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Administrative reforms and urban development: Lessons from Italian unification

Abstract

We study how changes in the political-administrative hierarchy of a country affect urban development. We exploit the 1865 administrative reform occurred in the aftermath of Italian unification as a quasi-natural experiment to assess whether district's capital cities endowed with supra-municipal administrative functions by law gained a population growth premium compared to similar non-capital cities in the period 1871-1921. We rely on difference-in-differences and event study estimation strategies, and find that district's capital cities recorded a time-persistent population growth premium. Three main mechanisms explain our results: increases in public employment; increases in manufacturing employment; and development of the infrastructure endowment.

Keywords

Administrative reforms; political-administrative hierarchy; urban development; Italian unification.

JEL Codes

H11; N13; O11; R11.

Statements and Declarations

The authors have no conflicts of interest to declare

1 Introduction

Political institutions can play a fundamental role in the process of urbanization and regional development (World Bank, 2000; Acemoglu et al., 2011; Bo, 2020; Bai and Jia, 2021). Central governments may establish or reshape a country's political hierarchy through administrative reforms by increasing (i.e., decentralization) or reducing (i.e., centralization) the number of the political-administrative functions assigned to sub-national geographical units (Gunlicks, 1984; Bo and Cheng, 2021). Changes in the administrative hierarchy and, consequently, in the functions attributed to sub-national units and their capital cities can have positive effects on urbanization processes (Feiock and Kim, 2001; Andini et al., 2017; Yin and Liu, 2017). Indeed, evidence shows that an increase in the government powers attributed to the capital city of a region, a province, or a county can spur urban development (da Mata et al., 2007; Liu et al., 2012; Zeng et al., 2016; Bo, 2020; Bai and Jia, 2021; Bo and Cheng, 2021).

Some recent papers have investigated the effects of political-administrative hierarchy on urban development. Using prefecture-level data for the period 1983-2003 and a difference-in-differences econometric strategy, Bo (2020) studies the effects of the 1983 Chinese political hierarchy reform. He finds that the reform, designed to decentralize government powers from the counties to the cities by creating prefecture-level cities with more political-administrative functions, stimulated industrial productivity of the newly-established cities. Bo and Cheng (2021) study the impact of the same 1983 Chinese reform on urban primacy. They rely on a difference-in-differences estimation strategy, and find that capital counties, in which prefecture-level governments were located, benefitted from this political reform by experiencing a faster increase in the non-agricultural population with respect to peripheral counties. In other words, the 1983 reform, by exacerbating the disparities between capital and peripheral counties, has significantly accelerated the urbanization process in China. These results are confirmed by Jia et al. (2021), who find that the municipality of Chongqing experienced a significant increase in the economic growth rate after its 1997 promotion to the level of a province-

level municipality. Becker et al. (2021) exploit the 1949 relocation of the West German government to the city of Bonn as an experiment to investigate the effects of Bonn' status change on its public and private employment. They find that Bonn experienced a significant increase in public employment, which, however, resulted in a small increase in private employment. Using a panel dataset of 261 Chinese prefectures, and exploiting exogenous variation driven by six different dynasty changes during the period 1000-2000 C.E., Bai and Jia (2021) find that changes in the provincial capital status shaped prefectures' regional development measured by population density and urbanization. They also show that political hierarchy affected regional development not only through an increase in public employment, but also through the development of transport networks and infrastructures.

A more radical and original way for analyzing how political-administrative hierarchy can shape urban development consists in studying the political and administrative unification process of a country. This is what we do in this paper. Indeed, European countries such as Italy (Pavone, 1964; Candeloro, 1968) and Germany (Gunlicks, 1984) experienced a process of nation-building in the mid-nineteenth century that was accompanied by administrative reforms which established the skeleton of the public administration system from the central government to regions, provinces, districts, and municipalities. These reforms affected not only the administrative geography of these countries, but also their internal political-administrative hierarchy, with positive effects on urban and regional development (Gambi, 1974).

In this paper we focus on the so-called Lanza reform, i.e., the "Law for the administration unification of the Kingdom of Italy", that was approved by the Italian Parliament on 20 March 1865. Before unification, Italy was politically fragmented and, until the establishment of the Kingdom of Italy in 1861, the seven pre-unification States were characterized by different institutional and administrative set ups (Federico and Tena-Junguito, 2014).[1] The strong heterogeneity of the pre-

[1] Online Appendix Figure A1 maps the seven Italian pre-unification States.

unification States made the process of nation-building – that began in the period 1859-1865 under the guidance of the Savoy House ruling the Kingdom of Sardinia – very complex. This process experienced a sudden acceleration in 1865, when the fundamental law for the administrative unification of the Kingdom of Italy (i.e., the Lanza Law) was approved (Pavone, 1964; Candeloro, 1968).

This reform – that can be considered as a 'breaking point' in the institutional and administrative history of the Kingdom of Italy – produced two effects. First, by incorporating the administrative geography based on four different sub-national administrative units (i.e., province, *circondario*, *mandamento*, and municipality) previously established by the 1859 Rattazzi Law of the Kingdom of Sardinia, it homogenized the political-administrative functions attributed to provinces throughout the newborn country. Second, the Lanza Law assigned to the capital cities of the *circondario* (district, henceforth) – i.e., an intermediate geographical-administrative unit between the province and the municipality – various supra-municipal administrative functions in fields such as public security, justice, public health, and regulation. In other words, district's capital cities were effectively attributed supra-municipal administrative functions only after the enforcement of the Lanza reform in 1865. The assignment of these new administrative functions to district's capital cities had, as we will show, positive effects on their urban development.

We test the effects of the 1865 Lanza administrative reform on the urban development of district's capital cities in the period 1871-1921. We choose this period of analysis because districts, as geographical-administrative units, were abolished by the Fascist regime in 1927. We rely on difference-in-differences and event study estimation strategies to analyze the population dynamics of district's capital cities – i.e., those municipalities which experienced an upgrade in the national political-administrative hierarchy through the acquisition of supra-municipal administrative functions by law – (constituting our treatment group) compared to municipalities that did not experience such a status change in 1865 (constituting our control group). We assess the

comparability of district's capital cities and municipalities in the control group by relying on kernel matching to deal with potential selection biases related to the non-random assignment of the district's capital city status prior to the approval of the 1865 Lanza Law, and by analyzing population dynamics starting from the pre-unification period. We find that district's capital cities gained a population growth premium compared to municipalities that were not attributed supra-municipal administrative functions by law, as well as that this premium has been persistent over time. We perform a variety of robustness tests, investigate the peculiar case of the Kingdom of the Two Sicilies, and finally provide more suggestive evidence on some potential mechanisms underlying urban development in district's capital cities.

Our paper is related to different streams of the literature. The first one concerns the role of politics and political institutions in shaping urbanization processes and the geographical concentration of economic activities in cities (Glaeser and Ades, 1995; Henderson and Becker, 2000). Glaeser and Ades (1995) suggest that the spatial proximity to political institutions – and, more generally, to the 'centers of power' – tends to increase the influence of politicians and lobbyists who live and work in the capital cities. This 'proximity' induces governments to transfer resources to the capital city, thus attracting workers, firms, and new business activities. Accordingly, a relationship between politics and urban concentration can emerge. Recently, the role of politics in influencing urbanization has also been analyzed by the so-called 'administrative urbanization' theory (Liu et al., 2012; Zeng et al., 2016; Yin and Liu, 2017). The process of state-oriented urbanization has been widely investigated in China after the 1978 economic reforms (e.g., Xu, 2021). The key idea of this literature is that the Chinese central government has played a fundamental role in promoting the process of urbanization and local development through both national urban

policies and local administrative interventions.[2] Finally, our paper is related to the literature on the 'administrative unit proliferation' (Grossman and Lewis, 2014; Grossman et al., 2017). Since the mid-1990s, both many developing economies (e.g., Sub-Saharan countries) and more advanced countries (e.g., Brazil, Hungary, Indonesia, Vietnam) have significantly increased the number of sub-national administrative units and, accordingly, also the number of administrative centers. The main aim of these policies was not only to increase the level and quality of public goods and services for citizens (Grossman et al., 2017), but also to stimulate the overall economic growth of the country (Bai and Jia, 2021).

Our contribution to the literature is threefold. First, by exploiting the 1865 Lanza reform as a quasi-natural experiment, we show the role played by politics in shaping economic geography and urban development in the aftermath of the Italian unification process. Second, we identify some mechanisms behind these phenomena, namely an increase in public employment and in (private) manufacturing employment, and an improvement in the railway network. Third, we draw policy implications useful for designing economic development strategies in transition and developing countries where the process of administrative (re)organization is not yet completed, and where cities and urban agglomerates are still evolving.

The rest of the paper is organized as follows. Section 2 presents the historical background and describes the 1865 Lanza administrative reform. Section 3 presents the data, the sample, the empirical modeling, and the identification strategy. Section 4 sets out the results. Section 5 analyzes and discusses the mechanisms. Section 6 discusses the main findings and draws some policy implications.

[2] Liu et al. (2012) analyze the process of city-making for Chinese small- and medium-sized cities. Focusing on the inland city of Hebi in the Henan province, they show that China's recent urban transformation process has been strongly shaped by the central government through both national urban policies and local administrative reforms. Similarly, Zeng et al. (2016) investigate the process of urbanization and administrative restructuring in the urban agglomeration of Wuhan in Central China. They analyze the influence of the administrative status of the city on urbanization, and find that changes in the administrative status at county level have had a significant role in shaping the process of urban development. Finally, Yin and Liu (2017) analyze the case of Ordos city in the Inner Mongolia Autonomous Region, and show that the local government has played a fundamental role in promoting the process of urbanization and local development through a set of administrative measures.

2 Historical background

In the period 1859-1865, the Kingdom of Italy experienced a complex process of administrative unification at the national level (Pavone, 1964). This process took place in two steps. In the first step, the municipal and provincial Law No. 3702 of 23 October 1859 – the so-called Rattazzi Law – was approved by the Kingdom of Sardinia. This law redesigned the administrative geography of the already-annexed pre-unification States into four geographical-administrative units (Article 1, Title I): (i) the province; (ii) the district, i.e., an intermediate geographical-administrative unit between the province and the municipality, then abolished in 1927; (iii) the *mandamento*, i.e., an intermediate administrative unit between the district and the municipality made up by few municipalities; and (iv) the municipality. The Rattazzi Law assigned some political-administrative functions only to municipalities and provinces, while no administrative functions were assigned to the district and the *mandamento*. Specifically, Title II of the Rattazzi Law – entitled *Dell'amministrazione comunale* – defined for each municipality its administrative and governing bodies (i.e., the council and the mayor), their composition, the rules for their election, and the principles of municipal administration and accounting. It also attributed to municipalities some political-administrative functions by assigning 'compulsory expenses' concerning: (i) the payment of salaries to municipal employees; (ii) primary education; (iii) the maintenance of municipal roads and public squares; (iv) the collection of municipal taxes; (v) the preservation of municipal properties; and (vi) the management of cemeteries. Similarly, Title III of the law – entitled *Dell'amministrazione provinciale* – defined for each province its administrative and governing bodies (i.e., the council, the provincial deputation, and the *Prefetto*), their composition, and the rules for their election. It also assigned to provinces some political-administrative functions, such as the management of properties and assets – in particular, roads and infrastructures (e.g., bridges). As already mentioned, the 1859 Rattazzi Law did not assign any political-administrative functions to the district and the *mandamento*.

The enforcement of the Rattazzi Law was highly heterogeneous in the period 1859-1865. Full enforcement – in terms of administrative geography and functions assigned to provinces and municipalities – was possible only in the Kingdom of Sardinia and, after the Peace of Villafranca (11 July 1859), in the annexed territories of the Kingdom of Lombardy-Venetia. Partial enforcement occurred in the annexed territories of Central Italy and in the Kingdom of the Two Sicilies. In these territories, the extension of the Rattazzi Law took place with some changes. After the plebiscites for the annexation to the Kingdom of Italy, the Rattazzi Law was introduced in the Marches and in Umbria (both previously ruled by the Papal States), but some of its articles concerning provinces were suspended, including Article No. 241, according to which all provincial expenses had to be financed by the State. A modified version of the Rattazzi Law was implemented in Sicily in August 1860, and, also in this case, some articles concerning provinces – including Article No. 241 – were excluded. In the Neapolitan area, the Rattazzi Law had still not been applied in 1861, as it was strongly contrasted by the local political elite.[3] Full non-application of the Rattazzi Law occurred only in the territories of the Grand Duchy of Tuscany, which maintained their administrative autonomy (i.e., the pre-unification administrative set up) until 1865.

The second step of the administrative unification process occurred when the Italian Parliament approved the "Law for the administrative unification of the Kingdom of Italy" (Law No. 2248) on 20 March 1865 – the so-called Lanza reform (Candeloro, 1968). With this reform, the administrative unification of the Kingdom of Italy took place effectively. The political elite of the Kingdom of Sardinia, so influential on the political decisions taken by the Italian Parliament in the aftermath of unification, decided to extend the bulk of the rules governing the administrative system of the Kingdom of Sardinia to the rest of the country. The Lanza Law introduced a centralized administrative system. In fact, alternatives based on a decentralized system of local autonomies or

[3] In a letter of November 1860 to Luigi Carlo Farini, sent to Naples as *Luogotenente* with dictatorial powers, Cavour, the first Prime Minister of the newborn Kingdom of Italy, advised him to "preserve as much as possible of the previous administration" (Pavone, 1964).

a federalist/regionalist structure were deemed unsuitable for Italy, as policymakers at the time considered the sense of belonging to the national community too fragile (Zarisky, 1983; Ballini, 2016).[4]

The 1865 Lanza Law consisted in turn of a package of six different sections concerning: (i) the municipal and provincial administration (Appendix A); (ii) public/internal security (Appendix B); (iii) public health (Appendix C); (iv) the Council of State (Appendix D); (v) administrative litigation (Appendix E); and (vi) public works (Appendix F).

From the point of view of the political-administrative hierarchy of the country, the first implication of the Lanza Law was to homogenize the application of the 1859 Rattazzi Law (Appendix A of the Lanza Law) throughout the entire national territory. In other words, the political-administrative functions attributed to provinces were homogenized nationally – indeed, some of its articles concerning provinces were suspended in some territories (e.g., the Marches, Umbria, and Sicily) in the period 1861-1865, while the Rattazzi Law never entered into force in Tuscany. The second implication of the Lanza Law – fundamental for our analysis – was to assign to the district's capital cities some specific supra-municipal administrative functions in fields such as public security, justice, and public health.[5] As already discussed, the 1859 Rattazzi Law did not assign any political-administrative functions to these administrative units. These functions were assigned by Appendices B and C of the Lanza Law, according to which districts were not assumed as political-administrative units such as municipalities and provinces, rather as supra-municipal organizations similar to the *arrondissment* of the French administrative tradition. Unsurprisingly, the

[4] The use of administrative institutions to maintain political unity was not restricted to Italy, and is highly documented in the literature (e.g., Johnson, 1976).

[5] As previously highlighted, the 1859 Rattazzi Law identified the *mandamento* as an intermediate geographical-administrative unit between the district and the municipality, without assigning any political-administrative function to it. The *mandamento* comprehended a very limited number of municipalities, and was never attributed political and high-order administrative functions. As for the 1865 Lanza Law (e.g., Articles 7 and 99, Appendix B), the *mandamento* could have been the seat of a local Court (the *Giudicatura di Mandamento*, then replaced by the *Pretura* with Royal Decree No. 262 of 6 December 1865), and was the seat of a local jail. Thus, the *mandamento* was entirely dependent on the reference district in fields such as public security, public health, regulations, and permissions, as its administrative functions were almost limited to the judicial sphere.

administrative functions of the district were assigned by a delegation from the central government, and not through political elections as for provinces and municipalities. Specifically, the capital city of the district was the seat of the sub-prefecture. The sub-prefect worked, with the help of a staff of secretarial employees, under the direction of the *Prefetto* of the reference province. The functions assigned to the district included: (i) the administration of public security (Appendix B of the Lanza Law); (ii) the management of permits, licenses, and authorizations (Appendix B of the Lanza Law); and (iii) the administration of public health (Appendix C of the Lanza Law). Finally, according to Law No. 2626 of 6 December 1865 regulating the judicial system in the Kingdom of Italy, the capital city of a district could be the seat of a Tribunal.

To summarize, the capital city of the district – where the sub-prefecture, the police headquarter, the Health Council, and very often also the Tribunal had their seat – had two fundamental roles within the administrative system of the Kingdom of Italy. First, it operated as an administrative center within Italian provinces with specific functions such as public security and justice, public health, and authorizations and licenses. Second, it acted as a 'node' for the reception and transfer at the local level of legal information, administrative procedures, political acts, regulations, and laws coming from the *Prefetto* – ruling the reference province – and the central government. In other words, district's capital cities played a central role in coordinating several administrative activities at the local level, and in connecting – according to a bilateral relationship – the peripheral municipalities located within the boundary of the district with the authorities at the province and central government level. Finally, it is interesting to note how the district was not only an administrative unit, but also a 'space of sociality' characterized by a strong social, cultural, and political identity. Indeed, many districts had their own daily and weekly newspapers, contributing to develop a sense of belonging to the district (Mori, 2019).

3 Data and methodology

3.1 Data

We use municipality-level population data drawn from population censuses carried out every 10 years starting in 1861 and provided by the Italian National Institute of Statistics (ISTAT), and combine them with population census data available for the pre-unification period – i.e., population figures prior to 1861 – collected from the *Censimento degli Antichi Stati Sardi*. This last historical source was published by the Italian Ministry of Agriculture, Industry and Trade between 1862 and 1864, and provides municipality-level data for each pre-unification State.

We examine municipalities' population dynamics over the pre-unification-to-1921 period. First, population data for the pre-unification period refer to the last census carried out by pre-unification States prior to their annexation to the Kingdom of Italy. These data refer to different years in the period 1853-1859 because every pre-unification State carried out its last population census in a different year. Specifically, data refer to 1853 for the Papal States; to 1857 for the Duchy of Parma and Piacenza, and the Grand Duchy of Tuscany; to 1858 for the Duchy of Modena and Reggio, and the island of Sicily belonging the Kingdom of the Two Sicilies; and to 1859 for the continental territories of the Kingdom of the Two Sicilies. Second, we select the census year 1921 as the last period of observation because the geographical-administrative unit of the district was abolished with Royal Decree No. 1 of January 1927 under the Fascist regime, in line with a more centralist political-administrative management of the State (Melis, 2018). Third, we do not have data available for the year 1891 because no census was carried out due to financial difficulties of the Kingdom of Italy (Ciccarelli and Fenoaltea, 2013).

We then enriched the dataset with municipality-level geographical data on land area, altitude, coastal feature, and geographical coordinates (latitude and longitude), and with historical data on the distance of a municipality to the closest Roman road (McCormick et al., 2013), whether a municipality was the seat of a bishop and/or an archbishop in the period 1300-1700, and whether a

municipality was qualified as a city in the period 1300-1700 according to a threshold level of 5,000 inhabitants (Malanima, 1998).[6] Finally, we included also province-level data on land area, population, railway length, available on an annual basis for the period 1839-1913 (Ciccarelli and Groote, 2017), and adult literacy rate, available on a decennial basis for the period 1821-1911 (Ciccarelli and Weisdorf, 2019).

3.2 Sample

As highlighted in Figure 1, and compared to the present-day borders of the Republic of Italy, in 1861 the Kingdom of Italy did not include part of the current province of Mantua (Lombardy region), the largest part of the current Latium region, and the current regions of Friuli-Venezia Giulia, Trentino-South Tyrol, and Veneto, which were annexed between 1866 and the end of World War I. We thus consider Italy at 1866 borders as our study region because the reform process that redesigned the country's administrative structure and functioning at the local level took place through the Rattazzi Law and the Lanza Law in the period 1859-1865.

[--- Figure 1 ---]

We restrict our analysis to those territories of the Kingdom of Italy that were part of the Duchy of Modena and Reggio, the Duchy of Parma and Piacenza, the Grand Duchy of Tuscany, the Papal States, and the Kingdom of the Two Sicilies. We thus exclude from the analysis all the municipalities that belonged to the Kingdom of Sardinia, as well as to the part of the Kingdom of Lombardy-Venetia annexed in 1859 by the Savoy House. On the one hand, we exclude the territories that

[6] We collected data on bishops and archbishops from various sources, namely: (i) the *Atlante delle diocesi d'Italia*, edited by the Italian Episcopal Conference (Istituto Geografico De Agostini, 2000); (ii) Bosker et al. (2013); (iii) the website "https://it.cathopedia.org/wiki/Elenco_delle_diocesi_italiane_suddivise_per_regioni_ecclesiastiche"; and (iv) the websites of the various bishops and archbishops, providing historical information on year of establishment and subsequent changes.

belonged to the Kingdom of Sardinia because its old provinces, characterized by a limited extension, were simply renamed as 'districts' and merged into new provinces always coinciding with the pre-existing divisions of the Kingdom of Sardinia. On the other hand, we exclude from the analysis the annexed part of the Kingdom of Lombardy-Venetia because this territory saw the immediate and full extension of the administrative organization characterizing the Kingdom of Sardinia. In particular, the Kingdom of Lombardy-Venetia was characterized by a sub-national administrative organization similar to the Kingdom of Sardinia – i.e., it was structured into provinces which, in turn, were organized into districts –, and its territories underwent very few changes after the 1859 annexation.

In 1861 the Kingdom of Italy was divided into 7,720 municipalities, 193 districts, 59 provinces, and 11 *compartimenti* – i.e., geographical macro-regions identified for statistical purposes, and not endowed with either political or administrative functions (ISTAT, 2018, p. 15). As shown in Panel A of Figure 2, our study region covers 131 districts distributed across 44 provinces. Within each district, one municipality was designed as the capital city by the 1859 Rattazzi Law (see Panel B of Figure 2), while the attribution of supra-municipal administrative functions to district's capital cities occurred only in 1865 with the approval of the Lanza Law. However, according to the Rattazzi Law, 44 out of the 131 district's capital cities were also acting as capital cities of their reference province. We thus exclude these 44 municipalities from the sample for two reasons. First, these municipalities were already endowed with supra-municipal functions at the province level attributed through the 'full' or 'partial' enforcement of the Rattazzi Law, that was extended to the annexed territories during the administrative unification process occurred between 1859 and 1865. As previously discussed, despite the Rattazzi Law was implemented in the annexed territories with high heterogeneity and different levels of enforcement, some functions and local government powers were already transferred to provincial capital cities, thus making them 'centers of power and services' in the new Kingdom of Italy. Second, provincial capital cities were already

main political, administrative, and economic centers in the pre-unification States. For example, the municipalities of Ancona, Bologna, and Perugia were already acting as capital city of *Legazione* under the Papal States, and became provincial capital cities under the Kingdom of Italy. Similarly, several municipalities acting as local capital cities under the Grand Duchy of Tuscany and the Kingdom of the Two Sicilies became provincial capital cities under the Kingdom of Italy.[7] We exclude from the analysis also the municipality of Noto – belonging to the Kingdom of the Two Sicilies, and then part of the *compartimento* of Sicily – because, despite being a district's capital city from 1865, it was previously attributed the status of provincial capital city by the Rattazzi Law. Specifically, Article 4 of the Lanza Law provided for the Province of Noto to change its name to Province of Siracusa, and for the municipality of Siracusa to upgrade its status from district's capital city to province's capital city in place of the municipality of Noto, which was declassified simply as capital city of the homonymous district.

[--- Figure 2 ---]

We thus identify 86 district's capital cities – out of the 131 district's capital cities in our study region – as our treated units, and we compare them with a control group consisting of 2,913 municipalities that were not attributed the status and functions of district's capital city by law in order to evaluate whether the former gained a population premium – as a proxy for urban development – compared to the latter after the enforcement of the 1865 Lanza Law.[8] Thus, our sample consists of 2,999 municipalities (86 treated and 2,913 control municipalities) for which we have been able to collect population data for the entire pre-unification-to-1921 period. Specifically,

[7] The 44 municipalities excluded from the sample because they were acting as capital city of both district and province are: Ancona; Arezzo; Ascoli Piceno; Avellino; Bari delle Puglie; Benevento; Bologna; Caltanissetta; Campobasso; Caserta; Catania; Catanzaro; Chieti; Cosenza; Ferrara; Firenze; Foggia; Forlì; Girgenti; Grosseto; Aquila degli Abruzzi; Lecce; Livorno; Lucca; Macerata; Massa; Messina; Modena; Napoli; Palermo; Parma; Perugia; Pesaro; Piacenza; Pisa; Potenza; Ravenna; Reggio di Calabria; Reggio nell'Emilia; Salerno; Siena; Siracusa; Teramo; Trapani.

[8] Online Appendix Table A1 lists the 86 district's capital cities included in our study region, also specifying the pre-unification State to which they belonged.

we exclude from the sample all (control) municipalities for which population figures were not available for either the pre- or post-unification period, as well as municipalities that have undergone territorial variations during the period of analysis. Overall, our sample represents the 91.3% of the selected study region in terms of number of municipalities, and the 81.1% in terms of 1861 population figure (ISTAT, 2018).

3.3 Empirical modeling

We test whether the attribution of supra-municipal administrative functions to district's capital cities by the 1865 Lanza Law affected their population dynamics compared to non-capital city municipalities. To this end, we adopt the following difference-in-differences specification:

$$\log\left(Population_{m,c,p,t}\right) = \alpha + \beta Capital\ City_{m,c,p,t} + \sum_{k=1}^{K} \gamma_k X_{p,t}^{k} + \delta_m + \theta_t + \tau_c + \tau_c^2 + \varepsilon_{m,c,p,t} \quad (1)$$

where $Population_{m,c,p,t}$ denotes population in municipality m, located in district c within province p, in census year t. The right-hand side of Equation (1) includes a constant term (α), and the key explanatory variable $Capital\ City_{m,c,p,t}$. This is a binary variable taking a value of one in census years $t = 1871, 1881, 1901, 1911, 1921$ following the approval of the 1865 Lanza Law for treated municipalities; a value of zero in the pre-unification observation period (which ranges over the years 1853 to 1859, depending on the pre-unification State) and in census year 1861 for treated municipalities; and a value of zero over the entire pre-unification-to-1921 period of analysis for control municipalities. Equation (1) includes also the vector $X_{p,t}^{k}$ of log-transformed province-specific control variables for: population density, defined as population per square kilometer ($Density_{p,t}$); population concentration, defined through the Herfindahl-Hirschman index over

municipalities' population ($Concentration_{p,t}$); adult literacy rate, covering the pre-unification-to-1911 period ($Literacy\ Rate_{p,t}$); and railway density, defined as railway length per square kilometer, and covering the pre-unification-to-1911 period ($Railway\ Density_{p,t}$). The terms δ_m and θ_t denote municipality and year fixed effects (FE), respectively; the terms τ_c and τ_c^2 denote a district-time trend and its squared term, respectively, to control for conditions and dynamics that are specific to the district where municipalities are located; and $\varepsilon_{m,c,p,t}$ denotes the error term. We thus estimate Equation (1) through a two-way FE estimator.

3.4 Identification strategy

Two main issues can bias the estimation of Equation (1) due to the quasi-natural feature of our empirical setting. First, the potential non-random assignment of the status of district's capital city to a municipality. Indeed, despite district's capital cities were assigned supra-municipal administrative functions only with the approval of the Lanza Law in 1865, the capital city of each district was formally identified through the extension of the 1859 Rattazzi Law to the annexed territories at the time of their annexation by the Savoy House. Second, despite Equation (1) includes a large number of fixed effects, our estimates could still be biased by unobservable factors that are not accounted for, and that can correlate simultaneously with the timing and the outcome of the Lanza Law – for example, a higher population growth potential characterizing district's capital cities compared to non-capital city municipalities before 1865 (e.g., Bo, 2020; Bai and Jia, 2021). Indeed, the reliability of our estimates relies on a standard parallel trend assumption, which requires the treatment and control groups experiencing the same pattern in the outcome variable, conditional on observables, in the absence of the shocking event. In our case, the identification assumption requires that municipalities in the treatment and control groups would have experienced the same population dynamics if the Lanza Law had not been passed by the Italian Parliament in 1865.

We deal with the potential non-random assignment of the district's capital city status by relying on a kernel matching approach to identify appropriate treatment and control groups, and to increase the similarity between treated and control municipalities, in order to evaluate the urban development effects of the 1865 Lanza Law. Given the relatively small size of our treatment group (i.e., only 86 municipalities), we expect kernel matching to exploit our data best as it uses all units in the control group to construct a match for each treated municipality conditional on treated and control units lying on the common support.

We match district's capital cities and control municipalities in a cross-sectional setting based on demographic, geographical, and historical variables. The set of pre-1865 demographic variables includes: population in the pre-reform census year 1861 to control for the size of municipalities, as we can hypothesize larger municipalities to be more likely selected as district's capital cities ($Population_m^{1861}$); the average yearly growth rate of population between the pre-unification observation year and the census year 1861 ($\overline{\Delta Population_m^{PU\ to\ 1861}}$), and its squared term to capture population growth dynamics. The set of geographical variables includes: land area ($Land\ Area_m$); altitude ($Altitude_m$); a dummy variable for coastal municipalities ($Coastal_m$); and a within-district centrality index ($Centrality\ Index_m$). Specifically, we compute the within-district centrality index by, first, calculating the average pairwise distance across the municipalities located within the same district, and, second, applying a normalization in the interval $[0, 1]$ in such a way that relative centrality increases from 0 to 1. We include this variable in the matching procedure under the rationale that more central municipalities could have been more likely to receive the status of capital city because of their better geographical location within the district. The set of historical variables includes: the geographical distance (in kilometers) between a municipality and the closest Roman road, under the rationale that municipalities closer to ancient commercial routes could have grown more as main trading and, consequently, also political and administrative centers ($Distance\ to\ Closest\ Roman\ Road_m$); a dummy variable capturing whether a municipality has

been the seat of a bishop and/or an archbishop between the years 1300 and 1700 to capture the presence of first forms of political and institutional organization and coordination ($Bishop\ and/or\ Archbishop\ (1300\ to\ 1700)_m$); a dummy variable capturing whether a municipality recorded a population of at least 5,000 inhabitants during the period 1300-1700 to capture the early presence of a 'large city' ($Large\ City\ (1300\ to\ 1700)_m$); and dummy variables for pre-unification States to capture similarities in pre-unification institutional and administrative set ups.[9]

We thus rely on a kernel matching with optimal bandwidth, which identifies 85 treated and 2,913 control municipalities lying on the common support – the unique unit lying outside the common support being the municipality of Pistoia in the former Grand Duchy of Tuscany. Overall, the matching procedure improves significantly the similarity between treated and control municipalities, as differences in mean value of the matching variables between the treatment and control group reduce compared to the un-matched sample – see Online Appendix Table A4, which reports the balance test on the matching procedure.[10] We then use kernel matching weights to estimates Equation (1) on the subset of municipalities lying on the common support.

As previously highlighted, our second concern relates to the parallel trend assumption. We test whether this identification assumption holds by relying on a more flexible specification of Equation (1) that accounts for a set of census-by-census treatment effects (e.g., Autor, 2003; Bo, 2020; Bai and Jia, 2021). Specifically, we modify Equation (1) to test for the absence of pre-1865 differences in population dynamics between treated and control municipalities. This allows us to test for the direction of causality between the attribution of supra-municipal functions by law to a district's capital city and its population dynamics by checking for anticipatory effects, and evaluating the comparability of treated and control municipalities in the period before the approval of the Lanza

[9] Online Appendix Tables A2 and A3 report some descriptive statistics and the correlation matrix of the matching variables, respectively.
[10] We will discuss robustness tests on the matching procedure later in the paper.

Law. Moreover, such a flexible specification allows us to assess the time-varying effect of the 1865 Lanza Law on population in the post-reform period. Formally, we modify Equation (1) according to an event study approach as follows:

$$\log(Population_{m,c,p,t}) = \alpha + \sum_{h=1}^{H} \zeta_{\omega-h} Capital\ City_{m,c,p,t}^{\omega-h} + \sum_{l=1}^{L} \zeta_{\omega+l} Capital\ City_{m,c,p,t}^{\omega+l} + \sum_{k=1}^{K} \gamma_k X_{p,t}^{k} + \delta_m + \theta_t + \tau_c + \tau_c^2 + \varepsilon_{m,c,p,t} \quad (2)$$

such that the variable $Capital\ City_{m,c,p,t}$ is replaced by a set of lead dummy variables ($Capital\ City_{m,c,p,t}^{\omega-h}$) referring to the two available pre-1865 observation periods h (i.e., the available pre-unification census year, and the census year 1861), with ω denoting the approval year of the Lanza Law, and a set of lag dummy variables ($Capital\ City_{m,c,p,t}^{\omega+l}$) referring to each post-1865 observation period l starting from 1871. Therefore, we expect $\zeta_{\omega-h} = 0$ for all h if the parallel trend assumption holds prior to the approval year of the Lanza Law. We estimate Equation (2) through a two-way FE estimator using kernel matching weights, and by specifying the lead dummy variable referring to the census year 1861 as the reference category.

4 Empirical results

4.1 Main results

Table 1 reports the results of the two-way FE estimation of Equation (1), with fixed effects and control variables included in the empirical specification according to a stepwise procedure. Results in Columns (1) to (3) refer to the pre-unification-to-1921 period of analysis, while we reduce the observation period up to the year 1911 in Column (4) as we control also for provincial literacy rate

and railway density.[11] We estimate a population elasticity to district's capital city ranging between 0.092 and 0.178.

[--- Table 1 ---]

Figure 3 reports the results of the estimation of Equation (2), which is used both to test whether the parallel trend assumption holds, and to evaluate time-persistency in the urban development effects of the Lanza Law. Specifically, Figure 3 plots census-specific coefficients over both the pre-unification-to-1921 observation period – i.e., by excluding provincial controls for literacy rate and railway density as for Column (3) in Table 1 –, and the pre-unification-to-1911 observation period – i.e., by including the full set of fixed effects and provincial controls as for Column (4) in Table 1. First, the coefficient referring to the pre-unification census year is very closed to zero, and we do not find evidence of a statistically significant difference in population between district's capital cities and control municipalities before the approval of the Lanza Law. This result suggests that the identification assumption holds, such that we can provide a causal interpretation to the results previously presented in Table 1. Second, we find evidence of an increase in population for district's capital cities compared to control municipalities starting from census year 1871. The effect of the 1865 administrative reform shows high temporal persistence.

[--- Figure 3 ---]

4.2 Robustness analysis

In this sub-section we present the results of a series of exercises aimed at testing for the robustness of our main findings with respect to: (i) spatial spillovers between treated and control municipalities;

[11] Online Appendix Table A5 reports some descriptive statistics of the dependent variable and the province-level control variables, while Online Appendix Table A6 reports the correlation matrix of the province-level control variables.

(ii) spatial correlation in the error term; (iii) bandwidth selection in the kernel matching; (iv) inclusion of pre-1865 demographic variables in the kernel matching; and (v) spatial proximity to the own provincial capital city.

4.2.1 Spatial spillovers

As a first exercise, we test for the absence of spatial spillovers occurring between treated and control municipalities. Indeed, Equation (1) allows us to assess whether the attribution of supra-municipal administrative functions by law to district's capital cities affected their population dynamics compared to control municipalities under the assumption that the Lanza Law had neutral effects on the latter type of municipality. However, the population growth premium we have estimated could be the result of a mere reallocation effect if the Lanza Law simply acted as a 'pushing force' inducing a migration of people and economic activities from non-capital city municipalities towards district's capital cities. In other words, evidence of spatial spillovers between a treated municipality and its neighbor control municipalities would imply a reallocation effect rather than a growth effect of the 1865 administrative reform (Miguel and Kremer, 2004).

To test whether spatial spillovers are in place, we follow Bo (2020) and modify Equation (1) as follows:

$$\log\left(Population_{m,c,p,t}\right) = \alpha + \beta Capital\ City_{m,c,p,t} + \xi Nearest\ Neighbors_{m,c,p,t} + \sum_{k=1}^{K} \gamma_k X_{p,t}^{k} + \delta_m + \theta_t + \tau_c + \tau_c^2 + \varepsilon_{m,c,p,t} \quad (3)$$

where $Nearest\ Neighbors_{m,c,p,t}$ denotes a binary variable referring to the four closest control municipalities identified (via geographical distance) with respect to each treated municipality, such that the variable takes a value of one in all post-1865 census years and a value of zero in the pre-

1865 census years. The parameter ξ captures the spillover effect, such that we expect no spatial spillovers to be in place if $\xi = 0$.

Table 2 reports the results of this exercise for both the pre-unification-to-1921 period – i.e., by including the full set of fixed effects but only provincial controls for population density and population concentration as for Column (3) in Table 1 – and the pre-unification-to-1911 observation period – i.e., by including the full set of fixed effects and provincial controls as for Column (4) in Table 1. The estimated specifications clearly suggest the absence of spatial spillover effects, as the variable for nearest neighbor control municipalities shows negligible estimated coefficients. Moreover, the results confirm our main evidence of a population premium for treated municipalities compared to municipalities in the control group. In other words, we find evidence that the Lanza Law had a growth effect for district's capital cities, rather than a mere reallocation effect between treated and control municipalities.

[--- Table 2 ---]

4.2.2 Spatial correlation in the error term

As a second exercise, we replicate the estimation of Equations (1) and (2) by clustering standard errors at the level of district and province in order to check for spatial correlation in the error term. All models are estimated over the pre-unification-to-1911 observation period by including the full set of fixed effects and provincial controls as for Column (4) in Table 1. Table 3 reports the results obtained from the estimation of Equation (1), while Figure 4 plots the estimated population elasticity to district's capital city obtained from the estimation of Equation (2). Both sets of results clearly confirm those previously presented in Table 1 and Figure 3.

[--- Table 3 ---]

[--- Figure 4 ---]

4.2.3 Bandwidth selection in the kernel matching

As a third exercise, we test for the sensitivity of our results to the selection of the bandwidth used in the kernel matching. Indeed, all the results presented in the previous sub-sections are based on a weighted regression with weights obtained from the use of an optimal bandwidth in the matching procedure.

We thus replicate the matching exercise using both a half-optimal bandwidth and a double-optimal bandwidth. The kernel matching with half-optimal bandwidth identifies 85 treated and 2,912 control municipalities lying on the common support; instead, when using a double-optimal bandwidth, the matching procedure identifies 85 treated and 2,913 control municipalities lying on the common support.[12] Table 4 and Figure 5 report the results obtained from the estimation of Equations (1) and (2), respectively, over the pre-unification-to-1911 observation period – i.e., by including the full set of fixed effects and provincial controls as for Column (4) in Table 1. The results fully confirm those presented in the previous sub-sections.

[--- Table 4 ---]

[--- Figure 5 ---]

4.2.4 Excluding pre-1865 demographic variables in the matching procedure

As a fourth exercise, we replicate the main analysis and all the robustness tests previously presented by using matching weights obtained from a kernel matching based on a restricted set of matching

[12] Online Appendix Table A7 reports the balance test on the kernel matching procedures using a half- and a double-optimal bandwidth.

variables. Specifically, we match only on the sets of geographical and historical variables, i.e., we do not match on the demographic variables for 1861 population, average yearly growth rate of population between the pre-unification observation year and the census year 1861, and the squared term of the population growth variable. The rationale for this test is to relax excessive forcing of the matching on pre-1865 demographic variables, as the outcome variable in our empirical model is municipalities' population.[13]

Table 5 reports the results obtained from the estimation of Equations (1) and (3), while Figure 6 reports the results obtained from the estimation of Equation (2). These results – which refer to the pre-unification-to-1911 observation period – fully corroborate those previously presented.

[--- Table 5 ---]

[--- Figure 6 ---]

4.2.5 Spatial proximity to the own provincial capital city

As a final robustness exercise, we deal with potential effects associated with proximity to a large city. Some papers have shown that city population growth is influenced by proximity to large services-oriented urban areas (e.g., Zeng et al., 2016; Bosker and Buringh, 2017; Beltrán Tapia et al., 2021). As previously discussed, provincial capital cities were higher-ranked than district's capital cities within the political-administrative hierarchy of the Kingdom of Italy, and were also acting as the main political, administrative, and economic centers in the pre-unification States. Moreover, the main idea behind the district was to strengthen the local presence of the central government's powers, and to extend its control over remote territories. We thus expect the urban development effects of the Lanza Law to be larger for district's capital cities located farer away from

[13] Online Appendix Table A8 reports the balance tests for the kernel matching with optimal, half-optimal, and double-optimal bandwidth using only geographical and historical matching variables.

their own provincial capital city. Indeed, we expect that more distant district's capital cities were both exerting higher control over their territories of competence, and representing a sort of 'center of services' alternative to the own provincial capital city for neighboring municipalities. We test for this potential effect – i.e., 'city centrality' – by accounting for heterogeneity related to the distance between a municipality and its own provincial capital city.

To this aim, we have first calculated the geographical distance in kilometers (d) between each municipality (m) and the own provincial capital city (pc). Second, we have augmented Equation (1) by an interaction term between our treatment variable for district's capital city ($Capital\ City_{m,c,p,t}$) and the municipality-to-own provincial capital city distance variable (d_m^{pc}). Formally, we have modified Equation (1) as follows:

$$\log\left(Population_{m,c,p,t}\right) = \alpha + \beta Capital\ City_{m,c,p,t} + \pi\left(Capital\ City_{m,c,p,t} \times d_m^{pc}\right) + \sum_{k=1}^{K} \gamma_k X_{p,t}^k + \delta_m + \theta_t + \tau_c + \tau_c^2 + \varepsilon_{m,c,p,t} \quad (4)$$

where the parameter π captures the smooth effect of the location of a municipality relative to the own provincial capital city, while all the other terms are defined as for Equation (1). We thus estimate Equation (4) via a two-way FE estimator using kernel matching weights.

Figure 7 reports the results obtained by estimating Equation (4) over the pre-unification-to-1911 period, and including the full set of fixed effects and provincial controls as for Column (4) in Table 1. Specifically, Panel A depicts the results obtained using weights from a kernel matching estimated with optimal bandwidth on the full set of pre-1865 demographic, geographical, and historical matching variables; Panel B, instead, depicts the results obtained using weights from a kernel matching estimated with optimal bandwidth on the reduced set of geographical and historical matching variables – i.e., by excluding the set of pre-1865 demographic variables from the kernel

matching procedure. We find that the greater the distance from the own provincial capital city, the larger the population premium for district's capital cities compared to the control municipalities. This result suggests that district's capital cities experienced a higher population premium when sufficiently distant from their main administrative, political, and economic center of reference, i.e., when they gained exclusivity as 'city of administrative functions and services' for the surrounding territories.

[--- Figure 7 ---]

4.3 The case of the Kingdom of the Two Sicilies

In this sub-section we focus on the case of the Kingdom of the Two Sicilies for two reasons. The first one is related to its administrative set up. Historians have shown the highly centralized administrative structure characterizing this Kingdom, where local-level government powers and functions were concentrated in the hands of the Intendant, who was in charge of ruling a particular province, while no functions were explicitly attributed to the capital cities of sub-national units other than the province. According to Law No. 570 of 12 December 1816, the Kingdom of the Two Sicilies was organized into 22 provinces, which were in turn divided into 76 districts, and more than 2,100 municipalities.[14] Each province was governed by an Intendant, who was appointed directly by the King. The Intendant was endowed with a broad set of administrative powers – e.g., maintenance of the public order using the police force, publication and execution of laws, decrees, regulations, and ministerial orders –, and was responsible for the control and supervision of municipalities' activities (Spagnoletti, 1997). This set up was confirmed by contemporary authors such as Liberatore (1834)

[14] There was another sub-national administrative unit in the Kingdom of Two Sicilies, i.e., the *circondario*. This unit, that generally included two or three municipalities, was very similar to the *mandamento* of the Rattazzi Law. Apparently, the only role assigned to these 684 administrative units was the judicial function.

and Manna (1840), who underlined how the political and administrative hierarchy of the Kingdom of the Two Sicilies was centered only on the province and the municipality.

By contrast, the district – an intermediate geographical-administrative unit between the province and municipality – had a very marginal role in the political-administrative set up of the Kingdom of the Two Sicilies. This unit – without any supra-municipal administrative functions – was entirely dependent on the decisions of the Intendant ruling the province of reference. Districts were characterized by continuous changes in their number, geographical boundaries, and size (Spagnoletti, 1997). For example, due to a severe fiscal crisis, in 1825 the number of provinces in Sicily was reduced from 7 to 4, and districts were abolished for many years. Moreover, also the municipalities designed as district's capital cities changed very frequently (Spagnoletti, 1997). The absence of supra-municipal functions assigned to district's capital cities in the Kingdom of the Two Sicilies is further confirmed by Gambi (1974), who carried out a qualitative analysis of the political-administrative functions assigned to a sample of Italian cities before (year 1850) and after (year 1875) the Italian administrative unification occurred in 1865 with the approval of the Lanza Law. The main findings of his work confirm that municipalities designed as district's capital cities in the Kingdom of Italy did not exercise any supra-municipal administrative functions in 1850: indeed, Gambi (1974) identified only municipal-level functions assigned to these municipalities similarly to non-district capital city municipalities.[15] All the municipalities that were designed as district's capital city in the Kingdom of Italy had moved from municipal-level administrative functions in 1850 to supra-municipal administrative functions in 1875. In addition, Gambi (1974) corroborates the hypothesis that all the administrative functions and activities of the province were concentrated in the provincial capital city, which was the seat of the Intendancy in the Kingdom of the Two Sicilies.

[15] The district's capital cities analyzed by Gambi (1974) are: Avezzano; Caltagirone; Castrovillari; Gerace; Isernia; Lagonegro; Lanciano; Larino; Mistretta; Modica; Nicosia; Palmi; Patti; Penne; Piazza Armerina; Piedimonte d'Alife; Rossano; Sala Consilina; Sciacca; Sulmona; Termini Imerese; Vallo della Lucania.

The second reason that makes the Kingdom of the Two Sicilies an interesting case study refers to the civil war occurred in its territories between the army of the newborn Kingdom of Italy and groups of Bourbon officers and brigands during the period 1861-1870. Recent contributions have clearly shown the political and ideological nature of the brigandage, i.e., a movement that defended the institutions and, more generally, the Bourbon regime (Pinto, 2019). This civil war caused not only thousands of deaths, but also a significant slowdown in the process of administrative unification in the former territories of the Kingdom of the Two Sicilies.

As we did before for the whole study region, we rely on a kernel matching procedure with optimal bandwidth to improve the similarity between treated and control municipalities, and to deal with the potential non-random assignment of the district's capital city status. First, we match on pre-1865 demographic, geographical, and historical variables. According to the kernel matching, all the 56 treated and the 2,041 control municipalities in the Kingdom of the Two Sicilies are identified as lying on the common support. Second, we exclude the set of pre-1865 demographic variables from the kernel matching. In this case, we identify 56 treated and 2,039 control municipalities lying on the common support.[16] We thus estimate Equations (1) and (2) – using kernel matching weights – over the pre-unification-to-1911 observation period – i.e., by including the full set of fixed effects and provincial controls as for Column (4) in Table 1.

The results of this exercise are reported in Table 6 and Figure 8. Two key insights emerge from this analysis. First, our main results are confirmed: indeed, district's capital cities endowed with supra-municipal administrative functions by law gained a population growth premium compared to similar non-capital city municipalities. Second, the only remarkable difference with respect to the previous analysis is that, within this pre-unification State, the urban development effects of the Lanza Law were 'postponed' to the end of the civil war occurred in the period 1861-

[16] We match on the same demographic, geographical, and historical variables used also for the whole study region, except that we replace the set of dummy variables for pre-unification States with two dummy variables capturing the continental part of the Kingdom of the Two Sicilies and the island of Sicily, respectively. Online Appendix Table A9 reports the balance test on the matching procedures.

1870 – and highlighted by the light-gay bar in Figure 8. Indeed, we find that the effects associated with the process of administrative unification in the former territories of the Kingdom of the Two Sicilies did not emerge until the early 1880s, thus suggesting a relatively strong slowdown in terms of urban development experienced by the Italian *Mezzogiorno*.

[--- Table 6 ---]

[--- Figure 8 ---]

5 Mechanisms

We exploit the 1865 Lanza Law as a quasi-natural experiment to study how the administrative reform process occurred in the aftermath of Italian unification shaped urban development by redesigning the country's territorial political-administrative hierarchy. We find that the urbanization process (measured by population size) of district's capital cities spurred – thanks to the administrative functions they had attributed by law – in the period 1871-1921 compared to municipalities that did not upgrade their status in the national hierarchy after 1865.

We can identify three potential mechanisms that may explain the relationship between administrative hierarchy and urban development (Bai and Jia, 2021). The first one concerns 'direct effects' related to public employment. Indeed, there is no doubt that district's capital cities attracted public employees, as some of the administrative functions they had attributed were associated with the employment of bureaucrats.

The second mechanism is related to spillover effects from public to private employment. This channel has been widely investigated in the literature, despite opposing conclusions have been reached. For example, Faggio and Overman (2014), analyzing English Local Authority-level data for the period 2003-2007, find that public employment has no identifiable effects on private

employment, but only impacts on its sectoral composition. Using Italian data for the period 2001-2011, Auricchio et al. (2020) find that public employment has a negative effect on the development of the private sector, especially in the South of Italy. Becker et al. (2021) find that a significant increase in public employment in the West Germany capital city of Bonn led to a small increase in private employment. Finally, Bai and Jia (2021) find a relatively small spillover effect of public employment on total private employment in China.

The third mechanism concerns market accessibility and transport networks. In a centralized State such as the Kingdom of Italy, infrastructure investments were key for the central government to connect peripheral territories with their administrative centers of reference, and to control the territory – e.g., for military reasons (Ciccarelli and Nuvolari, 2015). In this respect, capital cities of provinces and districts should have been easily accessible from the local population of neighboring municipalities. Accordingly, infrastructure investments – which facilitated not only the movement of people and goods among cities, but also the reallocation of economic activities over space – contributed significantly to urban and regional development processes. In the second half of the nineteenth century, the railway network was the most important and efficient transport infrastructure. In 1873, a year for which we have historical data on existing train stations at the municipality level, the construction of the national railway network was still in progress. Despite the skeleton of the railway network was well defined – the North and the South of Italy were connected through the two major costal lines opened soon after the unification of the country, and it was also partly possible to cross the country from East to West, and vice versa, passing through the Apennines –, the rail traffic was still limited, the service was too expensive for the masses, and the frequency of trains was reduced. Indeed, the railway network started to become widespread in our study region only from the 1880s, also as a result of the approval of the Baccarini Law in 1879 (Bonfatti et al., 2021), which established the opening of dozens of minor internal lines, gradually filling the gaps in the national network. Moreover, after repeated failures and public bailouts of

various railway companies, the management of the network was assigned to only three companies in 1885, namely the *Rete Adriatica*, the *Rete Mediterranea*, and the *Rete Sicula*, and, after twenty years, the management of the railway sector passed to the newborn *Ferrovie dello Stato* company, that was operating in a regime of public monopoly. Starting from 1905, the railway service underwent a decisive new impulse that increased passenger and freight traffic through the increase in both the number and the frequency of trains.[17]

We test for these three mechanisms in a cross-sectional setting by considering a series of dependent variables defined between the years 1873 and 1911, and capturing the level of public employment, the level of private (namely, manufacturing) employment, and the development of the infrastructure endowment. We specify the following general equation:

$$Y_{m,c,p,g} = \alpha + \beta Capital\ City_{m,c,p,g} + \sum_{j=1}^{J} \gamma_j X^j_{m,c,p,g} + \sum_{k=1}^{K} \delta_k X^k_{p,g} + \theta_g + \varepsilon_{m,c,p,g} \quad (5)$$

where $Y_{m,c,p,g}$ denotes the dependent variable used to proxy for either public employment, private (i.e., manufacturing) employment, or infrastructure endowment in municipality m, located in district c within province p, in geographical macro-area g defined at the *compartimento* level. We estimate Equation (5) both using weights from the kernel matching with optimal bandwidth on the full set of pre-1865 demographic, geographical, and historical variables, as well as on the full sample of municipalities (i.e., un-weighted regression).

First, we test for the 'public employment' mechanism through the number of employees working in industries providing public goods and services to the society. We use data drawn from the 1911 *Censimento degli opifici e delle imprese industriali al 10 giugno 1911* published by the

[17] Online Appendix Figure A2 illustrates the diffusion of railways in the Kingdom of Italy through a set of maps covering the period 1861-1911.

Italian Ministry of Agriculture, Industry and Trade in 1913, and define the dependent variable as the log-number of workers per inhabitant ($Public\ Service^{1911}_{m,c,p,g}$).[18] Second, we test for spillover effects from public to private employment – the second mechanism – through the log-number of manufacturing workers per inhabitant in 1911 ($Manufacturing^{1911}_{m,c,p,g}$), with data on manufacturing employment drawn from the same source as before. Finally, we test for the 'infrastructure' mechanism through train station endowment. We draw information from the third edition of the 1874 *Dizionario dei Comuni del Regno d'Italia*, and consider a binary dependent variable taking a value of one whether a municipality was endowed with a train station in 1873 ($Train\ Station^{1873}_{m,c,p,g}$), and a value of zero otherwise. We gather data also on whether a municipality was endowed with a train station in 1865 (i.e., the approval year of the Lanza Law) using information on the period of construction of railway sections drawn from the paper-based source *Sviluppo delle ferrovie italiane dal 1839 al 31 dicembre 1926* published by the Italian Ministry for Communication and the Directorate-General of Italian State Railways in 1927.

The right-hand side of all the versions of Equation (5) includes a constant term (α); the treatment variable for district's capital city ($Capital\ City_{m,c,p,g}$); a series of municipality-level geographical controls included in the vector $X^{j}_{m,c,p,g}$ (i.e., log-distance to the own provincial capital city, log-land surface, log-altitude, coastal dummy, within-district centrality index); the vector θ_g of macro-region (*compartimento*-level) geographical dummies; and the error term ($\varepsilon_{m,c,p,g}$). When considering the dependent variables for 1911 public and manufacturing employment, we include: (i) municipality-level variables for log-population in 1911, population growth rate between 1861 and 1911, and train station endowment in 1873 in the vector $X^{j}_{m,c,p,g}$; and (ii) province-level log-transformed controls in the vector $X^{k}_{p,g}$ for 1911 population density, 1911 population concentration in a province, 1911 adult literacy rate, and 1911 railway density. When looking at the probability of

[18] The 1911 *Censimento degli opifici e delle imprese industriali al 10 giugno 1911* was the first industrial census carried out by the Kingdom of Italy.

having a train station in 1873, we include: (i) municipality-level variables for log-population in 1871, population growth rate between 1861 and 1871, and train station endowment in 1865; and (ii) province-level log-transformed controls for 1871 population density, 1871 population concentration in a province, 1871 adult literacy rate, and 1871 railway density.

Table 7 reports the results of these analyses. First, we find a positive association between the district's capital city variable and our proxy for public employment – Columns (1) to (3). Second, we find a positive association between the district's capital city variable and the variable for manufacturing employment – Columns (4) to (6). Finally, we find that district's capital cities recorded a higher probability of being endowed with a train station in 1873 than their counterparts in the control group (conditional on train station endowment in 1865) – Columns (7) to (9).

Overall, these findings confirm that changes in the political-administrative hierarchy induced by a central government-led administrative reform can shape urban development in terms of population dynamics, as well as in terms of public and private employment, and infrastructure endowment development.

[--- Table 7 ---]

6 Conclusions

In this paper we have exploited the 1865 Lanza reform, which assigned specific supra-municipal administrative functions to district's capital cities in the aftermath of Italian unification, as a quasi-natural experiment to study how exogenous changes in political-administrative hierarchy shaped Italian urban development over the period 1871-1921. Our results show that changes in the administrative functions assigned to district's capital cities had an important role in driving the geography of urbanization and local development processes during the first sixty years of the Italian history. We also find a strong temporal persistence of these effects. In particular, three potential

mechanisms explain the relationship between political-administrative hierarchy and urban development, namely: increases in public employment, increases in private employment, and development of the infrastructure endowment.

The lesson from the Italian political and administrative unification process supports recent contributions focused on how political hierarchy can shape the process of urban growth and local development (e.g., Bo, 2020; Bai and Jia, 2021; Becker et al., 2021). Thus, we can identify political decision-making through administrative reforms as a further mechanism driving urbanization processes in developed and high-income countries, in addition to market forces (e.g., industrialization) and advantageous natural conditions (e.g., Henderson, 2003; Nunn and Puga, 2012).

Our results have relevant policy implications for country- and local-level economic development strategies. First, targeted interventions aimed at strengthening the administrative functions of minor cities could favor both a more evenly-balanced distribution of functions and a more widespread dissemination and coordination of government powers. This, in turn, could contribute to reduce within-country heterogeneity in bureaucratic efficiency and to improve local institutional environments, with positive effects on local development and growth (e.g., North, 1990; Hall and Jones, 1999; Acemoglu et al., 2001; Rodrik et al., 2004; Égert, 2016; Rodríguez-Pose and Ganau, 2022).

Second, our results may suit particularly transition economies and developing countries characterized by a process of administrative (re)organization that is not yet completed, and by the presence of cities that are still evolving. Governments of relatively 'young' countries could intervene to shape the national economic geography and promote homogeneous economic development by strengthening sub-national and city-level administrative functions, and by increasing the centrality of those cities and (still-evolving) urban agglomerations that suffer from a lack of (natural) resources and poor accessibility.

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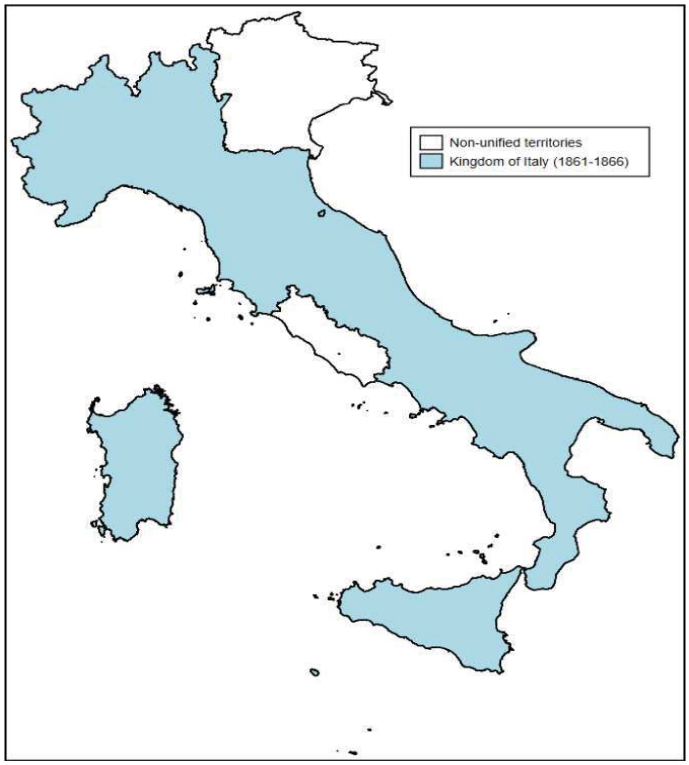
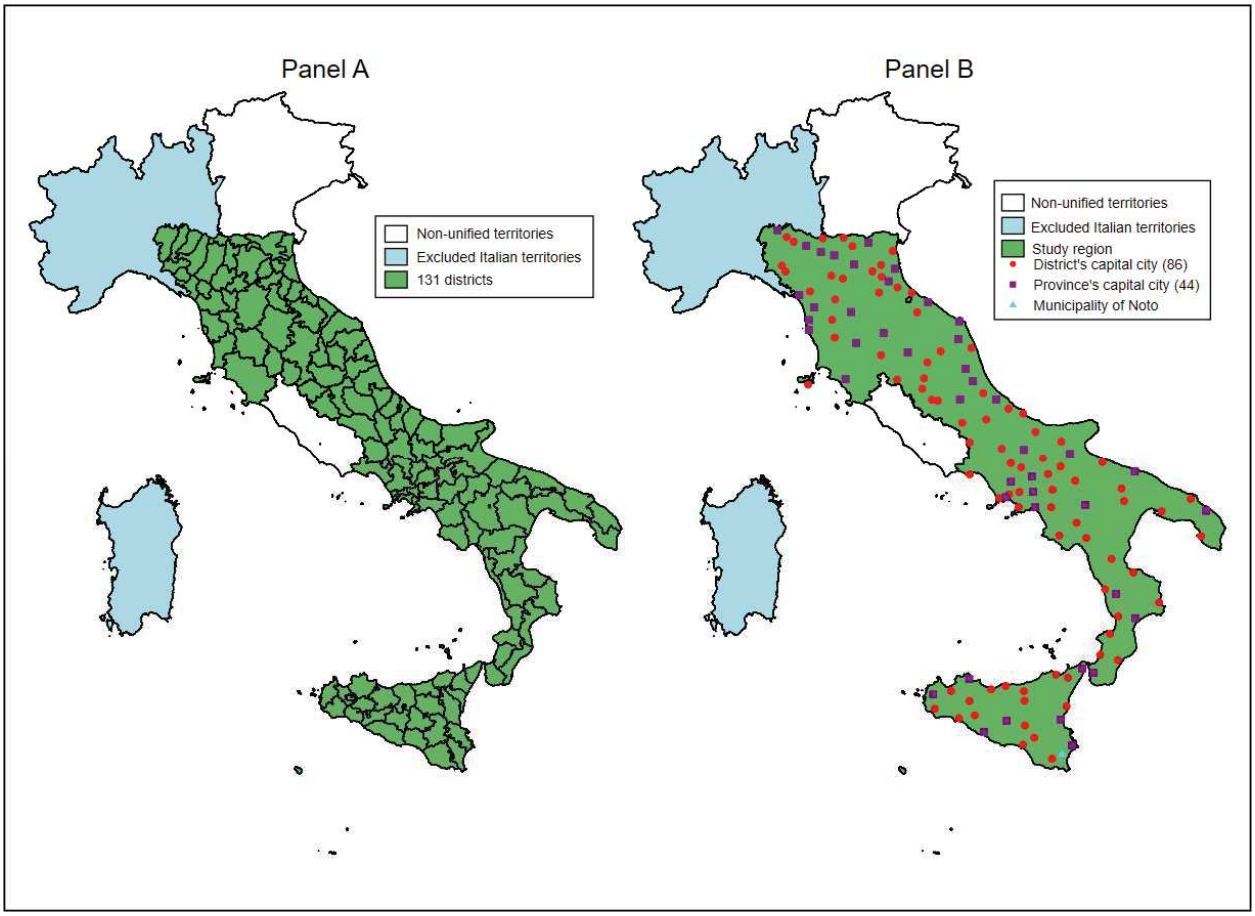
Figure 1: Kingdom of Italy (1861-1866).



Notes: Authors' elaboration on digital cartography provided by ISTAT.

Figure 2: Study region and capital cities.



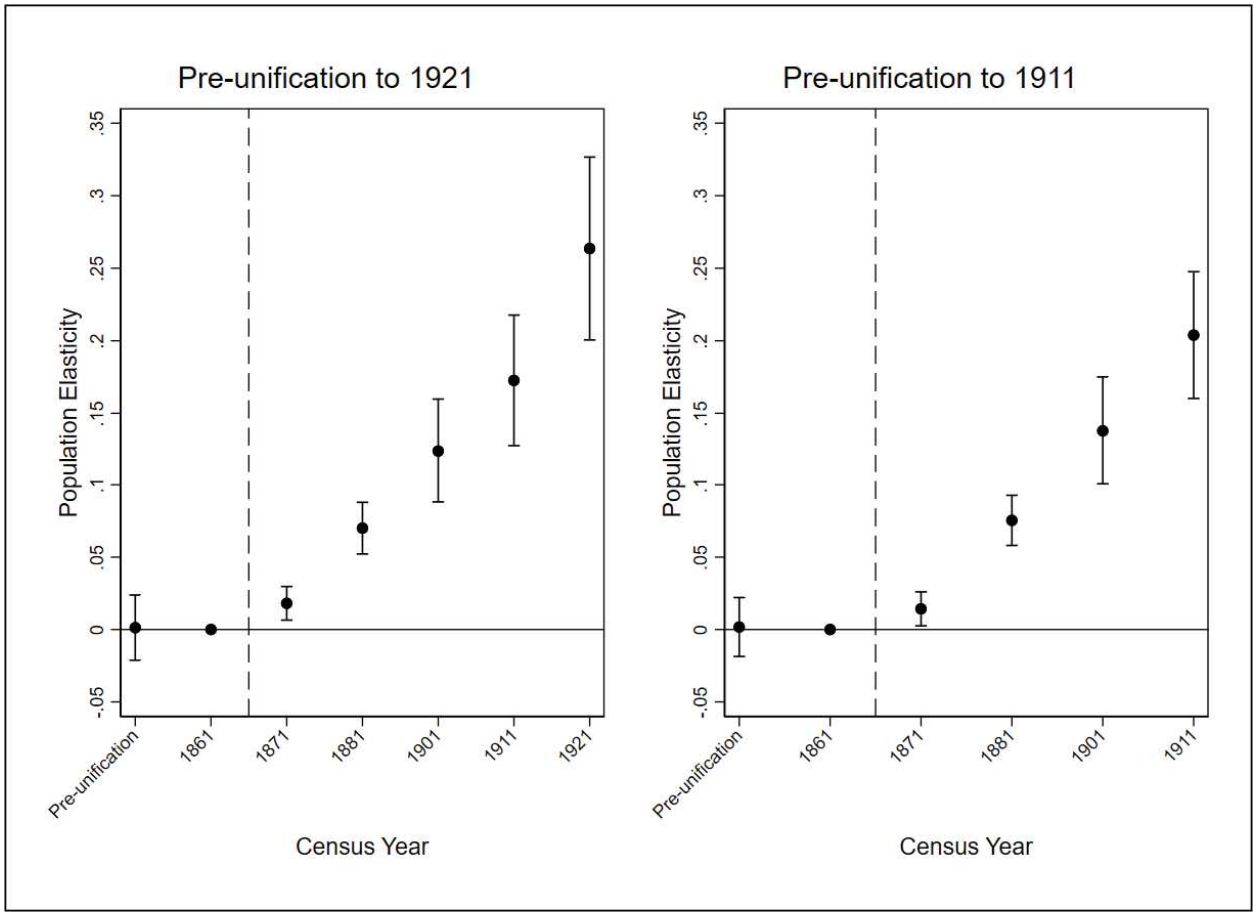
Notes: Authors' elaboration on digital cartography provided by ISTAT. Red dots in Panel B denote district's capital cities; purple squares denote province's capital cities; the light-blue triangle denotes the municipality of Noto.

Table 1: Urban development effects of the 1865 Lanza Law.

Period Covered	Pre-unification to 1921			Pre-unification to 1911
	(1)	(2)	(3)	(4)
$\text{Capital City}_{m,c,p,t}$	0.172****	0.178****	0.114****	0.092****
	(0.023)	(0.026)	(0.017)	(0.013)
$\log(\text{Density}_{p,t})$	…	…	1.116****	1.017****
			(0.110)	(0.087)
$\log(\text{Concentration}_{p,t})$	…	…	0.134**	0.055
			(0.056)	(0.087)
$\log(\text{Literacy Rate}_{p,t})$	…	…	…	0.372
				(0.258)
$\log(\text{Railway Density}_{p,t})$	…	…	…	-0.343
				(0.335)
Municipality FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
District × Trend	Yes	Yes	Yes	Yes
District × Squared Trend	No	Yes	Yes	Yes
No. of Observations	20,986	20,986	20,986	17,988
No. of Municipalities	2,998	2,998	2,998	2,998
No. of Treated Municipalities	85	85	85	85
No. of Control Municipalities	2,913	2,913	2,913	2,913
No. of Years	7	7	7	6
R^2	0.95	0.96	0.98	0.98
Model F Statistic [p-value]	54.48 [0.000]	45.30 [0.000]	43.96 [0.000]	40.09 [0.000]

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the municipality level, and reported in parentheses.

Figure 3: Urban development effects of the 1865 Lanza Law – Event study analysis.



Notes: Estimated elasticities (90% confidence intervals) of lead and lag dummy variables defined around the approval year of Law No. 2248/1865 (vertical dashed line). The pre-reform census year 1861 is set as the reference period. Statistics of the model estimated on the pre-unification-to-1921 period: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 7; no. observations = 20,986; R^2 = 0.98; model F statistic (p-value) = 33.78 (0.000). The model includes fixed effects and provincial controls as for Column (3) in Table 1. Statistics of the model estimated on the pre-unification-to-1911 period: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 31.80 (0.000). The model includes fixed effects and provincial controls as for Column (4) in Table 1.

Table 2: Testing for spatial spillovers.

Period Covered	Pre-unification to 1921	Pre-unification to 1911
	(1)	(2)
$\text{Capital City}_{m,c,p,t}$	0.129****	0.105****
	(0.019)	(0.016)
$\text{Nearest Neighbors}_{m,c,p,t}$	0.085	0.073
	(0.055)	(0.050)
Province-Level Controls		
$\log(\text{Density}_{p,t})$; $\log(\text{Concentration}_{p,t})$	Yes	Yes
$\log(\text{Literacy Rate}_{p,t})$; $\log(\text{Railway Density}_{p,t})$	No	Yes
Municipality FE	Yes	Yes
Year FE	Yes	Yes
District × Trend	Yes	Yes
District × Squared Trend	Yes	Yes
No. of Observations	20,986	17,988
No. of Municipalities	2,998	2,998
No. of Treated Municipalities	85	85
No. of Control Municipalities	2,913	2,913
No. of Years	7	6
R^2	0.98	0.98
Model F Statistic [p-value]	33.38 [0.000]	34.23 [0.000]

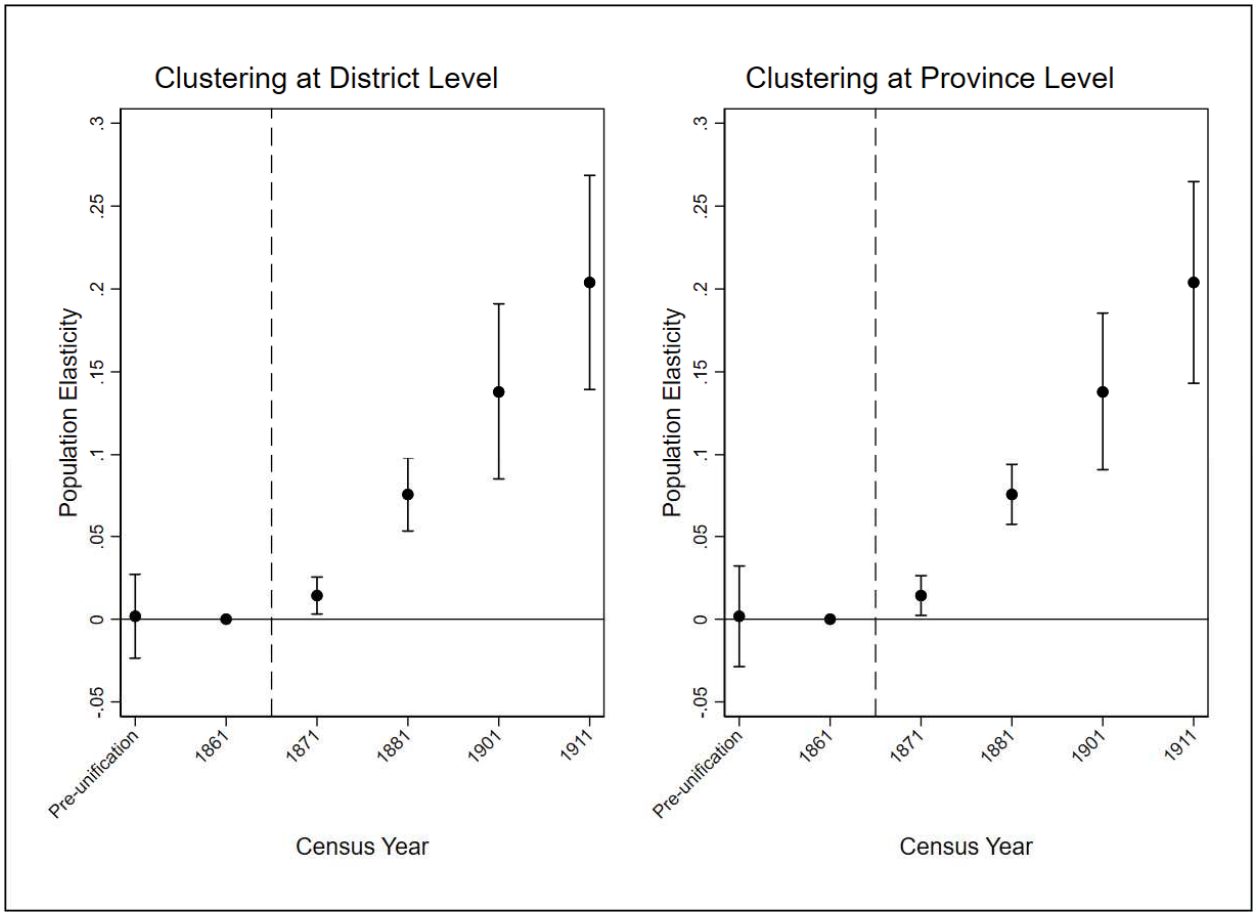
Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the municipality level, and reported in parentheses.

Table 3: Clustering standard errors.

Period Covered	Pre-unification to 1911	
Clustering Standard Errors by	District	Province
	(1)	(2)
$\text{Capital City}_{m,c,p,t}$	0.092****	0.092****
	(0.019)	(0.017)
Province-Level Controls	Yes	Yes
Municipality FE	Yes	Yes
Year FE	Yes	Yes
District × Trend	Yes	Yes
District × Squared Trend	Yes	Yes
No. of Observations	17,988	17,988
No. of Municipalities	2,998	2,998
No. of Treated Municipalities	85	85
No. of Control Municipalities	2,913	2,913
No. of Years	6	6
R^2	0.98	0.98
Model F Statistic [p-value]	16.75 [0.000]	22.84 [0.000]

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Clustered standard errors are reported in parentheses. Provincial controls as for Column (4) in Table 1.

Figure 4: Event study analysis clustering standard errors.



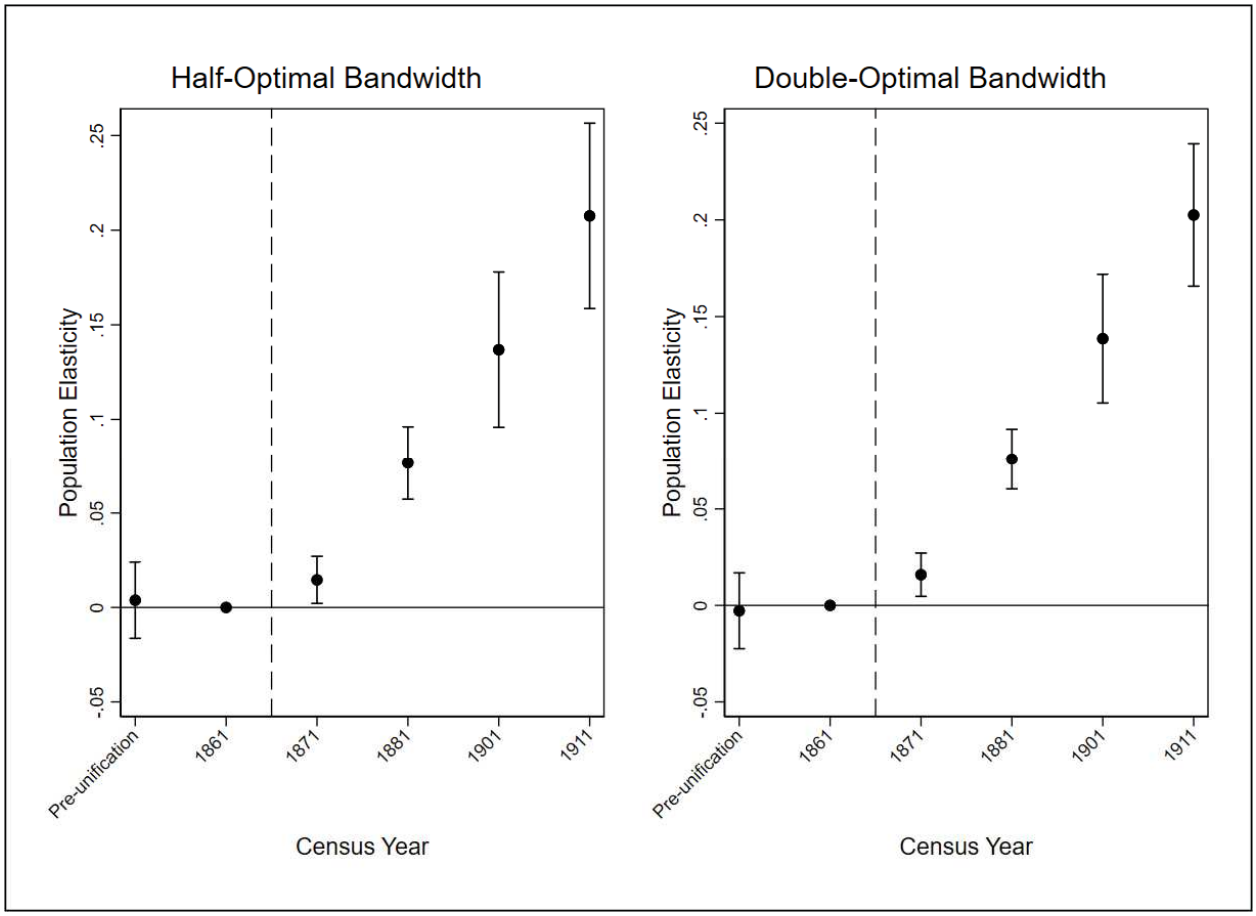
Notes: Estimated elasticities (90% confidence intervals) of lead and lag dummy variables defined around the approval year of Law No. 2248/1865 (vertical dashed line). The pre-reform census year 1861 is set as the reference period. Statistics of the model estimated with standard errors clustered by district: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 11.13 (0.000). Statistics of the model estimated with standard errors clustered by province: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 23.67 (0.000). Both models include fixed effects and provincial controls as for Column (4) in Table 1.

Table 4: Alternative bandwidths in kernel matching.

Period Covered	Pre-unification to 1911	
Bandwidth	Half-Optimal Bandwidth	Double-Optimal Bandwidth
	(1)	(2)
$\text{Capital City}_{m,c,p,t}$	0.091****	0.096****
	(0.015)	(0.011)
Province-Level Controls	Yes	Yes
Municipality FE	Yes	Yes
Year FE	Yes	Yes
District × Trend	Yes	Yes
District × Squared Trend	Yes	Yes
No. of Observations	17,982	17,988
No. of Municipalities	2,997	2,998
No. of Treated Municipalities	85	85
No. of Control Municipalities	2,912	2,913
No. of Years	6	6
R^2	0.98	0.98
Model F Statistic [p-value]	37.23 [0.000]	48.22 [0.000]

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the municipality level, and reported in parentheses. Provincial controls as for Column (4) in Table 1.

Figure 5: Event study analysis using alternative bandwidths in kernel marching.



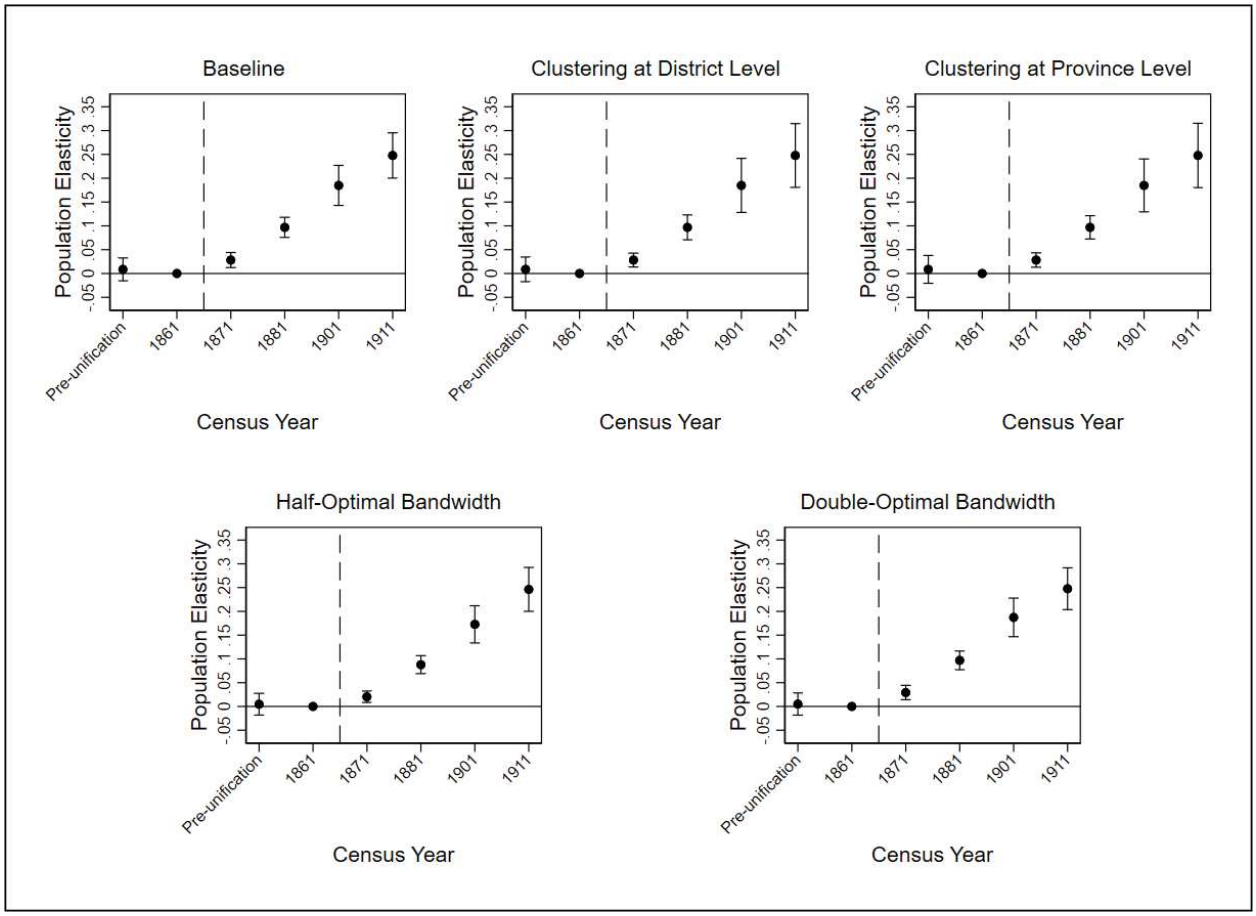
Notes: Estimated elasticities (90% confidence intervals) of lead and lag dummy variables defined around the approval year of Law No. 2248/1865 (vertical dashed line). The pre-reform census year 1861 is set as the reference period. Statistics of the model estimated using a half-optimal bandwidth in the kernel matching: no. treated municipalities = 85; no. control municipalities = 2,912; no. municipalities = 2,997; no. years = 6; no. observations = 17,982; R^2 = 0.98; model F statistic (p-value) = 27.30 (0.000). Statistics of the model estimated using a double-optimal bandwidth in the kernel matching: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.99; model F statistic (p-value) = 40.11 (0.000). Both models include fixed effects and provincial controls as for Column (4) in Table 1.

Table 5: Restricted set of matching variables.

Period Covered	Pre-unification to 1911					
Robustness Test	Baseline	Spatial Spillovers	Clustering Standard Errors		Alternative Bandwidth	
Standard Errors Clustered by	Municipality	Municipality	District	Province	Municipality	Municipality
Bandwidth in Kernel Matching	Optimal	Optimal	Optimal	Optimal	Half-Optimal	Double-Optimal
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Capital City}_{m,c,p,t}$	0.124****	0.130****	0.124****	0.124****	0.117****	0.129****
	(0.015)	(0.017)	(0.019)	(0.019)	(0.014)	(0.013)
$\text{Nearest Neighbors}_{m,c,p,t}$	…	0.031	…	…	…	…
		(0.046)				
Province-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District × Trend	Yes	Yes	Yes	Yes	Yes	Yes
District × Squared Trend	Yes	Yes	Yes	Yes	Yes	Yes
No. of Observations	17,988	17,988	17,988	17,988	17,970	17,994
No. of Municipalities	2,998	2,998	2,998	2,998	2,995	2,999
No. of Treated Municipalities	86	86	86	86	84	86
No. of Control Municipalities	2,912	2,912	2,912	2,912	2,911	2,913
No. of Years	6	6	6	6	6	6
R^2	0.98	0.98	0.98	0.98	0.98	0.98
Model F Statistic [p-value]	32.75 [0.000]	27.58 [0.000]	15.34 [0.000]	15.64 [0.000]	36.51 [0.000]	34.11 [0.000]

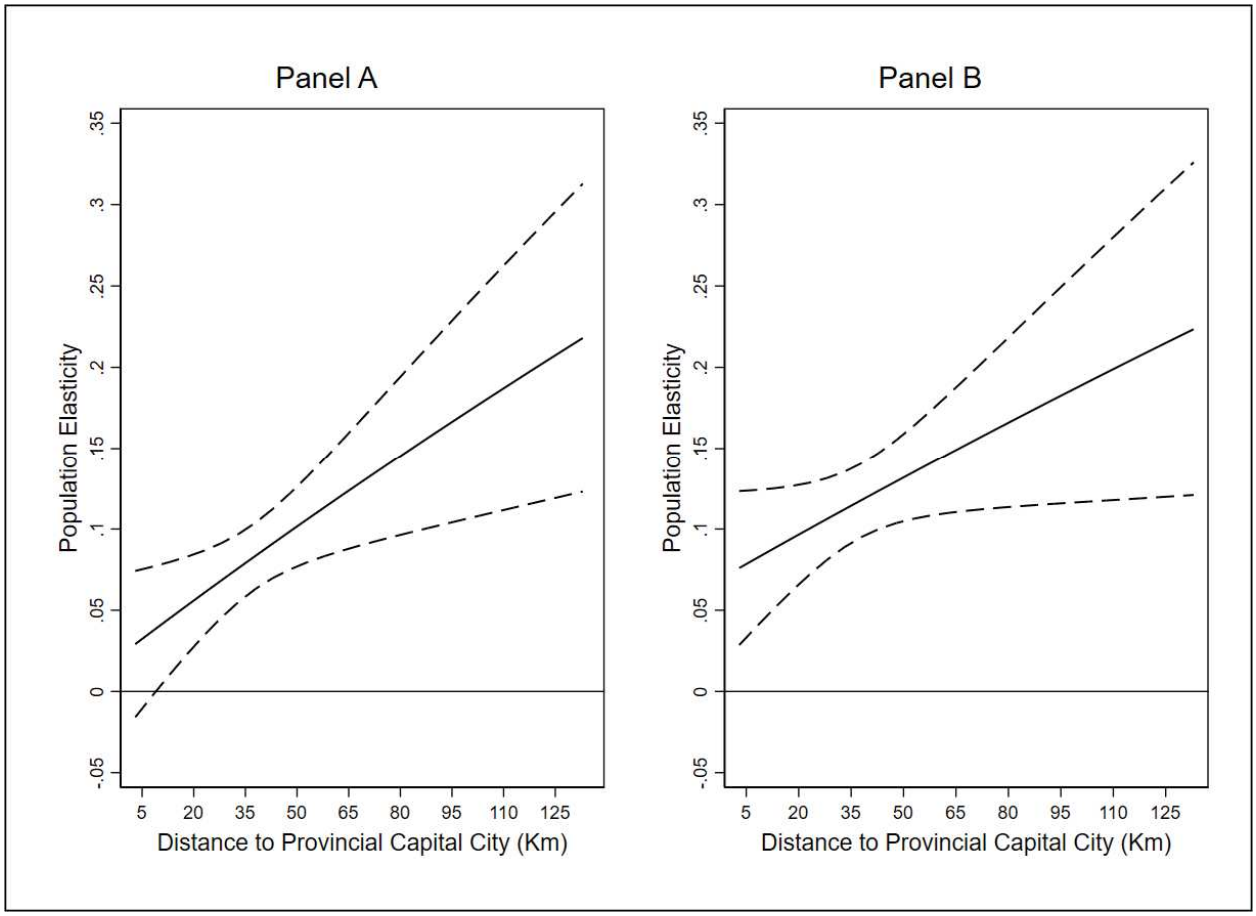
Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Clustered standard errors are reported in parentheses. Provincial controls as for Column (4) in Table 1.

Figure 6: Event study analysis using a restricted set of matching variables.



Notes: Estimated elasticities (90% confidence intervals) of lead and lag dummy variables defined around the approval year of Law No. 2248/1865 (vertical dashed line). The pre-reform census year 1861 is set as the reference period. Statistics of the baseline model estimated using the optimal bandwidth in the kernel matching: no. treated municipalities = 86; no. control municipalities = 2,912; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 29.63 (0.000). Statistics of the baseline model estimated with standard errors clustered by district: no. treated municipalities = 86; no. control municipalities = 2,912; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 13.36 (0.000). Statistics of the baseline model estimated with standard errors clustered by province: no. treated municipalities = 86; no. control municipalities = 2,912; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 17.40 (0.000). Statistics of the model estimated using a half-optimal bandwidth in the kernel matching: no. treated municipalities = 84; no. control municipalities = 2,911; no. municipalities = 2,995; no. years = 6; no. observations = 17,970; R^2 = 0.98; model F statistic (p-value) = 30.59 (0.000). Statistics of the model estimated using a double-optimal bandwidth in the kernel matching: no. treated municipalities = 86; no. control municipalities = 2,913; no. municipalities = 2,999; no. years = 6; no. observations = 17,994; R^2 = 0.98; model F statistic (p-value) = 33.71 (0.000). All models include fixed effects and provincial controls as for Column (4) in Table 1.

Figure 7: The mediation effect of distance to the own provincial capital city.



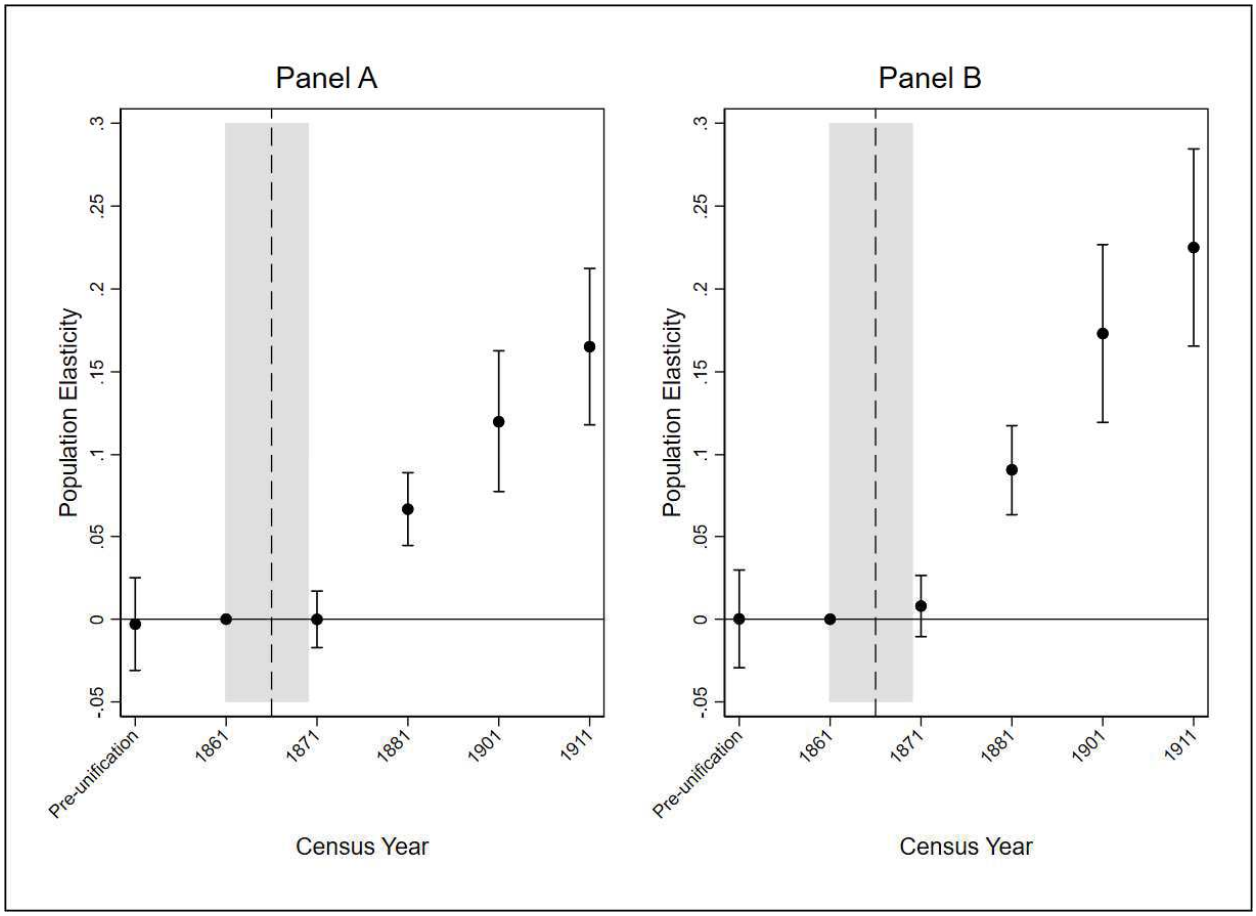
Notes: Estimated elasticity (90% confidence intervals, dashed lines) of the treatment variable by the distance to the own provincial capital city (in kilometers). Panel A: kernel-matched sample obtained using an optimal bandwidth and the full set of matching variables. Panel B: kernel-matched sample obtained using an optimal bandwidth and a restricted set of matching variables. Statistics of the model in Panel A: no. treated municipalities = 85; no. control municipalities = 2,913; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 38.34 (0.000). Statistics of the model in Panel B: no. treated municipalities = 86; no. control municipalities = 2,912; no. municipalities = 2,998; no. years = 6; no. observations = 17,988; R^2 = 0.98; model F statistic (p-value) = 31.40 (0.000). Both models include fixed effects and provincial controls as for Column (4) in Table 1.

Table 6: Kingdom of the Two Sicilies.

Period Covered	Pre-unification to 1911	
	(1)	(2)
$\text{Capital City}_{m,c,p,t}$	0.077****	0.116****
	(0.017)	(0.021)
Province-Level Controls	Yes	Yes
Municipality FE	Yes	Yes
Year FE	Yes	Yes
District × Trend	Yes	Yes
District × Squared Trend	Yes	Yes
Matching Variables		
Pre-1865 Demographic	Yes	No
Geographical	Yes	Yes
Historical	Yes	Yes
No. of Observations	12,582	12,570
No. of Municipalities	2,097	2,095
No. of Treated Municipalities	56	56
No. of Control Municipalities	2,041	2,039
No. of Years	6	6
R^2	0.98	0.98
Model F Statistic [p-value]	30.30 [0.000]	22.38 [0.000]

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the municipality level, and reported in parentheses. Provincial controls as for Column (4) in Table 1.

Figure 8: Event study analysis on the Kingdom of the Two Sicilies.



Notes: Estimated elasticities (90% confidence intervals) of lead and lag dummy variables defined around the approval year of Law No. 2248/1865 (vertical dashed line). The light-gray bar denotes the civil war that occurred between the years 1861 and 1870. The pre-reform census year 1861 is set as the reference period. Panel A: kernel-matched sample obtained using an optimal bandwidth and the full set of matching variables. Panel B: kernel-matched sample obtained using an optimal bandwidth and a restricted set of matching variables. Statistics of the model in Panel A: no. treated municipalities = 56; no. control municipalities = 2,041; no. municipalities = 2,097; no. years = 6; no. observations = 12,582; R^2 = 0.98; model F statistic (p-value) = 23.33 (0.000). Statistics of the model in Panel B: no. treated municipalities = 56; no. control municipalities = 2,039; no. municipalities = 2,095; no. years = 6; no. observations = 12,570; R^2 = 0.98; model F statistic (p-value) = 17.87 (0.000). Both models include fixed effects and provincial controls as for Column (4) in Table 1.

Table 7: Detecting mechanisms: public sector, private sector, and infrastructure development.

Mechanism	Public Sector			Private Sector			Infrastructure Development		
Dependent Variable	$\log(\text{Public Service}^{1911}_{m,c,p,g})$			$\log(\text{Manufacturing}^{1911}_{m,c,p,g})$			$\text{Train Station}^{1873}_{m,c,p,g}$		
Estimation Method	OLS			OLS			Probit		
Weighted Regression (Kernel Matching)	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\text{Capital City}_{m,c,p,g}$	0.001**	0.001***	0.001****	0.011**	0.012**	0.009**	0.585**	0.521**	0.448**
	(0.000)	(0.000)	(0.000)	(0.005)	(0.005)	(0.004)	(0.270)	(0.262)	(0.188)
Municipality-Level Controls (a)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-Level Controls (b)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Province-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compartimento FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Municipalities	2,998	2,998	2,999	2,998	2,998	2,999	2,998	2,998	2,999
No. of Treated Municipalities	85	85	86	85	85	86	85	85	86
No. of Control Municipalities	2,913	2,913	2,913	2,913	2,913	2,913	2,913	2,913	2,913
R^2	0.20	0.27	0.08	0.28	0.31	0.13	…	…	…
Pseudo R^2	…	…	…	…	…	…	0.51	0.53	0.37

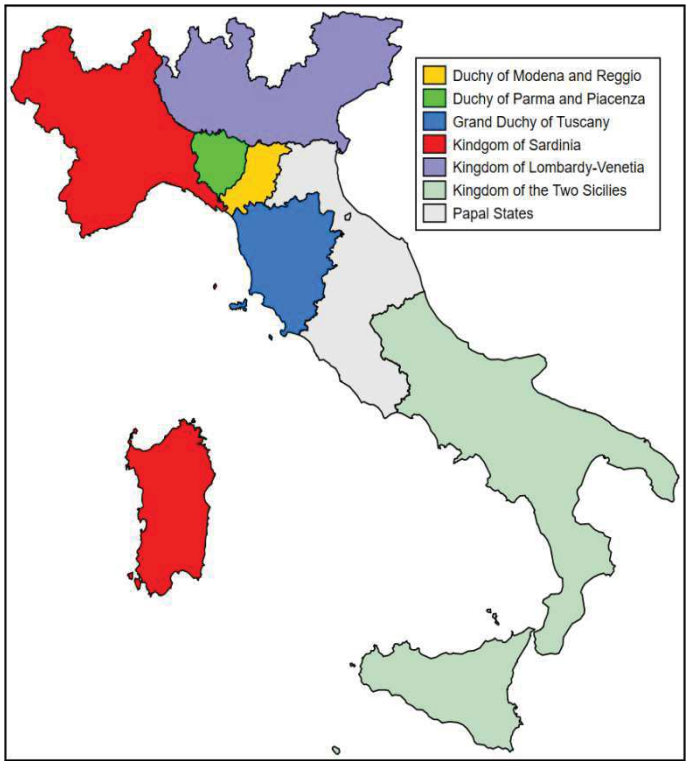
Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$. Standard errors are clustered at the municipality level, and reported in parentheses. Results in Columns (1), (2), (4), (5), (7) and (8) are obtained on the kernel-matched sample, while results in Columns (3), (6) and (9) are obtained on the un-matched sample. Municipality-level controls included in the set (a) for public and private sector mechanisms are: log-population in 1911; population growth between 1861 and 1911; train station endowment in 1873; log-distance to own provincial capital city. Municipality-level controls included in the set (a) for the infrastructure development mechanism are: log-population in 1871; population growth between 1861 and 1871; train station endowment in 1865; log-distance to own provincial capital city. Municipality-level controls included in the set (b) are variables used also in the kernel matching procedure, namely: log-land surface; log-altitude; coastal dummy; within-district centrality index.

ONLINE APPENDIX

for

"Administrative reforms and urban development: Lessons from Italian unification"

Figure A1: Italian pre-unification States.



Notes: Authors' elaboration on Shepherd (1926, p. 161) and digitalized cartography provided by GEO-LARHRA.

Table A1: District's capital cities in the study region.

No.	Municipality	Pre-unification State	No.	Municipality	Pre-unification State	No.	Municipality	Pre-unification State
1	Acireale	Kingdom of the Two Sicilies	30	Fiorenzuola d'Arda	Duchy of Parma and Piacenza	59	Piazza Armerina	Kingdom of the Two Sicilies
2	Alcamo	Kingdom of the Two Sicilies	31	Foligno	Papal States	60	Piedimonte d'Alife	Kingdom of the Two Sicilies
3	Altamura	Kingdom of the Two Sicilies	32	Gaeta	Kingdom of the Two Sicilies	61	Pistoia	Grand Duchy of Tuscany
4	Ariano di Puglia	Kingdom of the Two Sicilies	33	Gallipoli	Kingdom of the Two Sicilies	62	Pontremoli	Duchy of Parma and Piacenza
5	Avezzano	Kingdom of the Two Sicilies	34	Gerace	Kingdom of the Two Sicilies	63	Portoferraio	Grand Duchy of Tuscany
6	Barletta	Kingdom of the Two Sicilies	35	Guastalla	Duchy of Modena and Reggio	64	Pozzuoli	Kingdom of the Two Sicilies
7	Bivona	Kingdom of the Two Sicilies	36	Imola	Papal States	65	Rieti	Papal States
8	Borgo San Donnino	Duchy of Parma and Piacenza	37	Isernia	Kingdom of the Two Sicilies	66	Rimini	Papal States
9	Borgotaro	Duchy of Parma and Piacenza	38	Lagonegro	Kingdom of the Two Sicilies	67	Rocca San Casciano	Grand Duchy of Tuscany
10	Bovino	Kingdom of the Two Sicilies	39	Lanciano	Kingdom of the Two Sicilies	68	Rossano	Kingdom of the Two Sicilies
11	Brindisi	Kingdom of the Two Sicilies	40	Larino	Kingdom of the Two Sicilies	69	Sala Consilina	Kingdom of the Two Sicilies
12	Caltagirone	Kingdom of the Two Sicilies	41	Lugo	Papal States	70	San Bartolomeo in Galdo	Kingdom of the Two Sicilies
13	Camerino	Papal States	42	Matera	Kingdom of the Two Sicilies	71	San Miniato	Grand Duchy of Tuscany
14	Campagna	Kingdom of the Two Sicilies	43	Mazara del Vallo	Kingdom of the Two Sicilies	72	San Severo	Kingdom of the Two Sicilies
15	Casoria	Kingdom of the Two Sicilies	44	Melfi	Kingdom of the Two Sicilies	73	Sant'Angelo dei Lombardi	Kingdom of the Two Sicilies
16	Castellammare di Stabia	Kingdom of the Two Sicilies	45	Mirandola	Duchy of Modena and Reggio	74	Sciacca	Kingdom of the Two Sicilies
17	Castelnuovo di Garfagnana	Duchy of Modena and Reggio	46	Mistretta	Kingdom of the Two Sicilies	75	Sora	Kingdom of the Two Sicilies
18	Castroreale	Kingdom of the Two Sicilies	47	Modica	Kingdom of the Two Sicilies	76	Spoleto	Papal States
19	Castrovillari	Kingdom of the Two Sicilies	48	Monteleone di Calabria	Kingdom of the Two Sicilies	77	Sulmona	Kingdom of the Two Sicilies
20	Cefalù	Kingdom of the Two Sicilies	49	Montepulciano	Grand Duchy of Tuscany	78	Taranto	Kingdom of the Two Sicilies
21	Cento	Papal States	50	Nicastro	Kingdom of the Two Sicilies	79	Termini Imerese	Kingdom of the Two Sicilies
22	Cerreto Sannita	Kingdom of the Two Sicilies	51	Nicosia	Kingdom of the Two Sicilies	80	Terni	Papal States
23	Cesena	Papal States	52	Nola	Kingdom of the Two Sicilies	81	Terranova di Sicilia	Kingdom of the Two Sicilies
24	Cittaducale	Kingdom of the Two Sicilies	53	Orvieto	Papal States	82	Urbino	Papal States
25	Comacchio	Papal States	54	Palmi	Kingdom of the Two Sicilies	83	Vallo della Lucania	Kingdom of the Two Sicilies
26	Corleone	Kingdom of the Two Sicilies	55	Paola	Kingdom of the Two Sicilies	84	Vasto	Kingdom of the Two Sicilies
27	Cotrone	Kingdom of the Two Sicilies	56	Patti	Kingdom of the Two Sicilies	85	Vergato	Papal States
28	Faenza	Papal States	57	Pavullo nel Frignano	Duchy of Modena and Reggio	86	Volterra	Grand Duchy of Tuscany
29	Fermo	Papal States	58	Penne	Kingdom of the Two Sicilies			

Table A2: Descriptive statistics of the variables used in the matching procedure.

Matching Variable	Mean	Std. Dev.	Min.	Max.
$\text{Population}_{m}^{1861}$	3,928.75	3,978.79	96.00	49,584.00
$\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}$	-0.01	0.08	-0.45	1.21
$\left(\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}\right)^{2}$	0.01	0.04	0.00	1.45
Land Area_{m}	50.23	55.36	0.12	593.93
Altitude_{m}	387.32	271.62	0.00	1,433.00
Coastal_{m}	0.13	0.33	0	1
$\text{Centrality Index}_{m}$	0.66	0.28	0	1
$\text{Distance to Closest Roman Road}_{m}$	14.89	11.03	0.17	91.51
$\text{Bishop and/or Archbishop (1300 to 1700)}_{m}$	0.06	0.23	0	1
$\text{Large City (1300 to 1700)}_{m}$	0.06	0.24	0	1
$\text{Duchy of Modena and Reggio}_{m}$	0.04	0.19	0	1
$\text{Duchy of Parma and Piacenza}_{m}$	0.03	0.17	0	1
$\text{Grand Duchy of Tuscany}_{m}$	0.07	0.25	0	1
$\text{Kingdom of the Two Sicilies}_{m}$	0.70	0.46	0	1
Papal States_{m}	0.16	0.37	0	1

Notes: Statistics refer to 2,2999 municipality-level observations. *PU* stands for pre-unification period.

Table A3: Correlation matrix of the variables used in matching procedure.

Matching Variable		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
$\text{Population}_{m}^{1861}$	[1]	1														
$\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}$	[2]	0.10	1													
$\left(\Delta\text{Population}_{m}^{\text{PU to 1861}}\right)^{2}$	[3]	0.03	0.51	1												
Land Area_{m}	[4]	0.61	0.09	-0.02	1											
Altitude_{m}	[5]	-0.20	-0.09	-0.04	0.05	1										
Coastal_{m}	[6]	0.15	0.07	0.09	0.06	-0.32	1									
$\text{Centrality Index}_{m}$	[7]	-0.03	-0.02	-0.01	-0.14	-0.07	-0.13	1								
$\text{Distance to Closest Roman Road}_{m}$	[8]	0.02	0.07	-0.03	0.17	0.17	-0.07	-0.08	1							
$\text{Bishop and/or Archbishop (1300 to 1700)}_{m}$	[9]	0.42	0.04	0.05	0.35	-0.10	0.12	-0.05	-0.02	1						
$\text{Large City (1300 to 1700)}_{m}$	[10]	0.58	0.03	0.00	0.48	-0.06	0.15	-0.04	0.02	0.43	1					
$\text{Duchy of Modena and Reggio}_{m}$	[11]	0.02	0.05	-0.02	-0.01	-0.06	-0.07	-0.02	0.12	-0.05	-0.05	1				
$\text{Duchy of Parma and Piacenza}_{m}$	[12]	0.02	0.03	-0.02	0.04	-0.09	-0.07	0.01	0.02	-0.04	-0.04	-0.04	1			
$\text{Grand Duchy of Tuscany}_{m}$	[13]	0.13	0.05	0.00	0.19	-0.10	-0.05	-0.01	0.20	0.02	-0.01	-0.05	-0.05	1		
$\text{Kingdom of the Two Sicilies}_{m}$	[14]	-0.09	-0.14	0.06	-0.14	0.19	0.15	0.03	-0.36	-0.02	0.02	-0.30	-0.27	-0.42	1	
Papal States_{m}	[15]	0.01	0.09	-0.06	0.03	-0.09	-0.09	-0.03	0.24	0.05	0.03	-0.09	-0.08	-0.12	-0.67	1

Notes: Statistics refer to 2,2999 municipality-level observations. *PU* stands for pre-unification period.

Table A4: Balance test on matching procedure.

Matching Variable	Difference in Mean Value (Treated – Control) [p-value]			
	Un-Matched Sample		Matched Sample	
$\text{Population}_{m}^{1861}$	10,301.60	[0.000]	692.00	[0.566]
$\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}$	0.02	[0.016]	0.01	[0.494]
$\left(\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}\right)^{2}$	0.00	[0.348]	0.00	[0.967]
Land Area_{m}	94.44	[0.000]	-3.11	[0.860]
Altitude_{m}	-101.64	[0.001]	27.74	[0.453]
Coastal_{m}	0.19	[0.000]	0.00	[0.984]
$\text{Centrality Index}_{m}$	0.07	[0.019]	0.00	[0.918]
$\text{Distance to Closest Roman Road}_{m}$	-2.23	[0.065]	-0.35	[0.830]
$\text{Bishop and/or Archbishop (1300 to 1700)}_{m}$	0.54	[0.000]	0.00	[0.957]
$\text{Large City (1300 to 1700)}_{m}$	0.56	[0.000]	-0.01	[0.877]
$\text{Duchy of Modena and Reggio}_{m}$	0.01	[0.676]	0.02	[0.527]
$\text{Duchy of Parma and Piacenza}_{m}$	0.02	[0.363]	0.03	[0.293]
$\text{Grand Duchy of Tuscany}_{m}$	0.00	[0.998]	0.00	[0.903]
Papal States_{m}	-0.05	[0.324]	-0.07	[0.311]
$\text{Kingdom of the Two Sicilies}_{m}$	0.02	[0.558]	0.03	[0.619]
No. Treated Municipalities	86		85	
No. Control Municipalities	2,913		2,913	

Notes: Kernel matching using optimal bandwidth. *PU* stands for pre-unification period.

Table A5: Descriptive statistics of dependent variable and province-level controls.

	Mean	Std. Dev.	Min.	Max.
Dependent Variable				
$\log(\text{Population}_{m,c,p,t})$	8.09	0.80	4.56	11.56
Province-Level Controls				
$\log(\text{Density}_{p,t})$	-0.20	1.00	-3.53	4.13
$\log(\text{Concentration}_{p,t})$	-3.50	0.84	-4.55	-0.10
$\log(\text{Literacy Rate}_{p,t})$	-1.27	0.45	-2.08	-0.16
$\log(\text{Railway Density}_{p,t})$	0.03	0.02	0.00	0.16

Notes: Statistics refer to 20,986 municipality-year observations, except for the variables capturing provincial literacy rate and railway density that cover the pre-unification-to-1911 period for a total of 17,988 municipality-year observations.

Table A6: Correlation matrix of province-level controls.

Province-Level Controls		Period Covered					
		Pre-unification to 1921		Pre-unification to 1911			
		[1]	[2]	[1]	[2]	[3]	[4]
$\log(\text{Density}_{p,t})$	[1]	1		1			
$\log(\text{Concentration}_{p,t})$	[2]	0.551	1	0.548	1		
$\log(\text{Literacy Rate}_{p,t})$	[3]	…	…	0.248	0.392	1	
$\log(\text{Railway Density}_{p,t})$	[4]	…	…	0.258	0.287	0.786	1

Notes: Correlation coefficients refer to 20,986 municipality-year observations for the pre-unification-to-1921 period, while to 17,988 municipality-year observations for the pre-unification-to-1911 period.

Table A7: Balance test on matching procedure using alternative bandwidths.

Matching Variable	Difference in Mean Value (Treated – Control) [p-value]					
	Un-Matched Sample		Matched Sample			
			Half-Optimal Bandwidth		Double-Optimal Bandwidth	
$\text{Population}_{m}^{1861}$	10,301.60	[0.000]	377.00	[0.751]	1,176.00	[0.345]
$\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}$	0.02	[0.016]	0.00	[0.691]	0.01	[0.480]
$\left(\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}\right)^{2}$	0.00	[0.348]	0.00	[0.939]	0.00	[0.965]
Land Area_{m}	94.44	[0.000]	-8.95	[0.615]	4.72	[0.972]
Altitude_{m}	-101.64	[0.001]	33.16	[0.363]	17.32	[0.645]
Coastal_{m}	0.19	[0.000]	-0.01	[0.936]	0.03	[0.647]
$\text{Centrality Index}_{m}$	0.07	[0.019]	0.00	['.994]	0.01	[0.751]
$\text{Distance to Closest Roman Road}_{m}$	-2.23	[0.065]	-0.47	[0.774]	-0.79	[0.628]
$\text{Bishop and/or Archbishop (1300 to 1700)}_{m}$	0.54	[0.000]	0.00	[0.986]	0.05	[0.519]
$\text{Large City (1300 to 1700)}_{m}$	0.56	[0.000]	-0.04	[0.624]	0.04	[0.610]
$\text{Duchy of Modena and Reggio}_{m}$	0.01	[0.676]	0.02	[0.481]	0.02	[0.560]
$\text{Duchy of Parma and Piacenza}_{m}$	0.02	[0.363]	0.03	[0.236]	0.03	[0.317]
$\text{Grand Duchy of Tuscany}_{m}$	0.00	[0.998]	0.01	[0.686]	-0.02	[0.662]
Papal States_{m}	-0.05	[0.324]	0.05	[0.418]	0.00	[0.994]
$\text{Kingdom of the Two Sicilies}_{m}$	0.02	[0.558]	-0.11	[0.106]	-0.03	[0.695]
No. Treated Municipalities	86		85		85	
No. Control Municipalities	2,913		2,912		2,913	

Notes: Kernel matching using half- and double-optimal bandwidth. *PU* stands for pre-unification period.

Table A8: Balance test on matching procedure using a restricted set of matching variables.

Matching Variable	Difference in Mean Value (Treated – Control) [p-value]							
	Un-Matched Sample		Matched Sample					
			Optimal Bandwidth		Half-Optimal Bandwidth		Double-Optimal Bandwidth	
Land Area$_m$	94.44	[0.000]	11.38	[0.497]	12.20	[0.459]	16.23	[0.337]
Altitude$_m$	-101.64	[0.001]	-3.59	[0.922]	6.92	[0.854]	-11.42	[0.758]
Coastal$_m$	0.19	[0.000]	0.01	[0.905]	0.03	[0.702]	0.03	[0.626]
Centrality Index$_m$	0.07	[0.019]	0.01	[0.719]	0.01	[0.789]	0.03	[0.474]
Distance to Closest Roman Road$_m$	-2.23	[0.065]	-0.59	[0.719]	-0.76	[0.646]	-1.20	[0.466]
Bishop and/or Archbishop (1300 to 1700)$_m$	0.54	[0.000]	0.02	[0.836]	-0.01	[0.903]	0.06	[0.416]
Large City (1300 to 1700)$_m$	0.56	[0.000]	-0.01	[0.896]	-0.03	[0.682]	0.04	[0.571]
Duchy of Modena and Reggio$_m$	0.01	[0.676]	0.02	[0.445]	0.02	[0.581]	0.01	[0.673]
Duchy of Parma and Piacenza$_m$	0.02	[0.363]	0.02	[0.384]	0.02	[0.526]	0.02	[0.587]
Grand Duchy of Tuscany$_m$	0.00	[0.998]	-0.01	[0.865]	-0.02	[0.564]	0.00	[0.956]
Papal States$_m$	0.02	[0.558]	-0.01	[0.923]	0.01	[0.845]	-0.01	[0.824]
Kingdom of the Two Sicilies$_m$	-0.05	[0.324]	-0.03	[0.644]	-0.02	[0.741]	-0.01	[0.858]
No. Treated Municipalities	86		86		84		86	
No. Control Municipalities	2,913		2,912		2,911		2,913	

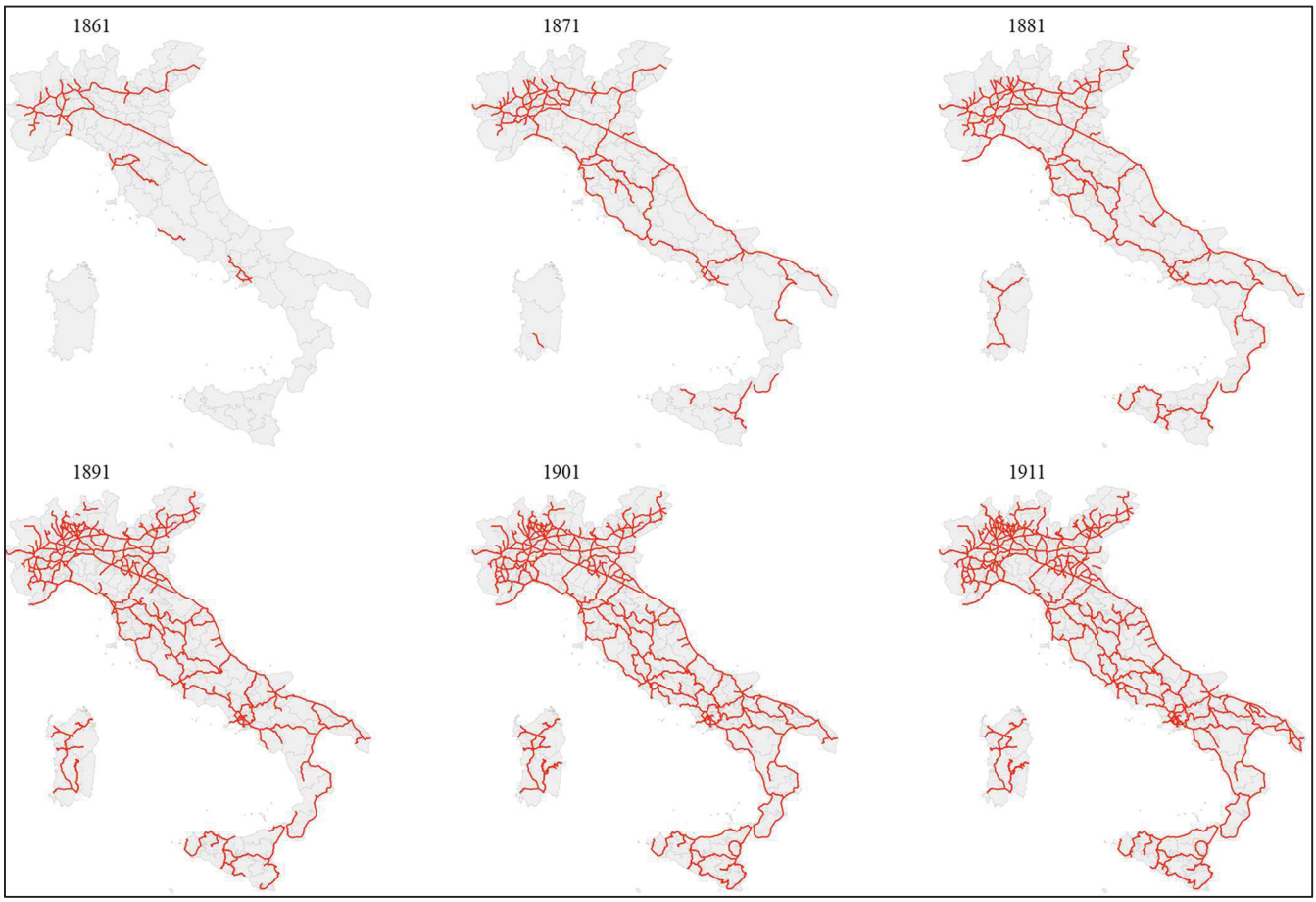
Notes: Kernel matching.

Table A9: Balance test on matching procedures on the Kingdom of the Two Sicilies.

Matching Variable	Difference in Mean Value (Treated – Control) [p-value]					
	Un-Matched Sample		Matched Sample			
			(1)		(2)	
$\text{Population}_{m}^{1861}$	9,195.30	[0.000]	511.00	[0.714]	…	
$\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}$	0.02	[0.168]	0.01	[0.402]	…	
$\left(\overline{\Delta\text{Population}_{m}^{\text{PU to 1861}}}\right)^{2}$	0.00	[0.669]	0.00	[0.885]	…	
Land Area_{m}	88.93	[0.000]	-17.18	[0.472]	4.08	[0.849]
Altitude_{m}	-98.89	[0.009]	37.95	[0.436]	6.80	[0.889]
Coastal_{m}	0.26	[0.000]	0.06	[0.485]	0.00	[0.992]
$\text{Centrality Index}_{m}$	0.06	[0.091]	0.00	[0.944]	0.00	[0.964]
$\text{Distance to Closest Roman Road}_{m}$	-2.86	[0.018]	0.05	[0.974]	0.04	[0.976]
$\text{Bishop and/or Archbishop (1300 to 1700)}_{m}$	0.53	[0.000]	0.02	[0.852]	0.04	[0.697]
$\text{Large City (1300 to 1700)}_{m}$	0.54	[0.000]	-0.01	[0.906]	0.01	[0.925]
$\text{Continental Territories}_{m}$	-0.13	[0.010]	-0.05	[0.535]	-0.03	[0.758]
Sicily_{m}	0.13	[0.010]	0.05	[0.535]	0.03	[0.758]
No. Treated Municipalities	56		56		56	
No. Control Municipalities	2,041		2,041		2,039	

Notes: Kernel matching using optimal bandwidth. *PU* stands for pre-unification period.

Figure A2: Evolution of the railway network in the Kingdom of Italy (1861-1911).



Notes: The maps show the temporal evolution of the Italian railway network from 1861 to 1911. In the fifty years from the unification of the country to World War I, the Italian railway network increased from about 2,500 kilometers in 1861 to about 18,000 kilometers in 1911. Maps are drawn from Basile et al. (2021). See also Ciccarelli and Nuvolari (2015) and Ciccarelli et al. (2021) for a more detailed discussion.

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