states alone is not sufficient to foster more social capital. It is only when those conditions can lead to the actual creation of free city-states that social capital increases.

In column 2 of Panel B we re-run the difference in difference regression controlling for heterogeneity in the size of the towns and other geographical and economic conditions. The results are, if anything, stronger.

In columns 3 and 4 we repeat the estimates using referenda turnout as our measure of social capital; we find a very large and significant effect of the Southern dummy, which can account for a difference in participation in referenda of about 19 percentage points. However we cannot detect any difference between predicted free cities and non-predicted ones. Results are instead consistent with free cities stimulating social capital when we measure it with the existence of an organ donation organization (columns 5 and 6). A city in the South has a 7 percentage points lower probability of having an organ donations organization, but within South predicted free cities are not different from non predicted free cities, while they are within North, as it should be if the free city historical episodes still foster social capital.

If instead of our simple probit, we identify the predicted commune in the South by using the Abadie et al (2004) routine, we obtain 29 rather than 33 matches, half of which overlap. But the final results are very similar, as Panel C shows.

Our difference in difference estimates suggest that only 47% of the 69% difference in social capital measured by the number of non-profit organizations between the Center North and the South can be directly attributed to the free city-state experience. It is possible (in fact likely)

that through interaction and migration the positive effect of free city-states spilled over into neighboring towns, increasing the average social capital of the Center-North. Alternatively, it is possible that other historical and/or geographical variables are responsible for the remaining half of the gap. Our approach is unable to distinguish between these two hypotheses.

4.2 Validating the instruments

A more direct way to validate our instruments is to exploit the fact that we know how history in the South evolved. Since even in the presence of favorable conditions, southern cities could not become independent, we can test the key identifying assumption of our instruments: that they do not have a direct effect on today social capital. In other words, if our two instruments are really orthogonal to the left hand side variable, we must see that in the South (where they could not affect the formation of free cities) they are uncorrelated with the current level of social capital, while in the Center North (where they did affect the formation of free cities) they are correlated.

Table 12 Panel A presents the result of this test. The first three columns report the effect of being the seat of a bishop and being founded by the Etruscan on our three measures of social capital. In the South, towns that were the seat of a bishop in year 1000 have no more social capital than cities that were not. This validates the exclusion restriction.

When it comes to being founded by the Etruscans, this variable has a *negative* (not positive) effect on our different measures of social capital and the coefficient is even statistically significant when social capital is measured as non-profit associations per capita. Thus, the worry that this variable has a positive direct effect on social capital is unfounded. In addition, the fact we pass the test of over-identifying restrictions guarantees us that if one instrument is valid (in this case being the seat of a bishop), the other is valid as well.

For comparison, columns (4)-(6) show the corresponding reduced form estimates for the Center North sample. We can never reject the hypothesis that the two instruments are jointly statistically significant (see the *F* test at the bottom of the table). Furthermore, in all the regressions the instruments have a positive effect on social capital, consistent with the idea that they facilitated the emergence of the free cities.

One further way we can check the validity of at least one of our instruments – the bishop city indicator - is by looking at the effect of bishop cities that had been created *after* the free city-state period rather than before. If there is something positive about being the seat of a bishop, not linked to the communal experience, it should also manifest itself in cities that became a seat in the last 800 years. By contrast, if the only reason why bishop cities have a higher social capital today is because of the presence of the bishop in 1000 facilitated the emergence of the commune, then

we should find that bishop cities that were created *after* the commune period have no positive effect on social capital.

In our sample of Center-Northern cities, there are 63 cities that became the seat of a bishop after the end of the communal experience, i.e. after 1400. In Table 12 Panel B we report both reduced form regressions and IV regression that include as a control the post-medieval bishop seats. In all cases the post-medieval bishop cities indicator is not statistically significant, while all the other variables retain essentially the same coefficient. This is further evidence that the effect of being a seat of a bishop works through the increased probability of being free city-states and not directly.

5. The Economic Effect of Social Capital

Social capital is ultimately important insomuch as it can affect economic outcomes. Yet, to identify the causal effect of social capital on the level of income one needs to find a source of exogenous variation in social capital. In our context one natural candidate is to use the free city indicator or alternatively the bishop city and the Etruscan city indicators as instruments for social capital. Having checked the predictive power and validity of these instruments as shifters of social capital one could think of exploiting them to study the effect of social capital on economic outcomes.[10]

We measure economic performance at the city level by using disposable income per capita in the city in 1999 as constructed from income tax statements. To make sure that the results are not affected by differential incentives to cheat on taxes, we check results with a measure of per capita wealth at the city level obtained by totaling housing wealth (in 1999) and bank deposits (in 2002) in the city and dividing by the city population.

Table 13, first column, shows the results of the OLS estimates obtained using the sample of cities in the Center-North. We measure social capital with the total number of non-profit organizations. We control for geography (city altitude and steepness, closeness to the sea and whether it is located at the intersection of two or more Roman roads), city population (linear and square) to account for city externalities in production and for the inequality of land ownership as well as for a full set of province dummies that account for heterogeneity in productivity across

[10] That our instruments are orthogonal to the error in the social capital equation does not automatically ensure that they are orthogonal to the error in the per capita income equation. In particular, there could be ways in which the free city-state experience affect today income directly and not only via the accumulated level of social capital. We will return to this point momentarily.

areas or other unobservables that are both correlated with income and social capital across provinces.

We find that cities that have more social capital also have a higher per capita income: a one standard deviation increase in social capital is associated with a higher per capita disposable income of about 800 euros – 5.3% of the sample mean. This effect is only slightly lower if we insert a full set of dummies for the provincial capitals to capture differences in income and social capital that may be generated by the administrative status of the city (column 2). This positive correlation is consistent with the one found in Knack and Keefer (1997) by using cross country variation. The additional contribution of our estimates is that they rely only on variation across cities within a rather homogeneous area and thus they exclude the possibility that the effect captures some institutional variable that drives both income and social capital.

Even so, however, the observed correlation may all be driven by reverse causality – higher income fostering more social capital. To address this issue, in column 3 (controlling for province dummies) and in column 4 (adding also province capital dummies) we run IV regressions, where we use as an instrument for social capital whether a city was a commune in 1167. Our previous results suggest that historical independence has a lot of predictive power on today's social capital and can thus constitute a powerful instrument. If past history of independence has no direct effect on today's city ability to produce income (an assumption to which we return below), this is also a valid instrument.

When we instrument today's social capital with the free city indicator, the estimated coefficient of social capital increases from 0.40 to around 0.57 and is highly statistically significant (columns 3 and 4). Raising social capital by one standard deviation increases per capita income by 1,120 euros, about 7.5% of the sample mean. This result suggests that reverse causality is unlikely to be driving the results as in this case the IV regressions should have yielded a lower estimate. It is social capital that is most likely to drive income, not the other way around. The high value of the *F* test of the excluded instrument (29.7 and 15.8 respectively, depending on whether controls for province capital are also included) implies that historical independence is a powerful instrument.

There is, however, one difficulty with this approach. While having been a free city may be a true factor in explaining social capital, it may fail as an instrument for social capital in an income regression. Having been a free city may have resulted, for instance, in accumulated assets of some sort that still *directly* affect income today, besides affecting it indirectly because of its boost on social capital. Moreover, we cannot rely on the southern sample to check the validity of this instrument because we do not observe communes in the South. Using the bishop city

indicator and the Etruscan city indicator is not a solution either. Even if in the South these variables had not explanatory power in a reduced form regression of income, we still could not use them as instruments for social capital in an income regression in the North since, as we have argued, they affect social capital precisely because they facilitated the emergence of the free city and thus also of all the unobservable assets that may continue to affect a city income today.

To address this issue we control directly for the most likely type of asset (besides social capital) that free cities created and that still generates income: historical attractions and arts that result in a richer tourist industry in the city. The wonderful piazzas, towers, and buildings, which commune such as Florence and Orvieto built, are certainly valuable assets today. They attract lots of visitors contributing to the production of income in these cities. For this reason, in column (5) of Table 13 we add to the regression the annual number of visitors to the city as a proxy for the inherited endowment of historical attractions. This variable is positively correlated with the free city indicator, consistent with the idea that a free city may attract more visitors. Its effect on per capita income is positive, but not statistically significant and does not really alter the coefficient of social capital. This result suggests that the free city-state experience affects current income through social capital and not through the monuments it has created.

We obtain similar results if instead of the indicator for a free city we use as instrument for social capital the (log) of the length of time a free city retained its independence (column 6) or the indicators of whether the city was the seat of a bishop in Medieval times and whether it had been founded by the Etruscan (column 7).[11] By using this later specification, the estimated effect of social capital on per capita income is 0.81 and is very precisely estimated. This point estimate implies that raising social capital by one standard deviation increases income per capita by 1,620 euros, or 11% of sample mean. Not surprisingly, the power of these instruments in predicting social capital is lower than in predicting that of the free city as registered by the lower value of the *F* test of the excluded instruments. As this may imply that our estimates suffer from a weak instrument problem it is particularly important that the instruments satisfy the orthogonality conditions. The extremely high p-value (p-value 0.976) of the Sargan test of over identifying restrictions implies that the null hypothesis that the instruments are valid cannot be rejected.

[11] Using a similar argument one could argue that pre-medieval bishop cities and Etruscan cities may affect current income because themselves are tourists attractions thanks to the cathedrals and the historical sites that they have. The number of visitors should also account for this effect; furthermore, for these two variables we can test whether it is actually the case that they affect income directly using the southern sample. When we run a reduced form regression of per capita income on the southern sample we find that Bishop city and Etruscan city indicators are never statistically significant either one by one or jointly (F test 0.38, p-value 0.6850).

Table 14 repeats the estimates obtained in Table 13 with the level of per capita wealth as left hand side variable. Results are qualitatively similar but economically stronger: OLS estimates imply that one standard deviation increase in social capital raises per capita wealth by 4,000 euros (11% of mean wealth). This effect is about twice as large if social capital is instrumented with the indicator for free city. When the number of visitors per capita is added to the regression (column 5) its coefficient is positive and statistically significant. Even in this case, however, the effect of social capital, while reduced by about 28%, continues to be strong and very precisely estimated. Finally by using the bishop city and the Etruscan city identifiers as instruments we obtain that one standard deviation increase in social capital raises per capita wealth by about 7,800 euros. As with the estimates of per capita income, the test of over identifying restrictions suggests that the orthogonally condition is satisfied.

6. Conclusions

Putnam (1993) conjectures that the difference in social capital between the North and the South of Italy was due to the fact that during the Middle Ages the Center-North had communes, while the South not. This conjecture, which Putnam does not formally test, is intriguing for two reasons. First, it identifies a form in which social capital can be formed, through experience of positive cooperation at the local level. Second, it presupposes an enormous degree of persistence of this experience. If Putnam is correct, a lot of the observed persistence in economic development might be due to the persistence in the social capital built in the development process.

In this paper we test Putnam's conjecture by using both the within difference in the Center-North and by doing a matched difference in difference estimation between the Center North and the South. Both methods suggest that Putnam's conjecture was right and that at least 47% of the North-South divide in Italy is due to the free city-state experience. More importantly, our results suggest that positive experiences of cooperation at the local level can have extremely long-lasting effects, even when the institutions associated with those experiences have all but vanished. This result has implications that reach much beyond Italy. What colonizers might have transferred in their colonies is not necessarily a set of institutions as in Acemoglu et al. (2001), but a different experience of cooperation or mistrust.

What our paper does not address is through what mechanism this very long-term persistence takes place. Our main hypothesis is that the transmission process is cultural. There is growing evidence of a long term persistence of beliefs and values (Fernandez et al, 2004, GSZ, 2006). Tabellini (2008), for instance, models how an intergenerational transmission of values can occur through an overlapping socialization process. In our case, this would imply that inhabitants

of free city-states have different social norms to which future generations will conform, even when the institutions associated with those norms disappear. By contrast, GSZ (2008) model the intergenerational transmission of beliefs and show that even a brief positive experience of cooperation (2-3 generations) can have permanent effects on the beliefs (and hence of the social capital) of a community. In that paper, we also provide a small hint that this difference persists through cultural mechanisms: major novels (written 150 years ago) in different parts of the countries reflect a very different set of beliefs on trust and cooperation.

An alternative hypothesis is that this persistence occurs through informal institutions that foster socializations. Italian summers are populated by various athletic contests in costume, called *palio*, fought to commemorate some event or tradition of the Middle Ages. These civic celebrations, which foster social cohesion (Durkheim, 1915), are rooted in the free city tradition. Faenza, for example has its *Palio del Nimballo*, while Sinigallia (as far as we know) does not have one. These (and other) traditions could be an alternative mechanism through which an historical experience relives today and affects current levels of social capital.

A third hypothesis is related to the architectural design of towns. The main distinguishing architectural feature of free city-states was the presence of a *piazza* designed not for religious purposes, but for civic purposes. The piazza was the place where the assembly of the commune took place and where important political decisions were made. To this day, these piazza are at the center of city life and are areas where citizens meet and socialize. To the extent city design can affect the interaction between its inhabitants, the architectural legacy of communes can still foster social interaction (and thus social capital) today. We plan to distinguish from amongst these different mechanisms in future work.

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Data Appendix

A. Measures of social capital

Number of non-profit organizations: the measure are obtained from the National Statistical Institute (Istat) 2001 census which collected data on all types of non-profit and voluntary organizations existing in Italy at times of census. It reports data on the total number of non-profit organizations, and separately on the number of voluntary associations, social cooperatives and foundations. The total number of non-profit organizations includes all the above types; voluntary organizations are the bulk of the total.

Referenda turnout: We measure voter turnout in referenda by averaging participation over three major referenda that took place after WWII and for which information at the town level was more easily accessible: these are the referenda on public order measures that restricted individual freedoms and on political parties public funding that took place on June 11, 1978, the referenda on abortion (May 17 1981) and that on wage indexation schemes (June 9, 1985). While several other referenda have taken place after WWII on a wide range of issues (e.g. choice between republic and monarchy (1946), divorce (1974), hunting regulation (1987), use of nuclear power (1987)), data at the city level were only available on paper and more easily obtainable from the Ministry of Interior for these referenda. However, referenda turnout tends to be highly correlated across different referenda. For instance, at the provincal level the correlation between turnout at the divorce referenda and average turnout in the other referenda is 0.95 while the correlation between the turnout at the three referenda used here is between 0.91 (funding to political parties and abortion) and 0.93 (abortion and indexation schemes). In Italy, voting at referenda is not mandatory.

Presence of an organ donation organization: The indicator of existence of an organ donation organization in the city was obtained from the 2005 Provincial Register of Voluntary Organizations. The registry reports the name, mission and address of the voluntary organizations located in the province. Registering with the Registry is not compulsory and since not all voluntary associations register, they provide an incomplete picture of the voluntary organizations in the municipality. Furthermore, in several regions in the South, the Registry is not yet available. However, for all regions in the Center-North in our sample we have been able to obtain a copy of the Registry from the Ministry of Labor and Social Policies and identified the presence of a branch of AIDO – the only organ donation organization in Italy – in the municipality. For the South sample we obtained the information by contacting directly each AIDO organization in the province capital and asking for the list of cities in their province with an AIDO association. AIDO was founded in 1973, thus much later than the blood donation association, and is present in about 2060 municipalities (out of 8,000 in the country) and counts 1,129,662 donors.

B. Historical variables

Commune: this is an indicator variable equal to 1 if the town was a commune according to two historical maps of Italy contained in "Atlante Storico De Agostini" (2007), Istituto Geografico De Agostini, Novara pp. 61-62. We use two maps. The first map shows lists of free cities around the time of the war between the communal cities and the Emperor of the

Holy Roman Empire Frederick I "Barbarossa" in the year 1167. This map is reported in Figure 1 (corresponding to map 28 in Atlante Storico De Agostini). The red line in the map marks the border of the Kingdom of Italy under the Holy Roman Empire. Communes are those marked with a black dot. The map also distinguishes which cities joined the Lombard League (names written in red) in the war for independence against the Emperor and which were allied to the Emperor (names written in blue). The remaining cities were neutral. This constitutes our first measure of free cities. The second measure is obtained from the map of Italy around the year 1300, as shown in Figure 2 (map 29 in Atlante Storico De Agostini); free cities are those that have a territory. A third measure is constructing as the union of the previous two measures.

Length of independence: Information on when independence was acquired and when it was lost has been obtained through a search from different sources: the main one is the "Istituto Enciclopedia italiana per le Regioni"; when the information was not available in "Istituto Enciclopedia italiana per le Regioni" we relied on the Touring Club guide which reports a brief historical summary of the cities listed in the guide and the historical summary on the official web page of the various cities.

City was a seat of a Bishop before 1000 C.E.: This identifier is obtained from the map "Italia altomedioevale: sedi vescovili" that reports the Bishop cities in the late Middle Ages. Bishop cities were mostly formed between the first and the third century AD, as the Christian movement spread out.

City was a 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 end of the communal experience. Late bishop cities have been 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 which also summarizes their history and reports the year or century in which the bishop city was founded. Since some bishop cities that were active in the XI century were subsequently discontinued or moved somewhere else (as for instance Udine and Gorizia which replaced Acuileia) we have used the map "Italia altomedioevale: sedi vescovili" from Atlante Storico Treccani, Volume I, Roma 2007, maps n. 152, 153 , 154, 155 to identify the old bishop cities and the list of current bishop cities to identify those created after the year 1400.

Etruscan city: is an identifier for whether the city was founded by the Etruscans and was part of the Etruscan "nation". Moving from Etruria – the region between the river Arno and the river Tiber (corresponding approximately to today's regions of Tuscany, Umbria and northern Lazio) – Etruscans founded two other city clusters, one north of Tuscany, in Romagna, and in Campania, South of Lazio. Since the Etruscans thought that number 12 had a magic power, these clusters included 12 cities each, though some uncertainty still remains on the exact list of Etruscan cities. Etruscans were organized as a system of independent and self-governed cities, which tended to coordinate their policies in an annual meeting that took place in Orvieto – the Etruscans capital. Data on Etruscan cities have been provided by Dr. Antonello Montesanti, an archeologist who has rigorously mapped and classified all the Etruscan and Roman cities and who has kindly made his files available to us. The table below lists the three clusters of 12 Etruscan cities in the three areas where they expanded. Cities in italics have no counterpart today. In the Etruscan cluster of Etruria two cities – Fiesole and Roselle – were added to replace cities that decayed progressively under the Romans.

Cluster of Etruscan cities in Etruria	**Cluster of Etruscan cities in Romagna**	**Cluster of Etruscan cities in Campania**
Veio	Bologna (capital)	Capua (capital)
Cerveteri	Mantova	Nola
Tarquinia	Ravenna	*Urina*
Montalto di Castro	Cesena	*Velsu*
Arezzo	Rimini	*Irnthi*
Vetulonia	Modena	Pontecagnano
Populonia	Parma	Sorrento
Volterra	Piacenza	Pompei
Orvieto (capital)	*Spina*	Ercolano
Chiusi	Marzabotto	Nocera
Perugia	Adria	Acerra
Cortona		

Size of city in year 1300 C.E.: We have classified two indicators for the size of cities in theyear 1300: *Large* is a dummy variable equal to 1 if the city population exceeds 10,000 people in year 1300; *Medium* is a dummy variable equal to 1 if the city population is between 1,000 and 10,000 people in that year. The information on city size is obtained from Bairoch, Batou and Chevre (1988, pp. 40-49) who report the population of European cities from year 800 up to year 1850 at a frequency of about every 100 years. The criteria for including a city in the list is that it must have had at least 5,000 inhabitants once between 800 and 1850. Needless to say, the more one goes back on time the more difficult it is to find information on population, which results in a missing observation. We have chosen the population in the year 1300 to balance the need to go as far back as possible and closer to year 1,000 while at the same time being able to have enough information on city population. The year 1300 is the first for which missing data appear to be limited.

City located at an intersection of Roman roads: is equal to 1 if the city is located on a relevant Roman road or at the intersection between two or more Roman roads. Roman roads are identified from the Touring Club Historical Atlas of Italy and from the "Reference Map of Ancient Italy" and then by comparing today location of the city using Google Maps with the map of the Roman cities.

C. City controls and measures of economic development

The main source for several city controls and variables is the database "Le Misure dei Comuni", 2003-2004 Edition. This database is assembled by Ancitel, the association of municipal administrations and reports about 320 variables measuring various items at the level of the city ranging from population to income, bank deposits and households.

City elevation: It is measured in meters from the sea level. Source: "Le Misure dei Comuni"

Max difference in elevation: It is the difference between the highest and the lowest point in the city territory, in meters. Source: "Le Misure dei Comuni"

Current Population: number of inhabitants according to the 2001 census. Source: "Le Misure dei Comuni"

Population at unification: number inhabitants in 1871 according to the 1871 census. Source: Istat, "Census Data"

Number of visitors: number of people that visited the city either in hotels or other premises in a year, scaled by city population. Source: "Le Misure dei Comuni"

Gross per capita disposable income: level of disposable income per capita: euros in the year 2000; the figure is obtained from tax filings at the city level and the original source is the Ministry of Finance. Source: "Le Misure dei Comuni"

Per capita household wealth: sum of property wealth and bank deposits divided by the city population; property wealth is estimated by Ancitel and refers to 1999; bank deposits are referred to 2002. The figure is in euros. Source: "Le Misure dei Comuni"

Gini land owenership inequality index: computed using data on the size distribution of agricultural firms in the year 2000 based on information from the 2001 census. Source: "Le Misure dei Comuni".

Figure 1 – Historical map of Italy at around year 1167

The figure shows the map of Italy at around year 1167. The red line marks the borders of the country that where the Holy Roman Empire of Germany. All the towns marked with a full dot were commune. Towns in red were commune that belonged to the Lombard League, those in blue were allied to the Emperor. The green areas mark the territories of various Principati and Feudi. The Southern part of Italy not belonging to the Empire was under the Norman Kingdom of Sicily.

http://www.scuola.com/storialocale/medioevo.htlm

Figure 2 – Historical map of Italy at around year 1300

The figure shows the map of Italy at around year 1300. It shows the communes and their territory (contado), as well as the principati that were ruling in various areas.

Figure 3. Orvieto's strategic advantage

A picture of Orvieto, showing the superior military location of the capital of the Etruscan nation

Table 1

City name	Commune in 1167 C.E.	Commune in 1300 C.E.	Population in 1871	Year city became independent	Year independence was lost	City part of the Lombard League?	City allied with Emperor Federick	Independent Signoria?	Bishop city?	Etruscan city?
ABBIATEGRASSO	0	0	10.11	0	0	0	0	0	0	0
ACQUI TERME	1	1	10.381	1150	1313	0	1	0	1	0
ADRIA	0	1	17.732	1090	1200	0	0	0	1	1
ALATRI	0	0	13.841	0	0	0	0	0	1	0
ALBA	1	1	10.815	1050	1259	0	1	0	1	0
ALESSANDRIA	1	1	56.962	1198	1348	1	0	0	1	0
ALFONSINE	0	0	8.873	0	0	0	0	0	0	0
AMATRICE	0	0	8.226	0	0	0	0	0	0	0
AMELIA	0	0	8.11	0	0	0	0	0	1	0
ANAGNI	0	0	8.256	0	0	0	0	0	1	0
ANCONA	0	1	48.738	1177	1532	0	0	0	1	0
ANGHIARI	0	0	7.015	0	0	0	0	0	0	0
AOSTA	0	0	7.749	0	0	0	0	0	0	0
ARCEVIA	0	0	9.633	0	0	0	0	0	0	0
ARCIDOSSO	0	0	6.685	0	0	0	0	0	0	0
AREZZO	1	1	39.054	1098	1337	0	0	1	1	1
ARGENTA	0	0	16.287	0	0	0	0	0	0	0
ARPINO	0	0	11.633	0	0	0	0	1	0	0
ARSIE'	0	0	6.884	0	0	0	0	0	0	0
ARZIGNANO	0	0	8.264	0	0	0	0	0	0	0
ASCIANO	0	0	7.235	0	0	0	0	0	0	1
ASCOLI PICENO	0	0	23.295	0	0	0	0	0	1	0
ASSISI	1	0	15.083	1000	1367	0	0	0	1	0
ASTI	1	1	36.917	1150	1313	0	1	0	1	0
AVIANO	0	0	7.922	0	0	0	0	0	0	0
BADIA POLESINE	0	0	9.303	0	0	0	0	0	0	0
BAGNACAVALLO	0	0	15.101	0	0	0	0	0	0	0
BAGNI DI LUCCA	0	0	12.403	0	0	0	0	0	0	0
BAGNO DI ROMAGNA	0	0	7.583	0	0	0	0	0	0	0
BARBERINO DI MUGELLO	0	0	9.639	0	0	0	0		0	0
BARDI	0	0	9.736	0	0	0	0	0	0	0

BARGA	0	0	8.316	0	0	0	0	0	0	0
BARGE	0	0	9.917	0	0	0	0	0	0	0
BASSANO DEL GRAPPA	1	0	15.284	1175	1250	0	0	0	0	0
BEDONIA	0	0	9.051	0	0	0	0	0	0	0
BELLUNO	1	1	15.971	1050	1350	0	0	0	1	0
BERGAMO	1	1	42.662	1125	1428	1	0	0	1	0
BERTINORO	0	0	6.624	0	0	0	0	0	0	0
BIELLA	0	0	17.24	0	0	0	0	0	0	0
BOLOGNA	1	1	118.217	1116	1274	1	0	1	1	1
BOLZANO	0	0	25.238	0	0	0	0	0	0	0
BONDENO	0	0	13.424	0	0	0	0	0	0	0
BORGO A MOZZANO	0	0	9.056	0	0	0	0		0	1
BORGO SAN LORENZO	0	0	12.289	0	0	0	0	0	0	1
BORGO VAL DI TARO	0	0	8.591	0	0	0	0	0	0	0
BORGOMANERO	0	0	9.641	0	0	0	0	0	0	0
BORGONOVO VAL TIDONE	0	0	6.659	0	0	0	0	0	0	0
BOVES	0	0	9.744	0	0	0	0	0	0	0
BRA	0	0	13.658	0	0	0	0	0	0	0
BRESCIA	1	1	58.539	1125	1258	1	0	0	1	0
BRESSANONE	0	0	7.46	0	0	0	0	1	0	0
BRISIGHELLA	0	0	12.434	0	0	0	0	0	0	0
BUCINE	0	0	7.525	0	0	0	0	0	0	0
BUDRIO	0	0	16.608	0	0	0	0	0	0	0
BUSCA	0	0	9.844	0	0	0	0	1	0	0
BUSSETO	0	0	8.603	0	0	0	0	0	0	0
BUSTO ARSIZIO	0	0	16.598	0	0	0	0	0	0	0
CAGLI	0	0	10.505	0	0	0	0	0	1	0
CALCI	0	0	6.79	0	0	0	0	0	0	0
CAMAIORE	0	0	16.967	0	0	0	0	0	0	0
CAMERINO	0	0	12.157	0	0	0	0	1	1	0
CAMOGLI	0	0	9.807	0	0	0	0	0	0	0
CAMPI BISENZIO	0	0	14.375	0	0	0	0		0	1
CANTU'	0	0	7.97	0	0	0	0	0	0	0
CAPANNORI	0	0	39.3	0	0	0	0		0	0

CARAGLIO	0	0	7.074	0	0	0	0	0	0	0
CARAVAGGIO	0	0	7.888	0	0	0	0	0	0	0
CARIGNANO	0	0	7.711	0	0	0	0	0	0	0
CARMAGNOLA	0	0	13.247	0	0	0	0	0	0	0
CARMIGNANO	0	0	8.144	0	0	0	0	0	0	0
CARPI	0	0	17.913	0	0	0	0	1	0	0
CARRARA	0	0	23.326	0	0	0	0	1	0	0
CASALE MONFERRATO	0	0	27.908	0	0	0	0	1	0	0
CASALMAGGIORE	0	0	13.283	0	0	0	0	0	0	0
CASCINA	0	0	19.332	0	0	0	0	0	0	0
CASSANO D'ADDA	0	0	7.053	0	0	0	0	0	0	0
CASSINO	0	0	12.54	0	0	0	0	0	0	0
CASTEL SAN GIOVANNI	0	0	8.475	0	0	0	0	0	0	0
CASTEL SAN PIETRO TERME	0	0	12.691	0	0	0	0	0	0	0
CASTELFIORENTINO	0	0	8.727	0	0	0	0	0	0	0
CASTELFRANCO EMILIA	0	0	12.732	0	0	0	0	0	0	1
CASTELFRANCO VENETO	0	0	10.719	0	0	0	0	0	0	0
CASTELLAMONTE	0	0	8.815	0	0	0	0	0	0	0
CASTELLEONE	0	0	6.818	0	0	0	0	0	0	0
CASTELNOVO NE'MONTI	0	0	6.863	0	0	0	0	0	0	0
CASTELNUOVO BERARDENGA	0	0	7.89	0	0	0	0	0	0	0
CASTELNUOVO SCRIVIA	0	0	7.301	0	0	0	0	0	0	0
CASTIGLION FIORENTINO	0	0	13.097	0	0	0	0	0	0	0
CASTIGLIONE DEL LAGO	0	0	10.539	0	0	0	0	0	0	0
CAVARZERE	0	0	15.038	0	0	0	0	0	0	0
CAVOUR	0	0	7.449	0	0	0	0	0	0	0
CECCANO	0	0	7.044	0	0	0	0	1	0	0
CENTO	0	0	19.611	0	0	0	0	0	0	0
CEREA	0	0	6.723	0	0	0	0	0	0	0
CERTALDO	0	0	7.237	0	0	0	0	0	0	0
CESENA	1	1	38.528	1190	1350	0	1	1	1	1
CHERASCO	0	0	8.991	0	0	0	0	0	0	0
CHIARI	0	0	9.515	0	0	0	0	0	0	0

CHIAVARI	0	0	12.008	0	0	0	0	0	0	0
CHIERI	0	1	12.248	1150	1350	1	0	0	0	0
CHIOGGIA	0	0	28.051	0	0	0	0	0	1	0
CHIUSA DI PESIO	0	0	6.738	0	0	0	0	0	0	0
CHIVASSO	0	0	9.123	0	0	0	0	0	0	0
CINGOLI	0	0	12.577	0	0	0	0	1	0	0
CITTA' DELLA PIEVE	0	0	6.755	0	0	0	0	0	0	0
CITTA' DI CASTELLO	0	1	24.216	1150	1400	0	0	1	0	0
CITTADELLA	0	0	8.57	0	0	0	0	0	0	0
CIVIDALE DEL FRIULI	0	0	8.413	0	0	0	0	0	0	0
CIVITANOVA MARCHE	0	0	9.17	0	0	0	0	0	0	0
CIVITAVECCHIA	0	0	9.718	0	0	0	0	0	0	1
CODOGNO	0	0	11.462	0	0	0	0	0	0	0
CODROIPO	0	0	8.36	0	0	0	0	0	0	0
COLLE DI VAL D'ELSA	0	0	8.521	0	0	0	0	0	0	0
COLLESALVETTI	0	0	7.349	0	0	0	0	0	0	0
COLOGNA VENETA	0	0	7.435	0	0	0	0	0	0	0
COLORNO	0	0	6.829	0	0	0	0	0	0	0
COMACCHIO	0	0	9.064	0	0	0	0	0	1	1
COMO	1	1	33.369	1090	1311	1	0	0	1	0
CONCORDIA SULLA SECCHIA	0	0	9.466	0	0	0	0	0	1	0
CONEGLIANO	0	0	7.872	0	0	0	0	0	0	0
COPPARO	0	0	11.865	0	0	0	0	0	0	0
CORIO	0	0	6.99	0	0	0	0	0	0	0
CORREGGIO	0	0	12.319	0	0	0	0	1	0	0
CORRIDONIA	0	0	8.481	0	0	0	0	0	0	0
CORTONA	0	1	26.441	1200	1323	0	0	1	0	1
COSTIGLIOLE D'ASTI	0	0	6.799	0	0	0	0	0	0	0
COTIGNOLA	0	0	6.881	0	0	0	0	0	0	0
CREMA	1	1	16.175	1150	1449	0	0	0	0	0
CREMONA	1	1	43.109	1150	1350	1	0	1	1	0
CRESCENTINO	0	0	6.671	0	0	0	0	0	0	0
CREVALCORE	0	0	10.815	0	0	0	0	0	0	0
CUNEO	0	0	23.453	0	0	0	0	0	0	0

DEMONTE	0	0	7.768	0	0	0	0	0	0	0
DRONERO	0	0	8.26	0	0	0	0	0	0	0
EMPOLI	1	0	16.672			0	0		0	1
ESTE	0	0	10.037	0	0	0	0	1	0	0
FABRIANO	0	0	19.771	0	0	0	0	1	0	0
FAENZA	1	1	36.385	1120	1250	1	0	1	1	0
FANO	0	0	20.053	0	0	0	0	1	1	0
FELTRE	1	0	13.064	0	0	0	0	0	1	0
FERENTINO	0	0	10.287	0	0	0	0	0	1	0
FERMO	0	0	18.853	0	0	0	0	1	1	0
FERRARA	1	1	67.306	1100	1267	1	0	1	1	1
FERRIERE	0	0	7.411	0	0	0	0	0	0	0
FIDENZA	0	0	11.014	0	0	0	0	0	0	1
FIESOLE	0	0	7.405	0	0	0	0	0	1	1
FIGLINE VALDARNO	0	0	9.781	0	0	0	0	0	0	1
FILOTTRANO	0	0	8.453	0	0	0	0	0	0	0
FINALE EMILIA	0	0	13.176	0	0	0	0	0	0	1
FINALE LIGURE	0	1	9.397	0	0	0	0	1	0	0
FIORENZUOLA D'ARDA	0	0	6.83	0	0	0	0	0	0	0
FIRENZE	1	1	201.138	1115	1434	0	0	1	1	1
FIRENZUOLA	0	0	10.192	0	0	0	0	0	0	0
FIVIZZANO	0	0	15.451	0	0	0	0		0	0
FOIANO DELLA CHIANA	0	0	7.819	0	0	0	0	0	0	0
FOLIGNO	0	0	21.197	0	0	0	0	0	1	0
FONDI	0	0	6.727	0	0	0	0	0	1	0
FORLI'	1	1	38.639	950	1315	1	0	1	1	1
FORMIA	0	0	12.504	0	0	0	0	0	0	0
FORMIGINE	0	0	6.739	0	0	0	0	0	0	0
FOSSANO	0	0	16.684	0	0	0	0	0	0	0
FOSSOMBRONE	0	0	9.845	0	0	0	0	0	1	0
FROSINONE	0	0	10.057	0	0	0	0	0	0	0
FUCECCHIO	0	0	11.021	0	0	0	0	0	0	0
GAETA	0	0	20.327	0	0	0	0	0	1	0
GALLARATE	0	0	10.233	0	0	0	0	0	0	0

GALLIATE	0	0	7.318	0	0	0	0	0	0	0
GAMBOLO'	0	0	6.793	0	0	0	0	0	0	0
GARESSIO	0	0	7.129	0	0	0	0	0	0	0
GARLASCO	0	0	6.885	0	0	0	0	0	0	0
GEMONA DEL FRIULI	0	0	7.895	0	0	0	0	0	0	0
GENOVA	1	1	256.486	1162	1650	0	1	0	1	0
GIAVENO	0	0	9.758	0	0	0	0	0	0	0
GONZAGA	0	0	7.072	0	0	0	0	0	0	0
GORIZIA	0	1	25.239	0	0	0	0	0	0	0
GREVE IN CHIANTI	0	0	11.35	0	0	0	0	0	0	0
GUALDO TADINO	0	0	8.246	0	0	0	0	0	0	0
GUASTALLA	0	0	10.906	0	0	0	0		0	0
GUBBIO	1	0	22.754	1150	1350	0	0	0	1	0
IMOLA	1	0	29.157	1150	1325	0	1	0	1	0
IMPRUNETA	0	0	7.166	0	0	0	0		0	0
ITRI	0	0	6.619	0	0	0	0	0	0	0
IVREA	1	1	9.637	1100	1313	0	1	0	1	0
JESI	0	0	19.307	0	0	0	0	0	1	0
LA SPEZIA	0	0	26.753	0	0	0	0	0	0	0
LARI	0	0	7.163	0	0	0	0	0	0	0
LASTRA A SIGNA	0	0	10.402	0	0	0	0	0	0	0
LAVAGNA	0	0	7.476	0	0	0	0	1	0	0
LECCO	0	0	18.083	0	0	0	0	0	0	0
LEGNAGO	0	0	13.403	0	0	0	0	0	0	0
LEGNANO	0	0	6.949	0	0	0	0	0	0	0
LENDINARA	0	0	9.523	0	0	0	0	1	0	0
LEONESSA	0	0	6.806	0	0	0	0	0	0	0
LERICI	0	0	6.906	0	0	0	0	0	0	0
LIVORNO	0	0	96.631	0	0	0	0	0	0	1
LODI	1	1	25.514	1158	1402	1	0	0	1	0
LONIGO	0	0	9.299	0	0	0	0	0	0	0
LORETO	0	0	8.333	0	0	0	0	0	0	0
LUCCA	1	1	70.537	1119	1314	0	0	1	1	1
LUGO	0	0	25.246	0	0	0	0	0	0	0

LUZZARA	0	0	7.731	0	0	0	0	0	0	0
MACERATA	0	0	19.8	0	0	0	0	1	0	0
MAGIONE	0	0	6.899	0	0	0	0	0	0	0
MANTOVA	1	1	33.783	1150	1272	1	0	1	1	1
MARLIANA	0	0	6.999	0	0	0	0	0	0	0
MAROSTICA	0	0	8.322	0	0	0	0	0	0	0
MARRADI	0	0	8.42	0	0	0	0	0	0	0
MARSCIANO	0	0	10.917	0	0	0	0	0	0	0
MASSA	1	1	17.853	1050	1442	0	0	1	1	0
MASSA MARITTIMA	0	0	8.27	0	0	0	0	0	0	1
MASSAROSA	0	0	9.172	0	0	0	0	0	0	0
MATELICA	0	0	7.521	0	0	0	0	0	0	0
MEDE	0	0	6.827	0	0	0	0	1	0	0
MEDICINA	0	0	11.58	0	0	0	0	0	0	1
MEL	0	0	7.185	0	0	0	0	0	0	0
MELDOLA	0	0	7.798	0	0	0	0	0	0	0
MERANO	0	0	15.153	0	0	0	0	1	0	0
MILANO	1	1	290.514	1050	1311	1	0	1	1	0
MINERBIO	0	0	7.454	0	0	0	0	0	0	0
MINTURNO	0	0	7.519	0	0	0	0	0	0	0
MIRA	0	0	8.603	0	0	0	0	0	0	0
MIRANDOLA	0	0	13.307	0	0	0	0	1	0	0
MIRANO	0	0	7.367	0	0	0	0	0	0	0
MODENA	1	1	56.995	1115	1288	1	0	1	1	1
MODIGLIANA	0	0	6.842	0	0	0	0	1	0	0
MOLINELLA	0	0	10.938	0	0	0	0	0	0	0
MONCALIERI	0	0	10.926	0	0	0	0	0	0	0
MONDOVI'	0	1	17.232	1198	1305	0	0	0	0	0
MONSELICE	0	0	9.802	0	0	0	0	0	0	0
MONTAGNANA	0	0	9.262	0	0	0	0	0	0	0
MONTALCINO	0	0	8.048	0	0	0	0	0	0	0
MONTE SAN SAVINO	0	0	8.173	0	0	0	0	0	0	0
MONTEBELLUNA	0	0	8.091	0	0	0	0	0	0	0
MONTEFIASCONE	0	0	7.231	0	0	0	0	0	0	0

MONTEPULCIANO	1	0	13.494	1100	1260	0	0	1	0	0
MONTESPERTOLI	0	0	9.182	0	0	0	0	1	0	0
MONTEVARCHI	0	0	9.77	0	0	0	0	0	0	0
MONTICELLI D'ONGINA	0	0	7.199	0	0	0	0	0	0	0
MONTICHIARI	0	0	7.342	0	0	0	0	0	0	0
MONZA	0	0	25.266	0	0	0	0	0	0	0
MORTARA	0	0	7.482	0	0	0	0	0	0	0
MUGGIA	0	0	8.264	0	0	0	0	0	0	0
NARNI	0	0	11.261	0	0	0	0	0	1	0
NORCIA	0	0	10.015	0	0	0	0	0	0	0
NOVARA	1	1	29.674	1050	1350	1	0	0	1	0
NOVELLARA	0	0	7.253	0	0	0	0	0	0	0
NOVI LIGURE	0	0	12.374	0	0	0	0	0	0	0
ODERZO	0	0	8.027	0	0	0	0	0	0	0
OLEGGIO	0	0	8.236	0	0	0	0	0	0	0
ORVIETO	1	0	14.431	1300	1350	0	0	0	1	1
OSIMO	0	0	17.234	0	0	0	0	0	1	0
OSTIGLIA	0	0	6.831	0	0	0	0	0	0	0
OVADA	0	0	7.045	0	0	0	0	0	0	0
PADOVA	1	1	64.862	1190	1237	1	0	1	1	0
PAESANA	0	0	7.885	0	0	0	0	0	0	0
PALAIA	0	0	7.434	0	0	0	0	0	0	0
PARMA	1	1	68.889	1140	1300	1	0	1	1	1
PAVIA	1	1	38.079	1100	1289	0	1	1	1	0
PAVULLO NEL FRIGNANO	0	0	10.237	0	0	0	0	0	0	0
PERGINE VALSUGANA	0	0	8.208	0	0	0	0		0	0
PERGOLA	0	0	9.356	0	0	0	0	0	0	0
PERUGIA	1	0	49.507	1000	1370	0	0	0	1	1
PESARO	0	0	27.573	0	0	0	0	1	1	0
PESCAGLIA	0	0	7.535	0	0	0	0	0	0	0
PESCIA	0	0	20.17	0	0	0	0	0	0	1
PEVERAGNO	0	0	7.201	0	0	0	0	0	0	0
PIACENZA	1	1	45.707	1126	1313	1	0	1	1	1
PIETRASANTA	0	0	12.085	0	0	0	0	1	0	1

PINEROLO	0	0	18.698	0	0	0	0	0	0	0
PIOVE DI SACCO	0	0	8.242	0	0	0	0	0	0	0
PISA	1	1	49.81	1050	1399	0	0	0	1	1
PISTOIA	1	1	54.825	1117	1306	0	0	1	1	1
POGGIBONSI	0	0	7.884	0	0	0	0	0	0	0
POIRINO	0	0	6.832	0	0	0	0	0	0	0
POMARANCE	0	0	7.311	0	0	0	0	0	0	1
PONTASSIEVE	0	0	11.024	0	0	0	0		0	0
PONTECORVO	0	0	10.812	0	0	0	0	0	0	0
PONTEDERA	0	0	12.02	0	0	0	0	0	0	1
PONTEVICO	0	0	6.685	0	0	0	0	0	0	0
PONTREMOLI	0	1	14.33	1250	1313	0	0	0	0	0
PORDENONE	0	0	9.561	0	0	0	0	0	0	0
PORTOGRUARO	0	0	9.182	0	0	0	0	0	0	0
PORTOMAGGIORE	0	0	9.697	0	0	0	0	0	0	0
POTENZA PICENA	0	0	6.95	0	0	0	0	0	1	0
PRATO	1	1	36.923	1150	1351	0	0	0	0	0
QUARRATA	0	0	9.485	0	0	0	0	0	0	0
RACCONIGI	0	0	9.68	0	0	0	0	0	0	0
RAPALLO	0	0	11.112	0	0	0	0	0	0	0
RAVENNA	1	1	58.544	0	0	0	1	1	1	1
RECANATI	0	0	13.982	0	0	0	0	0	0	0
REGGELLO	0	0	10.752	0	0	0	0	0	0	0
REGGIO NELL'EMILIA	1	1	50.955	1100	1335	1	0	0	1	1
RHO	0	0	7.39	0	0	0	0	0	0	0
RIETI	0	0	18.886	0	0	0	0	0	1	0
RIMINI	1	1	29.732	1150	1216	0	1	1	1	1
RIVAROLO CANAVESE	0	0	6.708	0	0	0	0	0	0	0
ROSIGNANO MARITTIMO	0	0	7.953	0	0	0	0	0	0	1
ROVATO	0	0	7.48	0	0	0	0	0	0	0
ROVERETO	0	0	14.382	0	0	0	0	0	0	0
ROVIGO	0	0	23.633	0	0	0	0	1	0	0
RUSSI	0	0	8.544	0	0	0	0	0	0	0
SABBIONETA	0	0	7.273	0	0	0	0	0	0	0

SALUZZO	0	1	16.214	0	0	0	0	1	0	0
SAN BENEDETTO DEL TRONTO	0	0	7.077	0	0	0	0	0	0	0
SAN BENEDETTO PO	0	0	10.399	0	0	0	0	0	0	0
SAN CASCIANO IN VAL DI PESA	0	0	12.605	0	0	0	0	0	0	0
SAN COLOMBANO AL LAMBRO	0	0	7.032	0	0	0	0	0	0	0
SAN DAMIANO D'ASTI	0	0	8.366	0	0	0	0	0	0	0
SAN DONA' DI PIAVE	0	0	8.01	0	0	0	0	0	0	0
SAN FELICE SUL PANARO	0	0	9.124	0	0	0	0	0	0	0
SAN GIMIGNANO	0	0	8.251	0	0	0	0	0	0	0
SAN GIOVANNI IN PERSICETO	0	0	15.444	0	0	0	0	0	0	0
SAN GIULIANO TERME	0	0	18.693	0	0	0	0	0	0	1
SAN MINIATO	1	0	16.229	1250	1369	0	0	0	0	0
SAN PIETRO IN CASALE	0	0	8.509	0	0	0	0	0	0	0
SAN REMO	0	0	12.89	0	0	0	0	0	0	0
SAN SALVATORE MONFERRATO	0	0	7.187	0	0	0	0	0	0	0
SAN SEVERINO MARCHE	0	0	14.836	0	0	0	0	1	0	0
SAN VITO AL TAGLIAMENTO	0	0	8.853	0	0	0	0	0	0	0
SANSEPOLCRO	0	0	8.2	0	0	0	0	1	0	1
SANTA MARGHERITA LIGURE	0	0	7.949	0	0	0	0	0	0	0
SANT'ANGELO LODIGIANO	0	0	8.876	0	0	0	0	0	0	0
SANTARCANGELO DI ROMAGNA	0	0	8.19	0	0	0	0	0	0	0
SANT'ELPIDIO A MARE	0	0	7.203	0	0	0	0	0	0	0
SARONNO	0	0	6.976	0	0	0	0	0	0	0
SARZANA	0	0	9.629	0	0	0	0	0	0	0
SASSO MARCONI	0	0	7.299	0	0	0	0	0	0	0
SASSOFERRATO	0	0	9.02	0	0	0	0	0	0	0
SAVIGLIANO	1	0	16.409	1184	1350	0	0	0	0	0
SAVONA	1	0	24.802	1191	1528	0	1	0	1	0
SCANDIANO	0	0	7.823	0	0	0	0	0	0	0
SCANDICCI	0	0	10.121	0	0	0	0	0	0	0

SCHIO	0	0	13.525	0	0	0	0	0	0	0
SENIGALLIA	0	0	22.695	0	0	0	0	0	1	0
SERAVEZZA	0	0	8.858	0	0	0	0	1	0	0
SEREGNO	0	0	7.003	0	0	0	0	0	0	0
SERMIDE	0	0	6.7	0	0	0	0	0	0	0
SESTO FIORENTINO	0	0	9.67	0	0	0	0	0	0	0
SESTRI LEVANTE	0	0	9.054	0	0	0	0	0	0	0
SEZZE	0	0	8.89	0	0	0	0	0	0	0
SIENA	1	1	31.844	1050	1399	0	0	0	1	1
SIGNA	0	0	7.472	0	0	0	0	1	0	0
SINALUNGA	0	0	9.072	0	0	0	0	0	0	1
SONCINO	0	0	7.343	0	0	0	0	0	0	0
SONDRIO	0	0	6.823	0	0	0	0	0	0	0
SORA	0	0	12.137	0	0	0	0	0	1	0
SORESINA	0	0	9.093	0	0	0	0	0	0	0
SOVICILLE	0	0	7.904	0	0	0	0	0	0	0
SPOLETO	0	1	21.168	1150	1354	0	0	0	1	0
STAZZEMA	0	0	7.667	0	0	0	0	0	0	0
STRADELLA	0	0	8.294	0	0	0	0	0	0	0
SUBIACO	0	0	7.525	0	0	0	0	0	0	0
SUZZARA	0	0	8.812	0	0	0	0	0	0	0
TARCENTO	0	0	8.259	0	0	0	0	0	0	0
TERNI	0	0	22.78	0	0	0	0	0	1	0
TERRANUOVA BRACCIOLINI	0	0	7.844	0	0	0	0	0	0	0
TIVOLI	0	0	7.449	0	0	0	0	0	1	0
TODI	0	0	15.049	0	0	0	0	0	1	0
TOLENTINO	0	0	11.422	0	0	0	0		0	0
TORINO	1	1	210.873	1050	1280	0	1	1	1	0
TORTONA	1	1	13.909	1150	1347	0	1	0	1	0
TRECATE	0	0	7.075	0	0	0	0	0	0	0
TREIA	0	0	9.624	0	0	0	0	0	0	0
TRENTO	0	1	36.622	0	0	0	0	0	1	0
TREVIGLIO	0	0	11.981	0	0	0	0	0	0	0
TREVISO	1	1	29.074	1150	1237	1	0	1	1	0

TRIESTE	0	0	171.436	0	0	0	0	0	1	0
TRINO	0	0	9.916	0	0	0	0	0	0	0
UDINE	0	0	29.425	0	0	0	0	1	0	0
UMBERTIDE	0	0	11.174	0	0	0	0	0	0	0
URBINO	0	0	15.786	0	0	0	0	1	1	0
VALDAGNO	0	0	8.782	0	0	0	0	0	0	0
VALDOBBIADENE	0	0	7.931	0	0	0	0	0	0	0
VALENZA	0	0	10.724	0	0	0	0	0	0	0
VARALLO	1	0	7.488	1150	1395	0	0	0	0	0
VARAZZE	0	0	9.528	0	0	0	0	0	0	0
VARESE	0	0	19.339	0	0	0	0	0	0	0
VARESE LIGURE	0	0	8.063	0	0	0	0	0	0	0
VELLETRI	0	0	13.901	0	0	0	0	0	1	0
VENEZIA	0	1	164.965	950	1797	1	0	0	0	0
VENTIMIGLIA	1	0	7.406	1150	1261	0	1	0	1	0
VERCELLI	1	1	56.962	1198	1348	1	0	0	1	0
VEROLI	0	0	11.474	0	0	0	0	0	1	0
VERONA	1	1	86.443	1150	1227	1	0	1	1	0
VIADANA	0	0	15.641	0	0	0	0	0	0	0
VIAREGGIO	0	0	12.249	0	0	0	0		0	0
VICCHIO	0	0	8.967	0	0	0	0	0	0	0
VICENZA	1	1	37.475	1110	1236	1	0	0	1	0
VICOPISANO	0	0	6.648	0	0	0	0	0	0	0
VIGEVANO	0	0	19.833	0	0	0	0	0	0	0
VIGONE	0	0	6.689	0	0	0	0	0	0	0
VILLA MINOZZO	0	0	7.411	0	0	0	0	0	0	0
VILLAFRANCA DI VERONA	0	0	8.377	0	0	0	0	0	0	0
VILLAFRANCA PIEMONTE	0	0	8.342	0	0	0	0	0	0	0
VIMERCATE	0	0	7.336	0	0	0	0	0	0	0
VINCI	0	0	6.646	0	0	0	0	0	0	0
VITERBO	1	0	27.232	1150	1251	0	0	0	1	1
VITTORIO VENETO	1	0	16.268			0	0		0	0
VOGHERA	0	0	15.454	0	0	0	0	0	0	0
VOLTERRA	1	1	13.279	1239	1340	0	0	1	1	1

Table 2: Summary Statistics

Panel A. Social capital measures (Center North sample; N=400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Number of non-profit organizations (per 1,000 people)	5.31	5.03	1.99	2.18	11.95
Referenda turnout (%)	86.70	87.88	5.59	66.07	94.87
City has organ donation association? (Yes=1)	0.42	0	0.49	0	1

Panel B. Historical variables (Center North sample; N=400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Commune at time of war against Frederick I (1167 C.E.)	0.14	0	0.35	0	1
Commune in 1300 C.E.					
Commune: combined definition					
Year independence was acquired (conditional on independence)	1130	1150	62.48	950	1300
Year independence was lost (conditional on independence)	1326.68	1315	78.86	1216	1650
Length of independence conditional on independence (# of years)	196.47	175	100.41	47	488
(log) Length of independence	0.73	0	1.81	0	5.91
City belonged to the Lombard League	0.06	0	0.24	0	1
City was allied to the Emperor Frederick I	0.04	0	0.19	0	1

Panel C. City geography (Center North sample; N=400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Elevation (thousand meters)	0.36	0.29	0.29	0.003	1.30
Max difference in elevation within city territory (thousand meters)	0.66	0.46	0.66	0.004	2.64
City located on the coast	0.08	0	0.27	0	1
City located more than 5 kilometers from the sea	0.03	0	0.18	0	1
City located at intersection of Roman roads	0.108	0	0..31	0	1
Population after unification in1871 (million people)	0.018	0.009	0.03	0.007	0.21
Current Population 2001 (million people)	0.045	0.018	0.16	0.003	0.61

Panel D. Economic Variables (Center North sample; N=400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Disposable income per capita (*'000* euros)	14.82	14.73	2.10	9.52	19.35
Gross per capita household wealth (*'000* euros)	33.22	31.72	12.41	14.01	90.19
Gini land ownership inequality index	0.63	0.63	0.13	0.32	0.91
Gini income inequality index	0.40	0.40	0.03	0.34	0.48
Yearly number of visitors divided by inhabitants	4.86	1.60	9.53	0	52.92

Panel E. Determinants of the probability of becoming a *Commune* (Center North sample; N=400)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Seat of a Bishop before 1000 C.E.? (Yes=1)	0.23	0	0.42	0	1
City founded by the Etruscans? (Yes=1)	0.12	0	0.32	0	1
City population above 10K in 1300 C.E.? (Yes=1)	0.09	0	0.28	0	1
City population between 1K and 10K people in 1300 C.E.? (Yes=1)	0.05	0	0.21	0	1
New seat of a Bishop after 1400? (Yes=1)	0.07	0	0.26	0	1

Panel F. Social capital indicators (South sample; N= 286)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Number of non-profit organizations (per '000 people)	3.18	2.98	1.31	0.78	6.53
Referenda turnout (%)	67.97	70.40	10.55	37.83	85.40
City has an organ donation association? (Yes=1)	0.27	0.00	0.45	0	1

Panel G. Historical variables that predict Commune (South sample; N= 286)

	Mean	Median	Standard deviation	1st percentile	99th percentile
Elevation	0.31	232	0.26	0.003	1.01
Max difference in elevation within city territory	0.75	600	0.58	27	3.15
Seat of a Bishop before 1000 C.E.? (Yes=1)	0.22	0	0.41	0	1
City was founded by the Etruscans? (Yes=1)	0.02	0	0.15	0	1
City population above 10K in 1300 C.E.? (Yes=1)	0.05	0	0.21	0	1
City population between 1K and 10K in 1300 C.E.? (Yes=1)	0.14	0	0.34	0	1

Table 3. Effect of communal history on the number of non-profit organizations

The table shows OLS estimates of the effect of having been an independent city on the number of non-profit organizations per inhabitant in the city. Regressions are weighted using city population. Panel A is run on the sample of the 400 largest towns located in the Center-North of Italy (as of 1871). Panel B includes the whole sample of cities in the same area. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Panel A: Sample of 400 largest towns in the Center-North

	Only History	History and geography	History, geography and endowment	No large towns	No provincial capitals	History, geog., endow. and income	History, geo,endow and area dummies
Commune	0.42	1.12***	1.05***	0.93**	1.72***	1.02***	1.26***
	(0.36)	(0.33)	(0.33)	(0.37)	(0.39)	(0.27)	(0.28)
Elevation		1.09	0.93	0.66	0.15	1.61**	2.71***
		(0.81)	(0.79)	(0.84)	(0.65)	(0.75)	(0.79)
Max difference in elevation		0.58*	0.52*	0.93***	0.81***	0.70***	0.47*
		(0.33)	(0.30)	(0.27)	(0.28)	(0.25)	(0.25)
Intersection of Roman roads		0.97***	0.89***	1.03***	0.25	0.59**	0.72**
		(0.33)	(0.32)	(0.38)	(0.64)	(0.26)	(0.30)
On the coast		-0.15	-0.16	-0.35	0.01	0.34	0.22
		(0.43)	(0.37)	(0.33)	(0.34)	(0.29)	(0.30)
More than 5km from coast		-0.77**	-0.67**	-0.31	-0.01	-0.03	-1.04***
		(0.34)	(0.29)	(0.27)	(0.22)	(0.26)	(0.39)
Population (million people)		-4.11**	-5.35***	-33.26*	-49.26***	-8.04***	-5.44***
		(1.89)	(1.80)	(18.42)	(12.46)	(1.36)	(1.53)
Population squared		1.98	2.05	351.79**	242.18***	3.78***	2.46**
		(1.43)	(1.39)	(163.69)	(86.97)	(1.07)	(1.15)
Gini inequality index of Land ownership			2.12**	0.38	0.11	2.75***	1.19
			(1.03)	(0.85)	(0.80)	(0.82)	(0.98)
Gini income inequality index			14.63***	12.98**	13.83***	-4.27	12.69***
			(4.91)	(5.19)	(5.11)	(5.01)	(4.31)
Income per capita						0.51***	
						(0.06)	
Observations	400	400	400	381	337	400	400
R-squared	0.02	0.25	0.30	0.30	0.26	0.48	0.39

Panel B . Total sample of cities in the Center-North

	Only History	History and geography	History, geography and endowment	No large towns	No provincial capitals	History, geogr. endow. and income	History, geogr. Endow. and area dummies
Commune	0.90***	2.07***	1.86***	1.77***	1.94***	1.55***	1.87***
	(0.33)	(0.34)	(0.32)	(0.37)	(0.41)	(0.28)	(0.26)
Elevation		1.97***	2.01***	1.65***	1.67***	2.38***	3.28***
		(0.51)	(0.50)	(0.51)	(0.54)	(0.45)	(0.54)
Max difference in elevation		1.42***	1.37***	1.54***	1.49***	1.34***	1.17***
		(0.24)	(0.24)	(0.21)	(0.24)	(0.22)	(0.23)
Intersection of Roman roads							-
On the coast		0.39	0.31	0.37	0.81***	0.65***	0.69**
		(0.34)	(0.32)	(0.24)	(0.23)	(0.25)	(0.28)
More than 5km from coast		1.02	1.16*	1.30**	1.42**	1.57**	1.06
		(0.66)	(0.67)	(0.65)	(0.65)	(0.66)	(0.68)
Population (million people)		-3.59	-4.32*	-59.91***	-65.97***	-7.04***	-4.26**
		(2.72)	(2.46)	(9.85)	(7.72)	(1.84)	(1.88)
Population squared		1.49	1.49	622.26***	475.75***	3.18**	1.84
		(2.04)	(1.82)	(110.61)	(80.43)	(1.36)	(1.39)
Gini inequality of land ownership index			0.65	0.34	0.24	1.24***	-0.00
			(0.55)	(0.38)	(0.33)	(0.48)	(0.46)
Gini income inequality index			10.04***	9.68***	7.60***	0.63	9.62***
			(2.22)	(1.75)	(1.50)	(2.23)	(1.91)
Income per capita						0.35***	
						(0.04)	
Observations	5,360	5,360	5,360	5,341	5,298	5,360	5,360
R-squared	0.01	0.08	0.08	0.09	0.08	0.1	0.09

Table 4: Effect of communal history on referenda turnout

The table shows OLS estimates of the effect of having been an independent city on average referenda turnout computed as the fraction of individuals that participated on average in three referenda held after WWII; estimates are run on the sample of the largest 400 towns located in the Center-North of Italy. Regressions are weighted using city population. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	Only History	History and geography	History, geography and endowment	No large towns	No province capitals	History, geography, endowment and income	History, geography, endowments and area dummies
Commune	-1.25	0.87	1.11**	0.20	0.13	1.11**	0.89*
	(1.08)	(0.55)	(0.56)	(0.61)	(0.70)	(0.56)	(0.44)
Elevation		-7.60***	-7.70***	-7.38***	-8.85***	-7.44***	-2.93*
		(1.63)	(1.63)	(1.61)	(2.05)	(1.64)	(1.68)
Max difference in elevation		-2.46***	-2.81***	-2.88***	-3.02***	-2.72***	-0.82
		(0.40)	(0.44)	(0.52)	(0.75)	(0.43)	(0.50)
Intersection of Roman roads		-0.28	0.09	-0.10	-0.52	-0.06	-0.64
		(0.47)	(0.52)	(0.56)	(1.06)	(0.51)	(0.44)
On the coast		-3.11***	-3.19***	-3.65***	-5.74***	-2.98***	-1.81***
		(0.72)	(0.71)	(0.83)	(1.05)	(0.67)	(0.67)
More than 5km from coast		0.31	-0.16	-0.35	-0.77	0.12	0.02
		(0.80)	(0.78)	(0.74)	(0.73)	(0.77)	(0.94)
Population (million people)		-7.87**	-9.64***	-16.09	8.77	-10.85***	-0.52
		(3.23)	(3.58)	(25.42)	(24.05)	(3.37)	(2.43)
Population squared		0.45	2.26	145.56	-230.29	3.01	-4.15**
		(2.42)	(2.68)	(214.29)	(169.67)	(2.51)	(1.90)
Gini inequality index of land ownership			3.06**	5.32***	5.75***	3.39**	1.94
			(1.50)	(1.89)	(2.15)	(1.54)	(1.87)
Gini income inequality index			-9.95	-16.70**	-14.70*	-18.28**	-2.57
			(6.80)	(8.04)	(8.73)	(8.71)	(7.38)
Income per capita						0.23	
						(0.15)	
Observations	400	400	400	380	337	400	400
R-squared	0.02	0.54	0.55	0.35	0.41	0.56	0.64

Table 5: Effect of communal history on the existence of an organs donation organization

The table shows OLS estimates of a linear probability model for the effect of having been an independent city on the existence of an organ donation organization (AIDO) in the city. Estimates are run on the sample of the largest 400 towns located in the Center-North of Italy. Regressions are weighted using city population. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	Only History	History and geography	History, geography and endowment	No large towns	No province capitals	History, geog., endowment and income
Commune	0.35***	0.24***	0.17**	0.10	0.02	0.16**
	(0.09)	(0.08)	(0.08)	(0.08)	(0.10)	(0.07)
Elevation		-0.35	-0.32	-0.38*	-0.17	-0.19
		(0.25)	(0.23)	(0.22)	(0.24)	(0.23)
Max difference in elevation within city territory		-0.21*	-0.16*	-0.04	-0.21**	-0.10
		(0.11)	(0.09)	(0.08)	(0.09)	(0.09)
At intersection of Roman roads		-0.07	-0.13	-0.12	-0.23**	-0.19**
		(0.09)	(0.09)	(0.08)	(0.10)	(0.09)
On the coast		-0.19	-0.17	-0.16*	-0.22**	-0.09
		(0.14)	(0.12)	(0.09)	(0.11)	(0.11)
More than 5km from coast		-0.42**	-0.34**	-0.22	-0.21	-0.25
		(0.17)	(0.16)	(0.16)	(0.17)	(0.16)
Population (million people)		0.59	0.55	5.44	9.72**	0.31
		(0.65)	(0.56)	(3.86)	(4.57)	(0.56)
Population squared		-0.41	-0.68*	14.50	-69.80	-0.54
		(0.47)	(0.37)	(32.49)	(45.76)	(0.38)
Gini inequality index of land ownership			0.41	-0.24	-0.44*	0.60*
			(0.36)	(0.22)	(0.26)	(0.33)
Gini income inequality index			5.45***	1.70	1.61	2.70*
			(1.44)	(1.18)	(1.34)	(1.41)
Income per capita						0.08***
						(0.02)
Observations	400	400	400	380	336	400
R-squared	0.14	0.25	0.32	0.33	0.22	0.36

Table 6: Robustness

Panel A shows non-weighted OLS estimates of the effect of having been an independent city on measures of social capital today. Panel B reports regressions of the effects of free cities on social capital for a Commune identifier obtained using the free cities in 1300 C.E. (first three columns) and for an identifier obtained as the union of the free cities in 1167 C.E. and in 1300 C.E. (columns 4-6). Estimates are run on the sample of the largest 400 towns located in the Center-North of Italy. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Panel A. OLS, non-weighted regressions

	Non-profit organizations	Referenda turnout	Organ donation organizations
Commune	1.16**	0.29	0.13*
	(0.32)	(0.57)	(0.07)
Elevation	1.68*	-8.75***	-0.48***
	(0.74)	(1.90)	(0.15)
Max difference in elevation	0.82**	-4.28***	-0.08
	(0.23)	(0.58)	(0.05)
At intersection of Roman roads	0.82*	-0.38	-0.11
	(0.36)	(0.67)	(0.08)
On the coast	0.09	-4.80***	-0.18**
	(0.38)	(0.91)	(0.08)
More than 5km from the coast	-0.36	-0.84	-0.11
	(0.23)	(0.83)	(0.15)
Population (million people)	-4.53	-1.60	3.02***
	(2.95)	(5.25)	(0.85)
Population squared	1.66	-5.08	-2.54***
	(2.32)	(4.22)	(0.68)
Gini inequality index of land ownership	0.00	9.98***	-0.07
	(0.77)	(2.28)	(0.19)
Gini income inequality index	11.36**	-4.51	2.70***
	(4.37)	(8.33)	(0.94)
Observations	400	400	400
R-squared	0.22	0.44	0.23

Panel B: alternative definition of commune

	Non-profit organizations	Referenda turnout	Organ donation organizations	Non-profit organizations	Referenda turnout	Organ donation organizations
Commune: 1300 C.E. definition	1.50***	0.68	0.21**			
	(0.32)	(0.57)	(0.09)			
Commune: combined definition				1.47***	1.08**	0.20***
				(0.29)	(0.51)	(0.08)
Elevation	1.30	-7.83***	-0.40*	0.92	-7.86***	1.30
	(0.85)	(1.70)	(0.23)	(0.75)	(1.62)	(0.85)
Max difference in elevation	0.57**	-2.75***	-0.18**	0.55**	-2.76***	0.57**
	(0.25)	(0.44)	(0.08)	(0.26)	(0.44)	(0.25)
On the coast	0.79**	0.09	-0.13	0.85***	0.08	0.79**
	(0.31)	(0.53)	(0.09)	(0.31)	(0.50)	(0.31)
More than 5km from the coast	-0.17	-3.41***	-0.15	-0.20	-3.33***	-0.17
	(0.30)	(0.68)	(0.11)	(0.30)	(0.67)	(0.30)
Intersection of Roman roads	-0.57**	-0.26	-0.32**	-0.51*	-0.12	-0.57**
	(0.28)	(0.79)	(0.16)	(0.28)	(0.78)	(0.28)
Population (million people)	-6.63***	-8.60**	0.37	-6.43***	-9.55***	-6.63***
	(1.53)	(3.69)	(0.65)	(1.43)	(3.47)	(1.53)
Population squared	2.89**	1.53	-0.52	2.82**	2.22	2.89**
	(1.17)	(2.77)	(0.42)	(1.09)	(2.61)	(1.17)
Gini inequality index of Land ownership	2.27**	2.87*	0.57	2.05**	2.87*	2.27**
	(0.97)	(1.51)	(0.39)	(1.00)	(1.49)	(0.97)
Gini income inequality index	13.90***	-8.48	4.85***	13.70***	-9.67	13.90***
	(4.61)	(6.97)	(1.19)	(4.57)	(6.73)	(4.61)
Observations	400	400	400	400	400	400
R-squared	0.34	0.55	0.31	0.35	0.55	0.31

Table 7: 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 social 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 communed 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 (aka Frederick Barbarossa). Regressions are run on the sample of the largest 400 towns located in the Center-North. 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 social capital

	Non-profit organizations	Referenda turnout	Organ donation organizations
Log of length of independence	0.33**	0. 16	0.0843*
	(0.16)	(0. 29)	(0.0484)
Elevation	3.71***	-3.66	-0.0002
	(1.50)	(2.60)	(0.0004)
Max difference in elevation	-0.23	-1.86**	-0.0002
	(0.54)	(0.90)	(0.0002)
Intersection of Roman roads	0.44	-0.51	0.076
	(0. 42)	(1.20)	(0.2108)
On the coast	0.71	0.03	
	(0.74)	(1.24)	
More than 5km from the coast	0.45	-0.69	-0.0872
	(0.42)	(0.64)	(0.1177)
Population (million people)	-7.35**	2.87	0.0005
	(3.13)	(5.02)	(0.0009)
Population squared	3.93	-6.30	(0.0000)
	(2.76)	(4.41)	
Mill's Ratio	-1.10	0.59	-0.2247
	(0.24)	(0.45)	(0.0749)
Observations	400	400	400
Uncensored observations	57	57	57

Panel B: The role of Signoria

	Non-profit organizations	Referenda turnout	Organ donation organizations
Commune	0.94***	0.91	0.13*
	(0.31)	(0.58)	(0.08)
Signoria	0.71**	0.72	0.18**
	(0.30)	(0.49)	(0.08)
Elevation	1.65*	-7.47***	-0.32
	(0.88)	(1.66)	(0.23)
Max difference in elevation	0.37	-2.72***	-0.16*
	(0.33)	(0.44)	(0.09)
Intersection of Roman roads	0.85***	-0.01	-0.15
	(0.31)	(0.54)	(0.09)
On the coast	-0.24	-3.02***	-0.13
	(0.32)	(0.70)	(0.10)
More than 5km from the coast	-0.65*	-0.02	-0.31**
	(0.39)	(0.76)	(0.15)
Population (million people)	-6.85***	-9.91***	0.40
	(1.85)	(3.71)	(0.53)
Population squared	2.90**	2.22	-0.62*
	(1.39)	(2.80)	(0.35)
Gini inequality index of land ownership	0.68	2.84*	0.36
	(0.96)	(1.50)	(0.33)
Gini income inequality index	16.20***	-9.89	5.30***
	(4.21)	(6.95)	(1.29)
Observations	400	400	400
R-squared	0.36	0.56	0.33

Panel C: The role of the Lombard League

	Non-profit organizations	Referenda turnout	Organ donation organizations
Neutral city	1.23***	1.09	0.19**
	(0.35)	(0.72)	(0.09)
Part of the Lombard League	1.45***	1.65**	0.28***
	(0.35)	(0.68)	(0.08)
Allied to Emperor Fredrick I	0.79*	-0.50	-0.10
	(0.41)	(1.07)	(0.17)
Elevation	1.05	-7.33***	-0.37*
	(0.79)	(1.52)	(0.22)
Max difference in elevation	0.64**	-2.61***	-0.16**
	(0.27)	(0.46)	(0.08)
Intersection of Roman roads	0.84***	-0.20	-0.17*
	(0.31)	(0.47)	(0.09)
On the coast	-0.16	-3.09***	-0.12
	(0.30)	(0.68)	(0.11)
More than 5km from the coast	-0.59**	-0.05	-0.31*
	(0.29)	(0.72)	(0.16)
Population (million people)	-5.01***	-5.73	1.14*
	(1.63)	(3.68)	(0.60)
Population squared	1.87	-0.41	-1.05***
	(1.23)	(2.66)	(0.40)
Gini inequality index of land ownership	2.18**	3.00**	0.55
	(1.02)	(1.49)	(0.36)
Gini income inequality index	11.80**	-16.77**	3.64***
	(4.75)	(6.59)	(1.11)
Observations	400	400	400
R-squared	0.33	0.57	0.34

Table 8: First stages

The table shows estimates of a linear probability model for whether the city was a Commune and the first stage estimates of the I.V. regressions reported in Table 9. Estimates are run on the sample of the largest 400 towns located in the Center-North. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	Only instruments	Instruments and geography	First stage estimates
Bishop city	0.74***	0.75***	0.54***
	(0.07)	(0.07)	(0.06)
Etruscan city	0.17***	0.14**	0.21***
	(0.06)	(0.06)	(0.05)
Elevation		-0.47**	-0.37**
		(0.22)	(0.18)
Max difference in elevation		-0.01	0.08
		(0.07)	(0.05)
Intersection of Roman roads		-0.06	-0.15**
		(0.08)	(0.06)
On the coast		-0.25**	-0.26***
		(0.11)	(0.08)
More than 5km from the coast		-0.14***	0.03
		(0.05)	(0.05)
Population (million people)			1.59***
			(0.31)
Population squared			-1.16***
			(0.23)
Gini inequality index of land ownership			-0.54**
			(0.21)
Gini income inequality index			2.76***
			(0.78)
Observations	400	400	400
R-squared	0.6	0.64	0.75
F-test of excluded instruments			65.77
Partial R-squared of excluded instruments			0.4746

Table 9: Instrumental variable estimates

The table shows I.V. estimates of the effect of having been an independent city on measures of current social capital. Instruments used for the estimates are an indicator of whether the city was a Bishop city in 1000 C.E. and an indicator of whether the city was founded by the Etruscans. The bottom of the table shows the *F*-test for the excluded instruments in the first stage regression, the partial R-squared of the excluded instruments in the first stage regression and the *p*-value of the Sargan test for the validity of the excluded instruments. Estimates are run on the sample of the largest 400 towns located in the Center-North of Italy. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	Non-profit organizations	Referenda turnout	Organs donation organizations	Non-profit organizations	Referenda turnout	Organs donation organizations
Commune: basic definition	1.03**	1.98***	0.42***			
	(0.47)	(0.75)	(0.13)			
Commune: 1300C.E. definition				1.34**	2.43**	0.57***
				(0.60)	(1.11)	(0.18)
Elevation	0.92	-7.27***	-0.32	1.21	-6.76***	-0.17
	(0.79)	(1.54)	(0.21)	(0.93)	(1.98)	(0.27)
Max difference in elevation	0.52*	-2.87***	-0.21**	0.57**	-2.78***	-0.19**
	(0.30)	(0.44)	(0.09)	(0.25)	(0.44)	(0.08)
Intersection of Roman roads	0.89***	0.03	-0.13	0.81***	-0.09	-0.16*
	(0.32)	(0.50)	(0.09)	(0.31)	(0.51)	(0.10)
On the coast	-0.17	-2.89***	-0.06	-0.21	-2.99***	-0.07
	(0.35)	(0.71)	(0.11)	(0.32)	(0.70)	(0.11)
More than 5km from the coast	-0.68**	0.03	-0.27*	-0.60**	0.14	-0.24
	(0.29)	(0.75)	(0.16)	(0.29)	(0.76)	(0.16)
Population (million people)	-5.31**	-11.85***	-0.15	-6.22***	-13.21***	-0.59
	(2.14)	(3.59)	(0.79)	(2.05)	(4.10)	(0.80)
Population squared	2.02	3.75	-0.17	2.61*	4.65	0.12
	(1.61)	(2.64)	(0.52)	(1.50)	(2.89)	(0.52)
Gini inequality index of land ownership	2.11**	3.39**	0.66	2.21**	3.50**	0.70*
	(1.02)	(1.48)	(0.42)	(0.96)	(1.58)	(0.42)
Gini income inequality index	14.68***	-12.45*	4.18***	14.28***	-12.96*	3.92***
	(4.99)	(6.56)	(1.21)	(4.90)	(6.68)	(1.22)
Observations	400	400	400	400	400	400
F-test of excluded instruments	65.77	65.77	65.77	18.99	18.99	18.99
Sargan test: *p*-value	0.1507	0.0083	0.9928	0.11198	0.0072	0.7621

Table 10: Predicting probability that a city is independent

Panel A shows probit estimates of the probability that a city in the Center-North becomes an independent city; it uses characteristics of the city at the time the Communes were formed. Regressions are run on the sample of the largest 400 towns located in the Center-North of Italy. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%. Panel B shows the distribution of the predicted probabilities using the estimates in Table 1 for the sample of towns in the Center-North of Italy. Panel C does the same, but for the sample of cities located in the South using the parameter estimates in Panel A.

Panel A. Probability city in Center-North of Italy is independent.

Bishop city	1.88***
	(0.26)
Founded by the Etruscans	0.68*
	(0.35)
Elevation	-0.12
	(0.85)
Max difference in elevation	0.03
	(0.24)
On the coast	-0.78*
	(0.42)
City population above 10k people (1300 C.E.)	2.30***
	(0.48)
City population between 1K-10K people (1300 C.E.)	1.12***
	(0.36)
Observations	400
Pseudo R-squared	0.61

Panel **B. Distribution of predicted probabilities in the Center-North of Italy**

Percentile	Total sample	Among cities that actually became independent	Among cities that did not become independent
1%	0.0012	0.0104	0.0012
5%	0.0052	0.012	0.0013
10%	0.0111	0.1289	0.01067
25%	0.0116	0.3503	0.0125
50%	0.0121	0.8803	0.01251
75%	0.1145	0.9948	0.1254
90%	0.6149	0.9953	0.1281
95%	0.9727	0.9954	0.3529
99%	0.9954	0.9959	0.6122
Mean	0.1480	0.6887	0.054
St. Dev.	0.2841	0.3465	0.1199
# of cities	400	61	339

Panel C. Distribution of predicted probabilities in the South of Italy

Percentile	Total sample	Potentially independent city	Potentially non-independent city
1%	0.0011	0.352	0.0011
5%	0.0012	0.3523	0.0012
10%	0.0012	0.3539	0.0012
25%	0.011	0.3612	0.0103
50%	0.012	0.5	0.012
75%	0.1218	0.874	0.028
90%	0.3534	0.8796	0.1251
95%	0.5098	0.8804	0.3266
99%	0.8797	0.9725	0.3471
Mean	0.1055	0.5866	0.0471
St. Dev.	0.1981	0.2136	0.0836
# of cities	286	31	255

Table 11: Difference in difference estimates

Panel A shows mean values of the level of social capital (number of non-profit organizations, referenda turnout, organ donation organizations) for independent and non-independent cities in Italy's Center-North and for predicted independent and predicted non-independent cities in the South and the differences in means. Panel B shows controlled regression estimates of the effects of independence on social capital in the two areas. Panel C shows the difference in difference estimates where the predicted commune in the South are obtained using the Abadie and Imbens (2002) matching technique rather than the probit model. Robust standard errors are shown in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

Panel A. Differences in social capital between Center-North and South and between independent and non-independent cities

	Non profit organizations			Referenda turnout			Organ donation organizations		
	North	South	Diff	North	South	Diff	North	South	Diff
Commune	6.21	3.48	2.73*** (0.356)	86.92	69.60	17.32*** (1.33)	0.72	0.35	0.37*** (0.10)
Non- commune	5.11	3.13	1.98*** (0.135)	86.65	67.77	18.88*** (0.75)	0.34	0.26	0.08** (0.04)
Differences	1.10*** (0.25)	0.35 (0.27)	**0.75** (0.37)**	0.27 (0.58)	1.83 (1.31)	**-1.65 (1.52)**	0.38*** (0.254)	0.278 (0.269)	**0.29*** (0.11)**

Panel B. Effect of free cities and on social capital in the Center-North and in the South

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-profit organizations	Non-profit organizations	Referenda turnout	Referenda turnout	Organ donation organizations	Organ donation organizations
Potential Commune	0.35	0.45	2.04	-0.03	0.09	-0.03
	(0.27)	(0.27)	(1.41)	(1.44)	(0.09)	(0.08)
(Potential Commune)×North	0.75**	0.83**	-1.65	-1.94	0.29***	0.18*
	(0.37)	(0.36)	(1.52)	(1.55)	(0.11)	(0.10)
South dummy	-1.98***	-2.11***	-19.09***	-16.95***	-0.08**	-0.07**
	(0.13)	(0.15)	(0.77)	(0.81)	(0.04)	(0.04)
Elevation		-0.35***		-9.20***		0.04**
		(0.06)		(1.97)		(0.02)
Max difference in elevation		0.20		-2.60***		-0.15***
		(0.14)		(0.58)		(0.03)
On the coast		0.13		-4.45***		-0.08*
		(0.19)		(0.95)		(0.05)
More than 5km from the coast		-0.24		1.87		-0.06
		(0.29)		(1.83)		(0.10)
Population (million people)		-1.05		24.52***		2.66***
		(1.96)		(8.17)		(0.58)
Populations squared		-0.84		-27.73***		-2.22***
		(1.58)		(7.30)		(0.50)
Gini income inequality index		6.80**		25.13*		2.51***
		(3.09)		(14.87)		(0.65)
Gini inequality index of land ownership		0.40		5.06*		0.40***
		(0.54)		(2.60)		(0.14)
Observations	686	686	686	686	686	686
R-squared	0.28	0.38	0.57	0.65	0.07	0.23

Panel C. As above but using Abadie and Imbens (2002) matching procedure

	(1)	(2)	(3)	(4)	(5)	(6)
	Non profit organizations	Non profit organizations	Referenda turnout	Referenda turnout	Organs donation	Organs donation
Potential free city (matched)	0.06	0.25	2.19	0.70	0.08	-0.05
	(0.26)	(0.25)	(1.72)	(1.74)	(0.09)	(0.08)
(Potential free city)×North	1.03***	1.00***	-1.80	-2.62	0.30***	0.19**
	(0.36)	(0.35)	(1.81)	(1.79)	(0.11)	(0.09)
South dummy	-1.94***	-2.09***	-19.09***	-17.03***	-0.08**	-0.07**
	(0.14)	(0.15)	(0.76)	(0.79)	(0.04)	(0.04)
Elevation		-0.35***		-9.09***		0.04**
		(0.06)		(1.97)		(0.02)
Max difference in elevation		0.20		-2.62***		-0.15***
		(0.14)		(0.58)		(0.03)
On the coast		0.13		-4.43***		-0.08
		(0.19)		(0.94)		(0.05)
More than 5km from the coast		-0.23		1.92		-0.06
		(0.29)		(1.83)		(0.10)
Population (million people)		-0.64		23.86***		2.65***
		(1.93)		(8.15)		(0.59)
Populations squared		-1.13		-27.37***		-2.22***
		(1.57)		(7.34)		(0.50)
Gini income inequality index		6.73**		25.23*		2.52***
		(3.09)		(14.81)		(0.65)
Gini inequality index of land ownership		0.39		5.11**		0.40***
		(0.55)		(2.60)		(0.14)
Observations	686	686	686	686	686	686
R-squared	0.28	0.38	0.57	0.65	0.06	0.23

Table 12: Validating the instruments

Panel A shows reduced form regressions of social capital in the South (first three columns) and in the North (last three columns); Panel B reports reduced form and I.V. estimates on social capital in the 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. Late 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. Reduced form regressions of social capital in the South and in the North

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-profit organizations South sample	Referenda turnout South sample	Organ donation organizations South sample	Non-profit organizations North sample	Referenda turnout North sample	Organ donation organizations North sample
Bishop city	0.44	1.89	0.15	0.64**	0.16	0.17**
	(0.33)	(1.54)	(0.10)	(0.31)	(0.44)	(0.07)
Etruscan city	-0.80**	-0.24	-0.21	0.49**	1.87***	0.10
	(0.33)	(3.31)	(0.16)	(0.25)	(0.52)	(0.07)
Elevation	-0.38**	-0.88	-0.37*	0.34	-7.47***	-0.37*
	(0.17)	(0.63)	(0.21)	(0.81)	(1.50)	(0.22)
Max difference in elevation	-0.23	-2.43**	-0.27***	0.79***	-2.47***	-0.21**
	(0.18)	(1.18)	(0.06)	(0.30)	(0.43)	(0.09)
On the coast	0.10	-2.34	-0.13	-0.40	-3.26***	-0.16
	(0.30)	(1.59)	(0.09)	(0.34)	(0.65)	(0.12)
More than 5km from coast	-0.05	3.47	-0.01	-0.44	0.23	-0.30*
	(0.58)	(3.34)	(0.12)	(0.27)	(0.79)	(0.16)
Population (million people)	1.40	12.98	-1.27	-2.59*	-8.39***	0.24
	(2.59)	(15.10)	(1.05)	(1.50)	(2.77)	(0.69)
Populations squared	-2.63	-18.44	1.59	-0.20	1.96	-0.36
	(2.49)	(13.22)	(1.02)	(1.13)	(2.08)	(0.46)
Gini income inequality index	5.74	55.75*	4.42**	0.81	1.71	0.57
	(4.51)	(28.51)	(1.85)	(1.04)	(1.42)	(0.38)
Gini inequality index of land ownership	1.25	-2.82	1.32***	19.85***	-7.23	4.68***
	(0.82)	(5.88)	(0.29)	(4.83)	(6.51)	(1.13)
Observations	286	286	286	400	400	400
-test for both instruments = 0 (*p*-value)	0.0434	0.4680	0.1672	0.0113	0.0006	0.0164
R-squared	0.19	0.09		0.26	0.57	0.13

B. Reduced form and IV regressions in the North controlling for cities that became a seat for the bishop after 1400 C.E.

	Non-profit organizations		Referenda turnout		Organ donation organizations	
	(2)	(3)	(5)	(6)	(8)	(9)
	Reduced form	I.V.	Reduced form	I.V.	Reduced form	I.V.
Seat of a bishop in 1000 C.E.	0.78**		0.08		0.20**	
	(0.34)		(0.46)		(0.08)	
Etruscan city	0.43*		1.89***		0.09	
	(0.26)		(0.53)		(0.07)	
New seat of a bishop (after 1400 C.E.)	0.73	0.83	-0.34	-0.19	0.13	0.07
	(0.54)	(0.51)	(0.69)	(0.74)	(0.11)	(0.11)
Commune		1.18**		1.94***		0.42***
		(0.50)		(0.71)		(0.12)
Elevation	0.26	0.92	-7.48***	-7.27***	-0.37*	-0.33
	(0.80)	(0.76)	(1.52)	(1.58)	(0.22)	(0.22)
Max difference in elevation	0.79**	0.52*	-2.46***	-2.87***	-0.21**	-0.20**
	(0.31)	(0.30)	(0.43)	(0.44)	(0.09)	(0.09)
Intersection of Roman roads	0.89***	0.96***	-0.02	0.02	-0.18**	-0.13
	(0.31)	(0.33)	(0.57)	(0.52)	(0.09)	(0.10)
On the coast	-0.46	-0.20	-3.24***	-2.89***	-0.17	-0.07
	(0.36)	(0.36)	(0.65)	(0.72)	(0.12)	(0.12)
More than 5km from the sea	-0.39	-0.63**	0.20	0.02	-0.29*	-0.27*
	(0.27)	(0.29)	(0.79)	(0.75)	(0.17)	(0.16)
Population (million people)	-2.54*	-5.51**	-8.38***	-11.80***	0.24	-0.15
	(1.52)	(2.21)	(2.78)	(3.59)	(0.69)	(0.78)
Population squared	-0.21	2.25	1.93	3.70	-0.35	-0.16
	(1.15)	(1.67)	(2.08)	(2.65)	(0.46)	(0.51)
Gini land inequality index	0.68	2.02*	1.81	3.42**	0.53	0.66
	(1.05)	(1.04)	(1.42)	(1.50)	(0.38)	(0.43)
Gini income inequality index	19.05***	13.29***	-6.75	-12.12*	4.50***	4.11***
	(4.84)	(4.96)	(6.58)	(6.59)	(1.13)	(1.24)
Observations	400	400	400	400	400	400
R-squared	0.27		0.57		0.31	

Table 13: Effect of social capital on income per capita

The table shows estimates of the effect of social capital on per capita income in the city. Social capital is measured with the number of non-profit organizations per 1000 inhabitants. The first two columns show OLS estimates; the remaining columns show I.V. regressions. In columns (3), (4) and (5) the instrument is the indicator for Commune; in column (6) the instrument is the log of the length of independence (the variable is zero if the city was not independent). In column (7) the instruments are: an indicator of whether the city was a Bishop city in 1000 C.E. and an indicator of whether the city was founded by the Etruscans. The last row shows the *F*-test for the excluded instruments in the first stage regression, and the *p*-value of the Sargan test for the validity of the excluded instruments. Robust standard errors are reported in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	(1) OLS	(2) OLS	(3) I.V.: Commune	(4) I.V.: Commune	(5) I.V.: Commune	(6) I.V.: length of indip	(7) I.V.: Bishop + Etruscan city
Social capital	0.40***	0.38***	0.57***	0.56***	0.56***	0.57***	0.81***
	(0.04)	(0.04)	(0.13)	(0.19)	(0.21)	(0.22)	(0.30)
Elevation	-0.72	-0.69	-1.02*	-1.00	-1.01	-1.08*	-1.32*
	(0.62)	(0.62)	(0.61)	(0.65)	(0.64)	(0.65)	(0.74)
Max difference in elevation	-0.48**	-0.48**	-0.45**	-0.45**	-0.46**	-0.49**	-0.41*
	(0.22)	(0.22)	(0.20)	(0.20)	(0.21)	(0.21)	(0.23)
On the coast	-0.11	-0.16	-0.01	-0.02	-0.03	-0.03	0.26
	(0.32)	(0.32)	(0.31)	(0.33)	(0.40)	(0.41)	(0.50)
More than 5km from the coast	-0.03	-0.05	0.06	0.06	0.06	0.11	0.19
	(0.47)	(0.47)	(0.44)	(0.45)	(0.45)	(0.47)	(0.51)
Intersection of Roman roads	0.04	-0.01	-0.15	-0.15	-0.15	-0.11	-0.34
	(0.24)	(0.24)	(0.27)	(0.27)	(0.27)	(0.27)	(0.33)
Population (million people)	13.61***	11.05***	13.15***	12.77***	12.73***	12.44***	15.13***
	(1.85)	(2.35)	(1.75)	(2.77)	(2.91)	(2.95)	(3.69)
Population squared	-9.03***	-7.20***	-8.61***	-8.34***	-8.31***	-8.03***	-9.90***
	(1.79)	(2.06)	(1.68)	(2.22)	(2.29)	(2.31)	(2.81)
Gini inequality index of land ownership	-0.26	-0.18	-0.13	-0.12	-0.12	-0.30	-0.06
	(0.70)	(0.70)	(0.66)	(0.65)	(0.65)	(0.65)	(0.73)
# of visitors per million people					0.00	0.00	-0.01
					(0.01)	(0.01)	(0.01)
Province dummies	YES	YES	YES	YES	YES	YES	YES
Province capital dummies	NO	YES	NO	YES	YES	YES	YES
Observations	400	400	400	400	400	383	400
Sargan test (*p*-value)							0.9763
F-test for excluded instrument			29.68	15.77	13.54	11.18	3.95
R-squared	0.74	0.74					

Table 14. Effect of social capital (number of non-profit organizations per capita) on total wealth per capita

The table shows estimates of the effect of social capital on gross per capita household wealth, measured as the sum of house equity value and bank deposits. Social capital is measured with the number of non-profit organizations per 1000 inhabitants. The first two columns show OLS estimates; the remaining columns show I.V. regressions. In columns (3), (4) and (5) the instrument is the indicator for Commune; in column (6) the instrument is the log of the length of independence (the variable is zero if the city was not independent). In columns (7) the instruments are: an indicator of whether the city was a Bishop city in 1000 C.E. and an indicator of whether the city was founded by the Etruscans. The last row shows the *F*-test for the excluded instruments in the first stage regression and the *p*-value of the Sargan test for the validity of the excluded instruments. Robust standard errors in parentheses. *** significant at less than 1%; ** significant at 5%; * significant at 10%.

	(1) OLS	(2) OLS	(3) I.V.: Commune	(4) I.V.: Commune	(5) I.V.: Commune	(6) I.V.: length of independence	(7) I.V.: Bishop city, Etruscan city
Social capital	2.14***	1.98***	3.92***	4.26***	3.09**	2.31	3.90*
	(0.32)	(0.34)	(1.04)	(1.51)	(1.49)	(1.56)	(2.01)
Elevation	-1.45	-1.27	-4.54	-5.06	-8.61*	-7.82*	-9.63*
	(4.75)	(4.75)	(4.81)	(5.18)	(4.63)	(4.61)	(5.07)
Max difference in elevation	-3.84**	-3.84**	-3.52**	-3.49**	-4.22***	-4.46***	-4.06***
	(1.67)	(1.67)	(1.59)	(1.62)	(1.49)	(1.49)	(1.57)
On the coast	12.62***	12.37***	13.76***	14.11***	7.53**	6.18**	8.49**
	(2.45)	(2.45)	(2.40)	(2.61)	(2.93)	(2.95)	(3.40)
More than 5km from the coast	0.00	-0.08	1.04	1.23	0.77	2.18	1.22
	(3.62)	(3.62)	(3.47)	(3.58)	(3.28)	(3.33)	(3.48)
Intersection of Roman roads	3.92**	3.66*	1.96	1.95	2.95	3.74*	2.34
	(1.87)	(1.88)	(2.08)	(2.12)	(1.99)	(1.95)	(2.28)
Population (million people)	58.17***	43.77**	53.32***	64.89***	49.50**	37.42*	57.30**
	(14.19)	(17.99)	(13.67)	(22.07)	(21.16)	(21.03)	(25.20)
Population squared	-13.37	-3.06	-8.88	-17.04	-6.94	1.95	-12.09
	(13.68)	(15.80)	(13.16)	(17.69)	(16.70)	(16.45)	(19.16)
Gini inequality index of land ownership	0.17	0.64	1.55	1.32	1.87	-0.41	2.06
	(5.40)	(5.40)	(5.16)	(5.21)	(4.75)	(4.67)	(4.95)
# of visitors per million people					0.32***	0.34***	0.30***
					(0.06)	(0.06)	(0.07)
Province dummies	YES	YES	YES	YES	YES	YES	YES
Province capital dummies	NO	YES	NO	YES	YES	YES	YES
Observations	400	400	400	400	400	383	400
Sargan test (*p*-value)							0.3079
F-test for excluded instrument	-	-	29.68	15.77	13.54	11.18	3.95
R-squared	0.70	0.70					