

# Cultural Persistence? Evidence from an Administrative Reform on Borders of Southern Italy

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## Abstract

We exploit an historical natural experiment set during Italy's Fascism to assess persistence vs. dynamics in social capital and culture. We do so in the paradigmatic critical area of Southern Italy, whose current economic backwardness is often associated to its low social capital endowment, a feature usually taken to be quite persistent locally and hence traced back to cultural and institutional heritage. In the experiment, an exogenous shift of a border in a territory entirely internal to that heritage provides us with an instrument to identify variation in culture and social capital levels in the 20th century in this doubly depressed region. A discontinuity exercise at the border shows that, starting from previous homogeneity, there is evidence of relatively recent adverse cultural dynamics in Southern territories. We emphasize the instructive potential of natural experiments of this kind for understanding mechanisms of social capital evolution, possibly guiding policy interventions aimed at fostering endowment in currently depressed regions. *JEL*: O43, O10, C31, Z10. *Keywords*: social capital, culture, persistence, crime.

## 1 Introduction

In the economic literature, the term “culture” is mostly referred to social capital. Many have been the definitions set forth for social capital, and the attempts to measure it (for examples of the two, see the handbook chapter by Guiso *et al.*, 2011). From the seminal work by Putnam (1993) up to the empirical analyses by Guiso *et al.* (henceforth GSZ, 2008 and 2013), Voigtlander and Voth (2012) or Alesina *et al.* (2013), various studies in economics have provided support for the great inertia or persistence of social capital and cultural traits. From there, it has been possible for a number of contributions to assess the economic impact of an inherited social capital endowment. In papers like De Blasio and Nuzzo (2009) or Tabellini (2010) persistence has been used to validate past institutions as an instrument to determine the impact of culture (including local informal institutions) on output.

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While a strong inertia in culture cannot be denied, cultural transformations do happen too, sometimes slowly, sometimes quite rapidly. As economists know well, people react to incentives that act at an individual level. Each individual changes his conditional plans over *any* choice variable when he realizes that the structure of the model he is in, including the opportunity set, has changed around him. Seeing culture as the aggregation of individual behavioral best reply functions, one also sees that it may well change when the opportunity set changes for a non-zero part of the population. Even if potentially persuasive, arguments of this kind need sound theoretical and empirical foundations, as understanding cultural dynamics is relevant for policy, and in particular for helping define actions to foster social capital improvements in depressed regions.

Identifying changing cultural traits may be just as difficult as it is for persistent ones. This paper empirically addresses the cultural and social capital persistence question by using an "exogenous" border shift, implemented in Central-Southern Italy by the Fascist regime, as an instrument to identify possible local variation. We believe that a case of social capital dynamics and endogeneity of culture is of interest in itself, but additional interest stems from the place hosting the "natural" experiment, covering the upper part of the South of Italy. In fact, poor current economic conditions in that region are said to depend greatly on a low social capital endowment, which is in turn said to be an heritage of the previous institutional history of the region. The experiment that we study allows us to highlight pure dynamics in culture as opposed to heritage.

The perturbation experiment performed by nature (by the hands of the legislator) that we analyze impinges on the shift of the border which, based on political and orographic factors, for more than eleven centuries separated the territories of southern Italy from the rest of the peninsula. Only recently with respect to that history, with Italian unification, that border had become just an administrative one, separating the regions of Latium and Campania. We are the first to operate in the neighborhood of the delicate "Banfield-Putnam border", by which we mean the border discriminating societies regarded as characterized by forward vs. backward, i.e., civic vs. regressive moral foundations, and we find it very instructive. Of course, we are well aware that it is difficult to identify in a line the divide separating the "North" of Italy from the "South". The Papal State itself might have served as a big *limes*, i.e. a thick border, for centuries. Nevertheless, a micro-experiment like ours has its own advantages: as it is based on a perturbation, it allows to grasp, with potential external validity, features of cultural evolution and its determinants. Also, this dynamic aspect makes it potentially more instructive for action than the reference to cultural persistence and legacy of history, which, unsuited to shed light on determinants that it places in the far past, leaves hopeless of recipes for improving a dimension so relevant for economic performance.

The experiment setup is as it is given by history, hence it is not perfect: a long time elapsed, and many events occurred, since the Fascist reform. However, one feature makes it special. The reform suddenly shifted the southern border of Latium down in an area

entirely internal to what, that far, had been Campania and its Caserta province (Terra di Lavoro) and, for centuries, had previously been Kingdom of Naples/Two Sicilies.

To maximize informativeness, the study of a natural experiment in a small region can only rely on sub-provincial data, posing a heavy data-mining requirement. We took the hardest way in that, consistently aiming at assessing cultural dynamics over a wide spectrum, we looked for past and present data on the widest possible variety of local indicators of individual and institutional behaviors. We came up with a unique data set, though not a panel as past variables which it was possible to assemble result more limited in number and kind with respect to those used in current social capital literature. Still, the data set is rich enough to allow a comparative local analysis and enjoy its advantages in studying cultural movement. Besides those mentioned just above, another advantage is that a local focus overcomes the inconveniences - not commonly considered in the literature - which arise when comparing culturally heterogeneous populations over dimensions whose definition and interpretation are culturally biased towards one or the other standpoint. Also, if culture is different in roots between macro-areas, a meaningful and useful comparison can only be drawn locally, i.e. for homogenous scales of values and behavioral models, so that continuity ensures comparability. Finally, another feature which stems from localness and adds power and interest to our natural experiment is that it is not about cultural change of displaced people, like emigrants of first or subsequent generation. Instead, it is about the behavioral impact of exogenous shifts in factors around people who are left where they or their families used to live.

Given data difficulties in applying diff-in-diff, the ideal empirical strategy to make our natural experiment informative for the persistence question consists of regression (or spatial) discontinuity exercises projecting pre- and post-treatment data on the new exact border. At an extreme, the major point in the paper could be shown even working only with contemporary outcomes. For centuries, an area was subject to a single institutional history, and was delimited and protected by a border which was strong in many dimensions. This area is thought to inherit a common social capital stock from its past. Unexpectedly and exogenously, in the first half of the 20th century a regime drew a new, merely administrative border inside of it. If today a cultural discontinuity emerges exactly on this new border, then this is evidence of local cultural dynamics, arisen in a reasonable span of time. In fact, this will be the main finding of the paper: the use of formal methods will highlight the contemporary differentiation of social capital and cultural indicators on the two sides of the new border. To keep accuracy high, we will apply these methods also to pre-reform data, finding confirmation of pre-treatment homogeneity across the border. Cultural change will be then identified: culture moves and the one we live into can be thought of as an outcome, of perhaps relatively recent development, rather than an immutable datum from a remote past. As a corollary, the experiment will also show evidence of heterogeneous cultural dynamics between adjacent areas, allowing to claim that the southern area experienced adverse social capital

evolution along the 20th century. As the border shift is just an instrument and not a cause, more work is left to be done about the consequent, welfare-relevant question that our experiment has the potential to answer, namely which are the factors that were able to induce the (differential) change. For the time being, we only provide possibly suggestive hints at the end of the paper.

The paper is organized as follows: next section describes the situation before and after the reform, emphasizing exogeneity of the modification. After some data description, an RD analysis on contemporary data in Section 4 evaluates the effect of being on one side or the other of the new border. Section 5 assesses the pre-reform distribution of outcome variables. Section 6 extends the main RD exercise to appropriate controls, with a main focus on migration flows. Robustness “placebo” checks follow. Before concluding, Section 8 sketches some hints to possible drivers of the main results.

## 2 Geography and history of the experiment

We focus on a region stretching for 120 km between Rome and Naples,<sup>1</sup> on the Tyrrhenian sea, reaching about 70 km inland (Figure 1). This territory has been hosting the State border with the longest effectiveness in the Italian peninsula: the south-western part of the border separating the Papal State and the Kingdom of the Two Sicilies, a political divide which lasted virtually unmodified from the consolidation of the Lombard southern conquests in the 8th century, up to the 19th century.<sup>2</sup> Its millennial effectiveness also relied on geographical factors: for a large part, it ran over mountain ridges, coinciding with an orographic divide, visible in Figure 1.<sup>3</sup> In 1870, the troops of the recently founded Kingdom of Italy tore down for good this border as a national border. Nevertheless, it remained effective as an administrative delimitation of two wide Provinces (the main sub-national units in Italy for the following century), that of Rome from that of Terra di Lavoro (the wider in Campania, with Caserta as capital). As such, it also delimited the Region of Latium (i.e. the latest configuration of the Papal State territories, since then hosting the capital city in Italy) from that of Campania (the north-western section of the Two Sicilies, featuring Naples as capital city). At first, Regions were a merely statistical partition quickly set up by the young Italian government; starting in 1970, they became the main sub-national level of government.

In December 1926, quite suddenly Mussolini abolished Terra di Lavoro and instituted 17 new Provinces. On Jan. 2, 1927, Frosinone became capital of a new Province

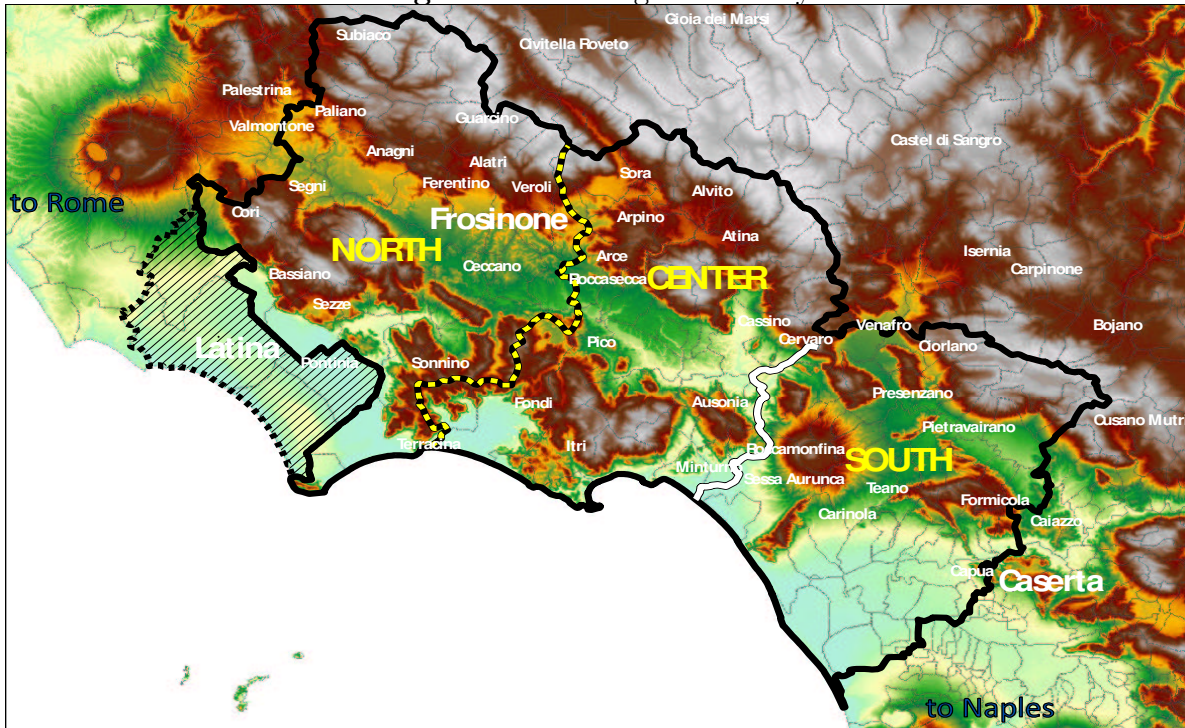
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<sup>1</sup>The length of the straight segment joining Rome and Naples is 189 km, which can be covered by a minimum route of 227 km according to *www.viamichelin.com*. The municipality in the sample which is the closest to Rome by route is Paliano (63 km), while Casapesenna is the closest to Naples (30 km).

<sup>2</sup>Actually, the first formal State on the southern side of the border emerged only in the 12th century, as Kingdom of Apulia. It later became Kingdom of Naples and, after 1815, of the Two Sicilies.

<sup>3</sup>Unsurprisingly, given geography and history, linguists draw on this border an isogloss too, i.e. a local separation of languages/dialects, with their cultural contents (see Bruni, 2002).

Figure 1 - The region of study



*Note:* The region of study is delimited by a black thick continuous line. The new border between Latium and Campania is marked with a white continuous line, the old border with a yellow-black dashed line. A black thick dashed line delimits municipalities excluded from the sample. The thin reticle of municipal territories is shown in the background, together with elevation. Territories above the black thick line in the upper-right corner belong neither to Latium nor to Campania.

with the same name, laying on internal territories across the “old” border, subtracted to the Provinces of Rome and of Terra di Lavoro. The border between Latium and Campania was shifted about 40 km southwards, falling in a quite flat area, entirely internal to what was Terra di lavoro, coinciding for the western two thirds with the Garigliano river, a position characterizing no geographical nor historical nor cultural discontinuity.<sup>4</sup> The villages of Terra di Lavoro south of this “new” border were assigned to Naples; the northern villages were assigned to Frosinone for the inland part, and to Rome for the coastal part. On Dec. 18, 1934, this latter strip of land, plus some other villages originally with Rome, became seat of another Province (Littoria, now Latina), following a massive campaign of marsh reclamation started in the second part of the 1920’s, carried out by workers coming from many areas in Italy but mainly from the

<sup>4</sup>“(Questo confine) è assai irregolare, non solo perché non ha alcuna rispondenza nella tradizione storica (la quale, come per le nazioni, così, in misura più ristretta, per le regioni, crea negli abitanti un particolare sentimento unitario), ma anche perché non è regolato da alcun criterio di carattere fisico” (Epifanio, 1927). Significantly, the 1940 edition of the *Campania* guide book by the Italian Touring Club was still mentioning “the territory transferred in 1927 from the territory of Caserta to those of Littoria and of Frosinone” saying that it “holds more Campania features then Latium ones”.

north-eastern regions of Veneto and Emilia. The reinstatement of the Province of Caserta after 19 years, at the end of 1945, did not shift the border back.

The official motivation that the Fascist regime set forth for the whole administrative reform was its intention to contrast mass urbanization, promoting instead ruralization. Nevertheless, the abolished Province of Terra di Lavoro was far from being a metropolitan area. This is taken by historians as proving that the real motivations behind this part of the reform were others: to resolve a local opposition internal to the regime between original fascists and nationalistic veterans;<sup>5</sup> to force a (merely rhetorical) emphasis on an expansion of the area of influence of Naples, while implementing a substantial enlargement of that of Rome instead. This is useful to our analysis inasmuch as it shows that the exact border shift did not seem to depend on unobservables which *jointly* explain both the position of the new border and the previous or subsequent pattern in local cultural indicators. This is true not only looking at the inspiring motivation, but also looking at the particular location where the new border was placed: no reason other than the presence of a line given by the river (historically, more a way of communication than a geographic impediment) seems able to give account of why the reform chose exactly that partition to tear apart administrative and jurisdictional districts with a long common tradition. As to the cut tailored for Latium, even geographers of the regime had to admit that the extended Latium was lacking homogeneity.<sup>6</sup>

The reform allows identifying an area enclosed between the old and the new borders, of approximately 40x60 km, including the territories formerly in Campania and from 1927 aggregated to Latium: we call it *Center*. Symmetrically on the map, we draw an area just below the new border - for comparability, of about the same size of the former - made of territories kept in Campania, and we call it *South*. For further comparability, we draw an analogous area also just above the old border, in territories that remained in Latium, and we call it *North*. The three areas turn out to be similar also in population (around 400,000, when excluding from the sample, as we do, three colonization towns founded by the Fascism) and in the number of municipalities (60-70 per area).

A formal comparison, per period, of cultural behaviors in the former two areas, i.e. those at the two sides of the new Latium-Campania border, is the main focus of this paper. Those two areas were territories exposed, for centuries until 1860-61, to the same pre-Italian institutions, and still administratively unified thereafter, until the fascist reform.<sup>7</sup> Cultural persistence would entail that social capital in the two areas remains

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<sup>5</sup>In 1925, in light of the contrasts, the government decided to take direct control over the Terra di Lavoro branch of the Associazione Nazionale Combattenti, elsewhere typically aligned with the regime after the 1922 March on Rome.

<sup>6</sup>“Esula dalla attuale circoscrizione amministrativa laziale il concetto geografico unitario. D'altra parte sopra siffatta considerazione, puramente speculativa, dovevano prevalere i criteri politico-amministrativi dai quali lo Stato non può prescindere” (Caputo-Romero, 1931, p. 438). Interestingly, Galasso (1995) rationalizes the border shift in terms of forward-looking geography, given the rising fate of Rome versus the declining gravitational attractiveness of Naples.

<sup>7</sup>The literature on economic performance has put emphasis on the effect on contemporary cultural

**Figure 2** - Turnouts at referenda in provinces of Central-Southern Italy



*Note:* Provincial referenda turnout; 1946-1989 average. A thin (thick) line marks provinces (regions).

still affected by past experiences. The simple fact that the new border was placed in the middle of this territory with common cultural and institutional background allows us checking cultural dynamics: particularly, we can check whether there has been any divergence in behavioral indicators between these areas. These cultural dynamics questions bear additional interest as Campania, and in particular the province of Caserta, rank last in a majority of social capital indicators surveys (e.g., Figure 2, or Tabellini, 2010), a characteristic often ascribed to their institutional and cultural heritage.

A complementary question that we address (in Appendix B) is whether there has been any cultural convergence between the old and the new parts of southern Latium, which had been separated for more than a millennium by an institutional and orographic border. With the reform, that border became internal to the two provinces of Frosinone and Latina, therefore void of any political or administrative content.

An alternative to our main experiment would be to consider migrants in a totally different area, and check cultural persistence in their behavior. However, such experiment would be plagued by many inconveniences, like self-selection in migration and the fact that migration strongly requires some shift towards the local, dominating culture (rapidly amplified in subsequent generations). Here we try to take the polar case of splitting a community while leaving people where they or their families used to live, and check for cultural divergence between groups of people with strong historical links.

### 3 The data

For our areas, we have assembled an innovative data set with sub-provincial level variables on local characteristics and on individual and institutional behavioral indicators, behaviors induced by having been exposed to the institutions of the Kingdom of Naples/Two Sicilies (e.g., De Blasio and Nuzzo, 2009, or Di Liberto and Sideri, 2013).

**Table 1** - Summary statistics - Contemporaneous covariates and major outcomes

| Variable                         | Center             | South              | Variable                           | Center         | South          |
|----------------------------------|--------------------|--------------------|------------------------------------|----------------|----------------|
| Elevation                        | 340<br>(245)       | 209<br>(207)       | Crimes                             | 132<br>(73)    | 155<br>(83)    |
| Max difference<br>in elevation   | 878<br>(463)       | 627<br>(413)       | <i>Violent</i>                     | 21<br>(10)     | 21<br>(18)     |
| Distance<br>from coast           | 29<br>(15)         | 29<br>(12)         | <i>Other</i>                       | 111<br>(67)    | 144<br>(102)   |
| Time from<br>Rome                | 1.90<br>(0.27)     | 2.31<br>(0.22)     | Turnout at<br>referenda            | 0.49<br>(0.09) | 0.32<br>(0.05) |
| Time from<br>Naples              | 1.67<br>(0.28)     | 1.15<br>(0.29)     | Turnout at<br>European elections   | 0.74<br>(0.08) | 0.66<br>(0.13) |
| Size                             | 36<br>(26)         | 32<br>(23)         | Non-profit<br>organizations        | 3.03<br>(1.64) | 2.65<br>(1.78) |
| Population                       | 5,529<br>(8,300)   | 5,667<br>(6,684)   | Illiteracy<br>rate                 | 27.5<br>(13.5) | 36.3<br>(18.9) |
| Graduates                        | 28<br>(12)         | 28<br>(11)         | Divorced                           | 8.6<br>(4.2)   | 6.0<br>(3.8)   |
| Income<br>tax base               | 6,479<br>(1,249)   | 5,405<br>(1,063)   | Observations<br>(municipalities)   | 66             | 70             |
| Residential<br>property wealth   | 37,732<br>(22,160) | 36,575<br>(20,721) | Cheating in<br>Italian             | 0.11<br>(0.13) | 0.23<br>(0.24) |
| Recycled<br>waste                | 0.10<br>(0.12)     | 0.20<br>(0.13)     | Cheating in<br>math                | 0.08<br>(0.11) | 0.23<br>(0.22) |
| Houses served<br>by aqueduct     | 0.90<br>(0.13)     | 0.86<br>(0.13)     | Negative<br>attributional style    | 0.10<br>(0.06) | 0.09<br>(0.05) |
| Municipal<br>personnel expend.   | 211<br>(86)        | 202<br>(53)        | Dialect<br>spoken                  | 0.19<br>(0.11) | 0.31<br>(0.10) |
| Total Pop. (sum)                 | 364,941            | 396,660            | Bullying                           | 0.12<br>(0.04) | 0.12<br>(0.04) |
| Observations<br>(municipalities) | 66                 | 70                 | Observations<br>(school districts) | 32             | 40             |

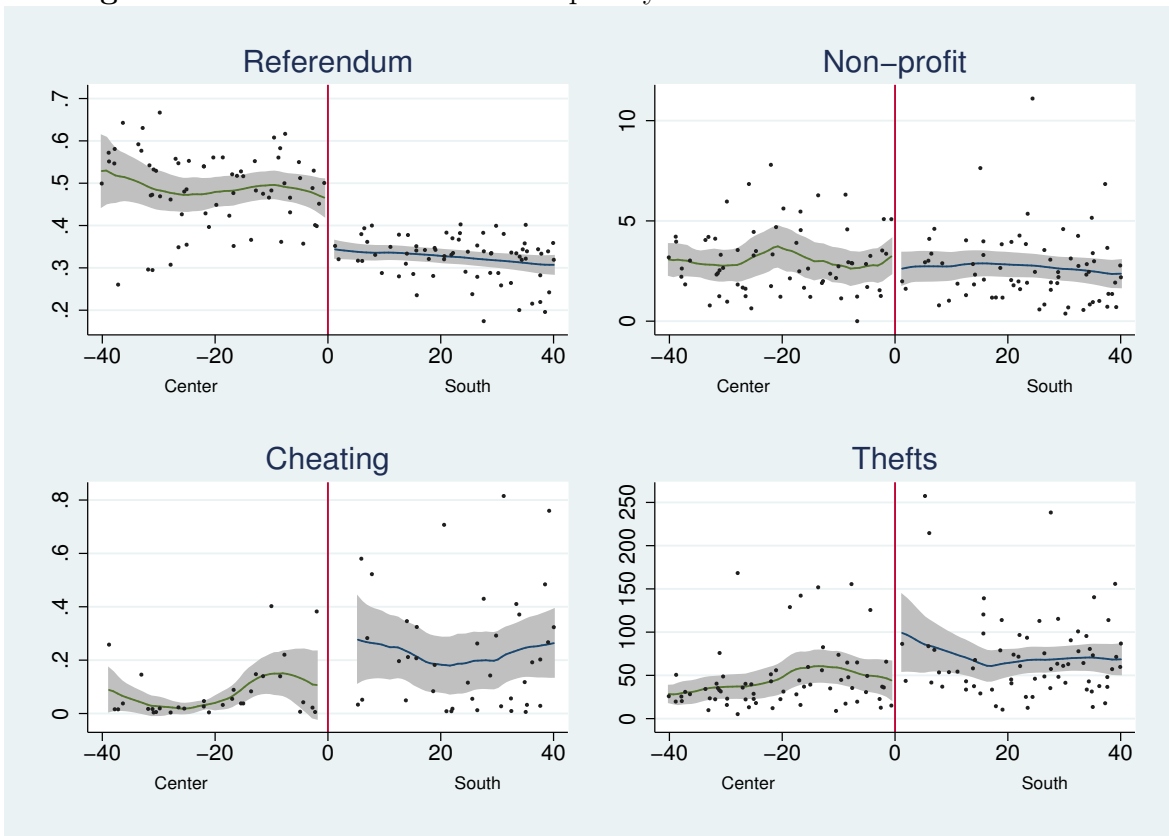
*Note:* Averages over municipalities in each 40 km band from the new border. St. dev. in parentheses.

resorting to a variety of past and contemporary sources. A detailed description is provided in Appendix A, while Table 1 presents some statistics.

At face-value, a first glance at the data shows that, despite a common cultural background, on average our Center area is characterized, with respect to South, by less economic-related crimes, greater turnout, more non-profit organizations, more divorces, less school cheating, illiterates and habitual dialect speakers. Instead, Center area averages are more similar to North ones (not shown). This picture looks opposite to the one that we would perhaps expect a-priori: territories with a shorter common cultural tradition seem to share behaviors more than territories which had been long-unified in a single State, administration and culture. But this is only an immediate glance: in the following sections we will develop a more formal (dis-)continuity check.



**Figure 3** - Non-linear fits of contemporary variables around the new border



## 4 Crossing the new border: today

Figure 3 provides a first graphical inspection of contemporary outcomes distributions across the new border. It fits the data for four outcome variables against the distance from either side of the new border, using a kernel-weighted local polynomial smoother. Selected outcomes are of the kind used by recent literature on social capital and cultural dynamics (see GSZ, 2008 and 2013, Paccagnella-Sestito, 2013, De Blasio-Menon, 2013), as they include: turnout at referenda, number of non-profit organizations, 5th grade students cheating in math, and thefts. First, the non-parametric approach around the threshold allows us to gauge a visual impression of the cultural discontinuity at the new border (but for non-profit). It also highlights the degree of non-linearity of the data, to be mimicked with the right polynomial in the forcing variable (algebraic distance).

Let's move to a more formal assessment of the effect of the “treatment” of being on one side or the other of our border. Under an assumption of continuity in potential outcomes, an observation unit in the left neighborhood of the border might be taken as a valid counterfactual to one in the right neighborhood. Ideally, one would like to have enough data in each neighborhood to estimate the average treatment effect without having to rely on functional forms, using instead only variation at the discontinuity.

Border sides in geographic regression discontinuity (RD) settings hardly display such data richness, as it is in our case too. In order to enlarge the data set, the researcher is bound to move away from the border. In our case, the distance between the old and the new border constrains our Center area to be no longer than 40 km. There follows an analogous dimensional constraint on the area to compare. Our approach is therefore necessarily semi-parametric, in that it relies only on observations in bands extending 40 km from the border. This is also of advantage, as it limits the effect on the conditional functions of observations lying far from each border, preserving local information content instead. We try to maximize this effect by zooming also to a closer band, but sample size limitations do not allow us to go closer than 25 km: with the exception of judicial data, more limited in the number of observations, we run every regression also for samples within this distance, being however aware that this might weaken precision, especially when increasing the number of coefficients to estimate.

Moving away from the border, we are left with the problem of disentangling the treatment indicator, which is a non-linear and discontinuous function of geographic position, from the smooth effects of distance or coordinates. It can be solved through an appropriately specified regression model. Indeed, one necessary condition for correct specification is ability to distinguish a nonlinearity from a discontinuity. In analogy with Dell (2008), we set up a semi-parametric geographical (spatial) regression discontinuity model, aimed at evaluating the treatment effect of being on either side of the border. It expresses cultural outcomes as functions of a number of georeferenced variables. Across our border, the estimation equation over municipality  $i$  variables takes the form

$$y_i = \alpha + \gamma T_i + f(\text{geographic location}_i, T_i) + X_i' \beta + \Phi_i + \varepsilon_i \quad (1)$$

Here  $y_i$  is an outcome variable,  $\alpha$  is a constant,  $T_i$  is our treatment dummy, valued 1 only if the municipality lies above the border,  $X_i$  is a vector of covariates, and  $\Phi_i$  is a set of fixed effects. The term  $f(\text{geographic location}_i, T_i)$  is the RD polynomial which controls for smooth functions of geographic location. In it, we include interactions of our position measure with the area dummy. If in the data the treatment effect is a constant function of the distance from the border, the interaction term would be irrelevant and the estimated difference between realized and potential outcomes would apply to the whole domain. As the treatment effect might well vary with the distance, one can show that in this case including the interaction yields a correct estimate of the average treatment effect at the threshold (only), which is where our comparison is most, or solely, effective: omission would make our estimate imprecise at the point where we care.

In order to select the correct specification in geographic location, we run regressions for this semi-parametric model over a number of polynomials in the forcing variable “algebraic distance from border”.<sup>8</sup> We do so for a number of social capital and cul-

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<sup>8</sup>We also tried polynomials in deviations of municipalities geographic coordinates from their mean, but, apart from the worse fit, they are unsuited to capture the treatment effect exactly at the border.

tural outcomes: in the first set we include referenda and European elections turnouts, non-profit associations and 5th grade students' cheating; in the second one, crimes and municipality efficiency. From crimes, we isolate the component which the literature regards as a valid (inverse) indicator of social cohesion, namely violent crimes (see Glaeser et al, 1996), and its complement, which is total economic-related crimes. Table 2 presents baseline estimates for the average treatment effect evaluated at the threshold based on fully interacted polynomials in algebraic distance. Panel I shows results for a linear polynomial with linear interaction, Panel II for a quadratic-quadratic case and Panel III for a cubic-cubic one. The main finding is that, for all specifications, at the new

**Table 2** - RD as function of geographic location across the New Border

|   | Dependent Variable |                   |                    |                   |                  |                    |                   |                 |
|---|--------------------|-------------------|--------------------|-------------------|------------------|--------------------|-------------------|-----------------|
|   | crimes             |                   |                    | refer.            | nonprof.         | admin.             | Eur. el.          | cheat           |
|   | total              | <i>violent</i>    | <i>other</i>       | turnout           | associat.        | effic.             | turnout           | ing             |
| Panel I. Interacted Linear Polynomial in Algebraic Distance to the New Border     |                    |                   |                    |                   |                  |                    |                   |                 |
| Center <40km  | -82.1<br>(51.7)    | -17.3**<br>(8.2)  | -64.8<br>(44.4)    | 0.12***<br>(0.02) | 0.04<br>(0.57)   | -0.85*<br>(0.49)   | 0.01<br>(0.04)    | -7.9<br>(10.2)  |
| Adj. $R^2$  | 0.06               | 0.11              | 0.06               | 0.57              | -0.01            | 0.16               | 0.13              | 0.13            |
| Center <25km  | -168.7**<br>(80.3) | -29.8**<br>(12.6) | -139.0**<br>(68.9) | 0.14***<br>(0.03) | 0.57<br>(0.86)   | -2.03***<br>(0.59) | 0.08<br>(0.05)    | -17.2<br>(16.3) |
| Adj. $R^2$  | 0.13               | 0.17              | 0.11               | 0.62              | 0.00             | 0.12               | 0.01              | 0.10            |
| Panel II. Interacted Quadratic Polynomial in Algebraic Distance to the New Border |                    |                   |                    |                   |                  |                    |                   |                 |
| Center <40km  | -196.0**<br>(98.2) | -35.6**<br>(15.3) | -160.3*<br>(84.4)  | 0.15***<br>(0.03) | 0.58<br>(0.86)   | -2.65***<br>(0.64) | 0.13**<br>(0.06)  | -22.0<br>(20.9) |
| Adj. $R^2$  | 0.09               | 0.16              | 0.08               | 0.56              | -0.01            | 0.19               | 0.15              | 0.15            |
| Center <25km  | -248.5*<br>(129.5) | -46.1**<br>(22.4) | -202.4*<br>(109.4) | 0.10***<br>(0.04) | 0.27<br>(1.36)   | -2.98***<br>(0.85) | 0.22***<br>(0.08) | -12.3<br>(31.9) |
| Adj. $R^2$  | 0.12               | 0.18              | 0.11               | 0.62              | 0.01             | 0.11               | 0.08              | 0.07            |
| Panel III. Interacted Cubic Polynomial in Algebraic Distance to the New Border    |                    |                   |                    |                   |                  |                    |                   |                 |
| Center <40km  | -264.7*<br>(134.7) | -48.2**<br>(22.9) | -216.5*<br>(114.2) | 0.10**<br>(0.04)  | 0.71<br>(1.27)   | -3.07***<br>(0.89) | 0.23***<br>(0.08) | -12.4<br>(36.7) |
| Adj. $R^2$  | 0.09               | 0.17              | 0.08               | 0.56              | 0.06             | 0.19               | 0.16              | 0.15            |
| Center <25km  | -187.1<br>(117.3)  | -36.8<br>(25.8)   | -150.3<br>(97.0)   | 0.08*<br>(0.05)   | 3.41**<br>(1.35) | -2.53***<br>(0.95) | 0.20<br>(0.13)    | 1.3<br>(92.8)   |
| Adj. $R^2$  | 0.11               | 0.20              | 0.09               | 0.62              | 0.03             | 0.09               | 0.07              | 0.01            |

*Note:* Estimated coefficients on Center dummy from regressions on polynomials in Euclidean distance from the municipality's townhall to the border, including interaction with the area dummy. "Center" equals 1 if the municipality is in Center, 0 if it is in South. The degree of the polynomial and of the interaction is linear in Panel I, quadratic in Panel II, cubic in Panel III. Constant and algebraic distance coefficients not shown. First lines in each panel consider observations within 40 km of the border (136 municipalities and 72 school districts); second lines reduce this distance to 25 km (74 municipalities and 37 districts). Robust st. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

border there is evidence of diffused discontinuities in cultural outcomes, particularly in all aggregations of the crime rate, in referenda turnout and in administrative efficiency.

Before commenting estimates further, we briefly report on a number of results (not shown) related to the choice of the baseline functional form in geographic location. The table does not show coefficients for the geographic location. We limit comment to interaction terms, which are generally statistically significant (at least up to quadratic forms). For all polynomial degrees, a comparison with the constant-effect polynomial assumption (i.e., with no interaction) confirms that the interaction terms generally improve the fit. Nevertheless, also specifications without interaction or in coordinates yield analogous results in terms of (dis-)continuities at the border. Furthermore, it is the interacted quadratic specification that seems to be preferred by the data. Tests statistics like the Akaike information criterion concentrate favor on the fully interacted quadratic specification: moving up one degree from quadratic does not generally improve these tests statistics and yields cubic coefficients which are rarely statistically significant (never in their dummy interaction). Therefore, it seems natural to adopt the fully interacted specification  $d_i + d_i^2 + d_i T_i + d_i^2 T_i$  as baseline of  $f(\text{geographic location}_i, T_i)$ .

Based on estimates from the data-preferred quadratic specification, cumulating over years 2004-2009, in South there were a total of 196 intentional crimes more than in Center for every thousand average residents; of these, 36 were violent crimes, 62 were thefts. This total amount increases to almost 250 when restricting estimation to the information contained in the 25 km sample (but with only 10% statistical significance). A lower bound estimate stems instead from the linear specification: 82 total crimes difference, of which 17 violent. Turnout at referenda was robustly 10-15 percentage points higher

**Table 3** - Balancing properties for the baseline covariates

|   | Dependent Variable |                 |                   |                 |                |                |                   |                   |
|---|--------------------|-----------------|-------------------|-----------------|----------------|----------------|-------------------|-------------------|
|   | Elevation          | Dist. coast     | Pop.              | Time Rome       | Time Naples    | Dist. highway  | Grad uates        | Pop. density      |
| Panel I. Municipalities within 40 km of the border (136 obs.) |                    |                 |                   |                 |                |                |                   |                   |
| Center  | -12.75<br>(96.99)  | -0.79<br>(6.39) | -1,698<br>(4,035) | -0.12<br>(0.13) | 0.12<br>(0.09) | 0.43<br>(3.63) | -0.003<br>(0.007) | -212.9<br>(148.7) |
| Adj. $R^2$  | 0.129              | 0.151           | -0.005            | 0.470           | 0.596          | 0.094          | -0.010            | 0.265             |
| Panel II. Municipalities within 25 km of the border (74 obs.) |                    |                 |                   |                 |                |                |                   |                   |
| Center  | -36.51<br>(120.74) | -5.12<br>(7.70) | -1,333<br>(4,101) | 0.17<br>(0.16)  | 0.03<br>(0.12) | 3.77<br>(4.76) | -0.007<br>(0.008) | 16.7<br>(71.7)    |
| Adj. $R^2$  | 0.044              | 0.173           | -0.021            | 0.296           | 0.282          | 0.005          | -0.023            | -0.025            |

*Note:* Estimated coefficients from regressions on a fully interacted quadratic polynomial in Euclidean distance from the municipality's townhall to the border. "Center" equals 1 if the municipality is in Center, 0 if it is in South. Constant and algebraic distance coefficients not shown. Panel I considers municipalities within 40 km of the border; Panel II reduces this distance to 25 km. Robust standard errors in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

in Center than in South, while for European elections a statistically significant difference ranges between 13 and 23 p.p. As for local administrative efficiency, the average number of balance sheet parameters signalling structural deficit in southern municipalities in 2001 was 3.5, while it was 0.9 in Center. In 2001, South had 12-17 illiterates every 1,000 residents more than Center (not shown).<sup>9</sup> A difference in the number of local branches of non-profit organizations emerges only at the closest distance and for the cubic specification, but this limited differentiation should come as little surprise for this number is quite low in all the three provinces most represented in our sample (Latina, Frosinone and Caserta): just 3.5, 3.2 and 2.5 units every 1,000 residents per municipality, respectively, against a national average of 5.6. Also, no statistically significant difference between Center and South is estimated in students' cheating (in math in the table, but in Italian tests too), but here our RD might imperfectly do its job of disentangling the effect of the distance from that of the treatment: on the one hand, the number of observations halves, as it only includes municipalities hosting the school district headquarters; on the other hand, Invalsi tests data incorporate a geographic imprecision which might not suit our small-scale exercise, as they attribute to the school district located in one municipality observations from the affiliated schools in other municipalities.<sup>10</sup>

Corresponding to this discontinuity results on the new border, virtually no statistically significant difference is estimated by an analogous RD exercise on the old border, as is shown in Appendix B: the only exception is a higher cheating in North with respect to Center, but just in the linear specification.

It is worth to discuss the continuity assumption required for the validity of our results. For correct identification, our RD exercise needs that all relevant variables but the treatment vary smoothly at the border. Denoting by  $y_1$  and  $y_0$  potential outcome for treated and non-treated units, respectively, and by  $d$  distance from the border, the requirement amounts to continuity of  $E[y_1|d]$  and  $E[y_0|d]$  at the border discontinuity. This is the only way to make sure that on the threshold or just around it we are comparing a treated observation to its appropriate untreated counterpart. In order to assess the plausibility of this assumption, Table 3 explores the balancing properties, around our threshold, of a number of covariates. It reports results from RD regressions (of the type in equation (1)) run using as dependent variables some dimensions of municipality heterogeneity which might be driving results in the main RD. We stick to the baseline specification in geographic location suggested by data, a quadratic polynomial where the interaction makes sure that our evaluation takes place exactly at the border. We focus on a number of characteristics, from geographic to socio-economic ones. If in the neighborhood of the border no effect of lying on one particular side is detected, then that variable is not associated to a local discontinuity. If this happens for all the vari-

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<sup>9</sup>The literature has used the literacy rate as one of the determinants of culture (e.g., Tabellini, 2010).

<sup>10</sup>Also, students from municipalities on one side of the border may attend schools on the other side (with data possibly attributed to an even further school district), using commuting patterns typical of the local labor markets which, as we will highlight, cross our border.

ables which might potentially affect the evolution of  $y_1$  and  $y_0$ , then we get evidence supporting the continuity assumption of the conditional expectation of  $y_1$  and  $y_0$  at the discontinuity, as required. Table 3 supports our assumption in that it shows that no jump occurs and continuity in the covariates holds at the border for all distance bands.

## 5 Crossing the new border: before the reform

The main problem of our exercise consists in that the “border perturbation” event happened quite a long time ago. This might give us some advantage too, as substantial effects of this kind of reforms are bound to materialize with years of delay. Moreover, a more recent modification of borders in democratic times would have probably entailed bargaining and endogenous determination, undermining randomization which is key to experiments like ours. In general, however, the distance in time brings two major problems, both related to a lack of data: first, it is an obstacle to comparing outcomes in social capital and culture indicators relying on similar data for the period before the reform and now; secondly, many events happened since the reform, and we miss intermediate data both on them and on outcomes so to control for their effects at mid-stage. Ideally, we would like to have data on given socio-economic variables for our units of observations at the eve of the treatment, i.e., before 1927, as well as later on: from there, a kind of diff-in-diff strategy, controlling for major events happened in the meanwhile, could possibly be the best one to pursue. Unfortunately, sub-provincial behavioral data are not easy to find for that remote period (nor for intermediate ones). Nonetheless, in order to set up a meaningful comparison, we can look at variables with available old data and with direct or indirect relation to our cultural outcomes. This is what we do in this section.

For culture in the pre-treatment period, an easy road could be to rely on a maintained hypothesis of cultural homogeneity derived from the persistence result found by other papers (e.g., GSZ, 2008 and 2013): given that our Center and South areas stayed politically and administratively unified under the Kingdom of Naples-Two Sicilies for almost 9 centuries, it would seem safe enough to assign them a common cultural background. This is what is done in papers using a “South” dummy to capture the inherited cultural homogeneity of Southern Italy (GSZ, 2004, and Di Liberto-Sideri, 2013). In the spirit of the current paper, we escape aggregative and potentially blurring methods and increase accuracy towards micro data: we collect data at the finest available level to let them tell about culture in the pre-treatment period, whatever the previous institutional experiences of the areas.

Given data constraints, we were able to focus on five variables directly correlated with some of our outcomes: literacy rate, crime rate, litigation rate and criminal and civil court efficiency.<sup>11</sup> For the former one, we use municipal data from the 1921 census.

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<sup>11</sup>Appendix B will show that previous to the reform four of these five variables were discontinuous at

**Figure 4** - Quadratic fits of pre-reform variables around the new border

For all the others, we exploit the circumstance that, upon Italian unification, judicial jurisdictions were very fractionalized, and that the municipalities that we consider were included in jurisdictions placed entirely above or below each border: in fact, for Center and South we only consider new civil and criminal lawsuits brought to court or settled between 1874 and 1891 in the 25 districts strictly included in each of those areas.

The limited number of observations for judicial districts constrains our analysis on pre-reform data. Figure 4 visualizes data as Figure 3 did, but it uses just a quadratic fit. It hints to variables continuity at the border. Moving to a more formal RD analysis, available degrees of freedom also limit the choice of the distance polynomial: our baseline fully interacted quadratic specification might be too demanding and might yield imprecise estimates. Table 4 reports results for a linear and a quadratic polynomials, both aug-

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the old, strong border. If one were willing to rely on priors, he could see this as indirect evidence that they constitute valid cultural indicators. As for the local efficiency of the judicial system, the literature has considered it a major example of embedded cultural heritage: wondering about the legacy of history, Tabellini (2010, p. 678) puts this efficiency in the forefront when stating that "the same institutions function very differently in different environments, suggesting that informal institutions play an important role. The judicial system works very differently in southern and northern Italy, for instance, with judges taking much longer to complete investigations and to rule on civil cases in the South than in the North. Yet the legal system and the career path for judges have been the same for 150 years, and the human resources available are also not very different. (...) These systematic differences in behavior can be traced back to different regional histories."

**Table 4** - Pre-treatment RD as function of geographic location across the New Border

|   | Dependent Variable |                  |                  |                   |                          |                           |                  |
|---|--------------------|------------------|------------------|-------------------|--------------------------|---------------------------|------------------|
|   | crimes             |                  |                  | litig<br>ation    | crim.court<br>efficiency | civil court<br>efficiency | literacy         |
|   | total              | <i>violent</i>   | <i>property</i>  |                   |                          |                           |                  |
| Panel I. Fully Interacted Linear Polynomial in Algebraic Distance to the New Border |                    |                  |                  |                   |                          |                           |                  |
| Center  | 3.971<br>(2.955)   | 0.359<br>(1.684) | 0.955<br>(0.971) | -4.882<br>(3.153) | 0.015<br>(0.021)         | -0.018<br>(0.113)         | 0.015<br>(0.041) |
| Adj. $R^2$  | -0.012             | -0.084           | -0.058           | 0.021             | 0.158                    | -0.064                    | -0.021           |
| Panel II. Interacted Quadratic Polynomial in Algebraic Distance to the New Border   |                    |                  |                  |                   |                          |                           |                  |
| Center  | 3.954<br>(3.010)   | 0.345<br>(1.716) | 0.958<br>(1.011) | -4.885<br>(3.218) | 0.015<br>(0.022)         | -0.017<br>(0.113)         | 0.034<br>(0.039) |
| Adj. $R^2$  | -0.055             | -0.109           | -0.110           | -0.028            | 0.116                    | -0.103                    | 0.018            |

*Note:* Estimated coefficients on Center dummy from regressions on polynomials in Euclidean distance from the municipality’s townhall to the border, including interaction with the area dummy. ”Center” equals 1 if the observation is in Center, 0 if it is in South. Panel I: linear polynomial with linear interaction; Panel II: quadratic polynomial with linear interaction. Constant and algebraic distance coefficients not shown. Except for literacy (municipal), the units of observation are the trial courts strictly included in the symmetric 40-km bands from each border (25 obs.). Robust st. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

mented with (just) a linear interaction term so to be still able to evaluate outcomes at the threshold. The table shows clearly that, in both specifications, no difference in any outcome turns out to be statistically significant at the new border - still far from being imagined in those times. Confirmation of local pre-reform homogeneity comes also from alternative measures of first-degree court efficiency (not shown): no statistically significant discontinuity is found in the ratio of investigated criminal trial cases over new plus pending ones, and the same happens for the duration measure of the number of civil lawsuits ruled within 15 days of their incoming.

This result completes the formal demonstration of cultural evolution in the area. During the 20th century, i.e. in recent decades, a cultural differentiation has emerged where - across the new border - there was none and in principle no reason for it to occur, given initial homogeneity over a common background. Complementarily, Appendix B will show that homogenization took instead place across the old, strong border. Culture and social capital endowments may change, as they did, over reasonable spans of time.

## 6 Extending to controls

This section explores a number of extensions of the simple contemporary RD model in algebraic distance presented in Section 4, to control for variables which might have played a role in the dynamics. The main results in terms of the impact on the average treatment effect at the border are reported in Table 5, just for major outcomes. All



regressions columns build on our baseline fully interacted quadratic polynomial in distance from the border, although neither the coefficients of the geographic location nor those of the control variables nor of the constant are shown. A single type of control per column is considered.

Section 4 found that covariates are balanced across the border. As such, even if estimation shows that geographical factors like elevation and distance from the coast (but not territory slope) do appear to have explanatory power for virtually all outcomes, they can only leave the estimated treatment effect unaffected at the border, as is shown in Table 5 under the cumulative column for geocontrols.

A nice explanation for referendum participation emerges when controlling for time from main cities. This addition narrows the interval for the estimated advantage in participation of Center over South to 11-13 percentage points (from 10-15 in the baseline, pooling estimates from the larger and the smaller sample). It does so with a strongly statistical significance in the negative coefficient for time to Rome: the less it takes to/from Rome, the more people participate. On the contrary, time from Naples does not appear to matter. Many people commute at medium to low frequency with Rome where many job opportunities are. Italian laws give the chance to vote at referenda away from one's official residence: therefore, it might be possible that people officially resident in municipalities in our sample more distant from Rome, but living for work reasons in that city, find it easier to vote where they live, so to avoid the (multi-dimensional) cost of homecoming. A shorter time to go back home over a week-end might affect positively the decision to participate in a referendum. Also, given that referenda usually concern national issues, as opposed to local ones, the higher the possibility of contact with the capital city, the higher the personal involvement in the topic that might result.

In fact, openness - approximated by the number of people that any person can meet - can be a relevant factor for cultural change: nevertheless, controlling for towns with more than 15,000 inhabitants (a number that marks a partition in the distribution of population in our sample) does not affect at all our results.

Interestingly, controlling for the number of graduates diminishes the statistical significance and the value of the difference in the crime rate.

Cultural behaviors are mainly influenced by the people we are in relation with. The workplace or the broad work environment is one of the main places of contamination of behavioral models, and one in which we spend several hours a day. When the job implies mobility or commuting, cultural cross-fertilization can result amplified. Therefore, we control for fixed effects of local labor markets (LLM) - as defined by the 2001 ISTAT classification - to give account of behavioral influences, originating in the economic domain, which might be determining local outcomes. First, we notice that some LLM's lay across our border. Commuting or work interactions across the border might help blurring local cultural differences: if this is the case, controlling for them should let discontinuities emerge with more strength. Indeed, this is what there seems to be in

**Table 5** - Specification extensions

|  | Control Variable |                  |                 |          |               |          |                |               |
|--|------------------|------------------|-----------------|----------|---------------|----------|----------------|---------------|
|  | Base-<br>line    | Geo-<br>controls | Time<br>Rom/Nap | Town     | Grad<br>uates | LLM      | Cassa<br>Mezz. | Migr<br>ation |
| Panel <i>a.</i> Dependent variable: Total crimes       |                  |                  |                 |          |               |          |                |               |
| Center   | -196.0**         | -199.1**         | -174.7*         | -197.0** | -187.1*       | -122.4*  | -205.7**       | -216.7***     |
| <40km  | (98.2)           | (95.6)           | (98.2)          | (97.8)   | (95.6)        | (65.8)   | (98.5)         | (78.1)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.09             | 0.30             | 0.13            | 0.22     | 0.19          | 0.31     | 0.13           | 0.43          |
| Center   | -248.5*          | -274.9**         | -257.7*         | -246.6*  | -218.0        | -275.7** | -252.6*        | -229.5**      |
| <25km  | (129.5)          | (136.3)          | (130.8)         | (129.6)  | (131.7)       | (104.6)  | (130.0)        | (94.7)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.12             | 0.27             | 0.15            | 0.20     | 0.31          | 0.38     | 0.17           | 0.42          |
| Panel <i>b.</i> Dependent variable: Referendum turnout |                  |                  |                 |          |               |          |                |               |
| Center   | 0.15***          | 0.14***          | 0.13***         | 0.15***  | 0.15***       | 0.13***  | 0.14***        | 0.15***       |
| <40km  | (0.03)           | (0.03)           | (0.03)          | (0.03)   | (0.03)        | (0.03)   | (0.03)         | (0.03)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.56             | 0.68             | 0.64            | 0.59     | 0.57          | 0.80     | 0.56           | 0.57          |
| Center   | 0.10***          | 0.08**           | 0.11**          | 0.10**   | 0.09**        | 0.16**   | 0.10**         | 0.09**        |
| <25km  | (0.04)           | (0.03)           | (0.04)          | (0.04)   | (0.04)        | (0.03)   | (0.04)         | (0.04)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.61             | 0.65             | 0.66            | 0.67     | 0.63          | 0.79     | 0.61           | 0.64          |
| Panel <i>c.</i> Dependent variable: Non-profit         |                  |                  |                 |          |               |          |                |               |
| Center   | 0.6              | 0.7              | 0.5             | 0.6      | 0.7           | -0.2     | 0.5            | 0.5           |
| <40km  | (0.9)            | (0.9)            | (0.8)           | (0.9)    | (0.9)         | (0.9)    | (0.9)          | (0.9)         |
| Adj. <i>R</i> <sup>2</sup>                             | -0.01            | 0.04             | 0.02            | -0.02    | 0.00          | 0.12     | -0.01          | -0.02         |
| Center   | 0.3              | 0.4              | 0.0             | 0.3      | 0.4           | -0.8     | 0.3            | 0.4           |
| <25km  | (1.4)            | (1.3)            | (1.4)           | (1.3)    | (1.4)         | (1.4)    | (1.4)          | (1.3)         |
| Adj. <i>R</i> <sup>2</sup>                             | 0.01             | -0.03            | 0.02            | 0.03     | 0.01          | 0.12     | -0.01          | 0.00          |
| Panel <i>d.</i> Dependent variable: Cheating in math   |                  |                  |                 |          |               |          |                |               |
| Center   | -22.0            | -21.8            | -19.9           | -22.1    | -22.0         | -40.6*** | -22.2          | -24.3         |
| <40km  | (20.9)           | (22.1)           | (21.5)          | (21.0)   | (20.7)        | (13.7)   | (20.9)         | (21.9)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.15             | 0.11             | 0.14            | 0.14     | 0.14          | 0.14     | 0.14           | 0.14          |
| Center   | -12.3            | -4.9             | -10.5           | -12.3    | -13.1         | -31.8    | -12.4          | -23.4         |
| <25km  | (31.9)           | (27.6)           | (30.7)          | (32.4)   | (31.8)        | (21.5)   | (32.2)         | (28.2)        |
| Adj. <i>R</i> <sup>2</sup>                             | 0.07             | 0.13             | 0.10            | 0.04     | 0.06          | 0.43     | 0.04           | 0.12          |

*Note:* Estimates from a fully interacted quadratic polynomial in Euclidean distance from the municipality's townhall to the border. "Center" equals 1 if the municipality is in Center, 0 if it is in South. Other coefficients not shown. First lines of coefficients in each panel consider municipalities within 40 km of the border; second lines reduce this distance to 25 km. Robust st. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. For the number of observations per regression, see Table 2.

the results: net of the component related to be part of a common LLM, treatment effects are generally strengthened in the 25 km sample (more affected by the overlap between border and LLM). In the 40 km sample, relevantly, the differential in the social capital indicator of cheating in math, muted in all other cases, becomes statistically significant, with more cheating in South with respect to Center (see Panel *d* of Table 5).

It seems that the LLM control manages to isolate the "contamination" effect coming from commuting and interacting for work (and possibly for schooling) across the border: absent this dampening component, the estimated treatment effect of laying on one side or the other would be even higher. It is instead tempered by economic driving forces which bring people to be mutually exposed to different local cultural models and which by this means induce cultural convergence.

We would like to control for the effect of economic factors on social capital more than what we did with LLM's. The 1926 reform was followed by a number of economic shocks of which at least one hit the whole region that we study. It is the infrastructural and firm financing programme carried out in the whole (extended) Southern Italy in post-WWII by the Cassa per il Mezzogiorno, a dedicated public institution. We do our best with available data and, under an assumption of proportionality between investments and firms size, we control for (the size class of persons employed in) firm plants in our municipalities that received investment subsidies from the Cassa. An RD test like those in Table 3 finds these (quite sparse) data to be balanced across the new border (not shown). Our finding is that the significance of the treatment effect across the border is again confirmed. Interestingly, in the case of crimes the effect even increases: holding equal (this proxy for the) transfers received by firms in each municipality, the difference in the crime rate would have been even higher. Nevertheless, better quality data are needed to draw more serious conclusions on the effects of this economic channel.

We delay discussion of migration to the next dedicated subsection.

## 6.1 Migration flows

So far, we have ignored the possibility of migration. In what follows we try to relax this assumption, extending the analysis in two dimensions: first, we try to answer the question of whether estimated cultural changes are, actually, the result of a physical local replacement of people, i.e. the result of their inflows and outflows, carrying different cultural backgrounds with them; secondly, we deal with the problem of selective migration, that is whether people sorted themselves according to their behavioral characteristics.

To answer the first question, we resort to municipal level data on residents migration flows. Unfortunately, these data do not specify at the same time municipality of origin and of destination of migrants, as it is instead the case for interprovincial flows. Nevertheless, they allow us to separately control for the effect of immigration on the one hand, and emigration on the other, thus emphasizing the magnitude of the migration phenomenon (the physical replacement of local people), as opposed to just looking at potentially misleading net flows.

We compute inflow and outflow rates (as equal to the number of immigrants and that of emigrants, each divided by the number of local residents) and add their averages per municipality as direct controls in our regressions. As a first approximation, averages are computed over the longest series available, that is from 1931 to 2012 for municipalities in

**Table 6** - Controlling for migration

|                      | Baseline           |                   | Overall flows        |                   | Period flows        |                   | Origin/Destination   |                   |
|----------------------|--------------------|-------------------|----------------------|-------------------|---------------------|-------------------|----------------------|-------------------|
|                      | Crime              | Refer.            | Crime                | Refer.            | Crime               | Refer.            | Crime                | Refer.            |
| Center               | -196.0**<br>(98.2) | 0.15***<br>(0.03) | -216.7***<br>(78.1)  | 0.15***<br>(0.03) | -188.0**<br>(89.0)  | 0.13***<br>(0.03) | -214.4***<br>(77.9)  | 0.15***<br>(0.03) |
| Inflow               |                    |                   | 11,400***<br>(1,858) | -2.88**<br>(1.24) |                     |                   |                      |                   |
| Outflow              |                    |                   | -8,626***<br>(2,447) | 2.47<br>(1.83)    |                     |                   |                      |                   |
| Inflow<br>1931-1970  |                    |                   |                      |                   | 4,414***<br>(1,601) | -1.18<br>(1.04)   |                      |                   |
| Outflow<br>1931-1970 |                    |                   |                      |                   | -4,097***<br>(843)  | 2.15**<br>(0.89)  |                      |                   |
| Inflow<br>1971-1986  |                    |                   |                      |                   | 2,026<br>(1,604)    | 1.54<br>(0.97)    |                      |                   |
| Outflow<br>1971-1986 |                    |                   |                      |                   | -1,626<br>(1,723)   | 1.55<br>(1.28)    |                      |                   |
| Inflow<br>1987-2012  |                    |                   |                      |                   | 2,978**<br>(1,409)  | -1.96<br>(1.65)   |                      |                   |
| Outflow<br>1987-2012 |                    |                   |                      |                   | 43<br>(2,267)       | -3.99**<br>(1.99) |                      |                   |
| Domestic<br>Inflow   |                    |                   |                      |                   |                     |                   | 12,621***<br>(2,210) | -1.19<br>(1.64)   |
| Domestic<br>Outflow  |                    |                   |                      |                   |                     |                   | -9,231***<br>(2,885) | 0.62<br>(2.12)    |
| Inflow<br>from abr.  |                    |                   |                      |                   |                     |                   | 1,567<br>(3,054)     | -9.50**<br>(3.92) |
| Outflow<br>abroad    |                    |                   |                      |                   |                     |                   | -8,372**<br>(3,481)  | 7.57*<br>(3.97)   |
| Adj. R <sup>2</sup>  | 0.09               | 0.56              | 0.43                 | 0.57              | 0.41                | 0.62              | 0.47                 | 0.58              |

*Note:* Estimated coefficients on Center dummy from fully interacted quadratic polynomials in Euclidean distance from the municipality's townhall to the new border (40 km bands; 136 obs.). "Center" equals 1 if the municipality is in Center, 0 if it is in South. Coefficients on algebraic distance and constant not shown. The flow variables are average rates over the period 1931-2012, unless a different period is indicated. Robust st. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

the Caserta province, and from 1958 to 2012 for all other municipalities. The last column of each panel of Table 5 show that the treatment effects are robust to the inclusion of these flows, sometimes reinforced in significance or magnitude.

As a refinement, we break up each of the two rates first according to a chronological criterion, and then according to whether flows were national or international. In order to capture periods of different migration behavior, for each municipality and flow we compute a distinct average for each of three periods: one from 1931 to 1970, when Italy was still a net sender of workforce abroad and inflows mainly consisted of homecomings of previous emigrants; a second period from 1971 to 1986, which we consider a neutral

time in which Italy was neither an absorber nor a releaser of workforce; and the last one from 1987 to 2012, when immigration of foreigners became a sizeable phenomenon.<sup>12</sup> As a second refinement, municipal inflows were split according to whether they were from other Italian municipalities or from elsewhere, and the same was correspondingly done for outflows. For the major outcomes of total crime rate and referenda turnout in the 40 km bands aside the border, Table 6 compares baseline estimates to results for the full set of regressions in which migration is controlled for. Again, one can immediately notice that controlling for averages in migration flows throughout all variables cuts does not alter the pattern of the treatment effects found earlier.

Focusing on crimes, migration flows turn out to be almost always significant (also in the 25-km bands, not shown). Generally, inflows are positively correlated with crimes, while outflows are negatively correlated, in particular for overall flows, for the 1931-1970 period and for domestic flows. Among outcomes not shown, other interesting relations concern the divorce rate, positively correlated with inflows of new residents, and the percentage of dialect speaking families, negatively related to inflows from other Italian municipalities.

Next we turn to selective migration, or sorting, which could have favored our finding of cultural divergence between areas given that it is based on people's preference to move in places where they can share similar tastes/habits with local residents: brutally speaking, "good" people could have moved in places (inside or outside our region of study) where they were expecting to find other good people, and similarly for bad.

Had intermunicipality migration flows been available, we could have derived a precise map of the migration flows involving municipalities in our Center and South areas. Migrations just across the border, or to any other Italian province, could have been directly controlled for in the regressions, providing treatment effect estimates for the limit case in which all migration per area had been selective. However, migration flows only start being available at the interprovincial level, allowing a loose assessment of the potential magnitude of selective migration: an assessment can be done only for the whole provinces interested, and with no possibility to check for the robustness of the baseline estimates of the treatment effects.

Thus, interprovincial flows can only give a sense of the flows occurred between our Center and South areas and between each of these areas and other provinces, identifying a broader upper bound for the selective migration effect. We found two series for such flows: the first one spans years from 1928 to 1938, the second one from 1955 to 2005. The earliest series covers the period in which many workers from other provinces immigrated to reclaim and colonize lands, creating Latina and other municipalities in its surroundings, all of them either excluded from our sample or in our North area. Therefore, the bulk of these early years large inflows did not concern municipalities in

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<sup>12</sup>The starting date of this phenomenon is controversial and we set it interpolating across different sources and assessments (including charity organizations' ones).

**Table 7** - Interprovincial emigration flows in 1955-2005

| Provinces of origin | Provinces of destination |                          |                                |                      |
|---------------------|--------------------------|--------------------------|--------------------------------|----------------------|
|                     | Caserta                  | Frosinone<br>+<br>Latina | Northern<br>Italy<br>provinces | Italian<br>provinces |
| Caserta             | -                        | 1                        | 7                              | 14                   |
| Frosinone + Latina  | 1                        | -                        | 8                              | 12                   |

*Note:* Emigration per 1,000 residents of the province of origin, average over years 1955-2005. Northern Italy provinces exclude Frosinone and Latina (and Caserta). They also exclude Abruzzi and Molise. Italian provinces include all provinces in Italy but the one(s) of origin.

the Center and South areas (i.e. in the southern part of today's provinces of Latina and Frosinone, and in the northern part of Caserta, respectively), which were little affected. How little? The facts that Latina territories belonged to Rome until 1935, and that Caserta had been merged into Naples with the reform, are another obstacle to a neat number, but our calculations, not reported, lead us to consider very limited the impact on people replacement and therefore on possible sorting, and in any case not higher than the one that we are about to see for post-WWII data.

In years 1955 to 2005, the relevant phenomenon was emigration towards, rather than immigration from, Northern Italy. What we find is that, in the period average, 8 persons every 1,000 inhabitants of the province of Caserta migrated yearly to provinces more in the north, 1 of which to Frosinone and Latina. Looking at outflows from these latter two provinces, 8 persons every 1,000 migrated to northern provinces, and 4 persons to southern ones, 1 of which to Caserta (see Table 7). Even though these figures - and the smaller ones from the 1928-1938 period - are not negligible once cumulated over decades, they can hardly make a difference in explaining cultural heterogeneity across the new border.

## 7 Robustness: Placebos treatments

In this section, we briefly test whether, in our sample, a discontinuity occurs only on the new administrative border created with the reform, and not elsewhere too. First, recall that Appendix B shows that no discontinuity is found on the old border (differently from the pre-reform period). Adding to that, here we make up a number of placebo borders across which we evaluate border salience. We consider three imaginary borders drawn in the middle of each of the three areas that we identified, i.e. 20 km from either the new or the old border. Results for observations in each area, i.e. included in 20 km bands, are shown in Table 8: they make evident that moving away from the new border washes away the treatment effects, supporting the validity of our findings.

**Table 8** - Treatment effects across placebo borders

|                | Dependent Variable |                 |                 |               |               |               |                 |
|----------------|--------------------|-----------------|-----------------|---------------|---------------|---------------|-----------------|
|                | crimes             |                 |                 | refer.        | non-prof.     | divor         | cheat           |
|                | total              | <i>violent</i>  | <i>other</i>    | turnout       | associat.     | ced           | ing             |
| South-placebo  | -41.6<br>(61.9)    | -16.3<br>(10.4) | -25.2<br>(53.9) | -0.0<br>(0.0) | -1.1<br>(1.1) | 1.0<br>(2.2)  | -15.6<br>(21.5) |
| Adjusted $R^2$ | 0.081              | 0.252           | 0.046           | 0.027         | -0.047        | 0.201         | -0.068          |
| Center-placebo | -7.9<br>(48.5)     | 0.3<br>(6.8)    | -8.2<br>(45.9)  | 0.0<br>(0.1)  | -0.6<br>(1.5) | -5.9<br>(3.8) | 8.2<br>(8.2)    |
| Adjusted $R^2$ | -0.008             | -0.047          | 0.005           | -0.034        | -0.017        | 0.015         | 0.137           |
| North-placebo  | -1.9<br>(65.5)     | 8.1<br>(10.0)   | -10.0<br>(62.3) | -0.0<br>(0.1) | 0.2<br>(1.7)  | 2.4<br>(3.1)  | 33.1*<br>(19.2) |
| Adjusted $R^2$ | -0.042             | -0.009          | -0.051          | 0.015         | 0.178         | 0.086         | 0.071           |

*Note:* Coefficients on placebo area dummies from a fully interacted quadratic polynomial in Euclidean distance from the municipality’s townhall to each placebo border (20 km bands; 70, 66 and 61 obs. respectively for South, Center and North placebo areas). Each placebo dummy equals 1 if the municipality is above the placebo border, 0 if it is below. Constant and algebraic distance coefficients not shown. The North-placebo sample excludes Latina, Sabaudia and Pontinia, and includes a dummy for each of the three pre-existing municipalities interested by marsh reclamations (see Appendix B). Robust st. err. are in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

## 8 Determinants of cultural dynamics: some hints

The quest for the determinants of social capital is still an open field. Some contributions have looked in various forms at institutional ones (e.g., Jacob and Tyrrell, 2010; Becker *et al.*, 2011; Nunn and Wantchekon, 2011; Barone-De Blasio, 2013). Another group of papers (see, in particular, Glaeser *et al.*, 2002, but also DiPasquale-Glaeser, 1999, and Glaeser-Redlick, 2009) have focused on the economic side, seeing social capital as any other form of capital, subject to accumulation laws determined by individual purposeful actions. It may be objected that this kind of capital has its own peculiarities, and that culture may change also as an unintentional externality effect. At any rate, wherever they come from,<sup>13</sup> economic determinants of social capital open the way to a circularity often overlooked in the literature dedicated to the impact of culture on economic variables. As Tabellini (2010, p. 678) stresses, “the key difficulty in estimating a causal effect of culture is that it is endogenous to economic development”.<sup>14</sup> Some empirical contributions have singled effects out by resorting to large unanticipated economic shocks or fully exogenous circumstances, like discoveries of mineral resources (e.g., the

<sup>13</sup>See Miguel *et al.*, 2006, and Barone-Mocetti, 2014, for alternative channels from economics to social capital dynamics.

<sup>14</sup>Doepke and Zilibotti (2013) outline a theoretical model of the two-way effect between economic growth and culture.

Gold Rush exercise by Couttenier and Sangnier, 2012),<sup>15</sup> or climatological differences (e.g., Duranton, 2011).<sup>16</sup>

Having these previous analyses in mind, we ask ourselves what could have triggered or be key to the (heterogeneous) cultural transformation that our experiment has demonstrated. In particular, we wonder whether there was any role for institutional or economic factors in shaping cultural evolution. Section 6 has already highlighted how economic driving forces, embedded in the job and network relations of a local labor market, might have favored cultural homogenization across the border. Differentiation at the border must have derived from other, prevailing forces, possibly in the same domain. To try to figure them out, it seems worth to explore the role played by the major institutional and economic innovations which impinged on our areas, and which possibly made a difference.

A sequence of shocks with institutional and economic content did hit the areas with the reform and after. One shock was concomitant, consisting of local innovations in public expenditures associated to the creation of two provincial administrations and the abolition of one: we postpone details of its economic dimensions to Appendix C.

We have already tried, again in Section 6, to tackle a second main shock that hit our whole region of study, namely the local funding intervention by the Cassa per il Mezzogiorno, the public institution operative in the whole Southern Italy (slightly extended upward) between the 1950's and the 1980's. At first, it pursued only infrastructuring; later on financial support to entrepreneurial activity too. Results based on the very scant data available to us showed that the Cassa expenditure for local firms financing, balanced across the two sides of the border, displayed only a limited impact on cultural divergence. Better data might however be more informative and improve this result.

A third, relevant shock was the institution of regional administrations in Italy, starting in 1970. With them, political decentralization brought to a local level the government of many functions that used to be a State prerogative. Given that the contemporary cultural discontinuity in the area of study occurs exactly at the regional jurisdiction limit, chances are that - even starting from a homogeneous level of pre-reform administrative efficiency, as shown at least in the judicial domain - the role of this institution for the detected cultural dynamics might have been sizeable (perhaps because of the adverse evolution of the levels of local services provided in Campania, and the effects on social cohesion that this might have entailed).<sup>17</sup> It is possible that this role would have been exerted for any extension that Latium and Campania had had at the time of

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<sup>15</sup>Along these same lines, mines are used as instruments in Buonanno *et al.* (2012), while rainfall shocks in Barone and Narciso (2013).

<sup>16</sup>In a comparison with Sicily, Duranton shows that the more intense mutual insurance behaviors in Britain can be associated to a higher past climatic variability. However, Sicilian observations come from interpolation over a smaller number of weather stations per grid cell.

<sup>17</sup>For contributions on how local administrative behaviors are related to social capital dynamics, see Barone-Mocetti, 2011, and Camussi-Mancini, 2014.



the regional decentralization: under this hypothesis, the fact that the border had been shifted southwards would be void of substantial impact, and would just be useful to us for identifying social capital change.

Such list of events yields no conclusion at the moment. To assess their role, more data are needed, especially for the intermediate phases between the eve of the reform and the contemporary period. Future work may be able to single out the determinants of the observed cultural transformation, assigning the right weight to economic factors too and thus, perhaps, highlighting how culture is affected by the variables which it concurs to determine.

## 9 Conclusions

With the aim of re-assessing cultural persistence, we have set up the study of a natural experiment based on the informativeness of culturally comparable local data regarding individual and institutional behaviors. In particular, we have analyzed a social capital case-study conducted on the border of a depressed area. Following a simple administrative reform (a provincial/regional border shift) in Central-Southern Italy of the first half of the 20th century - a sort of perturbation method involuntarily implemented by the dictatorial legislator - we have found that by the end of the century a number of (robust) local cultural discontinuities had emerged where apparently there was none and, in principle, there was no reason for them to occur given a long common background. In particular, we have shown that the area of Southern Italy that we have analyzed has experienced a quite rapid social capital worsening compared to the area at its immediate north, characterized by the same cultural and institutional history. While we believe that cultural inertia is a fact of life too, we take our results as evidence that culture is endogenous and that it may change over a reasonable span of time: despite its intrinsic degree of persistence, culture is an outcome, possibly of quite recent determination, rather than an endowment basically determined in a remote past.

The border shift did not cause by itself the observed local dynamics, but it is very useful as an instrument to capture them. We have posited some conjectures for factors that might have contributed to the observed change in levels of social capital, but more work is needed on this front.

Given its focus on local dynamics, the natural experiment that we consider has the potential to be instructive for understanding mechanisms of transformation of social capital. This is liable to have several implications, all of them related to the ascertained welfare impact of a given level of social capital.

First, for analysis and documentation purposes, once we see that social capital is subject to changes, over shorter or longer horizons, estimation exercises of the impact on economic variables of a given social capital distribution become less straightforward. In particular, under the hypothesis of the endogeneity of culture to the economic process,

the results of a number of empirical exercises on the economic impact of social capital would be at least quantitatively questioned, as they would become liable to the same objection of circularity set forth for exercises willing to gauge the impact of economic variables on social capital. Over recent years, the literature has become increasingly aware of this caveat, and therefore more careful in empirical studies. A general prescription which can be derived is that any exercise which aims at evaluating the impact of culture on the economy should take care of the possible two-way, and usually spiralling, relation existing between these two objects. More research is due on the topic.

Second, for policy purposes, focusing a research agenda on social capital dynamics, also based on the analysis of special historical cases in which changes materialized discretely, can be rewarding in that it can single out channels through which social capital accumulation can occur. This in turn could be of relevance for instructing policy-makers, left hopeless by the message of the persistence literature: social capital has ancient roots and will improve with great difficulty (with the remote past uninformative about recipes on how to do it). Instead, if culture is endogenous as this paper has shown, a question is put on the table: if it has changed, as it did quite recently, how to make it change again (and in a desirable direction)? Understanding factors contributing to cultural dynamics may open the way to a better design of policy interventions targeted at hitting the keys to a social capital surge in areas featuring current under-endowment.

# Appendix

## A The data

We set up an innovative data-set, assembling cultural and economic variables from a large number of sources, mostly at subprovincial level, running throughout the history of unified Italy. Non-contemporary entries (the earliest, from 1874) were mainly inputted from books stored in the archives of three libraries, whose welcome and help were much appreciated: Baffi (Banca d'Italia), Istat, and National of Naples. Data were collected for the areas of interest (provinces of Caserta, Latina, Frosinone, Rome plus two Is-ernia municipalities) at the level of provinces, judicial districts, school districts, and municipalities.

### A.1 Provincial data

- Province Administration Balance Sheets.
- Interprovincial migration flows, 1928-1938 and 1955-2012. Source: ISTAT.
- Marsh reclamation expenditures per province at 1938. Source: Tassinari (1939).

### A.2 Judicial district data

We collect data on incoming and settled first-degree lawsuits per judicial district of the pre-reform period. We use the judicial district capital to pinpoint geographic location of the district. We consider only districts strictly included in each of our areas, exploiting the fact that their territories did not cross any of the two borders in our focus. For the years for which we present data (1874-1875 for crime rate and criminal court efficiency, 1874-1876 for civil court efficiency, 1878-1879 for lawsuits duration and 1885-1891 for litigation rate), we have a total of 40 judicial districts observations, covering 176 out of the 197 municipalities registered in our full sample.<sup>18</sup>

The collection of useful data is constrained by the evolution of recording strategies and of judicial geography. First, in the years immediately after those just listed, civil and criminal lawsuits data started to be provided with no distinction between new and pending lawsuits. Also, they quite soon started to be published in more aggregate forms, i.e. for higher-level judicial areas. Together with the continuous process of judicial districts merging (leaving few available observations, also for entrance-level *Giudici di Pace*), such modifications have been limiting up to our days the use of judicial sub-provincial data.

A descriptive list of the variables used, in order of appearance, follows:

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<sup>18</sup>Our sources are statistics publications from the Ministero di Grazia e Giustizia e dei Culti (henceforth, MGGC): “Statistica degli affari civili e commerciali e degli affari penali” (1875) and its continuation, and “Prospetti statistici dimostrativi dei termini entro cui furono pubblicate le sentenze civili e commerciali delle corti, dei tribunali e delle preture” (1879, 1880).

*Crimes*: Number of convictions per 1,000 inhabitants. Average over years 1874-1875. Source: MGGC.

*Violent crimes*: Number of convictions for crimes against other people (murders, assaults, threats, insults, rapes) per 1,000 inhabitants. Average over years 1874-1875. Source: MGGC.

*Crimes against property*: Number of convictions for theft per 1,000 inhabitants. Average over years 1874-1875. Source: MGGC.

*Litigation rate*: Number of new civil lawsuits per 1,000 inhabitants. Average over years 1885-1891. Source: MGGC.

*Criminal court efficiency*: Number of first-degree defined cases divided by the sum of new and pending criminal lawsuits. Average over years 1874-1875. Source: MGGC.

*Civil court efficiency*: Number of first-degree settled cases divided by the sum of new and pending civil lawsuits. Average over years 1874-1876. Source: MGGC.

### A.3 School district data

The Italian institute for education assessment (Invalsi) collects data at school district level on several dimensions of the education process. We use Invalsi data from a questionnaire submitted to 5th grade students as part of the annual institutional test. Data (average at school district level over schools located in municipalities in the district) are imputed to the municipality which hosts the district headquarters. Academic year is 2009-2010.

A descriptive list of the variables used, in order of appearance, follows:

*Cheating*: Indicator of cheating elaborated using average performance and concentration of performances in a test. Unless otherwise indicated, performances are in math tests. Source: Invalsi.

*Negative attributional style*: Net percentage of test answers in which students blame on themselves for negative events and praise external factors for positive ones, net of opposite attributions. Source: Invalsi.

*Dialect*: Percentage of children speaking mainly dialect at home. Source: Invalsi.

*Bullying*: Frequency of bullying episodes during the previous month. Source: Invalsi.

### A.4 Municipal data

As explained in Section 2, given the distance between the two borders identifying our Center area, our total sample includes municipalities lying within 40 km from each border; as a result, our three areas host 200 equally-distributed municipalities. These exhaust municipalities in Frosinone province, about so in Latina (28 out of 33), two thirds of them in Caserta (68 out of 104); for geographical continuity, 13 municipalities in Rome province and 2 in Isernia are also included. As visible in Figure 1, three observations (Latina, Sabaudia and Pontinia) were excluded from the North area sample

as they were founded after 1927 almost exclusively by families coming from elsewhere in Italy for the marsh reclamation and city building campaigns, according to the policies of internal migration of the Fascist regime.<sup>19</sup> Results on the local cultural transformation would be biased by their inclusion. In the RD analysis for the border between North and Center areas (Appendix B) we use a dummy for Sermoneta, Terracina and San Felice Circeo, pre-existing villages affected by the campaign and by the specific internal migration in the decade after the administrative reform.

A descriptive list of the variables used, in order of appearance, follows:

*Elevation*: Elevation (m.) of the main square of each municipality. Source: ISTAT.

*Maximum difference in elevation*: Distance (m.) between the highest and the lowest point in the municipal territory. Source: ISTAT.

*Distance from coast*: Euclidean distance (km.) from the municipality's townhall to the coast. Source: elaborations on GIS.

*Time from Rome/Naples*: Hours needed to reach either Rome or Naples (decimal scale). Source: [www.viamichelin.it](http://www.viamichelin.it)

*Size*: Size of the municipal territory (square km.). Source: ISTAT.

*Population*: Number of inhabitants. Year: 2012. When used as denominator to compute rates, the year matches with that of the respective numerator. Source: ISTAT.

*Graduates*: Number of graduates per 1,000 inhabitants more than six years old. Average over years 1981, 1991 and 2001. Source: ISTAT.

*Income tax base*: Income tax base over population. Euros. Average over years 2003-2006. Source: Ministry of Treasury.

*Residential property wealth*: Residential property tax base over population. Euros. Year: 2006. Source: Ministry of Interior.

*Recycled waste*: Percentage of recycled waste. Year: 2009. Source: Regione Lazio and DPS-ISTAT.

*Houses served by aqueduct*: Percentage of houses served by aqueduct. Average over years 1981, 1991 and 2001. Source: ISTAT.

*Municipal personnel expenditure*: Per-capita municipal personnel expenditure. Euros. Average over years 1998-2011. Source: Ministry of Interior.

*Crimes*: Number of criminal events per 1,000 inhabitants. Sum over years 2004-2009. Source: Ministry of Interior.

*Violent crimes*: Number of murders, assaults, batteries, threats, insults and sexual crimes per 1,000 inhabitants. Sum over years 2004-2009. Source: Ministry of Interior.

*Other crimes*: Number of episodes of theft, robbery, extortion, usury, kidnapping, conspiracy, organized crime, money laundering, fraud, arson, damage, smuggling, drug, exploitation of prostitution, forgery, intellectual property right infringement, others, per

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<sup>19</sup>The pre-existing municipality of Cisterna di Latina, which experienced triple population in ten years for being the seat of the campaign headquarters, was excluded from the outstart for just exceeding our distance criterion.

1,000 inhabitants. Sum over years 2004-2009. Source: Ministry of Interior.

*Referenda turnout*: Turnout rate at Italian referenda held in years 2009 and 2011. Average. Data on turnout at other contemporary referenda were not available at a municipal level. Source: Ministry of Interior.

*European elections turnout*: Turnout rate at 2004 and 2009 European elections. Average. Source: Ministry of Interior.

*Non-profit organizations*: Number of local branches of non-profit organizations (excluding Church-based voluntary organizations) per 1,000 inhabitants. Year: 2001. Source: ISTAT.

*Administrative efficiency*: Number of municipal balance sheet parameters in the "structural deficit" range. Year: 2009-2011. Source: Ministry of the Interior.

*Divorced*: Number of divorced people per 1,000 inhabitants. Average over years 2002-2012. Source: ISTAT.

*Distance to highway*: Euclidean distance (km.) from the municipality's townhall to the closest Rome-Naples highway access. Source: our elaborations on GIS.

*Population density*: Number of inhabitants divided by municipal size. Year: 2012. Source: ISTAT.

*Literacy rate*: Percentage of residents, at least 6 years old, that could read. Year: 1921 and 2001. Source: Istituto Centrale di Statistica and ISTAT.

*Town*: Dummy for municipalities with more than 15,000 inhabitants in 2012.

*Local labor markets (LLM)*: Categorical variable indicating the local labor market in which each municipality is included. Year: 2001. Source: ISTAT.

*Cassa Mezzogiorno*: Median of the size class of persons employed in a firm plant that received at least one investment subsidy from the Cassa per il Mezzogiorno in the period 1965-1977. Sum over firms in a municipality. Source: CESAN.

*Inflow/Outflow*: Number of immigrants/emigrants divided by the number of local residents. *Domestic* is for people coming from/going to other Italian municipalities. *Inflow from abroad / Outflow abroad* is for people coming from/going abroad plus other incoming/outgoing. Average over years 1931-2012 for municipalities in the province of Caserta, and over years 1958-2012 for the other municipalities. Source: ISTAT - Municipal Offices of Vital Statistics data.

## **B RD on the Old Border**

In this Appendix we briefly report about the RD exercises performed on the old Latium-Campania border. Coinciding also with geographical impediments, this border was effective as a political boundary for more than a millennium, marking a divide epitomized in a linguistic differentiation between its two sides. Upon Italian unification in 1870, it was downgraded to administrative border, until being totally erased by the 1926 reform. It is now a line entirely internal to southern Latium, cutting in halves the provinces of

Latina and Frosinone. For comparison and complement to our main exercise, we ask whether cultural convergence has occurred among municipalities in this part of Latium.

Figure B.1, counterpart to Figure 3 related to the new border, provides a first visual impression of continuity in contemporary social capital and cultural indicators at the old border. Formal RD analysis, for the same set of specifications used for Table 2 in text, gives virtually full confirmation to this impression (see Table B.1). The only exception is a higher cheating in North with respect to Center, but just in the linear specification. Note that (Table B.2) covariates balancing holds across the old border too.

Differently from contemporary outcomes, data for the pre-treatment period provide evidence of behavioral and institutional discontinuities at the old border. Table B.3 shows that, before the reform, literacy, litigation rate and criminal and civil court efficiency were different on that border, while no difference emerged in crimes.

We interpret these results as a further confirmation of cultural dynamics. During the 20th century, i.e. a few decades from today, a cultural differentiation emerged where, on the new border, there was none, while an homogenization of earlier cultural differences emerged there where the old separating border was located.

**Figure B.1** - Non-linear fits around the Old Campania-Latium border



**Table B.1** - Contemporary RD as funct. of geographic location across the Old Border

|   | Dependent Variable |                |                 |               |               |               |                  |
|---|--------------------|----------------|-----------------|---------------|---------------|---------------|------------------|
|   | crimes             |                |                 | refer.        | nonprof.      | divorced      | cheating         |
|   | total              | <i>violent</i> | <i>other</i>    | turnout       | associat.     |               | in math          |
| Panel I. Fully Interacted Linear Polynomial in Algebraic Distance to the Old Border     |                    |                |                 |               |               |               |                  |
| North<br>< 40km   | -1.1<br>(21.3)     | 1.3<br>(3.6)   | -2.4<br>(19.6)  | 0.0<br>(0.0)  | -0.3<br>(0.5) | -0.3<br>(1.3) | 19.0**<br>(8.6)  |
| Adj. $R^2$  | -0.02              | -0.01          | -0.02           | 0.04          | 0.16          | 0.01          | 0.06             |
| North<br>< 25km   | 3.5<br>(24.9)      | -1.1<br>(3.9)  | 4.6<br>(23.2)   | 0.0<br>(0.0)  | -0.4<br>(0.5) | -0.4<br>(1.6) | 24.7**<br>(11.7) |
| Adj. $R^2$  | 0.06               | 0.03           | 0.06            | -0.03         | 0.09          | 0.05          | 0.07             |
| Panel II. Fully Interacted Quadratic Polynomial in Algebraic Distance to the Old Border |                    |                |                 |               |               |               |                  |
| North<br>< 40km   | 13.5<br>(29.2)     | -3.0<br>(4.7)  | 16.5<br>(26.8)  | 0.0<br>(0.1)  | -0.9<br>(0.7) | -0.6<br>(2.1) | 19.3<br>(13.3)   |
| Adj. $R^2$  | 0.02               | 0.03           | 0.02            | 0.03          | 0.16          | -0.01         | 0.03             |
| North<br>< 25km   | -8.7<br>(38.4)     | -5.7<br>(5.2)  | -3.0<br>(36.1)  | 0.0<br>(0.1)  | -1.1<br>(0.7) | 0.0<br>(2.6)  | 10.5<br>(14.2)   |
| Adj. $R^2$  | 0.04               | 0.01           | 0.04            | -0.06         | 0.10          | 0.09          | 0.05             |
| Panel III. Fully Interacted Cubic Polynomial in Algebraic Distance to the Old Border    |                    |                |                 |               |               |               |                  |
| North<br>< 40km   | -22.2<br>(41.3)    | -7.4<br>(6.2)  | -14.8<br>(38.2) | 0.0<br>(0.1)  | -1.1<br>(0.9) | -0.9<br>(3.0) | 17.2<br>(16.1)   |
| Adj. $R^2$  | 0.02               | 0.02           | 0.01            | 0.01          | 0.15          | 0.02          | 0.00             |
| North<br>< 25km   | 1.0<br>(55.3)      | -12.0<br>(8.8) | 13.0<br>(50.7)  | -0.1<br>(0.1) | -1.7<br>(1.2) | 0.7<br>(4.0)  | 1.0<br>(21.2)    |
| Adj. $R^2$  | 0.02               | -0.002         | 0.01            | -0.07         | 0.08          | 0.13          | 0.12             |

*Note:* Estimated coefficients on North dummy from regressions on polynomials in Euclidean distance from the municipality's townhall to the border, including interaction with the area dummy. "North" equals 1 if the municipality is in North, 0 if it is in Center. The degree of the polynomial and of the interaction is linear in Panel I, quadratic in Panel II, cubic in Panel III. Constant and algebraic distance coefficients not shown. First lines in each panel consider municipalities within 40 km of the border (127 municipalities and 66 school districts); second lines reduce this distance to 25 km (88 municipalities and 49 districts). The North sample excludes Latina, Sabaudia and Pontinia (see Appendix A). Robust standard errors in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.



**Table B.2** - Balancing properties for the baseline covariates

|   | Dependent Variable |                 |                   |                 |                 |                 |                 |                  |
|---|--------------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|------------------|
|   | Elevation          | Dist. coast     | Popu lation       | Time Rome       | Time Naples     | Dist. highway   | Grad uates      | Pop. density     |
| Panel I. Municipalities within 40 km of the border (127 obs.) |                    |                 |                   |                 |                 |                 |                 |                  |
| North   | -130.3<br>(94.6)   | -9.92<br>(6.75) | 3,830<br>(4,664)  | -0.10<br>(0.13) | -0.12<br>(0.17) | -0.74<br>(3.83) | -0.01<br>(0.01) | 15.2<br>(66.9)   |
| Adj. $R^2$  | 0.147              | 0.125           | -0.006            | 0.339           | 0.515           | -0.013          | 0.083           | -0.015           |
| Panel II. Municipalities within 25 km of the border (88 obs.) |                    |                 |                   |                 |                 |                 |                 |                  |
| North   | 114.0<br>(95.9)    | -1.35<br>(7.96) | -2,094<br>(5,262) | -0.08<br>(0.16) | -0.06<br>(0.20) | -1.64<br>(4.86) | -0.01<br>(0.01) | -81.7<br>(88.45) |
| Adj. $R^2$  | 0.149              | 0.073           | -0.021            | 0.289           | 0.346           | -0.030          | 0.054           | -0.032           |

*Note:* Estimated coefficients from a fully interacted quadratic polynomial in Euclidean distance from the municipality's townhall to the border. "North" equals 1 if the municipality is in North, 0 if in Center. Constant and algebraic distance coefficients not shown. The North sample excludes Latina, Pontinia and Sabaudia (see App. A). Robust st. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

**Table B.3** - Pre-treatment RD as funct. of geographic location across the Old Border

|   | Dependent Variable |                    |                           |                        |                      |
|---|--------------------|--------------------|---------------------------|------------------------|----------------------|
|   | crime rate         | litigation rate    | criminal court efficiency | civil court efficiency | literacy rate        |
| Panel I. Fully Interacted Linear Polynomial in Algebraic Distance to the Old Border |                    |                    |                           |                        |                      |
| North   | -1.294<br>(2.769)  | 6.748**<br>(3.084) | -0.083**<br>(0.036)       | 0.252***<br>(0.066)    | -0.156***<br>(0.034) |
| Adj. $R^2$  | -0.059             | 0.098              | 0.278                     | 0.397                  | 0.152                |
| Panel II. Interacted Quadratic Polynomial in Algebraic Distance to the Old Border   |                    |                    |                           |                        |                      |
| North   | -1.114<br>(2.962)  | 5.272*<br>(2.761)  | -0.076**<br>(0.036)       | 0.245***<br>(0.064)    | -0.181***<br>(0.035) |
| Adj. $R^2$  | -0.096             | 0.140              | 0.273                     | 0.378                  | 0.213                |

*Note:* Estimated coefficients from regressions on a polynomial in Euclidean distance from the municipality's townhall to the border. "North" equals 1 if the observation is in North, 0 if it is in Center. Panel I: linear polynomial with linear interaction; Panel II: quadratic polynomial with linear interaction. Algebraic distance coefficients not shown. Except for literacy (municipal), the units of observation are the trial courts strictly included in the symmetric 40-km bands from the border (29 obs.). Robust std. err. in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

## C The economic implications of the reform

We provide some additional detail on the exogenous economic shocks which came along with the administrative reform. The main ones were related to the creation of two new provinces and the abolition of a third one, and to the huge campaign of public works (especially, marsh reclamation) associated to the colonization of the province of Latina.

At the end of 1926, Frosinone, with its 13,380 inhabitants, was only the sixth largest town of the province that it was going to head. It was lacking not only all kinds of buildings, facilities and services to serve its new role, but also basic premises like a secondary school (see Jadecola, 2003). The news of the upgrade caused a great local movement, aimed at hosting all the new kind of institutions and organizations, from the largest to the smallest, that by law or default the new status of capital of province entailed. Just to mention a few, these included premises (and employees' housing) for: the Province Administration itself, the local representation of the Government (*Prefettura*), the provincial headquarters for a number of public and private institutions and services (Bank of Italy, Fascist Party, postal office, trade unions, tax collection, public health service).<sup>20</sup>

As for Latina, not only those institutions, but the city itself had to be created anew. In view of obvious large start-up needs, Mussolini himself - reporting to the Parliament on the law for the creation of the Province at the end of 1934 - highlighted the provision according to which the government would have taken charge of the financial unbalances of the new administration and its municipalities (often newly founded, as in the case of the province capital itself).<sup>21</sup> Data below will show that actually it did.

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<sup>20</sup>In an interview of March 1927, i.e., on the immediate aftermath of the reform, the new Prefetto gave an idea of these movements: "La prefettura è stata allocata nella sede della sottoprefettura. L'alloggio prefettizio è già in ordine. Mentre gli uffici amministrativi funzionano provvisoriamente nei locali del Commissariato di P.S. la Questura ha trovato conveniente sede, riordinata ed adattata allo scopo, nell'antica pretura, che è passata al vecchio municipio, il quale si è trasferito nella nuova degnissima sede recentemente completata (...) Sono anche ormai a posto la Federazione Provinciale Fascista, i Sindacati, il Patronato Nazionale, la Federazione degli Enti Autarchici, la Milizia, la Cattedra Ambulante di Agricoltura, la Divisione dei Regi Carabinieri, l'Amministrazione Provinciale. (...) Sono in corso le pratiche per il miglioramento degli uffici postali e per la costituzione della Direzione Provinciale delle Poste e Telegrafi. È già pronta la sede per l'Intendenza di Finanza. Gli altri uffici, a mano a mano che saranno qui costituiti, potranno avere conveniente sistemazione nei locali dove sono ora le scuole, le quali passeranno tra pochi mesi nel nuovo edificio scolastico, che potrà essere degnissima sede anche di istituti medii. Sono già innanzi le pratiche per la edificazione di case per impiegati, e si prepara il progetto del Palazzo di Giustizia che renderà disponibili gli attuali locali destinati a sede del Tribunale e della corte di Assise. La Giunta Provinciale Amministrativa è già in funzione; la commissione Provinciale annonaria già attende al suo compito. Il Comitato forestale è già nominato, la Commissione del Tiro a Segno è costituita, quella per gli orfani di guerra lo sarà tra giorni, e così tra poco funzioneranno il Consiglio Provinciale Sanitario e tutte le altre Commissioni stabilite dalle varie leggi" (Giuliani, 1928). He was not mentioning a key organism, which he was chair of, the Consiglio Provinciale dell'Economia, a promoter of local economic development.

<sup>21</sup>"L'articolo 4 pone sotto la speciale tutela del Ministero dell'Interno anche la provincia di Littoria

**Table C.1** - Real per capita Provinces expenditures and government transfers

|           | Total<br>expenditure | Gov.t<br>transfers | Total<br>expenditure | Gov.t<br>transfers |
|-----------|----------------------|--------------------|----------------------|--------------------|
|           | <u>1936 to 1939</u>  |                    | <u>1946 to 1948</u>  |                    |
| Latina    | 28.3                 | 7.2                | 34.1                 | 3.4                |
| Frosinone | 24.4                 | 2.8                | 26.6                 | 2.1                |
| Caserta   | 21.9                 | 1.4                | 22.6                 | 0.3                |

*Note:* Average over years. Values are expressed in liras per capita at 1938 constant prices. For years 1936-1939, unitary values for Caserta are those for the Provincial administration of Naples.

According to an historian, the creation of the two new provinces constituted “an attempt to give impulse to a stagnating local life by introducing the political and bureaucratic structures of the State and of the Fascist Party (prefettura, federazioni dei fasci, consigli provinciali dell’economia, sindacati, ispettorati e uffici di settore, opere assistenziali) to later assign them public investment”.<sup>22</sup>

The investment flows to set and start up the new provincial institutions and organisms, corresponded by parallel expenditure for their ordinary business (including personnel expenditure), overall generated an increase in all branches of local economy. By contrast, the economy of the Caserta area received the same kind of shock but with a negative sign, until its reinstatement on a smaller scale at the end of 1945.

In order to try to grasp a quantitative flavor of this asymmetric economic shock, we look at provincial administration balance sheets checking the territorial distribution of per capita local public expenditure and government transfers in the years after the reform. However, available data are affected by three problems: first, in those immediate years the comparison of Latina and Frosinone can only be made with the wider province of Naples (in which the remainder of that of Caserta was melted), highly conditioned by its capital city; secondly, after the reform, 1936 is the first year for which balance sheet data were published (budgeting is instead available already for 1928 and 1935); last, the war soon interrupted the series. With these constraints in mind, in the first two columns of Table C.1 we can see that, in the 1936-1939 average, real per capita expenditure in Latina and Frosinone was equal to 28 and 24 liras, respectively; in Naples was 22. Real

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e i Comuni assegnati alla sua circoscrizione sprovvisi dei mezzi necessari per raggiungere il pareggio dei proprio bilanci. (...) Per assicurare il funzionamento dei detti Enti, lo stesso art. 4 dispone che venga ad essi corrisposto dall’Opera Nazionale Combattenti un contributo integrativo da determinarsi con poteri discrezionali dal Ministero dell’Interno.” *Atti Parlam. Legisl. XXIX, Camera dei Deputati, doc. 254.*

<sup>22</sup>Our translation from Musci, 1996, pp. 129-130, who later concludes that “Gli anni Trenta e Sessanta sono quelli in cui il rafforzamento dell’iniziativa statale nei flussi di investimento permette un aumento sensibile degli interventi di trasformazione infrastrutturale e produttiva del territorio”.

government transfers were more unbalanced, being 7 liras per capita in Latina, 3 in Frosinone, and only 1 in Naples. The table uses the Bank of Italy public administration value added deflator (Baffigi, 2011) and ISTAT inter-census population per year, but this kind of ranking is robust to a number of deflationary and population measures. As the right-hand side couple of columns in the table show, the ranking applies also when looking at immediate post-war data, when the Province of Caserta was re-established.

Another big source of public works was the one that accompanied, and followed, the reform, namely the huge campaign of marsh reclamation that made living and farming possible where earlier it was not. This involved also the province of Caserta, but it happened with a unique intensity in that of Latina, whose very existence is due to that campaign. Works were either realized directly by the State, or - as it was most the case - given in concession to other entities. Based on Tassinari (1939) we can have a detailed picture of the distribution of the provincial per-capita expenditure for reclamation work realized in concession as of July 1938. Table C.2 shows that reclamation expenditures were much more intense in the province of Latina, where the ensuing creation of land value was therefore extraordinary.

**Table C.2** - Works for marsh reclamation realized in concession in 1938 per province

|           | Total Amount<br>(million liras) | Per-capita Amount<br>(liras) |
|-----------|---------------------------------|------------------------------|
| Latina    | 599.4                           | 2244                         |
| Frosinone | 5.6                             | 12                           |
| Caserta   | 81.4                            | 149                          |

*Note:* Per-capita amounts are based on population at 1943, as this is the first year for which a population referred to the province of Caserta is available after its abolition.

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