Endogenous Institutions and Economic Outcomes.*

Carmine Guerriero

Department of Economics and ACLE, University of Amsterdam

May 12, 2014

Abstract

This paper evaluates the relative importance of a "culture of cooperation," which is the strength of norms of trust and respect for others, and "inclusive political institutions," which enable voters to check the power delegated to their representatives. I divide Europe into 120km × 120km grids and exploit exogenous variation in both institutions driven by Medieval history. In particular, I document strong first stage relationships between present-day culture and the forces that aggravated consumption risk—i.e., climate volatility—between 1000 and 1600 and between the inclusiveness of present-day regional political institutions and the factors that shaped the returns from elite-citizenry investments in the Middle Ages, i.e., terrain ruggedness and direct access to the coast. Using this instrumental variables approach, I show that only culture has a first order effect on development, even after controlling for country fixed effects and present-day human capital, financial development, sectoral specialization, climate volatility, and distance to the coast. Crucially, the excluded instruments have no direct impact on development and the economic effect of culture holds within pairs of adjacent grids with different Medieval climate volatility. An explanation for these results is that culture but not democracy is necessary to produce public-spirited politicians and push voters to punish political malfeasance. Micro-evidence supports this idea.
Keywords: Geography; Culture; Democracy; Development; Political Accountability.
JEL classification: Z10; H10; O10; D72.

*I would like to thank Serra Boranbay, Giuseppe Dari-Mattiacci, Luigi Guiso, Naci Mocan, Tommaso Nannicini, Andrea Ruggeri, Andrea Stella, Guido Tabellini, and two anonymous readers for useful comments, and Raffaella Paduano for the invaluable help in organizing the data. I am indebted to Ben Gardiner who provided the data on the real capital stock. Address: Roetersstraat 11, 1018 WB Amsterdam, The Netherlands. Phone: +31 (0)205254162. Fax: +31 (0)205255318. E-mail: c.guerriero@uva.nl

1 Introduction

Overwhelming evidence suggests that a "culture of cooperation," which is the strength of norms of trust and respect for others (Tabellini, 2010), and "inclusive political institutions," which enable voters to check their representatives (Persson and Tabellini, 2009), foster economic development and are correlated with past inclusive political institutions (Guiso, Sapienza, and Zingales, 2013). Yet, documenting that the two types of institutions reinforce one another and are persistent does not help in identifying their relative importance. This paper tackles this issue by devising an instrumental variables approach that exploits exogenous variation in institutions created at the European regional level by Medieval history.

The anarchy created by the fall of the Western Roman empire pushed the population to seek the protection of strong patrons who, empowered by the feudal contract, pacified their estates (Stearns, 2001). This new order fueled an institutional revolution that changed Europe forever. On the one hand, attracted by the prospect of farming investments and long-distance trade partnerships, the lords started to offer high powered contracts to the peasants and both protection against pirates and tax breaks to the merchants (Vitolo, 2000). These innovations flourished where reforms towards a more inclusive political process fortified their credibility (Stearns, 2001), e.g., first in the communes of Northern Italy (1050-1628), the maritime republics of Genoa and Venice (1095-1297), the *Giudicati* in Sardinia (1100-1297), and the towns of Aragon and Catalonia (1150-1213), and then with the opening of the Atlantic routes in the Provinces (1384-1795) and England (1215-1707). On the other hand, the monasticism movement, revived by the creation of the Cistercian and Franciscan orders in 1098 and 1209 respectively, started to meet the population's demand for insurance against consumption shocks in exchange for the acceptance of a culture of cooperation. Together with the population, the Cistercians reclaimed undeveloped lands, organized trade fairs, and introduced major technological innovations (Woods, 2005). The risk of being deprived of such support let the population accept an ideal of charity pursued not through alms but "via moral consideration and practical engagement" [Muzzarelli 2001, p. 115]. This approach was so attractive that hundreds of communities pushed the nearest monasteries to join the order and then embraced the same culture of cooperation [Berman 2000, p. 95, 107, and 223].

Similarly, the Franciscans organized a network of thousands of houses launching the first micro-credit institutions, i.e., *Monti di Pietà* (Muzzarelli, 2001). Once summoned by a community, they first gathered sufficient alms to start and run these pawnshops and then improved "the morality [...] of the customers evaluating the loan use [in order to] make the citizenry cohabitation more cooperative and fair" [Muzzarelli 2001, p. 7 and 216].

Inspired by these key institutional discontinuities and previous research on endogenous institutions,[1] Boranbay and Guerriero (2013) employ a panel of 90 European regions spanning the 1000-1600 period to test the idea that the elite implements more inclusive political institutions to convince the citizens that their returns from hard-to-observe investments will not be expropriated, whereas the citizenry accumulates a culture of cooperation to successfully share consumption risk and commit to cooperate in investment with the elite. Consistent with these predictions, reforms towards tighter constraints on the elite's power were mostly driven by the factors affecting the observability of farming investments and long-distance trades, i.e., respectively the ruggedness of the terrain and the direct access to the coast. In addition, the discounted number of years Cistercian and Franciscan houses were active per square kilometres was positively related to the risk of harvest destruction, as driven by the contemporaneous volatility of the growing season temperature, and to the factors depressing the elite's prospect of profitable investments, i.e., the shift of long-distance trades towards the Atlantic. Given that present-day institutional arrangements can be traced back to this Medieval revolution (Boranbay and Guerriero, 2013), the positive correlation between past institutions created by the commitment dimension produces first stage relationships between past political infrastructures and present-day culture and democracy, which however are insufficient to identify the relative importance of each of the two institutions.

To deal with this issue, I exploit the geographic determinants of past institutions to devise a multiple instrumental variables approach as illustrated in figure 1. The success of this identification strategy depends on the power of the two sets of instruments isolating the roles of culture and inclusive political institutions. Operationally, I divide Europe into 120km $\times$ 120km grids and show that the average volatility of the growing season temperature

[1] While Fleck and Hanssen (2006) show that in Ancient Greece democratization was stronger where the elite found more difficult to monitor the citizens' farming investments, Durante (2010) documents that Europeans living today in regions where the climate was more erratic between 1500 and 1750 trust more others.

between 1000 and 1600 has a strong effect on the norms of respect and trust self-reported to the 2008 European Value Survey (GESIS, 2008) and no impact on the inclusiveness of regional political institutions averaged between 1950 and 2010. This last variable is obtained supplementing the Polity IV's constraint on the executive score measured at the national level with information on the extent of political autonomy from the central government of the NUTS 2 regions in the sample. The latter has been recognized by a large literature as a key determinant of the citizenry's ability to monitor politicians (Frey, 2005). The terrain ruggedness and the direct access to the coast have instead a large impact on current political institutions and a little one on present-day culture. Building on these separate first stages, I show that only culture has a first order effect on the log of GDP per capita averaged between 2002 and 2009, even after controlling for country fixed effects and present-day human capital, financial development, sectoral specialization, religious beliefs, climate volatility, and distance to the coast (see figure 1). Crucially, I cannot reject the overidentifying restrictions at a level nowhere lower than 15%. This last piece of evidence is consistent with the semi-reduced forms estimates, which suggest that none of the excluded instruments has a direct impact on development once present-day climate volatility is included in the specification. Finally, the positive effect of culture on economic success also holds within neighboring grids falling in the same country and differing in their Medieval climate volatility.

An explanation for these results is that more inclusive political institutions facilitate the monitoring of politicians by voters but are irrelevant if citizens are not morally compelled to punish political malfeasance or if politicians have weak civic virtues (Boix and Posner, 1998). To confirm this idea, I show that criminal prosecutions of Italian Parliament members are considerably smaller in electoral districts in which culture is stronger but not significantly different in those endowed with more inclusive political institutions. This pattern points to a key channel through which culture shapes the economy and cannot be driven only by a more diligent enforcement since prosecutions can be initiated by any Italian tribunal and are consistently correlated with measures of corruption (Chang, Golden, and Hill, 2010).

The papers most closely related to mine are Acemoglu and Johnson (2005) and Tabellini (2010). The latter also tries to overcome problems inherent to cross-country regressions by using past political institutions to measure the impact of current culture on the develop-

ment of 69 European regions. Differently from this and the related contributions examining the within-country impact of past institutions (Dell, 2010; Michalopoulos and Papaioannou, 2013; Gennaioli et al., 2013), I devise an empirical strategy explicitly accounting for the existence of within-country confounding factors that might drive at the same time past institutions, present-day institutions, and present-day outcomes. Acemoglu and Johnson (2005) instead share with me the aim of unbundling institutions but focus on contracting and property rights institutions. No previous study however has attempted to estimate the separate roles of culture and democracy.[2] Crucially, I do so by identifying the geographic determinants of permanent institutions in a sample in which it is unlikely that geography has shaped the economy otherwise, i.e., by modulating the spread of slavery (Nunn and Puga, 2012) or the colonizers' settlement strategy (Acemoglu, Johnson, and Robinson, 2001). The rest of the paper is organized as follows. Section 2 discusses the data and the empirical strategy. Next, section 3 evaluates the relative importance of culture and the inclusiveness of political institutions showing the primacy of the former. Section 4 provides additional evidence documenting that only culture significantly shapes the extent of political accountability. Finally, section 5 concludes. The appendix gathers tables and figures.

2 Data and Empirical Strategy

The sample consists of 578 grids in 16 European countries for which I have sufficient historical data (see footnote 14 and table 1). The grids have width of 1°—i.e., 120km, which is the spatial resolution of the most refined geographic dataset I use, i.e., G-Econ dataset.[3] In contrast to a region-based approach, this empirical design allows me to compare observations of similar size and sidestep the possible endogeneity of regional boundaries. The estimates are similar if I discard grids with a land area lower than 100 or 200 square kilometres.

2.1 Measuring a Culture of Cooperation

The proxy for culture is obtained from the 2008 European Value Study (GESIS, 2008). The most detailed level at which these data can be aggregated is that of the NUTS 2 regions

[2] Gorodnichenko and Roland (2011) use genetic differences as an instrument to provide cross-country evidence of the impact of individualism on income and of a two-way causal effect between culture and democracy.

[3] Grids lying on the borders are divided in sub-grids each belonging entirely to a single country. Considering the undivided grids to deal with unobserved determinants of national boundaries produces similar results.

in which the respondents resided at the time of the survey. Eurostat defines NUTS 2 regions on the basis of administrative criteria and their population ranges from 800,000 to 3 million. The average number of respondents per region is 313 and the median 167.[4]

Drawing on a large sociological literature (see for a review Tabellini, [2010]), I define a culture of cooperation as the extent of the citizenry's "generalized" trust and respect for others, both meant as abstract rules of conduct applied also to individuals outside the family (Platteau, 2000). Starting from generalized trust, not only it favors cooperation in prisoner's dilemma type of situations as documented by a broad experimental evidence, but it also reduces transaction costs, expands anonymous market exchange, and facilitates both the provision of public goods and the division of labor (Dixit, 2004). To measure generalized trust, I consider the share of answers "most people can be trusted" to the question "generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"—*Trust*. Turning to respect, it makes individuals more reluctant to free-ride on others and more willing to participate in the political and administrative life of their local communities (Tabellini, 2010). Operationally, I use the share of answers mentioning "tolerance and respect for other people" as an important quality that children should be encouraged to learn, i.e., *Respect*. To isolate the common source of variation of the two self-reported norms of conduct, I focus on the first principal component extracted from *Trust* and *Respect*, i.e., *Culture* (see table 2 for the exact definition and sources of all the variables I employ).[5] As detailed in the internet appendix, the evidence is substantially similar when I use either *Trust* or *Respect* alone. If a grid belongs to multiple NUTS 2 regions, I assign this grid a figure equal to the average of the values *Culture* assumes in each represented region weighted by the region's relative contribution to the grid's land area. I apply this procedure to the remaining variables measured at the regional level.

The top right map in figure 2 illustrates the large variation in *Culture* across Europe and the relative size of both the grids I use as cross-section identifiers in the empirical analysis

[4]I focus on this wave in order to maintain a temporal homogeneity with the other data I introduce below. Yet, because of the strong path-dependence of the recorded answers, the empirical exercise will offer similar conclusions should I also take into account the previous three waves, i.e., 1981, 1990, 1999.

[5]Tabellini (2010) also considers the cultural relevance of individualism and the belief that effort will pay off. Yet, these dimensions are not closely related to a "culture of cooperation." Similarly, *Culture* is not meant to capture social capital, i.e., "those persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities" (Guiso, Sapienza, and Zingales, 2013).

and the NUTS 2 regions surveyed by the European Value Study. Even if continuous measures are used in the analysis, in these and the following maps data are displayed in five intervals whose break points are chosen to best group similar values and maximize the differences between groups.[6] Darker colors correspond to higher values. While the Benelux, Northern Italy, England, and Scotland exhibit a stronger culture of cooperation, the populations of Southern Italy, Poland, Portugal, and Slovenia report a more limited one.

As clarified by the comparison between this pattern and that described by the top left map of figure 2, the distribution of *Culture* is deeply rooted in the Medieval risk-coping-driven culture of cooperation proxied by *Culture-M*. This is the discounted number of years Cistercian and Franciscan houses were active in the grid over the 1000-1600 period.[7] The raw data are collected from Van Der Meer (1965) and Moorman (1983). As discussed above, both monastic orders assumed a key role in the accumulation of culture by organizing risk-sharing activities together with the population, proposing norms of trust and respect, monitoring their effective spread, and punishing the defectors by withdrawing their support. Given the substantial homogeneity of the two orders' action (Tobin, 1995) and that no other order covered a similar role (Logan, 2002), Boranbay and Guerriero (2013) propose that *Culture-M* gauges the input to the technology that transformed the citizenry's involvement with culture into evolutionary stable norms of cooperation. This is consistent with the key insights of evolutionary psychology (Barkow, Cosmides, and Tooby, 1992) and Malthusian growth theories (Clark and Hamilton, 2006): group-specific cultural values result from a process that instills, via natural selection or cross-punishment, norms maximizing the fitness of the group's members. Hence, higher values of *Culture-M* should detect a stronger past culture.[8]

Since information on past grid's population is unavailable, I don't normalize *Culture-M*. Also, I consider only the 1000-1600 period since the Protestant Reformation deprived

[6] The goodness of variance fit method minimizes the average deviation of the interval's values from its mean, while maximizing the average deviation of the interval's values from the means of the other intervals.

[7] For each of the 712 (2952) Cistercian (Franciscan) houses, this figure equals in year t the difference between the years of operation of the house and those elapsed by its eventual closure if positive and zero otherwise.

[8] To further cross-validate this variable, Boranbay and Guerriero (2013) report its high correlation—0.8—with the discounted number of years the *Monti di Pietà* were active per square kilometres. Since these pawnshops survived only if loans were repaid (Muzzarelli, 2001), their endurance is related to the share of successful risk-sharing interactions and so it is an outcome-based measure of past culture just as the electoral turnout and blood donations are of present-day culture (Guiso, Sapienza, and Zingales, 2013).

monasticism of its pivotal role (Stearns, 2001). A glance to the two top maps of figure 2 reveals that the expansion of the Cistercians in the Benelux, England, Scotland, and Southern France first (Berman, 2000) and the success of the Franciscans in Northern Italy then (Moorman, 1983) are associated to a more robust culture of cooperation nowadays.

2.2 Measuring the Inclusiveness of Political Institutions

I define the inclusiveness of political institutions as the strength of the rules enabling voters to select more public-spirited representatives and check more closely their decisions. To capture both aspects for present-day Europe, I supplement the Polity IV's constraint on the executive score measured at the national level with information on the extent of political autonomy from the central government of the NUTS 2 regions in the sample.[9] According to Frey (2005), there are three major advantages of decentralized units. First, politicians in decentralized units are directly accountable for local policies. Second, they are selected for their fit with the preferences of the unit's population. Third, they can design public goods fulfilling the most these preferences. I construct the variable *Democracy* as the average over the 1950-2010 period of the sum of the Polity IV's constraint on the executive score plus an indicator taking value 1 if the region has exclusive control over a limited set of policy—e.g., healthcare, 2 if it has also a significant public spending independence as determined by a process of fiscal decentralization, 3 if it has substantial political autonomy from the central government, and 0 otherwise.[10] *Democracy* gauges not only the institutional differences between the postwar autocracies that ran the Communist block and Francoist Spain and the democracies observed at the time in the rest of the sample, but also the diverging experiences of the autonomous regions of Austria, Belgium, France, Italy, Spain, and the UK.[11] Previous contributions on the economic effect of political institutions have exclusively looked at the former aspect (Persson and Tabellini, 2009), which in my sample still represents an important

[9] The Polity IV's constraint on the executive score ranges between 1 and 7 and higher values indicate stronger institutionalized constraints on the decision making power of chief executives (Marshall and Jaggers, 2011).

[10] I consider a region as fiscally decentralized if it can raise a significant part of its fiscal revenues by selecting region-specific taxes whereas the central government maintains its financial responsibility. Furthermore, I treat a region as politically autonomous if it is endowed with fiscal decentralization, can elect its own parliament, and controls all policies except those of national relevance like defense.

[11] The message of the empirical exercise will be similar should I switch to either the executive or the legislative index of electoral competitiveness developed by the World Bank database of political institutions.

source of within-country variation because of the different political trajectories of Eastern and Western Germany. I obtain a similar evidence when I consider only the regions' political autonomy by averaging *Democracy* over the 2000-2010 period or when I use the first principal component extracted from the Polity IV's score and the regional political autonomy index (see the internet appendix). Accordingly, the empirical results do not rest merely on the strategy adopted to measure the inclusiveness of political institutions.

The bottom right map of figure 2 displays the sizeable variation in *Democracy*. On the one hand, the experience of totalitarian regimes has created an institutional gap between the regions lying on the two sides of the Iron Curtain. On the other hand, South Tyrol, region Wallone, Vlaams Gewest, Corse, the Italian and Spanish regions, Northern Ireland, Scotland, and Wales have been entrusted in the postwar period a more or less complete political autonomy by their central governments. These arrangements range from the exclusive legislative power on specific policies, like education, granted to all the Italian regions in 2001 (Article 117, Italian Constitution) to the almost complete autonomy obtained by the linguistic areas of Belgium in 1962 and the devolved UK regions in 1999. In these cases, the central governments have kept their responsibility for excepted matters like defense, whereas the regional Parliaments have acquired the residual legislative power and the possibility to invest the region's tax revenues to produce local public goods. As a result of these patterns, *Democracy* ranges from a minimum of 3.20 scored by the ex-Eastern Germany regions of Brandeburg and Sachsen to the maximum of 9 observed, for instance, in Vlaams Gewest.

The bottom left map of figure 2 clearly shows that the present-day heterogeneity in regional political institutions has its roots in Medieval history. This map depicts the average over the 11th-16th centuries of the "constraint on executive" variable coded by Boranbay and Guerriero (2013) for each half a century between 1000 and 1600, *Democracy-M*. The variable is obtained by first matching groups of present-day NUTS 2 regions to the major polities prevailing over the Medieval period (see table 1) and then looking at the history of each polity in a 40-year window around each date (see also Acemoglu, Johnson and Robinson, [2005]). Between 1100 and 1350, the first reforms towards a more inclusive political process were implemented by the agrarian communities of the kingdom of Aragon and the commercial republics of the Sardinian "Giudicati", the communes of Northern Italy, and the maritime

cities of Genoa and Venice (Stearns 2001). Initially organized as "a sworn association of free men endowed with political and economic independence" [Stearns 2001, p. 216], such polities were governed by a public assembly that attended to general interest matters and selected the executive. Later on, the shift of long-distance trades towards the Atlantic harbours of Cape Town and Havana allowed the merchants of the Provinces and the Reign of England to constrain the power of their monarchs (Acemoglu, Johnson, and Robinson, 2005). In the postwar period, Medieval parliaments have been restored with the justification that the very specific preferences of a historically homogeneous community should be satisfied by local representatives (Frey, 2005). The two bottom maps of figure 2 document the long term journey towards more inclusive political institutions of these European regions.

2.3 Unbundling Institutions

The options open to a society characterized by a weak culture of cooperation but more inclusive political institutions are very different from those left to a society in which the political process is less democratic but cooperation is facilitated by solid norms of trust and respect. While the former can barely sustain decentralized markets and support both investments and division of labor, the latter has always the option of side-stepping centralized powers and relying on informal networks of cooperation enforcing contracts and protecting property rights (Dixit, 2004; Greif, 2006). Moreover, culture shapes the way citizens participate in policy making and the behaviors of public officials. On the one hand indeed, a culture of cooperation reduces the citizens' cost of punishing political malfeasance by relaxing the collective action constraint, building their qualities of judgement, and shifting their preferences towards community-oriented policies (Boix and Posner, 1998). On the other hand, untrustworthy and inconsiderate public officials are likely to engage in nepotism and corruption even in the face of "de jure democratic institutions" (Putnam, 1993). The very unequal performances of the public administration and the judiciary in Northern and Southern Italy despite the common 150-years-long political trajectory constitute a glaring example.

Hence, it is reasonable to suppose that the performance of a region characterized by a forceful culture of cooperation but significantly less inclusive political institutions—e.g., Emilia Romagna—will be superior to that of a region in which a more democratic political

process is left in the hands of less respectful voters, e.g., Sardinia. Next, I test this prediction.

2.4 Identification Strategy

Ignoring nonlinearities, I can write the relationship I am interested in identifying as

$$Y_{i,c} = \alpha_c + \beta_0 C_{i,c} + \gamma_0 D_{i,c} + \mathbf{X}'_{\mathbf{i,c}}\delta_{\mathbf{0}} + \epsilon_{i,c}, \tag{1}$$

where $Y_{i,c}$ is the natural logarithm of GDP per capita in grid i of country c, in euro, averaged between 2002 and 2009, i.e., *Income*. The data source is Eurostat, which collects the data at the NUTS 2 regional level. I obtain similar results when I switch to the G-Econ's estimate of the GDP per capita in 1985, which is in grid format at 1 degree spatial resolution (see the internet appendix).[12] α_c accounts for differences in the origins of national legal systems, the incidence of past wars, as well as other country-wide time-independent factors. $C_{i,c}$ and $D_{i,c}$ denote *Culture* and *Democracy* respectively, whereas $\mathbf{X_{i,c}}$ is a vector of controls introduced below. Since the correlation between $C_{i,c}$ and $D_{i,c}$ is 0.28, multicollinearity is not an issue.

The simplest strategy is to estimate equation (1) using OLS regression. There are two distinct issues with this strategy. First, both culture and democracy are endogenous, so I may be capturing reverse causality, or the effect of some omitted characteristics like religion or other geographic features. Second, both variables are measured with error, so there may be a downward attenuation bias. To appreciate the importance of these concerns and cope with them, I compare the inconsistent OLS estimates with those obtained by using two-stage least squares—2SLS from here on—with distinct and plausible instruments for culture and democracy. These instruments should be correlated with the endogenous regressors but orthogonal to any other omitted variable, i.e., uncorrelated with the outcome of interest through any channel other than their effect via the endogenous regressors. A successful instrumental variables strategy would correct not only for the reverse causality and omitted variable biases, but also for differential measurement errors in the two endogenous variables as long as the measurement errors have the classical form and β_0 and γ_0 can be consistently

[12] Given the see-sawing performances of some European regions, it would be more instructive to link the Medieval institutional revolution to the average development of each cell over a longer spell of time, e.g., a century. Unfortunately, the only proxies for the dependent and independent variables in equation (1) at the regional level are those I consider. I thank an anonymous reader to have drawn my attention to this point.

estimated (see Acemoglu and Johnson, [2005]). The specifications of the two first stages are

$$C_{i,c} = \alpha_c + \zeta_1 T_{i,c} + \eta_1 R_{i,c} + \theta_1 I_{i,c} + \mathbf{X'_{i,c}}\delta_\mathbf{1} + \omega_{i,c},$$

$$D_{i,c} = \alpha_c + \zeta_2 T_{i,c} + \eta_2 R_{i,c} + \theta_2 I_{i,c} + \mathbf{X'_{i,c}}\delta_\mathbf{2} + \nu_{i,c}, \tag{2}$$

where $T_{i,c}$ is the volatility of the average temperature during the growing season averaged between 1000 and 1600, and corresponds to the instrument for culture (see section 2.5). $R_{i,c}$ and $I_{i,c}$ label the terrain ruggedness and a dummy for direct access to the coast, respectively, and represent instead the instruments for inclusive political institutions (see section 2.5). The exclusion restriction is that in the population $Cov(\epsilon_{i,c}, T_{i,c}) = Cov(\epsilon_{i,c}, R_{i,c}) = Cov(\epsilon_{i,c}, I_{i,c}) = 0$, where $\epsilon_{i,c}$ is the error term in equation (1).

2.5 The Geographic Determinants of Institutions

Building on the institutional traits discussed above and the fact that Medieval economies were primary based on farming and long-distance trade, Boranbay and Guerriero (2013) study accumulation of culture and democratization in a simple and yet general society. Formally, "citizens" and "elite" members either share risk with any other individual or invest with a member of a different group. The inherent differences between the two activities allow to distinguish between a more fundamental form of cooperation aimed at hedging against consumption shocks and one directed toward surplus formation, e.g., long-distance trades. First, each group costly instills into its members a psychological gain from cooperating, for instance, by attracting a monastic order. This implicit reward substantiates a culture of cooperation. Second, the elite decides whether to introduce democracy or preserve autocracy. Democracy allows the citizens to fix the share of investment surplus spent on the production of a public good and its type, whereas autocracy gives this right to the elite. Third, agents are randomly matched and the elite selects the activity if she meets a citizen. The investment surplus and the risk-sharing payoff are each shaped by a specific exogenous factor, e.g., geography. In addition, heterogeneity in the production abilities and the preferences for the public goods renders investment infeasible under autocracy. The equilibrium prescribes that a rise in the investment surplus favors democratization, whereas accumulation of culture increases with the forces aggravating consumption risk if they are not too strong.

Consistent with this prediction, culture over the 1000-1600 period and its present-day counterpart are stronger in the regions where it was more necessary to cope with consumption risk because of the high but never extreme climate volatility (Boranbay and Guerriero, 2013). On top of this evidence, I elect as instrument for *Culture* the average standard deviation of the spring-summer temperature over the period 1000-1600 in Celsius, *Temperature_SD-M*.[13] The raw data are in grid format and collected from Guiot et al. (2010). They cover most of Europe at a 5 degrees spatial resolution for all the years between 600 and 2000.[14] The observations are derived from several indirect proxies such as tree-rings, ice cores, pollens, and historical written records and, to the best of my knowledge, they constitute the only record of the European climate before 1500 at the grid level. If grid i belongs to multiple climatic cells, I assign this grid a figure equal to the average of the values Medieval climate volatility assumes in each represented cell weighted by the cell's relative contribution to grid i's area. Since the conditioning set $\mathbf{X_{i,c}}$ gathers present-day human capital, financial development, sectoral specialization, religious beliefs, and climate volatility, it is very unlikely that the climate volatility of more than four centuries ago affects present-day differences in regional performances through a channel other than a culture of cooperation.

Turning to political institutions, Boranbay and Guerriero (2013) show that, consistent with their model, between 1000 and 1600 reforms towards tighter constraints on the elite's power were mostly driven by the factors boosting the investment surplus. In particular, they apply the argument put forward by Fleck and Hanssen (2006) and use as a proxy for investment surplus the difficulty-to-observe investments in farming technologies and long-distance trades. Starting from the former, the main determinant of the observability of farming activities is the terrain ruggedness in Km, *Ruggedness*. These data are retrieved directly from the G-Econ data set, which is in grid format and covers most of the world surface at the same spatial resolution of the cross-section used in the present study, i.e., 1 degree. For what concerns long-distance trades, a natural proxy for their observability

[13] Medieval climate volatility squared is not significantly related to culture (Boranbay and Guerriero, 2013).

[14] I exclude the Canarias, and part of Castilla y León, Galicia, Northern and Western Ireland, Scotland, and Portugal (Andorra, Gibraltar, Luxembourg, Malta, and San Marino) since the relative raw data are unavailable (to have sufficient within-country geographic variation). This strategy has no material impact on the estimates. Finally, I do not consider some of the cells available from Guiot et al. (2010) since I lack sufficient data on the historical political entities to which they belonged in the Middle Ages.

would be the grid's distance from the major Medieval harbours. In the following, I discuss the results generated by employing a dummy equal to 1 if the grid has a direct access to the Mediterranean or the Atlantic Ocean, *Coast*. Yet, the estimates will be quite similar should I switch to the variable *Trade*, which equals: 1. the average of the sea distances between the major grid's harbour—i.e., that with the highest average population between 1000 and 1600 according to Bairoch, Batou, and Chèver (1988)—and respectively Istanbul and Alexandria if the grid has a direct access to the Mediterranean; 2. the average of the sea distances between the major grid's harbour and respectively Cape Town and Havana if the grid has a direct access to the Atlantic Ocean; 3. 0 if the grid has no direct access to the coast. Since for grids with a direct access to the coast *Trade* increases in the distance from the major hubs channelling long-distance Medieval trades (Brady, Oberman, and Tracy, 1994), it gauges better than *Coast* the difficulty to observe the investments that determined *Democracy*. The relative coefficients however are more difficult to interpret. Building on an argument similar to that unravelled before, conditional on present-day climate volatility, distance to the coast, and main shifters of transportation costs, like specialization patterns, *Ruggedness* or *Coast* should have no impact on *Income* through channels other than *Democracy*.

A comparison between the two top (bottom) maps of figure 2 and the central (rightmost) map of figure 3 plus the estimates listed in table 3 confirm that the evidence on culture (inclusive political institutions) discussed by Boranbay and Guerriero (2013) remains true in my sample. Both past institutions and their geographic determinants are powerful drivers of present-day institutions.[15] Crucially, not only all the coefficients reflect the theoretical predictions, but geography enters the first stages in a nice separable way whereby the factor modulating the need of risk-sharing shapes mostly present-day culture, whereas the forces determining the investment surplus drive mainly current political institutions.

To assure that the exclusion restriction holds, I include in $X_{i,c}$ not only those determinants of development possibly related to culture and democracy, but also the most likely alternative channels through which the instruments could directly shape present-day outcomes.

First, a growing body of research prompts that institutions are affected by education,

[15]While a recent legacy of theoretical works has clarified that cultural traditions inherited from earlier generations deeply shape the prevailing culture (see Tabellini, [2008]), a vast body of empirical contributions has stressed the persistence of political infrastructures (Acemoglu, Johnson, and Robinson, 2001).

which also directly modulates economic growth (Tabellini, 2010; Gennaioli et al., 2013). To avoid that $C_{i,c}$ and $D_{i,c}$ absorb the variation in human capital, I consider *Tertiary-Education*, which is the percentage of the population aged 20-24 enrolled in tertiary education averaged between 2002 and 2009. The raw data are collected by Eurostat at the NUTS 2 level.[16]

Second, a relevant concern is that more politically autonomous regions have received over time more transfer payments from the central government and this could bias upward the estimate of γ_0 (Tabellini, 2010). To account for this issue, I also include *Capital*, which is defined as the estimated 2000 real capital stock per capita, in millions of euro, at the NUTS 2 regional level (Derbyshire, Gardiner, and Waights, 2013). Taking into account *Capital* also assures that the estimate of β_0 is not picking up only the correlation between the climate-driven micro-credit activities that spread in the 15th and 16th centuries thanks to the Franciscans and present-day financial development (Muzzarelli, 2001).

Third, it is conceivable that Medieval climate variability has influenced the patterns of sectoral specialization and, within agriculture, the relative success of crops with different degrees of weather sensitivity. To evaluate this idea, I also include the employment share in agriculture and fishing between 2002 and 2008 collected at the NUTS 2 regional level by the Regio project, *AF_Employment*. In the internet appendix, I also show that my estimates remain unaffected if I experiment with the average land quality and the standard deviation of the land quality within the grid calculated following Michalopoulos (2012).

Fourth, by determining the diffusion of Cistercian and Franciscan monasteries, *Temperature_SD-M* could have persistently induced the intensity of Catholic beliefs and, in turn, influenced the emergence of both the prevailing institutions and the economy in ways different from those discussed above (see for a review McCleary and Barro, [2006]). Therefore, I also incorporate in the analysis *Catholicism*, which is the share of respondents to the 2008 European Value Study declaring themselves Roman Catholic who answered "very important" to the question "how important is religion in your life?" (GESIS, 2008).

Finally, I add to $X_{i,c}$ a series of observable geographic features correlated with the instruments. The first two of these covariates are the standard deviation of the monthly temperature over the year in Celsius averaged between 1980 and 2008—*Temperature_SD*—and

[16]The evidence will be pretty similar should I also include the primary and secondary school enrolments.

the maximum monthly temperature in Celsius averaged between 1961 and 1990, *Temperature_Max*. Both characteristics are collected from the G-Econ data set and should exclude that Medieval climate shocks directly affect development via their stickiness. Finally, I take into account the average distance to the coast in Km in the grid again collected from the G-Econ data set, *Distance-to-Coast*. This proxy gauges the modern economic relevance of the sea as a means of exchange since, in Europe, terrestrial movements are free nowadays but were heavily regulated in the Middle Ages (Brady, Oberman, and Tracy, 1994).

The empirical results will be similar should I also consider the average over the 1980-2008 period of either the monthly temperature (precipitation) in Celsius (ml) or the standard deviation of the (maximum) monthly precipitation over the year in ml, the distance to either a navigable river or an ice-free ocean in km, and the area of the grid in square kilometres (see the internet appendix). These factors could affect *Income* by modulating the extent of ethnic diversity (Michalopoulos, 2012). Finally, allowing clustering by country produces similar second stages but weakens the first stages because of the high within correlation among climate cells due to the data resolution (see the internet appendix).

3 Culture Versus Political Institutions

A glance to figures 2 and 3 already reveals the main result of the paper. The regional pattern of present-day per capita output in the leftmost map of figure 3 is strikingly similar to that of present-day culture in the upper right map of figure 2 and that of past climate volatility in the central map of figure 3. Indeed, Southern France and Germany, Northern Italy, and Switzerland are richer, have more positive cultural indicators, and have experienced fiercer Medieval climate shocks than the rest of the sample. Instead, Czech Republic, Eastern Germany, Poland, and Portugal are marked by lower values of all three variables. The correlation however is imperfect. The Benelux and Southern England are more culturally and economically advanced but did not face heavy climate shocks during the Middle Ages, whereas Southern Spain displays very low values of both *Income* and *Temperature_SD-M* but a quite strong culture of cooperation. On the contrary, the relationship among *Ruggedness*, *Coast*, and present-day per capita output and political institutions is less clear. Although the graphical comparison is instructive, multivariate analysis is more convincing.

3.1 Main Results

Table 4 reports both the OLS estimates of the basic specification of equation (1) and the second stages of the different specifications of the same equation obtained through the multiple instrumental variables strategy. I do not present the first stages since they are very similar to the estimates listed in table 3. A comparison between columns (1) and (2) reveals that OLS tend to underestimate the impact of culture on *Income*. In fact, the coefficient on *Culture* increases from 0.08 to 0.30, whereas the one on *Democracy* remains almost equal. This is consistent with the idea that while culture is measured with error, more inclusive political institutions could be driven by better economic outcomes as suggested by the modernization theory. The estimate of β_0 in column (2) is significant at 1% and implies that a one-standard deviation improvement in culture—i.e., 0.91—will lead to a 27% rise in present-day GDP per capita. Moving from the lowest level of culture—i.e., -2.72 in Baleares and Cataluna—to its mean would increase GDP per capita by 88 percentage points. In contrast, the coefficient on *Democracy* in column (2) is not statistically significant.

3.2 Robustness and Sensitivity Checks

The basic estimates suggest that culture has a first-order positive effect on income per capita, whereas the impact of more inclusive political institutions albeit positive is economically small and statistically insignificant. This is consistent with an expanding literature concluding that the average effect of democracy on performance is at most weak (see Persson and Tabellini, [2009]). Next, I illustrate a number of robustness and sensitivity checks.

3.2.1 Controlling for Observables

Columns (3) to (8) of table 4 reveal that the proxy for culture is not picking up only differences in either human capital or financial development across regions, that the significant coefficient on *Culture* is not driven by the omission of either sectoral specialization or religious beliefs, and that the impact of past geography on present-day development is not capturing stickiness in climate volatility or the mere vicinity to the coast.[17] As expected, financial development seems to be a key mechanism through which culture fosters economic growth. Finally, while the overidentifying restrictions cannot be rejected at a level nowhere

[17]The OLS counterparts of these specifications point in a similar direction (see the internet appendix).

lower than 15%, the Anderson canonical correlations test rejects that equation (1) is underidentified always at 0% except in column (7).[18] In this last case, the test does not reject the null hypothesis because of the weakness of the first stage for *Democracy* due to the strong correlation between *Temperature_SD* and both *Ruggedness* and *Coast*, i.e., 0.35. Yet, the F-Test on the excluded instruments in the first stage for *Culture* is still high—i.e., 10.51—since *Temperature_SD-M* is almost uncorrelated with *Temperature_SD* and *Temperature_Max*.

3.2.2 Semi-Reduced-Forms

The validity of the exclusion restriction is confirmed by the semi-reduced-forms estimates (see table 5). Here, I address the potential concern that the geography relevant in the Middle Ages might be affecting the economy through channels other than institutions. This is quite worrisome in the light of the fierce debate in the development literature on whether the correlation between institutional and economic success is driven by unobservable geographic features (Michalopoulos and Papaioannou, 2013). In panel A (B), *Culture* is instrumented by *Temperature_SD-M* and *Coast* (*Temperature_SD-M*) but *Ruggedness* (*Ruggedness* and *Coast*) enters (enter) the second stage regressions directly and is (are) also included in the first stage regressions. The estimated effect of *Culture* has about the same order of magnitude as in table 4 and is always significant at 1%, whereas both *Ruggedness* and *Coast* are not significant. This time, both the underidentification test and the Sargan statistics support the identification strategy at the usual significance level. In panel C (D), *Democracy* is instrumented by *Ruggedness* and *Coast* (*Ruggedness*) but *Temperature_SD-M* (*Temperature_SD-M* and *Coast*) enters (enter) the second stage regressions directly and is (are) also included in the first stage regressions. The key observation here is that, conditional on present-day climate volatility, *Democracy*, *Temperature_SD-M*, and *Coast* have no direct significant effect on development and I cannot reject the overidentifying restrictions (see column (6)).

3.2.3 Pairwise Analysis of Adjacent Grids

In spite of employing a rich conditioning set, one may still be worried that some unobservable feature, like some unconsidered but relevant geographic characteristic, is driving the results. To tackle this issue, I focus on contiguous grids with different Medieval cli-

[18] With multiple endogenous regressors, it does not make sense to judge underidentification from the size of the F-test since each instrument is called upon to play a role in each first stage (Angrist and Pischke, 2008).

mate volatility to confirm the link between culture and development (see also Michalopoulos and Papaioannou, [2013]). Even if this exercise cannot be tailored to contrast culture and democracy, it is naturally fitted to confirm the casual impact of culture on economic success. Operationally, I first identify contiguous grids falling in the same country whose difference in *Temperature_SD-M* is at least 0.01 Celsius.[19] When one of these grids is adjacent to more than one other grid with different *Temperature_SD-M*, I include all pairs. Next, to avoid that the results are driven by the redistribution of resources towards the administrative center of each country or by pairs of units with very diverse land area, I exclude the grids to which the national capitals belong and those with an area lower than 200 square kilometres. This procedure leaves me with 204 pairs of grids. I run second stage specifications of the form

$$Y_{i(j),c} = \alpha_{i(j),c} + \beta_0 C_{i,c} + \mathbf{X}'_{\mathbf{i,c}}\delta_{\mathbf{0}} + \epsilon_{i(j),c}, \tag{3}$$

where $Y_{i(j),c}$ is *Income* in grid i of country c that is adjacent to grid j in the same country c with grid i and j differing in their *Temperature_SD-M* values. Since I am now including country-specific, grid-pair fixed effects—$\alpha_{i(j),c}$, the coefficient on a culture of cooperation, β_0, captures whether differences in Medieval climate volatility translate into differences in the natural logarithm of GDP per capita within pairs of contiguous grids in the same country conditional on the rich set of observables contained in $X_{i,c}$ and grid-pair specific, time-invariant features like persistent beliefs, unobserved geography, and local inputs.

Table 6 reports the results of the contiguous-grid analysis. Starting from the first stages, the key observations are that *Temperature_SD-M* is always a strong predictor of *Culture* and that none of the observables in $X_{i,c}$ is strongly correlated with *Culture* within pairs of contiguous grids. These patterns imply that, by focusing on neighboring grids, I neutralize the role of local observables that were instead relevant in tables 4 and 5 (estimates available upon request). Turning to the second stages, columns (1) to (7) show that within country, within pairs of contiguous grids, *Income* is significantly higher in the grids that display stronger norms of trust and respect today because they experienced a more erratic climate during the Middle Ages. A one-standard deviation rise in present-day culture—i.e., 0.52—will lead

[19] This is the first quartile of the strictly positive differences in *Temperature_SD-M* between contiguous grids. The gist of this section will be the same should I use as threshold either the second or the third quartile.

to a 6% increase in present-day GDP per capita and the estimated β_0 is significant at 10% or better. This time, the estimates suggest that both human and real capital are significant channels through which culture shapes the economy. Finally, the Anderson canonical correlations test rejects that equation (3) is underidentified at a level nowhere higher than 1% and, once *Coast* is used as second excluded instrument, I cannot reject the overidentifying restrictions at the usual significance level (results available upon request).

4 Inside the Black Box

The evidence so far establishes that a culture of cooperation has a first order effect on long-run economic development, whereas the inclusiveness of political institutions does not play a relevant role. What could be the micro-mechanisms justifying this pattern? While an exhaustive answer to this question is beyond the scope of the present paper, in this section I exploit data on the misbehaviors of the members of the House of Representatives of the Italian Parliament gathered by Chang, Golden, and Hill (2010) to substantiate the idea that culture but not democracy is necessary to produce public-spirited politicians and push voters to punish political malfeasance. Ideally, this test would need data on the misbehaviors of the incumbents of the regional elections of all the NUTS 2 units in the sample. Yet, it is extremely hard to identify comparable measures of misbehaviors across regions. Focusing instead on the incumbents of Italian national elections has several major advantages. First, as illustrated below, it is available an extremely homogeneous and precise measure of political malfeasance. Second, more inclusive regional institutions should strengthen the voters' incentives to monitor all their representatives and not only the regional ones. Third, autonomous regions are typically run by region-specific parties, which usually obtain also the majority of the preferences in the region at national elections. For instance, since its foundation in 1945, the Südtiroler Volkspartei has represented the interests of Ladin minorities and constantly gained two-thirds of the preferences in both regional and national elections run within the province of Bolzano.[20] Finally, Italy provides large variation in the strength of a culture of cooperation, regional political institutions, and geography both across Northern

[20] See http://it.wikipedia.org/wiki/Categoria:Elezioni_regionali_in_Trentino-Alto_Adige

and Southern regions and within the two clusters (see figures 2 and 3).[21]

I rely on data from the first to ninth legislatures elected between 1948, year of the first parliamentary election of the Italian Republic, and 1987 for 31 of the 32 electoral districts existing at the time. Data for the 31st district of Sardinia are unavailable. Typically these districts group several NUTS 3 Italian units, i.e., *province*. After having dropped politicians with missing values, the total number of observations is 5,755. During this period, elected representatives enjoyed immunity from criminal prosecution. Immunity could be waived by a vote of Parliament, at the request of the prosecutor. The prosecutor's request to continue with its criminal investigation—i.e., *Richiesta di Autorizzazione a Procedere* or RAP from here on—typically received a lot of attention from the media. Accordingly, I follow Nannicini et al. (2013) and use as main indicator of misbehaviors a binary turning on whenever the politician received a request by the prosecutor for removal of parliamentary immunity because suspected of a crime, i.e., *RAP*. Since not all alleged criminal offences were actually very serious, I also consider a second dummy referring only to the more serious crimes—*Serious-RAP*—like corruption, private interest in official duties, racketeering organization, fraud, and violence.[22] By definition, a RAP is an allegation of malfeasance, rather than a conviction, and as such it could also capture judicial zeal and prejudice. Yet, members of Parliament could receive a RAP from any Italian tribunal and at the province level there exists a strong correlation between *RAP* and a measure of corruption based on the extent of missing infrastructures in public works in the 1990s (Chang, Golden, and Hill, 2010).

Nannicini et al. (2013) propose a model implying that a larger fraction of civic voters discourages moral hazard by politicians. Moreover, a stronger culture of cooperation produces representatives who are less opportunistic and more likely to internalize social welfare. Finally, immoral politicians might self select in low culture districts in search of a lenient electorate. A more inclusive political process, instead, can produce more information on the behaviors of politicians but is irrelevant if voters are not morally compelled to punish

[21] Focusing on the excluded instruments, the standard deviations of *Temperature_SD-M*, *Ruggedness*, and *Coast* within the Northern (Southern) regions are respectively 0.04 (0.08), 0.11 (0.09), and 0.50 (0.41).

[22] Following the scandals that destroyed the major political parties, the XI legislative term opened the so-called *Second Republic*. Nannicini et al. (2013) also present two measures of political misbehaviors for this period, i.e., the absenteeism rate and the politician's propensity to propose laws targeted to local constituencies. I do not consider these proxies since the two conducts are much less disruptive and publicized than RAPs.

political malfeasance or if politicians have weak civic virtues (Boix and Posner, 1998).

I expect that a stronger culture of cooperation should be significantly associated with lower values of *RAP* and *Serious-RAP*, whereas *Democracy* should not. Figures 2, 3, and 4 confirm this idea whereby representatives elected in districts where culture is weaker are more likely to receive both types of criminal prosecutions, and those elected in autonomous regions do not seem to be more virtuous than an average Italian politician (see figure 4).

4.1 Empirical Strategy and Main Results

Turning to multivariate analysis, I add to the basic specification proposed by Nannicini et al. (2013) the variable *Democracy* running as a result second stage regressions of the type

$$M_{p,j,t} = \kappa_t + \beta_1 C_j + \gamma_1 D_j + \mathbf{V_j'}\delta_\mathbf{3} + \mathbf{Z'_{p,j,t}}\xi + \rho_{p,j,t}, \tag{4}$$

where $M_{p,j,t}$ is either *RAP* or *Serious-RAP* for politician p in the electoral district j during the legislature t.[23] The excluded instruments for C_j and D_j are again *Temperature_SD-M*, *Ruggedness*, and *Coast*. While the legislature fixed effects κ_t account for aggregate legislative term shocks, the vector $\mathbf{Z_{p,j,t}}$ gathers individual characteristics like education, age, and previous government experience. Finally, $\mathbf{V_j}$ pools both district-specific variables, as per-capita income and urbanization, and the other controls discussed above (see table 7). To match data measured at the NUTS 2 unit (grid) level to districts, I construct district averages weighted by the unit's (grid's) relative contribution to the district's area.

Panel A of table 7 reports the estimates when the dependent variable is *RAP*, whereas panel B of table 7 lists the estimated coefficients when the dependent variable is *Serious-RAP*. The estimates reveal that the incidence of both general and serious RAP is significantly lower in districts in which internalized norms of respect and trust are stronger but not in districts historically characterized by more inclusive political institutions. According to column (2), an increase in *Culture* equal to its standard deviation—i.e., 0.63—would reduce the incidence of receiving a RAP by about 4.6 percent and that of receiving a RAP for serious crimes by about 2.7 percent. Moving from the lowest level of culture—recorded in the Sicil-

[23] Switching to an instrumental variables probit estimator is not feasible since the routine maximizing the relative likelihood function often fails to converge. Including in equation (4) regional dummies as in Nannicini et al. (2013) would make the first stages weak by taking away much of the variation in *Temperature_SD-M*.

ian districts—to the highest level of culture—recorded in Valle d'Aosta—would reduce the expected value of *RAP* by almost 23 percent, and that of *Serious-RAP* by almost 14 percent.[24] Once again, the consistency of the estimates is confirmed by the underidentification test, the Sargan statistics, and the semi-reduced forms estimates (available upon request).

I interpret this evidence as supporting the notion that my measure of culture and the sources of variation I exploit are related to the willingness of voters to punish their political representatives and the politicians' morality. Since political accountability constitutes the key instrument through which society can curb the risk of expropriation by politically powerful elites and assure that taxation is transformed in public goods, this mechanism constitutes a crucial channel through which a culture of cooperation shapes economic activities.

5 Concluding Comments

Overwhelming evidence suggests that a culture of cooperation and inclusive political institutions foster development and are correlated with past experiences of an inclusive political process. Yet, showing that the two types of institutions reinforce one another and are persistent does not help in identifying their separate roles. This paper tackles this issue by exploiting exogenous variation created at the European regional level by Medieval history.

I divide Europe into 120km $\times$ 120km grids and proxy a culture of cooperation with measures of self-reported trust and respect for others and the inclusiveness of the political process with the political autonomy of the NUTS 2 regions to which the grid belongs. Next, I show that Medieval history induces strong and distinct first stages between past climate volatility and present-day culture on the one hand and between past investment-specific factors and present-day political institutions on the other hand. Using this multiple instrumental variables strategy, I find robust evidence that only culture has a major influence on development. A possible explanation for this pattern is that more inclusive political institutions facilitate the monitoring of politicians by voters but are irrelevant if citizens are not morally compelled to punish political malfeasance or if politicians have weak civic virtues. To test this idea, I show that criminal prosecutions of Italian Parliament members are considerably

[24] A possible concern with these estimates is that culture discourages criminal prosecution through the behaviors of the judiciary, rather than those of voters. As proposed by Nannicini et al. (2013), this is not very likely since more zealous judges in high-culture districts might actually increase the likelihood of RAPs.

smaller in electoral districts in which culture is stronger but not significantly different in those endowed with more inclusive political institutions. The former are also the districts witnessing a harsher electoral punishment of the incumbent's misbehavior (Nannicini et al., 2013). The role of culture in strengthening political accountability points to a key channel through which it also shapes contract enforcement and property rights protection. This is only one possible mechanism inducing the primacy of culture, and more work is needed to characterize the different conduits through which institutions affect the economy.

References

Acemoglu, Daron, and Simon Johnson. 2005. "Unbundling Institutions." *Journal of Political Economy*, 113: 949-995.

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review*, 91: 1369-1401.

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2005. "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth." *American Economic Review*, 95: 546-579.

Angrist, Joshua, and Jörn-Steffen Pischke. 2008. "Mostly Harmless Econometrics: An Empiricist's Companion." Princeton, NJ: Princeton University Press.

Bairoch, Paul, Jean Batou, and Pierre Chèver. 1988. *La Population des Villes Europeenees de 800 a 1850: Banque de Données et Analyse Sommaire des Résultats.* Geneva: Librarie Droz.

Barkow, Jerome H., Leda Cosmides, and John Tooby. 1992. *The Adapted Mind: Evolutionary Psychology and the Generation of Culture.* New York, NY: Oxford University Press.

Berman, Constance H. 2000. *The Cistercian Evolution: the Invention of a Religious Order in Twelfth-century Europe.* Philadelphia: University of Pennsylvania Press.

Boix, Carles, and Daniel N. Posner. 1998. "Social Capital: Explaining Its Origins and Effects on Government Performance." *British Journal of Political Science*, 28: 686-693.

Boranbay, Serra, and Carmine Guerriero. 2013. "Endogenous (In)Formal Institutions." Unpublished.

Brady, Thomas A., Heiko A. Oberman, James D. Tracy. 1994. *Handbook of European History, 1400-1600: Late Middle Ages, Renaissance, and Reformation.* Leiden, New York and Köln: Brill.

Chang, Eric C. C., Miriam A. Golden, and Seth J. Hill. 2010. "Legislative Malfeasance and Political Accountability." *World Politics*, 62: 177-220.

Clark, Gregory, and Gillian Hamilton. 2006. "Survival of the Richest: The Malthusian Mechanism in Pre-Industrial England." *Journal of Economic History*, 66: 707-736.

Dell, Melissa. 2010. "The Persistent Effects of Peru's Mining Mita." *Econometrica*, 78: 1863-1903.

Derbyshire, James, Ben Gardiner, and Sevrin Waights. 2013. "Estimating the Capital Stock for the NUTS2 Regions of the EU27." *Applied Economics*, 45: 1133-1149.

Dixit, Avinash K. 2004. *Lawlessness and Economics Alternative Models of Governance*. Princeton: Princeton University Press.

Durante, Ruben. 2010. "Risk, Cooperation and the Economic Origins of Social Trust: an Empirical Investigation." Unpublished.

Fleck, Robert K., and F. Andrew Hanssen. 2006. "The Origins of Democracy: a Model with Application to Ancient Greece." *Journal of Law and Economics*, 49: 115-146.

Frey, Bruno S. 2005. "Beyond Traditional Borders: a New Proposal For Federalism." *The Economists' Voice*, 2: 1-6.

Gennaioli, Nicola, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2013. "Human Capital and Regional Development." *Quarterly Journal of Economics*, 128: 105-164.

GESIS. 2008. *EVS 2008 - Variable Report Integrated Dataset*. Köln, Germany: GESIS Press.

Gorodnichenko, Yuriy, and Gérard Roland. 2011. "Culture, Institutions and the Wealth of Nations." Unpublished.

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge: Cambridge University Press.

Guiot, Joel, Christophe Corona, and ESCARSEL. 2010. "Growing Season Temperatures in Europe and Climate Forcings Over the Past 1400 Years." PLoS ONE 5: e9972.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2013. "Long-term Persistence." EIEF Working Paper 23/13.

Logan, F. Donald. 2002. *A History of the Church in the Middle Ages.* London: Routledge.

Marshall, Monty G., and Keith Jaggers. 2011. "Polity IV Project, Political Regime Characteristics and Transitions 1800-2011, Dataset Users Manual." University of Maryland.

McCleary, Rachel M., and Robert J. Barro. 2006. "Religion and Economy." *Journal of Economic Perspectives*, 20: 49-72.

Michalopoulos, Stelios. 2012. "The Origins of Ethnolinguistic Diversity: Theory and Evidence." *American Economic Review*, 102: 1508–1539.

Michalopoulos, Stelios, and Elias Papaioannou. 2013. "Pre-Colonial Ethnic Institutions and Contemporary African Development." *Econometrica*, 81: 113-152.

Moorman, John R.H. 1983. *Medieval Franciscan Houses.* New York: Franciscan Institute Publications.

Muzzarelli, Maria Giuseppina. 2001. *Il Denaro e la Salvezza. L'Invenzione del Monte di Pietà.* Bologna: Il Mulino.

Nannicini, Tommaso, Andrea Stella, Guido Tabellini, and Ugo Troiano. 2013. "Social Capital and Political Accountability." *American Economic Journal: Economic Policy*, 5: 222-250.

Nunn, Nathan, and Diego Puga. 2012. "Ruggedness: The Blessing of Bad Geography in Africa." *Review of Economics and Statistics*, 94: 20-36.

Persson, Torsten, and Guido Tabellini. 2009. "Democratic Capital: The Nexus of Political and Economic Change." *American Economic Journal: Macroeconomics*, 1: 88-126.

Platteau, Jean-Philippe. 2000. *Institutions, Social Norms, and Economic Development*. London: Academic Publishers & Routledge.

Putnam, Robert D. 1993. *Making Democracy Work. Civic Traditions in Modern Italy*. Princeton University Press.

Stearns, Peter N. 2001. *The Encyclopedia of World History: Ancient, Medieval, and Modern, Chronologically Arranged*. Cambridge: James Clarke and Co.

Tabellini, Guido. 2008. "The Scope of Cooperation: Values and Incentives." *Quarterly Journal of Economics*, 123: 905-950.

Tabellini, Guido. 2010. "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of European Economic Association*, 8: 677-716.

Tobin, Stephen. 1995. *The Cistercians: Monks and Monasteries of Europe*. New York: the Herbert Press.

Van Der Meer, Frederic. 1965. *Atlas de L'Ordre Cistercien*. Amsterdam: Elsevier.

Vitolo, Giovanni. 2000. *Medioevo: I caratteri Originali di un' Età di Transizione*. Firenze: Sansoni.

Woods, Thomas. 2005. *How the Catholic Church Built Western Civilization*. San Francisco: Ignatius Press.

Figures and Tables

Figure 1: Unbundling Institutions: Conceptual Framework

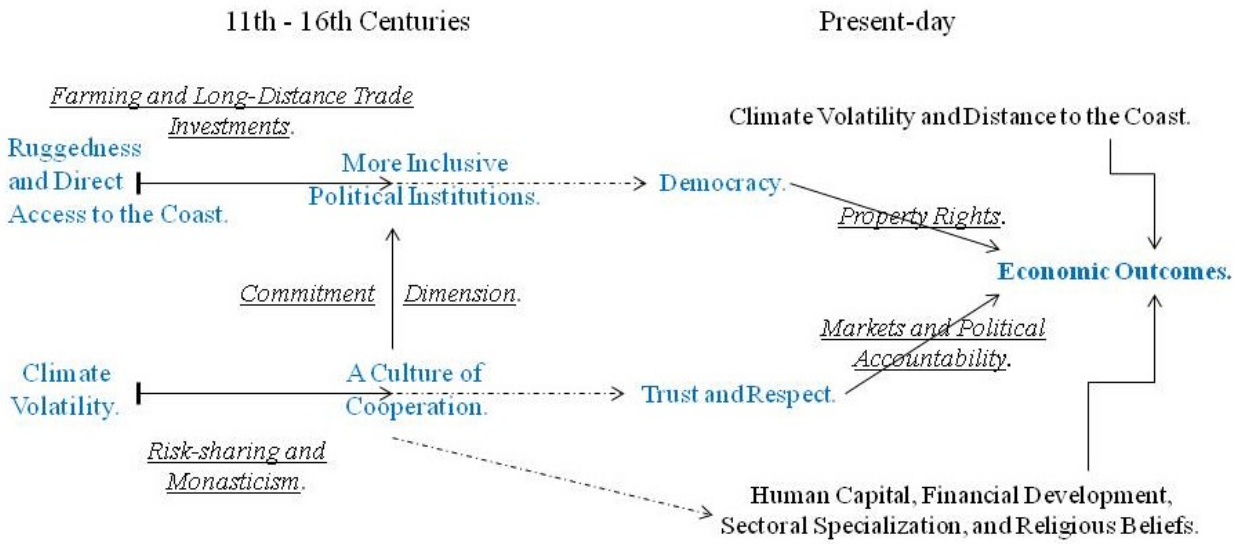


Table 1: Historical Polities

GENOA: Italy (*Liguria*); France (*Corse*). HOLY ROMAN EMPIRE: Austria (*Styria*, *Tyrole*); Belgium (*Region Bruxelles*, *Region Wallone*); Germany (*Baden-Wuerttemberg*, *Bayern*, *Brandenburg*, *Bremen - Hamburg - Niedersachsen*, *Hessen*, *Mecklenburg - Vorpommern*, *Nordrhein - Westfalen*, *Rhainland-Pfalz-Saarl*, *Sachsen*, *Schleswig-Holstein*, *Thuringen-Sachsen-Anhalt*); Slovenia (*Carniola*, *Styria*). KINGDOM OF BOHEMIA: Czech Republic (*Eastern Czech Republic*, *Western Czech Republic*); Poland (*Western Poland*). KINGDOM OF PORTUGAL: Portugal (*Alentejo*, *Algarve*, *Centro*, *Norte*). KINGDOM OF SICILY: Italy (*Abruzzo - Molise*, *Basilicata - Campania*, *Calabria*, *Sicilia*). KINGDOM OF TUSCANY: Italy (*Toscana*). PAPAL STATE: Italy (*Emilia-Romagna*, *Lazio*). PROVINCES: Netherlands (*Noord Nederland - Groningen*, *Oost Nederland*, *West Nederland*, *Zuid Nederland*). REIGN OF ENGLAND: Ireland (*Eastern Ireland*, *Western Ireland*); UK (*East Anglia - London*, *East Midlands*, *North-Eastern UK*, *North-Western UK*, *Northern Ireland*, *Scotland*, *South-Eastern UK*, *South-Western UK*, *Wales*, *West Midlands*, *Yorkshire - Humberside*). REIGN OF FRANCE: Belgium (*Vlaams Gewest*); France (*Eastern France*, *Ile De France*, *Mediterrean France*, *Northern France*, *Paris Basin*, *South-Eastern France*, *South-Western France*, *Western France*). REIGN OF HUNGARY: Hungary (*Central Hungary*, *Styria-Hungary*, *Western Hungary*); Slovakia (*Eastern Slovakia*, *Western Slovakia*). REIGN OF POLAND: Poland (*Eastern Poland*, *Northern Poland*, *Southern Poland*). REIGN OF SPAIN: Spain (*Andalucia*, *Aragon, Asturia-Cantabria*, *Baleares, Castilla-La Mancha*, *Castilla y León*, *Cataluna*, *Comunidad Valenciana*, *Extremadura*, *Galicia*, *Madrid*, *Murcia*, *Navarra - Rioja, Pais Vasco*). SARDINIAN GIUDICATI: Italy (*Sardegna*). SAVOY: Italy (*Piemonte - Valle D'Aosta*). STATE OF MILAN: Italy (*Lombardia*). SWISS CANTONS: Switzerland (*Northern Switzerland*, *Southern Switzerland*). VENICE: Italy (*Friuli-Venezia Giulia - Trentino-Alto Adige - Veneto*).

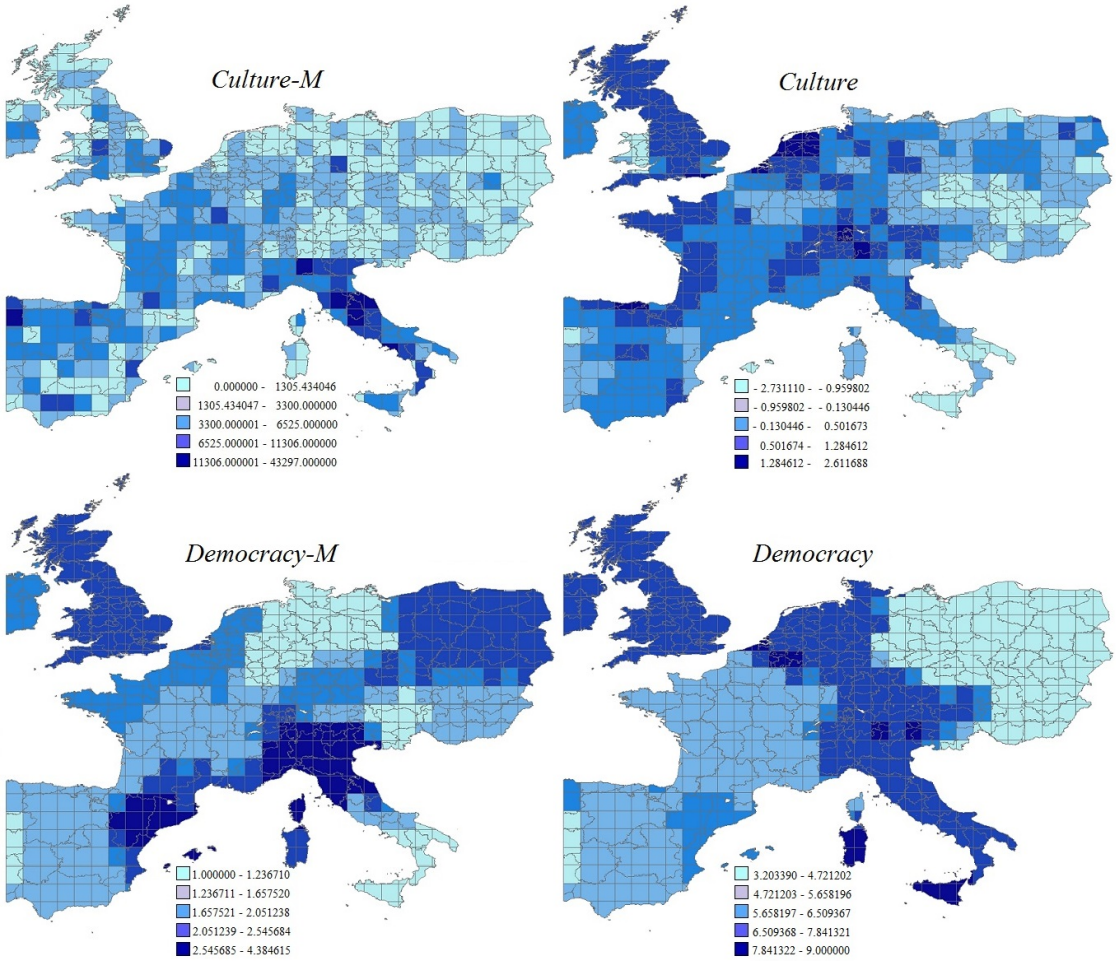
Note: 1. The names of the historical polities are in capital letters, those of the regions constructed by Boranbay and Guerriero (2013) are in Italic lowercase, and those of the present-day countries to which these regions belong are in regular lowercase.

Table 2: Summary of Variables

	Variable	Definition and Sources	Statistics
Economic outcomes:	*Income*:	Average natural logarithm of the annual GDP per capita in the NUTS 2 regions to which the grid belongs, in euro, between 2002 and 2009. Source: Eurostat, available at http://epp.eurostat.ec.europa.eu/	9.837 (0.545)
Political accountability:	*RAP*:	Dummy equal to one if the member of Parliament received a request for removal of immunity because suspected of a crime. Source: Chang, Golden, and Hill (2010).	0.233 (0.423)
	Serious-RAP:	Dummy equal to one if the member of Parliament received a request for removal of immunity because suspected of a serious crime. Source: Chang, Golden, and Hill (2010).	0.137 (0.343)
Institutions:	*Culture-M*:	Cumulated discounted number of years of activity between 1000 and 1600 of Cistercian and Franciscan houses. Source: Van Der Meer (1965); Moorman (1983).	1981.085 (3143.883)
	Culture:	See text. Source: European Value Study, GESIS (2008).	0.024 (0.907)
	Democracy-M:	Average "constraint on executive" in the historical regions to which the grid belonged between 1000 and 1600. Source: Boranbay and Guerriero (2013).	1.841 (0.621)
	Democracy:	See text. Source: Marshall and Jaggers (2011) and Author's codification.	5.982 (1.426)
Excluded Instruments:	*Temperature_SD-M*:	Average standard deviation of the growing season temperature over the period 1000-1600 in Celsius in the Guiot et al.'s (2010) cells. Source: Guiot et al. (2010).	0.531 (0.128)
	Ruggedness:	Terrain ruggedness in Km. Source: G-Econ, available at http://gecon.yale.edu/	0.163 (0.150)
	Coast:	Dummy equal to 1 if the grid has a direct access to the Mediterranean or the Atlantic Ocean, 0 otherwise.	0.367 (0.482)
Other controls:	*Tertiary-Education*:	Average percentage of the population aged 20-24 years enrolled in tertiary education—ISCED 5-6—between 2002 and 2009 in the NUTS 2 regions to which the grid belongs. Source: Eurostat, available at http://epp.eurostat.ec.europa.eu/	51.057 (15.845)
	Capital:	Average real capital stock per capita in 2000, in millions of euro, in the NUTS 2 regions to which the grid belongs. Source: Derbyshire, Gardiner, and Waights (2013).	0.052 (0.026)
	AF_Employment:	Average share of population employed in agriculture and fishing between 2002 and 2008 in the NUTS 2 regions to which the grid belongs. Source: Regio, available at http://epp.eurostat.ec.europa.eu	0.065 (0.054)
	Catholicism:	See text. Source: European Value Study, GESIS (2008).	0.258 (0.152)
	Temperature_SD:	Standard deviation of the monthly temperature over the year in Celsius averaged between 1980 and 2008. Source: G-Econ, available at http://gecon.yale.edu/	0.651 (0.145)
	Temperature_Max:	Maximum monthly temperature over the year in Celsius averaged between 1961 and 1990. Source: G-Econ, available at http://gecon.yale.edu/	18.391 (3.353)
	Distance-to-Coast:	Average distance to the coast in Km. Source: G-Econ, available at http://gecon.yale.edu/	160.470 (158.693)

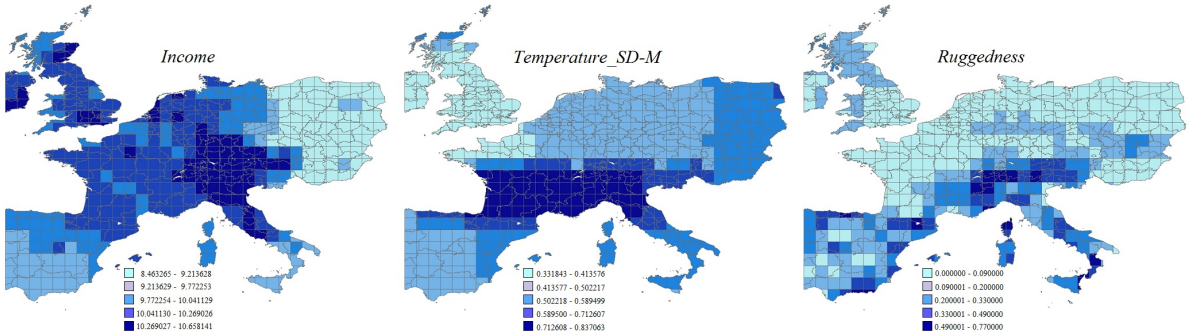
Note: 1. The last column reports the mean value and, in parentheses, the standard deviation of each variable. The statistics are computed for the sample used in tables 3 and 4 except *RAP* and *Serious-RAP*, which are computed for that employed to obtain table 7.

Figure 2: Permanent Institutions



Note: 1. The range of each variable is divided into five intervals using the goodness of variance fit method.

Figure 3: Income and Geography



Note: 1. The range of each variable is divided into five intervals using the goodness of variance fit method.

Table 3: Endogenous and Permanent Institutions

	(1)	(2)	(3)	(4)
	The dependent variable is:			
	Culture	*Culture*	*Democracy*	*Democracy*
Culture-M	0.00002			
	$(9.43e^{-06})$***			
Democracy-M			0.118	
			(0.059)**	
Temperature_SD-M		1.563	- 0.478	- 0.265
		(0.282)***	(0.304)	(0.298)
Ruggedness	0.689	0.195	0.679	0.747
	(0.231)***	(0.233)	(0.248)***	(0.246)***
Coast	- 0.146	- 0.126		0.130
	(0.067)**	(0.065)*		(0.060)**
Estimation	Country fixed effects OLS			
R^2	0.04	0.07	0.02	0.02
Number of observations	578	578	578	578

Notes: 1. Robust standard errors in parentheses.
2. *** denotes significant at the 1% confidence level; **, 5%; *, 10%.

Table 4: Institutions and Economic Outcomes - OLS Versus 2SLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	The dependent variable is *Income*							
Culture	0.077	0.298	0.291	0.186	0.290	0.307	0.196	0.298
	(0.011)***	(0.054)***	(0.062)***	(0.051)***	(0.051)***	(0.057)***	(0.095)**	(0.052)***
Democracy	0.060	0.066	0.062	0.056	0.070	0.071	- 0.104	0.072
	(0.011)***	(0.095)	(0.095)	(0.069)	(0.093)	(0.097)	(0.305)	(0.092)
Tertiary-Education			0.001					
			(0.001)					
Capital				5.639				
				(1.360)***				
AF_Employment					0.147			
					(0.183)			
Catholicism						0.130		
						(0.159)		
Temperature_SD							- 0.281	
							(0.826)	
Temperature_Max							- 0.009	
							(0.014)	
Distance-to-Coast								0.0001
								(0.0001)
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Estimation	OLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
R^2	0.11							
P-value of underidentification test		0.00	0.00	0.00	0.00	0.00	0.50	0.00
P-value of Sargan statistics		0.21	0.15	0.72	0.22	0.23	0.15	0.31
Number of observations	578	578	578	563	573	578	560	578

Notes: 1. Standard errors in parentheses.
2. *** denotes significant at the 1% confidence level; **, 5%; *, 10%.
3. All specifications include a constant term. The control variables used in the second stage are also included in the first stage.
4. In columns (2) to (8), the endogenous variables are *Culture* and *Democracy* and the excluded instruments are *Temperature_SD-M*, *Ruggedness*, and *Coast*.
5. The null hypothesis of the Anderson canonical correlations—underidentification—test is that the excluded instruments are uncorrelated with the endogenous variables.
6. The null hypothesis of the Sargan test of overidentifying restrictions is that the excluded instruments are exogenous as a group.

Table 5: Institutions and Economic Outcomes - Semi-reduced Forms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel A. The dependent variable is *Income*						
Culture	0.267	0.255	0.158	0.260	0.269	0.246	0.267
	(0.057)***	(0.064)***	(0.040)***	(0.053)***	(0.058)***	(0.067)***	(0.054)***
Ruggedness	0.099	0.094	0.013	0.102	0.099	0.126	0.097
	(0.085)	(0.082)	(0.059)	(0.083)	(0.085)	(0.095)	(0.084)
Estimation	2SLS with country fixed effects						
P-value of underidentification test	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value of Sargan statistics	0.38	0.24	0.35	0.69	0.38	0.42	0.52
Number of observations	578	578	563	573	578	560	578
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel B. The dependent variable is *Income*						
Culture	0.243	0.207	0.174	0.238	0.244	0.234	0.244
	(0.060)***	(0.069)***	(0.044)***	(0.057)***	(0.062)***	(0.067)***	(0.062)***
Ruggedness	0.111	0.115	0.006	0.113	0.111	0.127	0.110
	(0.082)	(0.077)	(0.061)	(0.081)	(0.082)	(0.093)	(0.083)
Coast	- 0.022	- 0.030	0.016	- 0.021	- 0.022	- 0.019	- 0.021
	(0.024)	(0.024)	(0.017)	(0.024)	(0.024)	(0.023)	(0.032)
Estimation	2SLS with country fixed effects						
P-value of underidentification test	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value of Sargan statistics							
Number of observations	578	578	563	573	578	560	578
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel C. The dependent variable is *Income*						
Temperature_SD-M	0.468	0.356	0.279	0.486	0.467	0.270	0.465
	(0.074)***	(0.070)***	(0.062)***	(0.076)***	(0.076)***	(0.141)*	(0.076)***
Democracy	0.038	0.016	- 0.007	0.030	0.032	- 0.312	0.001
	(0.073)	(0.068)	(0.048)	(0.073)	(0.073)	(0.299)	(0.071)
Estimation	2SLS with country fixed effects						
P-value of underidentification test	0.00	0.00	0.00	0.00	0.00	0.32	0.00
P-value of Sargan statistics	0.00	0.00	0.73	0.00	0.00	0.83	0.00
Number of observations	578	578	563	573	578	560	578
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel D. The dependent variable is *Income*						
Temperature_SD-M	0.436	0.323	0.293	0.455	0.466	0.290	0.427
	(0.086)***	(0.081)***	(0.076)***	(0.088)***	(0.087)***	(0.150)*	(0.088)***
Coast	- 0.080	- 0.087	- 0.011	- 0.082	- 0.081	- 0.013	- 0.116
	(0.025)***	(0.023)***	(0.034)	(0.025)***	(0.025)***	(0.051)	(0.033)***
Democracy	0.212	0.203	0.029	0.208	0.214	- 0.200	0.226
	(0.100)**	(0.093)**	(0.119)	(0.099)**	(0.100)**	(0.490)	(0.105)**
Estimation	2SLS with country fixed effects						
P-value of underidentification test	0.00	0.00	0.06	0.00	0.00	0.45	0.00
P-value of Sargan statistics							
Number of observations	578	578	563	573	578	560	578

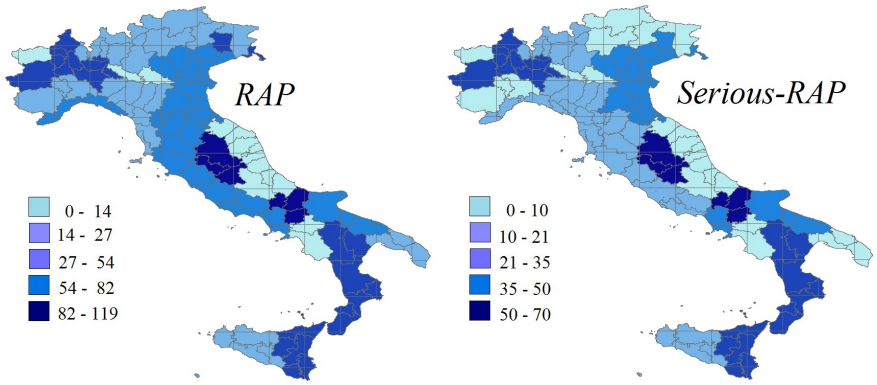
Notes:
1. Standard errors in parentheses.
2. *** denotes significant at the 1% confidence level; **, 5%; *, 10%.
3. All specifications include a constant term; in addition, those in columns (2) to (7) incorporate respectively *Tertiary-Education*, *Capital*, *AF_Employment*, *Catholicism*, *Temperature_SD* and *Temperature_Max*, and *Distance-to-Coast*. The control variables used in the second stage are also included in the first stage.
4. In panel A (B), the endogenous variable is *Culture* and the excluded instruments are (instrument is) *Temperature_SD-M* and *Coast* (*Temperature_SD-M*). In panel C (D), the endogenous variable is *Democracy* and the excluded instruments are (instrument is) *Ruggedness* and *Coast* (*Ruggedness*).
5. The null hypothesis of the Anderson canonical correlations—underidentification—test is that the excluded instruments are uncorrelated with the endogenous variable.
6. The null hypothesis of the Sargan test of overidentifying restrictions is that the excluded instruments are exogenous as a group.

Table 6: Institutions and Economic Outcomes - Pairwise Analysis of Adjacent Cells

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				The dependent variable is *Income*			
Culture	0.125	0.103	0.100	0.116	0.125	0.149	0.129
	(0.060)**	(0.057)*	(0.060)*	(0.064)*	(0.065)**	(0.075)**	(0.071)*
Tertiary-Education		0.007					
		(0.001)***					
Capital			4.125				
			(0.869)***				
AF_Employment				0.018			
				(0.197)			
Catholicism					0.020		
					(0.097)		
Temperature_SD						0.075	
						(0.111)	
Temperature_Max						0.021	
						(0.011)*	
Distance-to-Coast							0.0001
							(0.0002)
				First Stage for *Culture*			
Temperature_SD-M	1.661	1.616	1.582	1.815	1.667	1.515	1.578
	(0.480)***	(0.477)***	(0.479)***	(0.507)***	(0.480)***	(0.481)***	(0.483)***
Tertiary-Education		0.008					
		(0.004)*					
Capital			6.784				
			(3.466)*				
AF_Employment				- 0.754			
				(0.811)			
Catholicism					0.386		
					(0.407)		
Temperature_SD						- 0.037	
						(0.456)	
Temperature_Max						- 0.059	
						(0.038)	
Distance-to-Coast							- 0.001
							(0.001)
R^2 in the First Stage	0.06	0.07	0.07	0.07	0.06	0.07	0.07
Estimation				2SLS With Adjacent-Cells Fixed Effects			
P-value of underidentification test	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of observations	408	408	408	394	408	390	408

Notes:
1. Standard errors in parentheses.
2. *** denotes significant at the 1% confidence level; **, 5%; *, 10%.
3. All specifications include a constant term.
4. The null hypothesis of the Anderson canonical correlations—underidentification—test is that the excluded instruments are uncorrelated with the endogenous variables.

Figure 4: Malfeasance by the Italian First Republic Politicians



Note: 1. The range of each variable is divided into five intervals using the goodness of variance fit method.

Table 7: Institutions and Political Accountability - The Case of the First Republic in Italy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A. The dependent variable is *RAP*							
Culture	- 0.060	- 0.073	- 0.065	- 0.073	- 0.059	- 0.075	- 0.058	- 0.086
	(0.010)***	(0.020)***	(0.019)***	(0.026)***	(0.024)**	(0.023)***	(0.018)***	(0.022)***
Democracy	- 0.011	- 0.040	- 0.039	- 0.036	- 0.043	- 0.043	- 0.016	- 0.068
	(0.012)	(0.052)	(0.042)	(0.051)	(0.050)	(0.052)	(0.032)	(0.050)
Tertiary-Education			- 0.0005					
			(0.0004)					
Capital				0.113				
				(0.985)				
AF_Employment					0.530			
					(0.410)			
Catholicism						- 0.040		
						(0.156)		
Temperature_SD							- 0.190	
							(0.098)*	
Temperature_Max							- 0.001	
							(0.003)	
Distance-to-Coast								0.0002
								(0.0002)
Estimation	OLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
R^2	0.08							
P-value of underidentification test		0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value of Sargan statistics		0.10	0.23	0.09	0.19	0.10	0.39	0.09
Number of observations	5755	5755	5755	5755	5755	5755	5755	5755
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel B. The dependent variable is *Serious-RAP*							
Culture	- 0.044	- 0.043	- 0.041	- 0.047	- 0.034	- 0.044	- 0.044	- 0.054
	(0.008)***	(0.016)***	(0.015)***	(0.021)**	(0.019)*	(0.018)**	(0.015)***	(0.018)***
Democracy	- 0.011	0.007	0.003	0.014	0.003	0.006	0.003	- 0.016
	(0.010)	(0.042)	(0.034)	(0.041)	(0.041)	(0.042)	(0.026)	(0.041)
Tertiary-Education			- 0.0002					
			(0.0003)					
Capital				0.372				
				(0.816)				
AF_Employment					0.378			
					(0.342)			
Catholicism						- 0.029		
						(0.124)		
Temperature_SD							- 0.007	
							(0.081)	
Temperature_Max							- 0.000	
							(0.002)	
Distance-to-Coast								0.0001
								(0.0002)
Estimation	OLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
R^2	0.04							
P-value of underidentification test		0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-value of Sargan statistics		0.55	0.76	0.48	0.78	0.56	0.52	0.50
Number of observations	5755	5755	5755	5755	5755	5755	5755	5755

Notes:
1. Robust standard errors in parentheses.
2. *** denotes significant at the 1% confidence level; **, 5%; *, 10%.
3. Other controls are a constant term, the member of Parliament's years of schooling, tenure in legislative terms, age and age squared in years, whether she/he was a minister or vice-minister, whether she/he had previous government experience at the local level, whether her/his previous parliamentary tenure is zero, whether she/he was part of the government coalition, job dummies—i.e., lawyer, executive, politician, entrepreneur, and teacher, legislative term dummies, and three electoral district-specific variables for 2003, i.e., per-capita income in thousand of euros, share of the population over 19 with a high-school degree, and share of the population living in cities above 15,000 inhabitants. For each variable's source, see Nannicini et al. (2013).
4. In columns (2) to (8), the endogenous variables are *Culture* and *Democracy* and the excluded instruments are *Temperature_SD-M*, *Ruggedness*, and *Coast*. The control variables used in the second stage are also included in the first stage.
5. The null hypothesis of the Anderson canonical correlations—underidentification—test is that the excluded instruments are uncorrelated with the endogenous variables.
6. The null hypothesis of the Sargan test of overidentifying restrictions is that the excluded instruments are exogenous as a group.