Internal Borders and Population Geography in the Unification of Italy*

Brian A'Hearn† and Valeria Rueda‡

Abstract

We offer new evidence on the spatial economic impact of Italian unification. Adopting municipal population as a proxy for local economic activity, we construct a new geocoded dataset spanning the pre- and post-unification periods, and discover robust evidence of an acceleration in growth near the former borders. A disproportionate improvement in market access boosted growth in these locations when barriers to trade were dismantled. Indirectly, unification's decisive contribution to intraregional market integration, local specialization and exchange, and economic development is revealed.

Keywords

Border Effects, Economic History, Economic Integration, Italy, Political Unification, 19th Century, Spatial Inequality

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† Brian.ahearn@pembroke.co.uk Pembroke College, University of Oxford and Oxford Centre for Economic and Social History.

‡ Valeria.rueda@nottingham.co.uk, School of Economics, University of Nottingham and CEPR.

1 INTRODUCTION

The Italian economy of the mid-nineteenth century was at a low point, a shadow of its former self as measured by real wages, heights, and GDP per capita (Malanima 2011; Allen 2001; A'Hearn 2003). An important obstacle to economic progress was fragmentation. Italy's inherently fractured physical geography was exacerbated by political division into seven states separated by tariff barriers, a plethora of weights and measures, linguistic differences, diverse legal institutions, and multiple currencies.[4] The seven states united in 1861 are illustrated in Figure 1. While internal borders were dismantled, new *external* borders were erected in several locations: permanently in the North-West, where Nice and Savoy were ceded to France; temporarily in the North-East, where Lombardy and Veneto were separated until 1866, and in the Center, where a rump Papal State around Rome was carved out of its larger former territory until 1870.

FIGURE 1

For the leaders of Italy's *Risorgimento*, political unification was a prerequisite not only for national political and cultural renewal, but also for an economic rebirth (see Mazzini, 1921, 69:62, for example). It was an article of faith among public intellectuals and patriots that free trade in a unified national market would promote competition, regional specialisation and trade, exploitation of the economies of scale, and enhanced capital accumulation (Tremelloni 1947, 1:151–63).

Disappointingly, unification failed to trigger an economic take-off. At less than half a percent per annum, growth was almost imperceptible in the twenty years to 1880. Moreover, the evidence does not suggest a post-unification boom in interregional trade. Coastal shipping grew no faster than international traffic in Italy's ports.[5] As for the railways, Schram (1997,

[4] The seven states were the Kingdom of Sardinia (Piedmont, henceforth), the Kingdom of Lombardy-Venetia (part of the Habsburg Empire), the Duchies of Parma-Piacenza and Modena-Reggio, the Grand Duchy of Tuscany, the Papal State, the Kingdom of the Two Sicilies ("the South", henceforth). An eighth state, the Duchy of Lucca, was incorporated into Tuscany in 1847 and does not appear in Figure 1.

[5] Data in the Annuario Statistico Italiano (1878, '81, '84) show that coastwise port traffic (ship tonnage) grew faster than international during 1861-77, but slower during 1871-81. Due to a change in the classification of trips by foreign vessels between Italian ports, no consistent series covers the entire 1861-81 period.

136–42) shows that up to 1884, the North's rail traffic with the Center-South was dwarfed by freight shipments to and from its seaports and border stations, or by rail transport within the North. What traffic there was, consisted of similar bulky commodities and raw materials moving in both directions rather than manufactures or specialised agricultural products. Regional commodity price convergence stalled; in 1870 Italian wheat markets remained less well integrated than any other western European economy (Federico 2007; 2011). As discussed in Section 2, scholars remain divided on the reasons.

In this paper we investigate whether internal borders hindered economic development in pre-unification Italy. We circumvent the problem of scarce trade data by looking for indirect evidence of the shadow cast by borders over local economic activity. We ask, more specifically, whether locations in the shadow of the former internal borders, benefited disproportionately from their demolition. Places near the old borders were peripheral before 1861, far from the economic center of gravity of their regional state, facing higher transport costs to reach the distant customers in their domestic market, and cut off from the nearby customers of a 'foreign' market. With unification, such marginal places suddenly became more central relative to a larger regional market, hence more attractive as production sites. Using municipal (*comune*) population as a proxy for economic activity, we find that towns near the former borders experienced a significant acceleration in growth in the decade after 1861. Our interpretation is that pre-unification borders impeded short-distance, intraregional trade based on economies of scale; their removal triggered a spatial reallocation of production.

To carry out our analysis, we construct a municipal population database which is original in two respects. First, we standardize municipality definitions – which were in constant flux in these early years – based on their 1871 boundaries. Second, we collect pre-1861 population data for three pre-unification states: Piedmont, Tuscany, and the mainland communities of the Kingdom of Two Sicilies, which we refer to as "the South". We then clean, standardize, and link these data with our 1861-71 figures.

We implement a difference-in-differences (DiD) strategy to identify the effect of eliminating borders on population growth. We observe that municipalities near removed borders experienced a growth acceleration compared to those ones farther away, suggestive of a spatial relocation of population towards the former border in the aftermath of unification. We control for a number of potential confounding factors such as distance to a rail line, elevation, or (via fixed effects) regional differences in institutions or demographic behavior. Still, our estimates would be biased if pre-unification trends in population growth were correlated with distance to removed borders. A particular concern is reverse causation, the possibility that economies were integrating and activity moving towards border areas before 1861, leading to calls for the process to be completed through political union. Several considerations offer reassurance on this point. First, for Piedmont we can directly verify the absence of such pre-trends. Second, the patterns we observe in the data do not suggest that border municipalities were already integrating. Indeed, we observe that before unification, places close to borders had, if anything, *lower* population growth compared to those farther away, a pattern which is only reversed after unification. Third, the consensus among historians is that, far from being protagonists, merchants and industrialists were largely disengaged from the Risorgimento struggle, according to the current consensus among historians (Davis 2000, 235; Toniolo 1998, 81; Riall 2009, 108). Finally, our results emerge not only in the North, but just as strongly in the South, which played no role in the designs of the Piedmontese leaders and unexpectedly came to be part of the new kingdom through the autonomous exploits of Garibaldi.

Our findings indicate a meaningfully large acceleration in population growth in municipalities near the former borders relative to other sample municipalities. Our results indicate that four hours (walking time) closer to a former border is associated with a post-1861 growth acceleration of approximately 0.08 percentage points, which can be compared to an average annual growth rate of 0.6%. This change could occur via either natural increase or migration. We find suggestive evidence for the second of these mechanisms: in municipalities near the former borders, an increase in the ratio of the population physically present to the population with legal residence is observed. This change in the number of recent arrivals, on the order of one per cent over the 1861-71 decade is large enough to be consistent with our estimated acceleration in population growth.

The remainder of the paper is organized as follows: in Section 2 we present evidence on how fragmentation impeded trade in preunification Italy, and review related literature on market access and borders; Section 3 describes the sources and construction of our population dataset and geographic controls, and present a descriptive overview of the data; Section 4 presents our main results; Section 5 discusses channels and robustness checks; and in Section 6 we offer some concluding thoughts.

2 BEFORE THE UNICATION – FRAGMENTATION, TRADE, AND RELATED LITERATURE

Out of the literature on the Italian economy in the long run have emerged numerous hypotheses about factors holding back development. Recent contributions, which typically adopt a regional perspective, have focussed on human capital (Ciccarelli and Weisdorf 2019a; Federico et al. 2021; Postigliola and Rota 2021b); social capital (Cappelli 2017; Guiso, Sapienza, and Zingales 2016; Mariella 2022); institutions (Federico and Dincecco 2021; de Oliveira and Guerriero 2018; Di Martino, Felice, and Vasta 2020); and natural resources and geography (Malanima 2016; Bardini 1997; A'Hearn and Venables 2013a). Here our focus is on an older concern, one that loomed especially large in the minds of contemporaries: the problem of market fragmentation. In this section, we discuss the evidence on pre-unification barriers to intra-Italian trade and the literature on market access to which our paper also relates.

2.1 Market fragmentation in Italy before unification

The best estimates of pre-unification trade are those of Federico and Tena-Junguito (2014) for the 1850s, which show that the Italian states traded much more with external partners than their immediate neighbors. Only in the small, landlocked Duchies of Modena and Parma did Italy's share of trade exceed one third; for Sicily, it was less than a tenth. The situation began to change after 1861 but long-distance interregional trade failed to take off in a dramatic way, and economic growth was anemic.

For Marxist historians, both trade and growth were held back by a stagnant, precapitalist agricultural sector, which kept even the unified national market small (Sereni 1966).[6] For Fenoaltea, high costs of transport were the binding constraint (2011 ch. 5). Others argue that, even if *de jure* unification could be accomplished with a simple vote of Parliament, *de facto* unification of markets was an inevitably slow process (Bastasin and Toniolo 2020 ch. 2). A more radical hypothesis is that the regional economies were too similar to benefit from specialization and exchange; all of them remained poor, agricultural, resource-scarce and labour-abundant. At least in terms of broadening markets, unification's impact was minimal (Zamagni 1983; Cafagna 1989, xxvii).

Before unification, an additional set of border-related costs hindered trade. Anderson and van Wincoop (2004) break such costs down into policy barriers (such as tariffs), language differences, currency differences, costs of acquiring information about markets and trading partners, and costs of contracting and enforcement across jurisdictional boundaries. Legal (Giorcelli and Moser 2020), cultural (Lecce, Ogliari, and Orlando 2021), and linguistic (De Mauro 1963; Tamburelli 2014) differences all mattered in Italy, but it is currency differences and protectionist barriers that were most significant.[7]

Six monetary systems operated in Italy on the eve of unification, some on a silver standard and others bimetallic, some decimalized and others adhering to older multiples of 12 or 20 (Conte, Toniolo, and Vecchi 2003; Chiaruttini 2018; Sannucci 1989). As many as 270 types of coin, extremely diverse in vintage and origin, circulated alongside the banknotes of nine

[6] For Sereni (1966), the political alliance between northern industrialists and great southern landowners had precluded land reform, such that remnants of feudalism blocked capital accumulation and innovation in rural Italy. These 'feudal residues' included a subsistence orientation among peasant households, domestic production of manufactures, concentration of property in the hands of precapitalist, absentee landlords, and tenancy arrangements like sharecropping. Only in the irrigated areas of the Po Valley in the North were modern, capitalist, agricultural operations to be found.

[7] Currency differences are the largest contributing element in Anderson and van Wincoop's (2004, 693) estimate of typical border-related costs for a modern, industrialized country, equivalent to a 14% tariff. Policy barriers contribute a further 8% even in the low tariff world of the 21st century; in our period such barriers were higher.

issuing banks.[8] Cross-border transactions entailed exchange rate risks. To illustrate this fact, we can look at bill of exchange prices, which reveal that Intra-Italian exchange rates were just as volatile as those between Italian and foreign currencies (Appendix Table B1). Indeed, the most volatile exchange rates of all were intra-Italian: between the Neapolitan ducat and either the Austrian or the Piedmontese lira. Similarly, correlations were low for intra-Italian currency pairs (Appendix Table B2). On the Milan bourse, for example, the exchange rate for Turin is much better correlated with the rates for Paris, Amsterdam, or Augsburg than with the rates for Florence or Naples. Recent studies of the Latin Monetary Union of 1865 confirm that monetary fragmentation hindered trade (Timini 2018; Vicquéry 2021).

A further limitation to market integration were tariff barriers, imposed by all Italian states. The best estimates of tariff protection are those of Tena-Junguito et al. (2012), for Piedmont, Lombardy, and the Papal State; despite substantial cuts after 1846, *ad valorem* tariffs on manufactured goods remained high on the eve of unification. In online Appendix Table B3, we report two additional measures that can be calculated for all states: total customs revenue as a share of total imports, and an index of specific tariffs relative to Piedmont. Both confirm the picture of substantial protection in the late 1850s, especially in Lombardy, the Papal State, and the South. Importantly, other Italian states were not accorded favorable treatment; if anything it was foreign states that benefited who benefited from special concessions. To these import taxes we can add non-tariff barriers such as outright prohibitions, state monopolies, time-consuming customs formalities, and differential port charges favoring home-flagged ships.[9] It is no wonder that by the 1840s "(t)he mirage of an Italian Zollverein conquered everyone" (Tremelloni 1947, 1:161).

[8] See Sannucci (1989, 274) for a list; I include also the Oesterreichische Nationalbank. Several of the note-issuing banks were founded only in the 1850s. Not counted are government-issued notes, which circulated in Lombardy-Venetia and, briefly, the Papal State.

[9] In an oft-cited passage regarding customs formalities, Serristori (1843, 295) gave the example of a Milan silk weaver sending his cloth to Florence, a distance of 150 miles. Passing through several territories along the way, his goods would be subjected to inspection and require paperwork at no fewer than eight customs offices.

2.2 Related literature: market integration and growth in economic history

Increased market access (or market potential; we will use the terms interchangeably) is the basis for our prediction of a reallocation of economic activity towards the former borders. The only study of market potential covering the pre-unification period is that of Bosker et al. (2008), who study Italian city populations over several centuries. The authors report mixed findings: although seaports and cities on navigable waterways grow faster, "a city's relative position, measured by its urban potential, is not significant" (p. 124). Studies of the post-unification period are more abundant, but the results are again mixed. Missiaia (2016; 2019a; 2019b) finds that the domestic component of market potential was an important determinant of per capita GDP in Italy's 16 regions from 1871 to 1911, but not of the location of particular industries, for which regional factor endowments were more fundamental. Basile and Ciccarelli (2018) find instead that the distribution of manufacturing output across Italy's 69 provinces was driven by domestic market potential, at least in capital intensive sectors.[10] A'Hearn and Venables (2013b) have it both ways, arguing that industry was first attracted to endowments, later by domestic market access, and finally by foreign market access. Our contribution to this literature is a granular approach that allows us to be more spatially precise and capture patterns that may not be visible at higher levels of aggregation.

In developing this approach we can draw on an economic geography literature relating municipal population growth to border proximity in cases of both newly erected and recently dismantled borders. These studies include: Brakman et al. (2012) on EU member state integration; Brülhart, et al. (2012) on eastern Austria after the fall of the iron curtain; Ploeckl (2010) on Saxony and the Zollverein after 1834; and Nagy (2015) and Kovacs (1989) on Hungary after the breakup of the Habsburg Empire. This work traces back to the influential study of German partition after the Second World War by Redding and Sturm (2008), which documents a relative decline in cities located near the new border. The paper includes a

[10] Daniele, Malanima, and Ostuni (2018) report a similar finding for the later period 1911-2001.

useful discussion of market access in economic geography models.[11] Our work documents the importance of border changes even in a pre-industrial setting.

3 DATA

3.1 Post-unification population

Italy conducted censuses at decennial intervals starting from 1861, publishing on each occasion a volume with the population of every municipality in the country. Italy's municipalities numbered 8,382 in 1871, and ranged in size from major urban centers like Naples (population 448,335) to rural territories with a population of less than a hundred. Two definitions of population are found in the Italian censuses: the population physically present on the day of the census (*popolazione presente*, "present population" henceforth), and the resident population. Our analysis is based on "present" population. Two considerations motivate this choice. First present population was more accurately measured, especially in the short run. The definition of the present population was transparent, consistent across censuses, and required neither judgment calls nor calculations beyond adding up the number of individuals physically present in each household on the day of the census. It was also, until 1881, the legally relevant concept for defining municipality size, which had manifold implications for local government and fiscal matters; there was an incentive to get this number right.[12] Second, we reconstruct population at historic 1871 municipal boundaries, and this can be done more accurately with present population.

[11] For studies of how national unification affected trade flows across former borders, see Wolf (2009) on Germany and Wolf (2005) on Poland.

[12] Calculating resident population started from present population, deducted individuals designated by heads of household as present in the dwelling but not part of the household (*estranei*), and added family members 'away from home' (*fuori casa*; 1861) or 'absent' (*assenti*; 1871). Because household heads routinely listed as 'temporarily absent' individuals who had long since left home, including emigrants, Italy's resident population exceeded the physically present population by more than 400,000 in 1861. In the census of 1861, the two population concepts (present and resident) are called *popolazione di fatto* and *popolazione di diritto*, respectively. In the census of 1871, *popolazione presente* is called exactly that, and presented alongside data on the *assenti dal comune*, both disaggregated in such a way that resident population can be calculated.

We downloaded these data from the website of Istat, Italy's National Statistical Institute; we call this the Sistat database.[13] Using data for 1861 and 1871, we construct a georeferenced database of municipality populations at constant 1871 municipal boundaries.

Geographical units are not constant across successive censuses, as municipalities gain and lose territory, or disappear altogether in mergers with neighboring municipalities. Name changes and the redrawing of provincial boundaries further complicate matters. Our approach to dealing with these problems is illustrated in the following, comparatively straightforward case. The Lombard municipality of Farinate was annexed to its neighbor Capralba in 1868. In the Sistat database, Capralba has 589 inhabitants in 1861 and 1,083 in 1871. Farinate, meanwhile, is recorded with 381 inhabitants in 1861, and is missing in 1871. Capralba thus displays spuriously rapid population growth (+84%). To correct for such changes, we use the constant 1871 borders based on territorial variations flagged in the Sistat database and more fully documented in the 1960 statistical compilation *Comuni e loro popolazione ai censimenti dal 1861 al 1951* (Italy. Istituto Centrale di Statistica 1960).[14] Our final database, therefore, has no entry for the suppressed municipality of Farinate, and a record for Capralba with a population of 970 (381+589) in 1861 and 1,083 in 1871. Using the same sources and similar procedures, we correct 1861 population figures for municipalities that ceded or absorbed territory by 1871.[15]

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[13] Sistema informativo sulle amministrazioni territoriale dal 1861 ad oggi, http://sistat.istat.it, most recently accessed 23 April, 2018.

[14] Also useful was the website www.elesh.it, which compiles the history of boundary changes for Italian municipalities. The site is part of the open data project Apps4Italy, funded by the Italian Ministry of Education initiative for innovative open data projects.

[15] For a small number of municipalities (roughly 158 out of our dataset's 7,317 municipalities), we either could not clearly establish from the sources how the territorial recomposition occurred or we are unsure about its accuracy. In such instances, we have flagged the municipality as having an "unadjusted" territorial gain or loss. Note that the adjustment process has implications for the population concept used. In the years 1861-1880, official information about the populations of municipalities and subunits (*frazioni*) undergoing boundary changes referred to the present population. (Only in 1881, when it became the relevant population concept for legal purposes, was an official definition of resident population adopted.) These are the data later collated in Istituto centrale di statistica (1960) used to adjust municipal populations to 1871 boundaries, giving us another reason to work with present, rather than resident population.

An alternative (and labor-saving) approach would have been to digitize a published Istat reconstruction of historical municipality populations at modern boundaries, for example Istat (1985), which uses the municipal boundaries of 1981. Our database at constant 1871 definitions has two advantages. First, using historical municipalities facilitates merging with pre-unification sources considerably, since there are far fewer differences in names and administrative boundaries. Second, using the ready-made sources for historical analysis can raise statistical concerns due to the modifiable areal unit problem (MAUP). MAUP refers to biases induced by the assembly of spatial subunits into larger aggregates of varying size and shape. There is no standard theory to guide the measurement of such distortions, but the empirical economic geography literature suggests that the problem is important, and recommends (i) maintaining a consistent aggregation process, and (ii) choosing units of aggregation that are relevant for the question asked (Briant, Combes, and Lafourcade 2010). Using today's administrative boundaries for a historical investigation such as ours would violate these rules.[16] Today's metropolitan municipalities, aggregating individual communities that were both smaller and less well linked in the past, violate (ii). Similarly, a sample including such large –and historically artificial– aggregations alongside other municipalities with unchanged definitions would mean heterogeneous aggregation processes in the data, violating (i).

Our post-unification dataset comprises 7,317 municipalities within Italy's borders of 1861. (This total includes the islands of Sicily and Sardinia, which will not be in our estimating samples. The regions Veneto and Lazio, annexed in 1866 and 1870 respectively, are excluded.) Of these, 1,357 experienced a name change; 24 were newly created after 1861; 8 lost territory after 1861 and were corrected to smaller, counterfactual boundaries; 85 lost territory in a way we could flag but not correct; 271 gained territory and were corrected to

[16] Figure A.1 in the online appendix illustrates the issue by zooming in on a part of Northwestern Italy, showing both 1871 municipality population centers and today's (2014) municipality boundaries. Many municipalities, especially in rural areas, have maintained their 1871 definitions to the present day. However, we can count, within the 2014 boundaries of Genoa, more than 20 independent municipalities of 1871 that were merged into the metropolis at some point between 1871 and 2014. Similarly, there are 4 formerly independent municipalities within today's Pavia, and 14 within today's Milan.

larger counterfactual boundaries (like Capralba); and 73 gained territory in a way that could be flagged but not corrected.

3.2 Pre-unification population

Finding and working with pre-unification data is challenging precisely because the country was not yet unified. There is no reliable compilation of pre- and post-unification municipal population data.[17] We have digitized pre-unification population figures for three states: Piedmont (1838 and 1848), Tuscany (1846), and the South (1828). The same issues that arise in harmonizing the censuses of 1861 and 1871 come up again in merging pre-unification data with our 1861-71 database. Our approach is to initially merge using province and municipality names, then investigate problem cases individually. We adjust pre-unification municipal populations to accord with 1871 definitions (e.g. Capralba would be merged with Farinate even before 1861 in our earlier example).[18] The resulting linked, geocoded database of pre- and post-unification municipal population figures is the first of its kind. It is based on the pre-unification sources described below for each state.

3.2.1 Piedmont

Pre-unification population data for Piedmont are from the 1848 census of the Kingdom of Sardinia published in 1852 (*Informazioni statistiche raccolte dalla Regia commissione superiore : censimento della popolazione per l'anno 1848*, 1852). The published census volumes also report

[17] A volume published subsequent to the 1861 census reports municipal population "in preceding years" alongside the figure for 1861, but specifies neither the source of pre-1861 data nor the year to which they refer (Italy. Ministero di Grazia e Giustizia e dei Culti 1863). In three cases — the former Kingdom of Sardinia, Kingdom of Lombardy-Venetia, and Duchy of Modena — the data appear to come from pre-unification censuses of 1857/58 reported in (Italy. Ministero d'Agricoltura, Industria e Commercio 1862). This date is too close to the events of the unification itself, to establish a baseline pre-unification growth rate. For the remaining pre-unification territories, with both the source and the year unknown, it impossible to either check for boundary changes before 1861 or calculate an annual growth rate for the pre-unification period.

[18] Our preunification sources for Tuscany and the South give us the populations of parishes, precincts, or neighborhoods at the sub-municipal level. These often match up with later municipal *frazioni* of 1861-71, enabling us to aggregate or subdivide pre-unification municipalities in conformity with 1871 boundaries. In other cases, an unmatched historical municipality can be matched to a *frazione* of a larger modern (21st century) municipality in the relevant province. For more difficult cases we rely on a wide range of additional sources, from nineteenth century statistical compilations to online maps and webpages detailing the history of particular municipalities. Examples include Wikipedia pages of historical municipalities, and the "Elesh" website mentioned in footnote 14.

municipality populations from the earlier census of 1838. We can thus compute preunification population growth rates for both 1838-1848 and 1848-1861. The merging procedure matches all 2,340 municipalities of 1871 to an 1848 counterpart.

3.2.2 Tuscany

The pre-unification population data for Tuscany are from *Introduzione al dizionario geografico fisico storico della Toscana* (Repetti 1846) and refer to the year 1846. Repetti does not specify his sources, but they are likely to have been unpublished government data based on the official registration system, in which vital statistics (monthly) and population totals (annually) were reported by parish priests to local government and forwarded to the central administration in Florence.[19] The merging procedure matches all 283 municipalities of Tuscany in 1861 to an 1846 counterpart, the population of both being adjusted to constant 1871 boundaries.

3.2.3 South

The pre-unification population figures for the South were compiled from a transcription of the *Atlante corografico storico e statistico del Regno delle Due Sicilie* (Marzolla, 1832). The data are based on official sources and refer to the year 1828.[20] The merging procedure matches 1,833 of 1,838 municipalities of 1861 to an 1828 counterpart, both being adjusted to constant 1871 boundaries.[21]

3.2.4 Population Definition

Our pre-unification sources report something more like resident population than the physically present population. This is explicit in the case of Piedmont, where the instructions for the 1848 census state that 'travelers, vacationers, infants in the care of wetnurses, [and]

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[19] The system is described by Bandettini (1960). Repetti also reports data for *comuni* of the then Duchy of Lucca and Duchy of Modena, which we use to reconstruct Tuscany at approximately its present regional borders. Bandettini (1960, 67) reports archival evidence of the Prefecture of Lucca complying with a request for municipal population by Repetti in 1850, suggesting his access to official but unpublished data.

[20] The original source was transcribed by a team at the University of Bari and can be downloaded from their website. Regarding the date and source of his data, Marzolla stated that they were valid "through 1828 according to information from the Directorate General of the Census" ("a tutto il 1828 giusta le notizie della Direzione Generale del Censimento").

[21] The unmatched municipalities were part of the enclaves of Benevento and Pontecorvo, territories belonging to the Papal State before 1861.

day-laborers should not be registered as inhabitants of the municipality where they by chance find themselves, but [rather] in that in which they normally reside.' Serving soldiers, students, and institutionalized persons were to be treated the same way (Kingdom of Sardinia 1852, p. vi). It is implicit in the cases of Tuscany and the South. The Tuscan data are based on population counts carried out by parish priests each year in the period around Easter, when it was traditional to visit and bless homes in the parish (Bandettini 1960, 61). This fact, and the absence of any instructions regarding either a particular date or a defined set of individuals to be counted, make it very unlikely that priests adopted a physically present definition of population.

The discrepancy between pre- and post-unification population definitions is problematic for our calculation of pre-1861 growth rates. The biggest concern is seasonal migration. The 1861 census was conducted on the 31st of December, a moment when mountain villages were depleted by emigration in search of work at lower altitudes. For such municipalities, linking pre-unification resident population to 1861 present population is likely to bias growth downward. We deal with this problem in several ways. First, we verify that resident population growth, though less accurate, has the same geographic pattern as present population growth in 1861-71, which means the change in definitions cannot be driving our results.[22] Second, across all our regressions, we show robustness to specifications where the outcome variable is *winsorized* at percentiles 1 and 99. This ensures that outliers, which municipalities with significant seasonal migration are likely to be, are not driving our results. Third, we pay careful attention to the cases of Piedmont and Tuscany, where seasonal outmigration was clustered in specific areas. This geographical clustering is a potential source of bias, as the error might correlate with our treatment of interest (distance to a removed border). The remainder of this section explains how we deal with these two cases.

[22] For purposes of this check, we require data on both present and resident municipal population, at constant boundaries. We obtained these by digitizing Istat's reconstruction at modern (1981) boundaries (Italy. Istituto Centrale di Statistica 1985). We take geographic information such as border distances from our own database, successfully matching 4/5s of the modern-definition municipalities in Piedmont, Tuscany and the South. In this sample, the correlation between resident and present population growth over 1861-71 is +0.77.

In the case of Piedmont, our concern is about clustering of measurement error in the Alps, a region with deeply rooted customs of seasonal migration in response to the constraints of a severe climate (Viazzo 1989; Quarantana 2011). Figure A.2.a in the online Appendix (accessible with the online supplementary materials to this paper), shows that outlier municipalities in Piedmont are indeed clustered at high elevations, many in the province of Turin. Furthermore, online Appendix Figure A.3 shows the result of a regression of population growth on a high elevation dummy interacted with period dummies. Though high elevation municipalities grew slower than average in all three periods, only in 1848-61 is the difference large and statistically significant for any definition of 'high elevation', which is consistent with our conjecture about the inconsistency of census population definitions. To deal with this issue, our preferred pre-unification growth period for Piedmont is 1838-48, which is not subject to changes in methods of population counts.

In the case of Tuscany, we lack pre-1846 municipal populations and so proceed differently. First, we identify the municipalities most at risk of experiencing seasonal outmigration. The province of Grosseto is of special interest because malaria rendered it almost uninhabitable in summer, whereas its population swelled in the autumn and winter, when there was plenty of agricultural work. Figure A.2.b in the online Appendix compares population growth in 1846-61 and 1861-71. The plot indicates that most outliers are from the province of Grosseto. Bandettini (1960, 8–12) documents that Grosseto was Tuscany's fastest-growing province before unification even when population is measured on a consistent basis, but also speculates that the *level* of population was too low due to undercounting of seasonal migrants (*popolazione avventizia*, p. 26). We therefore include a binary indicator for Grosseto province in our regressions, and we also verify the robustness of our main results to excluding observations from this province.

Finally, in the case of the South, the discrepancy in population definitions does not appear to systematically concern a particular province (see online Appendix Figure A.2.c). Therefore, for this case, we do not implement checks beyond winsorization of the outcome variable.

3.3 Geographic data

To geocode the 1871 municipalities we obtain locational data from a detailed file produced by Istat giving the latitude, longitude, and elevation of population centers (*località*) in 2001.[23] The sub-municipality detail at the level of *località* allow us to match many 1871 municipalities that no longer existed in 2001. A majority of municipalities can be matched straightforwardly on name and region. 580 now-defunct municipalities of 1871 we locate one-by-one using Google Maps and additional information such as webpages on particular municipalities listing their administrative subdivisions (*frazioni*) or recounting their history in detail.

The locations of borders abolished in 1861 are of fundamental importance. Fortunately, the pre-unification state borders largely coincide with later province borders, which we obtain from Istat shapefiles for 1861 (see Figure 1). Based on historic maps we hand correct discrepancies such as Pavia province, today entirely in Lombardy but before 1861 split with Piedmont.

We georeference official railway maps from 1861 and 1871 (Ferrovie dello Stato 1911). We also georeference data on the location of the main commercial ports in the Kingdom of Italy. Port data come from published statistical records (Statistica del Regno d'Italia 1866).[24] Elevation rasters are obtained from CIAT.

3.4 Measuring Distances

Our treatment variable is distance to a border, which we measure overland.[25] Given Italy's complex geography and rough terrain, aerial distance can be a poor representation of the actual travel cost between two points, especially for transporting freight. A solution would be to estimate the freight transportation cost between each point, as done by Donaldson and Hornbeck (2016) who use 19th century transport cost estimates for the United States from

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[23] Obtained from http://geodati.gfoss.it/wiki/index.php/Dati_liberi_-_Località_Istat on 26 August, 2016.

[24] Figure A.5 in the online appendix shows the location of the georeferenced ports. Since the data include all ports, most of which are tiny, we define main commercial ports as the top 10% of the distribution by tonnage of arriving and departing ships. This selection results in a map of 27 ports.

[25] Bosker and Garretsen (2010) caution that in estimates of market access effects, the specification of trade costs – for which distance is one of a handful of directly observable proxies - can have a significant impact.

Fogel (1970). However, in the case of Italy, data limitations prevent us from using the same approach. There are very few sources describing accurately the transport network and transport costs in Italy at the time of unification (and even fewer before), and those extant do not cover the entire country or all modes of transport. Detailed maps published after our period have the problem that significant infrastructure improvements were completed following unification.

To approximate transport costs in the absence of direct evidence, we employ an alternative measure that accounts for rough terrain: walking-time. To estimate walking-time, we use Tobler's hiking speed function, which specifies a relationship between terrain irregularity and walking speed. Hiking speed W varies relative to approximately 5km/h on a flat surface according to:

$$\mathrm{W} = 6e^{-3.5\left|\frac{dh}{dx}+0.05\right|} \tag{3}$$

The slope $\frac{dh}{dx}$ is the change in elevation over the aerial distance covered. The function is roughly symmetrical because going downhill is only advantageous when the slope is not too steep. For each cell, we estimate the travel time using as the average of walking uphill and downhill through that cell. We then calculate the quickest path to a border and record the associated walking time as our measure of distance. Figure A.4 in the online appendix plots our estimated times against those found using Google Maps for a random sample of municipality pairs, it shows that, reassuringly, the points in the scatter plot stay very close to the 45-degree line. In Section 5, we also show robustness to the use of aerial distance.

3.5 Descriptive Statistics and Data Visualization

Table 1 shows descriptive statistics of our controls and variables of interest for the full 1861-1871 data (columns 1-4) and the subsample for which we have been able to assemble pre-unification data (columns 5-8). Mean growth over the decade of 1861-1871 is 6.04%, which corresponds to a yearly growth of approximately 0.59%.

Furthermore, we explore spatial patterns in growth for the post-unification period using a local Moran statistic. It identifies municipalities which, in conjunction with their neighbors, exhibit unusual growth patterns. These can be categorized as "Hot-Hot" ("Cold-Cold") clusters when both the municipality and its neighbors display above-average (below-average) growth, or as "Hot-Cold" local anomalies when an unusually fast-growing municipality is surrounded by slow growers ("Cold-Hot" for the mirror-image anomaly). Figure 2 maps municipalities with statistically significant local Moran values. The map reveals slow growth clusters primarily in the Alpine and southern Apennine areas. Fast growth clusters are scattered throughout the peninsula. Some are near major centers of commercial activity (around Genoa), early industrialization (Bergamo, northeast of Milan), or market-oriented agriculture (Lecce, in the heel of the boot). If these examples are quickly explained, the logic of other "hotspots" is less immediately obvious. On the Piedmont side of the former border with Lombardy is a cluster which turns out to coincide with an irrigated rice-growing zone. Rice was a booming sector in the 1860s, with production and export both growing at more than 10% per year (Istat 2011, 626; Coclanis 1993, 1076).[26] Another example spans the formerly fragmented stretch of coast between Liguria and Tuscany, which has the appearance of a diversified economy serving wider markets. The dynamic coastal towns of La Spezia (naval base), Viareggio (tourism), and Massa and Carrara (limestone and marble), may have been the driving force of this diversified economy, but growth spread well inland to encompass smaller municipalities in the foothills of the Apuan Alps. These and other spatial patterns evident in Figure 2 or uncovered in the empirical analysis of section 4 are discernable only with spatially disaggregated data, and are documented here for the first time.

TABLE 1

FIGURE 2

[26] The area under discussion benefitted from a significant increase in irrigation capacity with 1866 opening of the Canale Cavour.

4 EMPIRICAL ANALYSIS

4.1 Specification

We aim at assessing whether unification changed patterns of growth at the local level for municipalities close to a removed border, which are those that experienced the largest internal market access shock. We rely on two main methods to answer this question. First, a semi-parametric estimate of the effect of distance to the border on population growth before and after unification. This first approach allows us to visualize a flexible relationship between population growth and distance to a removed border at different points in time. Second, a Difference-in-Differences (DiD) estimate of the difference in the effect of distance to the border on local population growth, before and after unification. This second approach permits estimation of the change in the effect of distance to a border after unification.

4.1.1 Semi-parametric estimates

We first estimate semi-parametrically equation (1).

$$\text{growth}_i = m(\text{distance}_i) + \boldsymbol{X_i'}\ \beta + \lambda_r + \varepsilon_i \tag{1}$$

The term growth_i is the population growth of municipality i. The term distance_i is the distance between municipality i and a the closest removed or newly imposed border. Removing borders increases market access, so we expect that municipalities at the vicinity of one will experience higher growth. On the contrary, imposing a new border restricts market access, so we expect them to decrease growth of municipalities nearby. The vector $\boldsymbol{X_i'}$ contains a set of controls at the municipality level: initial population; elevation; a binary variable equal to one if the municipality experienced territorial gains in the period 1861-71 and the associated population growth could not be corrected when standardizing municipalities to 1871 boundaries[27]; a counterpart variable flagging uncorrected losses; and distances to the nearest major port, large city, and railway line. λ_r is a region fixed-effect.[28]

[27] See footnote 14 for more details.

[28] Region here means one of post-unification Italy's 12 peninsular *compartimenti*, excluding Veneto and Lazio. These statistical reporting units had no administrative function at the time. The *compartimenti* are small enough to allow for considerable between-region variation in underlying economic/demographic growth, a potential confounder, but large enough to allow for meaningful within-region variation in border-distances.

To avoid comparing places that are too dissimilar and where very different determinants of agglomeration apply, all our estimates focus on municipalities that fall within a 25 hour walking-time buffer to the nearest border (this restriction applies throughout the paper).[29]

The function $m(.)$ is estimated using Robinson's double difference estimator. The semi-parametric approach allows for a flexible effect of distance to a border on growth (while control effects are linear), yielding a graphic visualization of the estimated effects. However, the double difference estimator estimates one non-parametric relationship at a time, which means that we separately estimate border effects for periods before and after unification. In other words, although this specification has the advantage of flexibility and visualization, it does not permit estimation of time-varying border effects. Introducing more complex multivariate semiparametric specifications is beyond the scope of this paper. We thus estimate average time-specific border effects using OLS in a linear DiD specification.

4.1.2 Differences-in-Differences

To measure whether, on average, unification *changed* the effect of distance to the border, we estimate a DiD using OLS. The regression is described in equation (2).

$$\text{growth}_{it} = \mu_1 \text{dis}_i + \mu_2 \text{post}_t \times \text{dis}_i + \mu_3 \text{post}_t + \boldsymbol{X}_i' \beta + \lambda_r + v_{it} \tag{2}$$

The outcome variable growth_{it} is average annual percentage population growth of municipality i in period t. For post-unification average annual population growth, the period is 1861-71. For pre-unification, the period varies depending on data availability for each state: for Piedmont 1838-48, for Tuscany 1846-61, and for the South 1828-61. Post_t is a binary variable equal to 1 if the observation dates from the post-unification period. The vector of time-invariant controls $\mathbf{X_i}$ and fixed effects λ_r are those described in the previous sub-section and summarized in Table 1. Our coefficient of interest is $\widehat{\mu_2}$, which captures the estimated change in the effect of distance to a border before and after unification. An acceleration of growth close to a removed border after unification, compared to before, implies $\mu_2 < 0$. Such an effect may be due to an acceleration of natural increase in municipalities close to a border

[29] The OLS prediction of the aerial distance equivalent for this 25-walking hour buffer is approximately 100 kms.

or to a relocation of population from farther municipalities. In section 5 we show evidence of internal migration, highlighting the plausibility of a relocation effect.

Bertrand, Duflo, and Mullainathan (2004) highlight the risk of underestimating standard errors in DiD specifications, given the possibility of serial correlation when treatments are defined for clusters of individuals (for instance, in an individual-level DiD with treatments defined at the administrative-unit level). One solution is to cluster standard errors at the treatment level. In our case, there are no individual observations aggregated into treatment clusters; both treatment intensity and observations vary at the municipality level. Municipality-level clustering would potentially underestimate standard errors if observations are spatially correlated (Kelly 2019). A more cautious approach is therefore to cluster standard errors at higher levels of aggregation. We thus cluster standard errors at the province level, which is the level of spatial aggregation above the municipality that is available in our data and therefore a natural unit to consider. One caveat is that there are few provinces in our sample (19 in total), which could introduce small cluster number bias. Therefore, we also construct arbitrary geographic units, whereby municipalities falling in the same cell of a 15 kmx15 km grid are attributed to the same cluster.[30] Standard errors clustered at both levels are reported in all the baseline specifications. We further assess the issue of spatial correlation in Section 4.4.

To assess the validity of our DiD estimation, we can test for pre-trends in the case for Piedmont, the only state for which we can compute population growth at two points in time before unification. This analysis, presented in detail in the results section, gives reassurance that any change in the effect of distance to the border is only significant after unification.

[30] The results are robust to using 10 or 20 km grids. We choose the 15 km one as it is the largest unit for which we end up with more than 40 clusters in all our specifications, the rule of thumb to avoid a "small number of clusters" problem.

4.2 Results

4.2.1 Semi-parametric estimates

Did unification change the effect of distance to the border on population growth? Figure 3 (a) shows that conditional on controls, population growth was higher farther from the border before unification and that this pattern is reversed after unification. Unification thus seems to have significantly accelerated population growth for municipalities close to a removed border.

Figures 3(b) to 3(d) present the same analysis separately for Piedmont (b), Tuscany (c) and the South (d). The pooled result hides heterogeneity. In Tuscany, we see that the pre-unification sharp increase in growth far from the border completely vanishes. [31] Piedmont offers stronger evidence. It appears that, conditional on controls, unification significantly increases population growth for municipalities close to the border but not immediately adjacent to it; the change is greatest at approximately 10 hours walking time. The southern case exhibits the most striking effect. Prior to 1861, municipalities near the country's northern border grew substantially and statistically significantly slower than average. After unification, growth accelerates quite dramatically near the former border: by as much as 0.7 percentage points per annum within a two to five hours' walk.

FIGURE 4

4.2.2 Differences-in-Differences

4.2.2.1 Baseline Results

We now turn to estimating the average effect of removing internal borders on local population growth. We estimate equation (2) using OLS. Table 2 reports the estimates of an OLS regression pooling Piedmont, Tuscany and the South. The table shows that $\widehat{\mu_2}$ is negative and statistically significant. The estimated effect is -0.023 (columns (1) and (3)) and is significant with both grid-level and province-level clustering. This implies that a 4 hour

[31] This pattern may be due to seasonal migration in Grosseto province, discussed in section 3.2.4. Adding a dummy in the semiparametric regressions reduces, but does not eliminate the pre-unification pattern in Figure 6.

decrease in walking time to a removed border is associated with 0.088 points faster growth after unification compared to before. This acceleration represents 14.5% of the sample average growth. Columns (2) and (4), which present estimates when growth rates are "winsorized," show that these results are not driven by outliers.

While distance to the border had a statistically significant positive impact on growth before unification, the total post-unification effect, $\widehat{\mu_1} + \widehat{\mu_2}$, becomes negative and statistically significant across all specifications. In other words, proximity to a removed border is associated with a growth penalty before 1861, and a growth *premium* after unification. In terms of magnitude, the growth premium of a 4-hour decrease in travel time to a former border after unification is approximately of 8.4% of the sample average growth.

Table 3 shows the results when equation (1) is estimated separately for Piedmont (panel A), Tuscany (panel B) and the South (panel C). In every case, the estimate $\widehat{\mu_2}$ is negative and statistically significant, thus showing that our results are not only driven by one particular state. However, the magnitudes are much larger in Tuscany. This result is driven by the province of Grosseto discussed in section 2. Table A.5 in the online Appendix shows that when the province is excluded, the estimated effects are half the size, thus of a magnitude more comparable to the South and Piedmont.

TABLE 2

TABLE 3

4.2.2.2 Testing for pre-trends

Our identification assumption is that municipalities close to the border have the same pre-unification trends in population growth as those farther away. We can test for the existence of pre-trends in the case of Piedmont, the only state for which we can compute yearly growth rates at two points before unification (1838-48 and 1848-61). Panel A of Table 3, shows the results when estimating equation (2) with all three periods (1838-48; 1848-61; and 1861-71) of

Piedmontese data. The results show that the effect of distance interacted with the period binary variable is only sizable and statistically significant for the post-unification period.[32]

As explained above, enumeration procedures differ before and after unification in Piedmont, which potentially biases downward population growth rates for 1848-61, especially in Alpine regions. Appendix Table A.1 confirms the robustness of the results presented in Panel A of Table 3, to excluding high elevation municipalities. Overall, these results provide reassurance regarding the validity of the pre-trends assumption for the DiD specifications.

5 ROBUSTNESS CHECKS AND DISCUSSION

5.1 Alternative definitions of border distance

Table 4 reports OLS estimates of the DiD regression with alternative definitions of the variable of interest. In columns (1)-(2), results using a binary variable for border proximity are reported. In other words, we now estimate:

$$\text{growth}_{ct} = \theta_1(\text{border<D})_c + \theta_2\text{post}_t \times (\text{border<D})_c + \theta_3\text{post}_\text{t} + \boldsymbol{X}_{\boldsymbol{c}}^{\boldsymbol{'}}\beta + \lambda_r + v_{ct}$$

The variable $(\text{border<D})_c$ equals 1 if municipality c is located within distance D of a removed border. We set D at 5 hours walking time. The estimated effect $\widehat{\theta_2}$ indicates that municipalities in the vicinity of a removed border experienced an increase in growth of 0.20 (column (1)) percentage points p.a., relative to municipalities farther away. This premium represents up to 30% of the sample mean. Figure A.7 in the online appendix shows that the results are robust to using other distance cut-offs for the buffers.

In columns (3)-(4), we return to a continuous treatment, now measuring border distance in kilometers, as the crow flies. The results with aerial distance are consistent with those described in section 4. Moving 20 km closer to a former border is associated with an

[32] In the appendix, Figure A.6 shows the semi-parametric relationships between border distance and growth in all three periods. The figure is less straightforward than the DiD OLS results. Growth is slower than average near the border in both pre-unification periods, but the low point is reached at different ranges (around 5 hours for 1838-48, and 10 hours for 1848-61). Overall, these graphs suggest that the OLS DiD estimates give us a plausible representation of the average change in the effect of distance after unification; distance-varying marginal effects recovered from the differences between the semiparametric estimates for different period are less reliable.

acceleration in growth of 0.10 after unification. Appendix Figure A.3 shows the semi-parametric fits of the relationship between aerial distance to a removed border and growth. The results are consistent with those presented in section 4.1.1.

TABLE 4

5.2 New borders

Unification also meant redrawing some borders with neighboring countries. Of special interest is Piedmont, which following the Treaty of Turin in March 1860 ceded the provinces of Nice and Savoy to France in exchange for its support in the war against Austria. If, as we claim, borders reduce market access and with it the attractiveness of production sites, we might expect to see a growth slowdown in the vicinity of newly imposed borders – the mirror image of the findings we have discussed so far. In the case of municipalities near Savoy, that is exactly what we find ($\widehat{\mu_2} > 0$ in Table 4, columns 7 and 8). The result for Nice is different. Like Savoy, the terrain was extremely rugged in the area near the new border. Unlike Savoy, coastal shipping was a viable (indeed, obviously superior) alternative to overland transport for most municipalities, making the new border less relevant for market access.[33] The semiparametric estimates are shown in the online appendix, figures A.8 and A.9.

5.3 Military presence in border towns

Section 3.2.4 explains possible measurement error in pre-unification growth rates arising from changes in the methods for counting population between pre- and post-unification censuses. A potential concern is the presence of military garrisons in border areas. They would have been counted in 1861 (as the census counted physically present individuals), but not before when censuses counted only legal residents. First, we note that this issue would lead us to over-estimate population growth close to border areas *before* unification and would therefore work against us by creating a spurious deceleration in population growth near the border, biasing our estimate of interest towards positive values. Second, we address this issue

[33] Distance to the nearest major port is one our standard controls, but this effect is time invariant. We discuss time-varying port distance effects in section 5.5.1.

in Table A.3 of the online Appendix, which shows the robustness of our results to excluding towns in the vicinity of the border.

5.4 Spatial correlation

Our analysis focusses on the effects of distances, which are geographic variables. We thus must be mindful of the spatial structure in the data: ignoring this issue can result in substantial upward bias in *t*-statistics. Figure A.12 in the online appendix shows evidence that post-unification population growth is spatially correlated. Compared to simulated distributions of the global Moran and Geary statistics, the *I* and *C* statistics lie well outside the extreme tails of the estimated distributions, equivalent to a *p*-value close to zero.

Note first that our regressions focus on the *change* in growth patterns before and after unification. It is not obvious how such a change could be driven by spurious spatial correlation. Second, we implement three methods of adjusting standard errors to address issues of spatial correlation. First, throughout the paper we cluster standard errors at the province level. This higher clustering level accounts for the fact that municipalities inside the same administrative division can have correlated errors. Second, we estimate Conley standard errors in our main DiD regression (equation (2)), using the code by Hsiang (2010). Figure A.10 in the appendix plots the *t*-statistics found using different distance cutoffs (from 30 to 300km). The resulting standard errors are larger at the vicinity of 100 km threshold, but the p-values remain well below 0.01. Similarly, we also compute standard errors with arbitrary clustering, using the approach described by Colella et al. (2019) and the results remain robust across different distance cutoffs (see Figure A.11).

5.5 Channels and extensions

5.5.1 Ports: Access to foreign markets

Our focus thus far has been on domestic markets. But unification entailed a shock to *foreign* market access too, as the liberal commercial policy of Piedmont was extended to the entire Kingdom, entailing dramatic tariff reductions in some states (as discussed in section 2. It is possible that in our period foreign market access was more important than the research on later years has found (Basile and Ciccarelli 2018; Daniele, Malanima, and Ostuni 2018;

Missiaia 2016; 2019a; 2019b). In the era before inexpensive ground transport, foreign market access was primarily through seaports (Fenoaltea 2011 ch. 5).[34] Distant domestic destinations, too, might be reached most cheaply by coastal shipping. Proximity to a seaport is thus a potential confounding influence, as well as a municipal growth factor of substantive interest.

Distance to the nearest seaport has been a control variable in all regressions reported thus far. We now allow its effect to vary before and after unification. Table 5 reports OLS estimates of the DiD specification adding distance to the nearest major port as an additional treatment of interest. The estimating sample includes municipalities within 25 walking hours of a removed border (same sample as in Table 2, results reported in columns (1) and (2)) and those within 25 walking hours of a port (reported in columns (3) and (4)). The regressions allow for interaction effects with region and period dummies for both port and border distances.

Results confirm that distance to a removed border after unification remains negatively and significantly associated with growth even with this more flexible treatment of port-distance as a control. Regarding port distance itself, the baseline effect is negative, suggesting the benefit of foreign market access exceeded the peril of exposure to foreign competition. But the post-unification treatment effect is small, inconsistently signed, and generally not statistically significant. It does not appear that foreign market access was having a more powerful impact on the location of economic activity than domestic market access.

TABLE 5

5.5.2 Migration

Faster population growth in municipalities with improved market access could occur via natural increase or in-migration; both are plausible channels in our context. Birth and death rates were certainly sensitive to grain price shocks in nineteenth-century Italy (Breschi, Derosas, and Manfredini 2004; Bengtsson and Dribe 2010; Breschi et al. 2014; Derosas et al.

[34] Italy's most important trading partner in our period was France. The Fréjus and St. Gotthard tunnels to France and Switzerland were not completed until the 1880s.

2014). Yet this evidence is of dubious relevance, for harvest fluctuations – narrow in time and broad in space – are very different from the changes induced by eliminating borders, which are broad in time (i.e. enduring) and narrow in space (local to border areas). For this reason we focus instead on labor mobility.

There is a tendency to assume that in a somnolent, deeply traditional, agrarian context, migration must have been minimal. This view is misguided; right across western Europe mobility was an integral part of pre-modern social life (Jackson and Moch 1989; Moch 1992). In mid-19th century Italy, though long-distance, permanent migration was quite limited, two other types of internal mobility were important.[35] The first was medium-distance seasonal migration linked to the agricultural production cycle, typically connecting mountainous areas with lower-lying plains (Gallo 2012 chs. 1-2). The second was 'circulatory migration' over short-distances, with high rates of return migration, which often generated a legal transfer of residence preserved in official records. Just after unification, the village of Casalecchio di Reno, near Bologna, experienced annual gross flows of both in- and out-migration as high as 6.9 per cent (Hogan and Kertzer 1985; Kertzer and Hogan 1985; 1990). Similar patterns of movement, responsive to economic conditions, have been documented for the pre-unification period in Casalguidi (near Pistoia in Tuscany) and in Ferrara province (Breschi, Manfredini, and Fornasin 2011, 500; Nani 2012). The result was a well-developed "culture of mobility" in Italy: an *animus migrandi*, in the words of Gallo (2012, 8). According to the census of 1861, 15 per cent of the native population resided outside their birth municipality; in several regions of the North-Center, the share exceeded 20 per cent.

The dual population concepts in the Italian census allow us to construct a proxy for recent migration. Migration altered the physically present population immediately, while affecting the less up-to-date resident population more slowly as legal residence was transferred or

[35] Major cities that acted as immigrant magnets in the early nineteenth century attracted very few incomers from beyond state borders (Arru and Ramella 2003). In the Papal State census of 1853 only 1.6% of the population had been born outside the state, while 93% lived in the same province where they had been born (Stato Pontificio 1857). Even in the late 19th century long-distance migration failed to eliminate significant real wage differences between Italy's five 'macroareas' (Federico, Nuvolari, and Vasta 2019).

household heads changed their view of who was “temporarily absent” and who had left permanently. A municipality experiencing in-migration therefore saw a rise in the ratio of present to resident population (P/R), while one experiencing out-migration saw a fall. For most of our DiD sample, we can calculate P/R in 1861 and 1871 (see footnote 19). The wide range in P/R changes we observe over the decade, from -0.11 to +0.15 at the first and 99th percentiles, indicates considerable churn in local labor markets. We next estimate a version of equation (2) with P/R as the dependent variable and a dummy for 1871 as the ‘post’ variable. Table 6 presents the results. The negative, statistically significant interaction coefficient, $\widehat{\mu_2}$, implies a larger P/R value in 1871 relative to 1861, the closer one moves to a former border. Closing the distance to the ex-border by 20 hours leads to a 0.01 increase in P/R, i.e. one percent more population due to still-unregistered new arrivals. This strongly suggests labor mobility produced the population changes we document near the former borders, supporting a relocation effect of integration.

5.5.3 Size Effects

As discussed in section 2, Italian municipalities varied widely in size: from less than 100 to more than 100,000 in 1861. Although we have included initial population as a control variable in our regressions, we have otherwise treated municipalities of all sizes alike, as equally affected by changes in market access. Theoretical considerations suggest this simplification may be problematic. First, as new economic geography models emphasize, a town’s own population provides much of its potential market, with the implication that large towns experience a smaller proportional change in market access when transport costs fall or borders come down. Second, monocentric models of an individual city and its hinterland typically have all manufacturing concentrated in the central city, while smaller communities in rural areas supply it with agricultural goods, which may be a better description of many Italian settlements in our period (Fujita, Krugman, and Venables 1999, ch. 6). In appendix Table A.6 we add to the basic difference-in-differences specification of section 3.3 a binary variable and an interaction term flagging the smallest 10% of municipalities, those below the median, and the 10% largest. No robust pattern emerges from these triple interactions, While this exercise yields little in the way of new insights, the stability of our main effect estimates reassures us that pooling municipalities of all sizes is not distorting our results.

6 CONCLUSION

Political unification's impact on economic integration in Italy has been difficult to document: no boom in interregional trade seems to have ensued, regional commodity prices varied widely, and growth proceeded at a crawl. Did the elimination of border-related impediments to internal trade not matter? The new evidence developed here shows that it did. The immediate rebound in economic activity near the former borders indirectly reveals the chilling local shadow they cast before unification.

The previously unremarked effects we find are meaningful: in-migration accelerated population growth by as much as one third near the former borders. That said, our effects point towards a relocation effect of integration, not necessarily an effect on growth. And we are not talking about a radical reshaping of the Italian population or dramatic episodes like the siting of a new steel complex. The change we document was anonymous, microgeographic - molecular one might say: the expansion of artisanal furniture production in a town, for example, or the construction of a new grain mill along a watercourse. The immediacy of the response, within a decade, suggests that those impediments to trade that changed immediately upon unification mattered: protective tariffs, multiple currencies, and the uncertainties of contracting with citizens of different states. For long-distance, interregional trade, these factors undoubtedly aggravated costs; for items that normally entered short- or medium-distance trade, they fragmented markets, blocked competition, and obstructed specialization and the exploitation of economies of scale. One immediate achievement of unification was, by integrating local markets, to unblock these mechanisms of economic development.

7 REFERENCES

A'Hearn, Brian. 2003. 'Anthropometric Evidence on Living Standards in Northern Italy, 1730-1860"'. *Journal of Economic History* 63 (2): 351–81.

A'Hearn, Brian, and Anthony Venables. 2013a. 'Regional Disparities: Internal Geography and External Trade'. In *The Oxford Handbook of the Italian Economy Since Unification*, edited by Gianni Toniolo, 599–630. Oxford: Oxford University Press.

———. 2013b. 'Regional Disparities: Internal Geography and External Trade'. In *The Oxford Handbook of the Italian Economy Since Unification*, edited by Gianni Toniolo, 599–630. Oxford: Oxford University Press.

Allen, Robert. 2001. 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War'. *Explorations in Economic History* 38: 411–47.

Anderson, James, and Eric van Wincoop. 2004. 'Trade Costs'. *Journal of Economic Literature* 42 (3): 691–751.

Arru, Angiolina, and Franco Ramella, eds. 2003. *L'Italia Delle Migrazioni Interne*. Roma: Donzelli.

Bandettini, Pierfrancesco. 1960. *L'evoluzione demografica della Toscana dal 1810 al 1889*. Torino: Industria libraria tipografica editrice.

Bardini, Carlo. 1997. 'Without Coal in the Age of Steam: A Factor-Endowment Explanation of the Italian Industrial Lag Before World War I'. *Journal of Economic History* 57 (3): 633–53.

Basile, Roberto, and Carlo Ciccarelli. 2018. 'The Location of the Italian Manufacturing Industry, 1871–1911: A Sectoral Analysis'. *Journal of Economic Geography* 18: 627–62.

Bastasin, Carlo, and Gianni Toniolo. 2020. *La strada smarrita. Breve storia del'economia italiana*. Rome-Bari: Laterza.

Bengtsson, Tommy, and Martin Dribe. 2010. 'Economic Stress and Reproductive Responses'. In *Prudence and Pressure: Reproduction and Human Agency in Europe and Asia, 1700-1900*, edited by Noriko Tsuya, Wang Feng, George Alter, and James Lee, 97–127. Cambridge, Mass.: MIT Press.

Bertrand, Marianna, Esther Duflo, and Sendhil Mullainathan. 2004. 'How Much Should We Trust Differences-in-Differences Estimates?' *Quarterly Journal of Economics* 119 (1): 249–75.

Bosker, Maarten, Steven Brakman, Harry Garretsen, Herman De Jong, and Marc Schramm. 2008. 'Ports, Plagues and Politics: Explaining Italian City Growth 1300–1861'. *European Review of Economic History* 12: 91–131.

Bosker, Maarten, and Harry Garretsen. 2010. 'Trade Costs in Empirical New Economic Geography'. *Papers in Regional Science* 89 (3): 485–511.

Brakman, Steven, Harry Garretsen, Charles van Marrewijk, and Abdella Oumer. 2012. 'The Border Population Effects of EU Integration'. *Journal of Regional Science* 52 (1): 40–59.

Breschi, Marco, Renzo Derosas, and Matteo Manfredini. 2004. 'Mortality and Environment in Three Italian Communities'. In *Life Under Pressure. Mortality and Living Standards in Europe and Asia*, edited by Tommy Bengtsson, Cameron Campbell, and James Lee, 209–51. Cambridge, Mass.: MIT Press.

Breschi, Marco, Alessio Fornasin, Matteo Manfredini, Lucia Pozzi, Rosella Rettaroli, and Francesco Scalone. 2014. 'Social and Economic Determinants of Reproductive Behavior Before the Fertility Decline. The Case of Six Italian Communities During the Nineteenth Century'. *European Journal of Population* 30: 291–315.

Breschi, Marco, Matteo Manfredini, and Alessio Fornasin. 2011. 'Demographic Responses to Short-Term Stress in a 19th Century Tuscan Population: The Case of Household out-Migration'. *Demographic Research* 25: 491–512.

Briant, A., P. -P. Combes, and M. Lafourcade. 2010. 'Dots to Boxes: Do the Size and Shape of Spatial Units Jeopardize Economic Geography Estimations?' *Journal of Urban Economics* 67 (3): 287–302.

Brülhart, Marius, Celine Carrere, and Federico Trionfetti. 2012. 'How Wages and Employment Adjust to Trade Liberalization: Quasi-Experimental Evidence from Austria'. *Journal of International Economics* 86 (1): 68–81.
Cafagna, Luciano. 1989. *Dualismo e sviluppo nella storia d'Italia*. Venice: Marsilio Editori.
Cappelli, Gabriele. 2017. 'The Missing Link? Trust, Cooperative Norms, and Industrial Growth in Italy'. *Journal of Interdisciplinary History* XLVII (3): 333–58.
Chiaruttini, Maria Stella. 2018. 'The Lira: Token of National (Dis)Union (1814–74)'. *European University Institute Department of History and Civilization Working Papers*, no. 1.
Ciccarelli, Carlo, and Jacob Weisdorf. 2019a. 'Pioneering into the Past: Regional Literacy Developments in Italy before Italy'. *European Review of Economic History* 23 (3): 329–64.
———. 2019b. 'Pioneering into the Past: Regional Literacy Developments in Italy before Italy'. *European Review of Economic History* 23 (3): 329–64.
Coclanis, Peter A. 1993. 'Distant Thunder: The Creation of a World Market in Rice and the Transformations It Wrought'. *The American Historical Review* 98 (4): 1050–78.
Colella, Fabrizio, Rafael Lalive, Seyhun Orcan Sakalli, and Mathias Thoenig. 2019. 'Inference with Arbitrary Clustering'. *IZA DP* 12584.
Conte, Leandro, Gianni Toniolo, and Giovanni Vecchi. 2003. 'Lessons from Italy's Monetary Unification (1862–1880) for the Euro and Europe's Single Market'. In *The Economic Future in Historical Perspective*, edited by Paul David and Mark Thomas, 315–38. Oxford: Oxford University Press for the British Academy.
Daniele, Vittorio, Paolo Malanima, and Nicola Ostuni. 2018. 'Geography, Market Potential and Industrialization in Italy 1871–2001'. *Papers in Regional Science* 97 (3): 639–62.
Davis, John. 2000. *Italy in the Nineteenth Century*. Oxford University Press.
De Mauro, Tullio. 1963. *Storia Linguistica Italiana*. Laterza. Bari.
Derosas, Renzo, Marco Breschi, Alessio Fornasin, Matteo Manfredini, and Cristina Munno. 2014. 'Between Constraints and Coercion. Marriage and Social Reproduction in Northern and Central Italy in the Eighteenth and Nineteenth Centuries'. In *Similarity in Difference Marriage in Europe and Asia, 1700-1900*, edited by Christer Lundh and Satomi Kurosu, 295–348. Cambridge, Mass.: MIT Press.
Di Martino, Paolo, Emanuele Felice, and Michelangelo Vasta. 2020. 'A Tale of Two Italies: "Access-Orders" and the Italian Regional Divide'. *Scandinavian Economic History Review* 68 (1): 1–22.
Donaldson, Dave, and Richard Hornbeck. 2016. 'Railroads and American Economic Growth: A "Market Access" Approach'. *The Quarterly Journal of Economics* 131 (2): 799–858.
Federico, Giovanni. 2007. 'Market Integration and Market Efficiency: The Case of 19th Century Italy'. *Explorations in Economic History* 44 (2): 293–316.
———. 2011. 'When Did European Markets Integrate?' *European Review of Economic History* 15: 93–126.
Federico, Giovanni, and Mark Dincecco. 2021. 'Napoleon in Italy: A Legacy of Institutional Reform?' In *The Crucible of Revolutionary and Napoleonic Warfare and European Transitions to Modern Economic Growth*, edited by Patrick O'Brien. Leiden: Brill.
Federico, Giovanni, Alessandro Nuvolari, Leonardo Ridolfi, and Michelangelo Vasta. 2021. 'The Race between the Snail and the Tortoise: Skill Premium and Early Industrialization in Italy (1861–1913)'. *Cliometrica* 15: 1–42.
Federico, Giovanni, Alessandro Nuvolari, and Michelangelo Vasta. 2019. 'The Origins of the Italian Regional Divide: Evidence from Real Wages, 1861–1913'. *Journal of Economic History* 79 (1): 63–98.

Federico, Giovanni, and Antonio Tena-Junguito. 2014. 'The Ripples of the Industrial Revolution: Exports, Economic Growth and Regional Integration in Italy in the Early Nineteenth Century'. *European Review of Economic History* 18 (3): 349–69.

Fenoaltea, Stefano. 2011. *The Reinterpretation of Italian Economic History*. Cambridge: Cambridge University Press.

Ferrovie dello Stato. 1911. *Ferrovie Italiane*. Torino: Ferrovie dello Stato.

Fogel, Robert W. 1970. *Railroads and American Economic Growth: Essays in Econometric History*. Baltimore: The Johns Hopkins University Press.

Fujita, Masahisa, Paul Krugman, and Anthony Venables. 1999. *The Spatial Economy: Cities, Regions, and International Trade*. Cambridge, Massachusetts: MIT Press.

Gallo, Stefano. 2012. *Senza attraversare le frontiere. Le migrazioni interne dall'Unità a oggi*. Roma-Bari: Laterza.

Giorcelli, Michela, and Petra Moser. 2020. 'Copyrights and Creativity: Evidence from Italian Opera in the Napoleonic Age'. *Journal of Political Economy* 128 (11): 4163–4210.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2016. 'Long-Term Persistence'. *Journal of the European Economic Association* 14 (6): 1401–36.

Hogan, Dennis, and David Kertzer. 1985. 'Migration Patterns during Italian Urbanization, 1865-1921'. *Demography* 22 (3): 309–25.

Hsiang, Solomon M. 2010. 'Temperatures and Cyclones Strongly Associated with Economic Production in the Caribbean and Central America'. *Proceedings of the National Academy of Sciences* 107 (35): 15367.

Informazioni statistiche raccolte dalla Regia commissione superiore : censimento della popolazione per l'anno 1848. 1852. Torino: Stamperia reale.

Italy. Istituto Centrale di Statistica. 1985. *Popolazione Residente e Presente Dei Comuni. Censimenti Dal 1861 al 1981*. Rome.

Italy. Istituto Cetrale di Statistica. 1960. *Comuni e Loro Popolazione Ai Censimenti Dal 1861 al 1951*. Roma: Azienda Beneventana Tipografica Editoriale.

Italy. Istituto nazionale di statistica (Istat). 2011. *L'Italia in 150 anni. Sommario di statistiche storiche 1861-2010*. Roma: Istat.

Italy. Ministero d'Agricoltura, Industria e Commercio. 1862. *Statistica Del Regno d'Italia. Popolazione. Censimento Degli Antichi Stati Sardi e Censimenti Di Lombardia, Di Parma e Di Modena.* Vol. 2. Torino: Stamperia Reale.

Italy. Ministero di Grazia e Giustizia e dei Culti. 1863. *Dizionario Dei Comuni Del Regno d'Italia e Tavole Statistiche e Sinottiche Della Circoscrizione Amministrativa Elettorale Giudiziaria Ed Ecclesiastica Con La Indicazione Della Popolazione Giusta l'ultimo Censimento*. Torino: Stamperia Reale.

Jackson, James, and Leslie Page Moch. 1989. 'Migration and the Social History of Modern Europe'. *Historical Methods* 22 (1): 27–36.

Kelly, Morgan. 2019. 'The Standard Errors of Persistence'. *CEPR Discussion Papers Series* DP13783.

Kertzer, David, and Dennis Hogan. 1985. 'On the Move: Migration in an Italian Community, 1865-1921'. *Social Science History* 9 (1): 1–23.

———. 1990. 'Household Organization and Migration in Nineteenth-Century Italy'. *Social Science History* 14 (4): 483–505.

Kovács, Zoltán. 1989. 'Border Changes and Their Effect on the Structure of Hungarian Society'. *Political Geography Quarterly* 8 (1): 79–86.

Lecce, Gianpaolo, Laura Ogliari, and Tommaso Orlando. 2021. 'Resistance to Institutions and Cultural Distance: Brigandage in Post-Unification Italy'. *Centro Studi Luca D'Agliano Development Studies Working Paper*, no. 473 (November).
Malanima, Paolo. 2011. 'The Long Decline of a Leading Economy: GDP in Central and Northern Italy, 1300–1913'. *European Review of Economic History* 15 (2): 169–219.
———. 2016. 'Energy Consumption in England and Italy, 1560–1913. Two Pathways toward Energy Transition'. *Economic History Review* 69 (1): 78–103.
Mariella, Vitantonio. 2022. 'The Agrarian Origins of Social Capital'. *Journal of Economic Behavior and Organization* 193: 543–67.
Marzolla, Benedetto. 1832. *L'Atlante Corografico Storico e Statistico Delle Due Sicilie*. Napoli: Reale Litografia Militare.
Mazzini, Giuseppe. 1921. *Scritti editi ed inediti di Giuseppe Mazzini*. Vol. 69. Imola: Paolo Galeati.
Missiaia, Anna. 2016. 'Where Do We Go from Here? Market Access and Regional Development in Italy (1871-1911)'. *European Review of Economic History* 20: 215–41.
———. 2019a. 'Market versus Endowment: Explaining Early Industrial Location in Italy (1871–1911)'. *Cliometrica* 13: 127–61.
———. 2019b. 'One Market Fits All? Market Access and the Origins of the Italian North–South Divide'. *Regional Studies, Regional Science* 6 (1): 92–100.
Moch, Leslie Page. 1992. *Moving Europeans : Migration in Western Europe since 1650*. Bloomington, Ind.: Indiana University Press.
Nagy, Dávid Krisztián. 2015. 'Border Effects and Urban Structure'. Princeton University Department of Economics.
Nani, Michele. 2012. 'Uno sguardo rurale. Le migrazioni interne italiane viste dalle campagne ferraresi dell'Ottocento'. *Meridiana*, no. 75: 27–57.
Oliveira, Guilherme de, and Carmine Guerriero. 2018. 'Extractive States: The Case of the Italian Unification'. *International Review of Law and Economics* 56: 142–59.
Ploeckl, Florian. 2010. 'Borders, Market Size and Urban Growth; the Case of Saxon Towns and the Zollverein in the 19th Century'. 42. Working Papers. Institut d'Economia de Barcelona (IEB).
Postigliola, Michele, and Matteo Rota. 2021a. 'Institutions and Literacy Rates: The Legacy of Napoleonic Reforms in Italy'. *European Review of Economic History* 25 (4): 757–79.
Postigliola, Michele, and Mauro Rota. 2021b. 'Institutions and Literacy Rates: The Legacy of Napoleonic Reforms in Italy'. *European Review of Economic History* 25 (4): 757–79.
Quarantana, Luciana. 2011. 'Agency of Change: Fertility and Seasonal Migration in a Nineteenth Century Alpine Community'. *European Journal of Population* 27: 457–85.
Redding, Stephen J., and Daniel M. Sturm. 2008. 'The Costs of Remoteness: Evidence from German Division and Reunification'. *American Economic Review* 98 (5): 1766–97.
Repetti, Emanuele. 1846. *Dizionario geografico fisico storico della Toscana contenante la descrizione di tutti i luoghi del granducato, ducato di Lucca, Garfagnana e Lunigiana*. Firenze: Gio. Mazzoni.
Riall, Lucy. 2009. *Risorgimento. The History of Italy from Napoleon to Nation State*. Palgrave Macmillan.
Sannucci, Valeria. 1989. 'The Establishment of a Central Bank: Italy in the 19th Century'. In *A European Central Bank?*, edited by Marcello De Cecco and Alberto Giovannini, 244–89. Cambridge: Cambridge University Press.
Schram, Albert. 1997. *Railways and the Formation of the Italian State in the Nineteenth Century*. Cambridge University Press.
Sereni, Emilio. 1966. *Capitalismo e mercato nazionale in Italia*. Rome: Editori Riuniti.
Serristori, Luigi. 1843. 'Sulla Possibilità Di Un'unione Doganale Tra Gli Stati Italiani'. *Annali Universali Di Statistica* 75 (March): 293–99.

Statistica del Regno d'Italia. 1866. *Movimento Della Navigazione Nei Porti Del Regno*.
Tamburelli, Marco. 2014. 'Uncovering the "Hidden" Multilingualism of Europe: An Italian Case Study'. *Journal of Multilingual and Multicultural Development* 35 (3): 252–70.
Tena-Junguito, Antonio, Markus Lampe, and Felipe Tamega Fernandes. 2012. 'How Much Trade Liberalization Was There in the World Before and After Cobden-Chevalier?' *Journal of Economic History* 72 (3): 708–40.
Timini, Jacopo. 2018. 'Currency Unions and Heterogeneous Trade Effects: The Case of the Latin Monetary Union'. *European Review of Economic History* 22: 322–48.
Toniolo, Gianni. 1998. *Storia economica dell'Italia liberale, 1850-1918*. Bologna: Il Mulino.
Tremelloni, Roberto. 1947. *Storia Dell'industria Italiana Contemporanea*. Vol. 1. Torino: Giulio Einaudi Editore.
Viazzo, Pier Paolo. 1989. *Upland Communities: Environment, Population and Social Structure in the Alps since the Sixteenth Century*. Cambridge, UK: Cambridge University Press.
Vicquéry, Roger. 2021. 'The Common Currency Effect on International Trade: Evidence from an Accidental Monetary Union'. *Banque de France Working Paper*, no. 856 (December).
Wolf, Nikolaus. 2005. 'Path Dependent Border Effects: The Case of Poland's Reunification (1918–1939)'. *Explorations in Economic History* 42: 414–38.
———. 2009. 'Was Germany Ever United? Evidence from Intra- and International Trade, 1885–1933'. *Journal of Economic History* 69 (3): 846–81.
Zamagni, Vera. 1983. 'Ferrovie e integrazione del mercato nazionale nell'Italia post-unitaria'. In *Studi in onore di Gino Barbieri,* 1635–49. Pisa: IPEM Edizioni.

Tables and Figures

Table 1: Summary statistics of municipality characteristics and sample information

	Full Sample				Pre-Unification Sample			
	Mean	Sd	Min	Max	Mean	Sd	Min	Max
Yearly growth after unification	0.59	0.86	-7	10	0.58	0.86	-7	9
Aerial dis to removed border, km	105.13	124.90	0	530	147.86	141.19	0	530
Walking time to removed border, hours	26.31	31.62	0	148	36.86	35.85	0	148
Population 1861	2850.71	8144.96	68	449050	3073.43	9102.36	68	449050
Population 1871	3021.85	8405.21	58	448335	3267.32	9391.18	58	448335
Aerial dist to port, km	99.10	54.36	0	256	78.28	49.78	0	221
Aerial dist to city (20M), km	34.62	23.68	0	125	41.08	25.23	0	125
Aerial dist to rail, km	16.90	16.74	0	98	19.29	18.04	0	79
Elevation	379.68	284.95	15	1884	416.99	296.03	18	1884
Uncorrected admin change: gained territory	0.01	0.10	0	1	0.01	0.10	0	1
Uncorrected admin change: lost territory	0.01	0.11	0	1	0.01	0.11	0	1
Yearly growth before unification					0.62	0.88	-4	9
Population before unification					2699.21	7156.96	47	359103
Observations	6589				5799			
Period for which yearly growth is calculated:	Same for all sample 1861-71				State specific - Piedmont: 1838-48 - Tuscany: 1846-61 - South: 1828-61			

Notes: This table reports summary statistics (averages, standard deviations, minima, and maxima). The first four columns show figures for the entire sample. The last four figures for Piedmont, Tuscany, or the South, which are the states in our pre-unification sample.

Table 2: Diff in Diff, pooled regression across all removed borders

	Grid clusters		Province Clusters	
	(1) b/se	(2) b/se	(3) b/se	(4) b/se
Post=1×Walking time to removed border, hours	-0.02275***	-0.02093***	-0.02275***	-0.02093***
	(0.00506)	(0.00459)	(0.00643)	(0.00598)
Walking time to removed border, hours	0.00899**	0.00726**	0.00899	0.00726
	(0.00387)	(0.00348)	(0.00618)	(0.00537)
Post=1	0.36451***	0.33930***	0.36451***	0.33930***
	(0.07397)	(0.06945)	(0.08408)	(0.08581)
Observations	4092	4092	4092	4092
R-sq	0.059	0.053	0.059	0.053
Mean growth	0.607	0.593	0.607	0.593
Sd growth	0.892	0.763	0.892	0.763
Censored growth	No	Yes	No	Yes
N Clusters	299	299	19	19

Notes: * p<0.10, ** p<0.05, *** p<0.01. The Table reports OLS estimates. The unit of observation is the municipality. The sample pools pre and post unification data for Piedmont, Tuscany, and the South. The dependent variable is yearly population growth in columns (1) and (3); and censored yearly population growth (5% cutoff) in columns (2) and (4). Standard errors are clustered at the 15 km×15 km grid level (columns (1) and (2)) or at the province level (columns (3) and (4)). Post-unification population growth is computed for the period 1861-71. For yearly pre-unification growth levels the period of choice depends on data availability: Piedmont 1838-48, Tuscany 1846-61, and South 1828-61. Controls are described in the text.

Table 3: Diff in Diff, all removed borders per state

	Grid Clusters		Province Clusters	
	(1)	(2)	(3)	(4)
Panel A: Piedmont				
Period=6171×Walking time to removed, hours	-0.01567***	-0.01345***	-0.01567***	-0.01345**
	(0.00577)	(0.00529)	(0.00428)	(0.00437)
Period=4861×Walking time to removed, hours	-0.00765	-0.00796	-0.00765	-0.00796
	(0.00832)	(0.00796)	(0.00960)	(0.00923)
Period=6171	0.22786***	0.19366**	0.22786***	0.19366***
	(0.08810)	(0.08252)	(0.05316)	(0.05488)
Period=4861	-0.50740***	-0.47841***	-0.50740**	-0.47841**
	(0.13449)	(0.12697)	(0.17800)	(0.17968)
Walking time to removed, hours	0.00416	0.00295	0.00416	0.00295
	(0.00442)	(0.00414)	(0.00479)	(0.00445)
Observations	4395	4395	4395	4395
R-sq	0.168	0.181	0.168	0.181
Mean growth	0.403	0.392	0.403	0.392
Sd growth	0.961	0.865	0.961	0.865
Censored growth	No	Yes	No	Yes
N Clusters	130	130	7	7
Panel B: Tuscany				
Post=1×Walking time to removed, hours	-0.10824***	-0.10314***	-0.10824**	-0.10314**
	(0.02565)	(0.02488)	(0.04619)	(0.04550)
Walking time to removed, hours	0.08739***	0.08368***	0.08739**	0.08368**
	(0.01760)	(0.01692)	(0.03167)	(0.03023)
Post=1	1.05221***	1.02903***	1.05221***	1.02903***
	(0.19886)	(0.19385)	(0.31872)	(0.31620)
Observations	466	466	466	466
R-sq	0.246	0.252	0.246	0.252
Mean growth	0.691	0.692	0.691	0.692
Sd growth	0.990	0.904	0.990	0.904
Censored growth	No	Yes	No	Yes
N Clusters	97	97	8	8
Panel C: South				
Post=1×Walking time to removed, hours	-0.01779	-0.02189**	-0.01779	-0.02189*
	(0.01120)	(0.00985)	(0.01204)	(0.01018)
Walking time to removed, hours	0.01023	0.00916	0.01023	0.00916
	(0.01053)	(0.01039)	(0.00969)	(0.00874)
Post=1	0.48478***	0.51144***	0.48478*	0.51144**
	(0.16266)	(0.15587)	(0.18664)	(0.18622)
Observations	658	658	658	658
R-sq	0.095	0.075	0.095	0.075
Mean growth	0.532	0.515	0.532	0.515
Sd growth	0.884	0.772	0.884	0.772
Censored growth	No	Yes	No	Yes
N Clusters	69	69	5	5
Censored growth (all panels)	No	Yes	No	Yes

Notes: * p<0.10, ** p<0.05, *** p<0.01. The Table reports OLS estimates. The unit of observation is the municipality. The dependent variable is yearly population growth in columns (1) and (3); and censored yearly population growth (5 and 95 % cutoff) in columns (2) and (4). Standard errors are clustered at the 15km×15km grid level (columns (1) and (2)) or at the province level (columns (3) and (4)). Post-unification population growth is computed for the period 1861-71. For pre-unification growth, the period of choice depends on data availability: Piedmont 1838-48 and 1848-1861, Tuscany 1846-61, and South 1828-61. Controls are described in the text.

Table 4: Diff in Diff, pooled regression across all removed borders with binary treatment

	Alternative Treatment Definition				New Borders			
	(1) b/se	(2) b/se	(3) b/se	(4) b/se	(5) b/se	(6) b/se	(7) b/se	(8) b/se
Post=1×Border < 5 hours=1	0.20378***	0.17939***						
	(0.08232)	(0.07547)						
Post=1×Aerial dis to removed border, km			-0.00482***	-0.00444***				
			(0.00121)	(0.00113)				
Post=1×Walking time to Piem/Nice, hours					-0.00151	-0.00032		
					(0.00655)	(0.00613)		
Post=1×Walking time to Piem/Sav, hours							0.02765**	0.02329**
							(0.01295)	(0.01107)
Border < 5 hours=1	-0.06328	-0.04581						
	(0.05996)	(0.05665)						
Aerial dis to removed border, km			0.00215**	0.00186**				
			(0.00093)	(0.00088)				
Walking time to Piem/Nice, hours					0.00923	0.00975		
					(0.00731)	(0.00680)		
Walking time to Piem/Sav, hours							0.00228	0.00254
							(0.00779)	(0.00716)
Post=1	0.05130	0.05349	0.33382***	0.30802***	-0.11616	-0.13541	-0.56387***	-0.47624***
	(0.05091)	(0.04475)	(0.07334)	(0.06940)	(0.11092)	(0.10624)	(0.20569)	(0.17133)
Observations	4092	4092	4026	4026	1428	1428	1424	1424
R-sq	0.054	0.046	0.060	0.053	0.050	0.051	0.057	0.057
Mean growth	0.607	0.593	0.609	0.596	0.561	0.554	0.459	0.460
Sd growth	0.892	0.763	0.880	0.765	0.793	0.693	0.783	0.691
Censored growth	No	Yes	No	Yes	No	Yes	No	Yes
N Clusters (Grid)	299	299	296	296	73	73	71	71

Notes: * p<0.10, ** p<0.05, *** p<0.01. The Table reports OLS estimates. The unit of observation is the municipality. The sample pools pre and post unification data for Piedmont, Tuscany, and the South. The dependent variable is yearly population growth. Post-unification population growth is computed for the period 1861-71. For pre-unification growth, the period of choice depends on data availability: Piedmont 1838-48, Tuscany 1846-61, and South 1828-61. Controls are described in the text. The treatment is a binary variable indicating that the comuni is located within 25 km (resp. 5 hour walk) to a removed border. Standard errors are clustered at the binary treatment x province level.

Table 5: Diff in Diff, removed borders and ports per state

	Border $\leq$ 25h		Port $\leq$ 25h	
	(1)	(2)	(3)	(4)
Panel A: Pooled Regression across all states				
Post=1 × Walking time to removed border, hours	-0.02263***	-0.02082***	0.00088	0.00097
	(0.00506)	(0.00458)	(0.00087)	(0.00078)
Post=1 × Walking time to port, hours	-0.00226	-0.00208	0.00135	0.00328
	(0.00363)	(0.00323)	(0.00502)	(0.00441)
Walking time to port, hours	-0.00647***	-0.00564***	-0.00269	-0.00372
	(0.00247)	(0.00233)	(0.00325)	(0.00311)
Walking time to removed border, hours	0.00893**	0.00720**	-0.00720***	-0.00698***
	(0.00387)	(0.00348)	(0.00157)	(0.00143)
Post=1	0.41628***	0.38682***	0.06264	0.02804
	(0.10940)	(0.09823)	(0.09480)	(0.08298)
Observations	4092	4092	5538	5538
Panel B: Piedmont				
Post=1 × Walking time to removed border, hours	-0.01565***	-0.01345***	-0.00954**	-0.00847**
	(0.00567)	(0.00531)	(0.00419)	(0.00378)
Post=1 × Walking time to port, hours	0.00021	0.00086	-0.00340	-0.00034
	(0.00444)	(0.00389)	(0.00845)	(0.00707)
Walking time to port, hours	-0.00870***	-0.00812***	-0.01481***	-0.01423***
	(0.00269)	(0.00259)	(0.00554)	(0.00502)
Walking time to removed border, hours	0.00012	-0.00092	-0.00127	-0.00194
	(0.00434)	(0.00404)	(0.00361)	(0.00327)
Post=1	0.22303*	0.17445	0.17124	0.10195
	(0.13113)	(0.11321)	(0.17398)	(0.13894)
Observations	2930	2930	2308	2308
Panel C: Tuscany				
Post=1 × Walking time to removed border, hours	-0.12558***	-0.10115***	-0.14004***	-0.11796***
	(0.02478)	(0.01855)	(0.02544)	(0.01822)
Post=1 × Walking time to port, hours	-0.04265***	-0.03841***	-0.02356	-0.01970
	(0.01045)	(0.00873)	(0.01881)	(0.01581)
Walking time to port, hours	0.02770***	0.02424***	-0.00032	-0.00364
	(0.00861)	(0.00714)	(0.01407)	(0.01108)
Walking time to removed border, hours	0.08911***	0.07064***	0.10150***	0.08532***
	(0.01894)	(0.01473)	(0.01821)	(0.01373)
Post=1	1.98715***	1.77257***	1.93099***	1.73543***
	(0.30206)	(0.24932)	(0.33613)	(0.27814)
Observations	544	544	392	392
Panel D: South				
Post=1 × Walking time to removed border, hours	-0.01912*	-0.02283**	-0.00033	-0.00008
	(0.01160)	(0.01041)	(0.00126)	(0.00117)
Post=1 × Walking time to port, hours	-0.02516*	-0.02043*	0.00819	0.00897*
	(0.01381)	(0.01189)	(0.00611)	(0.00557)
Walking time to port, hours	0.01838	0.01475	0.00208	0.00134
	(0.01817)	(0.01761)	(0.00601)	(0.00574)
Walking time to removed border, hours	0.01089	0.00951	-0.00668***	-0.00649***
	(0.01152)	(0.01130)	(0.00207)	(0.00192)
Post=1	1.31257***	1.18185***	0.13863	0.09863
	(0.53717)	(0.48711)	(0.14603)	(0.13763)
Observations	658	658	2894	2894
Censored growth (all panels)	No	Yes	No	Yes

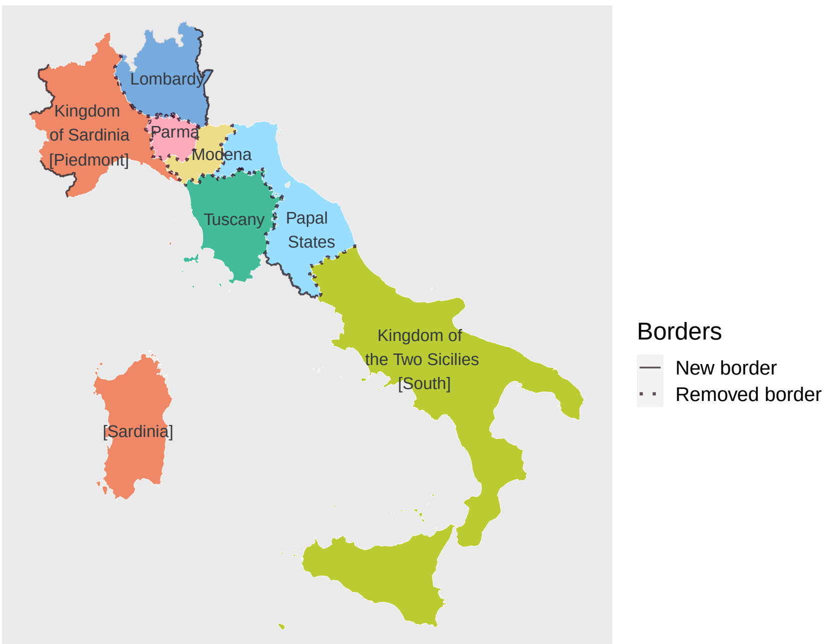
Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The Table reports OLS estimates. The unit of observation is the municipality. The dependent variable is yearly population growth in columns (1) and (3); and censored yearly population growth (5 and 95 % cutoff) in columns (2) and (4). Standard errors are clustered at the 15km×15km grid level. Post-unification population growth is computed for the period 1861-71. For pre-unification growth, the period of choice depends on data availability: Piedmont 1838-48 and 1848-1861, Tuscany 1846-61, and South 1828-61. Controls are described in the text. The number of clusters, not stated for the sake of saving space, exceeds 30 in all specifications and can be recovered from the replication files.

Table 6: Diff in Diff, Present/Resident Population 1861 vs 1871

	Grid Clusters		Province Clusters	
	(1)	(2)	(3)	(4)
	b/se	b/se	b/se	b/se
Year=1871×Walking time to removed border, hours	-0.00049**	-0.00034*	-0.00049**	-0.00034*
	(0.00022)	(0.00021)	(0.00021)	(0.00019)
Walking time to removed border, hours	0.00229***	0.00206***	0.00229***	0.00206***
	(0.00027)	(0.00023)	(0.00036)	(0.00030)
Year=1871	-0.01552*	-0.01733**	-0.01552***	-0.01733***
	(0.00871)	(0.00787)	(0.00553)	(0.00531)
Observations	3094	3094	3094	3094
R-sq	0.279	0.312	0.279	0.312
Mean growth	0.951	0.950	0.951	0.950
Sd growth	0.074	0.064	0.074	0.064
Censored growth	No	Yes	No	Yes
N Clusters	225	225	18	18

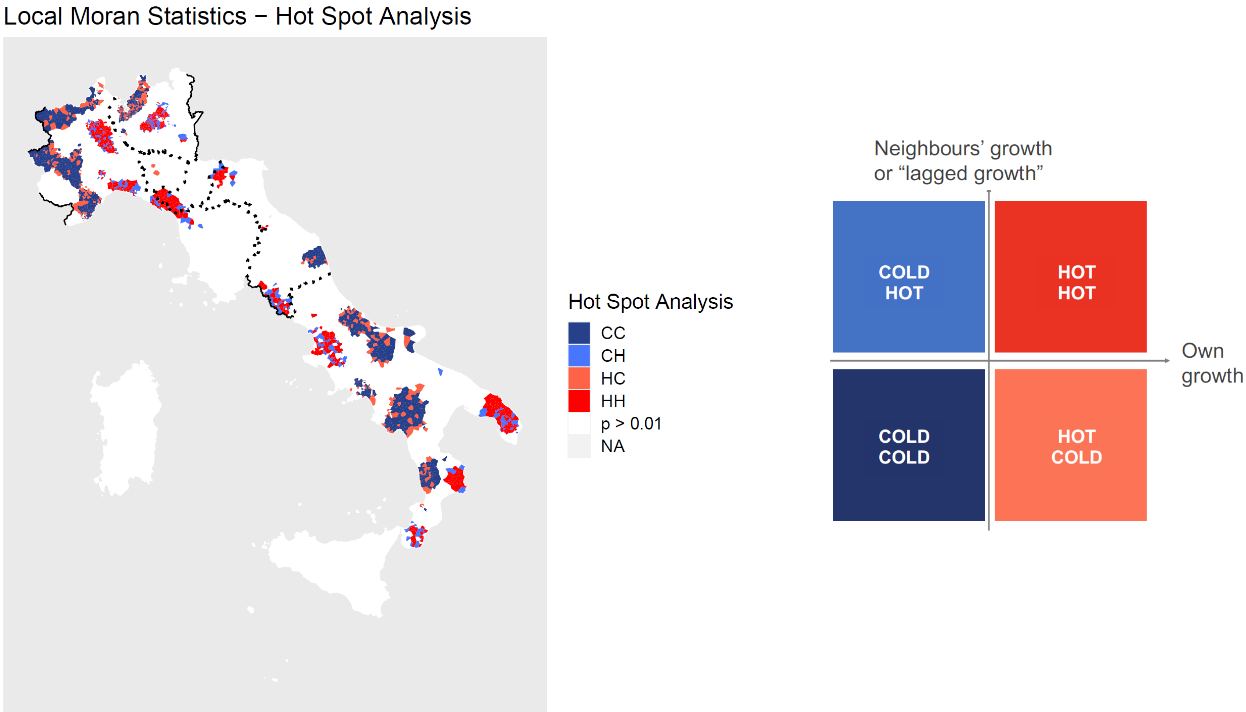
Notes: * p<0.10, ** p<0.05, *** p<0.01. The Table reports OLS estimates. The unit of observation is the municipality. The dependent variable is the post-unification ratio of present over resident population (P/R) in the years 1861 or 1871. Standard errors are reported in brackets and clustered at the province level. The distance variables are interacted with a year binary variable flagging year 1871.

Figure 1: Italian states before unification with removed and newly imposed borders



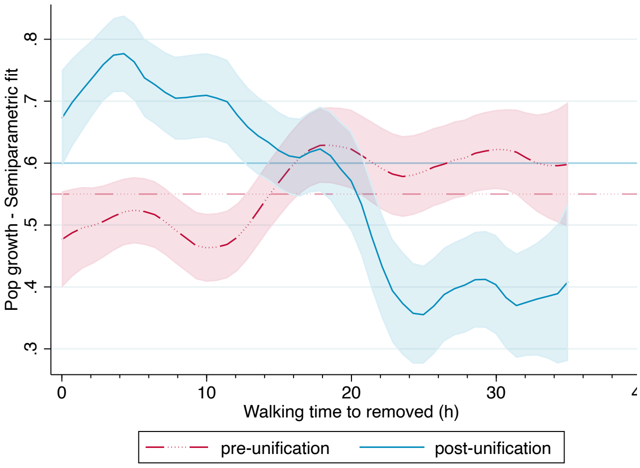
Notes: This map shows the states that were merged to form the Kingdom of Italy (with boundaries as to 1861).

Figure 2: Hot spot analysis – Local Moran statistic of 1861-71 population growth



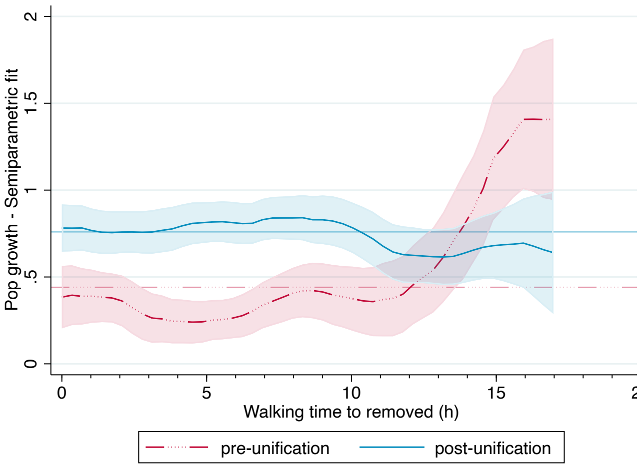
Notes: The left hand side maps the statistically significant clusters found when computing a local indicator of spatial association (LISA) at the comuni level. The indicator used is the local Moran statistic. The weights are row-standardized and computed with proximity measure $1/\sqrt{w_{ij}}$, where w_{ij} is the Tobler hiking time between comuni i and comuni j. The right-hand side diagram represents the types of spatial associations that can be found in a Moran scatter plot.

Figure 3: Smoothed yearly growth and distance to removed border, pooled regression



(a) Pooled: All removed Borders

(b) Piedmont



(c) Tuscany

(d) South

Notes: These graphs illustrate the effect of distance to a removed border on yearly growth, before and after unification. The average growth in the samples (pre and post-unification) is indicated with the horizontal pastel-colored lines. The shaded area represents the 95% confidence interval. The sample is restricted to comuni with a 100 km buffer from the border.