



# Historical social contracts and their legacy: a disaggregated analysis of the medieval republics

P. Buonanno<sup>1</sup> · M. Cervellati<sup>2,3</sup>  · S. Lazzaroni<sup>2</sup> · G. Prarolo<sup>2,4</sup>

Accepted: 7 May 2022 / Published online: 2 July 2022  
© The Author(s) 2022

## Abstract

We study the comparative political economy within the territories ruled by the medieval republics in Northern Italy. Building on the historical evidence, we conceptualize the emergence of more inclusive vs. extractive institutions in these sovereign polities as driven by the interests of local rulers and their need to build state capacity. We provide novel insights on the role of geography and historical contingencies in the development of public governance, individual attitudes, and social-inclusion, which mutually supported each other and persisted over time. We measure the origin, territorial evolution, and disappearance of all the sovereign polities that ruled over the Italian peninsula during the period of 1000-1800 AD. The empirical analysis connects contemporary socio-economic outcomes across spatially disaggregated northern Italian localities, at the municipality level, to local political history. We distinguish between so-called “communal” and “maritime republics” and show that the intensity and stability of exposure to the different types of republican rule in pre-industrial times continues to shape local public good provision and individual fiscal compliance, and has left a tangible imprint on today’s population diversity.

**Keywords** Local political geography · Emergence and persistence of inclusive institutions · Individual attitudes · Population diversity · Geo-referenced data · Sub-national development · Mechanisms of persistence

---

✉ M. Cervellati  
m.cervellati@unibo.it

P. Buonanno  
paolo.buonanno@unibg.it

S. Lazzaroni  
sara.lazzaroni@unibo.it

G. Prarolo  
giovanni.prarolo@unibo.it

<sup>1</sup> University of Bergamo, Bergamo, Italy

<sup>2</sup> University of Bologna, Bologna, Italy

<sup>3</sup> CEPR, CESifo, IZA, Bologna, Italy

<sup>4</sup> CEPR, LdA Milan, Milan, Italy

## 1 Introduction

The medieval republics, the self-governed city states that emerged in Italy after AD 1000, are considered precursors of modern states in view of their early dismissal of the feudal apparatus and their innovative systems of public finance and economic regulations (e.g. Waley, 1969; Hohenberg & Lees, 1995; Epstein, 1999). Scholars have largely associated the distinctly different development paths in Italy to the presence of the republics in the North and the autocratic-feudal historical institutions in the South (e.g. Putnam et al., 1994). This paper takes a different perspective and studies the, hitherto largely neglected, comparative political economy of the territories historically ruled by these self-governed polities. We focus, in particular, on the origin and persistence of the very different socio-economic regulations implemented by the elites of the so-called “communal” and “maritime” republics. Our empirical analysis connects a variety of present-day socio-economic outcomes across spatially disaggregated northern Italian localities to the intensity and stability of exposure to the different types of republican “treatments” in these localities in pre-industrial times.

We advance a structural narrative, guided by a simple conceptual framework and supported by the historical evidence. Specifically, in the communal republics, small territorial size and the almost exclusive reliance on internal tax revenues from production and local trade meant that the elites in these polities had incentives to supply public goods and grant more personal and economic freedoms in order to elicit higher internal fiscal compliance from the population. In contrast, the larger territorial size of the maritime republics, coupled with the ability of the ruling merchants to extract rents from long-distance sea trade with their colonies abroad, implied a limited need to induce internal fiscal compliance, resulting in an opposite set of incentive-compatible strategies for these elites. The maritime polities were consequently characterized by more exclusive institutions, limited provision of public services, and personal and economic subjugation of vast segments of the population. The republics also differed in their expansion approaches: communal polities mostly aimed to stabilize territorial control and their fiscal base by also applying their inclusive regulations to the annexed territories, while the maritime polities engaged in more expansive and extractive colonial strategies.

The high level of political fragmentation and intense territorial competition between historical polities (see, Jones, 1981; Mokyr, 1992, 2016; Fukuyama, 2011) meant that, until the emergence of modern states in Europe, patterns of territorial control in pre-industrial times were fluid and often involved changes in borders (e.g. Strayer, 1970; Tilly, 1990). An important contribution of our study is the extraction and digitization of the complete political geography of Italy at yearly frequency during the AD 1000–1800 time period, including information on the origin, territorial dynamics, location of capitals, and disappearance of each independent political entity that existed within this 800-year period. We use this information on the changing spatial distribution of borders and on distance to the centers of power to build highly spatially disaggregated data on the political history of each locality (as measured by  $5 \times 5$  arcminute grid cells). This spatial disaggregation also allows to distinguish between the locations where a given polity came into being (i.e., the “seeds” of a republic), and the locations that were subsequently “annexed” to its territory. We measure the intensity of exposure to the rule of different polities and isolate the empirical implications of being forcefully controlled by either type of republic (communal or maritime), as well as the effect of historical instability in political rule in each location.

Our conceptual framework interprets the emergence of historical institutions with different degrees of inclusiveness as multiple “social contracts.” By this, we intend equilibria in which individual attitudes in the population and policies implemented by the ruling elites are mutually consistent and persist over time. Inclusive equilibria arise when the provision of productive regulation and fiscal compliance sustain each other, while in extractive equilibria, exploitation is coupled with fiscal avoidance. In line with this perspective, we study the legacy of local political history for public policies and attitudes today. The regression analysis is performed at the level of, the around 5000, municipalities in the North of the country, whose territories were all exposed to the rule of the medieval republics. Measuring local social contracts today, in terms of attitudes towards fiscal compliance and public good provision, at such disaggregated level is far from straightforward. We exploit municipal data on the share of households complying with the payment of a small (flat and not enforced) national television-radio tax that, we argue, represents the best available proxy for attitudes towards fiscal compliance at the local level. Data on the public provision of goods and services are extracted from municipal budgets. Finally, we collect information on the universe of surnames in each municipality and build measures of population diversity to explore the role of the differential attractiveness of the republican social contracts and historical migration.

In line with the structural origins and persistence of the divergent institutional configurations, our empirical findings show that variation in the intensity and stability of exposure of contemporary localities to different types of historical republican “treatments” still affects local social contracts today. A longer period of exposure to the rule of communal republics increases fiscal compliance and productive governance both in “seeds” and in annexed locations, while the opposite is true for the length of exposure to maritime rule, although this negative effect is detected only in annexed locations. Changes in the identity of rulers in a location can, according to the conceptual framework, impact policies and harm fiscal compliance, representing a main threat for the persistence of inclusive social contracts. In line with this view, we document that higher historical political instability has a robust negative effect on both fiscal compliance and the provision of public goods today. The results also carry over to the latent inclusivity of socio-economic institutions, as reflected by surname diversity. Our findings are robust to an extensive set of controls and checks, including a careful treatment of spatial auto-correlation. They are further confirmed with an IV strategy that exploits exogenous variation in exposure to the different polities due to the latent territorial competition and distance to the changing networks of republican centers of power. We next discuss a set of further results emerging from our analysis in light of the relevant literature.

*Literature* Our new database on local political history, the main empirical findings on the impact on today’s social contracts, and the additional results discussed below contribute novel insights to several recent strands of the literature on the deep determinants of political and economic development.

Relatively little is known about the historical emergence of different social contracts (that is, configurations sustained by different attitudes and policies, and the mechanisms of their persistence) and empirical evidence is scant (see Bowles, 2020; Bisin, 2020 for discussions). Our conceptualization is based on three elements that to date have not simultaneously been considered, but which we argue are necessary to understand the historical social contracts in the medieval republics. First, the process of state formation was under the control of (oligarchic) elites. As in Lizzeri and Persico (2004), Galor and Moav (2006) and Ashraf et al. (2020), discerning the economic interests of local elites is key to comprehending public policies and the inclusiveness of implemented institutions. Second, in

pre-industrial times both extractive capacity and the provision of public services sharply declined with distance from centers of power (see, e.g., Cervellati et al., 2019), with important implications for the role of polity size in shaping the interests of the elites and for their strategies of territorial control.<sup>1</sup> Third, public policies and behavior within the population should be interpreted as jointly determined in the long run (as in, e.g., Benabou & Tirole, 2006; Tabellini, 2008; Bisin & Verdier, 2000; Besley, 2020).

This study furthermore contributes to the literature linking geography and history to diverging paths over the long term (see Ashraf & Galor, 2018; Michalopoulos & Papaioannou, 2020; Nunn, 2009 and 2020 for discussions). Historical evidence, discussed in Sect. 2, supports our structural narrative on the origin of multiple republican “treatments” and differences in observed inclusiveness. Historically, the emergence of the rule of law has been connected to the rise of merchant classes and the associated curbing of the extractive power of the landed (feudal) nobility (e.g., De Long & Shleifer, 1993; Acemoglu et al., 2005) and through the practice of more effective private-order bilateral contract enforcement (see, e.g., Greif, 1993). Our narrative qualifies these canonical arguments. As we discuss below, compared to the inter-city trade typical of the urban belt, long-distance sea trade in the maritime republics implied a more centralized control of returns in the hands of a minority of economically and politically powerful (vessel-owner) families (see also de Lara et al., 2008). This, and the extensive rents accruing from the colonies, favored the emergence of more extractive state capacity. Thus, both geography, i.e., more or less easy access to the sea, and historical contingencies, i.e., related to the ability of communal rulers to offer productive services and to the uncertain fortunes of long-distance trade and military expeditions, shaped the interests of local elites and the emerging social contracts.<sup>2</sup>

Studies of historical republicanism have thus far relied on information on free cities or city charters (see Stasavage (2010, 2014); Bosker et al. (2013); Guiso et al. (2016); Belloc et al. (2016); Angelucci et al. (2020); Serafinelli and Tabellini (2022), among others). We offer a measurement of local exposure to these multiple republican treatments across the different locations in terms of intensity and stability at a high level of spatial disaggregation, which, following the conceptualization, also tracks the patterns and stability of forceful territorial annexation. Our results provide robust evidence of systematic differences in local policies, individual attitudes, and population diversity. The findings support, at the municipal level, the evidence advanced by Tabellini (2010), namely that regional differences in culture and policies persist within the same formal national institutions. In terms of mechanisms of historical persistence, in our conceptualization changes in the identity of rulers represent the main threat for the endurance of productive social contracts. In line with this perspective, we document that the number of polities ruling over a locality has

---

<sup>1</sup> Our conceptual framework predicts that inclusive institutions are more likely to emerge in polities of smaller territorial size due to spatially declining state capacity, given that the benefits from productive governance shrink with distance from the capitals (which also limits elites’ incentives for territorial expansion). This prediction complements, but differs, from arguments on the role of territorial size for rule of law related to the better monitoring of the political process; see Levi (1988); Downing (1992); Stasavage (2010, 2011).

<sup>2</sup> As clarified in the theoretical framework reported in the Appendix, the relationship between geographic features and the social contracts should not be interpreted as deterministic but rather as mediated by historical contingencies. In the model, multiple equilibria can always emerge for the same fundamentals, but their selection is affected by parameters (e.g., the random rents controlled by the elites). Geographic characteristics and historical contingencies should therefore be understood as affecting the likelihood of different social contracts.

a robust negative effect on the inclusiveness of current social contracts in terms of public good provision, individual compliance, and population diversity.<sup>3</sup>

Our analysis also qualifies existing arguments on the role of formal political institutions. Differently from interpretations of institutions as rules or commitment devices (e.g., North, 1990; Acemoglu & Robinson, 2000), in our conceptual framework constraints on the executives are not necessary to sustain productive equilibria since, given a complying population, offering productive governance and limiting wasteful rent extraction can also be in the best interests of unconstrained ruling elites. In this perspective, though formal institutions are neither necessary nor sufficient for the emergence and persistence of productive equilibria (see also Greif & Laitin, 2004), constraints on the executive may help align expectations and favor equilibrium selection serving as a coordination device. In fact, as also discussed in Sect. 2, inclusive regulations have often persisted with the advent of lordships well after the end of republican experiences. To explore the possible role of early constraints on the executive in the selection of social contracts, we collect data on the identity of all historical chief administrators of each republic (e.g., “podestà,” “signori,” and “dogi”) and show that a higher administrative turnover in the early phases of emergence of the communal republics positively affects their duration.<sup>4</sup>

Finally, our results intersect with investigations of the imprint of historical contingencies and geography on individual traits and population diversity. Existing evidence documents the historical drivers of trust (Nunn & Wantchekon, 2011), time preferences (Galor & Özak, 2016), loss aversion (Galor & Savitskiy, 2018), individualism (Bazzi et al., 2020), and familistic moral values (Enke, 2019), among others. We contribute to this stream of literature by showing that local political history impacts individual attitudes of fiscal compliance and also has significant, although heterogeneous, effects on measures of social capital and social cooperation.<sup>5</sup> Recent studies have explored population diversity on a global scale by isolating the role of long-run migrations out of Africa and genetic diversity (Ashraf & Galor, 2013; Ashraf et al., 2019a; b), the cross-country process of nation-state formation (Ahlerup & Olsson, 2012), and the long-term exposure to diseases on African ethnicities (Cervellati et al., 2018). We provide evidence on the role of local productive or extractive institutions for the latent process of selected migration across densely populated historical localities. Our findings also suggest that the composition of the population, in terms of surname diversity, indirectly played a role in sustaining the different social contracts.<sup>6</sup>

<sup>3</sup> Empirically, persistence has been shown to be favored by the tightness of ancestral family kinship (Enke, 2019), by the process of occupational and productive specialization (Valencia Caicedo, 2018), and by preferential ethnic sexual endogamy (Cervellati et al., 2018). We build on these studies by contributing novel evidence on the role of political and territorial instability in the persistence of social configurations.

<sup>4</sup> We collect data from primary and secondary historical sources that allow to build a measure of historical administrators' turnover that is indirectly informative on the (latent) regulation of access to political power and selection of public officials based on the frequency of different families (surnames) as chief executive. We also document that the appointment and turnover of professional (and often foreign) administrators is higher in the communal as compared to the maritime republics.

<sup>5</sup> We find that while a more intense exposure to inclusive historical institutions also increases behavior typically associated to generalized morality, such as organ donations and electoral turnout, it also crowds out informal insurance institutions, as measured by the presence of mutual help associations. The opposite is true for historical exposure to exclusive institutions and political instability.

<sup>6</sup> The predicted role of migration, typically interpreted as harmful for persistence in a cultural transmission perspective (e.g., Bisin & Verdier, 2000 and 2001), is more nuanced in our conceptualization. In particular, selected migration of complying migrants to locations with more attractive social contracts is expected to favor, rather than harm, their stability. In line with this perspective, we find that part of the effect of political history is mediated by population diversity. Furthermore, exploiting surnames of toponym origin in the communal and maritime republics, (e.g., “Bolognesi” vs. “Veneziani”), we find suggestive evidence of differential migration across different types of republics.

The paper is structured as follows. Section 2 discusses the predictions of the conceptual framework (a simple theoretical model is reported in the Appendix) and the historical evidence. Section 3 presents the data and the main patterns of the territorial emergence and historical evolution of the republics, as well as the measurement of local social contracts today. Section 4 provides the main empirical results, Sect. 5 details different robustness checks and further results, and Sect. 6 concludes.

## 2 Conceptual framework and historical evidence

Our conceptual framework considers the trade-off between rent extraction and public good provision by the ruling elites of a pre-industrial polity with imperfect state capacity over space, that is faced with endogenous fiscal compliance, or avoidance, in the population. A simple model, reported in the Appendix, illustrates the idea that both individual incentives to cover the cost of state capacity and the decisions of the elites depend on the expected level of fiscal compliance in the population at large. The resulting strategic complementarity between individual behavior and the choices of the elite allow for the possibility of multiple equilibria in terms of public policies and fiscal compliance; that is, different “social contracts.” In this section, we briefly discuss the main predictions, in line with historical evidence on the medieval republics. Historians have documented markedly different patterns of governance and social configurations within these polities. The existing evidence supports our structural narrative and predictions in terms of the interests of the ruling elites, economic and social regulations, strategies of territorial control, and patterns of selected migration.

### 2.1 The emergence of the republics and territorial control

At the beginning of the 11th century, particular historical contingencies profoundly changed the political landscape of the Italian peninsula. The investiture controversy between the Holy Roman Empire and the Church, and internecine wars for the imperial succession temporarily reduced the territorial grip of Holy Roman Emperors on Italian lands. This favored efforts to gain and stabilize self-governance and independence all over the peninsula. Historical circumstances led, however, to very different outcomes in the North, where the Emperor eventually had to withdraw and concede formal independence, and the South, where a successful strategic marriage stabilized the centralized feudal system.

Our conceptual framework focuses on the incentives of the rulers of the (nascent) self-governed polities, i.e., the republics. The model delivers insights on the role of the territorial size of these polities and on the optimal strategies of territorial control. A declining state capacity over space implies that productive social contracts are easier to sustain in polities of small territorial size. A further crucial element of the conceptual framework regards the varying treatment of annexed locations by the different republics. In line with the predictions, historians document that communal republics extended their regulation of

economic and personal freedom to their annexed territories (see, e.g., Parker, 1996; Chittolini, 1989; Carboni, 2008). These polities “strove systematically to eliminate all intermediary and indirect forms of government and to organize their territories into lower-level districts run by officials from the city (*podestà*, *vicari*); the law, lower-level legislation, and the fiscal, juridical, and administrative rules of the city were extended to the countryside headed by the city” (Chittolini, 1989: 693).

In the maritime republics, in contrast, economic benefits were strictly confined to the population in the capital cities and, in particular, to the merchant elites that controlled the fleet. Medieval Italy was home to several self-governed maritime cities ruled by merchant elites, though not all of them succeeded as territorial polities. Pisa, Venice, and Genoa managed to develop from coastal cities into independent regional states in the Low Middle Ages, thanks also to fortunate military campaigns.<sup>7</sup> An increasing need for resources (particularly wood, grains and food), as well as an abundant labor force to operate the large man-powered fleet was met by heavily extracting from the hinterlands (Mallett & Hale, 1984). For instance, in 1423, 19,000 seamen were needed to operate Venice’s 3,000 merchant ships and the 43 major warships and 300 smaller ones that protected them (Chamberlin, 1982: 120). At that time, accounting for city revenues and those from inland (the *Terraferma*) and overseas (the *Mar*) territories, the Republic of Venice, or La Serenissima, was wealthier than either France or England (Braudel, 1979: 118–123). Cipolla (1994) argues that the relationship between maritime cities and their controlled territories in the 13th–14th centuries in many ways resembles that between the extractive European motherlands and their colonies up until the XIX century.

## 2.2 The historical social contracts

Our social contract perspective emphasizes that adopting productive, rather than extractive governance, is ultimately in the interests of the local elites. Specifically, elites’ incentives to accommodate a productive social contract are seen as instrumental to building state capacity. In line with this argument, Downing (1992), among others, argues that a need for resources, taxes, and credit in the newborn polities is key to explaining patterns of public governance in the communal republics (sometimes called “medieval constitutionalism”). In contrast, the maritime republics built their fiscal and military capacity on rents from (long-distance) sea trade. Crucially, this meant that local elites did not need to provide benefits to the populations exposed to their territorial rule and met their increasing demand for resources and manpower by implementing extractive colonial strategies.

Historians observe that the approaches of communal and maritime republics to public governance, regulation of access to economic activities, and personal freedom considerably diverged (e.g. Finer, 1999). In our model, the emergence of fiscal compliance requires the provision of benefits to the population. Historical evidence broadly supports

---

<sup>7</sup> “The term ‘maritime republics’ traditionally designates the autonomous coastal cities of Amalfi, Pisa, Venice, and Genoa, whose political and economic power was based on maritime trade and the development of fleets, active in the Mediterranean basin. The most long-lived, Genoa and Venice developed an aristocracy of merchant origin - patriciate- that formed the ruling class within a republican institutional reality” (Treccani, 2011). The maritime city of Amalfi initially enjoyed de facto independence before 1000 AD, though this was soon lost to the rule of the Langobard Principality of Salerno during the first half of the XI century and, not long afterwards, to the Normans. Similarly, the independent maritime cities of Noli and Ancona could not compete with Venice and failed to control any annexed territories in our observation period (1000–1800 AD). Our analysis focuses on self-governed sovereign polities, as opposed to cities.

this perspective for the communal republics, which developed fundamental innovations in public governance and social policies with their “counter-feudal and counter-monarchical theory and practice of government – Republicanism” (Finer, 1999: 951). Botero (1588) interprets the provision of “utility” to citizens as instrumental for independence and prosperity, which requires active participation of the populace. Carboni (2008: 19) stresses that taxation was “more accepted and tolerated by the taxpayers (...) [as] the spontaneous adhesions of citizens were higher.” Although outside the scope of our empirical investigation, comparable accounts exist for the case of the Dutch republics, for which our conceptual framework would similarly apply. To this regard, Van Zanden & Prak (2006: 118) observe that “citizens [of the Dutch republics] were prepared to pay relatively high taxes in return for the public goods they desired,” and that this also involved a wide range of productive regulations, from the protection of property rights to the supply of education and health services.

The maritime republics were similarly characterized by a self-governance and republican organization outside the control of the landed nobility and feudal system, though their fiscalia was more regressive and engineered to protect rents rather than to provide utility to the populace (Epstein, 1996). Illustrative of this is the well-studied case of Genoa in the early 14th century, and its need to address public debt accumulated from wars. The fiscal system was re-devised, essentially maintaining the wealth of the richest Genoese (those who could afford shares in the various *compere*) while taxes were raised on imports and subsistence goods. “Some tolls, the income from the entire Riviera Ponente, and taxes on markets, taverns, and butchers augmented the monies set aside to pay interest on the debt. [...] The gabelles and head tax were regressive, and much of the taxes on trade could be pushed off on prices charged to foreigners. Genoa provides a classic case of how public debt can facilitate the transfer of wealth from ordinary people to the rich, as well as defer taxes through borrowing” (Epstein, 1996: 190). In line with our argument, the populace in annexed locations was subject to extractive regulations and responded with fiscal avoidance. Similarly, Belfanti (2001: 300-302) reports that “the installation of Venetian representatives in the main cities was followed by legislative reforms and emendation of the urban statutes aimed at erasing all elements that contrasted openly with Venetian sovereignty.” The “Venetian government restricted itself to measures forbidding the sale on Venetian territory of cloth [and products] that could compete with its own output” as “Venice’s commercial supremacy, based upon a secular tradition of trade between Europe and the Levant, would not seem to have had any need of institutional support.”<sup>8</sup> Controlling the in-land territories required substantial effort, given the hiding of resources, elusion of duties, and recurrent uprisings and attempts to revolt by the population of ruled cities (see also Kirk, 2012).

---

<sup>8</sup> While here we adopt a dichotomous classification of the republican social contracts, strategies of productive and extractive regulations and territorial control sometimes displayed hybrid features even within the communal republics. For instance, when the communal republic of Florence eventually evolved into the Florentine State it also increasingly implemented aggressive strategies of territorial control and rent extraction in its annexed cities. “The subject cities and their contadi were absorbed into the Florentine state during the fifteenth century along lines devised by the Florentine government and administered by its representatives. [...] Manufacturing regulations were introduced to protect the interests of the capital’s merchant-entrepreneurs” (Belfanti, 2001: 294).



### 2.3 Social inclusion and migration

Inclusive economic and social policies should be expected to favor, as mentioned, the resilience of the productive social contracts by attracting productive migrants. That the communal republics devised innovative legal regulations that increased economic and personal freedoms is well documented. Policies explicitly aimed to increase population size, the fiscal and military base, and attract skilled artisans and traders. Examples include the exemptions from payment of taxes for migrants (an early form of fiscal competition), a facilitated access to land ownership (Chittolini, 1989, and a granted freedom to conduct economic activities (Finer, 1999; Belfanti, 2001). In sharp contrast to the feudal system prevailing at the time, personal freedom was strategically used to increase the involvement of the population. For instance, thanks to the efforts of lawyer Bonaccorso da Soresina, Bologna was the first polity to fully abolish slavery in 1256 across its territory (including its contado and the annexed locations), an action that was soon replicated by other communal republics. Although formally ideologically motivated, this expensive policy consolidated the size of the free citizenry and the fiscal base of the newborn republic. The commune freed 6,000 slaves at market price with money raised within the city population. The former slaves' "only" obligation was to reside in the territory of the republic and pay taxes. These new free citizens increased the total population of the capital city by more than a third. In contrast, in the maritime republics, slaves (and their trade) were heavily exploited, access to local manufacture and arts was kept insulated from foreigners, and trade was centrally regulated and controlled. In a well-studied case, in 1271 the Venetian elites banned the employment of foreign workers in the glass industry and, to further increase control, subsequently moved all production to Murano island, where it is located still today (see also Cipolla (1994)).

Extensive narratives support the view that within northern Italy migration between the republics was sizable. Exploiting data on invalids admitted to Florence's hospitals between 1413 and 1456, Sandri (1988: 151) finds that 9.4% came from other communal republics. Historical accounts emphasize that migration was also driven by economic opportunities: "personal hardship could convince a worker to abandon what had been his land. Thus, [...] Sieneese peasants oppressed by their debts and by the accentuated tax burden sought refuge in the countryside of Florence" (Balestracci, 1988: 167). Local elites often actively recruited foreign workers. For instance, "the urban communes negotiate even across large distances to promote in-migration of specialized workers [...]. [T]he commune [of Bologna in 1231] stipulates agreements with workers in the wool and silk sectors from several cities in Tuscany and Lombardy, in particular Verona and Lucca, offering interest-free loans, fiscal exemptions, and lodging support, which attracted about 150 masters with their families" (Barbero, 2009: 21).

Despite these extensive narratives, however, no formal evidence yet exists on the testable implication that productive social contracts should be associated to higher population diversity in the long run.

### 2.4 Persistence of the social contracts

Our conceptual framework highlights the instrumental role of formal institutions and constraints on the executive as coordination devices, though it also emphasizes that these are not necessarily persistent inclusive social contracts. Historians document the introduction of limits to the exercise of power in the communal republics, where "legal codes were

promulgated to confine the violence of the overmighty” (Becker, 1981: 60). As a result, “the structure of authority in the communal republics was fundamentally more liberal and egalitarian than in contemporary regimes elsewhere in Europe” (Putnam et al., 1994: 125).<sup>9</sup>

Delegation strategies were adopted and professional administrators were hired to implement productive regulations. As Putnam et al., (1994 :126) point out, “[p]ublic administration in the communal republics was professionalized. A corp of experts in municipal government developed remarkably advanced systems of public finance (including a market in negotiable public securities), land reclamation, commercial law, accounting, zoning, public hygiene, economic development, public education [...]”. These historically unprecedented forms of participation and, in particular, the limits to the exercise of authority were, however, often short-lived, eventually giving way to lordships (“signorie”). That said, the use of professional administrators (often hired from other polities) was frequently maintained.

The existence of extensive rents and the need to keep the ruled populace under control was, in contrast, associated to a more “familistic-oligarchic” and highly hierarchical administration of power in the maritime republics (see also De Lara et al., 2008; Puga & Treffer 2014). “Unlike all the other [republics], which perforce drew their podestà and their judges from other places [...], [Venice] not only called on its own native population, but upon that same nobility which staffed all other departments of the state” (Finer, 1999: 1008). Similarly, in Genoa “the representatives on the council of anziani were mostly former officeholders, and even when the wards selected the members of an advisory body, the familiar names usually predominated” (Epstein, 1996: 135). No systematic evidence exists, however, on the possible role of trained administrators and term limits in the persistence of productive social contracts.

Enduring inclusive configurations require persistence in policies and attitudes. In line with our conceptual framework, evidence suggests that inclusive policies were often not discontinued with the advent of lordships. For instance, in 1459 Duke Francesco Sforza granted certain privileges to silk workers who established residency in Milan, including citizenship, exemption from taxes and tolls for a period of ten years, and the right to employ non-Milanese workers in their shops (Fennel Mazzaoui, 1984: 527). Battilani (2001) offers suggestive evidence of the persistence of medieval multiple social contracts through an analysis of municipalities’ balance sheets at the moment of Italian unification in 1863. She documents enduring differences in the administration of local public finance that were arguably due to pre-existing differences in historical local regulation and were only partially attenuated in the forty years after unification.

<sup>9</sup> In fact, as Ventura (1964: 11) observes: “[while] only the members of the ruling class based in the city had full political capacity [...] the commune has to be considered a democracy in that it was clearly in contraposition to the hierarchical, autocratic and intrinsically aristocratic feudal system. With respect to the feudal system, the democratic commune was ideologically and politically opposite because sovereignty was practically at the base and no longer at the vertex of the social pyramid, in the citizens rather than in the emperor or prince; if the root of this regime was restricted to the highest classes, it could spread further to include lower classes. Bourgeois and merchants became part of the ruling class and obtained respect of their needs through guilds and corporations, which became part of the communal government (e.g., in Padua the *Maggior Consiglio* went from 400 to 600 and finally 1,000 members in 1277, in a city with an estimated 5925 households)”.

### 3 Data and empirical patterns

The historical evidence discussed in Sect. 2 broadly aligns with our structural narrative. Here, we aim to systematically measure the evolution of local political institutions and empirically investigate their potentially persistent impact on public policies and attitudes, that is on local social contracts, – today. Broadly, we present the construction of the main variables of interest. Section 3.1 focuses on data tracking the spatio-temporal evolution of the intensity and stability of exposure to the rule of the medieval republics and provides descriptive evidence. Section 3.2 describes the construction of the outcome variables for the regression analysis and their spatial distribution.

#### 3.1 The medieval republics

*Data and measurement* As no existing, ready-to-use measurement of the evolution of the territorial rule of the medieval republics is available, we collect and geo-localize information on the emergence, evolution, and disappearance of the sovereign polities ruling over Italian locations during the period 1000–1800 AD. Specifically, we assemble a yearly panel database with disaggregated data that relies on 0.0833x0.0833 degree (roughly 10x10 square kilometers at the equator, or 66 square kilometers in Italy) grid cells as units of observation. We digitize and geo-reference maps on the changing borders of each independent sovereign polity. That is, polities at the highest level of sovereignty, ruling over the territory of the Italian peninsula at yearly frequency, using the Centennia Historical Atlas of Europe (Reed, 2014) as a baseline source of information. Details on our data construction procedure, sources, description of polities, sample selection, and descriptive statistics are reported in the Supplementary Appendix 1.

We construct several variables on the political history of each location. In particular, for each location / grid-cell, we track the territorial evolution of each polity and the turnover of rulers, giving us a measure of local “political instability.” Information on the appearance of new polities and historical sources are used to identify the emergence of each of the medieval republics. Grid-cell level information is then mapped at the level of today’s roughly 8000, Italian municipalities (at the centroid) (Fig. 1). As baseline in the regression analysis, we focus on the approximately 5000 municipalities whose territory was exposed to the rule of any medieval republic for at least one year during the observation period. Figure 2 illustrates some of the data by depicting in panel (a) a summary of the geographic distribution of the number of years a municipality was ruled by republics (in centuries, cumulating any republican experience) and in panel (b) the number of changes of ruler (including non-republics as well). On average, a given municipality was ruled by a republic for about 3 centuries and experienced 20 changes of ruler. Both variables display, however, large variation even across neighboring municipalities, ranging from only 1 year to over a millennium of republican rule, and 3 to 71 changes of ruler.

We also track the time-varying centrality of each location in the historical network of republics. To this end, we collected data on the set of centers of power in each year, and for each location we computed the distance to each republican capital. This information is used to build measures of the predicted, rather than actual, annexation to the rule of the different types of republics in the IV analysis.

*Patterns of territorial control* The database allows us to explore the predictions of the conceptual framework relative to the different strategies of territorial control in the communal and maritime republics. We distinguish between the territory ruled by each republic

at the moment of its emergence, the *seeds* of the republic, and the locations that were subsequently *annexed* to the latter. To this regard, Fig. 3a depicts the locations that were *ever* part of the seeds of any communal republic and the territories that were annexed under the rule of any of these polities for at least a year during the observation period. Figure 3b shows the same information for the maritime republics. The seeds of communal and maritime republics are (geographically) disjointed subsets, while some locations have been annexed over the years by both communal and maritime republics.<sup>10</sup> In the baseline regression analysis, we exploit information on the overall duration of exposure (in centuries) as seed and as annexed territory of any communal or maritime republic. We also track the locations that had been both a seed of a communal republic and an annexed territory under the rule of a maritime republic (and viceversa), as well as locations that had been annexed to both types of republics but were never seeds.

The conceptual framework emphasizes the role of the territorial size of polities in the emergence of productive and extractive social contracts and the differing strategies of territorial control implemented by communal and maritime elites. In spite of the historical narratives discussed above, no formal study has thus far tracked the patterns of territorial control. Figure 4 provides supporting evidence by depicting the average size of communal and maritime republics as well as the evolution of seeds and annexed territories over the 800 years of the observation period. The data illustrates the smaller and roughly stable average size of communal republics and the larger, and increasing, territorial rule of the maritime republics.

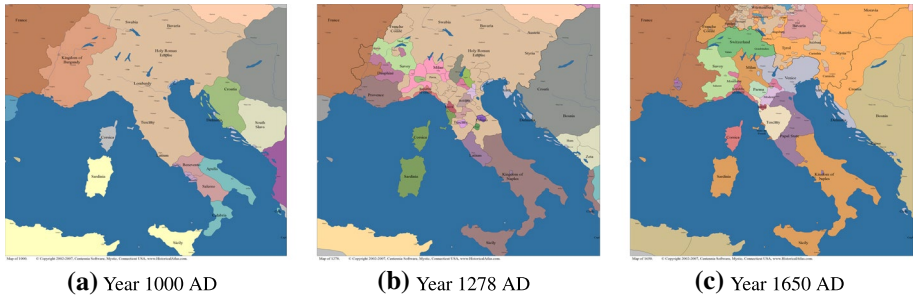
Figure 5 documents the different strategies of territorial control and annexation. We see that the size of the seeds of the communal republics remains roughly stable until the mid-fifteenth century and is comparable to the size of the annexed territories (given by the difference between total territory in any year and the territory of the seeds in the same year). The opposite is true of the maritime republics, where the size of the annexed territories is substantially larger than the size of the seeds. As illustrated in the Supplementary Appendix, the number of communal republics is hump-shaped, peaking in the twelfth century and displaying a sharp reduction starting in the early fifteenth century, while the number of maritime republics is more stable. The total territory controlled by the communal and maritime republics follows similar patterns (see Fig. A.1 in the Supplementary Appendix).

### 3.2 Socio-economic outcomes today

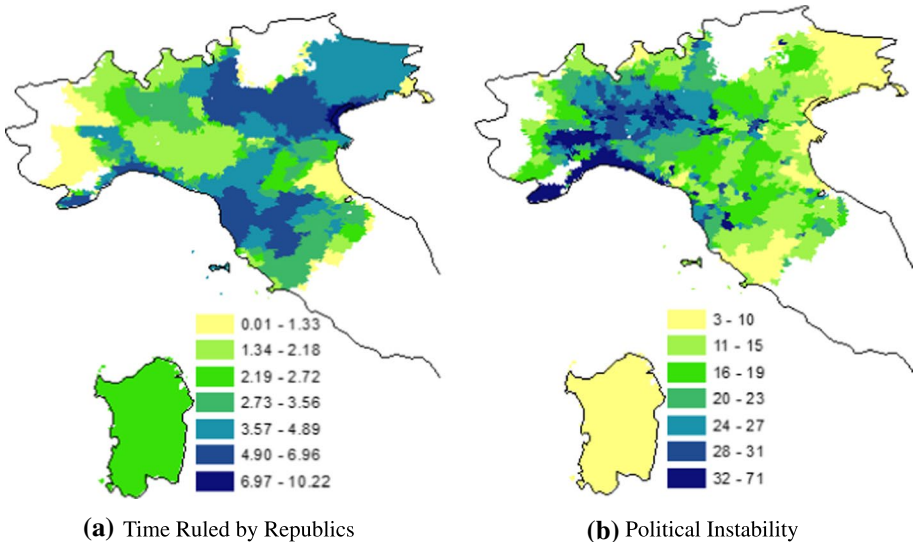
In this section, we turn to the outcome variables of main interest for the regression analysis.

*Fiscal compliance and productive governance* Measuring attitudes on fiscal compliance in the population necessarily requires dealing with “evidence of the invisible” (Slemrod & Weber, 2012). As no data on fiscal compliance exists at a disaggregated, municipal, level, we build our own measure of local fiscal compliance. Specifically, we collected information from the Italian national public broadcasting company (RAI - Radiotelevisione Italiana) on the number of households paying the television-radio license fee at the municipality level (average for the period 2004–2010). This is, for several reasons, the best available information for assessing attitudes towards fiscal compliance at a disaggregated level. First,

<sup>10</sup> Figure A.3 in the Supplementary Appendix 1.3.2 displays the entire sequence of rulers for today’s municipality of Padua.



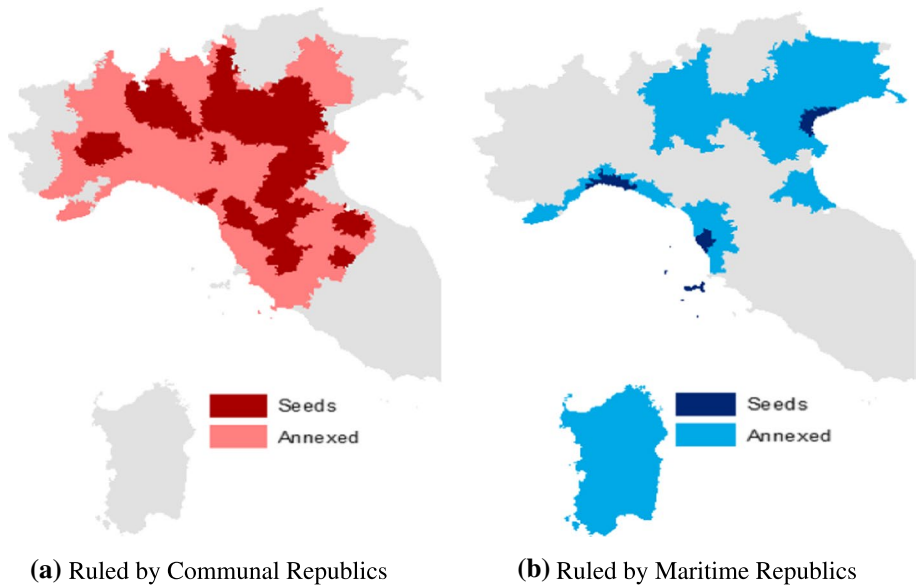
**Fig. 1** Political Geography of Italy—Examples for Selected Years (*Centennia Historical Atlas*)



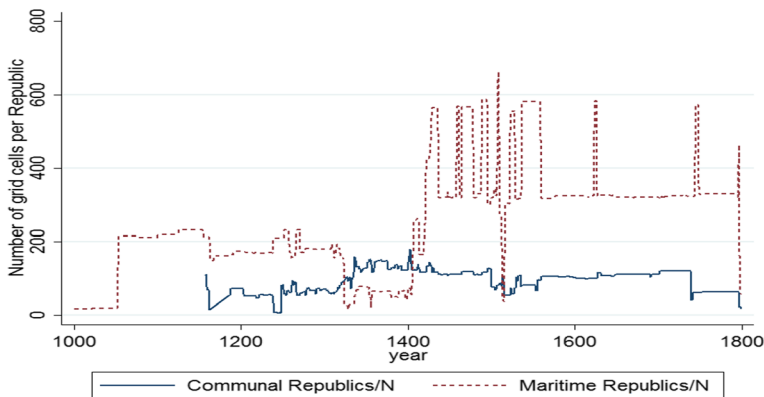
**Fig. 2** Intensity of Exposure to Republican Rule and Historical Political Instability. Time ruled by any republic and number of ruler changes in the period 1000–1800 AD (municipality level)

the fee is due by all households for the mere possession of a television or radio set and therefore essentially applies to the universe of the population. Second, the annual fee is flat and comparatively small (ranging from 99.60 euros in 2004 to 109 euros in 2010), is levied at the level of households independently of the number of family members, and is paid in a single installment. The small amount implies that tax avoidance is mostly related to attitudes towards fiscal compliance rather than to the existence of sizable (and heterogenous across households) economic gains. Third, the data refers to a public good that is not provided locally and is therefore, by construction, unrelated to the efficiency of local institutions.<sup>11</sup> In practice, households received a letter once a year reminding them of the deadline

<sup>11</sup> As in many other European countries in the early 2000s, broadcasted programs could be received by all apparatus even without paying the license fees, with no incentives to contribute (see also Berger et al., 2016)

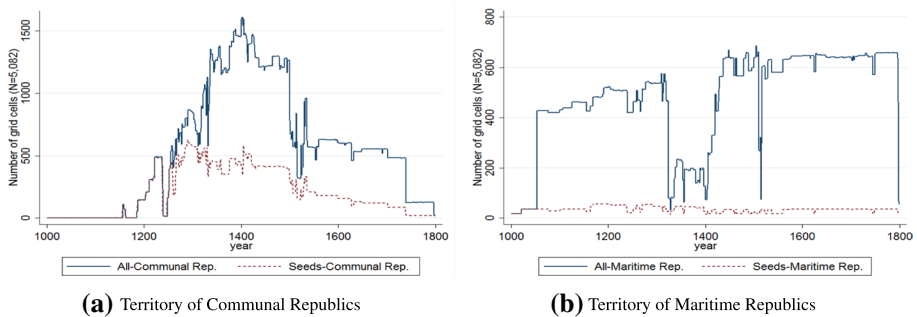


**Fig. 3** Seeds and Annexed Locations: Communal vs Maritime Republics. Locations that formed part of a republic at its emergence are labeled *Seeds*. Locations that were ruled by a republic after its emergence (for at least a year) are labelled *Annexed*. Time period of 1000–1800 AD



**Fig. 4** Size of the Medieval Republics. Number of locations being ruled by a communal or maritime republic at  $5 \times 5$  arcminute grid cells covering the Italian territory. Yearly data for the period of 1000–1800 AD.

and the amount to be paid but, given the difficulty and comparative costs of implementing controls, there was little or no enforcement and threats of checks were not credible. Evading the fee was thus very easy. Importantly, even the limited enforcement was centralized and not managed by the municipality, implying that the measure is conceptually unrelated to the effectiveness of local institutions in enforcing fiscal compliance. Fourth, information on the (lack of) payment was fully private, such that compliance can be interpreted as driven more by attitudes than by social sanctions. Fifth, data on the share of households



**Fig. 5** Strategies of Territorial Control in the Medieval Republics. Number of locations being ruled by any communal or maritime republic (seeds and total) for  $5 \times 5$  arcminute cells. Yearly data for the period of 1000–1800 AD

paying the fee is available at the municipality level. Finally, the measure correlates with traditional measures of tax evasion that are, however, available only at more aggregate spatial levels.<sup>12</sup> We therefore have a precise and reliable measure of individual attitudes towards fiscal compliance at the municipality level for the universe of households in Italy. Average compliance with payment of the fee is 66%, though with large variability in the sample even across neighboring locations, ranging from around 13 percent to 100 percent (standard deviation around 9).

We measure local public governance using Italian National Institute of Statistics (ISTAT) data on the provision of local public goods and services. As baseline we focus on expenditures for the provision of preschool directly supplied and managed by the municipality. Specifically, we employ information on the (logarithm of) the average expenditures during the period 2013–2018 in each municipality divided by the population (in the range 0–4.7). This variable is labeled *productive governance*.

*Population diversity and social closure* Information on the distribution of surnames across the entire population of each municipality sheds light on long-term patterns of migration across locations. Following Buonanno and Vanin (2017), we build measures that capture the differential patterns of in-migration and the latent attractiveness of historical politico-economic conditions. A higher intensity of historical in-migration in a given location manifests, all else equal, in higher levels of surname entropy today. This variable is labeled *population diversity*.<sup>13</sup> We also look at the distribution of the five most frequent surnames, which provides a more directly informative measure of the closeness of the population; we label this variable *social closure*.

Figure 6 depicts the spatial distribution of the main variables of interest.

<sup>12</sup> The Supplementary Appendix 2.1 provides additional technical notes on the characteristics of the Italian TV-radio tax. Figure A.4, again in the Supplementary Appendix 2.1, offers evidence that cross-validates our measure of tax compliance by showing that (when aggregated at a higher spatial level) the Italian TV-radio tax correlates to existing province-level data on the real estate tax gap (defined as the difference between the amount due and the amount effectively paid) from Imperioli et al. (2015).

<sup>13</sup> The Entropy Index in each municipality is calculated as  $Entropy = -\sum_{i=1}^S p_i \log(p_i)$ , where  $S$  is the total number of surnames in a municipality, and  $p_i$  is the municipality's population share with a given surname. Entropy measures are a good proxy for how open a (small) society is to the long-run inflow of others. See Buonanno and Vanin (2017) for a discussion of the nature of this measure, the construction of the Entropy Index, and the literature on diversity that exploits information on the distribution of surnames.

## 4 Empirical analysis

### 4.1 Econometric specification

Our baseline empirical analysis involves isolating the impact of political history on modern outcomes in specifications like,

$$Y_i = \gamma_0 + \gamma_1 Com_i + \gamma_2 Mar_i + \gamma_3 Inst_i + \delta \mathbf{X}_i + \epsilon_i \quad (1)$$

where, for each municipality  $i$ ,  $Y$  denotes an outcome variable of interest. The variables  $Com$  and  $Mar$  denote the centuries of exposure to *communal* and *maritime* republican rule, respectively, while  $Inst$  denotes historical political instability in terms of number of changes of ruler. The vector of covariates is denoted by  $\mathbf{X}$  while  $\epsilon$  is the error term. When we distinguish the republican experience in terms of exposure as either *seed* or *annexed* location, we estimate specifications like,

$$Y_i = \beta_0 + \beta_1 SeedCom_i + \beta_2 AnnCom_i + \beta_3 SeedMar_i + \beta_4 AnnMar_i + \beta_5 Inst_i + \delta \mathbf{X}_i + \epsilon_i. \quad (2)$$

where  $SeedCom$  and  $SeedMar$  denote time of exposure to communal and maritime republics as seeds while  $AnnCom$  and  $AnnMar$  denote the time of exposure to the different republics as annexed locations.

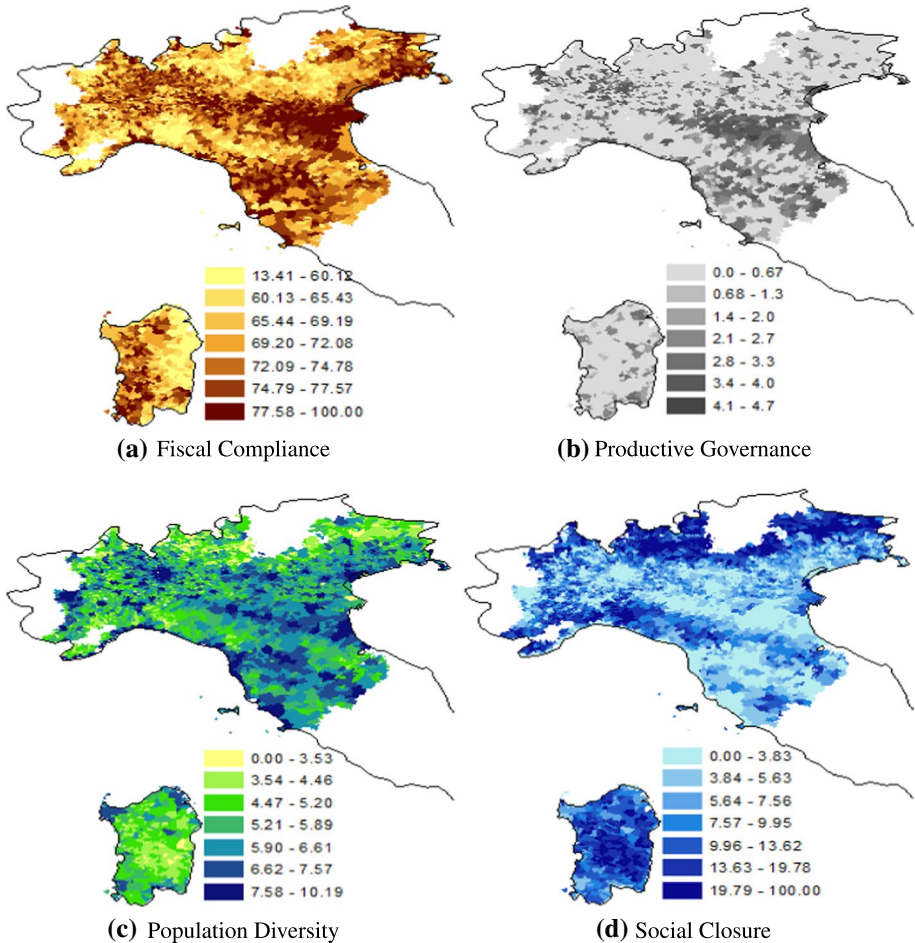
The baseline specification accounts for spatial correlation in two ways. First, standard errors are double-clustered along the two main treatment dimensions i.e., municipalities experiencing the same sequence of rulers over the period of 1000-1800 AD, and the length of republican experience (see Cameron et al., 2011). Second, we compute standard errors estimated with a spatial correction accounting for cross-sectional spatial correlation, as in Conley (1999) (reported in the Tables in squared brackets). As baseline we retain a radius of 70 Km, meaning that we can account for spatial autocorrelation with the neighboring 473 municipalities (Italian municipalities are rather small, having an average surface of 32.53 squared kilometers), and allow a Bartlett distance linear decay in the correlation structure so as to account for spatial decays even across observations within the same cluster.

### 4.2 Preliminary analysis: correlates of republican experiences

Before presenting our empirical investigation of current outcomes, we first explore the geographical and historical correlates of local political history. This preliminary analysis elucidates the features that may have affected the likelihood a given territory was ever part of a communal or maritime republic (as either seed or as annexed location) and the probability of being subject to more ruler changes, relevant potential confounders of modern institutional and socio-economic outcomes.

In light of our conceptual framework and the historical narratives, we control for three important baseline sets of variables: geography, historical population and routes, and historical political experiences. First, easy access to sea trade should impact the likelihood that a location is part of the (seeds of) maritime republics, while the opposite might be true for seeds of communal republics. We thus control for whether a municipality is located on or close to the coast and for distance to the sea. Altitude and ruggedness might also affect the emergence of seeds or the likelihood of being annexed. This could be either indirectly,





**Fig. 6** Local Social Contracts and Population Diversity Today. Spatial distribution of the main outcome variables for the sample of municipalities ever ruled by medieval republics. **a** share of households paying the television-radio fee; **b** (log of) the municipality expenditures per capita for directly managed municipal preschools; **c** entropy (index) of the universe of surnames in the municipality; **d** distribution of most frequent (top) surnames

through their impact on historical development, or directly, by making certain locations more or less easy to conquer. We also control for agricultural suitability (pre-1500 AD i.e., before the Columbus exchange) and distance from main rivers. Second, according to the conceptual framework, differences in historical levels of development, proxied in a Malthusian perspective by historical population in the year 1000 AD, can affect the likelihood that locations were republican seeds. Similarly, access to inland trade, in terms of the distance from the main trade and transportation networks given by the Roman roads (see Dalgaard et al., 2018), can have a direct impact on the emergence, in particular, of communal seeds. Third, we control for historical experiences that, in view of the literature, might interact with the emergence of the self-governed republics. To account for the role of historical centers of economic and religious power, we control for the distance from cities hosting bishops that existed in the year 1000 AD (see Belloc et al., 2016). Finally, we also control

for free cities and cities fighting against the Emperor, assessed in terms of participation in the Lombard League.<sup>14</sup>

The empirical results, reported in Table 1, show that most of these covariates impact the likelihood of different republican experiences, in line with priors (columns 1–6). In particular, proxies of easier access to sea trade increase the likelihood of being a seed of a maritime republic and decrease that of being a seed of a communal republic. Meanwhile, access to inland trade routes raises the probability of being a seed of a communal republic. Other geographic features display less systematic patterns, while historical development (measured in terms of population) increases the likelihood of being a seed of either type of republic. Notably, conditional on geography, population, and location in terms of access to inland and sea trade, no systematic significant patterns can be detected for the experiences of free cities and participation in the Lombard League.<sup>15</sup>

Results in column (7) indicate that locations on the coast, close to rivers, and near bishop cities, which presumably were historically more economically attractive in terms of territorial control and competition, are significantly associated to higher historical political instability. Meanwhile, we detect no significant patterns for other geographic and historical correlates when accounting for spatial autocorrelation.<sup>16</sup>

### 4.3 Political history and local social contracts today

The conceptual framework and historical evidence support the prediction that a more intense exposure to the rule of communal republics should favor the emergence and persistence of inclusive social contracts in terms of fiscal compliance and productive governance, while the opposite is expected for the intensity of historical exposure to the rule of maritime republics, particularly as annexed locations. Historical political instability is expected to deter persistence, and therefore the likelihood of observing, inclusive social contracts. Preliminary unconditional correlations align well with these predictions (see Fig. A.5 in the Supplementary Appendix). In this Section, we report the results of a regression analysis that systematically investigates the effect of the intensity and stability of exposure to the rule of the republics on the main outcomes of interest and present a brief assessment

<sup>14</sup> All geo-morphological controls with the exception of ruggedness are available from the Italian National Institute of Statistics (ISTAT). We constructed the municipal measure of terrain ruggedness using the Global Land One-km Base Elevation Project (GLOBE), a global gridded digital elevation data set covering the Earth's surface at a 10-minute spatial resolution (approximately 1km). Data on caloric suitability comes from Galor and Özak (2016). Historical population in all locations in the year 1000 AD is computed using data on the cities with at least 5000 inhabitants in 1000 AD from Bairoch et al. (1988) as updated by Bosker et al. (2013) as a baseline source of information. Distance to Roman roads is measured using information from McCormick (2013). All variables regarding further historical political experiences are estimated relying on data from Guiso et al. (2016). Details on the different data sources and the construction of each variable, summary statistics, and the correlation tables for these and further variables discussed below are reported in the Supplementary Appendix. The role of other covariates and extensive robustness checks that account for the impact of location-specific characteristics are presented in Sect. 5.

<sup>15</sup> This is not all that surprising since the free cities and the republics represent different political experiences. For instance, cities like Bologna were first free cities, then capitals of communal republics and never exposed to the rule of maritime republics. Other capitals of republics were never free cities, and vice-versa. The experience of the free cities represented specific charters of self-government within city walls, while the rule of the republics also extended to the control of other territories outside city walls and included other cities.

<sup>16</sup> Political instability is also rather orthogonal to the different republican treatments, with correlations ranging from  $-0.26$  to  $+0.33$ . See also Table A.5 in the Supplementary Appendix.

**Table 1** Exposure to Republics and Instability: Geographic and Historical Correlates

| Dep. Var.                               | Communal                           |                                    |                                    | Maritime                           |                                   |                                    | Pol.Instability                    |      |         |
|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------------|------------------------------------|------------------------------------|------|---------|
|   | Any                                | Seed                               | Annexed                            | All                                | Seed                              | Annexed                            | Any                                | Seed | Annexed |
|   | (1)                                | (2)                                | (3)                                | (4)                                | (5)                               | (6)                                | (7)                                | (8)  | (9)     |
| <i>Geography</i>                        |                                    |                                    |                                    |                                    |                                   |                                    |                                    |      |         |
| On the coast                            | -0.026<br>(0.027)<br>[0.078]       | -0.134<br>(0.023)***<br>[0.099]    | -0.044<br>(0.029)<br>[0.087]       | 0.001<br>(0.025)<br>[0.111]        | 0.110<br>(0.023)***<br>[0.048]**  | -0.064<br>(0.031)**<br>[0.117]     | 4.617<br>(0.853)***<br>[2.237]**   |      |         |
| Within 5 km coast                       | -0.055<br>(0.040)<br>[0.081]       | -0.165<br>(0.033)***<br>[0.083]**  | -0.052<br>(0.043)<br>[0.099]       | 0.192<br>(0.026)***<br>[0.107]*    | 0.077<br>(0.030)***<br>[0.044]*   | 0.117<br>(0.039)***<br>[0.120]     | 4.180<br>(1.329)***<br>[3.201]     |      |         |
| Distance from the sea                   | 0.139<br>(0.009)***<br>[0.072]*    | 0.214<br>(0.015)***<br>[0.112]*    | 0.057<br>(0.014)***<br>[0.102]     | -0.237<br>(0.016)***<br>[0.156]    | -0.031<br>(0.005)***<br>[0.014]** | -0.209<br>(0.016)***<br>[0.159]    | 3.207<br>(0.306)***<br>[2.296]     |      |         |
| Distance from the rivers                | -0.329<br>(0.005)***<br>[0.028]*** | -0.107<br>(0.007)***<br>[0.041]*** | -0.345<br>(0.006)***<br>[0.034]*** | 0.145<br>(0.008)***<br>[0.059]**   | -0.007<br>(0.002)***<br>[0.005]   | 0.152<br>(0.008)***<br>[0.060]**   | -3.876<br>(0.152)***<br>[1.022]*** |      |         |
| Altitude                                | 0.004<br>(0.002)**<br>[0.007]      | -0.021<br>(0.003)***<br>[0.013]    | 0.001<br>(0.003)<br>[0.009]        | -0.054<br>(0.004)***<br>[0.017]*** | -0.001<br>(0.001)<br>[0.001]      | -0.054<br>(0.004)***<br>[0.017]*** | 0.059<br>(0.063)<br>[0.236]        |      |         |
| Ruggedness                              | 0.009<br>(0.003)***<br>[0.009]     | -0.034<br>(0.004)***<br>[0.015]**  | -0.007<br>(0.004)*<br>[0.015]      | 0.051<br>(0.005)***<br>[0.022]**   | 0.007<br>(0.001)***<br>[0.006]    | 0.043<br>(0.005)***<br>[0.023]*    | -0.372<br>(0.086)***<br>[0.484]    |      |         |
| Caloric Suitability (pre 1500 AD)       | 0.003<br>(0.001)**<br>[0.004]      | 0.002<br>(0.002)<br>[0.007]        | -0.003<br>(0.001)**<br>[0.005]     | -0.019<br>(0.002)***<br>[0.008]**  | 0.002<br>(0.000)***<br>[0.001]    | -0.020<br>(0.002)***<br>[0.009]**  | 0.135<br>(0.031)***<br>[0.134]     |      |         |
| <i>Historical Population and Routes</i> |                                    |                                    |                                    |                                    |                                   |                                    |                                    |      |         |
| Population 1000 AD (ln)                 | 0.044<br>(0.009)***<br>[0.029]     | 0.168<br>(0.019)***<br>[0.050]***  | 0.013<br>(0.013)<br>[0.046]        | 0.069<br>(0.016)***<br>[0.063]     | 0.057<br>(0.010)***<br>[0.026]**  | 0.012<br>(0.017)<br>[0.061]        | 0.604<br>(0.335)*<br>[1.342]       |      |         |

Table 1 (continued)

| Dep. Var.                      | Communal                           |                                  |                                 | Maritime                        |                                  | Pol.Instability                 |                                    |
|--------------------------------|------------------------------------|----------------------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------|------------------------------------|
|                                | Any<br>(1)                         | Seed<br>(2)                      | Annexed<br>(3)                  | All<br>(4)                      | Seed<br>(5)                      | Annexed<br>(6)                  | (7)                                |
| Distance to Roman roads        | 0.172<br>(0.065)***<br>[0.228]     | -0.241<br>(0.106)**<br>[0.525]   | 0.128<br>(0.088)<br>[0.313]     | -0.345<br>(0.103)***<br>[0.499] | 0.022<br>(0.027)<br>[0.074]      | -0.289<br>(0.104)***<br>[0.504] | -5.471<br>(1.724)***<br>[6.766]    |
| <i>Free Cities and Bishops</i> |                                    |                                  |                                 |                                 |                                  |                                 |                                    |
| Distance to Bishops 1000 AD    | -0.562<br>(0.047)***<br>[0.233]*** | 0.015<br>(0.070)<br>[0.351]      | -0.183<br>(0.061)***<br>[0.368] | 0.346<br>(0.075)***<br>[0.390]  | 0.042<br>(0.019)**<br>[0.039]    | 0.343<br>(0.076)***<br>[0.395]  | -11.662<br>(1.264)***<br>[5.396]** |
| Experience of Free City        | -0.081<br>(0.054)<br>[0.075]       | -0.112<br>(0.082)<br>[0.073]     | -0.008<br>(0.057)<br>[0.091]    | -0.002<br>(0.065)<br>[0.082]    | -0.057<br>(0.025)**<br>[0.026]** | 0.051<br>(0.068)<br>[0.085]     | -2.164<br>(1.569)<br>[1.937]       |
| Part of Lombard League         | -0.162<br>(0.088)*<br>[0.102]      | -0.293<br>(0.139)**<br>[0.132]** | -0.136<br>(0.098)<br>[0.114]    | -0.058<br>(0.108)<br>[0.150]    | -0.036<br>(0.049)<br>[0.061]     | -0.013<br>(0.114)<br>[0.144]    | -3.937<br>(2.209)*<br>[2.792]      |
| N. Municipalities              | 4,625                              | 4,625                            | 4,625                           | 4,625                           | 4,625                            | 4,625                           | 4,625                              |
| R-Squared                      | 0.608                              | 0.208                            | 0.372                           | 0.267                           | 0.129                            | 0.237                           | 0.215                              |

The unit of observation is the territory of a municipality today. Columns (1–3) focus on the communal experiences and columns (4–6) on the maritime experiences. For both sets of results, the dependent variable in the first specification is a dummy taking a value of 1 for municipalities that have ever been ruled by the given type of republic (without discriminating whether this was as seed or as annexed), while in the second and third specifications the dependent variable is a dummy taking a value of 1 for municipalities having ever been a seed or an annexed to the given type of republic, respectively. The dependent variable in column (7) is *Political Instability*, that is the number of changes of ruler in the period 1000–1800 AD. *Geographic Controls* are: a dummy variable for municipalities on the coast and a dummy variable for municipalities within 5 km of the coast, distance to the sea and to rivers (× 100 km), average altitude and ruggedness (× 100 Mt), and pre-Colombian Exchange caloric suitability (× 100). The *Historical population and routes* variables are the estimated municipality population in 1000 AD and distance to Roman roads (× 100 km). *Free Cities and Bishops* include: distance to a bishop seat in 1000 AD (× 100 km), a dummy for the experience of free city, and a dummy for the free cities that were part of the Lombard League. Additional information on all variables can be found in the text and in the Supplementary Appendix. OLS estimates. Robust standard errors reported in parentheses, Conley (1999) standard errors in squared brackets, allowing for spatial correlation within a 70 km radius and Bartlett kernel decay across observations within the same cluster. \*\*\*, \*\*, \* indicate significance at 1-, 5-, and 10-% level, respectively

of their quantitative impact. Further analysis documenting the validity of the main findings and additional results are discussed in Sect. 5.

*Fiscal compliance and productive governance* Table 2 reports the results using fiscal compliance (in columns 1–4) and productive governance (in columns 5–8) as outcome variables. We estimate the effect of the time of exposure to republican rule also distinguishing between seeds and annexed locations, to explore the predicted mechanism related to the existence of different, inclusive or exploitative, historical territorial strategies. The results provide broad support for the predicted role of political history on today's social contracts. Being exposed to communal republics significantly increases fiscal compliance, while exposure to maritime republics has the opposite effect. Notably, the positive effect of the exposure to communal republics is mainly driven by the seeds, while the negative effect of the exposure to maritime republics is mostly driven by the annexed territories. Looking at the extremes, an increase in the time ruled as either seed of a communal republic or as annexed of a maritime republic, is respectively associated to a 11% increase and 7% reduction in the standard deviation of fiscal compliance.<sup>17</sup> The results for productive governance document that municipalities ruled longer by communal republics display a higher provision of public services, with an effect that is very similar in both seeds and annexed locations (although estimates for the former are more precise). The opposite is true for municipalities ruled longer by maritime republics, where the effect is largely driven by annexed locations. In line with the prior of the harmful effect of historical changes of ruler, historical political instability has a robust negative effect on both fiscal compliance and productive governance across specifications.

*Population diversity and social closure* The conceptual framework and historical evidence furthermore emphasize the role of inclusive institutions as instrumental in attracting in-migration. This view implies the testable prediction that a longer exposure to inclusive social contracts, proxied by the exposure to communal rule, should increase the level of population diversity. In Table 3, we report the results for population diversity, measured in terms of entropy in the population (in columns 1–4), and for social closure, measured in terms of the highest concentration of surnames (in columns 5–8). Our findings show that the intensity of exposure to communal rule increases population diversity while no significant effects are detected for the maritime republics. Locations ruled by the maritime republics, particularly as annexations, display a higher degree of social closure. Consistently, historical political instability strongly and robustly reduces population diversity (and increases social closure); plausibly explained by the lower level of attractiveness of these locations for in-migration. These patterns offer evidence that aligns with the historical narratives, namely that communal republics implemented more attractive legal regulations and offered a more permeable economic environment, which also favored the arrival of migrants (see also Sect. 5.2 below).

*Discussion* Before presenting the robustness checks and further results, we perform a quantitative assessment of the importance of the intensity and stability of historical

<sup>17</sup> In the sample of municipalities ever ruled by a republic, the standard deviation of fiscal compliance is 8.65 percentage points, while the standard deviations of time ruled as seed or annexed of a communal or maritime republic are 1.30, 1.10, 0.61 and 1.70 centuries, respectively.

exposure to the different types of medieval republican institutions relative to other covariates. To this end, we exploit two methodologies. First, following Ashraf et al. (2021) we compute the added explanatory power associated to each group of explanatory variables in terms of partial  $R^2$  statistics. Second, we perform a Shapley decomposition (Shorrocks, 2013) to evaluate the weight of each group of regressors in the overall estimated  $R^2$ .<sup>18</sup>

The results of the two methodologies, reported in Table 4, deliver complementary insights. Geographical characteristics have the largest explanatory power and account, for instance, for 14 percent of the total residual variation in fiscal compliance; in the Shapley decomposition, these account for 64 percent of the overall  $R^2$ . For the same variable of interest, the measures of exposure to republican rule have the second highest overall explanatory power (followed by political instability), explaining about 4% of the total residual variation and 17 percent of the overall  $R^2$  (i.e., about a third compared to geography). Interestingly, the variables tracking political history have comparatively larger explanatory power for productive governance, while geography is by far the stronger predictor of population diversity and social closure. This aligns with the insights of the conceptual framework, which interprets the effect of social contracts on population diversity to be only indirect and related to their impact on differential migration in the long run.<sup>19</sup> Interestingly, however, the explanatory power of geographical features is differentially reduced by the inclusion of historical covariates. This reduction tends to be small for the case of fiscal compliance and productive governance (about 1 percentage point if we compare the most parsimonious specification with the full specification) but is larger for population diversity and social closure (the reduction being 4 and 7 percentage points, respectively). Taken together, these results suggest that geography is a relatively more important driver of population diversity, but also that part of the “first nature” effects of geography for these variables runs through historical, “second nature,” mechanisms.

## 5 Robustness and further results

In this section, we discuss several checks performed to assess the validity of the empirical evidence, as well as present further results and additional evidence on the mechanisms at play.

### 5.1 Robustness

Given the use of disaggregated data, the main conceptual concerns regard the potential role of omitted location-specific characteristics and the correct handling of spatial autocorrelation. Our baseline analysis accordingly employs the empirical strategies typically implemented in the literature to deal with these issues. All results are robust to conditioning on a large set of covariates in terms of geographic and historical socio-economic and political

---

<sup>18</sup> This approach has been used, for instance, by Handerson, Squires, Henderson et al. (2018) to assess the marginal contribution of malaria, ruggedness, agricultural and trade variables, and country fixed effects to the overall  $R^2$  of a regression with night lights as the dependent variable.

<sup>19</sup> As discussed in the Introduction, the framework implies positive effects of selected migration on the persistence of inclusive social contracts (see also the model in the Appendix). In line with this insight, the results reported in Table A.7 in the supplementary appendix document that population diversity and social closure explain some of political history’s total effect on modern outcomes.

**Table 2** The Legacy of Political History on Local Social Contracts

| Dep. Var.               | Fiscal compliance                  |                                    |                                    | Productive governance              |                                    |                                    |                                    |                                    |
|-------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
|                         | (1)                                | (2)                                | (3)                                | (4)                                | (5)                                | (6)                                | (7)                                | (8)                                |
| Comm. Rep. (or Seeds)   | 0.720<br>(0.212)***<br>[0.289]**   | 0.709<br>(0.214)***<br>[0.289]**   | 0.921<br>(0.228)***<br>[0.279]***  | 0.916<br>(0.230)***<br>[0.279]***  | 0.062<br>(0.035)*<br>[0.044]       | 0.080<br>(0.034)**<br>[0.041]*     | 0.054<br>(0.036)<br>[0.043]        | 0.075<br>(0.035)**<br>[0.039]*     |
| Annexed Communal        |                                    |                                    | 0.337<br>(0.247)<br>[0.352]        | 0.331<br>(0.250)<br>[0.351]        |                                    |                                    | 0.076<br>(0.046)*<br>[0.065]       | 0.088<br>(0.045)**<br>[0.062]      |
| Marit. Rep. (or Seeds)  | -0.512<br>(0.232)**<br>[0.328]     | -0.505<br>(0.237)**<br>[0.330]     | 0.352<br>(0.449)<br>[0.447]        | 0.393<br>(0.453)<br>[0.445]        | -0.109<br>(0.021)***<br>[0.031]*** | -0.089<br>(0.019)***<br>[0.028]*** | -0.083<br>(0.040)**<br>[0.035]**   | -0.036<br>(0.040)<br>[0.033]       |
| Annexed Maritime        |                                    |                                    | -0.642<br>(0.226)***<br>[0.314]**  | -0.632<br>(0.230)***<br>[0.315]**  |                                    |                                    | -0.110<br>(0.021)***<br>[0.031]*** | -0.093<br>(0.020)***<br>[0.029]*** |
| Political Instability   | -0.206<br>(0.031)***<br>[0.040]*** | -0.208<br>(0.029)***<br>[0.039]*** | -0.212<br>(0.028)***<br>[0.037]*** | -0.214<br>(0.025)***<br>[0.035]*** | -0.019<br>(0.004)***<br>[0.006]*** | -0.019<br>(0.004)***<br>[0.005]*** | -0.019<br>(0.004)***<br>[0.006]*** | -0.020<br>(0.004)***<br>[0.006]*** |
| Geography               | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                |
| Hist. Pop. and Routes   | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                | Yes                                |
| Free Cities and Bishops | No                                 | Yes                                | No                                 | Yes                                | No                                 | Yes                                | No                                 | Yes                                |
| Cluster1 (Length)       | 354                                | 354                                | 354                                | 354                                | 354                                | 354                                | 354                                | 354                                |
| Cluster2 (Same story)   | 836                                | 836                                | 836                                | 836                                | 836                                | 836                                | 836                                | 836                                |
| N. Municipalities       | 4,625                              | 4,625                              | 4,625                              | 4,625                              | 4,625                              | 4,625                              | 4,625                              | 4,625                              |
| R-Squared               | 0.226                              | 0.227                              | 0.233                              | 0.234                              | 0.099                              | 0.137                              | 0.099                              | 0.138                              |

**Table 2** (continued)

The unit of observation is the territory of a municipality today. The dependent variable in columns (1–4) is the level of fiscal compliance measured as the share of households that pay the television-radio tax in a municipality, while in columns (5–8) the dependent variable is the logarithm of the average municipality expenditure per capita associated to directly managed municipal preschools during the period 2013–2018. The variable “*Communal Republics (or Seeds)*” refers to the time ruled by communal republics (columns 1–2 and 5–6) and to the time spent as a seed of a communal republic (columns 3–4 and 7–8), respectively. “*Annexed Communal*” refers to the time ruled as an annexed location of a communal republic. The same applies for the variables “*Maritime Republics (or Seeds)*” and “*Annexed Maritime*.” “*Political Instability*” is a variable accounting for the number of changes of ruler in the period 1000–1800. For a description of the variables included in the *Geographic Controls*, *Historical Population and Routes* and *Free Cities and Bishops* see text and Table 1. Additional information can be found in the Supplementary Appendix. OLS estimates. Standard errors reported in parentheses are double-clustered along treatment dimensions (municipalities with the same sequence of rulers in the period 1000–1800 and length of republican experience). Conley (1999) standard errors in squared brackets, allowing for spatial correlation within a 70 km radius and Bartlett kernel decay across observations within the same cluster. \*\*\*, \*\*, \* indicate significance at 1-, 5-, and 10-% level, respectively



characteristics. Given the findings of heterogeneous effects, it is challenging to discern the type of omitted variables or process of selection into treatments that could drive purely statistical biases, inducing estimates with systematic opposite signs. Such omitted factors should consistently bias the estimated effects of time ruled by (annexed to) the republics in opposite directions for all the different variables of interest. Nonetheless, in this section we discuss the results of robustness checks that further explore the possible role of omitted variables and patterns of spatial clustering using an identification-by-committee approach. The findings are reported in the Supplementary Appendix.

*Seemingly unrelated regressions* The dimensions of the social contracts in terms of attitudes, policies, and population diversity are, in theory, co-determined in equilibrium. This implies that even if the variables explaining these outcomes are assumed to be exogenous, the error terms are not independent of one another as, for instance, a random shock to fiscal compliance in the population could impact productive governance and the attractiveness of the social contracts. The Breusch-Pagan test of independence of the error terms indeed suggests that the error terms of the four regressions are not independent of one another. To explore the potential impact of this correlation on the results, we run seemingly unrelated regressions (SUR) with double clustered standard errors. The findings reassuringly show that the results hold also when explicitly accounting for the interdependence of the outcomes of interest (see Table A.8).

*Spatial autocorrelation: further checks* The use of highly disaggregated data raises the question as to how to correctly implement statistical inference accounting for the role of spatial autocorrelation.<sup>20</sup> In the baseline analysis, we double-cluster standard-errors and use Conley standard errors with a 70 km radius. Following Colella et al. (2019), we further show that the baseline results are robust using Conley standard errors for radii ranging from 10 to 100 Km (see Appendix 3.2).<sup>21</sup>

*Geographic fixed effects and sample* We further push our strategy of accounting for pre-determined confounders of the republican experiences by exploring the role of populations and polities before the advent of the republics. Specifically, we include fixed effects for Roman regions (in 117 AD, from Talbert 2000) and account for different sovereign polities ruling the Italian peninsula in the year 1000 AD (from the *Centennia Historical Atlas*). We assess the impact of sample composition by restricting to the territory in the North of the country (thereby also including municipalities that were never ruled by the medieval republics but were located nearby these polities). With the relevant caveat that the borders of Roman regions and early polities are uncertain and therefore likely subject to large measurement error, the results confirm the baseline findings (see Fig. A.8).

*Fixed effects for random territorial units* Studies using highly disaggregated data often condition on fixed effects for modern administrative units like provinces or regions. In our application, this strategy is problematic since the exposure to the republics endogenously shaped modern administrative borders. Similarly, modern covariates such as level of income or population are potentially endogenous to local political history and thus may

---

<sup>20</sup> If not explicitly accounted for, the existence of spatial autocorrelation can inflate t-statistics thereby leading to high levels of statistical significance. This is a general point that applies to all empirical analysis with spatial units that always display some degree of spatial autocorrelation. See also Kelly (2020) for a discussion of this issue in the context of studies involving historical data. This issue relates in particular to the statistical inference (that is on the correct computation of the standard errors).

<sup>21</sup> A radius of 100 km implies correcting for spatial autocorrelation in each municipality with more than 950 surrounding municipalities. The patterns show that standard errors stabilize around 50 km and that the baseline of 70 km represents the more conservative set-up.

**Table 3** The Legacy of Political History on Population Diversity

| Dep. Var.              | Population diversity               |                                    |                                    | Social closure                     |                                   |                                 |                                  |                                   |
|------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------------|---------------------------------|----------------------------------|-----------------------------------|
|                        | (1)                                | (2)                                | (3)                                | (4)                                | (5)                               | (6)                             | (7)                              | (8)                               |
| Comm. Rep (or Seeds)   | 0.058<br>(0.037)<br>[0.051]        | 0.075<br>(0.036)**<br>[0.047]      | 0.075<br>(0.041)*<br>[0.055]       | 0.095<br>(0.040)**<br>[0.051]*     | -0.334<br>(0.214)<br>[0.282]      | -0.375<br>(0.209)*<br>[0.266]   | -0.395<br>(0.234)*<br>[0.290]    | -0.437<br>(0.228)*<br>[0.269]     |
| Annexed Communal       |                                    |                                    | 0.026<br>(0.040)<br>[0.060]        | 0.039<br>(0.038)<br>[0.056]        |                                   |                                 | -0.219<br>(0.251)<br>[0.362]     | -0.260<br>(0.244)<br>[0.346]      |
| Marit. Rep. (or Seeds) | -0.023<br>(0.025)<br>[0.029]       | -0.003<br>(0.024)<br>[0.029]       | 0.006<br>(0.044)<br>[0.055]        | 0.053<br>(0.046)<br>[0.058]        | 0.484<br>(0.217)**<br>[0.229]**   | 0.424<br>(0.216)*<br>[0.236]*   | 0.404<br>(0.211)*<br>[0.284]     | 0.265<br>(0.220)<br>[0.293]       |
| Annexed Maritime       |                                    |                                    | -0.030<br>(0.025)<br>[0.028]       | -0.012<br>(0.024)<br>[0.028]       |                                   |                                 | 0.507<br>(0.225)**<br>[0.236]**  | 0.453<br>(0.225)**<br>[0.243]*    |
| Political Instability  | -0.018<br>(0.004)***<br>[0.005]*** | -0.019<br>(0.004)***<br>[0.005]*** | -0.019<br>(0.004)***<br>[0.005]*** | -0.020<br>(0.004)***<br>[0.005]*** | 0.102<br>(0.030)***<br>[0.039]*** | 0.110<br>(0.027)***<br>[0.036]* | 0.102<br>(0.030)***<br>[0.040]** | 0.111<br>(0.027)***<br>[0.036]*** |
| Geography              | Yes                                | Yes                                | Yes                                | Yes                                | Yes                               | Yes                             | Yes                              | Yes                               |
| Hist. Pop. and Routes  | Yes                                | Yes                                | Yes                                | Yes                                | Yes                               | Yes                             | Yes                              | Yes                               |
| Free Cities & Bishops  | No                                 | Yes                                | No                                 | Yes                                | No                                | Yes                             | No                               | Yes                               |
| Cluster1 (Length)      | 354                                | 354                                | 354                                | 354                                | 354                               | 354                             | 354                              | 354                               |
| Cluster2 (Same story)  | 835                                | 835                                | 835                                | 835                                | 836                               | 836                             | 836                              | 836                               |
| N. Municipalities      | 4613                               | 4613                               | 4613                               | 4613                               | 4623                              | 4623                            | 4623                             | 4623                              |
| R-Squared              | 0.339                              | 0.379                              | 0.340                              | 0.381                              | 0.435                             | 0.442                           | 0.435                            | 0.442                             |

**Table 3** (continued)

The unit of observation is the territory of a municipality today. The dependent variables are: the entropy of the distribution of surnames in a municipality (columns 1–4) and the share of the first 5 most frequent surnames (columns 5–8). The variable “*Communal Republics (or Seeds)*” refers to the time ruled by communal republics (columns 1–2 and 5–6) and to the time spent as a seed of a communal republic (columns 3–4 and 7–8), respectively. “*Annexed Communal*” refers to the time ruled as an annexed location of a communal republic. The same applies for the variables “*Maritime Republics (or Seeds)*” and “*Annexed Maritime*.” “*Political Instability*” is a variable accounting for the number of changes of ruler in the period 1000–1800. For a description of the variables included in the *Geographic Controls*, *Historical Population and Routes* and *Free Cities and Bishops*, see text and Table 1. Standard errors reported in parentheses are double-clustered along treatment dimensions (municipalities with the same sequence of rulers in the period 1000–1800 and length of republican experience). Conley (1999) standard errors in squared brackets, allowing for spatial correlation within a 70 km radius and Bartlett kernel decay across observations within the same cluster. \*\*\*, \*\*, \* indicate significance at the 1-, 5-, and 10-% level, respectively

be bad controls. To further explore unobserved local characteristics, we include simulated, rather than actual, territorial fixed effects, thereby exploiting variation within random territorial units of about the size of actual administrative provinces. We replicate the analysis a thousand times and report the distribution of point estimates obtained using the residual variation within these artificial provinces. Each random iteration also effectively implies allowing for different, and random, perturbations of the spatial autocorrelation across neighbouring locations. The results confirm the baseline finding of the opposite effects of political history in communal and maritime republics (see Fig. A.9).

*Isolated locations and municipalities on historical borders* Isolated municipalities, in particular those found on the island of Sardinia, display a lower degree of variability in all the variables of interest (see Figs. 2 and 6). Excluding municipalities in Sardinia confirms the observed patterns and even renders the findings slightly stronger in magnitude (see Table A.9). We also explore, following Kitamura and Lagerlöf (2020), the role of historical borders. The baseline results are robust to controlling for having been split by a border or controlling for the length of time a municipality has spent on historical borders (see Table A.10).

*Predicting patterns of annexation: IV estimates* Finally, we devise an IV strategy based on the conceptual framework and the historical narratives, where measures of the latent ability of rulers to annex a location is used as instrument for actual annexation. We exclude locations exposed to the republics only as seeds. This limits by construction endogeneity related to the origin of each polity. We build three instruments that are informative on the predicted annexation based on the fact that the state capacity of pre-industrial polities was declining in the distance from centers of power (see Sect. 2), and on the different strategies of territorial control and competition pursued by elites of communal and maritime republics (see Sects. 2 and 3). First, decay in the territorial grip of maritime republics is measured by the (log) distance from their capitals ruling over a location in a given moment in time, or the distance to the closest maritime capital (for the locations ruled by communal republics in a given year). Second, we build a similar variable for the distance to the capital of communal republics although, in view also of their smaller territorial size, this measure is less informative. Finally, following the idea that territories that are more centrally located in the network of communal capitals face more intensive competition and have a higher probability of be annexed, we track their centrality within the changing network of communal republics. Higher average centrality in the network of communal republics and distance to maritime capitals increase the exposure to communal republics, the distance from own (or closer) maritime capital is a strong predictor of the time spent as an annexed territory to these polities, while centrality in the network of communal republics reduces it.<sup>22</sup> The OLS estimates in the restricted sample of ever annexed locations are similar to the

<sup>22</sup> The distance to own/closest capital of each type is averaged across the years thereby obtaining a variable that, for each location, is informative on the latent ability of rulers to annex that location. This can be used as instrument for actual exposure. Similarly, we compute the average distance from a location to all the communal capitals existing in a given year and average out over the observation period. The correlation between the resulting instruments ranges from around 0.3 to 0.7. The computation of Conley (1999) standard errors for IV regressions is performed using the STATA routine recently released by Colella et al. (2019). Test statistics, including the Sanderson-Windmeijer (SW) first-stage F-statistic for multiple regressors and chi squared test for underidentification, jointly suggest that the specification does not suffer from problems of non-relevance and weak identification. The Hansen-J test for over-identification suggests that the instruments are correctly excluded.

baseline. The validity of the exclusion restriction, while impossible to test, must hold conditional on the extensive set of covariates.

The IV results confirm the findings and their magnitude is two to four times larger than the OLS estimates. While generally moderate, the difference in magnitudes may be due to attenuation bias induced by measurement error and by the role of historical contingencies that are orthogonal to the instruments and lead to lower estimates of the ATE for given LATE. Specifically, while representing good predictors of the likelihood of being ruled by the different polities, the distance to communal and maritime capitals and the centrality in the communal network at a given point in time are not the only determinants of annexations by communal and maritime republics. Historical contingencies, such as conflicts or random events that impact the ability of a location to facilitate or resist annexation attempts, also likely mattered. Conceptually, the presence of such “defiers” would attenuate the estimate of the ATE relative to the estimated LATE. Reduced form, intention-to-treat, estimates are reported in Table A.11 while first stage, OLS, and IV results are reported in Table A.11.

## 5.2 Further results

We conclude the empirical analysis by looking at the effects of the historical republican experience on other outcomes that help shed light on the mechanisms at play. We furthermore explore additional predictions of the conceptual framework.

### 5.2.1 Institutions, social capital and cooperation

An assessment of the impact of political history on other relevant outcomes offers complementary evidence and insights on the mechanisms at work. The results, reported in Table 5, provide suggestive evidence that municipalities that were ruled by a communal republic also display more efficient local fiscal institutions, as measured by their effectiveness in fighting tax evasion.<sup>23</sup> Given the existing literature, we also look at measures of civic attitudes, social capital, and cooperation. Though the conceptual framework is, strictly speaking, silent on the predicted effect of historical social contracts on these dimensions, the results deliver several interesting patterns worth mentioning. A more intensive rule by communal republics reduces the presence of mutual aid association, while higher political instability robustly increases it.<sup>24</sup> A tentative interpretation of these findings is that a more effective public provision of social services reduces the need for forms of private mutual insurance, while historical political instability has the opposite effect. In line with this reasoning, we also find no crowding out effects for other measures of cooperation relating to services that cannot be offered by local government (e.g., individual organ donations) or for measures typically associated to social capital and generalized morality (e.g.,

<sup>23</sup> As an outcome of interest, we consider the results of a national program meant to incentivize municipalities to engage in fighting tax evasion. The central government remitted the value of the evaded national taxes (personal income, VAT, firms' income) to the municipalities that detected them. Data refer to the year 2012, the first year in which the national government returned 100% of the detected evasion to the municipality.

<sup>24</sup> We use data from the “2015 Third Italian Census of Non-profit Organizations” on the number of mutual aid association and organizations (per 1,000 inhabitants) working in the social sector including religious associations providing social services, among others, to youth and elderly.

electoral turnout).<sup>25</sup> We consistently find effects similar to those for fiscal compliance attitudes, namely a positive effect of exposure to communal republics and a negative effect of exposure to maritime republics and political instability.

### 5.2.2 Interaction between different “Republican Treatments”

An interesting element of local political history, tracked by our measures of political geography, is that the territory of some municipalities was exposed to the rule of both communal and maritime republics. This implies, for instance, that some locations that started out as a seed of either a communal or maritime republic were later annexed as a territory of the other type, and sometimes even reverted back to being a territory ruled by the original type. Some locations shifted back and forth as annexed territories of the two types of republics without belonging to a seed territory. A consideration of the interactions between the different republican treatments as seed and annexed locations allows to further explore the implications of exposure to different historical social contracts.<sup>26</sup> The findings, reported in Table A.13, show that adding information on the interactions between treatments confirms the baseline patterns on the opposite role of the intensity of exposure to each type. The estimated impact of intensity of exposure as communal seeds is slightly stronger in magnitude, while the estimated impact of annexation to a maritime republic is weaker. Interestingly, and in line with priors, locations that were originally part of communal seeds but later annexed to maritime republics display lower levels of fiscal compliance, while the opposite is true for locations that were maritime seeds but then annexed by communal polities. The same patterns can also be detected for population diversity. Finally, we do not discern any further impact for locations that were not seeds but shifted between being annexations of communal and maritime republics.

### 5.2.3 Historical selected migration

The historical evidence discussed in Sect. 2 and the conceptual framework (see also the discussion in the Appendix) suggest the presence of historical selected migration, driven by the differential attractiveness of the historical social contracts. We use information on surnames building on Crow’s (1983:383) observation that “surnames provide a quick, easy, cheap, and crude way to study human inbreeding and migration. Isonymy is the poor man’s population genetics.” Specifically, we exploit the fact that many Italian (and generally European) surnames originated from individual nicknames of toponym nature that mean “from...” These largely emerged in the Middle Ages and were also given to migrants from other locations. Using a simple supervised text analysis, we track the frequency of toponym surnames in each of the medieval republics, distinguishing between the communal

<sup>25</sup> The variable on mutual help associations is a dummy for the presence of an organ donation association (Aido) in a municipality (from Guiso et al. (2016)). Political turnout has been regarded as a good proxy of social capital (see Guiso et al., 2004) and political efficacy (see Campbell & Miller, 1954; Guiso et al. 2020). We look at both national political elections and referenda.

<sup>26</sup> To this end, we look at locations that (i) were communal seeds and annexed to maritime republics; (ii) were maritime seeds and annexed to communal republics; and (iii) were never part of any republican seed, but were annexations of both communal and maritime republics.

**Table 4** Quantitative Assessment: Geography and History

|                         | Fiscal Compliance |           | Productive Governance |           | Population Diversity |           | Social Closure |           |
|-------------------------|-------------------|-----------|-----------------------|-----------|----------------------|-----------|----------------|-----------|
|                         | PR2               | (Shapley) | PR2                   | (Shapley) | PR2                  | (Shapley) | PR2            | (Shapley) |
|                         | (1)               | (2)       | (3)                   | (4)       | (5)                  | (6)       | (7)            | (8)       |
| Overall $R^2$           | 0.237             |           | 0.141                 |           | 0.384                |           | 0.444          |           |
| Methodology             | PR2               | (Shapley) | PR2                   | (Shapley) | PR2                  | (Shapley) | PR2            | (Shapley) |
| Geography               | 0.141             | (63.73%)  | 0.029                 | (22.69%)  | 0.214                | (55.99%)  | 0.312          | (72.07%)  |
| Hist. Pop. and Routes   | 0.000             | (6.01%)   | 0.006                 | (12.11%)  | 0.017                | (11.71%)  | 0.008          | (5.99%)   |
| Free Cities and Bishops | 0.002             | (4.43%)   | 0.044                 | (37.92%)  | 0.063                | (21.30%)  | 0.013          | (13.09%)  |
| Republican Experiences  | 0.038             | (17.15%)  | 0.032                 | (20.71%)  | 0.014                | (8.57%)   | 0.018          | (7.36%)   |
| Political Instability   | 0.043             | (8.67%)   | 0.019                 | (6.56%)   | 0.027                | (2.43%)   | 0.015          | (1.48%)   |

This table employs OLS regressions to explore the added explanatory power of republican experiences and political instability for tax compliance, productive governance, population diversity, and social closure across today's municipalities that have ever been ruled by a republic. “*Republican Experiences*” includes the number of centuries a municipality was a seed/annexed of a communal/maritime republic, “*Political Instability*” includes a variable tracking the number of changes of ruler in the period 1000–1800. The full list and description of variables included in the each set of covariates is reported in Table 1

and the maritime (e.g., “Bolognesi” or “Fiorentini” versus “Pisani” or “Veneziani”).<sup>27</sup> The shares of communal and maritime surnames are indirectly informative on the latent process of in-migration from the communal and maritime republics, respectively. The results, reported in Table A.14, document that locations ruled by communal republics positively attracted individuals from other republics (although significantly so only from the other communal polities), while no evidence of this latent differential migration is detected for the maritime republics.

#### 5.2.4 Chief administrators of the medieval republics

The conceptual framework delivers further untested insights on the role of constraints on the executive as coordination devices and for the persistence of inclusive social contracts (see also the Appendix). The historical evidence discussed in Sect. 2 supports the predictions by offering extensive descriptions of the differential permeability of access to political power. In the maritime republics, this was limited to the ruling families and precluded to foreigners, while the communal republics saw the introduction of terms limits and use of professional administrators. No ready to use data is, however, available that allows to empirically explore these predictions. Here we briefly discuss suggestive evidence obtained by collecting data on the full sequence of chief administrators of each republic. This consists specifically of the name and period in office of each “podestà” or “doge” ruling over the republics during their period of existence. The information is gathered from primary archival sources, together with secondary

<sup>27</sup> We obtained data on the universe of last names at the municipality level and coded the set of surnames originating from the name of a republic and/or its capital. For instance, surnames from “Bologna” include: *Bologna*, *Bolognesi*, *Bolognani* and *Bolognari*, among others. Examples of surnames arising from “Venezia” include, for example, *Veneziani*, *Veneti* and *Venezian*, among others. This procedure is replicated for all communal and maritime republics. In these empirical specifications, we also condition for the level of entropy in the population, as this should be expected to mechanically increase the number of any type of surname, including those of communal origin.

sources used to homogenize information across languages (surnames are sometimes reported in Latin and sometimes in ancient Italian or local dialects) and across multiple spellings (the same person is often referred to slightly differently across sources). The data confirm the historical narratives and document that different communal republics often sequentially hired the same expert (e.g., a lawyer) to implement economic and legal reforms. The raw data is then used to build measures of ruler turnover. The empirical patterns display a systematically higher turnover of government administrators in the communal republics, aligning with the introduction of stricter term limits described by historians. Furthermore, in line with a latent role of early constraints on the executive as coordination devices, we observe that the communal republics that implemented a higher turnover of professional administrators in the period of their emergence lasted longer (see Fig. A.14). Finally, in Table A.15, we show that the baseline results are robust to weighted measures of exposure to different republican experiences based on data on administrator turnover.

## 6 Concluding remarks

We comparatively study the political economy within the territories historically ruled by the medieval republics in northern Italy. We link the emergence of institutions and policies in the republics to the needs of local rulers to build state, fiscal, and military capacity in these newborn independent sovereign polities. We argue that existing historical evidence and narratives support the perspective that the ability of local rulers to extract rents and control large territories represented a main driver of the emergence of more inclusive or extractive socio-economic policies. Our proposed conceptual framework, which interprets multiple equilibria as social contracts, delivers a set of novel insights on the role of geography and historical contingencies in the emergence of patterns of public governance, social inclusion, and individual attitudes that mutually support each other and persist over time.

To explore the empirical validity of our predictions, we produced a novel geo-referenced database that tracks the origin, territorial evolution, and disappearance of all the sovereign polities that ruled over the Italian peninsula in the period of 1000–1800 AD and the changing locations of their centers of power. Using municipality level data, we document that the intensity and stability of historical exposure to the rule of different republics continues to shape local public policies and attitudes, and has left a tangible imprint on today's population diversity. The evidence suggests that the degree of historical political instability, measured in terms of the number of polities ruling over each territory, and the related process of self-selected migration has impacted the persistence of productive social contracts. Our empirical results, which are robust to extensive checks, provide a first systematic evidence on the role of historical political geography as a main driver of social configurations and population diversity still today. The findings furthermore highlight the need for additional research, able to offer a deeper understanding of the role of local political history in shaping today's political preferences and individual attitudes towards diversity and social inclusion.



**Table 5** Further Results: Institutions, Social Capital, and Cooperation

| Dep. Var.                     | Institutions                       |                                    | Mutual Help                      |                                  | Organ Donation                     |                                    | Turnout (National)               |                                  | Turnout (Referenda)               |                                   |
|-------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
|                               | (1)                                | (2)                                | (3)                              | (4)                              | (5)                                | (6)                                | (7)                              | (8)                              | (9)                               | (10)                              |
| Communal Republics (or Seeds) | 0.012<br>(0.006)*<br>[0.010]       | 0.005<br>(0.006)<br>[0.009]        | -0.006<br>(0.008)<br>[0.013]     | -0.017<br>(0.008)**<br>[0.012]   | 0.009<br>(0.004)**<br>[0.005]*     | 0.006<br>(0.003)<br>[0.004]        | 0.407<br>(0.142)***<br>[0.185]** | 0.409<br>(0.135)***<br>[0.168]** | 0.219<br>(0.185)<br>[0.281]       | 0.089<br>(0.197)<br>[0.293]       |
| Annexed Communal              |                                    | 0.025<br>(0.008)***<br>[0.014]*    |                                  | 0.012<br>(0.010)<br>[0.017]      |                                    | 0.015<br>(0.006)***<br>[0.007]**   |                                  | 0.403<br>(0.178)**<br>[0.235]*   |                                   | 0.461<br>(0.209)**<br>[0.318]     |
| Maritime Republics (or Seeds) | -0.004<br>(0.004)<br>[0.005]       | -0.003<br>(0.009)<br>[0.009]       | 0.001<br>(0.008)<br>[0.011]      | 0.001<br>(0.013)<br>[0.010]      | -0.003<br>(0.002)<br>[0.003]       | 0.009<br>(0.008)<br>[0.010]        | -0.157<br>(0.129)<br>[0.173]     | -0.118<br>(0.127)<br>[0.123]     | -0.658<br>(0.131)**<br>[0.170]**  | -0.502<br>(0.198)**<br>[0.168]**  |
| Annexed Maritime              |                                    | -0.003<br>(0.004)<br>[0.006]       |                                  | 0.004<br>(0.008)<br>[0.011]      |                                    | -0.003<br>(0.002)<br>[0.003]       |                                  | -0.161<br>(0.136)<br>[0.183]     |                                   | -0.640<br>(0.135)***<br>[0.174]** |
| Political Instability         | -0.003<br>(0.001)***<br>[0.001]*** | -0.003<br>(0.001)***<br>[0.001]*** | 0.004<br>(0.001)***<br>[0.002]** | 0.004<br>(0.001)***<br>[0.002]** | -0.002<br>(0.000)***<br>[0.000]*** | -0.002<br>(0.000)***<br>[0.000]*** | 0.001<br>(0.021)<br>[0.024]      | 0.000<br>(0.021)<br>[0.024]      | -0.092<br>(0.024)***<br>[0.040]** | -0.095<br>(0.024)***<br>[0.039]** |
| Geography                     | Yes                                | Yes                                | Yes                              | Yes                              | Yes                                | Yes                                | Yes                              | Yes                              | Yes                               | Yes                               |
| Historical Pop. and Routes    | Yes                                | Yes                                | Yes                              | Yes                              | Yes                                | Yes                                | Yes                              | Yes                              | Yes                               | Yes                               |
| Free Cities and Bishops       | Yes                                | Yes                                | Yes                              | Yes                              | Yes                                | Yes                                | Yes                              | Yes                              | Yes                               | Yes                               |
| Cluster1 (Length)             | 354                                | 354                                | 354                              | 354                              | 354                                | 354                                | 354                              | 354                              | 354                               | 354                               |
| Cluster2 (Same story)         | 836                                | 836                                | 836                              | 836                              | 836                                | 836                                | 836                              | 836                              | 836                               | 836                               |
| N. Municipalities             | 4,625                              | 4,625                              | 4,553                            | 4,553                            | 4,625                              | 4,625                              | 4,625                            | 4,625                            | 4,625                             | 4,625                             |
| R-Squared                     | 0.076                              | 0.080                              | 0.014                            | 0.017                            | 0.231                              | 0.234                              | 0.489                            | 0.489                            | 0.298                             | 0.302                             |

The unit of observation is the territory of a municipality today. The dependent variable is a dummy for municipalities that cooperated with the central government to fight tax evasion in 2012 in columns (1-2), the number of mutual aid and religious associations per 1,000 inhabitants in a municipality (2011 Census) in columns (3-4), a dummy for the presence of an organ donation association (Aïdo) in a municipality in columns (5-6), the average turnout at national political elections in columns (7-8), and the average turnout at referenda in columns (9-10). For a description of the variables included in the *Geographic Controls, Historical Population and Routes, and Free Cities and Bishops*, see text and Table 1. OLS estimates. Robust standard errors reported in parentheses, Conley (1999) standard errors in squared brackets, allowing for spatial correlation within a 70 km radius and Bartlett kernel decay across observations within the same cluster. \*\*\*, \*\*, \* indicate significance at 1-, 5-, and 10-% level, respectively.

## Appendix: Conceptual framework: a simple model

### Set-up

*Geography, population and rents* Take a simple geography. Locations on a line each being populated by a unit mass of individuals with an exogenous endowment,  $e \equiv 1$ . Be  $S$  the territorial size of a polity (i.e. the subset of the line) ruled by an elite in the capital located in the middle of the territory, i.e. at distance  $S/2$  from the borders. The elite enjoys benefits  $E \geq 0$ , that are associated to their status of rulers. This benefit can be different for different polities being related, for instance, to the (exogenous) rents that the elite can extract from long-distance sea trade. Operating the polity requires sustaining the cost of the state apparatus, e.g. fiscal and military capacity, that are increasing in  $S$ :  $K(S) > 0$  with  $K'(S) > 0$ . For simplicity assume  $K(S) = kS$ . Failing to cover these costs results in the loss of control of the elite over the territory, that is, for instance, being conquered by another polity or replaced by another ruler.<sup>28</sup>

*Declining fiscal and regulatory capacity over space* Rulers have to decide whether to extract rents to their exclusive benefits, or offer productive governance that also benefits the population. Denote by  $R(d)$  the rents that can be extracted by the elite in a ruled location at a distance  $d \geq 0$  from the capital while  $G(d)$  is benefit enjoyed by the population if productive governance is provided. As discussed in Sect. 2, these benefits historically related to the provision of valuable goods and services, access to economic activities and property of land and personal freedom that ultimately facilitates income production (e.g. trade, manufacture, etc). Crucially, both extractive and productive capacity is imperfect and declines in space:  $R'(d) < 0$  and  $G'(d) < 0$ . Hence locations that are further away from capitals are more insulated from rent extraction but, being more peripheral, also enjoy inferior productive governance. For tractability consider linear specification:  $R(d) = \max\{0, r(1 - \alpha d)\}$  and  $G(d) = \max\{0, g_i(1 - \beta d)\}$ . This formulations imply a maximum distance from the capital at which rents can be forcefully extracted and benefits from public goods be supplied. Benefits obtained from the productive governance can be individual specific (e.g. based on innate productive ability or skills). By  $g_i$  we denote the benefit enjoyed by an individual  $i$ .

*Fiscal compliance* Strategic complementarities are modelled assuming that the benefits from productive regulation (e.g. the possibility to do business, own land or have protection from the rulers) can be enjoyed only upon paying the taxes that are needed to finance the cost of state capacity. Each individual decides whether to comply to the payment or avoid taxes. The effective cost faced by those who comply ultimately depends on how many other individuals do the same since the per-capita cost is given by  $k/x(S)$  where  $x(S)$  is the share of compliers in the population.<sup>29</sup> Denote by  $\tilde{x}_i(S)$  the belief that individual  $i$  holds about

<sup>28</sup> We normalize the size of population in each location to one and assume that the size of the elite is negligible (i.e. the elite is a small aristocracy). This implies that both the size of territory of the polity and its total population equal  $S$ . The assumption of a linear space with a capital located in the center and of a fixed cost for the state apparatus follows Alesina and Spolaore (1997) as it allows a closed form solution. To concentrate attention to endogenous policies and attitudes we consider a simple framework with polity size taken as given. See Cervellati et al. (2019) for an investigation of endogenous polities and borders in a strategic perspective.

<sup>29</sup> This condition also implies that individual contributions are given by the total costs divided by total contributions,  $kS/x(S)S$ . Equivalently, we could assume that all individuals are called to contribute to a pure public good delivering and that contributions can be avoided only at a cost (where either the benefit or the cost are individual specific).

the expected share of the population that, in a polity of size  $S$ , will comply. The higher the expected level of contributions in the population, the lower the expected cost of individual compliance.

## Equilibria

Absent productive governance, individuals enjoy no benefits and therefore have no incentives to contribute. Consider, for the moment being, the case in which the benefit of productive governance only depends on distance so that  $g_i = g$  for all  $i$ . An individual located at a distance  $d$  from the capital finds it optimal to contribute if, and only if,

$$g(1 - \beta d) \geq \frac{k}{\bar{x}_i(S)} \quad (3)$$

Inspection of eq. (3) allows to illustrate several insights of the conceptual framework that are key for the structural narrative and that have been discussed in the context of the historical evidence in Sect. 2.

- The provision of utility to the population, that is offering productive governance, is *necessary to induce fiscal compliance*;
- Provision of public governance is *not a sufficient condition* since individual incentives for fiscal compliance depend on expectations about compliance by part of others. For instance, if  $\bar{x}_i(S) = 0$ , then no individual has an incentive to contribute, making expectations of lack of compliance self-fulfilling in equilibrium.
- At the opposite extreme, all individuals have incentives to comply if  $\bar{x}_i(S) = 1$  and  $g(1 - \beta b) \geq k$ , where  $b$  is the distance from the capital to the border.
- Higher benefits from public goods,  $g$ , allow to sustain (larger) levels of compliance in polities of any size, while higher costs of state capacity  $k$  do the opposite.

Consider the case in which the elite expects that a large enough share of the population fiscally complies and the cost of state capacity,  $K(S)$ , is covered. The payoff obtained by the elite providing productive governance is given by  $g + E$ . The payoff of the elite is, in this case, given by their exogenous rents (e.g. from long-distance sea trade), plus the rents that they can forcefully extract from the territory under their control, that are given by  $R = r \int_0^{S/2} (1 - \alpha x) dx = r(1 - \alpha S^2)$ , net of the costs of state capacity,  $K(S)$ . As a result providing public governance is optimal for the elite only if they expect large enough compliance in the population and if,<sup>30</sup>

$$g + E \geq (r - k)S - r\alpha S^2 + E \quad (4)$$

The discussion and eq. (4) has several implications:

<sup>30</sup> The assumption of a uniform distribution of the population over the territory is without loss of generality and only allows a closed form solution of the extracted rents. Let us abstract from the case in which  $S$  is so large that in some locations extractive capacity is zero. Notice that this case would be an out-of-equilibrium dominated scenario since the elite would increase net rents by reducing territorial size thereby saving on the costs of state capacity as further discussed below.

- Absent fiscal compliance the cost of state capacity needs to be covered by the elite exploiting other rents. If the population does not fiscally comply then the elite has no incentives to provide public goods and to abstain from rent extraction.
- Even under the expectation that the population contributes to cover the costs of state capacity, the trade-off faced by the elite depends on the relative profitability of productive governance, rent-seeking and territorial size (as specifically discussed below).

## Discussion and empirical implications

Let us briefly discuss the implications that are useful for the interpretation of the historical evidence discussed in Sect. 2 and for the interpretation of the measurement of political geography in Sect. 3 and for the design of the empirical analysis of Sects. 4 and 5.

*Multiple social contracts: fiscal compliance and productive governance* The model economy is characterized by two types of equilibria. In the first the elite provides a productive governance and abstains from rent extraction, and in exchange (a sufficiently large part of) the population complies to fiscal contributions and covers the costs of state capacity. A multiplicity of equilibria can be sustained depending on the expected degrees of compliance in the population at large. This type of equilibrium requires that people expect that the elite engages in productive governance and can be sustained by different shares of complying population. Alternatively, the equilibrium involves rent extraction and lacks fiscal compliance.<sup>31</sup>

- strategic complementarity *within* the population and *between* the elite and the population imply that *multiple equilibria* where fiscal compliance and productive governance go hand-in-hand in equilibrium.

If the cost of state capacity is large given rent extraction, that is if  $r - k \leq 0$ , then the ability of the elites to retain control of the territory crucially rests on their ability to implement a productive social contract or use their endowment,  $E$ . Hence, while not directly affecting the trade-off faced by the elite, the existence of larger exogenous rents,  $E$  coming from e.g. sea trade, allows to afford higher costs of state capacity without the need to induce fiscal compliance by making the right-hand-side of eq. (4) positive, and therefore feasible, for larger  $k$ . This implies that

- Higher rents  $E$  make *rent extraction equilibria feasible even absent fiscal compliance*.
- Elites with low rents  $E$  can support state capacity (and rule covering the cost of the state apparatus  $k$ ) only if they offer productive governance and successfully manage to induce fiscal compliance.

Being sustained by opposite, but mutually compatible, attitudes and policies we refer to these equilibria as productive (or inclusive) and extractive “social contracts”, respectively. In short, the framework predicts the emergence of multiple social contracts and illustrates the role of the costs of state capacity and of exogenous rents for the likelihood of their emergence.

<sup>31</sup> In fact, although this is not modelled, in the extractive equilibrium the population would even be willing to forego resources to avoid, or evade, contributions.

*Size of polities and strategies of territorial control* Equations (3) and (4) have several implications. There exists a maximum size of the polity, given by  $\bar{S} = (2/\beta)(1 - k/g)$ , such that all the population find it optimal to contribute to public finance under the expectation that all other individuals do the same, that is, if  $\bar{x}_i(S) = 1$ .<sup>32</sup> Maximum compliance in the population is lower than one if  $S > \bar{S}$  and then declines with  $S$  since individuals in more remote locations enjoy lower benefits and, accordingly, face lower incentives to contribute. The declining regulatory capacity coupled with the need to supply benefits to the population imply that the maximum territory of polities engaging in productive governance is implicitly bounded by the distance at which they can provide net benefits to the population. Specifically, for any  $g$ , the fact that maximum (and average) compliance (weakly) decreases with  $S$  implies that productive equilibria might not be sustainable even under the most optimistic expectations if  $S$  is too large. In this case a large territory is not an advantage for the elite either, since it essentially only increases the costs of state capacity.<sup>33</sup> This discussion implies that

- Sustaining productive social contracts, that is equilibria with sufficient fiscal compliance and the provision of productive governance, is easier in *smaller polities*;
- The elites ruling polities that implement inclusive social contracts over their full territory have *no gains from excessively increasing their territorial size*.

The scope for the emergence of productive equilibria depends on the incentives of the elites and, ultimately, on the comparison between the benefits  $g$ , and the rents that can be extracted from the population  $R$ . The size of the polities and the exogenous rents that can be extracted by the elites (e.g. rents from long-distance sea trade) play a crucial role in shaping this trade-off. If  $r - k > 0$ , then the rents that can be extracted, i.e. the right-hand side of (4), are increasing in the territorial size (up to a limit) since from the right-hand side of equation (4), rents are increasing in  $S$  for all  $S \leq (r - k)/(2ar)$ . Taken together this discussion implies that, for given  $g$ ,

- *Rent extraction*, and therefore the emergence of extractive social contracts, is a *more appealing strategy for elites controlling larger territories*.
- Having the possibility to do so, extractive elites would benefit from *expanding the size of their domains* to increase rent extraction from ruled territories.

*Social inclusion and migration* Consider the case in which the geography hosts multiple polities with both inclusive and extractive social contracts. Consider the general case in which the benefits of productive governance are individual specific  $g_i$ . Now notice that payoff of an individual depends on several elements. First, the payoff is larger in productive equilibria compared to extractive ones. Second the payoff (enjoyed both extractive and productive equilibria) depends on the distance from centers of power. Third, the payoff depends on the individual benefits enjoyed from productive governance (related to e.g. innate talents, profession or skills). Imagine individuals can relocate in space within and across polities but only at a cost. In this case more productive individual would have incentives to face the costs of moving from the periphery of inclusive polities to the center and

<sup>32</sup> Recall that by assumption the capital is located in the middle of the territory, then a polity with size  $S$  has borders located at a distance  $b = S/2$ .

<sup>33</sup> In this scenario, in the limit  $\lim E \rightarrow 0$  only polities with  $\lim S \rightarrow 0$  can be successfully ruled.

from more extractive to more inclusive polities. Notice that individuals have incentives to move only if they fiscally comply. These observations has three main implications.

- There are incentives for directed migration within polities (from annexed or peripheral locations towards the capitals) and across polities (from extractive to productive polities and possibly even across productive polities).
- Inward migration into inclusive polities increases average fiscal compliance facilitating the persistence of productive equilibria. Outward migration of productive migrants from extractive polities reinforce the extractive incentives of ruling elites (by making inclusive equilibria supported by fiscal compliance even less likely).
- Elites providing productive regulations would gain by actively attracting these productive migrants.

As a result, locations offering more attractive social contracts and for longer times should be expected to face more intense (cumulative) inward migration and should be characterized by higher population diversity in the long-run.

*Persistence of social contracts* Consider the case in which both the population and the elite find it profitable to engage in a productive social contract. This means that Eqs. (3) and (4) jointly hold. Notice that these are necessary but not sufficient conditions since equilibrium selection crucially depends on expectations of both population and elites. This also implies that

- Random perturbation of either the level of fiscal compliance or productive governance can always lead to the disappearance of inclusive equilibria.

The prediction that sustaining social contracts requires coordinating expectations and behavior of both the people and elite finally has relevant implications also for the role of formal institutions. In particular,

- the introduction of formal limits to the extractive capacity of rulers (i.e. constraints on the executive) *can be in the own interests of ruling elite* aiming at implementing productive social contracts;
- constraints on the executives *can help the emergence of inclusive equilibria* by coordinating expectations of both the population and the elite on the emergence of inclusive equilibria where productive governance is sustained by enough fiscal compliance;
- constraints on the executive *are not necessary* to sustain inclusive equilibria *once they are in place*;

These observations are relevant also for the interpretation of historical narratives and empirical results in two main ways. First, changes in the identity of rulers controlling a given location or territory represent a main shock to policy implementation and, therefore, a main threat to the persistence of productive social contracts. Second, the historical introduction of forms of delegation of policy implementation and constraints on the executive in the communal republics might have had long-term impacts on the likelihood of sustaining productive social contracts. Importantly, however, their impact can have been long-lasting even if they were short-lived (with e.g. the advent of lordships). Furthermore, if productive configurations are needed to finance state capacity, then

early constraints on the executive might have affected the ability of rulers sustaining self-governance and therefore increasing the duration of the republics.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10887-022-09209-1>

**Acknowledgements** We are very grateful to Alberto Bisin, Davide Cantoni, Bruno Caprettini, Giorgio Chiovelli, Pedro Dal Bo, David de la Croix, Jeremiah Dittmar, Elena Esposito, James Fenske, Luigi Guiso, Oded Galor, Alex Lehner, Joel Mokyr, Ola Olsson, Giacomo Ponzetto, Uwe Sunde, Guido Tabellini, and Felipe Valencia for useful comments on an early version of the project. Thanks also to audience members at presentations in Barcelona, Bergamo, Workshop on Econ/Hist Bologna, Bonn, Brown, EUI Florence, the workshop on Culture and Institutions in Galatina, Geneva, Lausanne, Leuven, Luxembourg, Messina, Moscow, LMU Munich, Collegio Carlo Alberto Turin, and SIOE 2020 for helpful comments and feedback. We thank Giorgio Monti for excellent research assistance. Financial support from the Italian Ministry of University and Research project PRIN2015 is gratefully acknowledged.

**Funding** Open access funding provided by Alma Mater Studiorum - Università di Bologna within the CRUI-CARE Agreement.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Acemoglu, D., Johnson, S., & Robinson, J. (2005). The rise of Europe: Atlantic trade, institutional change, and economic growth. *American Economic Review*, *95*, 546–579.
- Acemoglu, D., & Robinson, J. A. (2000). Why did the West extend the franchise? Democracy, inequality, and growth in historical perspective. *The Quarterly Journal of Economics*, *115*, 1167–1199.
- Ahlerup, P., & Olsson, O. (2012). The roots of ethnic diversity. *Journal of Economic Growth*, *17*, 71–102.
- Alesina, A., & Spolaore, E. (1997). On the number and size of nations. *The Quarterly Journal of Economics*, *112*, 1027–1056.
- Angelucci, C., Meraglia, S., & Voigtländer, N. (2020). How merchant towns shaped parliaments: From the Norman Conquest of England to the Great Reform Act, Working paper.
- Ashraf, Q., & Galor, O. (2013). The 'Out of Africa' hypothesis, human genetic diversity, and comparative economic development. *American Economic Review*, *103*, 1–46.
- Ashraf, Q., Galor, O., & Klemp, M. (2019a). Heterogeneity and productivity, Technical report, Working Paper.
- Ashraf, Q., Galor, O., & Klemp, M. (2019b). The out of Africa hypothesis of comparative development reflected by nighttime light intensity.
- Ashraf, Q. H., Cinnirella, F., Galor, O., Gershman, B., & Hornung, E. (2020). Structural change, elite capitalism, and the emergence of labor emancipation, Technical report.
- Ashraf, Q. H., & Galor, O. (2018). The macrogenoeconomics of comparative development. *Journal of Economic Literature*, *56*, 1119–55.
- Ashraf, Q. H., Galor, O., & Klemp, M. (2021). The ancient origins of the wealth of nations. *The Handbook of Historical Economics* (pp. 675–717). Amsterdam: Elsevier.
- Bairoch, P., Batou, J., & Chèvre, P. (1988). *La population des villes européennes: banque de données et analyse sommaire des résultats*, Librairie Droz.

- Balestracci, D. (1988). L'immigrazione di manodopera nella Siena medievale. In: G. Cherubini and G. Pinto, eds., *Forestieri e stranieri nelle città basso-medievali. Atti del Seminario Internazionale di Studio (Bagno a Ripoli - Firenze, 4–8 giugno 1984)*, Salimbeni (pp. 163–180).
- Barbero, A. (2009). Le migrazioni medievali. In: Corti, P., & Sanfilippo, M., (eds.), *Storia d'Italia. Annali 24. Migrazioni*, 24, 21–39.
- Battilani, P. (2001). Decentramento o accentramento: obiettivi e limiti del sistema amministrativo locale scelto con l'Unità del paese. *Rivista di storia economica*, 17, 313–358.
- Bazzi, S., Fiszbein, M., & Gebresilasse, M. (2020). Frontier culture: The roots and persistence of “rugged individualism” in the United States. *Econometrica*, 88, 2329–2368.
- Becker, M. B. (1981). *Medieval Italy: Constraints and creativity*. Indiana University Press.
- Belfanti, C. M. (2001). Town and country in central and northern Italy, 1400–1800. In S. E. Epstein (Ed.), *Town and Country in Europe, 1300–1800*. Cambridge: Cambridge University Press.
- Belloc, M., Drago, F., & Galbiati, R. (2016). Earthquakes, religion and transition to self-government in Italian cities. *Quarterly Journal of Economics*, 131, 1875–1926.
- Benabou, R., & Tirole, J. (2006). Belief in a just world and redistributive politics. *The Quarterly Journal of Economics*, 121, 699–746.
- Berger, M., Fellner-Rohling, G., Sausgruber, R., & Traxler, C. (2016). Higher taxes, more evasion? Evidence from border differentials in TV license fees. *Journal of Public Economics*, 135, 74–86.
- Besley, T. (2020). State capacity, reciprocity, and the social contract. *Econometrica*, 88, 1307–1335.
- Bisin, A. (2020). A comment on: “State Capacity, Reciprocity, and the Social Contract” by Timothy Besley. *Econometrica*, 88, 1345–1349.
- Bisin, A., & Verdier, T. (2000). “Beyond the melting pot”: Cultural transmission, marriage, and the evolution of ethnic and religious traits. *The Quarterly Journal of Economics*, 115, 955–988.
- Bosker, M., Buringh, E., & van Zanden, J. L. (2013). From Baghdad to London: Unraveling Urban Development in Europe, the Middle East, and North Africa, 800–1800. *Review of Economics and Statistics*, 95, 1418–1437.
- Botero, G. (1588). *Delle Cause della Grandezza delle Città*. Appresso Giooanni Martinelli, Roma.
- Bowles, S. (2020). A comment on: “State Capacity, Reciprocity, and the Social Contract” by Timothy Besley. *Econometrica*, 88, 1337–1343.
- Braudel, F. (1979). *Civilisation and capitalism: Fifteenth-eighteenth century*. University of California Press.
- Buonanno, P., & Vanin, P. (2017). Social closure, surnames and crime. *Journal of Economic Behavior and Organization*, 137, 160–175.
- Cameron, A., Gelbach, J., & Miller, D. (2011). Robust inference with multiway clustering. *Journal of Business & Economic Statistics*, 29, 238–249.
- Campbell, A., Gurin, G., & Miller, W. E. (1954). *The voter decides.*, Row, Peterson, and Co.
- Carboni, M. (2008). *Stato e finanza pubblica in Europa dal medioevo a oggi: un profilo storico*. Torino: Giappichelli Editore.
- Cervellati, M., Chiovelli, G., & Esposito, E. (2018). *Bite and divide: Malaria and ethnolinguistic diversity*. London: CEPR. Technical report
- Cervellati, M., Lazzaroni, S., Prarolo, G., & Vanin, P. (2019). Political Geography and Pre-Industrial Development: A Theory and Evidence for Europe 1000–1850, Technical report, CEPR Discussion Paper No. DP13719.
- Chamberlin, E. (1982). *The World of the Italian Renaissance*, Book Club Associates.
- Chittolini, G. (1989). Cities, “City-States”, and Regional States in North-Central Italy. *Theory and Society*, 18, 689–706.
- Cipolla, C. M. (1994). *Before the Industrial Revolution: European Society and Economy, 1000–1700*. New York: W. W. Northon Company.
- Colella, F., Lalive, R., Sakalli, S. O., & Thoenig, M. (2019). Inference with arbitrary clustering, *IZA Discussion Paper*.
- Conley, T. G. (1999). GMM estimation with cross sectional dependence. *Journal of Econometrics*, 92, 1–45.
- Crow, J. F. (1983). Discussion. *Human Biology*, 55, 383–397.
- Dalgaard, C.-J., Kaarsen, N., Olsson, O., & Selaya, P. (2018). Roman roads to prosperity: Persistence and non-persistence of public goods provision.
- De Lara, Y. G., Greif, A., & Jha, S. (2008). The administrative foundations of self-enforcing constitutions. *American Economic Review: Papers & Proceedings*, 98, 105–109.
- De Long, J. B., & Shleifer, A. (1993). Princes and merchants: European city growth before the industrial revolution. *The Journal of Law and Economics*, 36, 671–702.
- Downing, B. (1992). *The military revolution and political change*. Princeton University Press.
- Enke, B. (2019). Kinship, cooperation, and the evolution of moral systems. *The Quarterly Journal of Economics*, 134, 953–1019.



- Epstein, S. A. (1996). *Genoa and the Genoese* (pp. 958–1528). University of North Carolina Press.
- Epstein, S. R. (1999). The rise and decline of Italian city-states, Economic history working papers, London School of Economics and Political Science, Department of Economic History.
- Fennel Mazzaoui, M. (1984). Artisan Migration and Technology in the Italian Textile Industry in the Late Middle Ages (1100–1500). In R. Comba, G. Piccinni, & G. Pinto (Eds.), *Strutture familiari epidemie migrazioni nell'Italia medievale* (pp. 519–534). Italiane: Edizioni Scientifiche.
- Finer, S. (1999). *The history of government from the Earliest Times*. Oxford: Oxford University Press.
- Fukuyama, F. (2011). *The origins of political order from Prehuman Times to the French Revolution*. Straus: Ferrar.
- Galor, O., & Moav, O. (2006). Das Human-Kapital: A theory of the demise of the class structure. *The Review of Economic Studies*, 73, 85–117.
- Galor, O., & Özak, Ö. (2016). The agricultural origins of time preference. *American Economic Review*, 106, 3064–3103.
- Galor, O., & Savitskiy, V. (2018). *Climatic roots of loss aversion*. National Bureau of Economic Research, Technical report.
- González de Lara, Y., Greif, A., & Jha, S. (2008). The administrative foundations of self-enforcing constitutions. *American Economic Review*, 98, 105–09.
- Greif, A. (1993). Contract enforceability and economic institutions in early trade: The Maghribi traders' coalition. *The American Economic Review*, 1, 525–548.
- Greif, A., & Laitin, D. D. (2004). A theory of endogenous institutional change. *American Political Science Review*, 98, 633–652.
- Guiso, L., Herrera, H., Morelli, M., & Sonno, T. (2020). Economic insecurity and the demand of populism in Europe. Einaudi Institute for Economics and Finance.
- Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American Economic Review*, 94, 526–556.
- Guiso, L., Sapienza, P., & Zingales, L. (2016). Long-term persistence. *Journal of the European Economic Association*, 14, 1401–1436.
- Henderson, J. V., Squires, T., Storeygard, A., & Weil, D. (2018). The global distribution of economic activity: Nature, history, and the role of trade. *The Quarterly Journal of Economics*, 133, 357–406.
- Hohenberg, P. M., & Lees, L. H. (1995). *The Making of Urban Europe, 1000–1994*. Harvard University Press.
- Imperioli, L., Manzo, M., & Monteduro, M. T. (2015). *Il Tax Gap delle Imposte Immobiliari e la Perequazione Fiscale*. Ministero Economia e Finanze - MEF: Technical report
- Jones, E. (1981). *The European Miracle: Environments, economies and geopolitics in the history of Europe and Asia* (1st ed.). Cambridge: Cambridge University Press.
- Kelly, M. (2020). Understanding persistence. *CEPR Discussion Paper No. DP15246*.
- Kirk, T. A. (2012). *Genoa and the sea. Policy and power in an Early Modern Maritime Republic, 1559–1684*. Baltimore: The Johns Hopkins University Press.
- Kitamura, S., & Lagerlöf, N.-P. (2020). Geography and state fragmentation. *Journal of the European Economic Association*, 18, 1726–1769.
- Levi, M. (1988). *Of rule and revenue*. Berkeley: University of California Press.
- Lizzeri, A., & Persico, N. (2004). Why did the elites extend the suffrage? Democracy and the scope of government, with an application to Britain's "Age of Reform.". *The Quarterly Journal of Economics*, 119, 707–765.
- Mallett, M. E., & Hale, J. R. (1984). *The Military Organisation of a Renaissance State: Venice c.1400 to 1617*. Cambridge University Press.
- McCormick, M. (2013). *Roman Road Network (version 2008)*, <https://darmc.harvard.edu/data-availability>: DARMC Harvard.
- Michalopoulos, S., & Papaioannou, E. (2020). Historical Legacies and African Development. *Journal of Economic Literature*, 58, 53–128.
- Mokyr, J. (1992). *The lever of riches: Technological creativity and economic progress*. Oxford University Press.
- Mokyr, J. (2016). *A culture of growth: The origins of the modern economy*. Princeton University Press.
- North, D. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- Nunn, N. (2009). The importance of history for economic development. *Annual Review of Economics*, 1, 65–92.
- Nunn, N. (2020). The historical roots of economic development. *Science*, 367, 1.
- Nunn, N., & Wantchekon, L. (2011). The slave trade and the origins of mistrust in Africa. *American Economic Review*, 101, 3221–52.

- Parker, G. (1996). *The Military Revolution: Military innovation and the rise of the West, 1500–1800*. Cambridge: Cambridge University Press.
- Puga, D., & Trefler, T. (2014). International trade and institutional change: Medieval Venice's response to globalization. *Quarterly Journal of Economics*, 129, 753–821.
- Putnam, R., Leonardi, R., & Nanetti, R. (1994). *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press.
- Reed, F. (2014). *Centennia Historical Atlas*. <http://www.historicalatlas.com>.
- Sandri, L. (1988). Stranieri e forestieri nella Firenze del Quattrocento attraverso i libri di ricordi e di entrata e uscita degli ospedali cittadini. In: Cherubini, G., & Pinto, G., eds., *Forestieri e stranieri nelle città basso-medievali. Atti del Seminario Internazionale di Studio (Bagno a Ripoli - Firenze, 4-8 giugno 1984)*, Salimbeni (pp. 149–162).
- Serafinelli, M., & Tabellini, G. (2022). Creativity over time and space. *Journal of Economic Growth*, 27, 1–43.
- Shorrocks, A. F. (2013). Decomposition procedures for distributional analysis: A unified framework based on the Shapley value. *Journal of Economic Inequality*, 11, 99.
- Slemrod, J., & Weber, C. (2012). Evidence of the invisible: Toward a credibility revolution in the empirical analysis of tax evasion and the informal economy. *International Tax and Public Finance*, 19, 25–53.
- Stasavage, D. (2010). When distance mattered: Geographic Scale and the Development of European Representative Assemblies. *American Political Science Review*, 104, 625–643.
- Stasavage, D. (2011). *States of credit: Size, power, and the development of European polities*. Princeton University Press.
- Stasavage, D. (2014). Was Weber right? The role of urban autonomy in Europe's rise. *American Political Science Review*, 108, 337–354.
- Strayer, J. (1970). *On the Medieval Origins of the Modern State*. Princeton University Press.
- Tabellini, G. (2008). The scope of cooperation: Values and incentives\*. *The Quarterly Journal of Economics*, 123, 905–950.
- Tabellini, G. (2010). Culture and institutions: Economic development in the regions of Europe. *Journal of the European Economic Association*, 8, 677–716.
- Talbert, R. J. (2000). *Barrington Atlas of the Greek and Roman World: Map-by-map Directory* (Vol. 1). Princeton: Princeton University Press.
- Tilly, C. (1990). *Coercion, capital, and European states, AD 990–1990*. Oxford: Blackwell.
- Treccani. (2011). *Dizionario di Storia - Repubbliche Marinare*. [https://www.treccani.it/enciclopedia/repubbliche-marinare\\_%28Dizionario-di-Storia%29/](https://www.treccani.it/enciclopedia/repubbliche-marinare_%28Dizionario-di-Storia%29/).
- Valencia Caicedo, F. (2018). The Mission: Human capital transmission, economic persistence, and culture in South America. *The Quarterly Journal of Economics*, 134, 507–556.
- Van Zanden, J. L., & Prak, M. (2006). Towards an economic interpretation of citizenship: The Dutch Republic between medieval communes and modern nation-states. *European Review of Economic History*, 10, 111–145.
- Ventura, A. (1964). *Nobiltà e popolo nella società veneta del '400 e '500*. Bari: Editori Laterza.
- Waley, D. P. (1969). *The Italian City Republics*. McGraw Hill.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.