

# **Sovereignty, Civic Capital, and Local Development. A Historical Perspective in Economic Geography**

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# **Sovereignty, Civic Capital, and Local Development.**

## **A Historical Perspective in Economic Geography\***

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### **Abstract**

We combine history with economic geography to contribute shading light on the long-run determinants of territorial development differentials in Italy. Specifically, we study the effects of historical sovereignty change on current local economic development. We measure historical sovereignty change through the yearly number of changes in sovereignty occurred in the period 1000–1861—that is, until the unification of Italy—and assess its effects on labor productivity in 2018. We estimate a negative effect of historical sovereignty change on current local economic development, and identify—both theoretically and empirically—civic capital as a plausible underlying mechanism.

### **Keywords**

Historical sovereignty change; civic capital; local economic development; Italy.

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# 1. Introduction

History plays a crucial role in shaping local economic prosperity. Factors such as historical productive specializations (Becattini 1990; Glaeser et al. 2015), formal and informal institutions (North 1990), the past concentration of entrepreneurship (Fritsch et al. 2019), innovations (Opper and Andersson 2019), and creative talents (Serafinelli and Tabellini 2022), along with events such as climate shocks (Malpede and Percoco 2022) and diseases (Percoco 2013), are key to understand the economic evolution of territories over time.

While the economic geography literature widely acknowledges the long shadow that history casts on local economic development (Boschma and Martin 2007; Liu 2009; Henning 2019; Martin 2021; Martin and Sunley 2022), the length of this shadow and its underlying mechanisms remain largely unexplored (Fritsch et al. 2024). Moreover, this literature tends to be rather general (MacKinnon 2008), often relying on case studies of specific regions (Gertler 2003; MacKinnon 2008) or adopting descriptive methodologies (Essletzbichler and Rigby 2007). In other words, the economic geography literature does not seem to take history as seriously as one might expect.

This gap in the literature is particularly relevant when analyzing how institutional changes occurring over time may influence local development. As Martin and Sunley (2022, 75) suggest, little work has been done to study “how long-term institutional conditions and changes have shaped the evolution of different places.” This paper aims to contribute to this literature by analyzing the impact of historical (*de jure*) sovereignty changes—used as a proxy for institutional change—on current local development while identifying civic capital as a potential mechanism underlying this relationship (Putnam et al. 1993). Sovereignty is generally defined as the authority with ultimate power and legal right to make and change laws independently of external control (Krasner 1999; de Jouvenel 2012). Institutions “operationalize” sovereignty by serving as the mechanisms that enforce and embody sovereign power. They establish the rules, norms, and procedures through which sovereignty is exercised. Consequently, changes in sovereignty—such as transitions from one ruling entity to another—can significantly influence institutional changes.

We rely on data drawn from the *Centennia Historical Atlas Research Edition* (CRE) database to measure historical sovereignty change by counting the annual number of sovereignty changes that occurred in Italian Local Labor Markets (LLM) from 1000 to 1861, and then assess the long-run effects of historical sovereignty change on labor productivity in 2018.<sup>1</sup> We thus explore the empirical relationship between historical sovereignty change and current local development in Italy, a country characterized by significant geographical heterogeneity in economic development. Additionally, Italy's complex history of sovereignty changes and state fragmentation up to its unification in 1861 further enhances its suitability for such analysis.

We also propose a theoretical framework that connects sovereignty change, civic capital, and local development. This framework helps elucidate the enduring impact of historical sovereignty change on present-day local economic outcomes through an underlying mechanism concerning civic capital (Putnam et al. 1993). First, we model civic capital formation and evolution in response to changes in sovereignty by examining the co-evolution of two types of trust, namely institutional and interpersonal trust (OECD 2017). The central idea is that certain groups within the population interpret a change in sovereignty as a “breach of trust” by the ruling authority. Consequently, a high frequency of sovereignty changes can lead not only to diminished trust in the ruling authority (i.e., institutional trust) but also to reduced trust among individuals (i.e., interpersonal trust). This latter phenomenon occurs because such changes in sovereignty increase the degree of heterogeneity and fragmentation within the population, such that we can identify a complementary relationship

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<sup>1</sup> The rationale behind choosing the LLM as the unit of analysis stems from the fact that LLMs are sets of contiguous municipalities wherein the majority of the labor force resides and works within the same geographical area. Indeed, LLMs are often regarded as superior for capturing the homogeneity of social and cultural values within a geographical area (Becattini 1990). This is for at least three reasons. First, they are deeply intertwined with the surrounding social and political fabric, thus offering a closer picture of cultural norms, traditions, and values prevailing within a local community. Second, LLMs operate within specific socio-political contexts, enabling them to adapt to and embody prevailing social and cultural values. Moreover, high levels of community participation and engagement in LLMs foster a sense of collective identity and shared values among workers and employers, contributing to greater homogeneity in social values within the local system (Becattini 1990). Finally, their deep historical roots provide a stable framework within which social, cultural, and political values can persist over time.

between these two types of trust.<sup>2</sup> This mechanism is very common when sovereignty changes: indeed, much historical evidence shows how populations often divide into at least two groups, that is, the “friends” and the “enemies” of the new ruler.<sup>3</sup> Second, we develop a trust-augmented endogenous growth model with fixed labor force participation and the savings coefficient depending on the trust levels to illustrate the persistent effect of historical sovereignty change on local development.

Our empirical analysis produces several noteworthy results. First, we find a negative effect of historical sovereignty change on current local development by estimating this relationship through both Ordinary Least Squares (OLS) and an instrumental variable (IV) approach, where we exploit exogeneity associated with the variability in the historical availability of subsistence resources. We thus show that present-day local development in Italy tends to be lower in those LLMs where sovereignty changed more frequently over time. Second, we provide evidence of the negative effect of historical sovereignty change on both the institutional and interpersonal dimensions of contemporary civic capital. Finally, we provide evidence of a positive association between contemporary civic capital and economic development based on structural model estimates.

From a broader perspective, our contribution to the economic geography literature is threefold. First, we identify a causal relationship between sovereignty changes over time—through which we capture the role of history—and current economic outcomes in local systems, while also exploring its underlying mechanisms. We achieve this by developing a theoretical model and

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<sup>2</sup> In the literature on trust, a relationship of substitutability rather than complementarity between institutional trust and interpersonal trust is often assumed. For example, in Chiaromonte (Lucania) in the early 1950s, as studied by Banfield (1958), the absence of trust in public officials, the law, and the state in general led to the phenomenon known as “amoral familism.” This term describes the absence of trust among family members towards all individuals outside the family nucleus. However, even in such a context where the two types of trust are substitutes, the short change of sovereignty linked to the French-led Neapolitan Revolution of 1799 (Rao 2021) polarized society in the Italian *Mezzogiorno*, dividing many families between supporters of the French and supporters of the dethroned Bourbons.

<sup>3</sup> With the conclusion of the Neapolitan Republic in 1799 and the subsequent restoration of Bourbon rule, a significant number of patriots who were sympathetic to the French were either condemned to death or forced into exile (Rao 2021). Conversely, when the French returned to power in 1806, members of the Bourbon elite were themselves exiled (Davis 2006). This example illustrates how successive changes in sovereignty can fragmentate a society and diminish trust among individuals.

testing it empirically. To the best of our knowledge, this is one of the first studies in economic geography to adopt this methodological approach and produce such findings. Second, we contribute to the literature by providing both theoretical and empirical evidence that institutional and interpersonal trust—that is, the two dimensions underlying civic capital formation—co-evolve over time, exhibiting a complementary relationship. This last finding contrasts with the common view that these two types of trust should exhibit a relationship of substitutability. Finally, we contribute to the ongoing debate on the conceptualization of history in economic geography. Specifically, we demonstrate that a local system’s civic capital endowment and, consequently, its current economic development are shaped not by a single historical shock, as in basic New Economic Geography (NEG) models (Krugman 1991a, 1991b), but by a succession of historical events, especially shifts in sovereignty over time. This perspective on historical processes aligns with the concept of regional path dependence (Martin and Sunley 2006) in Evolutionary Economic Geography (EEG), where a sequence of historical events or processes can profoundly influence a region’s current economic outcomes, thereby shaping contemporary spatial economic patterns and disparities within a country. Such sequences may lead to path dependence, where regions or local systems follow specific developmental trajectories driven by self-reinforcing mechanisms (Boschma and Lambooy 1999; Martin and Sunley 2006). We argue that these conceptualizations better capture “real history” and its effects on contemporary socio-economic outcomes (Henning 2019). In this way, we align with the view that economic geography is fundamentally a “historical social science” (Martin and Sunley 2022, 67), and with the idea that a less abstract conceptualization of history should be developed (Henning 2019).

The remainder of the paper is organized as follows. We discuss the link between history and local development in the economic geography literature in Section 2. We illustrate the empirical framework in Section 3. We present evidence on the relationship between historical sovereignty change and current local development in Section 4. In Section 5, we explore the underlying

mechanism by first presenting our theoretical model and then testing the relationship between historical sovereignty change and contemporary civic capital. Section 6 concludes the paper.

## **2. Conceptual framework**

This section develops the conceptual framework for our study. We first examine the relationship between history and local development to clarify the positioning and contribution of our paper within the ongoing debate about the role of history in economic geography. Then, we review recent contributions that elucidate the mechanisms underlying our analysis.

### **2.1 History and local development in economic geography**

That history has a long-lasting impact on economic growth is widely recognized in economics—see Nunn (2020) for a review. The enduring influence of history on the spatial distribution of economic activities has also become a key topic in economic geography. Indeed, this literature recognizes the relevance of historical events and past local characteristics in influencing current levels of entrepreneurship, innovation, and development (Fritsch et al. 2019; Oppen and Andersson 2019; Fritsch et al. 2024).

The “historical turn” in economic geography has emerged from two recent strands of literature, that is, NEG and EEG, both of which emphasize history as a key determinant in explaining local economic dynamics and development (Liu 2009; Garretsen and Martin 2010). However, significant differences exist regarding the conceptualization of history and path dependence, and its relationship with local economic development.

In basic NEG models developed to understand uneven spatial development, particularly the phenomenon of spatial agglomeration of economic activities (Krugman 1991a, 1991b), the equilibrium outcome depends on the initial conditions (e.g., the initial location patterns), which capture history (Liu 2009). Different initial conditions can lead to distinct equilibrium landscapes,

resulting in multiple stable equilibria. NEG models consider path dependence but they deny any real historical significance, identifying this concept with the instantaneous movement from one equilibrium to another after an exogenous shock (Garretsen and Martin 2010).

This conceptualization of history is generally regarded as overly simplistic and abstract (Carpataux and Crevoisier 2007; Liu 2009). Since history is merely a “hypothetical history”—that is, “a story about how the economy evolves over time, allowing us to explore only a limited subset of the vast, perhaps infinite, possibilities” (Fujita et al. 1999, 23)—, the historical process is seen as a selection process among multiple equilibria, leading to a new equilibrium. Needless to say, this logical and abstract conception of time differs significantly from any real, historical time (Boschma and Frenken 2006; Henning 2019).

The EEG literature (Boschma and Frenken 2006, 2011; Martin and Sunley 2006; Boschma and Martin 2007; MacKinnon 2008; Martin 2010), based on core evolutionary principles such as variety, selection, and retention (Boschma and Lambooy 1999), also takes history seriously by recognizing the relevance of place-specific characteristics and dynamic processes in explaining the temporal evolution of territories. In EEG, the “historical turn” is primarily associated with the concept of regional path dependence.<sup>4</sup> The key idea is that initial historical accidents or random events can have long-term consequences through self-reinforcing, increasing returns mechanisms that “lock in” a particular regional development trajectory (Boschma and Lambooy 1999; Martin and Sunley 2006). In other words, current socio-economic outcomes depend on the early characteristics or historical events of a place, as well as on the adjustment processes triggered by these past events. Therefore, these processes can significantly affect contemporary spatial economic patterns and within-country disparities.

In this paper, we also examine the relationship between history and local development. Specifically, we hypothesize that a local system’s civic capital endowment—and, consequently, its

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<sup>4</sup> Relational economic geography also emphasizes the role of path dependence, temporal context, and contingency (Bathelt and Glückler 2003).



current economic development level—is not influenced by a single historical shock as in NEG basic models, but by a sequence of historical events, particularly changes in sovereignty over time. In this regard, our view of the relationship between history and local development aligns more closely with that developed in recent EEG contributions.

## **2.2 Civic capital as the underlying mechanism**

We now turn to the literature on the underlying mechanism of our analysis, namely civic capital. As previously noted, while the role of history in shaping a territory’s evolution over time is widely recognized in economic geography, the specific mechanisms driving this process remain largely underexplored. This paper also focuses on these mechanisms. Accordingly, we examine studies on the relationship between historical institutions, changes in sovereignty, and civic capital, as well as research investigating the link between civic capital and local development.

### ***2.2.1 Historical institutions, sovereignty change, and civic capital***

The literature widely recognizes that historical institutions can have long-lasting effects on current social norms, cultural values, and civic capital (Putnam et al. 1993; Nunn 2020). This has been documented through various historical contexts, including the Habsburg Empire (Becker et al. 2016), the Italian city-states of the Middle Ages (Guiso et al. 2016), and the separation and reunification processes in Germany (Fuchs-Schündeln and Schündeln 2005; Alesina and Fuchs-Schündeln 2007; Becker et al. 2020). This literature shows that the emergence of certain historical institutions fostered the development of social and cultural values among the populations living in the affected territories, and that these “cultural traits” were subsequently transmitted across generations and continue to influence present-day civic capital.

While cultural values and social norms often persist over time (Nunn 2020), institutions can change significantly due to political and administrative reforms or shifts in governance structures. As Acemoglu et al. (2021, 365) correctly note in their discussion on institutional change and

institutional persistence, “change is as much a part of our experience as is persistence.” A historical example is Napoleon’s rule over several European countries, including Germany, Spain, and Italy, during the first fifteen years of the nineteenth century. This period brought about radical institutional changes through the introduction of the Napoleonic administrative tradition (Peters 2021) and the implementation of the *Code Napoléon* (Acemoglu et al. 2011).

However, only a few recent studies have thoroughly examined the role and effects of historical institutional change on contemporary social norms, cultural values, and socio-economic outcomes (Abramson et al. 2022). A central issue is identifying appropriate proxies for measuring institutional change from a historical perspective. Without suitable proxies, capturing the complex nature of institutional evolution over time becomes challenging, which impedes our ability to analyze its effects on cultural values, social norms, and economic outcomes. An interesting proposal comes from Abramson et al. (2022), who proxy institutional change through historical border changes at the regional level. Although borders are not institutions *per se*, they are crucial components of the institutional structures that define and regulate a state’s interactions within its territory and with other states (Carter and Goemans 2018). In this sense, borders can be viewed as institutions that delineate jurisdictions and, thus, shape individual behaviors and expectations (Abramson and Carter 2016). Abramson et al. (2022) demonstrate that historical border changes are associated with contemporary measure of people’s political and social trust in Europe. Individuals living in geographical areas whose borders have changed frequently over time, thus preventing the establishment of stable patterns of social interactions and making it difficult to form a cultural, linguistic, and social identity, tend to exhibit lower levels of political and social trust.<sup>5</sup> In other words, border changes seem to have played a crucial role in shaping the social norms and cultural values of contemporary societies, as well as in influencing individual decision-making

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<sup>5</sup> In a similar vein, Giuliano and Nunn (2021) use data from the United States to demonstrate that the similarity and stability of the environment across different generations contribute to contemporary cultural persistence. They find that individuals residing in geographical areas that experienced significant climate instability in the past exhibit lower levels of persistence in cultural traditions.

processes through several mechanisms. Specifically, Abramson et al. (2022) identify two mechanisms that can account for these results. The first involves a reduction in the homogeneity of a region's cultural, political, and social values. Frequent changes in borders may lead to fractionation of the system of social norms and cultural values of a local population. Consequently, greater fragmentation or heterogeneity can lead to reduced trust among the individuals residing in that area. The second mechanism suggests that border changes may inhibit interpersonal relationships and the formation of social networks. Modern-day examples of these phenomena include the Berlin Wall and the separation barriers in Jerusalem, where individuals lost the ability to commute to their jobs or visit family members (Getmansky et al. 2019). Walls, borders, and other forms of barrier—such as the regulatory obstacles many states impose on immigration—impede the formation of social networks and, consequently, the development of shared norms and values.

An alternative proxy for measuring long-term institutional change is the shift in sovereignty within a geographical area. Sovereignty refers to the authority that holds the ultimate power and legal right to make and change laws independently of external control (Krasner 1999; de Jouvenel 2012), while institutions—often defined as “the rules of the game” (North 1990, 3)—establish norms, laws, and regulations that operationalize sovereignty. Therefore, changes in sovereignty can significantly impact institutions. Moreover, institutions shape the incentives and constraints faced by individuals, thus influencing their behaviors and decisions and, consequently, their cultural values and social norms (North 1990).<sup>6</sup> Some historical examples can support our argument regarding the impact of sovereignty on institutional change. The entry of the French Revolutionary Army into the Kingdom of Naples in February 1806 led to a new organization of the state and the establishment of new administrative institutions (Davis 2006). Similarly, the transition from

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<sup>6</sup> Of course, this is not the only definition of institutions. In the context of relational economic geography, institutions are defined as “stabilizations of mutual expectations and correlated interactions between individual or collective actors” (Bathelt and Glückler 2014, 341).

Spanish to Austrian control of the Duchy of Milan in the first half of the eighteenth century led to significant institutional reforms across various levels of public administration (Capra 1987).<sup>7</sup>

These shifts in sovereignty can serve as a meaningful measure of institutional change over time. This is indeed the approach we adopt in our analysis and, to our knowledge, no other paper has utilized this proxy to capture institutional instability over time.

### ***2.2.2 Civic capital and local development***

The idea that civic capital is fundamental to local development dates back to the pioneering works of Coleman (1988), Putnam et al. (1993), and Fukuyama (1995).<sup>8</sup> Civic capital emerges from a historical experience (Putnam et al. 1993) as a “community-specific set of productive intangible assets” (Ganau and Rodríguez-Pose 2023, 529). These assets are typically associated with a system of shared cultural values and social norms that reduce fragmentation and heterogeneity within the local community. Over time, this process fosters increased trust among individuals and lowers transaction costs. Marshallian industrial districts (Becattini 1990) exemplify these kinds of local communities with a high degree of cultural, political, and social homogeneity. This homogeneity, often resulting from long-standing historical traditions, is fundamental in explaining the higher levels of civic capital and lower transaction costs within these local systems. This is one reason for the success of Marshallian industrial districts.

As evident from the above analysis, the concept of civic capital is closely related to that of trust (Alesina and La Ferrara 2002; Glaeser et al. 2002). We distinguish two types of trust: institutional trust, which refers to trust in the ruling authority; and interpersonal trust, which refers to trust among individuals. Our hypothesis is that frequent sovereignty changes over time have

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<sup>7</sup> It is worth noting that there are also some examples of a change in sovereignty that does not result in a change of the overall institutional system. For instance, after the Congress of Vienna, the Bourbons, upon being reinstated in the Kingdom of Naples, maintained the administrative institutions inherited from the “French Decade” (1806–1815) while restoring some institutions of the *Ancient Regime* (e.g., civil status and property rights). Of course, this issue can also be extended to the analysis of borders. For example, the Kingdom of Naples retained its borders largely unchanged over centuries despite being under Angevin, Spanish, Bourbon, and French domination in the period 1282–1860.

<sup>8</sup> Putnam et al. (1993) demonstrates that Southern Italy’s deficiency in civic capital has resulted in slower economic development compared to Northern Italy, which benefits from a greater endowment of civic capital.

impeded the development of civic capital by undermining trust both between the ruling authority and the population, and within the population itself. This occurs because a segment of the local population may perceive each sovereignty change as a “breach of trust” by the ruling authority. Therefore, frequent sovereignty changes lead not only to diminished institutional trust but also to reduced interpersonal trust due to increased heterogeneity within the population. This discourages the development of shared values and weakens cooperative relationships both between the ruling authority and the population, and among individuals within a geographical area, consequently resulting in low levels of civic capital (Abramson et al. 2022).

When civic capital is high, transaction costs are low, enabling large organizations to operate more efficiently and promoting faster financial and economic development (Alesina and La Ferrara 2002). This suggests that low transaction costs are generally associated with high levels of economic performance (Burker and Minerva 2014; Muringani et al. 2021). Conversely, low civic capital increases transaction costs, thus hampering local development.

In recent years, a substantial body of literature has empirically tested this relationship at the country, regional, and firm levels. In general, empirical studies find a positive correlation between levels of civic capital and trust—measured in various ways—and socio-economic performance (Knack and Keefer 1997; Zak and Knack 2001; Beugelsdijk et al. 2004; Tabellini 2010; Ganau and Rodríguez-Pose 2023). In other words, civic capital positively affects the economic performance of countries, regions, and firms.

We contribute to this literature stream both by providing a theoretical explanation for the economic returns of civic capital based on the co-evolution of institutional and interpersonal trust driven by historical sovereignty change over time, and by testing empirically such relationships in a structural estimation framework.

### 3. Empirical framework

#### 3.1 Empirical modeling

We study whether historical sovereignty change exhibits long-run effects on current local economic development through the following cross-sectional regression equation:

$$\text{Labor Productivity}_l = \alpha + \beta \text{Sovereignty Change}_l + \sum_{k=1}^K \gamma_k X_l^k + \varepsilon_l \quad (1)$$

where the dependent variable captures the labor productivity of LLM  $l = 1, \dots, 611$  in year 2018;  $\alpha$  is a constant term;  $\text{Sovereignty Change}_l$  is the variable capturing historical sovereignty change in the period 1000–1861, with  $\beta$  being the associated parameter of our interest;  $X_l^k$  is a vector of LLM-specific control variables; and  $\varepsilon_l$  denotes the error term. The rationale for analyzing historical sovereignty change up to the year 1861 is that the process of unification of Italy was completed for most territories at that time—that is, sovereignty remains unchanged for most Italian territories starting from 1861.<sup>9</sup>

##### 3.1.1 Labor productivity

We capture current local economic development through a measure of labor productivity defined as value added (thousand Euros) per employee in 2018, and constructed using data provided by the Italian National Institute of Statistics (ISTAT). Value added and employment figures are available for 610 LLMs existing in 2018, after the LLMs of Corigliano Calabro and Rossano were merged into the LLM of Corigliano–Rossano in that year. We retrieved value added and employment

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<sup>9</sup> Specifically, 84.29% of the Italian territory—as defined at the current borders—had already been annexed by the House of Savoy to the newborn Kingdom of Italy in 1861; 8.67% of it—that is, the Veneto region and some areas belonging to the regions of Friuli-Venezia Giulia, Lombardy, and Trentino-South Tyrol—had been annexed in 1866; 2.29% of it—that is, some areas belonging to the regions of Latium, Tuscany, and Umbria—had been annexed in 1870; and 4.75% of it—that is, most of Trentino-South Tyrol and some areas of Friuli-Venezia Giulia—had been annexed in 1920.

figures for the two merged LLMs by weighting for land area shares, so as to include in our analysis all the 611 LLMs identified by ISTAT in the 2011 *Industry and Services Census*.

### **3.1.2 Historical sovereignty change**

We rely on a measure of historical sovereignty change that captures the yearly number of changes in sovereignty that occurred in the period 1000–1861 at the LLM level. We construct this variable by first identifying the geometric center of the polygon defining the boundaries of each LLM and, second, computing how many times over the relevant period (i.e., 1000–1861) the centroid of each LLM changed sovereignty, defined as a change in ruler with respect to the previous year.<sup>10</sup> The data on sovereignties are drawn from the CRE database, which provides yearly shapefiles of historical sovereignty boundaries starting from year 1000.<sup>11</sup>

### **3.1.3 Control variables**

We include four sets of controls in the vector  $X_t^k$  entering the right-hand side of Equation (1) to relax biases related to unobserved heterogeneity, namely: geographical; demographic and economic; infrastructural; and historical variables.

The set of geographical controls aims at controlling for heterogeneity related to natural conditions that may affect economic development (Rosenthal and Strange 2004). It includes a variable for altitude from the sea level; an index of terrain ruggedness; a variable for the closest distance between the centroid of a LLM and the seacoast; a variable capturing the change in caloric suitability—as a proxy for crop-based potential agricultural output—between the pre- and post-1500 period; and macro-region dummy variables for Northern Italy, Central Italy, Southern Italy, and the two main islands of Sardinia and Sicily.<sup>12</sup>

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<sup>10</sup> LLMs are mostly convex, such that their geometric centers fall inside their area.

<sup>11</sup> Figure A1 (Online Appendix A) reports the spatial distribution of the variables for labor productivity and historical sovereignty change.

<sup>12</sup> We consider changes in caloric suitability between the pre- and post-1500 period to account for “the expansion of suitable crops for cultivation [occurred] in the course of the Columbian Exchange” (Galor and Özak 2016, 3065).

The set of demographic and economic controls—all referring to the year 2011—includes a variable for resident population (thousand inhabitants) to account for the absolute size of a LLM; a variable for employment density defined as the number of employees per square kilometer (km) to account for agglomeration effects; the share of the tertiary-educated population to account for human capital endowment; unemployment rate to account for the conditions of the local labor market; and a dummy variable capturing whether a LLM was identified as an industrial district by ISTAT.<sup>13</sup>

The set of infrastructural controls aims at controlling for heterogeneity related to physical endowment that may affect firms' economic performance and, thus, aggregate local development (Glaeser and Gottlieb 2009). It includes variables for the density of navigable rivers, the density of national streets, and the density of railways.

Finally, the set of historical controls aims at controlling for historical initial conditions that may have affected local development in the long run. It includes a variable capturing the density of ancient Roman roads to control for exposure to ancient commercial routes that could have favored the growth of a LLM as a main trading, political, and administrative center (Dalgaard et al. 2022); a variable counting the number of Roman human settlements identified as cities in the period 100 B.C.–A.D. 300 and a dummy variable capturing the existence of a large city—with at least 10,000 inhabitants—in year 1000 to control for early urbanization processes and the early presence of large cities (Bosker et al. 2013); a variable counting the number of bishop seats in year 1000 to control for the presence of first forms of political and institutional organization and coordination (Guiso et al. 2016); and a set of dummy variables capturing the six sovereignties dominating in the Italian peninsula in year 1859—that is, when the Italian unification process began

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<sup>13</sup> Becattini (1990, 38) defines an industrial district as “a socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area.” ISTAT identified 141 LLMs as industrial districts in the 2011 *Industry and Services Census*.



with the annexation of the Milanese territories of the Kingdom of Lombardy–Venetia to the Kingdom of Sardinia—to control for pre-unification state-level institutional heterogeneity.<sup>14</sup>

### 3.2 Identification strategy

We begin our analysis by estimating Equation (1) via OLS. However, such results could be biased by endogeneity arising from heterogeneity across LLMs related to their attractiveness to potential conquerors. Indeed, the observed degree of historical sovereignty change may depend on, *ceteris paribus*, how attractive and of interest a territory was for conquest. In other words, we can hypothesize that some LLMs have been relatively more exposed to sovereignty changes over time than others due to their relatively higher attractiveness for conquest.

We thus rely on an IV approach and also estimate Equation (1) via Two-Stage Least Squares (TSLS). We instrument the variable for historical sovereignty change with the variability in the historical availability of subsistence resources captured by a variable defined as the LLM-specific standard deviation in the share of crop and pasture land in 100-year intervals over the period 500–1900. The rationale for the identification strategy rests on the idea that a lower variability in the availability of resources at a time when individuals’ subsistence was mostly based on agriculture and pastoralism would have made a territory more attractive for conquest: indeed, *ceteris paribus*, the search for new and increased sources of livelihood for the population and the army can reasonably be counted among the reasons behind military invasions. Thus, conditional on observables, variability in the availability of subsistence resources in a period when industrialization had still to take place can be considered a good predictor of historical sovereignty

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<sup>14</sup> In 1859, the six sovereignties dominating the Italian pre-unification states were: the House of Bourbon–France in the Duchy of Parma and Piacenza; the House of Bourbon–Two Sicilies in the Kingdom of the Two Sicilies; the House of Habsburg–Este in the Duchy of Modena and Reggio; the House of Habsburg–Lorraine in the Grand Duchy of Tuscany, the Kingdom of Lombardy–Venetia, and the northeastern territories corresponding to the current regions of Friuli-Venezia Giulia and Trentino-South Tyrol that were part of the Habsburg Empire; the House of Savoy in the Kingdom of Sardinia; and the Papal States under Pope Pius IX. Table A1 (Online Appendix A) summarizes the definition and data source of the variables entering Equation (1), while descriptive statistics are reported in Table A2 (Online Appendix A).

change. In addition, the validity of the identification strategy is guaranteed by the fact that the IV is likely to be exogenous to local economic development in recent times when the main sources of labor productivity are technological development and education.

We construct our IV using data drawn from the *History Database of the Global Environment* (HYDE, version 3.1), which provides information on human-induced land use changes in 100-year intervals over the period 10000 B.C.–A.D. 2005 with a 5 arc-minutes spatial resolution (Klein Goldewijk et al. 2011). Despite the global scale of the database, its spatial coverage prevents us from computing the IV for all the 611 LLMs we observe, as we miss information for the LLMs of Capri, Forio, and Ischia located in the Ischia Island, and the LLM of Lipari located in the homonymous island.

## **4. Evidence on historical sovereignty change and local development**

### **4.1 Main results**

Table 1 reports the results of the OLS and TSLS estimation of Equation (1), that point to a negative and statistically significant effect of historical sovereignty change on current local economic development.<sup>15</sup> We estimate that every additional change in sovereignty that occurred in the period 1000–1861 leads to an average reduction in LLMs’ labor productivity of approximately 1,023 thousand Euros in value added per employee—see Column (8).

Our results suggest that current local development tends to be lower in those LLMs where sovereignty changed more frequently over time. In other words, historical sovereignty change can be identified as a factor contributing to explain current economic development differentials at the local level.

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<sup>15</sup> Looking at the TSLS results, it is worth noting that the first-stage F statistics on the excluded IV are higher than the conservative cut-off value of 10 in all the estimated specifications, thus suggesting a good predictive power of the chosen IV. Moreover, the estimated first-stage coefficients of the IV are highly statistically significant and show the expected negative sign, meaning that higher variability in the availability of subsistence resources made a territory less attractive for conquest and, thus, less subjected to sovereignty changes.

## **4.2 Robustness and placebo analyses**

We corroborate our results through a series of robustness and placebo exercises which are discussed in detail—and whose results are presented—in Online Appendix B.

## **5. The underlying mechanism**

We now discuss a potential mechanism underlying the link between historical sovereignty change and current local economic development, namely people’s civic capital defined as the set of norms and values affecting individuals’ behavior in society (Guiso et al. 2011).

We hypothesize that a high number of changes in sovereignty that occurred over time in a geographical area may have inhibited trust, cooperation, and stable patterns of interaction both between the institutions and the population, and within the population, thus resulting in low levels of civic capital (Abramson et al. 2022). Thus, the rationale for civic capital being the “missing link” (Guiso et al. 2011, 417) between historical sovereignty change and current local economic development rests on the idea that reduced trust towards the institutions and reduced homogeneity of a local system in terms of political, cultural, and social values induced by high instability (Giuliano and Nunn 2021) have hampered institutional and social cooperation, as well as the formation of social networks; this, in turn, has discouraged the emergence of shared values among institutional and economic actors (i.e., the government, public authorities, households, workers, entrepreneurs) resulting in increased transaction costs (Burker and Minerva 2014) and low investment levels (Schmitz 2023), with negative effects on local development.

### **5.1 Modeling persistence of sovereignty changes**

We propose a simple theoretical model that links sovereignty change, civic capital, and local economic development. Following Guiso et al. (2011, 418), civic capital can be defined as “the set of values and beliefs that help cooperation,” with mutual trust being a prerequisite for civic capital

formation (Bracco et al. 2015). Thus, for simplicity, we model the evolution of two types of trust as a proxy for civic capital formation, that is, institutional trust and interpersonal trust (OECD 2017). Indeed, as shown in Figure 1, cross-country evidence suggests a strong positive correlation not only between Gross Domestic Product (GDP) per capita and institutional and interpersonal trust, respectively, but also between the two types of trust we consider to model civic capital formation.<sup>16</sup>

### ***5.1.1 Modeling the evolution of trust***

We model trust between the sovereignty and the general population (i.e., institutional trust) by borrowing from game theory, that is, we consider the sovereignty and the population as players in an iterated prisoner dilemma. Individuals within the population can either cooperate with the ruling sovereignty or defect. Cooperation consists in, for example, paying taxes and following the rules imposed by the sovereignty without trying to subvert it with violence, while defection represents the opposite behavior. Similarly, a sovereignty can cooperate with members of the population by providing them with an acceptable standard of living, and peaceful if not prosperous conditions, while it is understood as defecting when it does not meet these requirements.<sup>17</sup>

We assume that at any given time  $t$  a fraction  $u$  of the population is willing to cooperate with the sovereignty, while the remaining members of the population are not. We also assume that a fixed proportion of the cooperating population sees a sovereignty change, when occurring, as a defection, and adopts a tit-for-tat strategy thereby ceasing to cooperate for the time being. We thus model the evolution of the cooperating fraction  $u$  of the population as follows:

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<sup>16</sup> In Figure 1, we consider countries belonging to the Organisation for Economic Co-operation and Development (OECD) and the European Union. We proxy country-level institutional trust with the percentage of individuals who trust the national government, while we proxy country-level interpersonal trust with the percentage of individuals who think that most people can be trusted.

<sup>17</sup> Clearly, whether the counterpart cooperates or defects is partly a subjective judgement, so we will refrain from modeling it in detail here.

$$\frac{du}{dt} = f(u) - bu \sum_{i=1}^N \delta(t - t_i) \quad (2)$$

where  $0 \leq u(t) \leq 1$  represents the fraction of the population that chooses to cooperate with the ruling sovereignty at time  $t$ ;  $f(u)$  is a continuous function defined in the interval  $[0, 1]$  that determines the slow evolution of cooperation over time due to enculturation phenomena within the population;  $b$  is a constant representing the fraction of the population seeing a regime change as a “breach of trust” on the part of the sovereignty;  $\delta$  denotes the Dirac’s delta function, also known as impulse function, that has a value of zero everywhere except when  $t = t_i$ , where it spikes to infinity such that  $\int_{-\infty}^{\infty} \delta(t - t_i) dt = 1$ ;  $t_i$  is the time at which a sovereignty change occurs.

The choice of  $f(u)$  has a crucial impact on the dynamics of societal trust as predicted by the model, as it represents the rate at which trust in institutions spreads from one citizen to another. For instance, setting  $f(u) = 0$  identically would result in a constant fraction of the population cooperating with the sovereignty in-between regime changes, with a decay by a factor  $b$  at every change of sovereignty. Ultimately, the form of  $f(u)$  is an empirical question which can be settled by uniformly measuring institutional trust over time. A reasonable form for  $f(u)$ , whose parameters may in principle be estimated empirically, is as follows:

$$f(u) = au(1 - u) \quad (3)$$

with  $a$  being a fixed coefficient of proportionality. The factor  $u(1 - u)$  corresponds to the fraction of pairwise interactions between citizens that hold opposite stances in terms of trust in the institutions. If we assume that cooperators do not trust defectors and vice versa—as it is common in the context of political divisions—, then a measure of “trust in the others” or interpersonal trust as opposed to institutional trust can be defined as follows:

$$v(u) = -u(1 - u) \quad (4)$$

Substituting Equation (3) into Equation (2) yields:

$$\frac{du}{dt} = au(1 - u) - bu \sum_{i=1}^N \delta(t - t_i) \quad (5)$$

with Equation (5) predicting a logistic growth of the fraction of cooperating population over time in-between “breach-of-trust events” at times  $t_i$ . The appeal of this form derives from the intuitive expectation that cooperative behaviors spread through interpersonal contacts and interactions, such that cooperation increases as the current cooperators (proportional to  $u$  in number) spread their values to the current non-cooperators (proportional to  $1 - u$  in number). Thus, the parameter  $a$  can be interpreted as the speed of propagation of these values in the society.<sup>18</sup> Equation (5) shows that the rate of change of trust in institutions ( $u$ ) is maximal when interpersonal trust ( $v$ ) is minimal: in other words, politically polarizing change breaks the fabric of society.

In the absence of sovereignty changes, that is, when Dirac’s delta function is equal to zero, the fraction of the population that chooses to cooperate with the ruling sovereignty grows over time (Figure 2, Panel A). Panel A in Figure 3, instead, shows the dynamics of interpersonal trust in the absence of shocks: interpersonal trust hits its minimum as the share of population regaining trust in the ruling sovereignty approaches 0.5. In other words, interpersonal trust is at its lowest when half of the population trusts the ruling sovereignty and another half does not. Eventually interpersonal trust grows.

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<sup>18</sup> Some support for this functional form can be gleaned from data on municipal waste segregation. Indeed, in early 2000s, the percentage of segregated municipal waste in Italy has been growing exponentially as in the early part of a logistic curve (Ferraris and Paleari 2013). The percentage of waste segregation can be seen as a measure of cooperation between the general population and the public authority (i.e., the ruling sovereignty) managing waste.

By contrast, the cooperation level between the ruling sovereignty and the population (i.e., institutional trust) falls abruptly in the case of a sovereignty change (Figure 2, Panel B). The possibility and speed of cooperation level recovery would depend on the frequency of sovereignty changes, the initial level of cooperation in society, the share of the population that sees a regime change as a “breach of trust” ( $b$ ), and the timescale for regaining trust modulated by the parameter  $\alpha$ . Panel B in Figure 3, instead, shows the corresponding dynamics of interpersonal trust: the shock hits when interpersonal trust is at its lowest and, thus, has a rather short-lived effect on interpersonal trust recovery.

### ***5.1.2 Trust-augmented local economic development***

We model the effect of the evolution of institutional trust and interpersonal trust and, therefore, of civic capital on local economic development by relying on a trust-augmented version of Lucas’ (1988) endogenous growth model with fixed labor force participation and the savings coefficient  $s$  depending on the trust levels  $u$  and  $v$ .<sup>19</sup> The positive relationship between trust and capital accumulation has been shown both theoretically (Zak and Knack 2001) and empirically (Dearmon and Grier 2011) in a cross-country setting. Moreover, firms’ credit access and investment decisions largely depend on the level of mutual trust in society (Knack and Keefer 1997), and result in productivity growth (Ganau and Rodríguez-Pose 2023).

The choice of Lucas’s (1988) model is motivated by our long-term temporal horizon, which necessitates a model capable of capturing the historical exponential growth of output in Italy. Lucas’s (1988) endogenous growth model features human capital that, unlike physical capital, is not limited by diminishing returns. We thus model the evolution of capital per capita ( $k$ )—with depreciation rate  $\rho$ —as follows:

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<sup>19</sup> Endogenous growth models have been recently used in the field of economic geography to account for the role of social capital (e.g., Ganau and Rodríguez-Pose 2023) and institutions (e.g., Rodríguez-Pose and Di Cataldo 2015; Rodríguez-Pose and Ganau 2022) in explaining innovation patterns and development at the firm and region levels.

$$\frac{dk}{dt} = s(u, v)k^\alpha h^{1-\alpha} - \rho k \quad (6)$$

with  $s(u, v) = u + v$  for simplicity, implying that institutional and interpersonal trust contribute additively to the savings rate. We can thus calculate the output per capita ( $y$ ) as follows:

$$y = k^\alpha h^{1-\alpha} \quad (7)$$

In this model,  $h$  represents human capital accumulation that, for a fixed  $\Phi$ , results in an exponential growth as follows:

$$\frac{dh}{dt} = \Phi h \quad (8)$$

Bearing in mind that the logistic growth of  $u(t)$  is subject to sovereignty change shocks, we consider the system of ordinary differential Equations (5), (6), and (8) and solve it numerically using the Euler method with a time step of  $10^{-3}$  years by integrating from year 1000 (set as  $t = 0$ ) to year 2000.<sup>20</sup> We then rely on sovereignty change data drawn from the CRE database to study the evolutionary path of two similar LLMs that have experienced different sequences of sovereignty change shocks—that is, that have experienced low and high historical sovereignty change—in the period 1000–2000, respectively. We specifically model the evolution until year 2000 in order to highlight the persistence of differences in the outcomes of interest, even though the two LLMs' most recent historical changes—that is, from around the Italian unification occurred in 1861—follow the same pattern. The results concerning the evolution of institutional and interpersonal trust in the presence of two different shock sequences are shown in Figure 4, and

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<sup>20</sup> The initial conditions of the integration process are set as  $h(0) = 1$ ,  $k(0) = 1$ , and  $u(0) = 0.1$ , while the coefficients are set as  $\delta = 0.05$ ,  $\Phi = 0.005$ ,  $\alpha = 0.6$ ,  $a = 0.01$ , and  $b = 0.1$ .



highlight a persistent gap in the level of trust between the two LLMs. The results concerning the evolution of output per capita—defined in terms of GDP—are shown in Figure 5: it is evident that, despite sharing the same history of stability since the Italian unification, the model still predicts a standing difference in GDP per capita between the two LLMs today.

## 5.2 Testing the link between historical sovereignty change and civic capital

We test empirically the proposed mechanism by relying on alternative proxies to capture the two dimensions underlying civic capital formation, that is, institutional and interpersonal trust. We do not have data allowing us to measure the two types of trust directly at the LLM level and, therefore, we can only rely on sets of variables capturing cooperative behaviors between the institution and the population, and among individuals in society, respectively.<sup>21</sup>

We proxy the institutional dimension of civic capital formation through three variables: voter turnout at the Italian referendum of June 2011; TV tax evasion in 2014; and waste recycling in 2013. We consider referendum voter turnout as it captures “the extent to which people in a community are willing to pay a personal cost to enhance the common good” without receiving any “direct economic payoff to voting” (Guiso et al. 2011, 453). In this respect, referendum voter turnout captures people’s trust in and willingness to cooperate with institutions (Putnam et al. 1993; Guiso et al. 2004). We consider the share of households not paying the mandatory, fix-rate TV licensing fee (i.e., *canone*) as its evasion can be considered a good proxy for individuals’ propensity to free-ride and elude institutions as its payment is “a pure public good contribution with almost no incentive to comply” (Buonanno et al. 2023, 4) capturing individuals’ “sense of civic duty” (Buonanno and Vanin 2017, 164). We consider the percentage of urban waste recycled as, similarly to voter turnout and TV tax evasion, can be considered a good proxy for individuals’ sense of civic

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<sup>21</sup> We present suggestive evidence by relying on survey-based trust measures in Online Appendix C.

duty and willingness to cooperate for the common good and, especially, with the public authority managing waste at the local level.<sup>22</sup>

We proxy the interpersonal dimension of civic capital formation through two variables capturing individuals' altruistic behavior in society based on non-profit associationism (Putnam et al. 1993), namely the number of unpaid voluntary workers in non-profit organizations per 1,000 inhabitants in year 2011 and the presence of a local section of the *Associazione Italiana per la Donazione di Organi* (AIDO)—that is, the leading association for organ donation in Italy. These two variables have been widely employed in the literature (e.g., Guiso et al. 2016; Buonanno et al. 2022; Buonanno et al. 2023), as the absence of economic payoffs in doing unpaid voluntary work or donate organs “can be seen as a direct measure of how much people internalize the common good” (Guiso et al. 2011, 453) and adopt behaviors of cooperation with respect to other members of society.

We also construct a synthetic index of civic capital based on the abovementioned variables, as well as two sub-indexes aimed at capturing its institutional and interpersonal dimensions separately.<sup>23</sup>

We thus modify Equation (1) by considering the individual proxy variables and synthetic indexes of civic capital as the dependent variables, and estimate it via both OLS and TSLS. The results reported in Table 2 confirm our theoretical prediction. Looking at the TSLS results concerning the individual proxy variables of civic capital, we estimate that every additional change in sovereignty that occurred in the period 1000–1861 is associated with a 0.5% reduction in voter turnout, a 2% increase in the share of households evading the TV tax, a 2.8% reduction in the share of recycled waste, a decrease of approximately 3.1 volunteers per 1,000 inhabitants, and a 0.5% reduction in the likelihood of hosting a section of AIDO. Such a negative relationship is confirmed when we consider the three synthetic indexes of civic capital: we estimate that civic capital

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<sup>22</sup> Information on waste recycling is available for 610 out of 611 LLMs, as we miss data for the LLM of Ayas in the Aosta Valley region.

<sup>23</sup> We provide details on the data and variables we rely on to proxy civil capital in Online Appendix C.

diminishes by approximately 2.1% to 3.1% for every additional change in sovereignty occurred in the period 1000–1861.<sup>24</sup>

### 5.3 Historical sovereignty change, civic capital, and local development

We conclude our empirical analysis by relying on a structural estimation approach to study the relationship between contemporary civic capital and current economic development, while accounting for the role of historical sovereignty change as the underlying driver of civic capital formation through the evolution of institutional and interpersonal trust.

We estimate a multiple-equation model via Maximum Likelihood, where the dependent variables are labor productivity, civic capital, and historical sovereignty change, respectively. Formally, we define the multiple-equation system as follows:

$$\begin{cases} \text{Labor Productivity}_l = \alpha_0 + \alpha_1 \text{Civic Capital}_l + \alpha_2 \mathbf{X}_l^g + \alpha_3 \mathbf{X}_l^{de} + \alpha_4 \mathbf{X}_l^i + \alpha_5 \mathbf{X}_l^h + \varepsilon_l \\ \text{Civic Capital}_l = \beta_0 + \beta_1 \text{Sovereignty Change}_l + \beta_2 \mathbf{X}_l^g + \beta_3 \mathbf{X}_l^{de} + \beta_4 \mathbf{X}_l^i + \beta_5 \mathbf{X}_l^h + \eta_l \\ \text{Sovereignty Change}_l = \gamma_0 + \gamma_1 \text{Attractiveness}_l + \gamma_2 \mathbf{X}_l^g + \gamma_3 \mathbf{X}_l^h + \omega_l \end{cases} \quad (9)$$

where  $\mathbf{X}_l^g$  denotes the vector of geographical controls;  $\mathbf{X}_l^{de}$  denotes the vector of demographic and economic controls;  $\mathbf{X}_l^i$  denotes the vector of infrastructural controls;  $\mathbf{X}_l^h$  denotes the vector of historical controls; and  $\text{Attractiveness}_l$  is the variable capturing the variability in the share of crop and pasture land over the period 500–1900.<sup>25</sup>

The results of this exercise are reported in Table 3, and fully corroborate our previous evidence. Indeed, they highlight the role of civic capital as a channel explaining the relationship between historical sovereignty change and current economic development, as we find evidence that LLMs where civic capital is higher are also experiencing higher economic development levels.<sup>26</sup>

<sup>24</sup> We present robustness exercises in Online Appendix C.

<sup>25</sup> The vector  $\mathbf{X}_l^h$  does not include the dummy variables for sovereignties in year 1859 in the equation for historical sovereignty change in the period 1000–1861.

<sup>26</sup> We provide additional evidence in Online Appendix D.

## 6. Conclusions

History materializes in different ways, one of which is through the succession of sovereignties within a territory over time. Each of these sovereignties introduces not only a system of social norms and cultural values but also a new institutional framework. This phenomenon was evident in the early nineteenth century when the Bourbons were replaced by the French in the Kingdom of Naples, and in the eighteenth century when the Austrians took over from the Spanish in the Duchy of Milan.

In this paper, we have attempted to show how changes in sovereignty over time can impact the formation and evolution of civic capital within a geographical area, thereby influencing local economic development. We have demonstrated both theoretically and empirically that historical changes in sovereignty—used here as a proxy for historical institutional changes—are negatively associated with contemporary civic capital, which in turn affects current local economic development.

Our approach combines theoretical modeling of the relationship between changes in sovereignty, cooperation levels (i.e., a core component of civic capital), and economic growth, alongside empirical testing of the resulting propositions. Like many models of complex social processes, our model does not account for all relevant elements. For example, we do not model the movement and destruction of physical capital or people due to international and internal conflicts. Despite these limitations, our model helps clarify the transmission process and the dynamics underlying the persistence of historical shocks.

We have thus demonstrated how history shapes the current development levels of Italian local systems. This raises the question of the role public policies might play in this context. More specifically, if history plays a significant role, to what extent can regional policies help mitigate inequalities and disparities between different territories within a country or even across Europe? We believe there is potential in at least three areas. First, some European regional policies, such as the Smart Specialisation Strategy, already incorporate the historical context. The sectors of

specialization within a region are generally the result of long-term historical processes, which often involve mechanisms of regional path dependence (Di Cataldo et al. 2022; Rigby et al. 2022). Second, regional policies can sometimes lead to significant deviations from the long-term development trajectories of a local system (Iammarino et al. 2019). For example, the territorial policies implemented by the Italian government between the 1950s and 1970s in favor of the southern regions, known as the *Cassa per il Mezzogiorno*, significantly reduced the North–South divide (Accetturo and de Blasio 2022). Finally, by elucidating the mechanism through which past shocks influence local development now, that is, through civic capital, we propose a way policy makers can “compensate” for history—that is, through the promotion of societal cooperation. Building up civic capital is not an easy task, and is an ongoing theme of research in anthropology, sociology, and economics. Some possible interventions include fostering citizen engagement in political processes (Schneider 2008) and promoting collaboration between society and state institutions (Bartoletti and Faccioli 2016).

In conclusion, a theoretical and empirical approach that combines history with economic geography could provide new insights into many phenomena at regional and local levels.

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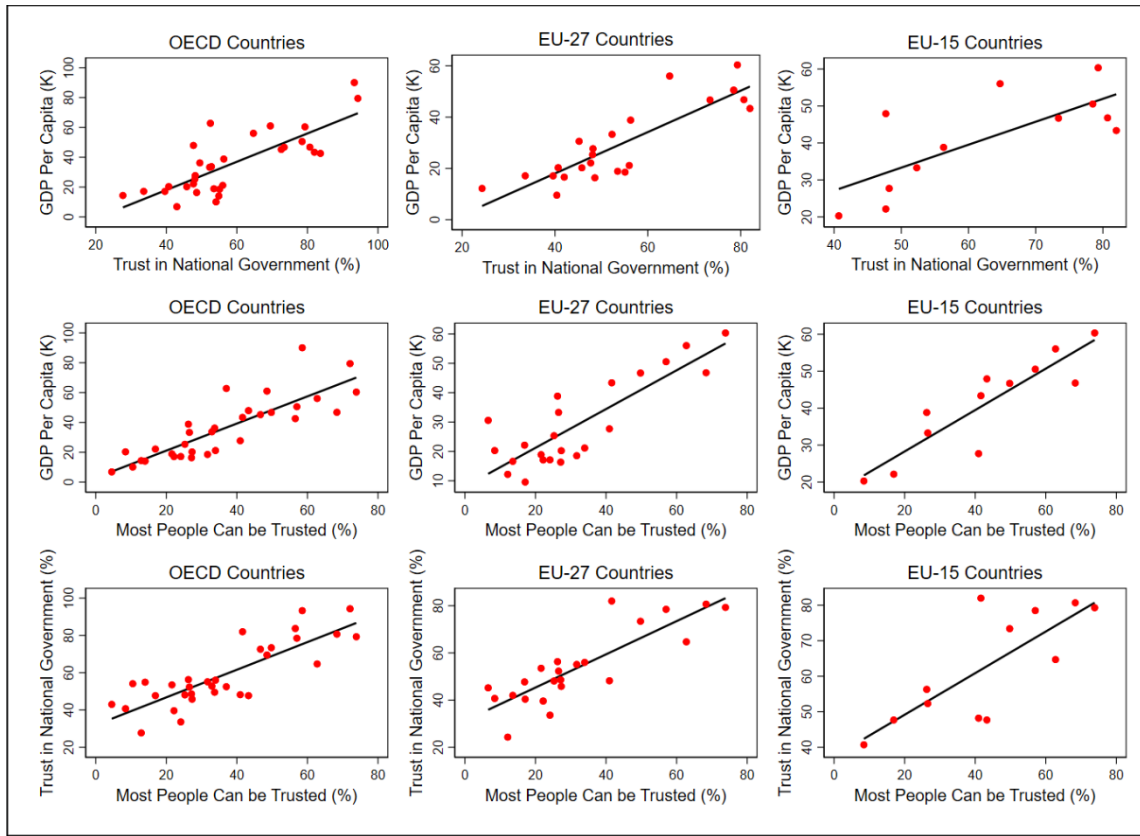
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Table 1: Historical sovereignty change and local development.

| Dependent Variable                     | Labor Productivity |             |             |             |
|----------------------------------------|--------------------|-------------|-------------|-------------|
| Estimation Method                      | OLS                |             |             |             |
|                                        | (1)                | (2)         | (3)         | (4)         |
| Sovereignty Change                     | -0.099*            | -0.111**    | -0.141***   | -0.117**    |
|                                        | (0.059)            | (0.055)     | (0.053)     | (0.057)     |
| Geographical Controls                  | Yes                | Yes         | Yes         | Yes         |
| Demographic and Economic Controls      | No                 | Yes         | Yes         | Yes         |
| Infrastructural Controls               | No                 | No          | Yes         | Yes         |
| Historical Controls                    | No                 | No          | No          | Yes         |
| Observations                           | 611                | 611         | 611         | 611         |
| F Statistic                            | 140.64             | 125.20      | 103.91      | 72.33       |
| R <sup>2</sup>                         | 0.60               | 0.66        | 0.66        | 0.68        |
| Estimation Method                      | TSLS               |             |             |             |
|                                        | (5)                | (6)         | (7)         | (8)         |
| Sovereignty Change                     | -0.710*            | -0.747**    | -0.907**    | -1.023***   |
|                                        | (0.376)            | (0.325)     | (0.375)     | (0.365)     |
| Geographical Controls                  | Yes                | Yes         | Yes         | Yes         |
| Demographic and Economic Controls      | No                 | Yes         | Yes         | Yes         |
| Infrastructural Controls               | No                 | No          | Yes         | Yes         |
| Historical Controls                    | No                 | No          | No          | Yes         |
| Observations                           | 607                | 607         | 607         | 607         |
| F Statistic                            | 102.20             | 87.61       | 63.50       | 44.08       |
| First-Stage F Statistic on Excluded IV | 16.30              | 18.28       | 15.15       | 19.95       |
| Excluded IV                            | -16.460****        | -17.649**** | -15.794**** | -18.032**** |
|                                        | (4.077)            | (4.127)     | (4.058)     | (4.037)     |

Notes: Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

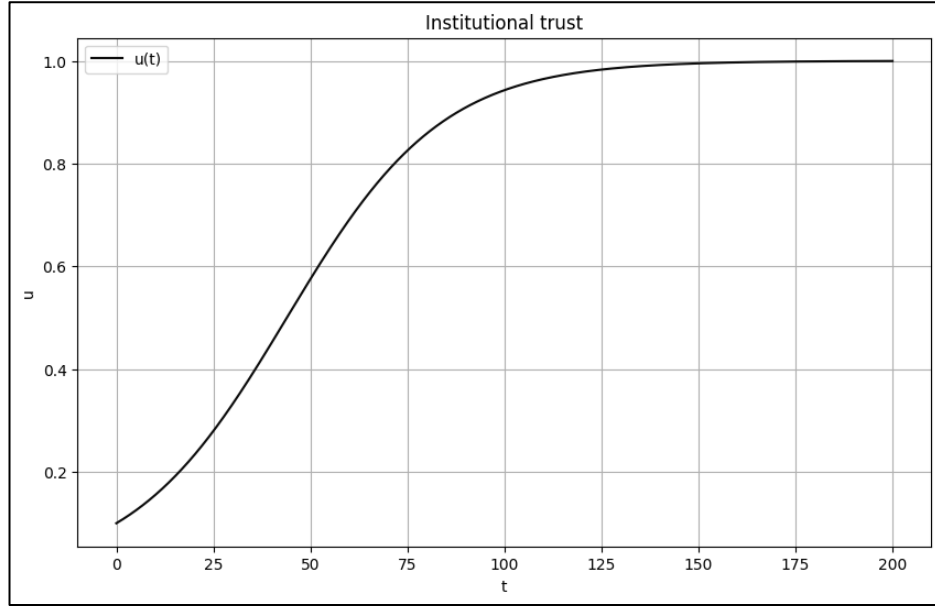
Figure 1: Correlation between development, institutional trust, and interpersonal trust.



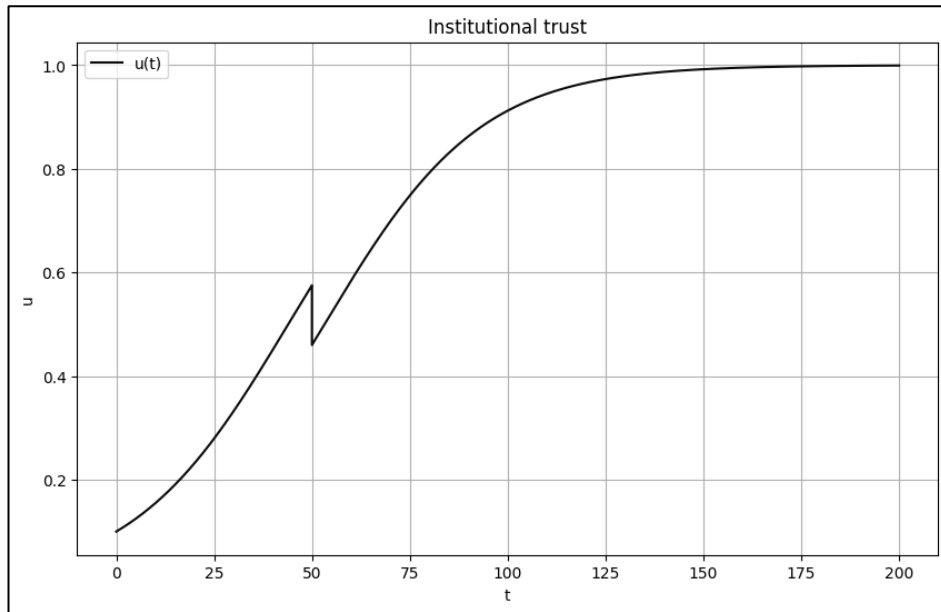
Notes: GDP per capita is expressed in thousands of constant 2015 USD, and refers to year 2022. The percentage of people trusting the national government refers to year 2020. The percentage of people who think that “most people can be trusted” refers to year 2022. Authors’ elaboration on data drawn from the World Bank Group, Wellcome Global Monitor, and the *Integrated Values Surveys* (European Value Study-World Value Survey). The following countries are not included in the sample due to missing values: Belgium (OECD, EU-27, EU-15); Costa Rica (OECD); Iceland (OECD); Ireland (OECD, EU-27, EU-15); Israel (OECD); Luxembourg (OECD, EU-27, EU-15); Malta (EU-27).

Figure 2: Institutional trust dynamics in the absence and presence of a sovereignty change.

Panel A: Absence of a sovereignty change



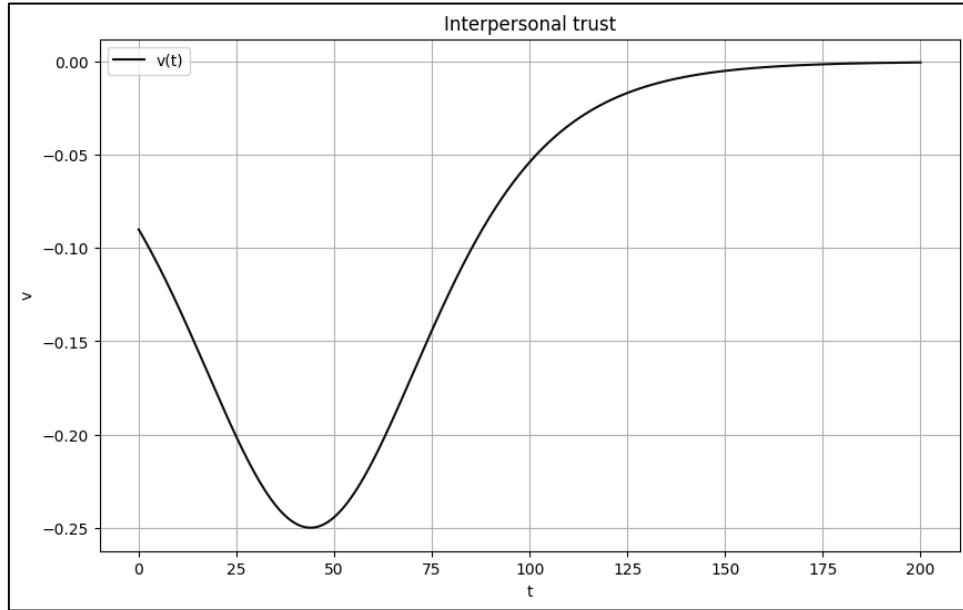
Panel B: Presence of a sovereignty change



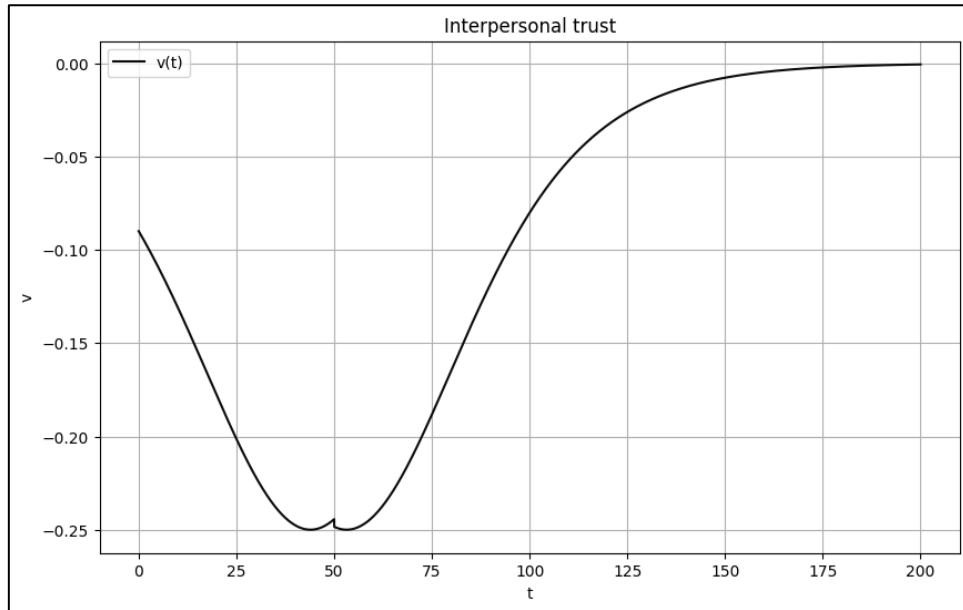
Notes: In Panel A, if we assume a logistic functional form of the evolution of institutional trust, a society reaches predominant cooperation with the institutions in the absence of regime changes, that is,  $u(t)$  reaches the value of 1. In Panel B, the level of cooperation in the society falls abruptly because of a sovereignty change at time  $t = 50$ . However, logistic growth continues undisturbed afterwards, as the level of  $u$  was relatively high at time  $t$ . Both curves in the figures correspond to the following parameters of  $u(t)$  evolution:  $a = 0.02$  and  $b = 0.2$ .

Figure 3: Interpersonal trust dynamics in the absence and presence of a sovereignty change.

Panel A: Absence of a sovereignty change



Panel B: Presence of a sovereignty change

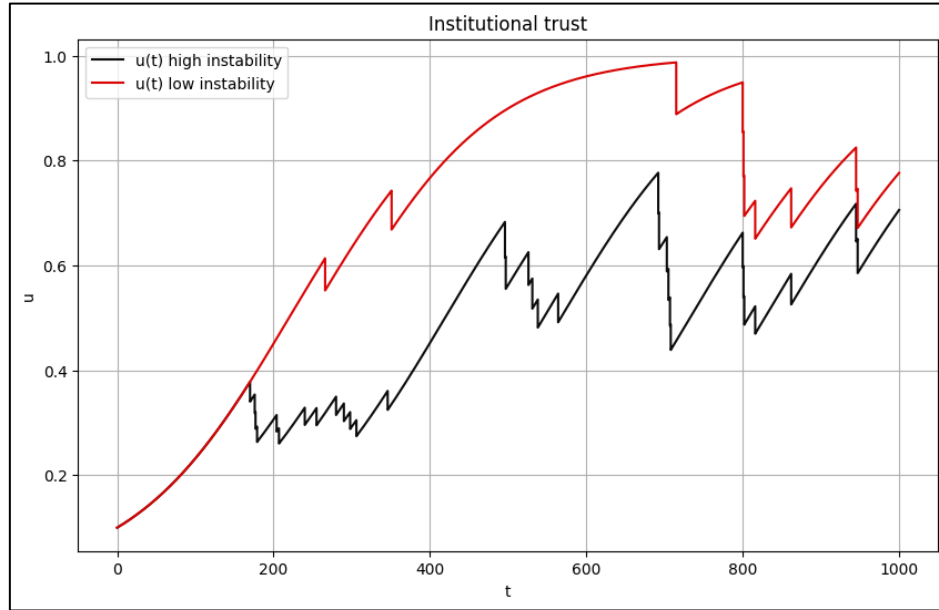


Notes: Panel A depicts evolution of interpersonal trust  $v(t)$  in society, with  $v(t)$  reaching its minimum value as institutional trust  $u(t)$  is at 0.5, that is when society is fractured in half regarding institutional trust. Eventually, as  $u(t)$  increases above 0.5 to 1,  $v(t)$  also increases and reaches its highest value. In Panel B, a sovereignty change that occurs at time  $t = 50$  impact  $v(t)$  through its relationship with institutional trust. However, the effect is short-lived, as the shock occurred when  $v(t)$  was already around its minimum. Both curves in the figures correspond to the following parameters of  $u(t)$  evolution:  $a = 0.02$  and  $b = 0.2$ .

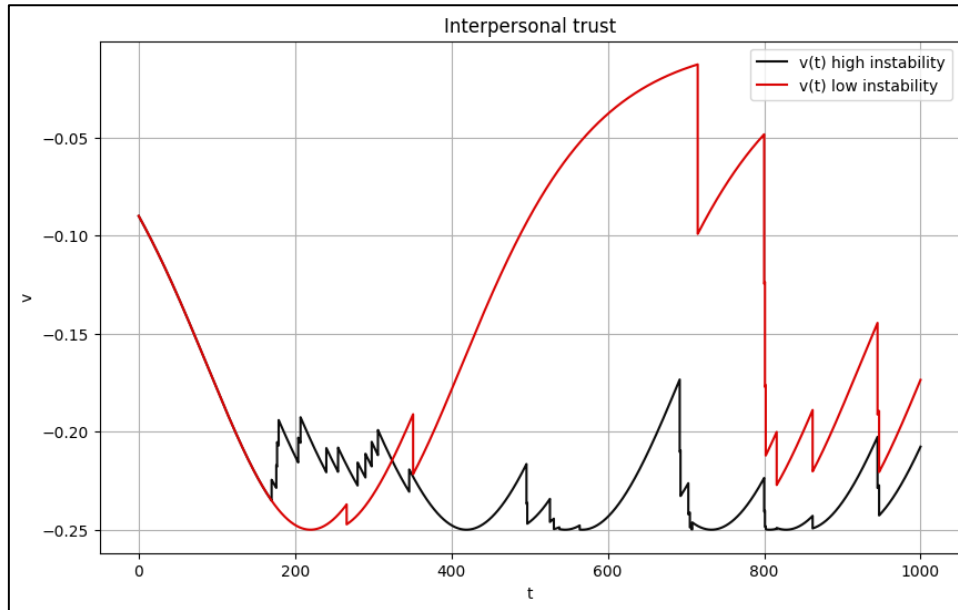


Figure 4: Long-term evolution of trust under two sequences of sovereignty shocks.

Panel A: Institutional trust

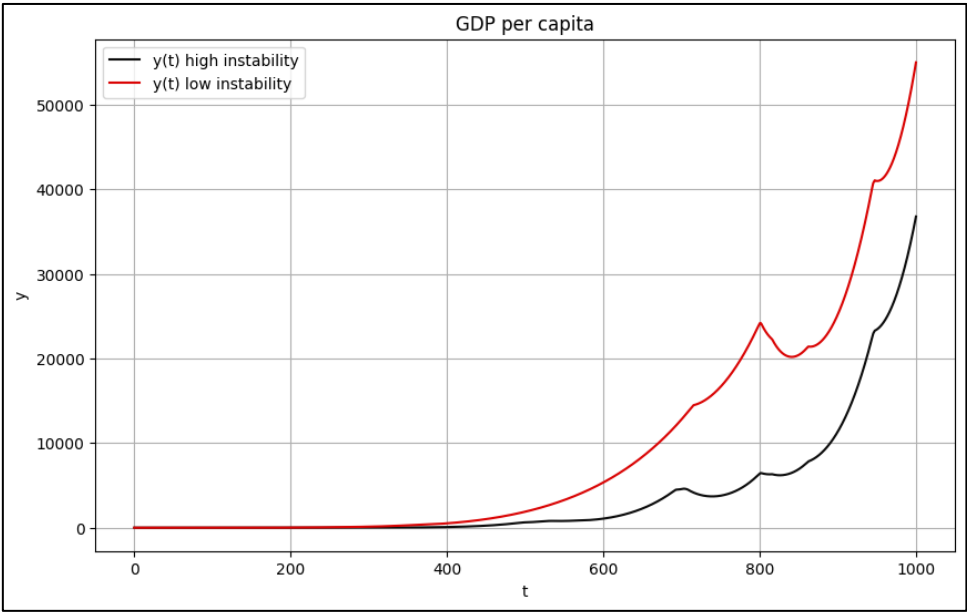


Panel B: Interpersonal trust



Notes: In Panel A, the red line depicts the evolution of  $u$  in a LLM that has experienced 10 sovereignty changes, while the black line refers to a LLM that has experienced 33 sovereignty changes in a 1000-year period. In Panel B, the red line depicts the evolution of  $v$  in a LLM that has experienced 10 sovereignty changes, while the black line refers to a LLM that has experienced 33 sovereignty changes in a 1000-year period.

Figure 5: Long-term evolution of trust-augmented GDP per capita.



Notes: A higher number of sovereignty changes (black line) results in a lower long-term economic development level.

Table 2: Mechanism analysis—Historical sovereignty change and civic capital.

| Civic Capital Dimension                |                                 |                        | Institutional         |                        |                       |                        | Interpersonal         |                        |                      |                        |
|----------------------------------------|---------------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|----------------------|------------------------|
| Dependent Variable                     | Voter Turnout                   |                        | TV Tax Evasion        |                        | Waste Recycling       |                        | Volunteering          |                        | AIDO Section         |                        |
| Estimation Method                      | OLS                             | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                  | TSLS                   |
|                                        | (1)                             | (2)                    | (3)                   | (4)                    | (5)                   | (6)                    | (7)                   | (8)                    | (9)                  | (10)                   |
| Sovereignty Change                     | -0.002****<br>(0.000)           | -0.005**<br>(0.002)    | 0.002****<br>(0.001)  | 0.020****<br>(0.005)   | -0.008****<br>(0.001) | -0.028****<br>(0.008)  | -1.435****<br>(0.276) | -3.144**<br>(1.504)    | -0.000<br>(0.003)    | -0.053***<br>(0.021)   |
| Geographical Controls                  | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Demographic and Economic Controls      | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Infrastructural Controls               | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Historical Controls                    | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Observations                           | 611                             | 607                    | 611                   | 607                    | 610                   | 606                    | 611                   | 607                    | 611                  | 607                    |
| F Statistic                            | 19.59                           | 18.98                  | 16.50                 | 9.44                   | 32.10                 | 22.74                  | 54.54                 | 46.96                  | 38.53                | 19.07                  |
| First-Stage F Statistic on Excluded IV | ...                             | 19.95                  | ...                   | 19.95                  | ...                   | 19.91                  | ...                   | 19.95                  | ...                  | 19.95                  |
| Excluded IV                            | ...                             | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037) | ...                   | -18.078****<br>(4.052) | ...                   | -18.032****<br>(4.037) | ...                  | -18.032****<br>(4.037) |
| Dependent Variable                     |                                 |                        | Civic Capital         |                        |                       |                        |                       |                        |                      |                        |
| Civic Capital Dimension                | Institutional and Interpersonal |                        |                       |                        | Institutional         |                        | Interpersonal         |                        |                      |                        |
| Estimation Method                      | OLS                             | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                  | TSLS                   |
|                                        | (11)                            | (12)                   | (13)                  | (14)                   | (15)                  | (16)                   | (15)                  | (16)                   | (15)                 | (16)                   |
| Sovereignty Change                     | -0.006****<br>(0.001)           | -0.029****<br>(0.007)  | -0.006****<br>(0.001) | -0.031****<br>(0.008)  | -0.003***<br>(0.001)  | -0.021***<br>(0.007)   | -0.003***<br>(0.001)  | -0.021***<br>(0.007)   | -0.003***<br>(0.001) | -0.021***<br>(0.007)   |
| Geographical Controls                  | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Demographic and Economic Controls      | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Infrastructural Controls               | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Historical Controls                    | Yes                             | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Observations                           | 610                             | 606                    | 610                   | 606                    | 611                   | 606                    | 611                   | 607                    | 611                  | 607                    |
| F Statistic                            | 48.93                           | 28.41                  | 31.67                 | 19.72                  | 39.42                 | 25.90                  | 39.42                 | 25.90                  | 39.42                | 25.90                  |
| First-Stage F Statistic on Excluded IV | ...                             | 19.91                  | ...                   | 19.91                  | ...                   | 19.95                  | ...                   | 19.95                  | ...                  | 19.95                  |
| Excluded IV                            | ...                             | -18.078****<br>(4.052) | ...                   | -18.078****<br>(4.052) | ...                   | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037) | ...                  | -18.032****<br>(4.037) |

Notes: Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table 3: Historical sovereignty change, civic capital, and economic development—Structural model estimates.

| Model                                                      | (1)                    |                                                            |                       | (2)                    |                                         |                                         |                       |
|------------------------------------------------------------|------------------------|------------------------------------------------------------|-----------------------|------------------------|-----------------------------------------|-----------------------------------------|-----------------------|
| Dependent Variable                                         | Sovereignty Change     | Civic Capital – Institutional and Interpersonal Dimensions | Labor Productivity    | Sovereignty Change     | Civic Capital – Institutional Dimension | Civic Capital – Interpersonal Dimension | Labor Productivity    |
| Attractiveness                                             | -15.857****<br>(4.048) | ...                                                        | ...                   | -15.860****<br>(4.049) | ...                                     | ...                                     | ...                   |
| Sovereignty Change                                         | ...                    | -0.081****<br>(0.018)                                      | ...                   | ...                    | -0.086****<br>(0.018)                   | -0.072****<br>(0.021)                   | ...                   |
| Civic Capital – Institutional and Interpersonal Dimensions | ...                    | ...                                                        | 18.288****<br>(2.580) | ...                    | ...                                     | ...                                     | ...                   |
| Civic Capital – Institutional Dimension                    | ...                    | ...                                                        | ...                   | ...                    | ...                                     | ...                                     | 12.502****<br>(2.260) |
| Civic Capital – Interpersonal Dimension                    | ...                    | ...                                                        | ...                   | ...                    | ...                                     | ...                                     | 7.126***<br>(2.244)   |
| Geographical Controls                                      | Yes                    | Yes                                                        | Yes                   | Yes                    | Yes                                     | Yes                                     | Yes                   |
| Demographic and Economic Controls                          | No                     | Yes                                                        | Yes                   | No                     | Yes                                     | Yes                                     | Yes                   |
| Infrastructural Controls                                   | No                     | Yes                                                        | Yes                   | No                     | Yes                                     | Yes                                     | Yes                   |
| Historical Controls                                        | Yes                    | Yes                                                        | Yes                   | Yes                    | Yes                                     | Yes                                     | Yes                   |
| Observations                                               | 606                    |                                                            |                       | 606                    |                                         |                                         |                       |
| Log-Likelihood                                             | -4,269.09              |                                                            |                       | -4,588.76              |                                         |                                         |                       |

Notes: Maximum Likelihood estimates. Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

## ONLINE APPENDIX

# **Sovereignty, Civic Capital, and Local Development. A Historical Perspective in Economic Geography**

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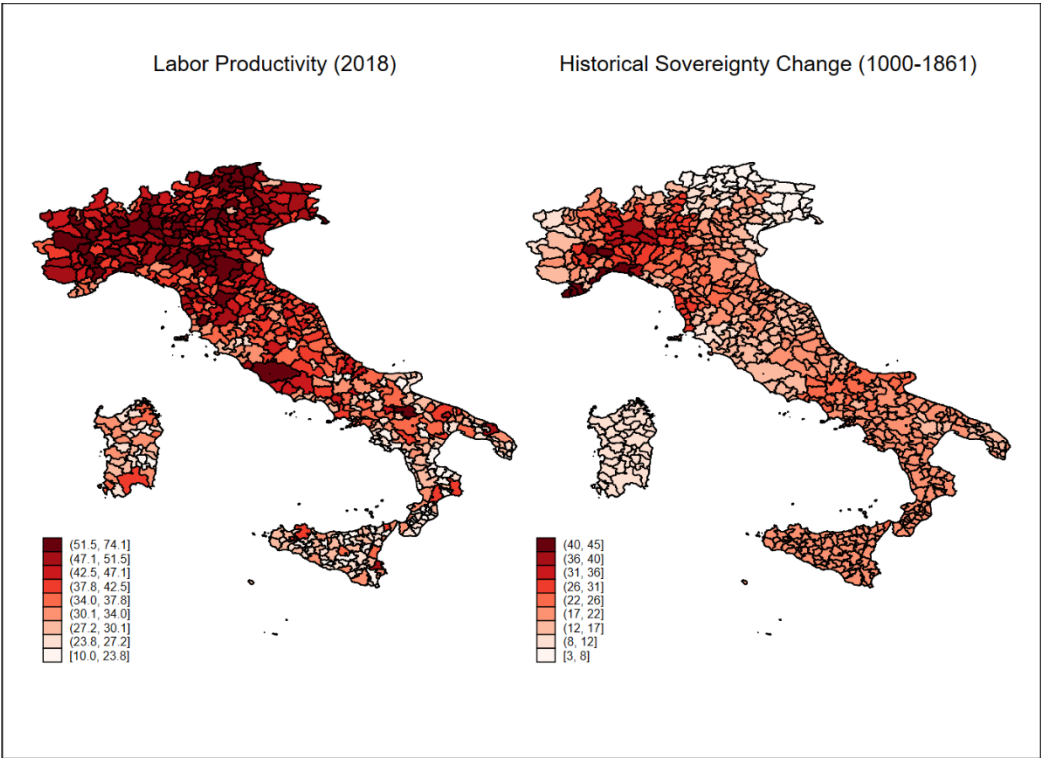
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## **APPENDIX A—Data and descriptive statistics**

This Appendix provides details on the variables entering Equation (1) in the main text. Figure A1 maps the spatial distribution of labor productivity in year 2018 and historical sovereignty change in the period 1000–1861. Table A1 summarizes the definition and data sources of these variables, while some summary statistics are reported in Table A2.

Figure A1: Spatial distribution of labor productivity and historical sovereignty change.



Notes: Labor productivity is defined as value added (thousand Euros) per worker in year 2018. Historical sovereignty change is defined as the yearly number of sovereignty changes in the period 1000–1861. Darker shades denote higher values of the variables. Authors’ elaboration on ISTAT and *Centennia Historical Atlas Research Edition*.

Table A1: Definition and source of variables.

| Variable                                            | Definition                                                                   | Source                                        |
|-----------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------|
| Labor Productivity in 2018                          | Value added (thousand Euros) per employee in 2018                            | ISTAT <sup>(1)</sup>                          |
| Sovereignty Change in 1000–1861                     | Yearly number of sovereignty changes in 1000–1861                            | CRE                                           |
| Altitude                                            | Average elevation from the sea level (meters)                                | ISTAT <sup>(2)</sup>                          |
| Terrain Ruggedness                                  | Average terrain ruggedness (km) based on 30 arc-seconds grid                 | Nunn and Puga (2012)                          |
| Distance to the Seacoast                            | Distance to the closest seacoast (km)                                        | ISTAT <sup>(3)</sup>                          |
| $\Delta$ Caloric Suitability Index (Pre-/Post-1500) | Growth rate of the caloric suitability index for pre- and post-1500          | Galor and Özak (2016)                         |
| Northern Italy                                      | Dummy for Northern Italy macro-region                                        | ISTAT <sup>(2)</sup>                          |
| Central Italy                                       | Dummy for Central Italy macro-region                                         | ISTAT <sup>(2)</sup>                          |
| Southern Italy                                      | Dummy for continental Southern Italy macro-region                            | ISTAT <sup>(2)</sup>                          |
| Islands                                             | Dummy for insular Southern Italy macro-region                                | ISTAT <sup>(2)</sup>                          |
| Resident Population in 2011                         | Number of residents (thousands) in 2011                                      | ISTAT <sup>(4)</sup>                          |
| Employment Density in 2011                          | Number of employees per square km in 2011                                    | ISTAT <sup>(1)(2)</sup>                       |
| Industrial District in 2011                         | Dummy for industrial district in 2011                                        | ISTAT <sup>(5)</sup>                          |
| Share Tertiary Educated Population in 2011          | Share of population with tertiary education in 2011                          | ISTAT <sup>(4)</sup>                          |
| Unemployment Rate in 2011                           | Unemployment rate in 2011                                                    | ISTAT <sup>(4)</sup>                          |
| Density of Navigable Rivers                         | Length of navigable rivers per square km                                     | OpenStreetMap; ISTAT <sup>(2)</sup>           |
| Density of National Streets                         | Length of national streets per square km                                     | ANAS; ISTAT <sup>(2)</sup>                    |
| Density of Railways                                 | Length of railways per square km                                             | OpenStreetMap; ISTAT <sup>(2)</sup>           |
| Density of Ancient Roman Roads                      | Length of ancient Roman roads per square km                                  | McCormick et al. (2013); ISTAT <sup>(2)</sup> |
| Number of Roman Cities in 100 B.C.–A.D. 300         | Number of settlements identified as Roman urban centers in 100 B.C.–A.D. 300 | Hanson (2016)                                 |
| Number of Bishop Seats in 1000                      | Number of bishop seats in 1000                                               | Treccani (2007)                               |
| Presence of a Large City in 1000                    | Presence of a city with at least 10,000 inhabitants in 1000                  | Bosker et al. (2013)                          |
| Pre-Unification Sovereignities in 1859              | Categorical variable for sovereignities in 1859                              | CRE                                           |

Notes: ISTAT stands for Italian National Institute of Statistics. CRE stands for *Centennia Historial Atlas Research Edition*. ANAS is the Italian national autonomous company managing national streets and highways under the technical and operative surveillance of the Italian Ministry of Infrastructure and Transport. <sup>(1)</sup> National economic accounts.

<sup>(2)</sup> Shapefile of LLMs. <sup>(3)</sup> Shapefile of coastline. <sup>(4)</sup> 2011 *Population Census*. <sup>(5)</sup> 2011 *Industry and Services Census*.



Table A2: Descriptive statistics.

| Variable                                            | Mean   | Std. Dev. | Min.  | Max.     |
|-----------------------------------------------------|--------|-----------|-------|----------|
| Labor Productivity in 2018                          | 37.09  | 11.27     | 10.02 | 74.13    |
| Sovereignty Change in 1000–1861                     | 18.40  | 6.27      | 3.00  | 45.00    |
| Altitude                                            | 459.95 | 420.12    | 0.83  | 2,314.34 |
| Terrain Ruggedness                                  | 0.25   | 0.19      | 0.00  | 0.80     |
| Distance to the Seacoast                            | 51.68  | 53.01     | 0.48  | 236.54   |
| $\Delta$ Caloric Suitability Index (Pre-/Post-1500) | -0.10  | 0.09      | -0.41 | 0.07     |
| Northern Italy                                      | 0.37   | 0.48      | 0     | 1        |
| Central Italy                                       | 0.17   | 0.38      | 0     | 1        |
| Southern Italy                                      | 0.28   | 0.45      | 0     | 1        |
| Islands                                             | 0.18   | 0.38      | 0     | 1        |
| Resident Population in 2011                         | 97.27  | 258.29    | 3.14  | 3,685.10 |
| Employment Density in 2011                          | 74.29  | 95.73     | 3.48  | 877.76   |
| Share Tertiary Educated Population in 2011          | 0.09   | 0.02      | 0.03  | 0.19     |
| Unemployment Rate in 2011                           | 0.12   | 0.06      | 0.01  | 0.27     |
| Industrial District                                 | 0.23   | 0.42      | 0     | 1        |
| Density of Navigable Rivers                         | 0.00   | 0.01      | 0.00  | 0.14     |
| Density of National Streets                         | 0.10   | 0.10      | 0.00  | 0.67     |
| Density of Railways                                 | 0.11   | 0.14      | 0.00  | 1.22     |
| Density of Ancient Roman Roads                      | 0.06   | 0.06      | 0.00  | 0.72     |
| Number of Roman Cities in 100 B.C.–A.D. 300         | 0.61   | 1.34      | 0.00  | 20.00    |
| Number of Bishop Seats in 1000                      | 0.46   | 0.86      | 0.00  | 7.00     |
| Presence of a Large City in 1000                    | 0.03   | 0.17      | 0     | 1        |
| Pre-Unification Sovereignities in 1859              |        |           |       |          |
| Habsburgs                                           | 0.28   | 0.45      | 0     | 1        |
| Bourbons                                            | 0.41   | 0.49      | 0     | 1        |
| Savoy House                                         | 0.16   | 0.37      | 0     | 1        |
| Papal States                                        | 0.11   | 0.31      | 0     | 1        |
| Duchy of Parma and Piacenza                         | 0.01   | 0.11      | 0     | 1        |
| Duchy of Modena and Reggio                          | 0.03   | 0.16      | 0     | 1        |

Notes: Descriptive statistics refer to 611 LLMs.

## APPENDIX B—Robustness and placebo analyses

This Appendix presents a series of robustness and placebo exercises aimed at testing the validity of the main results presented in Table 1 in the main test.

### Robustness analysis

First, we test the robustness of the Ordinary Least Squares (OLS) and Two-Stage Least Squares (TSLS) analyses by relying on alternative variables capturing local economic development, namely value added (thousand Euros) per capita and income per capita in year 2018.<sup>1</sup> The OLS and TSLS estimates, which are reported in Table B1, fully corroborate our main findings.

Second, we corroborate the main results when considering historical sovereignty change defined as the yearly number of changes in sovereignty occurred over the period 1000–1920, that is, when the Italian unification process ended with the annexation of the remaining territories belonging to the present-day regions of Trentino-South Tyrol and Friuli-Venezia Giulia (Table B2).

Third, we corroborate the baseline OLS estimates for inference by accounting for spatial dependence a la Conley (1999), and consider distance cut-off values in the error structure set between 50 km and 800 km (Table B3).

Fourth, we replicate our baseline OLS analysis by accounting for imputed labor productivity data and/or missing data in the TSLS analysis. The results, which are reported in Table B4, fully corroborate the main ones presented in Table 1 in the main text.

Fifth, we test the reliability of the *Centennia Historical Atlas Research Edition* (CRE) database by comparing it with the *Euratlas Periodic Historical Atlas of Europe* (EurAtlas), which provides shapefiles of sovereignty boundaries with a 100-year interval in the period 1–2000. For the sake of comparison, we calculate the number of sovereignty changes that occurred in the period

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<sup>1</sup> Income data at the municipality level are obtained from the Italian Ministry of Economy and Finance.

1000–1900 based on a 100-year interval using both the CRE and the Euratlas databases. As shown in Table B5, our main results are fully confirmed.<sup>2</sup>

Sixth, we corroborate the TSLS results reported in Table 1 in the main text when accounting for spatial dependence a la Conley (1999) with distance cut-off values set at 50 km and 200 km, respectively (Table B6).

Seventh, we test the robustness of the TSLS results by considering an alternative instrumental variable for historical sovereignty change defined as the variability in the share of crop and pasture land over the period 500–1900 relative to that of the surrounding LLMs lying within 200 km of the reference LLM. The rationale for this alternative IV is to capture the relative rather than absolute attractiveness of a LLM for potential conquerors. Besides robust standard errors, we consider standard errors a la Conley (1999) with distance cut-off values set at 50 km and 200 km, respectively. The results, which are reported in Table B7, fully corroborate the main ones.

Finally, we also test for cross-LLM labor productivity spillover effects by modifying Equation (1) in the main text according to a spatial lag model estimated via TSLS. Specifically, we construct the spatial lag of the labor productivity dependent variable through an inverse distance, row-normalized spatial weights matrix, and instrument it with the spatial lags of the explanatory variables defined according the same spatial matrix. The results of this exercise, which are reported in Table B8, confirm a negative and statistically significant effect of historical sovereignty change on current local economic development. They also suggest the presence of cross-LLM labor productivity spillovers which are, however, very small in magnitude and marginally significant from a statistical point of view.

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<sup>2</sup> We consider sovereignty changes based on a 100-year interval because this is the minimum time span available in the Euratlas database. We compute these variables for the period 1000–1900 because the time span of the Euratlas database prevents us from calculating them for the period 1000–1861. Moreover, the Euratlas database adopts a relatively more restrictive measure of the coastline, such that the centroid of five LLMs—that is, Capri, Comacchio, Malcesine, Santa Teresa Gallura, and Venice—falls into the water. As a consequence, we cannot compute the variable for historical sovereignty change using the Euratlas database for the abovementioned five LLMs—indeed, the variable is calculated by counting how many times the centroid of a LLM changes sovereignty.

## **Placebo analysis**

We also run a placebo exercise by randomly assigning the number of sovereignty changes that occurred in the period 1000–1861 to LLMs (Chetty et al. 2009; Belloc et al. 2016). Specifically, we randomly draw 1,000 placebo variables for historical sovereignty change and estimate Equation (1) in the main text via both OLS and TSLS. We find that the estimated placebo effect is statistically significant in only 8.4% of occurrences when relying on the OLS estimator, and in only 7.5% of occurrences when relying on the TSLS estimator (Table B9).

Overall, these results support our main evidence, and suggest that the estimated negative relationship between historical sovereignty change and current local economic development is not due to pure chance.

Table B1: Historical sovereignty change and local development—Alternative dependent variables.

| Dependent Variable                     | Value Added Per Capita |                        | Income Per Capita     |                         |
|----------------------------------------|------------------------|------------------------|-----------------------|-------------------------|
| Estimation Method                      | OLS                    | TSLS                   | OLS                   | TSLS                    |
|                                        | (1)                    | (2)                    | (3)                   | (4)                     |
| Sovereignty Change                     | -0.102****<br>(0.028)  | -0.680***<br>(0.209)   | -26.566***<br>(8.700) | -188.043***<br>(62.521) |
| Geographical Controls                  | Yes                    | Yes                    | Yes                   | Yes                     |
| Demographic and Economic Controls      | Yes                    | Yes                    | Yes                   | Yes                     |
| Infrastructural Controls               | Yes                    | Yes                    | Yes                   | Yes                     |
| Historical Controls                    | Yes                    | Yes                    | Yes                   | Yes                     |
| Observations                           | 611                    | 607                    | 611                   | 607                     |
| F Statistic                            | 80.30                  | 44.07                  | 337.03                | 193.85                  |
| First-Stage F Statistic on Excluded IV | ...                    | 19.95                  | ...                   | 19.95                   |
| Excluded IV                            | ...                    | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037)  |

Notes: Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B2: Historical sovereignty change in 1000–1920 and local development.

| Dependent Variable                     | Labor Productivity  |                        |
|----------------------------------------|---------------------|------------------------|
|                                        | OLS                 | TSLS                   |
| Estimation Method                      | (1)                 | (2)                    |
| Sovereignty Change in 1000–1920        | -0.132**<br>(0.059) | -1.023***<br>(0.366)   |
| Geographical Controls                  | Yes                 | Yes                    |
| Demographic and Economic Controls      | Yes                 | Yes                    |
| Infrastructural Controls               | Yes                 | Yes                    |
| Historical Controls                    | Yes                 | Yes                    |
| Observations                           | 611                 | 607                    |
| F Statistic                            | 72.26               | 44.35                  |
| First-Stage F Statistic on Excluded IV |                     | 19.53                  |
| Excluded IV                            | ...                 | -18.025****<br>(4.079) |

Notes: Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B3: Historical sovereignty change and local development—Inference test on OLS estimates.

| Dependent Variable                | Labor Productivity |                    |                     |                      |                       |                       |
|-----------------------------------|--------------------|--------------------|---------------------|----------------------|-----------------------|-----------------------|
| Distance Cut-Off Value            | 50 km              | 100 km             | 200 km              | 400 km               | 600 km                | 800 km                |
|                                   | (1)                | (2)                | (3)                 | (4)                  | (5)                   | (6)                   |
| Sovereignty Change                | -0.117*<br>(0.063) | -0.117*<br>(0.068) | -0.117**<br>(0.059) | -0.117***<br>(0.044) | -0.117****<br>(0.034) | -0.117****<br>(0.030) |
| Geographical Controls             | Yes                | Yes                | Yes                 | Yes                  | Yes                   | Yes                   |
| Demographic and Economic Controls | Yes                | Yes                | Yes                 | Yes                  | Yes                   | Yes                   |
| Infrastructural Controls          | Yes                | Yes                | Yes                 | Yes                  | Yes                   | Yes                   |
| Historical Controls               | Yes                | Yes                | Yes                 | Yes                  | Yes                   | Yes                   |
| Observations                      | 611                | 611                | 611                 | 611                  | 611                   | 611                   |

Notes: Standard errors corrected for spatial dependence a la Conley (1999) in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B4: Historical sovereignty change and local development—Test on imputed and/or excluded observations.

| Dependent Variable<br>Test For    | Labor Productivity                           |                                             |                                             |
|-----------------------------------|----------------------------------------------|---------------------------------------------|---------------------------------------------|
|                                   | Imputed Economic Data                        | Missing Data in IV Estimates                | Both Imputed and Missing Data               |
|                                   | (1)                                          | (2)                                         | (3)                                         |
| Sovereignty Change                | -0.118<br>(0.057)**<br>[0.063]*<br>{0.059}** | -0.114<br>(0.057)**<br>[0.063]*<br>{0.059}* | -0.114<br>(0.057)**<br>[0.063]*<br>{0.059}* |
| Geographical Controls             | Yes                                          | Yes                                         | Yes                                         |
| Demographic and Economic Controls | Yes                                          | Yes                                         | Yes                                         |
| Infrastructural Controls          | Yes                                          | Yes                                         | Yes                                         |
| Historical Controls               | Yes                                          | Yes                                         | Yes                                         |
| Observations                      | 609                                          | 607                                         | 605                                         |
| R <sup>2</sup>                    | 0.68                                         | 0.68                                        | 0.68                                        |

Notes: Robust standard errors in parentheses. Standard errors corrected for spatial dependence a la Conley (1999): in brackets with distance cut-off set at 50 km; in braces with distance cut-off set at 200 km. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .



Table B5: Historical sovereignty change and local development—Database validity test.

| Dependent Variable                | Labor Productivity                                  |                                                     |                                                 |
|-----------------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|
| Database                          | CRE                                                 |                                                     | Euratlas                                        |
|                                   | (1)                                                 | (2)                                                 | (3)                                             |
| Sovereignty Change                | -1.325<br>(0.329)****<br>[0.348]****<br>{0.282}**** | -1.325<br>(0.329)****<br>[0.350]****<br>{0.293}**** | -1.007<br>(0.322)***<br>[0.350]***<br>{0.399}** |
| Geographical Controls             | Yes                                                 | Yes                                                 | Yes                                             |
| Demographic and Economic Controls | Yes                                                 | Yes                                                 | Yes                                             |
| Infrastructural Controls          | Yes                                                 | Yes                                                 | Yes                                             |
| Historical Controls               | Yes                                                 | Yes                                                 | Yes                                             |
| Observations                      | 611                                                 | 606                                                 | 606                                             |
| R <sup>2</sup>                    | 0.68                                                | 0.69                                                | 0.68                                            |

Notes: CRE stands for *Centennia Historical Atlas Research Edition*. Robust standard errors in parentheses. Standard errors corrected for spatial dependence a la Conley (1999): in brackets with distance cut-off set at 50 km; in braces with distance cut-off set at 200 km. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B6: Historical sovereignty change and local development—Inference test on TSLS estimates.

| Dependent Variable                     | Labor Productivity     |                        |
|----------------------------------------|------------------------|------------------------|
| Distance Cut-Off Value                 | 50 km                  | 200 km                 |
|                                        | (1)                    | (2)                    |
| Sovereignty Change                     | -1.023**<br>(0.416)    | -1.023***<br>(0.342)   |
| Geographical Controls                  | Yes                    | Yes                    |
| Demographic and Economic Controls      | Yes                    | Yes                    |
| Infrastructural Controls               | Yes                    | Yes                    |
| Historical Controls                    | Yes                    | Yes                    |
| Observations                           | 607                    | 607                    |
| First-Stage F Statistic on Excluded IV | 13.51                  | 14.25                  |
| Excluded IV                            | -18.032****<br>(4.675) | -18.032****<br>(4.553) |

Notes: Standard errors corrected for spatial dependence a la Conley (1999) in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B7: Historical sovereignty change and local development—Alternative IV.

| Dependent Variable                     | Labor Productivity    |                       |                       |
|----------------------------------------|-----------------------|-----------------------|-----------------------|
|                                        | Robust                | Conley (1999)         |                       |
|                                        |                       | 50 km                 | 200 km                |
| Standard Errors                        | (1)                   | (2)                   | (3)                   |
| Sovereignty Change                     | -1.088***<br>(0.404)  | -1.088**<br>(0.438)   | -1.088****<br>(0.324) |
| Geographical Controls                  | Yes                   | Yes                   | Yes                   |
| Demographic and Economic Controls      | Yes                   | Yes                   | Yes                   |
| Infrastructural Controls               | Yes                   | Yes                   | Yes                   |
| Historical Controls                    | Yes                   | Yes                   | Yes                   |
| Observations                           | 607                   | 607                   | 607                   |
| First-Stage F Statistic on Excluded IV | 17.70                 | 12.30                 | 14.51                 |
| Excluded IV                            | -2.260****<br>(0.537) | -2.260****<br>(0.614) | -2.260****<br>(0.565) |

Notes: Standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B8: Historical sovereignty change and local development—TSLS spatial lag estimates.

| Dependent Variable                                               | Labor Productivity  |                     |                        |
|------------------------------------------------------------------|---------------------|---------------------|------------------------|
|                                                                  | Exogenous           | Endogenous          |                        |
| Historical Sovereignty Change                                    | (1)                 | (2)                 | (3)                    |
| Sovereignty Change                                               | -0.122**<br>(0.060) | -0.118**<br>(0.056) | -1.044**<br>(0.445)    |
| W×Labor Productivity                                             | 0.151<br>(0.098)    | 0.186*<br>(0.105)   | 0.190*<br>(0.104)      |
| Geographical Controls                                            | Yes                 | Yes                 | Yes                    |
| Demographic and Economic Controls                                | Yes                 | Yes                 | Yes                    |
| Infrastructural Controls                                         | Yes                 | Yes                 | Yes                    |
| Historical Controls                                              | Yes                 | Yes                 | Yes                    |
| Observations                                                     | 611                 | 607                 | 607                    |
| F Statistic                                                      | 63.43               | 65.36               | 39.57                  |
| First-Stage F Statistic on Excluded IVs for W×Labor Productivity | 93.41               | 95.21               | 95.21                  |
| First-Stage F Statistic on Excluded IV for Sovereignty Change    | ...                 | ...                 | 19.35                  |
| Excluded IV for Sovereignty Change                               | ...                 | ...                 | -21.889****<br>(4.081) |

Notes: Robust standard errors (bootstrapped, 1000 replications) in parentheses. All specifications include a constant term. The spatially lagged dependent variable is instrumented with the spatial lags of the explanatory variables defined through an inverse distance, row-normalized spatial weights matrix. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table B9: Inference on 1,000 randomly assigned numbers of sovereignty change.

| Significance Level | Regressions with Significant Placebo Coefficient |      |      |      |
|--------------------|--------------------------------------------------|------|------|------|
|                    | OLS                                              |      | TSLS |      |
|                    | No.                                              | %    | No.  | %    |
| 10%                | 37                                               | 3.70 | 54   | 5.40 |
| 5%                 | 36                                               | 3.60 | 21   | 2.10 |
| 1%                 | 11                                               | 1.10 | 0    | 0.00 |
| 0.1%               | 0                                                | 0.00 | 0    | 0.00 |
| Total              | 84                                               | 8.40 | 75   | 7.50 |

Notes: Percentage values are defined with respect to 1,000 estimations of Equation (1) in the main text.

## **APPENDIX C—Underlying mechanism**

In this Appendix, we present additional materials and robustness exercises on the empirical relationship between historical sovereignty change and civic capital.

### **Suggestive evidence based on survey data**

We provide suggestive evidence on the direct link between historical sovereignty change and trust by relying on individual-level data drawn from the 2010 wave of the *Survey on Household, Income and Wealth* (SHIW) provided by the Bank of Italy.

We collect trust information for 2,820 individuals across 147 LLMs. We proxy institutional trust through available information on trust towards the banks, and interpersonal trust through available information on generalized trust. Both trust variables are originally assessed on a 1–10 scale; we also normalized them in the interval  $[0, 1]$ . Although we are unable to capture directly trust towards the institutions, trust in the banking system can be considered a good proxy for it, at least empirically. Indeed, as shown in Figure C1, there is a positive cross-country correlation between trust in the national government and confidence in the banking system.

The results based on survey data are reported in Table C1, and suggest a negative and statistically significant association between historical sovereignty change and both institutional and interpersonal trust, thus corroborating our theoretical model and insights.

### **Data and variables on trust and civic capital**

#### *The institutional dimension of civic capital formation*

As discussed in the main text of this paper, we proxy the institutional dimension of civic capital formation through three variables, namely referendum voter turnout, TV tax evasion, and waste recycling.

First, we consider the Italian referendum held in June 2011, and use data provided by the Italian Ministry of the Interior. The June 2011 referendum included four questions, namely: the entrusting and management of local public services with economic relevance; the determination of the integrated water service tariff based on an adequate return on invested capital; the production of nuclear electric power on the national territory; and the legal impediment of the Prime Minister and the Ministers. We define voter turnout as the average value with respect to the four questions of the referendum, and normalize the variable in the interval  $[0, 1]$ .

Second, we consider the share of households not paying the TV licensing fee in year 2014, and use data provided by INTWIG.<sup>3</sup> The TV licensing fee is a mandatory, fix-rate tax that every household—regardless of the number of members—owning at least one telecommunication device receiving radio and/or TV signals has to pay, independent of use (Buonanno et al. 2022).<sup>4</sup> We define the variable for TV tax evasion rate as the share of households that do not pay the TV tax over the total number of resident households in a LLM, and normalize it in the interval  $[0, 1]$ .

Third, we proxy the institutional dimension of civic capital with the percentage of urban waste recycled—normalized in the interval  $[0, 1]$ —in year 2013, and use data provided by the Italian Institute for Environmental Protection and Research (ISPRA).

### *The interpersonal dimension of civic capital formation*

We proxy the interpersonal dimension of civic capital formation through two variables capturing individuals' altruistic behavior in society based on non-profit associationism (Putnam et al. 1993).

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<sup>3</sup> Municipality-level data on TV tax evasion in year 2014 can be accessed at [https://twig.carto.com/viz/0a806338-777b-11e5-877e-0ecd1babdde5/public\\_map](https://twig.carto.com/viz/0a806338-777b-11e5-877e-0ecd1babdde5/public_map).

<sup>4</sup> Free-riding on the TV tax has been traditionally a widespread behavior for two main reasons. First, despite the compulsory nature of the TV tax, programs offered by the Italian public broadcasting company can be accessed even without paying the licensing fee. Second, evasion of the TV tax could only be determined by entering households' residence to assess the presence of telecommunication devices: this makes it a private act unobservable to other individuals and, thus, entailing a low risk of institutional and social sanctions (Bagnato 2022). For these reasons, starting from July 2016, the Italian government implemented a new legislation stipulating that the TV licensing fee should be paid in conjunction with the electricity bill, thus making evasion nearly impossible on pain of suspension of the electricity supply.

First, we consider the number of unpaid voluntary workers in non-profit organizations per 1,000 inhabitants in year 2011, and use data drawn from the *Census of Non-Profit Institutions* provided by ISTAT.

Second, we consider a dummy variable capturing the presence of a local section of the *Associazione Italiana per la Donazione di Organi* (AIDO), and use data drawn from Guiso et al. (2016).

### *Synthetic indexes of civic capital*

We also construct a synthetic index of civic capital based on the individual proxy variables we rely on to capture the institutional and interpersonal dimensions of civic capital formation. Specifically, we first standardize each of the abovementioned variables to have zero mean and unitary standard deviation; second, we average them to construct a synthetic measure capturing both the institutional and interpersonal dimension of civic capital formation; finally, we normalize the synthetic variable in the interval  $[0, 1]$ .

Besides such an overall index of civic capital, we also construct two sub-indexes capturing the institutional (based on voter turnout, TV tax evasion, waste recycling) and interpersonal (based on volunteering activity and the presence of an AIDO section) dimensions of civic capital, respectively.

It is worth underlining that we consider the percentage of households who do not evade the TV tax when constructing the synthetic indexes of civic capital such that all the underlying variables register a value of civic capital increasing in the value of the variable.

### **Robustness analysis**

We fully corroborate the results presented in Table 2 in the main text through a series of robustness exercises.

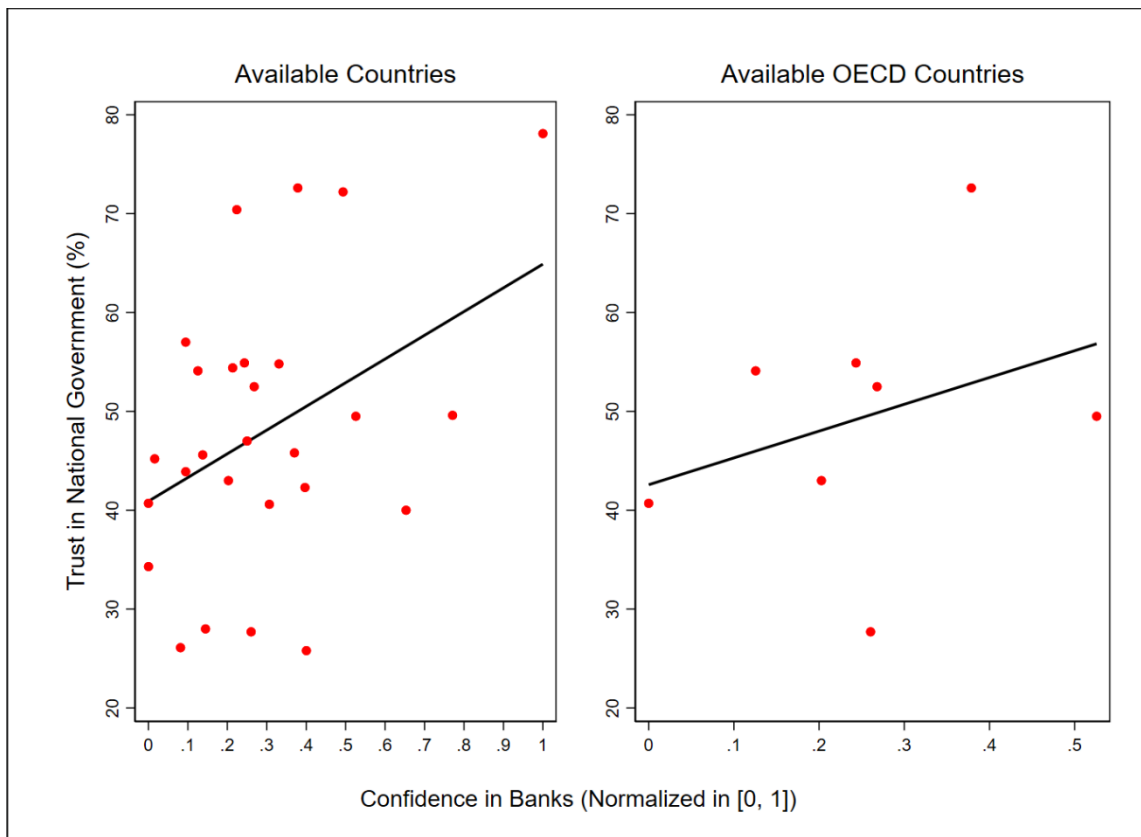


First, we account for spatial dependence a la Conley (1999) and consider distance cut-off values set at 50 km and 200 km, respectively, to test the relationship between historical sovereignty change in the period 1000–1861 and the battery of variables used to proxy for the institutional and interpersonal dimensions of civic capital formation (Table C2).

Second, we replicate the previous exercise to analyze the relationship between historical sovereignty change and the three synthetic indexes of civic capital (Table C3).

Finally, we test the robustness of the results obtained when proxying the institutional dimension of civic capital formation with referendum voter turnout by considering voter turnout with respect to the four referendum questions separately (Table C4).

Figure C1: Correlation between institutional trust and confidence in banks.



Notes: The percentage of people trusting the national government refers to year 2020. Confidence in banks is normalized in the interval  $[0, 1]$ , and refers to the period 2017–2020. Authors' elaboration on data drawn from Wellcome Global Monitor and the *World Values Survey* (wave 7, years 2017–2020). The following countries are included in the sample: Argentina, Bolivia, Brazil, Canada (OECD), Chile (OECD), Colombia (OECD), Cyprus, Ecuador, Egypt, Ethiopia, Greece (OECD), Hong Kong, Iran, Iraq, Japan (OECD), Jordan, Kenya, Mexico (OECD), Mongolia, Nicaragua, Peru, Russia, Serbia, Tunisia, Turkey (OECD), Ukraine, United States (OECD).

Table C1: Historical sovereignty change and trust at the individual level.

| Dependent Variable        | Trust in Banks                   |                                  | Generalized Trust                |                                   |
|---------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
|                           | 1 to 10 scale                    | [0, 1]                           | 1 to 10 scale                    | [0, 1]                            |
| Estimation Method         | OLS                              | Fractional Probit                | OLS                              | Fractional Probit                 |
|                           | (1)                              | (2)                              | (3)                              | (4)                               |
| Sovereignty Change        | -0.037<br>(0.014)***<br>[0.020]* | -0.011<br>(0.004)***<br>[0.006]* | -0.041<br>(0.015)***<br>[0.021]* | -0.012<br>(0.004)***<br>[0.006]** |
| Individual-Level Controls | Yes                              | Yes                              | Yes                              | Yes                               |
| NUTS-2 Region FE          | Yes                              | Yes                              | Yes                              | Yes                               |
| Observations              | 2,820                            | 2,820                            | 2,820                            | 2,820                             |
| R <sup>2</sup>            | 0.22                             | ...                              | 0.09                             | ...                               |
| Pseudo- R <sup>2</sup>    | ...                              | 0.04                             | ...                              | 0.02                              |

Notes: Robust standard errors in parentheses. Standard errors clustered at the LLM level in brackets. The set of individual-level controls includes sex, age, Italian nationality, marital status, education level, and employment status. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table C2: Mechanism analysis—Inference test on individual proxies for institutional and interpersonal dimensions of civic capital.

| Civic Capital Dimension                                          | Institutional         |                        |                     |                        | Interpersonal         |                        |                       |                        |                   |                        |
|------------------------------------------------------------------|-----------------------|------------------------|---------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-------------------|------------------------|
| Dependent Variable                                               | Voter Turnout         |                        | TV Tax Evasion      |                        | Waste Recycling       |                        | Volunteering          |                        | AIDO Sections     |                        |
| Estimation Method                                                | OLS                   | TSLS                   | OLS                 | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS               | TSLS                   |
| Conley (1999) Standard Errors with 50 km Distance Cut-Off Value  |                       |                        |                     |                        |                       |                        |                       |                        |                   |                        |
|                                                                  | (1)                   | (2)                    | (3)                 | (4)                    | (5)                   | (6)                    | (7)                   | (8)                    | (9)               | (10)                   |
| Sovereignty Change                                               | -0.002****<br>(0.000) | -0.005*<br>(0.003)     | 0.002***<br>(0.001) | 0.020****<br>(0.006)   | -0.008****<br>(0.001) | -0.028**<br>(0.011)    | -1.435****<br>(0.352) | -3.144*<br>(1.801)     | -0.000<br>(0.003) | -0.053**<br>(0.024)    |
| First-Stage F Statistic on Excluded IV                           | ...                   | 13.51                  | ...                 | 13.51                  | ...                   | 13.43                  | ...                   | 13.51                  | ...               | 13.51                  |
| Excluded IV                                                      | ...                   | -18.032****<br>(4.675) | ...                 | -18.032****<br>(4.675) | ...                   | -18.078****<br>(4.701) | ...                   | -18.032****<br>(4.675) | ...               | -18.032****<br>(4.675) |
| Conley (1999) Standard Errors with 200 km Distance Cut-Off Value |                       |                        |                     |                        |                       |                        |                       |                        |                   |                        |
|                                                                  | (11)                  | (12)                   | (13)                | (14)                   | (15)                  | (16)                   | (17)                  | (18)                   | (19)              | (20)                   |
| Sovereignty Change                                               | -0.002***<br>(0.001)  | -0.005*<br>(0.003)     | 0.002**<br>(0.001)  | 0.020***<br>(0.006)    | -0.008****<br>(0.001) | -0.028*<br>(0.016)     | -1.435**<br>(0.563)   | -3.144*<br>(1.761)     | -0.000<br>(0.003) | -0.053**<br>(0.025)    |
| First-Stage F Statistic on Excluded IV                           | ...                   | 14.25                  | ...                 | 14.25                  | ...                   | 13.88                  | ...                   | 14.25                  | ...               | 14.25                  |
| Excluded IV                                                      | ...                   | -18.032****<br>(4.553) | ...                 | -18.032****<br>(4.553) | ...                   | -18.078****<br>(4.625) | ...                   | -18.032****<br>(4.553) | ...               | -18.032****<br>(4.553) |
| Geographical Controls                                            | Yes                   | Yes                    | Yes                 | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes               | Yes                    |
| Demographic and Economic Controls                                | Yes                   | Yes                    | Yes                 | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes               | Yes                    |
| Infrastructural Controls                                         | Yes                   | Yes                    | Yes                 | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes               | Yes                    |
| Historical Controls                                              | Yes                   | Yes                    | Yes                 | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes               | Yes                    |
| Observations                                                     | 611                   | 607                    | 611                 | 607                    | 610                   | 606                    | 611                   | 607                    | 611               | 607                    |

Notes: Standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table C3: Mechanism analysis—Inference test on synthetic indexes of civic capital.

| Dependent Variable                                               | Civic Capital                   |                        |                       |                        |                      |                        |
|------------------------------------------------------------------|---------------------------------|------------------------|-----------------------|------------------------|----------------------|------------------------|
| Civic Capital Dimension                                          | Interpersonal and Institutional |                        | Institutional         |                        | Interpersonal        |                        |
| Estimation Method                                                | OLS                             | TSLS                   | OLS                   | TSLS                   | OLS                  | TSLS                   |
| Conley (1999) Standard Errors with 50 km Distance Cut-Off Value  |                                 |                        |                       |                        |                      |                        |
|                                                                  | (1)                             | (2)                    | (3)                   | (4)                    | (5)                  | (6)                    |
| Sovereignty Change                                               | -0.006****<br>(0.001)           | -0.029****<br>(0.008)  | -0.006****<br>(0.001) | -0.031****<br>(0.009)  | -0.003***<br>(0.001) | -0.021***<br>(0.007)   |
| First-Stage F Statistic on Excluded IV                           | ...                             | 13.43                  | ...                   | 13.43                  | ...                  | 13.51                  |
| Excluded IV                                                      | ...                             | -18.078****<br>(4.701) | ...                   | -18.078****<br>(4.701) | ...                  | -18.032****<br>(4.675) |
| Conley (1999) Standard Errors with 200 km Distance Cut-Off Value |                                 |                        |                       |                        |                      |                        |
|                                                                  | (7)                             | (8)                    | (9)                   | (10)                   | (11)                 | (12)                   |
| Sovereignty Change                                               | -0.006****<br>(0.001)           | -0.029****<br>(0.008)  | -0.006****<br>(0.001) | -0.031****<br>(0.009)  | -0.003**<br>(0.002)  | -0.021***<br>(0.007)   |
| First-Stage F Statistic on Excluded IV                           | ...                             | 13.88                  | ...                   | 13.88                  | ...                  | 14.25                  |
| Excluded IV                                                      | ...                             | -18.078****<br>(4.625) | ...                   | -18.078****<br>(4.625) | ...                  | -18.032****<br>(4.553) |
| Geographical Controls                                            | Yes                             | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Demographic and Economic Controls                                | Yes                             | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Infrastructural Controls                                         | Yes                             | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Historical Controls                                              | Yes                             | Yes                    | Yes                   | Yes                    | Yes                  | Yes                    |
| Observations                                                     | 610                             | 606                    | 610                   | 606                    | 611                  | 607                    |

Notes: Standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

Table C4: Mechanism analysis—Voter turnout to individual referendum questions.

| Dependent Variable                     | Voter Turnout         |                        |                       |                        |                       |                        |                       |                        |
|----------------------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|
|                                        | Question #1           |                        | Question #2           |                        | Question #3           |                        | Question #4           |                        |
|                                        | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   | OLS                   | TSLS                   |
| Estimation Method                      | (1)                   | (2)                    | (3)                   | (4)                    | (5)                   | (6)                    | (7)                   | (8)                    |
| Sovereignty Change                     | -0.002****<br>(0.000) | -0.005**<br>(0.002)    | -0.002****<br>(0.000) | -0.005**<br>(0.002)    | -0.002****<br>(0.000) | -0.005**<br>(0.002)    | -0.002****<br>(0.000) | -0.005**<br>(0.002)    |
| Geographical Controls                  | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    |
| Demographic and Economic Controls      | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    |
| Infrastructural Controls               | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    |
| Historical Controls                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    |
| Observations                           | 611                   | 607                    | 611                   | 607                    | 611                   | 607                    | 611                   | 607                    |
| F Statistic                            | 19.59                 | 19.02                  | 19.60                 | 19.04                  | 19.60                 | 18.94                  | 19.56                 | 18.91                  |
| First-Stage F Statistic on Excluded IV | ...                   | 19.95                  | ...                   | 19.95                  | ...                   | 19.95                  | ...                   | 19.95                  |
| Excluded IV                            | ...                   | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037) | ...                   | -18.032****<br>(4.037) |

Notes: Robust standard errors in parentheses. All specifications include a constant term. The dependent variables for voter turnout refer to the referendum held in June 2011: question #1 concerns the entrusting and management of local public services with economic relevance; question #2 concerns the determination of the integrated water service tariff based on an adequate return on invested capital; question #3 concerns the production of nuclear electric power on the national territory; question #4 concerns the legitimate impediment of the Prime Minister and the Ministers to appear in criminal hearings. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

## **APPENDIX D—Civic capital and local economic development**

In this Appendix, we provide additional evidence on both the direct association between contemporary civic capital and local economic development, and the structural model estimates presented in Table 3 in the main text.

First, we estimate the direct association between labor productivity and the three synthetic indexes of civic capital via OLS. As shown in Column (1) of Table D1, we find that a 0.01 increase in civic capital is associated with an average increase in LLMs' labor productivity of approximately 178 thousand Euros in value added per employee. However, such an overall magnitude is driven by the institutional dimension of civic capital: indeed, we estimate that a 0.01 increase in the institutional dimension of civic capital is associated with an average increase in LLMs' labor productivity of approximately 121 thousand Euros in value added per employee, while an equivalent increase in the interpersonal dimension of civic capital is associated with an average increase in LLMs' labor productivity of approximately 70 thousand Euros in value added per employee.

Second, we replicate the structural model estimation analysis—see Table 3 in the main text—by considering the individual proxy variables used to capture the institutional and interpersonal dimensions of civic capital formation rather than the three synthetic indexes of civic capital. The results of this exercise are reported in Table D, and fully corroborate the main findings.

Table D1: Civic capital and economic development.

| Dependent Variable                                         | Labor Productivity                                  |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
|                                                            | (1)                                                 | (2)                                                 |
| Civic Capital – Institutional and Interpersonal Dimensions | 17.815<br>(2.546)****<br>[2.781]****<br>{2.988}**** | ...                                                 |
| Civic Capital – Institutional Dimension                    | ...                                                 | 12.118<br>(2.210)****<br>[2.428]****<br>{2.614}**** |
| Civic Capital – Interpersonal Dimension                    | ...                                                 | 6.954<br>(2.301)***<br>[2.420]***<br>{2.126}***     |
| Geographical Controls                                      | Yes                                                 | Yes                                                 |
| Demographic and Economic Controls                          | Yes                                                 | Yes                                                 |
| Infrastructural Controls                                   | Yes                                                 | Yes                                                 |
| Historical Controls                                        | Yes                                                 | Yes                                                 |
| Observations                                               | 610                                                 | 610                                                 |
| R <sup>2</sup>                                             | 0.70                                                | 0.70                                                |

Notes: Robust standard errors in parentheses. Standard errors corrected for spatial dependence a la Conley (1999): in brackets with distance cut-off set at 50 km; in braces with distance cut-off set at 200 km. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .



Table D2: Structural model estimates—Individual proxies for civic capital.

| Dependent Variable                | Sovereignty Change     | Voter Turnout         | Labor Productivity     |
|-----------------------------------|------------------------|-----------------------|------------------------|
| Attractiveness                    | -15.151****<br>(4.033) | ...                   | ...                    |
| Sovereignty Change                | ...                    | -0.016**<br>(0.007)   | ...                    |
| Voter Turnout                     | ...                    | ...                   | 30.789****<br>(5.847)  |
| Observations                      |                        | 607                   |                        |
| Log-Likelihood                    |                        | -4,303.91             |                        |
| Dependent Variable                | Sovereignty Change     | TV Tax Evasion        | Labor Productivity     |
| Attractiveness                    | -14.929****<br>(4.030) | ...                   | ...                    |
| Sovereignty Change                | ...                    | 0.064****<br>(0.017)  | ...                    |
| TV Tax Evasion                    | ...                    | ...                   | -13.975****<br>(3.163) |
| Observations                      |                        | 607                   |                        |
| Log-Likelihood                    |                        | -4,267.21             |                        |
| Dependent Variable                | Sovereignty Change     | Waste Recycling       | Labor Productivity     |
| Attractiveness                    | -15.393****<br>(4.092) | ...                   | ...                    |
| Sovereignty Change                | ...                    | -0.084****<br>(0.022) | ...                    |
| Waste Recycling                   | ...                    | ...                   | 6.036****<br>(1.830)   |
| Observations                      |                        | 606                   |                        |
| Log-Likelihood                    |                        | -4,270.31             |                        |
| Dependent Variable                | Sovereignty Change     | Volunteering          | Labor Productivity     |
| Attractiveness                    | -15.542****<br>(4.057) | ...                   | ...                    |
| Sovereignty Change                | ...                    | -3.428*<br>(1.757)    | ...                    |
| Volunteering                      | ...                    | ...                   | 0.343*<br>(0.183)      |
| Observations                      |                        | 607                   |                        |
| Log-Likelihood                    |                        | -6,805.34             |                        |
| Dependent Variable                | Sovereignty Change     | AIDO Section          | Labor Productivity     |
| Attractiveness                    | -14.995****<br>(4.024) | ...                   | ...                    |
| Sovereignty Change                | ...                    | -0.137****<br>(0.021) | ...                    |
| AIDO Section                      | ...                    | ...                   | 8.946****<br>(1.514)   |
| Observations                      |                        | 607                   |                        |
| Log-Likelihood                    |                        | -4,130.21             |                        |
| Geographical Controls             | Yes                    | Yes                   | Yes                    |
| Demographic and Economic Controls | No                     | Yes                   | Yes                    |
| Infrastructural Controls          | No                     | Yes                   | Yes                    |
| Historical Controls               | Yes                    | Yes                   | Yes                    |

Notes: Maximum Likelihood estimates. Robust standard errors in parentheses. All specifications include a constant term. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$ .

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