# The Medieval origins of Catholic political preferences*

Alice Dominici[1]

[1]European University Institute, Department of Economics

March 16, 2022

**Abstract**

To what extent do conservative culture and institutions affect conservative political preferences in the long term? In every Italian election with a running Catholic party, regions in north-eastern Italy showed marked differences in their Catholic votes (above 20 p.p.), which are also reflected by anti-divorce and anti-abortion votes in dedicated referenda (1974, 1981). I exploit a natural experiment to disentangle the effects of two possible long-term determinants of these different preferences: conservative formal institutions (the theocratic Papal States), and conservative culture (Medieval patriarchal norms). For several centuries, a river separated two regions: one with conservative culture but progressive institutions, the other with progressive culture and only partially subject to conservative institutions. I formalize and estimate an extension to geographic regression discontinuity designs, the Difference-in-Geographic Discontinuities (DIG) estimator, and I find that conservative institutions do not explain the different votes. I argue that the entire effect is attributable to conservative culture.

JEL Codes: Z10, D72, N9, C21
Keywords: culture, institutions, political preferences, persistence, gender norms

*I thank Sule Alan, Giulia Caprini, Andrea Ichino, Fabrizia Mealli, Alberto Venturin, and all the attendants of the LSE Graduate Economic History Seminar Series and of the EUI Microeconometrics Working Group.

## 1 Introduction

Why do some regions exhibit persistent conservative political preferences? Do conservative cultural norms or conservative institutions have long-term effects on political preferences? If so, to what extent? Central-northern Italy offers a lab to answer. The eastern tract of river Po separates two regions characterized by different cultural norms and historical institutions. It is also the turning point for Catholic votes: north of the river, they notably increase. Indeed, Italians commonly refer to the region north of the river Po as "white", from the colour that identified Catholic workers' leagues dating back to the XIXth century, and more recently the Catholic party *Democrazia Cristiana (DC)* (1943-1994). Conversely, the area south of the river is commonly referred to as "red", from the socialist and communist leagues and parties dominating the local political scene.[1]

This point is illustrated in Figure 1 and Figure 2. Figure 1 plots, for each municipality in north-eastern and north-western Italy ($N = 4523$), the percentage of votes obtained by the Catholic party (DC) in 1979.[2] Horizontal lines are percentiles: in the "slice" between any two consecutive lines (e.g. 15 and 16) there is 1% of all municipalities in the map, approximately 46 for each one. The Po river is approximated by the 28th percentile line: while Catholic votes notably increase north of the Po in the East, this does not happen in the West. To clarify even more the starkness of this increase, Figure 2 shows the same information by "slice", with "slices" on the horizontal axis and the mean percentage of Catholic votes on the vertical axis. The "slices" in the proximity of the Po river in the West do not exhibit an increase in their mean Catholic votes, which remain fairly stable between 30% and 40%. In the East instead, they pass from 25% to approximately 60%.

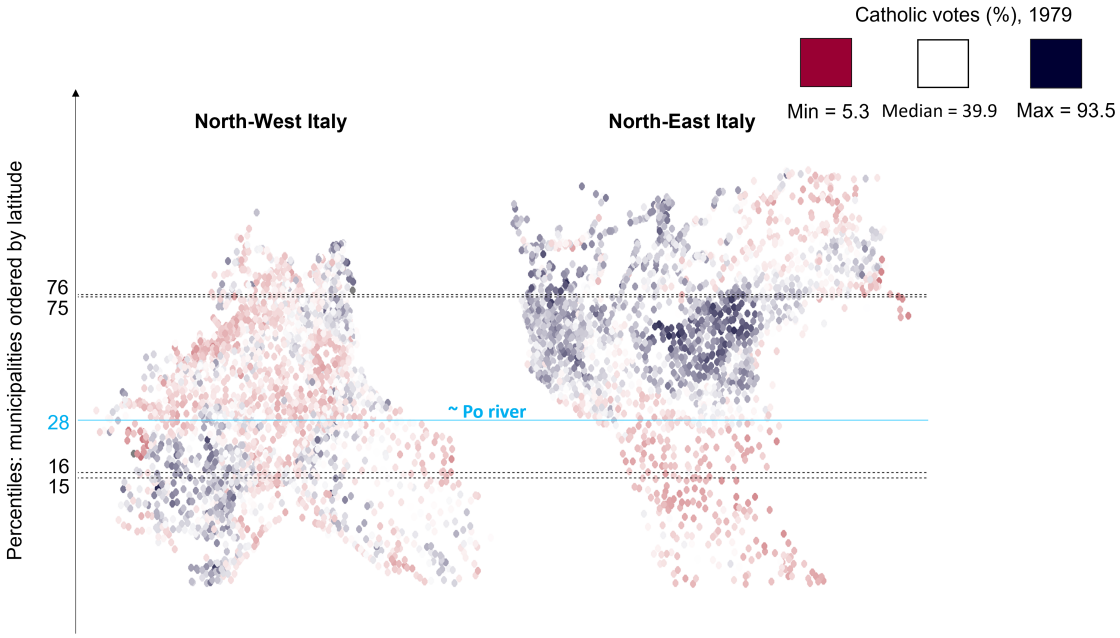
The differences in Catholic votes between the two river banks are accompanied by differences in cultural norms and historical institutions, that I explore as possible long-term determinants of conservative (i.e. Catholic) political preferences. The first candidate determinant is defined as culture (C): by looking at the entire European continent, Todd (1990) theorized that spatial patterns of political preferences and religiosity are explained by family organization and patriarchal rules developed since the Middle Ages, which he defines family systems. North of the Po, these norms are more conservative ($C = 1$), whereas they are more progressive on the southern riverside ($C = 0$). The second candidate determinant relates to formal institutions ($I$). Approximately half of the municipalities south of river Po were part of the Papal States, a theocratic state with conservative formal institutions based on Catholic doctrine ($I = 1$).[3] The other municipalities south of the Po were subject to more progressive institutions. The same is true for the northern riverside, which was entirely under the rule of the Republic of Venice ($I = 0$).

[1] In this tract of the river, the region on the northern riverside is Veneto, whereas the region south of the river is Emilia-Romagna.

[2] The map is essentially unvaried from 1948 until the 1986 elections. I display 1979 because it is the benchmark year for data harmonization, as explained in Section 4.

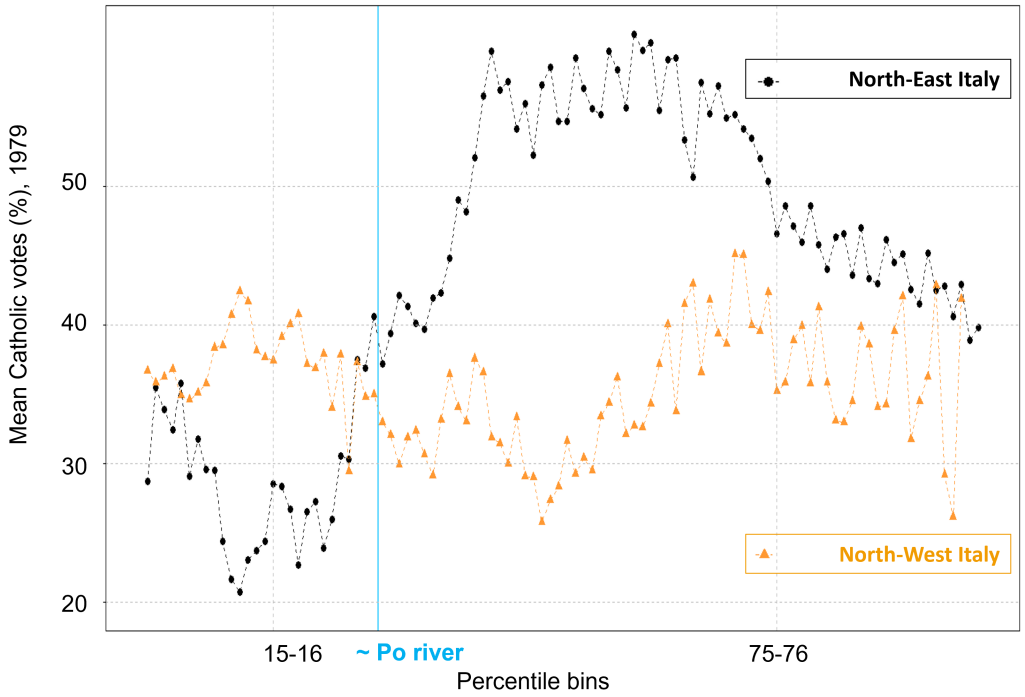
[3] Vatican City, the contemporary evolution of Papal States, is still subject to doctrine-based legislation. For instance, it maintains the illegality of divorce and abortion to this date.

**Figure 1:** (%) Catholic votes (DC) in north-eastern and north-western Italy



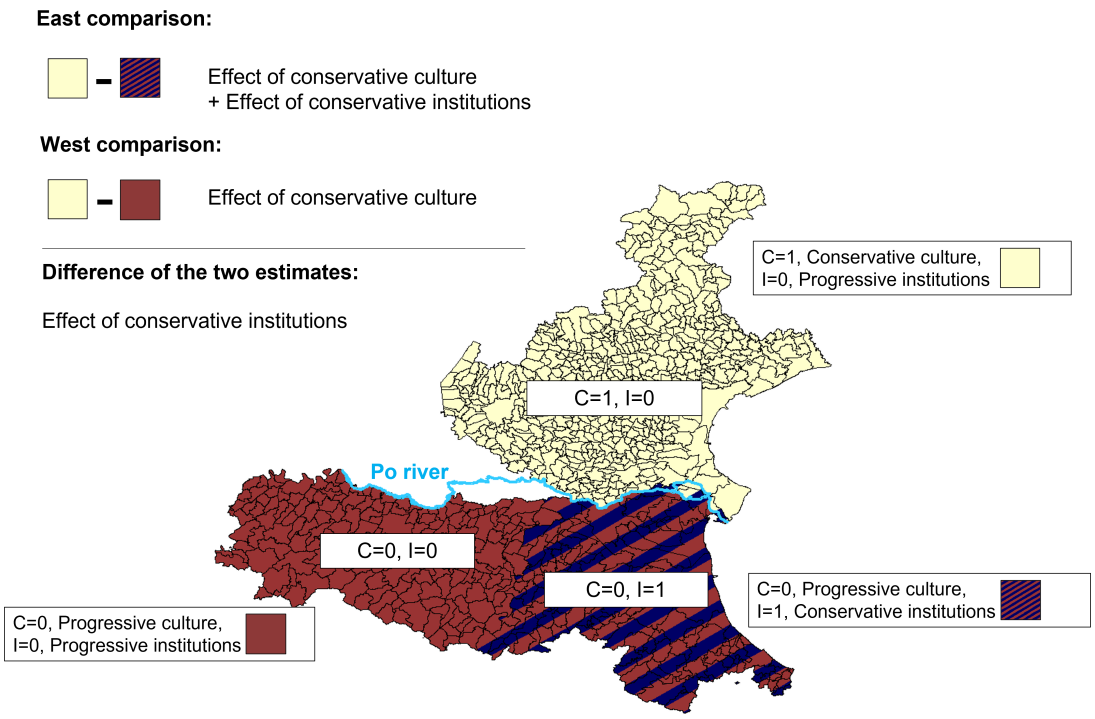

Notes: The map shows the percentage of Catholic votes in 1979 by municipality, in north-eastern and north-western Italy. Each dot is a municipality. Horizontal lines are percentiles of the number of municipalities ordered by latitude: for instance, approximately 15% of the municipalities in the graph are located below the line denoted as 15. There are approximately 46 municipalities between each two consecutive percentile lines (e.g. between 15-16 and 75-76). The Po river is approximated by the line of the 28th percentile.

**Figure 2:** Mean (%) votes to the Catholic party (DC) by latitude "slices" in north-eastern and north-western Italy




Notes: The graph summarizes the change in Catholic votes at river Po, separately for north-eastern and north-western Italy. Each point on the horizontal axis corresponds to a horizontal slice in Figure 1. For instance, line 15-16 shows the mean percentage of Catholic votes for the 46 municipalities (separately for eastern and western ones) comprised between the 15th and 16th percentile lines of Figure 1. The light blue vertical line approximates the course of the Po river with a straight line.

**Figure 3:** Geographic disposition of treatments and DIG estimator




Notes: The figure shows how the geographic disposition of more conservative culture ($C = 1$) and formal institutions ($I = 1$) allows to disentangle the effect of more conservative institutions on votes for the Catholic party (1948-1992), and votes against divorce and abortion (1974, 1981). This is done by estimating a "West " and an "East" regression discontinuity and taking their difference (DIG).

The river has been nearly impossible to cross until the 20th century. The two river banks, which are morphologically, climatically, and agriculturally comparable, were colonized by populations from the respective inland only after the river course stabilized in its definitive form, in the Low Middle Ages. By then, these populations had just begun to develop different family systems (cultures, $C$). Subsequently, one part of the southern river bank has been subject to the ruling of the Papal States ($I = 1$) for at least three centuries (XVI-XIXth).[4]

Causal identification exploits the spatial disposition of culture ($C$) and institutions ($I$), along with the hard border function of river Po. As summarized in Figure 3, I identify the effect of conservative institutions (Papal States) by dividing the area into a West and an East section, estimating one geographic regression discontinuity for each one, and taking their difference. This is the intuition behind the Differences-in-Geographic discontinuities (DIG) estimator formalized in this paper.

I find that conservative institutions (Papal States) do not explain 20th-century Catholic political preferences, nor votes against the legalization of divorce and abortion in dedicated referenda. I then argue that the entire effect (on average 25 percentage points in votes) is attributable to conservative culture (C=1). I consider the referenda votes as a measure of acceptance of gender-oriented policies

[4]Some territories were part of the Papal States since the XIIIth century, for a total of approximately 700 years.

since both referenda were abrogative. Voters were asked whether to repeal laws that allowed divorce and abortion, that had been previously approved by the Parliament's chambers.

Votes for an openly religious party represent a demand for the active involvement of religious doctrine in political decision-making. My results indicate that in the Italian context, where a monotheistic religion – Catholicism – was the only widespread religion until recent years, a patriarchal familiar tradition and in particular the indivisibility of inheritance increased such demand, whereas an openly theocratic formal institution had no effect. The importance of religious institutions and patriarchal norms is declining in Europe, but it remains relevant in the political life of developing countries, especially in Muslim and Latin-American contexts.[5]
In developed countries instead, the importance and variety of gender-oriented policies make their acceptance politically and financially relevant (e.g. European Commission (2018, 2019, 2021)). This is true both in domestic terms and for foreign aid: 34% of all DAC donors' aid is now targeted at gender equality and women empowerment – approximately 53 billion USD per year (OECD, 2021). My results on divorce and abortion indicate that cultural norms that impact religious political preferences also have a persistent effect on the acceptance of these policies.

The paper proceeds as follows: Section 2 reviews the literature, Section 3 presents the two treatments $(C, I)$ within the historical setting, Section 4 describes the data, Section 5 presents the empirical strategy and formalizes the DIG estimator, Section 6 discusses the results, Section 7 and lists robustness checks. Section 8 concludes the paper.

## 2 Literature Review

This paper contributes to the literature on culture and institutions, reviewed by Alesina and Giuliano (2015). It is particularly related to studies on the effect of family ties (e.g. Alesina and Giuliano (2010, 2014)), and the long-term persistence of historical institutions on economic development. Among these, Acemoglu et al. (2011) show evidence that the sudden and brief imposition of progressive Napoleonic institutions in Germany had a long-term impact on economic development; Malik and Mirza (2019) look at Muslim shrines in Punjab Pakistan and find a negative impact. There are several contributions on the long-term impact of super-imposed institutions on political preferences. Fontana et al. (2018) use a geographic RD design in central-northern Italy and attribute the root of widespread communist preferences in Emilia-Romagna to Nazi occupation during WWII. They also provide a review of studies on the origins of extreme political preferences. The latter are also studied by Acemoglu et al. (2020), who explain the rise of fascism in Italy as a response to socialism in the aftermath of WWI. Basten and Betz (2013) also use a geographic RD design: they show that the pseudo-random conversion to Protestantism in XVIth-century Switzerland increases current dislike over government intervention, redistributive policies, and the

[5] Among the most recent examples, Tunisia is among the first Arab African countries to foresee a reform of religion-based inheritance laws for women: https://dai-global-developments.com/articles/strengthening-womens-control-over-land-inheritance-reform-in-tunisia.

reduction of working hours, in line with Protestant doctrine.

This paper is also related to the causal literature on the persistence and long-term determinants of gender norms. Among cultural explanations, Alesina et al. (2013) and La Ferrara and Milazzo (2017) use Murdock's classification of ethnicities as treatments. The former show that the use of the plough in the distant past translates into lower contemporary female labour participation and less equal gender norms; the latter analyze the effect of an inheritance law reform in Africa on populations with different inheritance norms, and find that the policy had different effects on the education investments made on boys and girls. On the institutional side, Lippmann et al. (2020) find that institutions in Eastern Germany have prevailed over traditional gender roles in shaping female labour market outcomes. Teso (2019), instead, shows that the gender imbalance caused by slave trades in Africa had persistent effects on contemporary gender norms and female labour participation.

I also contribute to the literature on Todd's family systems in both economic history and applied microeconomics, since they define the cultural variable in this study (they are presented in more detail in Section 3.1). Family systems have been shown to correlate with various modern and contemporary socio-economic indicators, such as education, regional growth, and labor market outcomes (Duranton et al., 2009). In light of the increasing availability of historical microdata, family systems informed new indexes such as the Female Friendliness Index by De Pleijt et al. (2019), or the Patriarchy Index by Szołtysek and Poniat (2018). Along with other correlational studies (e.g. Carmichael et al. (2016); Bertocchi and Bozzano (2015, 2016)), these contributions show that family systems can predict gender differences in educational attainments, employment, and various indicators of female agency. To my knowledge, this is the first paper that causally tests Todd's theories on the nexus between family systems, religiosity, political affiliation, and female emancipation.

Finally, to attain causal identification, I propose and formalize an extension to geographic regression discontinuities designs, the Difference-in-Geographic RD (DIG). The proposed extension allows tackling the issue of compound treatments discussed by (Keele and Titiunik, 2015) by exploiting spatial heterogeneity in the assignment of multiple treatments. Methodologically, it relates to Grembi et al. (2016), who proposed a similar strategy to disentangle compound effects in traditional RD studies, when the adoption of multiple treatments is staggered over time rather than across space.

## 3 Historical background

In this section, I present the historical setting with the objective of clarifying the definition of the two treatments. In Section 3.1, I describe family systems, the cultural treatment ($C$); in Section 3.2 I sketch the evolution and characteristics of historical states in the area, and their relationship with Catholic religion ($I$). Having defined both, Section 3.3 discusses the history and geography of

the Po river in relation to the identifying assumptions of a geographic discontinuity design. Finally, Section 3.4 provides a concise description of the history of Italian politics across the XXth century to clarify the nature of the outcome variables. Overall, the geographic disposition of treatments around the Po is such that, if historical institutions continue to drive behaviour and affect culture long after their dissolution, I would expect their effects to offset that of family system. Namely, while the more conservative culture north of the Po river would imply stronger religious political preferences, the historically more progressive institutions in the same area would imply more secular preferences.

### 3.1 Culture ($C$): Family systems

Mason (2001) concisely defines family systems as "a set of beliefs and norms, common practices, and associated sanctions through which kinship and obligations of particular kinship relationships are defined. Family systems typically define what it means to be related by blood, or descent, and by marriage; who should live with whom and at what stages of the life course; the social, sexual, and economic rights and obligations of individuals occupying different kin positions in relation to each other; and the division of labour among kin-related individuals". They were classified in Europe at the NUTS-3 level by Todd (1990),[6] who pinpoints the origin of these norms around A.D. 1000, in the heart of the Middle Ages.[7]

In my setting around the Po river there are two family systems (Figure 3) characterized by different inheritance norms and a different intensity of patriarchal authority:

- The *Communitarian family system*, which I will refer to as **"Progressive culture"** ($C = 0$) for simplicity, was located south of the Po river, in the region of Emilia-Romagna.
  In this system, all male children could get married and their wives entered the groom's extended household under the authority of the groom's father, the patriarch. Upon his death, each male child inherited an equal share of the family's wealth, and became patriarch of his own household;

- The *STEM family system*, which I will refer to as **"Conservative culture"** ($C = 1$), was located north of the Po river, in the region of Veneto.
  In this system, only one male child was allowed to get married: only his wife entered the household, and they lived under the patriarch's authority. Upon the patriarch's death, the chosen son inherited the role of household head and the entire wealth. Other male sons were allowed to marry, but they were not entitled to any bequests or authority. They were often required to leave the household. If they remained, they did under their brother's authority.

[6] Todd built on pre-existing work by the French sociologist Le Play, (1806 - 1882) (Todd, 1985).

[7] In line with other popular cultural classifications, like the ethnic classification by Murdock (1967) adopted by Alesina et al. (2013), family systems are strongly associated to traditional agrarian practices, which shaped norms within families in periods when households also constituted agricultural enterprises.

Typically, they remained unmarried to avoid future inheritance claims, or joined the clergy.

Todd's classification is based on the cohabitation of married siblings in historical census data and parish registries.[8] The rules that characterized family systems were strict and enforced. Garino (1985) reports that between the XIIIth and the XVIIIth century, both noble and peasant families north of the Po (conservative, $C = 1$) made frequent use of the *fedeicommissum* institution. This allowed the patriarch to command that the entire wealth remained in the hands of a single heir: all bequests in the hands of non-designated children were bound to return to the designated heir upon their death.

For agricultural families, the enforcement of norms had consequences for the family's sustenance. Especially on the northern riverside ($C = 1$), families entered a sharecropping contract with the landowner. Due to the direct link between the family's workforce and agricultural output, until the XIXth century these contracts stated that marriages and fertility choices had to be approved by the landlord (Molini, 1858). Within the family, the patriarch was directly responsible for abiding by these clauses. A hypothetical young couple that violated these norms and left the household would turn to salaried work, with much lower living standards, as they would not have the necessary workforce to enter a separate sharecropping contract (Barbagli, 2000).[9]

Moreover, since the Middle Ages, Canon Law (for many centuries the only family law) sanctioned that the patriarch had authority upon children's marriages, based on social and economic convenience, and that challenging it was a prosecutable crime (Catholic Church, 1959; Esposito, 2018). In Italy, sharecropping was abolished in 1964, and the legal figure of the household head in 1975.[10]

Quantitative descriptive evidence of family systems' persistence comes from XIXth century census data (MAIC, 1874, 1883, 1900), which show that the share of children born outside wedlock had its national minimum on the north bank of the Po (conservative, $C = 1$) and its maximum in the provinces on the south bank (progressive, $C = 0$). In most cases, these children were then recognized in their first years of life after the parents got married, suggesting that this metric is indicative of sexual freedom, and of different levels of patriarchal authority over fertility and marriages choices (Bertocchi and Bozzano, 2015, 2016). Moreover, the different norms predict a

[8] Parish registries were mandated by the Catholic Church in 1614, but the Republic of Venice on the north bank of the Po had begun collecting census data already in the XVth century (Sonnino, 1996).

[9] Sharecropping remained the prevalent form of agricultural production on both riversides until the XIXth century, when the southern riverbank ($C = 0$) saw a sudden shift towards salaried agricultural work. Sharecropping became again prevalent following targeted fascist policies.

[10] In both cases, the formal and actual abolition coincide. Italian agricultural workers already demanded the abolition of sharecropping in 1919 (Cova, 2011). However, its importance was even increased by the fascist regime, which used it to colonize formerly uninhabited lands with people from distant regions (especially Veneto and Emilia-Romagna, on the Po riversides). These colonization experiences were sometimes prolonged long after the end of fascism, until the 1970s (for instance, in the case of the Pontine Marshes (Folchi, 2000; Alfieri, 2018)). The 1970s were also years of protests and female emancipation movements, which firmly campaigned to keep divorce and abortion legal before the respective referenda, and for women's parity in Family Law – including the abolition of the household head figure (Vellati, 2017).

larger family size in the conservative region ($C = 1$): Section F in the Appendix shows with maps that this prediction is verified until the 1970s, and that average family size is spatially correlated with Catholic votes.

Todd's theoretical hypothesis on the causal link from family systems to religiosity, ideology, and gender norms posits that Catholic doctrine is closely mirrored by a strong patriarchal authority and by non-egalitarian inheritance norms. Hence, STEM families (conservative, $C = 1$) would adhere more strongly to Catholicism and exhibit more conservative political preferences compared to Communitarian (progressive, $C = 0$) families.[11] A more direct mechanism is the higher reliance on the clergy as a means of sustenance for unmarried children north of the Po ($C = 1$). Inheritance norms also affect women's role within the household, which mirrors closely their husband's authority (Barbagli, 2000; Carmichael et al., 2016). In STEM (conservative, $C = 1$) families, unequal bequest rules imply that only the chosen heir can marry: by construction, there will be on average fewer women or, if the numbers are comparable, a much larger portion will be represented by the patriarch's daughters, who have no access to inheritance and are thus in a more submissive position. In a Communitarian (progressive, $C = 0$) family, more women will be wives of male children, each of whom is entitled to the same share of inheritance and authority. To this end, Barbagli (2000) reports that in STEM (conservative, $C = 1$) families these hierarchies also translated in codified domestic rites: for instance, it was typical for women to eat meals separately from males and while standing, except for the patriarch's wife, if she was old enough. Table 1 summarizes the characteristics of family systems on the two banks of the Po river. Todd's theory predicts that the northern bank (conservative, $C = 1$) should exhibit stronger support for the Catholic party, and stronger resistance to the legalization of abortion and divorce.

**Table 1:** Summary of Family Systems ($C$)

| Location | Family System | Inheritance norms (over wealth and patriarchal authority) | Patriarchal authority | Female agency |
|---|---|---|---|---|
| North of Po river (Veneto) | **More conservative** ($C = 1$) (STEM) | Undivided | Stronger | Weaker |
| South of Po river (Emilia) | **More progressive** ($C = 0$) (Communitarian) | Egalitarian | Weaker | Stronger |

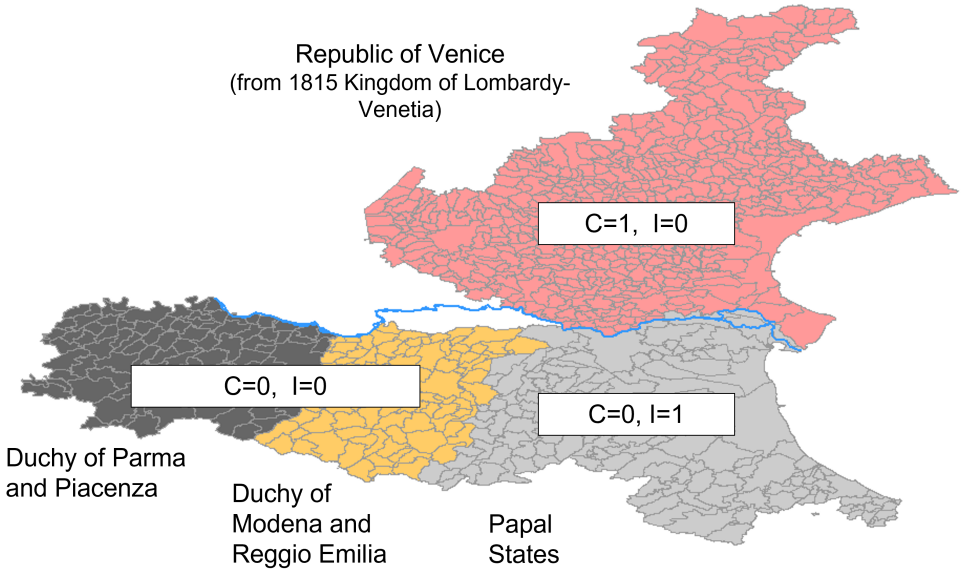
### 3.2 Formal institutions ($I$): pre-unitary states and religion

Figure 4 shows the different states in the area around the Po in 1797. It is representative of the historical setting from the end of the XVIth century to 1866, with the exception of the Napoleonic period. Section A in the Appendix provides additional details on the evolution of pre-unitary borders over time, whereas Section D.2 provides a robustness check to rule out any confounding

[11] See Todd (1990), part 2.

effect from the intensity of Napoleonic occupation. Reconstructing the relationship between formal institutions and religion relies mostly on anecdotal evidence until the beginning of the XIXth century, when Napoleonic codes made laws directly comparable. However, due to their particular characteristics, the Papal States (conservative, $I = 1$) and the Republic of Venice (progressive, $I = 0$) exhibit clear and sharp differences in their formal relationship with Catholic religion already from the Middle Ages. I report these differences in three key historical phases: (i) from the Low Middle Ages to the Inquisition period (A.D. 1000-1500 ca.); (ii) from the Inquisition period to the codification of laws (A.D. 1500-1800 ca.); (iii) the Modern era (A.D. 1800-1861), when codification allows to include other states south of the Po (progressive, $I = 0$).

**Figure 4:** Territorial divisions in 1797




Notes: Papal States will be defined as "conservative institutions" ($I = 1$). All other territories in this map are coded as $I = 0$ ("progressive institutions"). This disposition of pre-unitary is representative since the XVIth century, and then again from 1815 to 1861.

**First period: from the Low Middle Ages to the Inquisition period (A.D. 1000-1500 ca.).**

In this period, the Papal States (conservative, $I = 1$) already followed Canon Law also for criminal and civil proceedings. The first codified piece of law, dated 1140, remained the cornerstone of Catholic Canon Law until its abolition in 1917 (Pertile, 1892; Prodi, 1982). It directly refers to the Sacred Books, and it equates crimes with sins, prescribing corporal punishments as a form of mortification of the body and expiation of sins. One of its fundamental principles sanctioned that secular tribunals are subject to the Church's authority, as a result of the equation between crimes

and sins (Catholic Church, 1959; Prodi, 1982).

As a result, from the Late Middle Ages (1250 ca.) Church tribunals began working with the explicit intention to monitor and control morality, advocating extra-territorial jurisdiction on moral and family law (which concerned abortions and bequests[12]), heresy and blasphemy (Bellabarba, 2008).
The Republic of Venice ($I = 0$) reacted by re-affirming its secular jurisdiction, while also engaging in several diplomatic and military conflicts with the Papal States over the domination of the Po waters and the surrounding area. This earned Venice several interdicts (collective excommunications from the Pope), from the XIIIth to the XVth century (Bouwsma, 1968; Piasentini, 1999). These contrasts, however, were institutional and not religious: during the entire duration of the 1480s excommunication, Venetians kept celebrating masses against the Pope's orders, with soldiers defending churches' gates (Piasentini, 1999). In terms of legislation against blasphemy, Cantini (1800) reports that in the Papal States ($I = 1$) blasphemous commoners were often subjected to severe corporal punishments.[13] Until 1442 in the Republic of Venice ($I = 0$), blasphemies – only those against Venice's protector, Mark the Evangelist – were simply subject to a fine, and there are no records of any process for blasphemy until 1450 (Piasentini, 1999; Derosas, 1980).

**Second period: from the Inquisition period to the codification of laws (A.D. 1500-1800 ca.)** In the last years of the XVth century, all European states underwent a phase of moralization and increased attention towards orthodoxy: the increased frequency of recent epidemics and, in the case of Venice, the recent defeats suffered from the Ottoman Empire, were interpreted as direct consequences of the widespread disrespect of Catholic morals. Within the Papal States' borders, the central control of Rome over the population and administrators in the peripheral provinces was strengthened, with virtually no distinction between secular and religious matters and with heavy use of repressive methods (Prodi, 1982).[14] This shift in attitudes became even stronger with the advent of the Protestant Reform, in 1517 (Piasentini, 1999; Cantini, 1800; Derosas, 1980), followed by the establishment of several Inquisition tribunals. The Italian Inquisition in particular, which reported directly to cardinals in Rome, strengthened its direct control on the population by setting up its tribunals also outside the Papal States. These claimed jurisdiction on all crimes connected to heresy and blasphemy and arrived at commanding compulsory confessions in Easter, which became the source of approximately 70% of all new investigations (Bellabarba, 2008; Black, 2009).

Even in this case, the Republic of Venice ($I = 0$) harshly negotiated and obtained jurisdiction over heterodoxy (Black, 2009). While the Papal States ($I = 1$) replaced the harshest corporal punishments with the death penalty (Cantini, 1800), the Republic of Venice kept corporal punishments out of the picture (Piasentini, 1999). The Republic established its own tribunal against blasphemy

[12] More in general, all that concerned family law, hence marriages, adultery, separations, sexual violence.

[13] They had to pay a high fine within 10 days or undergo corporal punishment: depending on the number of admonitions, these could go from public exposition to lashing and tongue mutilation.

[14] This period coincided with the conquer of the cities of Bologna and Ferrara south of the Po. The repression of independent decision-making also affected local clergy, which was put under the strict monitoring of new administrators sent from Rome.

shortly after, also aimed at preventing the cession of power to the Inquisition (Derosas, 1980). This *de facto* independent tribunal punished blasphemy, a very widespread habit in the Republic of Venice, only when committed along with other crimes (Derosas, 1980),[15] and even trials for heresy and witchcraft in the Republic made particularly limited use of torture and led to no executions (Seitz, 2011).[16] In 1606, the tension with the Papal States over jurisdiction brought a new papal interdiction, which led Venice to exile a large part of the clergy. This fact, known as the Interdict War, almost developed into a wide-European conflict and was only resolved by the mediation of France (Loughlin, 1913).[17] At the end of the Interdict War, Venice kept the ban on the Jesuits, key actors of the Inquisition tribunals.

**Third period: Modern era (A.D. 1800-1861)** After the Napoleonic occupations, the criminal codes of the Papal States ($I = 1$) and all more progressive institutions ($I = 0$: the Duchy of Modena and Reggio Emilia, the Duchy of Parma and Piacenza and the Kingdom of Lombardy-Venetia) can be directly compared. Table 2 shows that religious crimes are punished much more harshly in the Papal States ($I = 1$). The same is true for abortion, except for the Duchy of Modena and Reggio Emilia, which prescribes 5 additional years of imprisonment compared to the Papal States. The Lombardy-Venetia's code and the Duchy of Parma and Piacenza's codes are far less detailed concerning crimes against religion.[18]

### 3.3 The Po as a hard border and the colonization of the Po Valley

The Po is the longest and one of the largest Italian rivers and it generates the Po Valley, the widest plain in the country. In its trait within my setting, its mean daily discharge between 1921 and 2011 is estimated between 180 and $280 m^3/s$: due to the lower exploitation of its waters for agriculture and to more intense precipitations, climatologists and historians estimate a higher discharge the further back in time. The areas just around the Po were characterized by frequent floods until the construction of embankments by Napoleon in 1806 (Zanchettin, 2008). Before that, floods made the area uninhabitable for most months of the year, due to the high prevalence of malaria and the absence of permanent roads over humid terrains (Bocchi, 1861).

These floods are particularly important for the colonization of the two riverbanks and hence for the classification of family systems, for two reasons. First, right after the fall of the Roman

[15] This institution, called *Esecutori contro la bestemmia* conducted a total of 702 trials for blasphemy between 1642 and 1657: among the condemned, none had committed only blasphemy, and sentences posed great emphasis on the other crimes.

[16] For a total of approximately 600 trials between 1550 and 1650. Magic was also a widespread habit of commoners since the Low Middle Ages, as documented by archival sources analyzed by Piasentini (1999).

[17] The conflict started when two monks were arrested and trialed by a Venetian tribunal and jailed over common crimes. The Catholic Church claimed full jurisdiction over any crimes committed by members of the clergy, and the Venetians refused to hand over the two prisoners. Also in this case, for the entire duration of the interdiction, Venetians kept celebrating masses and Catholic festivities.

[18] Section E.3 will show that the inclusion or exclusion of the Duchy of Parma and Piacenza south of the Po, which is the most lenient among the states labeled as progressive ($I = 0$), does not affect the estimates.

**Table 2:** Comparison of XIXth century penalties for religious and moral crimes

| | $I=1$ | $I=0$ | $I=0$ | $I=0$ |
|---|---|---|---|---|
| **Crime** | **Papal States** | **Duchy of Modena and Reggio Emilia** | **Duchy of Parma and Piacenza** | **Kingdom of Lombardy-Venetia** |
| Abortion | 10 years imprisonment | 15 years imprisonment | 3-5 years imprisonment | 1-5 years imprisonment |
| Blasphemy | 1-3 years forced labour | 6 months imprisonment if due to anger outburst, 5 years forced labour if heretical and deliberate | Unmentioned | Unmentioned |
| Theft of sacred objects | Death | Death for sacramental bread, for other sacred objects ≥5 years forced labour | Forced labour for life for sacramental bread, undefined for other sacred objects | Unmentioned |
| Scandalous interruption of religious function | 15-20 years imprisonment | Max 7 years imprisonment if the priest is outraged | 1-3 years imprisonment | 6-12 months imprisonment, 1-5 years imprisonment if public safety is put at risk |

Notes: Based on the direct comparison of post-Napoleonic criminal codes (1815-1866)– (Ducato di Modena e Reggio, 1852; Ducato di Parma, Piacenza e Guastalla, 1850; Catholic Church, 1862; Regno Lombardo-Veneto, 1852). The Kingdom of Lombardy-Venetia includes all territories north of the Po in the area of study.

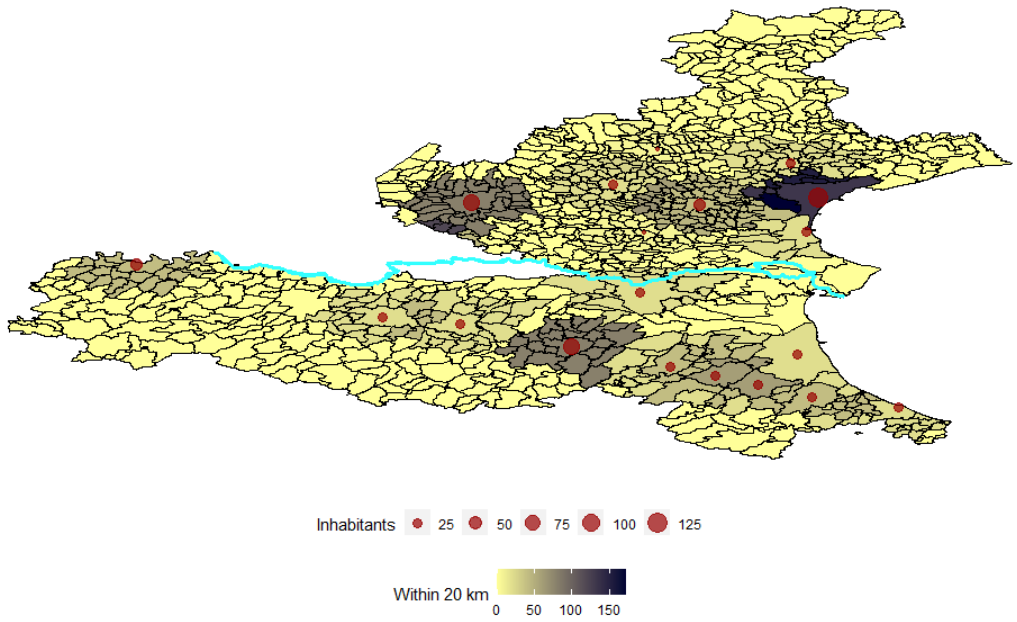
Empire (A.D. 569-774),[19] they caused a drastic demographic fall around the river, coupled by frequent Germanic incursions that the river contained to the northern riverside. The conservative culture ($C = 1$) is typical of Germanic populations and the incursions were probably a channel of transmission (Todd, 1990). Second, the current course of the river is the result of a series of intense floods that occurred around A.D. 1152 (Uggeri, 2004), that is before the areas immediately close to the river were permanently re-colonized by the farther inland. Figure 5 shows cities in the area with more than ten inhabitants in 1300, the moment of maximal development in the Middle Ages. Excluding Ferrara (8km away from the 1152 course of the Po), the area near the river was still sparsely populated. Indeed, the second wave of colonization (which did not concern the lowest points of the plain) began only in the XVth century, with some areas close to the river's mouth colonized as late as the XVIIIth century (Sonnino, 1996). This complements Todd (1990)'s evidence on the Po river representing a discontinuity in the culture of family systems.

The remaining challenge for identification using a regression discontinuity design at the Po is potential interferences between the two riversides (note that, however, though these would imply a negative bias). Crossing the Po became feasible for a common citizen only at the end of the XIXth century, for several reasons. First, quite trivially, because that is when the first permanent bridges were built (Romanoni, 2008). Second, because although the Po had a higher discharge in the past, the width of the Po in this trait has remained constant over time, implying stronger currents and more dangerous navigation (Orlando, 2011). Direct historical reports from the XVth century on the length of a military mobile bridge coincide with the length of the current permanent bridge (Uggeri, 2004).[20] Direct historical recounts of the dangers of navigation due to rip currents

[19] During the Langobard Kingdom.

[20] "Marin Sanudo the Young", in 1483, reports that the pontoon bridge in Pontelagoscuro was 410 Roman steps long (23 boats). I calculated that it corresponds to 607m. The current bridge in the same locality is 610m long.

**Figure 5:** Thousands urban inhabitants within one day of travel (20 km) in 1300




Notes: Red dots show urban population estimates in thousands inhabitants for year 1300, before the Black Death demographic crisis Sonnino (1996). For each municipality, the colour indicates city inhabitants (thousands) within a 20km radius, which approximates the maximum distance that a man could cover by walking in a day.

can be found from the XIIIth to the XIXth century (Uggeri, 2004; Bocchi, 1861). Finally and most importantly, because the Po has always been the border between different states, in conflict with each other for many centuries over the control of navigation. As such, the river itself has been the theatre of several conflicts from the IXth to the XVIth side, to the extent that all existing (temporary) bridges before the XIXth centuries were guarded pontoons or fortified wooden bridges, controlled by soldiers from either river bank, whose aim was monitoring, taxing and often blocking each other's commercial traffic on the river (Romanoni, 2008; Uggeri, 2004; Bocchi, 1861). Wooden bridges were often the target of attacks from enemy ships (Romanoni, 2008). For all these reasons, already in the XIIIth century the Republic of Venice established an armed fluvial police force on the Po, aimed at preventing any form of unauthorized mobility, escorting ships to protect them from attacks, and supporting them in case of shipwrecks due to currents (Orlando, 2011).[21]

### 3.4 A primer on Italian Catholic politics after WWII

The first openly Catholic party, *Partito Popolare Italiano* (PPI) was founded in 1919 and first ran for elections between 1919 and 1924. Those elections, however, were characterized by widespread

[21] In the Peace of Costanza (1186), the Republic of Venice had also sanctioned that building pontoons was an exclusive right of state institutions.

fascist violence aimed at preventing Catholics and socialists from voting, especially in the Po valley. Therefore, I exclude them from the main analysis. In Section B.1 in the Appendix, I provide further historical details and I present results for those 3 elections.

*Democrazia Cristiana* (DC) was founded as the successor of PPI in 1943 and became a key element of the Italian Resistance. The first post-war political elections were held in 1948, for the first time with male and female universal suffrage. The 1948-1994 period, known as the *first republic*, was characterized by large mass parties: DC (the largest one) and, most notably, the red *Partito Comunista Italiano* (PCI) and *Partito Comunista Italiano* (PSI). The end of the *first republic* coincided with the dissolution of all three parties. PCI was the first to dissolve, in 1991, following the fall of the U.S.S.R.. On the other hand, PSI and DC dissolved after a series of scandals on party financing and corruption known as *Tangentopoli*. The latter began in 1992: it led to the redefinition of the entire Italian political scene and to the end of the mass-party era in Italy.

## 4 Data

I combine data from several sources. I employ data from the Italian Ministry for Internal Affairs (Ministero dell'Interno, 2020a,b,c) on the results on the two referenda, which were held in 1974 (on divorce) and 1981 (on abortion), and of every political election from 1948 to 1992, a total of 11 elections. I restrict my attention to Chamber of Deputies elections, which involved a wider electorate.[22][23] For all voting occasions, there are no missing election data ($N = 923$). Since several municipalities underwent mergers and separations between 1948 and 1994, I harmonize all years to the municipalities in place in 1972, that is the mid-election and also the one that preceded the first referendum.

Other covariates at the municipality level, measured every 10 years from 1951 to 1991, are taken from the decennial census (ISTAT, 2020). Since they are contemporaneous to the outcome variables, they are not used as baseline covariates in my model. However, I look at average family size, a proxy of the persistence of family systems, for a descriptive corroboration of my results. For each municipality, I also compute the number of urban inhabitants within 20 km of the modern city hall in year 1300, based on population data from Sonnino (1996) – shown in Figure 5. Coordinates and altitude of municipalities are taken from ISTAT (2015): in computing distances from rivers, I take the coordinates of the city hall.[24] Finally, I get raster data on rivers from ISPRA (2020).

[22] Perfect bicameralism implies that at political elections, voters above 25 years old could vote for both the Chamber of Deputies and the Senate, whereas the voting age (18 since the 1976 elections) only allows voting for the Chamber of Deputies. Moreover, in Section B.1 I repeat the analysis for the 1919, 1921, and 1924 elections: for those, I only have access to results for the Chamber of Deputies.

[23] While the results of the 1972 political elections and the referendum on divorce from 1974 are available online, the results of the 1981 referendum on abortion at the municipal level are kept at physical archives of the Ministry of Internal Affairs and were digitized manually.

[24] As an alternative, I also computed the distance between the river and the average latitude and longitude within a municipality's polygon, and taking the minimum distance of each polygon from the river: the results are not affected. However, the procedure is much more computationally intensive. Note that the oldest available geographic data are from 2011: in cases when municipalities underwent mergers from the period of analysis to 2011, I assign the

Summary statistics by treatment groups are presented in Table C.4 in the Appendix.

## 5 Empirical Strategy

### 5.1 Geographic Regression Discontinuity Estimator

In intuitive terms, a DIG point estimate is the difference of two geographic regression discontinuity (GRD) estimates. These, in turn, must be estimated with an underlying GRD estimator. In what follows, I will briefly define GRD estimators in generic terms: for a more detailed presentation, I refer the reader to Keele and Titiunik (2015).
Consider a municipality $i$, with $i \in \{1, 2, ..., N\}$, uniquely identified by its coordinates (latitude and longitude), $\boldsymbol{L}_i = (L_i^1, L_i^2)$. For the sake of illustrating a generic GRD estimator, let there be a single binary treatment indicator $T = \{0, 1\}$, which changes discontinuously at a geographic threshold denoted $\mathcal{B}$, the border. In this setting, the border $\mathcal{B}$ corresponds to a line (the river), and it is composed of a set of points denoted $\boldsymbol{b}$, where $\boldsymbol{b} = (L^1, L^2) \in \mathbb{R}^2$. Let $\mathcal{B}$ separate space in two non-overlapping regions, defined as the sets of treated and control units, $\boldsymbol{L_t} \equiv \{(L_i^1, L_i^2) : T_i = 1\}$ and $\boldsymbol{L_c} \equiv \{(L_i^1, L_i^2) : T_i = 0\}$. Define average potential outcomes as $Y(T) \equiv \mathbb{E}(Y_i(T_i) \mid T_i)$. Finally, let $t$ index treated units, $t \in \{1, 2, .., N_t\}$ and $c$ index control units, such that $c \in \{N_t + 1, N_t + 2, .., N\}$, so that $N_t + N_c = N$. Under continuity of potential outcomes, the GRD at border point $\boldsymbol{b}$, for an observed outcome $Y$, is identified by:

$$E_{\mathcal{B}}[\tau(\boldsymbol{b})] \equiv E_{\mathcal{B}}\big[\lim_{\mathbf{L_t} \to \boldsymbol{b}} E\left\{Y_i \mid \mathbf{L}_i \in \boldsymbol{L_t}\right\} - \lim_{\mathbf{L_c} \to \boldsymbol{b}} E\left\{Y_i \mid \mathbf{L}_i \in \boldsymbol{L_c}\right\}\big]$$

Note that one could potentially identify $\tau(\boldsymbol{b})$ for each $\boldsymbol{b} \in \mathcal{B}$ and obtain their distribution. This formulation indicates that the GRD estimator of interest is the mean of that distribution, i.e. $E_{\mathcal{B}}[\tau(\boldsymbol{b})]$. For simplicity, in the remainder of this paper I will restrict to the neighbourhood of $\mathcal{B}$ implicitly: I will omit from the notation the limits and the expectation over the distribution of $\mathcal{B}$, and I will refer to $E_{\mathcal{B}}[\tau(\boldsymbol{b})]$ as:

$$\tau(\boldsymbol{b}) \equiv E[Y(1)] - E[Y(0)]$$

There are many possible estimators for GRDs. The one I will adopt in my analysis is the Distance Adjusted Propensity Score Matching estimator (DAPSm) by Papadogeorgou et al. (2019). The DAPSm estimates the Average Treatment Effect on the Treated (ATT, the estimand) by performing 1:1 nearest-neighbour matching without replacement on the DAPS score:

$$DAPS_{tc} = w \times |PS_t - PS_c| + (1 - w) \times \text{Dist}_{tc} \tag{1}$$

where $w \in [0, 1]$ determines the relative importance of the geographic distance between two elements

coordinates of the new city hall to all the original municipalities.

of each pair, and of their propensity scores $PS$, which models assignment to treatment conditional on a vector of observables $\boldsymbol{X}$. Let me anticipate that I also include in $\boldsymbol{X}$ the closest tract of the river. Namely, I separate the river into 10 equally long tracts and for each municipality, I define a factor variable indicating the closest one, to ensure that matching is also based on longitude. In my analysis, I compute $\text{Dist}_{tc}$ as the Euclidean distance between paired $t$ and $c$'s city halls, and I set $w = 0.5$. In Section E.2 in the Appendix, I show that results remain comparable with different values of $w$ (estimates become slightly larger as $w$ approaches 1). I also specify a caliper equal to 0.4 for the propensity score $PS$, such that two municipalities whose propensity scores differ by more than 0.4 cannot be matched. Moreover, even though DAPSm relies on propensity score matching, I include a limit on the standardised difference in means across treated and control group on single covariates in $\boldsymbol{X}$, equal to 0.5. In other words, if for any observed covariate the standardised difference in means between the treated and control group exceeds 0.5, the matched dataset is not considered valid and the matching algorithm starts over.

The choice of DAPSm is motivated by two observations. First, as noted by Keele et al. (2015), in traditional RD designs that restrict to a small neighbourhood of $\mathcal{B}$, unconfoundedness holds regardless of conditioning on covariates: this, however, requires a sufficient density mass of observations located around the border $\mathcal{B}$. Conditioning on pre-treatment covariates can guarantee unconfoundedness in contexts where it is necessary to enlarge the bandwidth beyond the immediate proximity of $\mathcal{B}$. In this setting, out of 923 municipalities, only 78 are located within 10 km of the river Po, 176 within 20 km: it is a natural consequence of using municipal rather than individual data. Incidentally, by showing robust estimates across specifications that include increasing numbers of covariates, I can test and show evidence of unconfoundedness even in the largest sample, where the maximum distance is 175 km (the 75th percentile is 81 km). Second, precisely because municipal data imply a limited sample size compared to standard matching studies, and because of computational feasibility, I prefer propensity score matching to exact and distribution-based matching methods: because of these two specific advantages, I chose the DAPSm over Keele et al. (2015)'s GRD estimator. Section E.3 in the Appendix presents a robustness check with a different underlying GRD estimator (Dell (2010)) that does not rely on matching.

### 5.2 Difference-in-Geographic discontinuities: the DIG estimator

Keele and Titiunik (2015) formalized and discussed, in the context of GRDs, the assumption of Compound Treatments Irrelevance. If multiple treatments change at $\mathcal{B}$, one must assume that all treatments except the one of interest are either continuous at $\mathcal{B}$, or that they have no effect on the outcome. Keele and Titiunik then hint towards a design à la Grembi et al. (2016): the intuition is that, if the confounding treatments vary at the same border but they are introduced at different points in time, one could estimate one GRD for each of the two periods and take their difference, and in this way isolate the effect of the policy of interest.

However, in this setting and in most long-term persistence studies, treatments are assigned in a distant past in which the only quantitative information available are geographic variables, and the outcomes are only measured in the present. The DIG estimator exploits geographic mismatches in the assignment of multiple treatments to identify the effect of (at least) one of them.

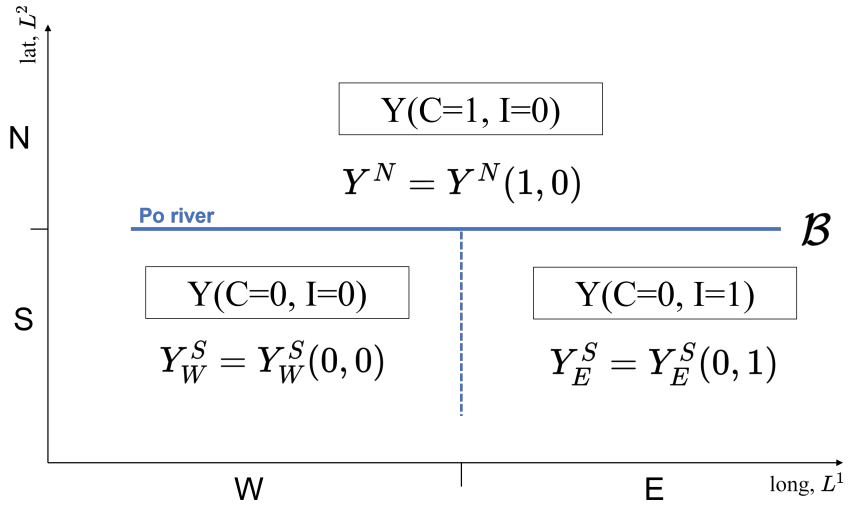
In the Po valley, two treatments are changing discontinuously at the river, which corresponds to the border $\mathcal{B}$. As in the previous sections, these treatments are denoted as $C_i$ (culture) and $I_i$ (Institutions):[25]

$$C_i = \begin{cases} 1, & \text{for } \boldsymbol{L}_i \text{ north of } \mathcal{B} \implies \text{conservative culture} \\ 0, & \text{otherwise} \implies \text{progressive culture} \end{cases}$$

$$I_i = \begin{cases} 1, & \text{if } i \text{ had conservative institutions (i.e. Papal States)} \implies C_i = 0 \\ 0, & \text{otherwise} \end{cases}$$

The aim is to identify the ATT of Papal States' domination (i.e. the effect on the treated of passing from progressive institutions, $I = 0$, to conservative ones, $I = 1$), unconditional from $C$. I denote average potential outcomes as $Y(C, I)$ and identify three geographic areas based on the observed values of $C$ and $I$. In Figure 6, I summarize the correspondence of observed and potential outcomes in this setting. For observed outcomes, I use superscripts $N, S$ to denote the areas north and south of the river, respectively, and subscripts $E, W$ to denote east and west in the southern area.

**Figure 6:** Correspondence of observed and potential outcomes




[25] Modern administrative regions are also separated by the Po river: I will show that this is not a concern when discussing results, in Section 6.

I make the following identifying assumptions:

**Assumption 1.** ***(Continuity)***
*All potential outcomes are, in expectation, continuous in latitude and longitude at the border. That is, for* $C, I = (0, 1)$ *and* $\forall \boldsymbol{b} \in \mathcal{B}$*:*

$$\lim_{\mathbf{L_i} \to \boldsymbol{b}} E[Y_i(C, I) \mid \mathbf{L}_i \in \boldsymbol{L_t}] = \lim_{\mathbf{L_i} \to \boldsymbol{b}} E[Y_i(C, I) \mid \mathbf{L}_i \in \boldsymbol{L_c}] = E[Y_i(C, I) \mid \mathbf{L}_i = \boldsymbol{b}] \tag{A1}$$

After separating the setting in a West and East areas (Figure 3, Figure 6), I specify an homogeneity assumption.

**Assumption 2.** ***(Spatial homogeneity)***
*The ATT of culture (C) is the same in the West and East areas. Namely, for* $I = 0, 1$*, in a neighbourhood of* $\mathcal{B}$*:*

$$E_{i=t}[Y^N(1, I)] - E_{i=t}[Y^S_W(0, I)] = E_{i=t}[Y^N(1, I)] - E_{i=t}[Y^S_E(0, I)] \tag{A2}$$

Note that this formulation of A2 is specific to this application for three reasons. First, I define my estimand as the ATT. To identify the ATNT, the expectation could be taken only over untreated units ($E_{i=c}$), or unconditionally if the estimand of interest is the ATE. Second, in other settings the spatial homogeneity might be required over latitude, or both latitude and longitude, depending on the "location" of the treatment whose effect needs to be subtracted. Third, in other settings where researchers can observe and want to use $Y(1, 1)$ to identify the treatment effect of both treatments, the assumption should be generalized to both treatments.
With A1-A2, I can drop superscripts $N, S$ and subscripts $E, W$ from potential outcomes.

**Assumption 3.** ***(Additivity)***
*The ATT of conservative institutions is independent of culture* $C$ *in the neighbourhood of border* $\mathcal{B}$*, when* $C = 0$ *(south of the Po):*

$$\begin{aligned} &E_{i=t}[Y(1, 1) \mid C = 0] - E_{i=t}[Y(1, 0) \mid C = 0] \\ &= E_{i=t}[Y(0, 1) \mid C = 0] - E_{i=t}[Y(0, 0) \mid C = 0] \end{aligned} \tag{A3}$$

Note that, to identify the unconditional ATT of conservative culture, I would need to write out the corresponding condition. While the latter entails different potential outcomes, the intuition is not different: they both require that C and I do not have interactive effects on Catholic votes. Let me underline two observations concerning A3. First, because of the disposition of treatments, I only need to assume this for territories south of the Po. Second, this assumption is only needed

to identify unconditional effects. Identifying the effect of conservative institutions conditional on progressive culture, or the effect of conservative culture conditional on progressive institutions does not require A3 (both cases correspond to what actually realized in the history of the region in my setting). I will discuss this further in light of the results in Section 6.
Finally, I assume SUTVA.

**Assumption 4.** ***(SUTVA)***
***4.1 Consistency.*** *Both $C$ and $I$ are consistent across space. Namely, $\forall i \neq j$:*

$$\begin{aligned} Y_i(C=1,I) - Y_i(C=0,I) &= Y_j(C=1,I) - Y_j(C=0,I) \\ Y_i(C,I=1) - Y_i(C,I=0) &= Y_j(C,I=1) - Y_j(C,I=0) \end{aligned} \tag{A4.1}$$

***4.2 No spillover effects.*** *For both treatments $C$ and $I$ and for any two distinct municipalities $i \neq j$, the probability of assignment to treatment of municipality $i$ does not affect the probability of treatment of municipality $j$:*

$$Y_i(C,I) \perp Y_j(C,I) \tag{A4.2}$$

Note that this formulation of SUTVA relies on the previous assumptions.

Define now the two following GRDs, one for the West and one for the East areas:

$$\begin{aligned} \tau_W(\boldsymbol{b}) &\overset{(A4)}{\equiv} E_{i=t}[Y^N(1,0)] - E_{i=t}[Y^S_W(0,0)] \\ \tau_E(\boldsymbol{b}) &\overset{(A4)}{\equiv} E_{i=t}[Y^N(1,0)] - E_{i=t}[Y^S_E(0,1)] \end{aligned} \tag{2}$$

The DIG estimator is the difference of these GRDs:

**Proposition 1** (DIG estimator)**.** *Under assumptions A1-A4, the DIG estimator identifies the ATT of having been dominated by the Papal States (conservative institutions) in the neighbourhood of $\mathcal{B}$:*

$$\tau_{DIG} \equiv \tau_W(\boldsymbol{b}) - \tau_E(\boldsymbol{b}) \tag{DIG}$$

*Proof.*

$$\begin{aligned} \tau_{DIG} &\equiv \tau_W(\boldsymbol{b}) - \tau_E(\boldsymbol{b}) \\ &\overset{(A1-A2)}{=} E_{i=t}[Y(1,0)] - E_{i=t}[Y(0,0)] \\ &\qquad - E_{i=t}[Y(1,0)] + E_{i=t}[Y(0,1)] \\ &\overset{(A4)}{=} E_{i=t}[Y(0,1)] - E_{i=t}[Y(0,0)] \\ &\overset{(A3)}{=} E_{i=t}[Y(C,1)] - E_{i=t}[Y(C,0)] \end{aligned}$$

□

In this discussion, I have implicitly made two assumptions. The first is an ignorability assumption. Namely, for the West GRD $\tau_W(\boldsymbol{b})$ to identify the effect of conservative culture conditional on progressive institutions ((2)), there must be no confounder of variable C in the West area. The second is a homogeneity assumption equivalent to A2, for residuals in the East and West comparisons. Namely, for the DIG to identify the effect of conservative institutions it is necessary that any residual determinant of Catholic votes has the same effect in the West and East comparisons. Formalizing them requires triple-indexed potential outcomes, which would complicate the notation and its readability. Therefore, I exclude them from the DIG estimator formalization, while acknowledging and testing them informally in robustness checks dedicated to confounders.

## 6 Estimation and results

Estimation is carried out in R.[26] I first estimate three GRDs by DAPSm, for each election between 1948 and 1992 and the two referenda. These are: (1) the overall GRD, estimated on the entire sample (2) $\widehat{\tau}_W(\boldsymbol{b})$, restricting to the West area, and (3) $\widehat{\tau}_E(\boldsymbol{b})$, restricting to the East area.

I set $w = 0.5$, such that geographic distance and the propensity score are given the same importance by the DAPS matching algorithm. The covariates included in the propensity scores are:

- The municipality's minimum altitude, which proxies agricultural characteristics;
- The disposition along the river Po in terms of longitude. Namely, I divide the river into 10 equally long segments and for each municipality, I indicate the closest segment with a factor variable. This proxies the easiness of crossing the river in the tract closest to the municipalities, in different centuries;
- The urban inhabitants located in cities within one day of travel (20 km) in year 1300. The year 1300 is considered the apex of Medieval urban expansion, after several centuries of growth and right before the XIVth century demographic crisis. Therefore, urban population in 1300 proxies maximum the availability of infrastructures and connections between rural and urban areas in the Low Middle Ages, the period of family systems' development.[27]

The continuity of altitude and 1300 urban inhabitants around the Po river can be inspected visually on maps, in Figure F.11 in the Appendix and in Figure 5.

[26] DAPSm estimation of the individual GRDs is carried out with the DAPSm R package by Papadogeorgou et al. (2019), available at this github repository. Standard errors for the DIG are obtained by non-parametric bootstrapping. All codes are available upon request.

[27] Note that this variable is highly correlated with the presence of *Communes* in the XIII-XIVth centuries, which were shown to affect contemporary cultural traits by Guiso et al. (2016). However, population size is more informative, since it allows to capture the intensity of commerce and thus the presence of roads and infrastructures.

**Table 3:** GRD and DIG estimates

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the Catholic party in year:** | | | | | | | | | | | |
| 1948 | 26.712*** | (2.028) | 212 | 29.094*** | (4.416) | 40 | 23.599*** | (2.002) | 160 | 5.494 | (2.579) |
| 1953 | 23.422*** | (1.317) | 386 | 23.501*** | (3.811) | 40 | 24.998*** | (1.474) | 294 | -1.497 | (2.214) |
| 1958 | 24.85*** | (1.344) | 390 | 26.082*** | (3.714) | 40 | 26.722*** | (1.501) | 296 | -0.641 | (2.261) |
| 1963 | 26.663*** | (1.276) | 402 | 26.536*** | (3.374) | 40 | 28.955*** | (1.423) | 306 | -2.419 | (2.230) |
| 1968 | 26.504*** | (1.226) | 406 | 27.537*** | (3.215) | 40 | 28.503*** | (1.368) | 308 | -0.967 | (2.056) |
| 1972 | 25.927*** | (1.219) | 406 | 27.888*** | (3.126) | 40 | 27.928*** | (1.359) | 308 | -0.04 | (2.170) |
| 1976 | 23.913*** | (1.147) | 406 | 25.954*** | (2.98) | 40 | 26.121*** | (1.257) | 308 | -0.166 | (1.936) |
| 1979 | 24.004*** | (1.119) | 406 | 26.256*** | (2.96) | 40 | 26.239*** | (1.256) | 308 | 0.017 | (1.946) |
| 1983 | 21.012*** | (1.048) | 416 | 24.236*** | (2.776) | 40 | 23.581*** | (1.182) | 316 | 0.655 | (1.818) |
| 1987 | 21.006*** | (1.043) | 406 | 22.754*** | (2.999) | 40 | 23.936*** | (1.146) | 308 | -1.183 | (1.843) |
| 1992 | 13.042*** | (0.861) | 406 | 16.12*** | (1.996) | 40 | 15.852*** | (0.904) | 308 | 0.268 | (1.424) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 25.099*** | (1.148) | 416 | 28.32*** | (3.363) | 40 | 27.353*** | (1.287) | 316 | 0.967 | (2.180) |
| Abortion (1981 referendum) | 22.862*** | (0.975) | 416 | 27.385*** | (2.878) | 40 | 24.506*** | (1.105) | 316 | 2.879 | (1.905) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Democrazia Cristiana*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

Since the list of existing municipalities varies slightly across years, the DAPSm matching algorithm is implemented in each year for both the West and East subsamples. Section E.4 presents balance tables. Then, for each voting occasion, I manually compute the DIG as $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$, and I estimate its standard error by non-parametric bootstrapping. In total, I obtain $16 \times 4 = 64$ point estimates.[28] I apply a Bonferroni correction for the presence of 16 hypotheses, one for each voting occasion. Table 3 summarizes results.

Consider the 1981 referendum on abortion, in the last line, as an example to clarify the interpretation of Table 3. The $\widehat{\tau}_W(\boldsymbol{b})$ estimate indicates that absent confounders, conservative culture ($C = 1$) implies approximately 27 additional percentage points against the legalization of abortion. $\widehat{\tau}_W(\boldsymbol{b})$ is estimated in the West, which south of the Po only includes municipalities that were not part of Papal States ($I = 0$). $\widehat{\tau}_E(\boldsymbol{b})$, instead, restricts the sample south of the Po river to municipalities that were part of Papal States ($I = 1$): this estimate is the compound effect of

[28] This number takes into account the 1919-1924 elections. Due to their peculiarities, the results for those are shown in the Appendix.

conservative culture and institutions on the percentage of votes against abortion. The DIG estimate is their difference, and it identifies the causal effect of conservative institutions ($I = 1$, Papal States), which is not distinguishable from zero. The overall GRD estimate (22.862) uses the entire sample. It is also a compound effect with a different weighting compared to $\widehat{\tau}_E(\boldsymbol{b})$, and since it is quantitatively close to $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ but it is estimated on a larger sample, it is included to provide a benchmark. Moreover, it shows that even when the DIG is not distinguishable from zero, there is a slight difference in magnitude between the overall GRD and the GRDs estimated on the two subsamples. This is important because, when researchers make ignorability assumptions on one treatment to comply with the Compound Treatment Irrelevance assumption, the overall GRD becomes the estimate for the causal effect of the single treatment of interest.

All DIG estimates are equal to zero. Moreover, for most years and regardless of the specific geographic area considered for the estimation, the Po river corresponds to a discontinuity in voting patterns of at least 20 percentage points. The only exceptions are concentrated in year 1992: they mirror the growing mistrust towards the party system, recently invested by the fall of U.S.S.R. and the first *Tangentopoli* scandals, which eventually led to the collapse of the entire Italian party system. Indeed, 1992 political elections hit the minimum turnout since 1948 and, as expected, the discontinuity at the Po is lower in magnitude but consistent across the West and East subsamples.

Within the entire *first republic* period instead (1948-1987), the estimates are remarkably stable at around 25 percentage points. This is particularly telling in light of the alternation of economic expansions (in the 1950s-1960s) and recessions (in the 1980s), the age of extremist terror attacks known as *Anni di piombo* in the 1970s, and the institution of regional governments. The latter, which happened in 1970, is particularly important: since the two riversides belong to different administrative regions, local governments' performance and regional policies could act as confounders for the cultural variable ($C$). However, if that was the case, one should see some instability in the estimates around the year 1970, which is not observed.

To conclude the interpretation of results, let me briefly discuss compliance with Assumption 3, the absence of interactive effects of culture and institutions south of the Po.
First, note that the separate estimation of the overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ already provides suggestive evidence of its validity. In fact, note that even in absence of A3, $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture ($C = 1$), conditional on $I = 0$, i.e. conditional on not having been dominated by Papal States. On the other hand, $\widehat{\tau}_E(\boldsymbol{b})$ identifies a compound effect of the two treatments. The two point estimates are statistically equivalent since their difference, the DIG, is not distinguishable from zero. If the two treatments interacted in some way that affected Catholic votes in the long term, the DIG could not have been zero, because $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ would have to be different, and the difference would have remained consistent over a number of consecutive elections.

However, the reader might still worry about spillovers south of the Po, such that even the municipalities that were not under the conservative institutions of Papal States ($I = 0$) would

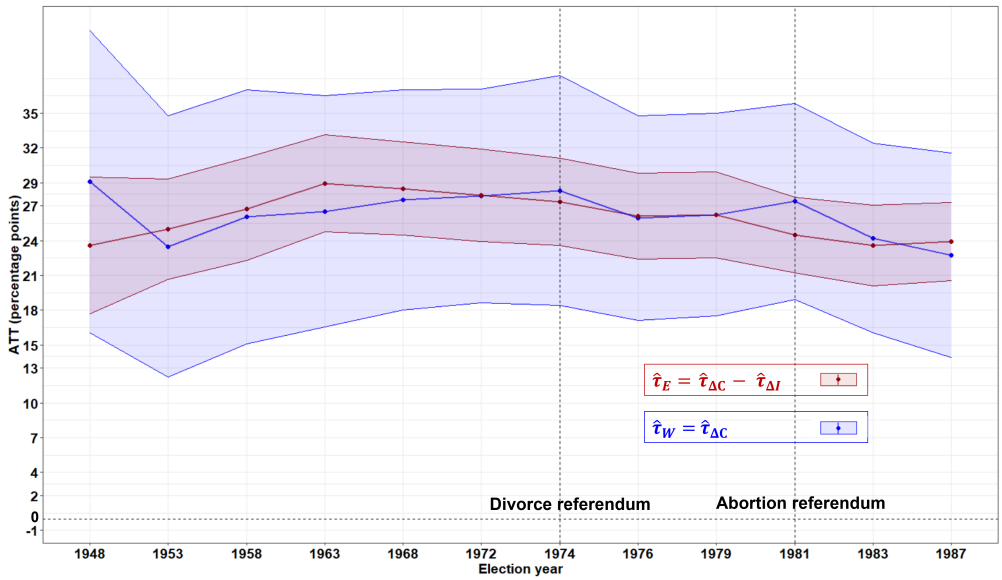
show the effects of their geographic proximity. Under this scenario, $\widehat{\tau}_W(\boldsymbol{b})$ would also identify a compound effect, and DIG estimates equal to zero might simply be the result of this violation of SUTVA, rather than a zero effect of conservative institutions. A piece of evidence against this possibility is the consistency of results when using an alternative underlying GRD estimator, the one introduced in the seminal paper by Dell (2010): this robustness check is described in detail in Section E.3. Dell includes all municipalities in the map, whereas the DAPS matching algorithm excludes those in the far-west corner, farther away from the Papal States, which would presumably be less impacted by spillovers. The Dell and DAPSm estimators produce the same DIG estimates, suggesting that spillovers are not a concern. Since it uses all the municipalities in the sample, this robustness check also allows excluding that the small sample size selected by DAPSm to estimate $\widehat{\tau}_W(\boldsymbol{b})$ might be driving the results.

To what degrees do these considerations help in identifying also the effect of conservative culture? Provided that the spatial distribution of treatment $C$ measures the cultural variable of family systems and not other correlated confounders, under A3 the unconditional ATT of conservative culture is identified by $\widehat{\tau}_W(\boldsymbol{b})$. Even without A3, the estimated effect of conservative culture conditional on progressive institutions equals all estimates of compound effects, suggesting the actual absence of interactions (i.e. the validity of A3): also in this case, spillover effects remain the only potential threat.
Does $C$ capture the culture of family systems rather than highly correlated confounders? The main potential confounder, perfectly correlated with family systems, are modern administrative regions. As discussed above, these were established in 1970, and any confounding effect would have shown as an instability in the estimates around that year. A possible historical confounder is the different intensity of Napoleonic occupation in the early XIXth century. A large fraction of municipalities north of the Po ($C = 1, I = 0$) passed almost immediately under the control of the Habsburg Empire, and as a result, they were not subject to Napoleonic reforms on family law, which covered divorce and inheritance, until later. Section D.2 in the Appendix shows that the length of Napoleonic occupation is not a concern, whereas Section D.1 excludes the confounding effect of other cultural dimensions.

On the other hand, the spatial distribution of other variables that are theoretically related to Todd's family systems supports the claim that variable $C$ is indeed capturing family systems. As mentioned in Section 3.1, the higher average family size north of the Po (conservative culture, $C = 1$) passes from a maximum of 8 in 1953 to a maximum of 5 in 1971, but it remains highly spatially correlated with Catholic votes for the entire period (see, in Appendix, Figure B.2 for 1921 elections, and Section F).
The stronger adherence of the conservative family systems ($C = 1$) to Catholicism is also related to the aforementioned statistics on illegitimate births in the XIXth century (MAIC, 1874, 1883, 1900), for which the two sides of the Po registered the national minima and maxima. Regardless of whether this results from misreporting by women and their families, they are indicative of different degrees of compliance with Catholic morals and patriarchal authority, as described by Todd's theories.

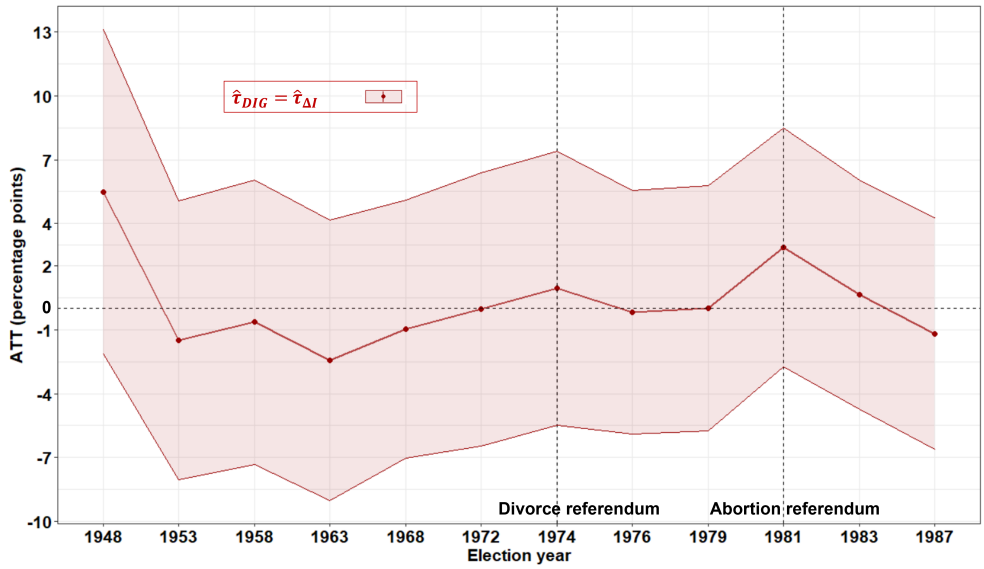
Both these metrics are only available at the province level, and therefore they can only serve as descriptive evidence. Given this and the above econometric considerations, I interpret $\widehat{\tau}_W(\boldsymbol{b})$ as the effect of conservative culture (STEM family system) on contemporary voting patterns.

**Figure 7:** Results: East and West GRDs




Notes: The figure shows, for each voting occasion, the point estimates and Bonferroni-corrected 95% C.I. for $\widehat{\tau}_E(\boldsymbol{b})$ (in red, compound effect of conservative culture and institutions) and for $\widehat{\tau}_W(\boldsymbol{b})$ (in blue, the effect of conservative culture). Their difference (the DIG) identifies the effect of conservative institutions.

**Figure 8:** Results: DIG, the effect of conservative institutions




Notes: The figure shows, for each voting occasion, the point estimates and Bonferroni-corrected 95% C.I. for $\widehat{\tau}_{DIG}$, which identifies the effect of conservative institutions. Standard errors are obtained by non-parametric bootstrapping.

## 7 Robustness checks

In this section, I list five robustness checks. Some have been already mentioned elsewhere in this paper. They are described in detail in dedicated sections of the Appendix.

### 7.1 Robustness of the identification strategy

The robustness checks for the identification strategy move along two dimensions. The first is the exclusion of possible confounders, to corroborate the claim that the entire difference in voting preferences between riverbanks can be attributed to conservative family culture. I consider two sets of confounders:

1. To exclude that other cultural dimensions may drive the results, I estimate a GRD at river Piave. The river runs entirely in the culturally conservative region ($C = 1$), it is similar to the Po in terms of difficulty of crossing, and it is known to separate other cultural dimensions (dialects, festivities). As shown in Section D.1, I find no significant effects on Catholic votes.

2. An institutional confounder is the length of Napoleonic occupation, which is partially spatially correlated to my cultural variable and implies a different exposition to the Napoleonic code, which introduced progressive reforms on inheritance and family law. Exploiting the river

Adige as the border of the area that stayed longer under Napoleonic domination within the culturally conservative region ($C = 1$), in Section D.2 I show that the length of Napoleonic occupation does not affect Catholic votes.

Finally, to provide quantitative evidence that the Po river was a hard border, in Section D.3 I consider the case of a province outside my setting where the Po could be crossed more easily due to historical reasons. Despite being classified as culturally conservative ($C = 1$), the easier contacts with culturally progressive areas ($C = 0$) led to more moderate differences in Catholic votes: the municipalities that are closer to progressive areas are those that display more progressive voting preferences.

### 7.2 Robustness of the estimation

I show the robustness of results to the following variations in the estimation of GRDs:

1. In Section E.1, I use alternative sets of covariates in the specification of the Distance-Adjusted-Propensity-Score (DAPS).
2. In Section E.2, I consider four alternative values of $w$ ($w = 0, 0.25, 0.75, 1$) in the DAPS matching algorithm. $w$ indicates the relative importance given to geographic distance and to the propensity score component;
3. In Section E.3, I replicate results using Dell (2010)'s GRD estimator instead of DAPSm. While it is not ideal in this setting from an econometric point of view, presenting it as an alternative estimation strategy has two advantages. Unlike matching estimators, Dell's GRD exploits all observations within a pre-specified bandwidth. First, this allows to replicate estimates of $\tau_W$, the effect of conservative culture, with a much larger sample: this shows that DAPSm estimates were not driven by outliers. Second, it includes municipalities in the west-most provinces south of the Po, which were not selected by the DAPS matching algorithm. These are the municipalities that are farther away from the Papal States: the fact that their inclusion does not alter point estimates is suggestive of no spillover effects from the Papal States to other municipalities (since geographic proximity is likely to increase potential spillovers).

## 8 Conclusion

Medieval family systems are still very relevant for economic outcomes in some areas of the world, in developing as well as more industrialized countries (Baudin and De Rock, 2021). This paper sheds light on another relevant aspect of complex family systems, namely their ability to explain long-term patterns in political preferences and attitudes towards gender equality policies. A specific

form of conservative culture that values patriarchal authority translates into more conservative voting behaviour in the long term.

However, alternative explanations propose historical institutions as drivers of modern political preferences. For instance, Basten and Betz (2013) show that the sudden imposition of Protestantism in some regions of XVIth-century Switzerland still affects preferences for redistributive policies. Along with family systems, I thus consider the effect of a conservative formal institution: the Papal States, a theocratic state based on Catholic doctrine.

To isolate the two effects, I focus on the area around the Po river in northern Italy, which constituted a hard border for both family systems and pre-unitary states for several centuries. In this area, the spatial distributions of family systems and the Papal States do not fully overlap. This mismatch allows me to overcome the issue of compound treatments and to identify the causal effect of conservative institutions, the Papal States. I formalize and estimate the Difference-in-Discontinuity estimator (DIG), an extension to Geographic Regression Discontinuity designs (GRDs), and I describe how the identifying assumptions can be easily generalized to other GRD designs and different causal estimands. I find that the conservative institutions of the Papal States did not affect votes to Catholic parties (1948-1992), nor on preferences over divorce and abortion (1974-1981). I then argue that the entire estimated discontinuity can be attributed to family based on a series of robustness checks, and available historical and correlational evidence from economic history. In particular, I find that a stronger patriarchal authority and the non-divisibility of inheritance led to an increase in Catholic preferences of at least 20 percentage points from 1948 to 1987.

In developed countries, the recent increased attention towards policies that enhance gender parity calls for an analysis of the determinants of female emancipation's acceptance. Family systems' relevance sheds light on the determinants of such acceptance and highlights the need to target policies and their communication to existing cultural norms.
At the same time, deeply-rooted family norms proved important in explaining the demand for the involvement of religion in politics. Female emancipation, the evolution of gender norms, and the importance given to religious doctrines in political decision-making are intertwined. Identifying family norms as their common determinants might offer new insights into the most effective ways of promoting policies concerning civil rights. Further research could explore concrete modalities of intervention that build on the knowledge of family systems, especially in contexts where patriarchal figures still hold decisive roles over women, and where doctrinal religions still attract large numbers of people and shape contemporary culture.

## References


Battaglie del Piave. *Enciclopedia Italiana Treccani, Dizionario di Storia.*

D. Acemoglu, D. Cantoni, S. Johnson, and J. A. Robinson. The consequences of radical reform: The French Revolution. *American economic review*, 101(7):3286–3307, 2011.

D. Acemoglu, G. De Feo, G. De Luca, and G. Russo. War, Socialism and the Rise of Fascism: An Empirical Exploration. *National Bureau of Economic Research Working Paper*, (No. w27854), 2020.

A. Alesina and P. Giuliano. The power of the family. *Journal of Economic growth*, 15(2):93–125, 2010.

A. Alesina and P. Giuliano. Family ties. *In Handbook of economic growth*, 2:177–215, 2014.

A. Alesina and P. Giuliano. Culture and institutions. . *Journal of Economic Literature*, 53(4): 898–944, 2015.

A. Alesina, P. Giuliano, and N. Nunn. On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics*, 128(2), 2013.

G. Alfieri. *Questo Piatto di Grano.* Atlandide editore, Latina, 2018.

M. Barbagli. *Sotto lo stesso tetto: mutamenti della famiglia in Italia dal XV al XX secolo.* Il Mulino, 2000.

M. Barbagli and D. Kertzer. An introduction to the history of Italian family life. *Journal of Family History*, 15(4):369–383, 1990.

C. Basten and F. Betz. Beyond work ethic: Religion, individual, and political preferences. *American Economic Journal: Economic Policy*, 5(3):67–91, 2013.

T. Baudin and B. De Rock. Economics and Family Structures. *CEPR Discussion Paper DP16516*, 2021.

M. Bellabarba. *La giustizia nell'Italia moderna. XVI-XVIII secolo.* Rome, Laterza, 2008.

G. Bertocchi and M. Bozzano. Family structure and the education gender gap: evidence from Italian provinces. *CESifo Economic Studies*, 61(1):263–300, 2015.

G. Bertocchi and M. Bozzano. Origins and Implications of Family Structure across Italian Provinces in Historical Perspective. *IZA Discussion Paper*, (10327), 2016.

C. Black. *The Italian Inquisition.* Yale University Press, 2009.

F. Bocchi. *Il Polesine di Rovigo.* Grande illustrazione del Lombardo-Veneto, ossia delle città, dei borghi, comuni, castelli, ecc. fino ai tempi moderni. Robert Laffont, coll. "Bouquins", Paris, 1861.

W. J. Bouwsma. *Venice and the Defense of Republican Liberty.* University of California Press, 1968.

L. Cantini. *Legislazione Toscana raccolta e illustrata.* Firenze: nella Stamp. Albizziniana da S. Maria in Campo, 1800.

S. Carmichael, S. Dilli, and L. Van Zanden. Introduction: Family Systems and Economic Development, Economic History of Developing Regions. *Economic History of Developing Regions*, 31 (1):1–9, 2016. doi: 10.1080/20780389.2015.1132625.

Catholic Church. *Regolamento sui delitti e sulle pene del 20 settembre 1832.* Tipi di Giuseppe Vitali, alle scienze, 1862.

Catholic Church. *Corpus iuris canonici. Graz : Akademische Druck- u. Verlagsanstalt. Electronic reproduction. Vol 1-2.* New York, N.Y. : Columbia University Libraries, 2007., 1959.

P. Corbetta and S. Piretti. *Atlante storico-elettorale d'Italia. 1861–2008.* Bologna, Zanichelli, 2009.

A. Cova. I cattolici e il sindacato: dall'estraneità alla partecipazione. In I. della Enciclopedia Italiana fondata da Giovanni Treccani, editor, *Cristiani d'Italia*, chapter 7, pages 1165–1183. 2011.

A. De Pleijt, J. L. Van Zanden, and S. Carmichael. Gender Relations and Economic Development: Hypotheses about the reversal of fortune in Eurasia. *Cliometrics of the Family*, pages 149–172, 2019.

M. Dell. The persistent effects of Peru's mining mita. *Econometrica*, 78(6):1863–1903, 2010.

R. Derosas. Moralità e giustizia a venezia nel '500-'600. gli esecutori contro la bestemmia. In G. Cozzi, editor, *Stato società e giustizia nella Repubblica veneta (sec. XV - XVIII), Vol. I*, chapter 6, pages 431–528. Roma, 1980.

G. Di Brenna and C. Cantù. *Grande illustrazione del Lombardo-Veneto, ossia, Storia delle città, dei borghi, comuni, castelli, ecc: fino ai tempi moderni per cura di letterati italiani, Vol. 5 Part 2.* Tranquillo Ronchi, Padova, 1861.

Ducato di Modena e Reggio. *Codice penale 1855: Codice criminale e di procedura criminale per gli Stati Estensi.* Modena: Per gli Eredi Soliani Tipografi Reali, 1852.

Ducato di Parma, Piacenza e Guastalla. *Codice penale 1820: Codice penale per gli Stati di Parma, Piacenza ecc. ecc. ecc. : ristampato con note e con un indice per materie.* . Parma, della Reale Tipografia, 1850.

G. Duranton, A. Rodriguez-Pose, and R. Sandall. Family Types and the Persistence of Regional Disparities in Europe. *Economic Geography*, 85(1):23–47, 2009.

Encyclopaedia Britannica. *The Fascist era - the rise of Mussolini*. Encyclopaedia Britannica, London, 2021a. URL https://www.britannica.com/place/Italy/The-Fascist-era.

Encyclopaedia Britannica. *War and its aftermath - Economic and political crisis: the "two red years"*. Encyclopaedia Britannica, London, 2021b. URL https://www.britannica.com/place/Italy/Economic-and-political-crisis-the-two-red-years.

F. . P. G. Esposito, A. Franceschi. *Violenza alle donne, una prospettiva medievale*. Il Mulino, 2018.

European Commission. *Report on equality between women and men in the EU*. 2018.

European Commission. *Report on equality between women and men in the EU*. 2019.

European Commission. *Report on equality between women and men in the EU*. 2021.

A. Folchi. *I contadini del duce: Agro Pontino, 1932-1941*. Pieraldo, 2000.

N. Fontana, T. Nannicini, and G. Tabellini. Historical roots of political extremism: The effects of Nazi occupation of Italy.. *CESifo Working Paper*, (No. 6838), 2018.

E. Garino. Insidie familiari. Il retroscena della successione testamentaria a Venezia alla fine del XVIII secolo. In G. Cozzi, editor, *Stato società e giustizia nella Repubblica veneta (sec. XV - XVIII), Vol. II*, chapter 7, pages 300–378. Roma, 1985.

A. Gelman and G. Imbens. Why High-Order Polynomials Should Not Be Used in Regression Discontinuity Designs. *Journal of Business & Economic Statistics*, 37(3):447–456, 2019.

V. Grembi, T. Nannicini, and U. Troiano. Do fiscal rules matter? *American Economic Journal: Applied Economics*, pages 1–30, 2016.

L. Guiso, P. Sapienza, and L. Zingales. Long-term persistence. *Journal of the European Economic Association*, 14(6):1401–1436, 2016.

ISPRA. Istituto superiore per la protezione e la ricerca ambientale. Reticolo Idrografico. 2020.

ISTAT. Istituto Nazionale di Statistica. Descrizione dei dati geografici e delle variabili censuarie per sezione di censimento Anni 1991, 2001, 2011 . 2015.

ISTAT. 8milaCensus. Istituto Nazionale di Statistica. 2020. URL http://ottomilacensus.istat.it/download-dati/.

L. Keele and R. Titiunik. Geographic boundaries as regression discontinuities. *Political Analysis*, 23(1):127–155, 2015.

L. Keele, R. Titiunik, and J. R. Zubizarreta. Enhancing a geographic regression discontinuity design through matching to estimate the effect of ballot initiatives on voter turnout. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 178(1):223–239, 2015.

E. La Ferrara and A. Milazzo. Customary norms, inheritance, and human capital: evidence from a reform of the matrilineal system in Ghana. *American Economic Journal: Applied Economics*, 9(4), 2017.

Q. Lippmann, A. Georgieff, and C. Senik. Undoing gender with institutions: Lessons from the German division and reunification. *The Economic Journal*, 130(629):1445–1470, 2020.

J. F. Loughlin. Pope Paul V. In *Catholic Encyclopedia, Vol. 11*. Roma, 1913.

MAIC. Censimento della popolazione del Regno d'Italia al 31 dicembre 1871. Ministero di agricoltura, industria e commercio, Direzione generale della statistica. 1874.

MAIC. Censimento della popolazione del Regno d'Italia al 31 dicembre 1881. Ministero di agricoltura, industria e commercio, Direzione generale della statistica. 1883.

MAIC. Popolazione: Movimento dello Stato Civile, 1898. Ministero di agricoltura, industria e commercio, Direzione generale della statistica. 1900.

A. Malik and R. A. Mirza. Pre-colonial Religious Institutions and Development: Evidence through a Military Coup. *Journal of the European Economic Association.*, 2019.

K. Mason. Gender and family systems in the fertility transition. *Population and Development Review*, 27:160–176, 2001.

Ministero dell'Interno. Dipartimento per gli Affari Interni e Territoriali. Archivio Storico delle elezioni. Risultati elezioni politiche dal 1948 al 1992. 2020a.

Ministero dell'Interno. Dipartimento per gli Affari Interni e Territoriali. Archivio Storico delle elezioni. Risultati Referendum 17/05/1981. 2020b.

Ministero dell'Interno. Dipartimento per gli Affari Interni e Territoriali. Archivio Storico delle elezioni. Risultati Referendum 12/05/1974. 2020c.

G. Molini. *Manuale per le scritte coloniche a mezzeria.* 1858.

G. Murdock. Ethnographic atlas: a summary. *Ethnology*, 6(2):109–236, 1967.

OECD. *Aid in Support of Gender Equality and Women's Empowerment - DONOR CHARTS*. 2021. URL https://www.oecd.org/development/gender-development/aid-in-support-of-gender-equality-2021.pdf.

E. Orlando. Governo delle acque e navigazione interna : il Veneto nel basso medioevo. *Reti Medievali*, 12(2):251–293, 2011.

G. Papadogeorgou, C. Choirat, and C. M. Zigler. Adjusting for unmeasured spatial confounding with distance adjusted propensity score matching. *Biostatistics*, 20(2):256–272, 2019.

Z. Pei, D. Card, D. S. Lee, and A. Weber. Local Polynomial Order in Regression Discontinuity Designs . *University of Princeton, Working Papers, Industrial Relations Section*, (622), 2018.

A. Pertile. *Storia del diritto penale, influenza del Cristianesimo, in Storia del diritto italiano, dalla caduta dell'Impero Romano alla codificazione.* Torino, Unione tipografico-editrice, 1892.

S. Piasentini. Indagine sulla bestemmia a Venezia nel Quattrocento. *Studi Storici*, Anno 40(2): 513–549, 1999.

P. Prodi. *Il sovrano pontefice. Un corpo e due anime: la monarchia papale nella prima età moderna.* Il Mulino, 1982.

Regno Lombardo-Veneto. *Codice penale dei crimini, dei delitti e delle contravvenzioni colle ordinanze sulla competenza dei giudizi penali, e col regolamento sulla stampa del 27 maggio 1852 per l'impero d'Austria.* Manz, Wien 1869, 1852.

F. Romanoni. Guerra e navi sui fiumi dell'Italia settentrionale (secoli XII-XIV). *Archivio storico lombardo*, 134:11–45, 2008.

J. Seitz. *Witchcraft and Inquisition in Early Modern Venice.* New York: Cambridge University Press, 2011.

L. D. . B. M. L. . P. G. Sonnino, E. Panta. *La popolazione italiana dal Medioevo a oggi.* Laterza, 1996.

M. Szołtysek and R. Poniat. Historical family systems and contemporary developmental outcomes: what is to be gained from the historical census microdata revolution? *The History of the Family*, 23(3):466–492, 2018.

E. Teso. The long-term effect of demographic shocks on the evolution of gender roles: Evidence from the transatlantic slave trade. *Journal of the European Economic Association*, 17(2):497–534, 2019.

E. Todd. *The Explanation of Ideology: Family Structures and Social Systems.* Basil Blackwell, Oxford, 1985.

E. Todd. *L'invention de l'Europe.* Editions du Seuil, Paris, 1990.

J. Tulard, J.-F. Fayard, and A. Fierro. *Histoire et dictionnaire de la Révolution française.* Robert Laffont, coll. "Bouquins", Paris, 1998.

S. P. Uggeri. *Carta archeologica medievale del territorio ferrarese. II. Le vie d'acqua in rapporto al nodo idroviario di Ferrara (Vol. 5).* All'Insegna del Giglio.Robert Laffont, coll. "Bouquins", 2004.

E. Vellati. Il nuovo diritto di famiglia e il ruolo della donna. *Novecento*, (8), 2017. doi: 10.12977/nov177.

C. Zaghi. *L'Italia di Napoleone dalla Cisalpina al Regno*. UTET, Torino, 1991.

P. . T. M. Zanchettin, D. Traverso. Po river discharges: a preliminary analysis of a 200-year time series. *Climatic Change*, 89(3):677–716, 2008.

# APPENDIX

## A Historical appendix

The territorial division depicted in Figure A.1 (and in Section 3.2) has been in place since 1598 and remained unaltered until the Italian Unification, in 1861, with the sole exception of the Napoleonic experience (1797-1815). During the Communal period that preceded this territorial division, all Italy was characterized by a large number of independent city-states that controlled small territories in their proximity, leading to a much more fragmented division. The communal experience is taken into account in the main analysis by controlling for the urban population in 1300, the apex of that period.

The two bigger states in the map started playing predominant roles already in the XIIIth century. South of the Po, the Papal States controlled large part of its 1797 territories already in 1248. North of the Po, the Republic of Venice experienced its maximal expansion and the creation of an Empire: it only missed the annexation of the territories closer to the Po, which at the time remained largely uninhabited. These were formally annexed in 1438.[29] By the beginning of the XVIth century, south of the Po, the Papal States ($I = 1$) occupied all territories coloured in gray, except the province of Ferrara, which was however a satellite state and passed under direct control of the Papal States in 1598. The two Napoleonic Italian campaigns (1797 and 1800) concerned the entire area, although to different degrees: all territories south of the Po and a small portion of the northern riverside (79 municipalities in the province of Verona) were annexed to the Cisalpine Republic from 1797 to 1815, whereas the rest of the north riverside was ceded to the Habsburg Empire and passed under direct French ruling between 1805-1815. [30] The Congress of Vienna in 1815 sanctioned that all former territories of the Republic of Venice (the entire north riverside) would be part of the Kingdom of Lombardy–Venetia, under the control of the Habsburg Empire, and that Papal States would retain the same borders they had in 1797. The portion of land that is not depicted, between the Republic of Venice and the Duchy of Modena and Reggio Emilia (in yellow), belonged to the Duchy of Mantua. While it is excluded from the main analysis, it will be discussed and included as a robustness check in Section 7. Italian unification, in 1861, only concerned territories south of the Po, whereas the Kingdom of Lombardy-Venetia north of the Po remained under Austrian rule until the third War of Independence in 1866.

## B Additional results

### B.1 The 1919-1924 elections

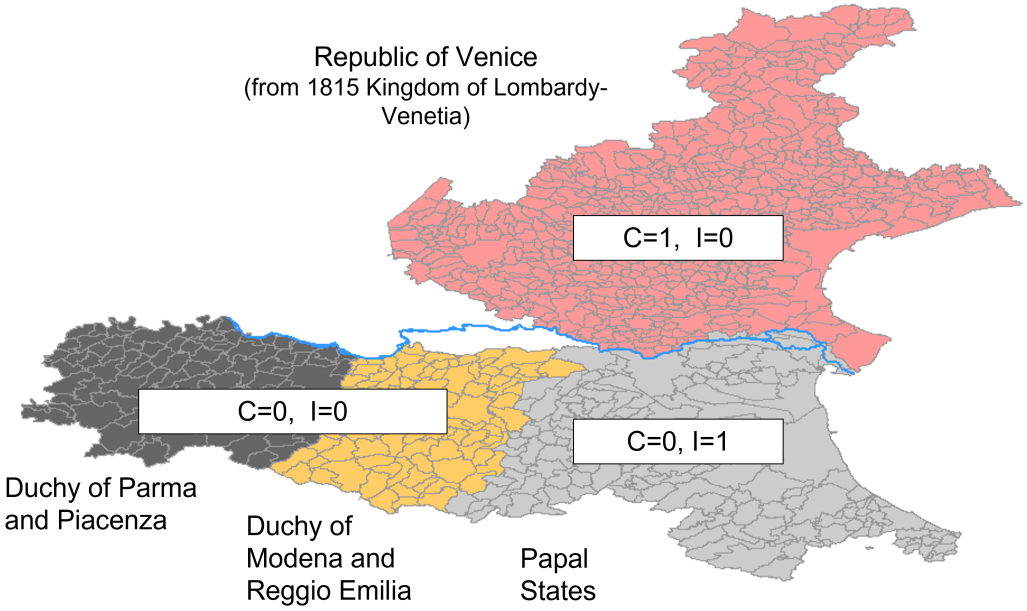
Despite the existence of a Catholic party running for elections between 1919-1924, I have not included those years in the main analysis because of the influence of fascist violence on election results. In this section, I detail the history of pre-WWII Catholic politics in Italy and present results for the 1919, 1921 and 1924 elections.

The first general elections in Italy were held in 1861. From 1874 to 1913, Catholics were prohibited to participate

[29] With the exception of 22 municipalities, known as *Transpadania Ferrarese*, which remained under Papal domination until 1797 and in some cases until 1815 (the latter are shown as grey in the map). These municipalities were very sparsely populated and contact with the southern river bank was arduous, resulting in long periods of isolation (Di Brenna and Cantù, 1861). Nevertheless, any effect attributable to Papal States in this municipalities would produce a downward bias. I remove them from the analysis, as they would formally render the geographic RD estimator inconsistent for the causal estimand of interest. Note, however, that due to their negligible number and scarce population, the results are quantitatively comparable if they are included. These results are available upon request.

[30] Section D.2 provides a robustness check to rule out any confounding effect from the intensity of Napoleonic occupation.

**Figure A.1:** Pre-unitary states as of 1797




in elections or be elected by the *Non expedit* Papal bull. In 1913, the Holy See signed the so-called *Patto Gentiloni*, which led to the election of approximately 200 Catholic candidates in the coalition sustaining the prime minister Giovanni Giolitti (Corbetta and Piretti, 2009). Nevertheless, the Holy See began participating to Italy's political life in 1901, when Pope Leone XIII formally recognized the "almost servile" conditions of proletarians,[31] and opened to the creation of Catholic associations of both workers and owners, the so-called *white leagues* (Cova, 2011). Until then, Catholic workers were not represented by the already existing *red leagues* (socialist), because these had strong anticlerical positions. the leagues, which until then were industry-specific, eventually merged and formed modern Italian labour unions in the aftermath of WWI. Regardless of their political affiliation, unions responded to the deep, war-initiated economic crisis with violent protests, strikes, land and factory occupations known as the *red biennium* (1919-1921). The agitations of agricultural workers in the Po valley were particularly intense, leading to a huge growth of the white union that, contrary to Leone XIII positions, preached revolution against the owners. Nevertheless, red and white unions also had violent clashes on the accounts of their different ideologies (Cova, 2011; Encyclopaedia Britannica, 2021b). 1919 was a year of crucial transformations:

- Following the end of WWI, the widespread discontent of war survivors over the unfavourable conditions of peace, and the surging economic crisis, 1919 elections were the first held under universal male suffrage (Corbetta and Piretti, 2009);
- The newly-founded Catholic Party, *Partito Popolare Italiano* (PPI) ran for the 1919 elections with the endorsement of the Catholic Church. It immediately became the main opponent of PSI, the biggest party, and ran until 1924 elections. It was then banned during the fascist regime (Corbetta and Piretti, 2009; Encyclopaedia Britannica, 2021b);

[31] In his *Rerum novarum* encyclical.

- Mussolini founded the *Fasci di combattimento*. These were armed militias that used violence as a means of repressing protests of both white and red unions, leagues and associations, with the aim of attracting middle-class votes for the newly-created fascist party, and dissuading votes towards the Catholic and Socialist parties, PPI and PSI. They were particularly active in the Po valley, especially in the two provinces neighboring the river, Ferrara and Rovigo. Intimidatory and punitive expeditions began in 1919, increased in frequency in the so-called *black biennium* (1921-1922), and continued until the establishment of fascist dictatorship (Encyclopaedia Britannica, 2021a). By the 1924 elections, socialist and Catholic opposition to fascism from lower classes had already been defeated, and Mussolini had already passed a new majoritarian electoral law which then granted him control of the Parliament.[32]

I use data collected by Corbetta and Piretti (2009), which report the votes obtained by PPI in a large number of municipalities ($N = 913$), for election in the Chamber of Deputies. Despite the missingness of some municipalities, which can be inspected visually in Figure B.2, I treat the data as complete.

Estimation by DAPSm yields the following results:

**Table B.1:** DAPSm results: 1919-1924 elections

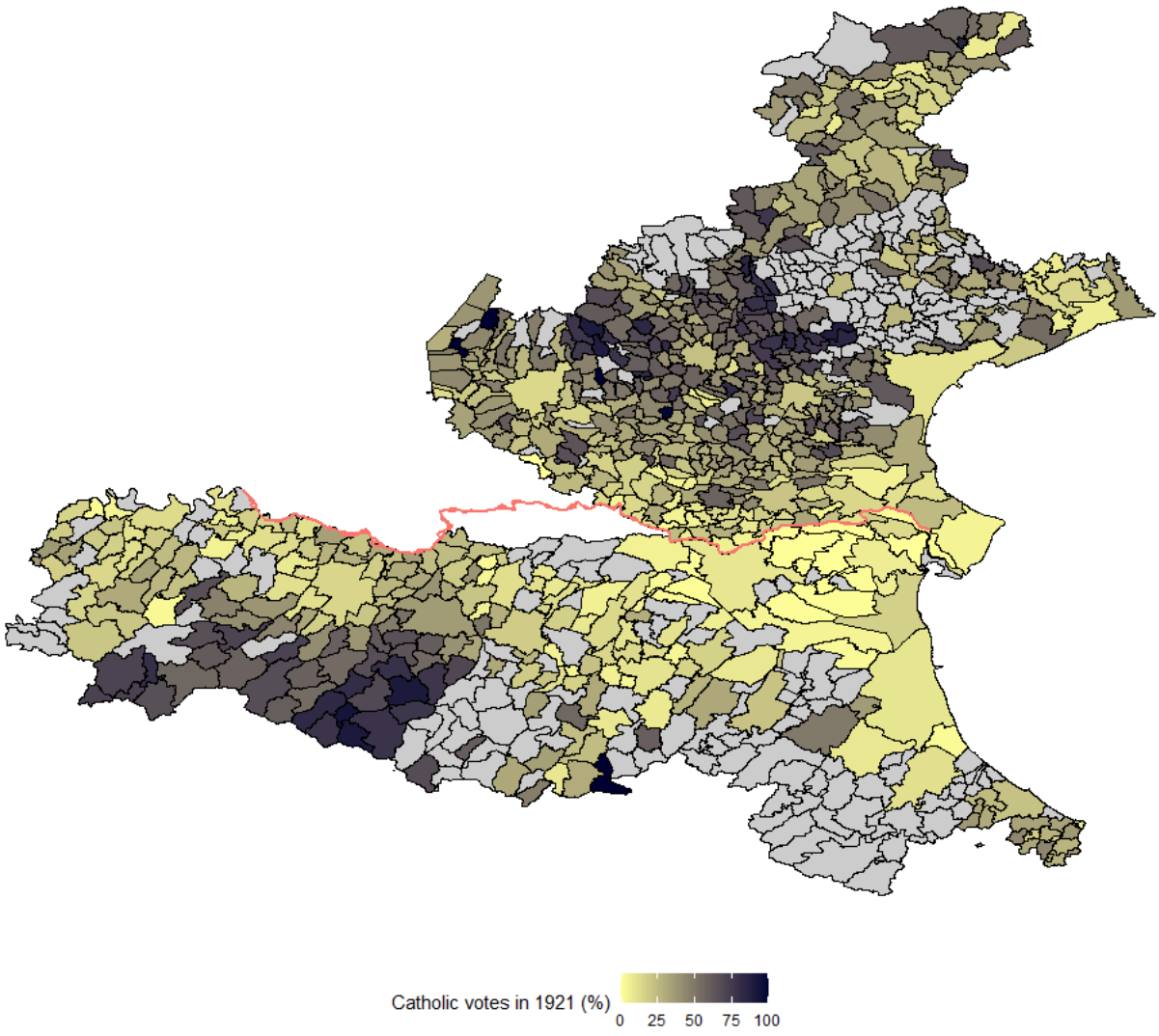
| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the Catholic party in year:** | | | | | | | | | | | |
| 1919 | 11.05*** | (1.902) | 386 | 19.726** | (6.364) | 40 | 11.361*** | (2.033) | 294 | 8.365 | (3.277) |
| 1921 | 9.037*** | (2.572) | 386 | 8.889 | (7.399) | 40 | 15.347*** | (2.56) | 294 | -6.458 | (3.975) |
| 1924 | 9.276*** | (1.216) | 386 | 10.06** | (3.076) | 40 | 11.319*** | (1.527) | 294 | -1.259 | (1.866) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Partito Popolare Italiano*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

The year-specific spatial distribution of fascist punitive expeditions is likely to influence the difference in magnitude between $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ and consequently, the DIG point estimate. DIG estimates, after accounting for the presence of multiple hypotheses, remain equal to zero. Even ignoring the Bonferroni correction, the estimates are largely unstable over time and change sign. Due to the influence of fascist violence, I maintain that while the effect of conservative institutions (measured by the DIG) is zero, it is not possible to make a quantitative statement on the effect of conservative culture only by looking at these three elections. All robustness checks on the main analysis have been performed for these elections: they were omitted for the sake of brevity and clarity, but they are available upon request.

[32] The rise of fascism in response to the events of the *red biennium* are studied quantitatively by Acemoglu et al. (2020).

**Figure B.2:** Catholic votes (%) in 1921



## C Summary statistics

The following tables summarize baseline covariates used for matching, contemporary characteristics and outcome variables in the treatment groups used to estimate GRDs. The overall GRD contrasts groups **North of Po - South of Po, overall**. $\tau_W(\boldsymbol{b})$ contrasts **North of Po - South-West of Po**, and $\tau_E(\boldsymbol{b})$ contrasts **North of Po - South-East of Po**.

**Table C.2:** Summary statistics by treatment groups: baseline covariates

| | | **Baseline covariates** | | | | |
|---|---|---|---|---|---|---|
| | | **Distance to Po (km)** | **Extension ($km^2$)** | **Minimum altitude(m)** | **Maximum altitude(m)** | **Inhabitants in year 1300** |
| **North of Po** $(F=1,P=0)$ | Mean | 64.058 | 31.591 | 121.768 | 578.068 | 17692.97 |
| | St.dev. | 39.79 | 32.969 | 216.26 | 866.265 | 28433.291 |
| | Min | 0.104 | 2.971 | -3 | 2 | 0 |
| | Max | 175.829 | 415.899 | 1075 | 3300 | 173000 |
| **South of Po, overall** $(F=0,P=0)$ | Mean | 47.165 | 65.56 | 110.858 | 509.568 | 17035.266 |
| | St.dev. | 32.243 | 61.147 | 136.497 | 570.447 | 22749.085 |
| | Min | 0.484 | 3.171 | -3 | 3 | 0 |
| | Max | 125.304 | 653.822 | 792 | 2165 | 80000 |
| **South-West of Po** $(F=0,P=0,1)$ | Mean | 31.869 | 58.884 | 145.064 | 610.736 | 9452.202 |
| | St.dev. | 21.281 | 39.945 | 154.006 | 637.19 | 14399.097 |
| | Min | 0.484 | 3.171 | 1 | 19 | 0 |
| | Max | 81.209 | 260.602 | 792 | 2165 | 40000 |
| **South-East of Po** $(F=0,P=1)$ | Mean | 66.358 | 73.937 | 67.938 | 382.632 | 26549.865 |
| | St.dev. | 33.386 | 79.421 | 94.645 | 442.375 | 27287.831 |
| | Min | 0.686 | 5.44 | -3 | 3 | 0 |
| | Max | 125.304 | 653.822 | 393 | 1945 | 80000 |

**Table C.3:** Summary statistics by treatment groups: contemporary characteristics

| | | Contemporary characteristics | | |
|---|---|---|---|---|
| | | **Turnout (1979)** | **Adult pop. (1979)** | **Mean family size in 1953** |
| **North of Po** $(F = 1, P = 0)$ | Mean | 0.916 | 5540.179 | 4.834 |
| | St.dev. | 0.073 | 16948.838 | 0.981 |
| | Min | 0.368 | 212 | 2.352 |
| | Max | 1.049 | 273621 | 8.628 |
| **South of Po, overall** $(F = 0, P = 0)$ | Mean | 0.944 | 9221.811 | 4.312 |
| | St.dev. | 0.058 | 27072.041 | 0.41 |
| | Min | 0.572 | 225 | 3.277 |
| | Max | 1.006 | 383956 | 5.674 |
| **South-West of Po** $(F = 0, P = 0, 1)$ | Mean | 0.929 | 7143.649 | 4.269 |
| | St.dev. | 0.073 | 17500.333 | 0.409 |
| | Min | 0.572 | 225 | 3.435 |
| | Max | 1.001 | 142071 | 5.674 |
| **South-East of Po** $(F = 0, P = 1)$ | Mean | 0.963 | 11829.315 | 4.366 |
| | St.dev. | 0.016 | 35455.625 | 0.406 |
| | Min | 0.915 | 680 | 3.277 |
| | Max | 1.006 | 383956 | 5.206 |

**Table C.4:** Summary statistics by treatment groups: outcomes

| | | Outcomes | | |
|---|---|---|---|---|
| | | **Votes to DC in 1979 (%)** | **Votes against divorce (%)** | **Votes against abortion (%)** |
| **North of Po** $(F = 1, P = 0)$ | Mean | 56.508 | 59.215 | 49.075 |
| | St.dev. | 13.803 | 14.017 | 11.902 |
| | Min | 21.839 | 25.743 | 21.9 |
| | Max | 92.974 | 91.751 | 85.6 |
| **South of Po, overall** $(F = 0, P = 0)$ | Mean | 32.827 | 35.593 | 27.532 |
| | St.dev. | 11.028 | 10.963 | 9.238 |
| | Min | 11.834 | 12.357 | 10.3 |
| | Max | 72.452 | 71.202 | 64.5 |
| **South-West of Po** $(F = 0, P = 0, 1)$ | Mean | 36.725 | 38.534 | 29.732 |
| | St.dev. | 11.558 | 11.107 | 9.065 |
| | Min | 14.461 | 16.465 | 12.9 |
| | Max | 72.452 | 71.202 | 64.5 |
| **South-East of Po** $(F = 0, P = 1)$ | Mean | 27.936 | 31.903 | 24.771 |
| | St.dev. | 7.983 | 9.584 | 8.7 |
| | Min | 11.834 | 12.357 | 10.3 |
| | Max | 49.332 | 55.393 | 55.8 |

## D Robustness checks on the identification

### D.1 Other cultural dimensions as potential confounders: the Piave river

In order to attribute the entire difference in Catholic votes between the two riversides to conservative culture, it is necessary to exclude the effect of possible confounders. I estimate a GRD at river Piave, that runs entirely within the culturally conservative region ($C = 1$) but separates other cultural dimensions – a map is provided in Figure F.7. For instance, the two riversides have different dialects, festivities and culinary traditions. If these dimensions had any role in explaining modern voting patterns, a GRD estimated along the Piave would return significant estimates. Historically, the Piave was equally large and difficult to cross. For instance, this is what made the Piave decisive during WWI. The river hard border was the first point were the Italian army was able to stop the advance of the Austro-Hungarians after the 1917 defeat of Caporetto (150 km away, to the north). Subsequently, in 1918, its strong currents prevented the construction of Italian pontoon bridges and destroyed others that had been already built, delaying the Second Battle of Piave by two days (tre). As shown in Table D.5, estimates are not discernible from zero at any voting occasion.

**Table D.5:** Robustness check: DAPSm GRD at river Piave

| | (1) | | | (2) - Preferred specification | | | (3) | | |
|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N height |
| **(%) votes for the catholic party in year:** | | | | | | | | | |
| 1948 | 3.836 | (3.778) | 477 | 3.948 | (3.769) | 477 | 4.124 | (3.745) | 476 |
| 1953 | 2.19 | (3.652) | 481 | 2.331 | (3.636) | 481 | 2.553 | (3.599) | 481 |
| 1958 | 4.258 | (3.612) | 482 | 4.256 | (3.586) | 482 | 4.328 | (3.531) | 482 |
| 1963 | 5.291 | (3.614) | 483 | 5.29 | (3.582) | 483 | 5.333 | (3.505) | 483 |
| 1968 | 6.419 | (3.628) | 483 | 6.418 | (3.606) | 483 | 6.38 | (3.543) | 483 |
| 1972 | 5.033 | (3.683) | 483 | 5.032 | (3.662) | 483 | 4.944 | (3.598) | 483 |
| 1976 | 6.638 | (3.57) | 483 | 6.637 | (3.527) | 483 | 6.606 | (3.474) | 483 |
| 1979 | 6.043 | (3.513) | 483 | 6.041 | (3.47) | 483 | 6.069 | (3.404) | 483 |
| 1983 | 6.579 | (3.433) | 483 | 6.578 | (3.398) | 483 | 6.594 | (3.325) | 483 |
| 1987 | 6.945 | (3.271) | 483 | 6.944 | (3.235) | 483 | 6.892 | (3.171) | 483 |
| 1992 | 3.94 | (2.688) | 483 | 3.94 | (2.67) | 483 | 3.875 | (2.613) | 483 |
| **(%) votes against legalization of:** | | | | | | | | | |
| Divorce (1972 referendum) | 5.343 | (3.256) | 483 | 5.342 | (3.226) | 483 | 5.617 | (3.14) | 483 |
| Abortion (1981 referendum) | 4.705 | (3.671) | 483 | 4.704 | (3.628) | 483 | 4.877 | (3.517) | 483 |
| **Covariates:** | | | | | | | | | |
| Longitude along river Po, Altitude | Yes | Yes | Yes | No | No | No | No | No | No |
| Urban Density in year 1300 | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Turnout and electorate size | No | No | No | No | No | No | Yes | Yes | Yes |

Notes: $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01, Bonferroni-adjusted p-values. The GRD at the Piave identifies the ATT of potentially confounding cultural dimensions, other than conservative family systems. The Catholic party is *Democrazia Cristiana*.

### D.2 Napoleonic occupation as a potential confounder: the Adige river

A second confounder for the effect of conservative culture is the intensity of Napoleonic occupation. Whereas all the southern Po riverside and a small number of municipalities north of the Po remained under direct Napoleonic control from 1797 to 1815 (as part of the Cisalpine Republic), the vast majority of municipalities north of the Po were only marginally affected by Napoleonic legislation, since Napoleonic occupation in 1797 lasted just few months, and was resumed again from 1805 to 1815 (Zaghi, 1991).[33] The Napoleonic Code, which was extended to all conquered territories, mandated the equal partition of inheritance among all living sons and daughters: it temporarily outlawed the primogeniture norms in place north of the Po (the conservative culture), and abolished the institution of *fideicommissum*. Moreover, while formalizing the supremacy of the husband over the wife that was customary of all Europe, and while imposing some limitations that made divorcing easier for the husband, the Code kept divorce legal based on the French Revolutionary Laws (1792), both on the grounds of adultery and of "incompatible moods" (Tulard et al., 1998). The institution of divorce came as a complete novelty for the inhabitants of former Italian states (Barbagli and Kertzer, 1990).

Within the northern Po riverside, a large part of the border between the Cisalpine Republic and other municipalities was set at river Adige, another large river characterized by rip currents and guarded by soldiers during the Cisalpine Republic years.

I exploit the tract of river Adige that served as a border as a geographic discontinuity, and estimate a GRD by Dell (2010). I do not carry out the estimation by DAPSm due to the low number of municipalities that were part of the Cisalpine Republic (79). Namely, for all outcomes I estimate: bbold

$$Y_m = \alpha + \gamma_{GRD}\mathbb{I}\{North\}_m + f(lat_m, long_m) + \phi_m + \boldsymbol{X'_m}\boldsymbol{\beta} + \varepsilon_m$$

Where $f(lat_m, long_m)$ is a squared polynomial of longitude and latitude, $\phi_m$ are border fixed effects, and $\boldsymbol{X}$ includes a number of municipalities' characteristics, summarized along the results in Table D.6. Since the entire area was characterized by a conservative culture ($C = 1$) and was previously under the progressive institutions of the Republic of Venice ($I = 0$), the GRD identifies the effect of the shorter length of Napoleonic occupation from those of culture and pre-existing formal institutions. Formally, the effect is estimated conditional on $C = 1$ and $I = 0$. All estimates are statistically equal to zero.[34]

Figure D.3 summarizes the characteristics of municipalities considered in this estimation:

[33] In his first military campaign in Italy in 1797, Napoleon forced the Republic of Venice to surrender and dissolve. However, already in January 1798, he ceded large part of the ex Republic of Venice to the Austrian Habsburg Empire. These territories passed again under Napoleonic control from 1805 to 1815, as part of the Kingdom of Italy, after the second Italian campaign.

[34] Albeit not very precisely, due to low number of municipalities under the Cisalpine Republic.

**Figure D.3:** Napoleonic occupation north of the Po river ($C = 1, I = 0$)

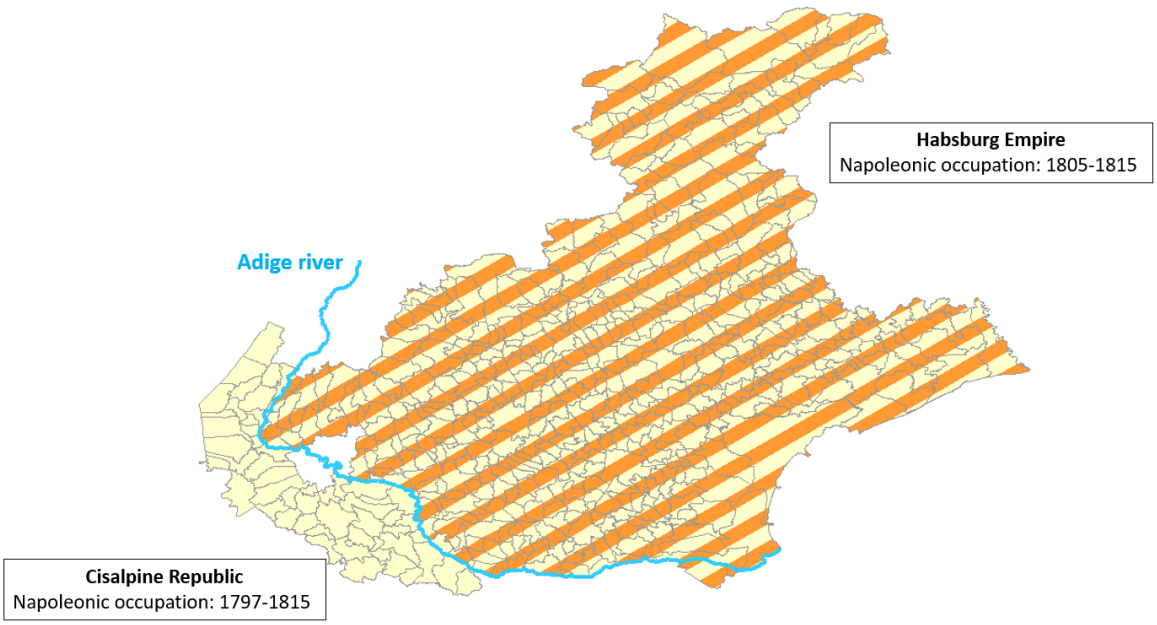



**Figure D.4:** Notes: the map shows the municipalities used in the robustness check on the intensity of Napoleonic occupation. Below the border of the Adige river, Napoleonic occupation through the Cisalpine Republic lasted from 1797 to 1815, whereas north of the Adige from 1805 to 1815.

**Table D.6:** The effect of Napoleonic occupation intensity: GRD at river Adige

| | (1) | | | (2) | | | (3) | | |
|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N height |
| **(%) votes for the catholic party in year:** | | | | | | | | | |
| 1948 | 3.836 | (3.778) | 477 | 3.948 | (3.769) | 477 | 4.124 | (3.745) | 476 |
| 1953 | 2.19 | (3.652) | 481 | 2.331 | (3.636) | 481 | 2.553 | (3.599) | 481 |
| 1958 | 4.258 | (3.612) | 482 | 4.256 | (3.586) | 482 | 4.328 | (3.531) | 482 |
| 1963 | 5.291 | (3.614) | 483 | 5.29 | (3.582) | 483 | 5.333 | (3.505) | 483 |
| 1968 | 6.419 | (3.628) | 483 | 6.418 | (3.606) | 483 | 6.38 | (3.543) | 483 |
| 1972 | 5.033 | (3.683) | 483 | 5.032 | (3.662) | 483 | 4.944 | (3.598) | 483 |
| 1976 | 6.638 | (3.57) | 483 | 6.637 | (3.527) | 483 | 6.606 | (3.474) | 483 |
| 1979 | 6.043 | (3.513) | 483 | 6.041 | (3.47) | 483 | 6.069 | (3.404) | 483 |
| 1983 | 6.579 | (3.433) | 483 | 6.578 | (3.398) | 483 | 6.594 | (3.325) | 483 |
| 1987 | 6.945 | (3.271) | 483 | 6.944 | (3.235) | 483 | 6.892 | (3.171) | 483 |
| 1992 | 3.94 | (2.688) | 483 | 3.94 | (2.67) | 483 | 3.875 | (2.613) | 483 |
| **(%) votes against legalization of:** | | | | | | | | | |
| Divorce (1972 referendum) | 4.705 | (3.671) | 483 | 4.704 | (3.628) | 483 | 4.877 | (3.517) | 483 |
| Abortion (1981 referendum) | 5.343 | (3.256) | 483 | 5.342 | (3.226) | 483 | 5.617 | (3.14) | 483 |
| **Covariates:** | | | | | | | | | |
| Longitude along river Po, Altitude | Yes | Yes | Yes | No | No | No | No | No | No |
| Urban Density in year 1300 | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Turnout and electorate size | No | No | No | No | No | No | Yes | Yes | Yes |
| Lat-long polynomial and border FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Notes: $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01, Bonferroni-adjusted p-values. The GRD at Adige river identifies the ATT of a shorter Napoleonic occupation on Catholic votes, and on votes against divorce and abortion. The Catholic party is *Democrazia Cristiana*. Due to the low number of municipalities that experienced a longer Napoleonic occupation (79), the GRD is estimated by Dell (2010). The city of Verona, which is crossed by river Adige, is excluded from the analysis.

### D.3 The Po as a hard border: evidence from Mantua

This robustness check compares summary statistics in the area of study to the province of Mantua, which is not in the setting of the main analysis. Despite being small, Mantua provides suggestive evidence of what would have happened if the Po river had not been a hard border between the two riversides in the main analysis setting.

The province includes 70 municipalities, and it is located between the west-most provinces of the north riverside ($C = 1$) and the south riverside ($C = 0$). It was part of a separate state with respect to both since 1115, except during the Napoleonic domination (1797-1815), when it became part of the Cisalpine Republic along the entire region of Emilia. Mantua has been classified by Todd (1990) as a STEM province (more conservative culture, $C = 1$).[35] It has the particular feature of being crossed by the Po river, as shown in Figure D.5. Uggeri (2004) reports the presence of a bridge within the province since the Middle Ages, and that Mantua had several military conflicts with states located on both riversides over the passage of merchant ships in its tract of the Po river. Due to military conflicts, the movement of people across its borders is not a concern during the Medieval centuries that saw the formation of family systems ($C$). Within the province of Mantua then, one would expect to find little or no difference in voting patterns between the two sides of the Po river. For what concerns the main analysis, the closeness of Mantuan municipalities (where $C = 1$) to the south-west riverside in the main setting (where $C = 0$) would imply, if anything, that the estimates overall GRD and the $\widehat{\tau}_W$ estimates are negatively biased. The fact that those estimates are quantitatively equivalent to those from the east sample is evidence that the bias is unlikely to be in place. Indeed, the map in Figure D.5 shows that the municipalities that display more Catholic preferences are those closer to the northern riverside in the setting (where $C = 1$), and those with less Catholic preferences are bordering the south riverside ($C = 0$).

The closeness of municipalities in the setting south of the Po ($C = 0$) also implies that once border controls were lifted, as during the Napoleonic period unification, and then again starting in 1861, the mixture of cultural norms would happen more quickly.

Table D.10 shows summary statistics of contemporary characteristics, baseline covariates and outcome variables for the two sides of the river, within the Mantua province. Table D.7 instead summarizes outcome variables (conservative votes) within the province of Mantua, in comparison with the setting's north riverside ($C = 1$) and south riverside ($C = 0$). Indeed, the differences in conservative votes between the two riversides in Mantua are far smaller than those between the two riversides, though still present. Taken as a whole, the province of Mantua displays modern political preferences that lie in between. However, by looking at them by riverside, it becomes clear that Mantuan municipalities south of the Po display very similar numbers to those from the setting's south riverside. Despite the presence of a bridge, these municipalities were closer to them than to the rest of Mantua, and the STEM family system ($C = 1$) did not have the same persistence it had in the setting's north riverside, as expected, except for the municipalities further away from the river, as shown in Figure D.5.

[35] Todd (1990) does not specify, in this case, whether the parish registries used for the classifications are located south or north of the Po river, and whether he used a single archive or multiple ones.

**Figure D.5:** DC votes (%) in 1979 in Mantua province

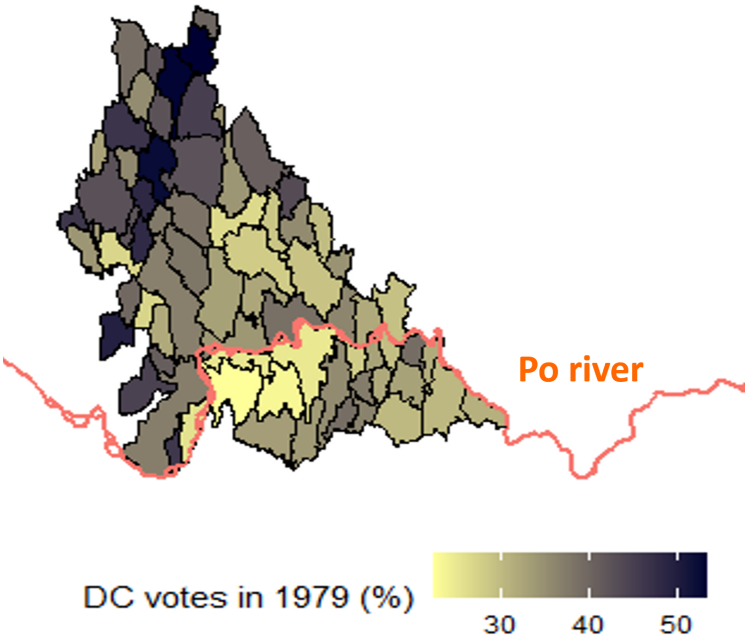



**Table D.7:** Outcome variables' summary statistics in Mantua relative to the riversides in the setting

| | | Mean | St.dev | Min | Max | N |
|---|---|---|---|---|---|---|
| Votes to Democrazia Cristiana (%) in 1979 | N riverside | 56.51 | (13.798) | 21.839 | 92.974 | 582 |
| | S riverside | 32.765 | (11.078) | 11.834 | 72.452 | 341 |
| | **Mantua** | 36.033 | (7.408) | 22.166 | 53.322 | 70 |
| Votes against abortion (%) (1981) | N riverside | 40.089 | (11.906) | 21.9 | 85.6 | 582 |
| | S riverside | 27.54 | (9.263) | 10.3 | 64.5 | 341 |
| | **Mantua** | 32.256 | (7.210) | 18.9 | 51.3 | 70 |
| Votes against divorce (%) (1974) | N riverside | 59.216 | (14.014) | 25.743 | 91.751 | 582 |
| | S riverside | 35.515 | (10.994) | 12.357 | 71.202 | 341 |
| | **Mantua** | 39.952 | (8.353) | 23.418 | 61.097 | 70 |

Notes: All outcome variables are measured in percentage points (0-100). Mantua displays mixed voting patterns with respect to the setting's north riverside ($C = 1$) and south riverside ($C = 0$). Despite being classified as a culturally conservative province ($C = 1$), within the province the Po was easier to cross. This suggests that instead, in the main area of study, the Po river was indeed a hard border.

**Table D.8:** Summary statistics by riverside within Mantua: baseline covariates

| | | Baseline covariates | | | | |
|---|---|---|---|---|---|---|
| | | **Distance to Po (km)** | **Extension ($km^2$)** | **Minimum altitude(m)** | **Maximum altitude(m)** | **Inhabitants in year 1300** |
| **Mantua North of Po** | Mean | 16.192 | 33.858 | 27.231 | 53 | 14615.385 |
| | St.dev. | 11.506 | 21.417 | 15.595 | 49.739 | 19298.662 |
| | Min | 0.31 | 8.913 | 11 | 17 | 0 |
| | Max | 30.020 | 103.843 | 88 | 214 | 40000 |
| **Mantua South of Po** | Mean | 4.918 | 32.269 | 12.778 | 19.444 | 8888.889 |
| | St.dev. | 3.649 | 18.446 | 2.521 | 3.927 | 16722.752 |
| | Min | 0.356 | 12.733 | 9 | 12 | 0 |
| | Max | 12.986 | 69.942 | 17 | 27 | 40000 |

**Table D.9:** Summary statistics by riverside within Mantua: contemporary characteristics

| | | Contemporary characteristics | | |
|---|---|---|---|---|
| | | **Turnout (1979)** | **Adult pop. (1979)** | **Mean family size (1953)** |
| **Mantua North of Po** | Mean | 0.961 | 4315.615 | 4.02 |
| | St.dev. | 0.012 | 6832.674 | 0.419 |
| | Min | 0.929 | 488 | 2.971 |
| | Max | 0.996 | 49836 | 4.773 |
| **Mantua South of Po** | Mean | 0.961 | 3729.5 | 3.921 |
| | St.dev. | 0.011 | 3301.909 | 0.361 |
| | Min | 0.939 | 746 | 3.368 |
| | Max | 0.977 | 14660 | 4.816 |

**Table D.10:** Summary statistics by riverside within Mantua: outcomes

| | | Outcomes | | |
|---|---|---|---|---|
| | | **Votes to DC in 1979 (%)** | **Votes against divorce (%)** | **Votes against abortion (%)** |
| **Mantua North of Po** | Mean | 37.789 | 41.654 | 33.81 |
| | St.dev. | 7.318 | 8.236 | 7.132 |
| | Min | 25.357 | 25.268 | 21 |
| | Max | 53.322 | 61.097 | 51.3 |
| **Mantua South of Po** | Mean | 30.962 | 35.032 | 27.767 |
| | St.dev. | 4.674 | 6.336 | 5.101 |
| | Min | 22.166 | 23.418 | 18.9 |
| | Max | 38.84 | 47.961 | 38.7 |

# E Robustness checks on the estimation

## E.1 Additional specifications of propensity scores

Table E.11 adds two alternative specifications for the propensity score component of the DAPS. For the sake of brevity, I restrict this check to the specification of the overall GRD, although results are equivalent also for $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$. First, I remove urban population in 1300, as it could be considered a post-treatment control with respect to family systems ($C$). I then add turnout and electorate size at the election: even comparing municipalities with similar contemporary population and political participation, estimates remain quantitatively stable.[36]

**Table E.11:** Overall GRD with different PS specifications

| | (1) | | | (2) - Preferred specification | | | (3) | | |
|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N |
| **(%) votes for the catholic party in year:** | | | | | | | | | |
| 1948 | 25.061*** | (1.926) | 208 | 26.712*** | (2.028) | 212 | 29.27*** | (2.122) | 216 |
| 1953 | 23.719*** | (1.33) | 388 | 23.422*** | (1.317) | 386 | 23.247*** | (1.38) | 384 |
| 1958 | 24.999*** | (1.347) | 392 | 24.85*** | (1.344) | 390 | 25.378*** | (1.395) | 390 |
| 1963 | 26.584*** | (1.274) | 404 | 26.663*** | (1.276) | 402 | 27.08*** | (1.312) | 408 |
| 1968 | 26.541*** | (1.216) | 408 | 26.504*** | (1.226) | 406 | 27.303*** | (1.287) | 400 |
| 1972 | 25.999*** | (1.205) | 408 | 25.927*** | (1.219) | 406 | 26.523*** | (1.276) | 404 |
| 1976 | 24.171*** | (1.135) | 408 | 23.913*** | (1.147) | 406 | 24.896*** | (1.177) | 404 |
| 1979 | 24.303*** | (1.106) | 408 | 24.004*** | (1.119) | 406 | 25.444*** | (1.172) | 404 |
| 1983 | 21.524*** | (1.04) | 420 | 21.012*** | (1.048) | 416 | 22.618*** | (1.157) | 394 |
| 1987 | 21.389*** | (1.031) | 408 | 21.006*** | (1.043) | 406 | 21.821*** | (1.095) | 400 |
| 1992 | 13.59*** | (0.857) | 408 | 13.042*** | (0.861) | 406 | 13.414*** | (0.885) | 406 |
| **(%) votes against legalization of:** | | | | | | | | | |
| Divorce (1972 referendum) | 25.761*** | (1.142) | 420 | 25.099*** | (1.148) | 416 | 25.959*** | (1.213) | 396 |
| Abortion (1981 referendum) | 23.475*** | (0.966) | 420 | 22.862*** | (0.975) | 416 | 23.25*** | (1.003) | 398 |
| **Covariates:** | | | | | | | | | |
| Longitude along river Po, Altitude | Yes | Yes | Yes | No | No | No | No | No | No |
| Urban Density in year 1300 | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Turnout and electorate size | No | No | No | No | No | No | Yes | Yes | Yes |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. For each election, the overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$. The Catholic party is *Democrazia Cristiana*.

[36] These are definitely post-treatment controls and could act as mediators, thus biasing the estimates. For this reason they are excluded from the main analysis.

## E.2 Robustness: changing $w$ in DAPSm

### E.2.1 Alternative values of $w$

This section replicates all results by varying $w$, the weight given to the propensity score by the DAPS matching algorithm. In the main analysis, I attributed the same weight to propensity scores and geographic distance ($w = 0.5$): I now replicate results with $w = (0, 0.25, 0.75, 1)$. As shown in the balance tables in Section E.4, the matching algorithm reduces the average distance from the river of treated units[37] at the expense of a slightly worse balance on some other baseline covariates. The algorithm also attributes high importance to longitude in the propensity score matching component of DAPS, as shown by balance tables. Comparing estimates for different values of $w$ allows to assess how this impacts results: intuitively, lower values of $w$ (higher importance given to distance) should yield estimates that are more affected by this trade-off. To illustrate this fact, in Table E.22 I report balance of baseline and outcome variables when $w$ takes the extreme values of 0 and 1. Table E.12 summarizes DIG estimates obtained with these weights:

**Table E.12:** DIG estimates with different values of $w$

| | DIG estimates | | | | |
|---|---|---|---|---|---|
| | $w = 0$ | $w = 0.25$ | $w = 0.5$ | $w = 0.75$ | $w = 1$ |
| **Dependent variable** | | | | | |
| **(%) votes for the catholic party in year:** | | | | | |
| 1948 | 0.684 | 2.069 | 2.493 | 5.053 | -0.233 |
| 1953 | -6.129 | -4.658 | -1.497 | -1.973 | -2.135 |
| 1958 | -5.247 | -3.781 | -0.641 | -0.798 | 1.71 |
| 1963 | -6.385 | -4.959 | -2.419 | -1.742 | -1.606 |
| 1968 | -4.937 | -3.383 | -0.967 | -0.908 | -2.367 |
| 1972 | -3.818 | -2.067 | -0.04 | -0.055 | -1.323 |
| 1976 | -3.762 | -1.985 | -0.166 | -0.44 | -1.107 |
| 1979 | -3.483 | -1.83 | 0.017 | -0.613 | -0.53 |
| 1983 | -2.968 | -1.315 | 0.655 | 0.296 | 1.116 |
| 1987 | -4.612 | -3.215 | -1.183 | -1.282 | 0.027 |
| 1992 | -1.257 | -0.843 | 0.268 | 0.908 | 3.074 |
| **(%) votes against legalization of:** | | | | | |
| Divorce (1972 referendum) | -2.942 | -0.737 | 0.967 | 1.012 | 2.09 |
| Abortion (1981 referendum) | -1.136 | 1.422 | 2.879 | 2.344 | 5.083 |

Notes: $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01, Bonferroni-adjusted p-values. The table shows how DIG estimates, which identify the ATT of conservative institutions on Catholic votes, vary with $w$. $w$ is the weight given to the propensity score by the DAPS matching estimator, as opposed to geographic distance. The value $w = 0.5$ is the one used in the main analysis. The Catholic party is *Democrazia Cristiana*. All estimates include altitude, urban population in 1300 and longitude along the river as covariates in the propensity scores. Standard errors are obtained by non-parametric bootstrapping.

DIG estimates remain stable at zero, while GRD estimates have higher magnitude for higher values of $w$. In other words, as the matching process attributes more importance to baseline covariates and less to distance between pairs of municipalities, the discontinuities in voting patterns at the Po river increase in magnitude. Nevertheless, even when geographic proximity is the only matching criterion ($w = 0$), estimates remain in the neighbourhood of 20 percentage points.

[37] The 1-to-1 greedy matching algorithm departs from treated units and finds a suitable match for each one. In the end, it keeps treated units that are closer to the river, and selects matches that are further away. As a result, the overall Average Standardized Difference in distance means increases overall.

**Table E.13:** GRD and DIG estimates with $w = 0$

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 26.712*** | (2.028) | 212 | 24.012*** | (3.69) | 40 | 23.328*** | (1.985) | 160 | 0.684 | (2.960) |
| 1953 | 23.422*** | (1.317) | 386 | 18.328*** | (2.802) | 40 | 24.458*** | (1.447) | 294 | -6.129 | (2.560) |
| 1958 | 24.85*** | (1.344) | 390 | 21.025*** | (2.786) | 40 | 26.271*** | (1.484) | 296 | -5.247 | (2.612) |
| 1963 | 26.663*** | (1.276) | 402 | 21.8*** | (2.496) | 40 | 28.185*** | (1.392) | 306 | -6.385 | (2.734) |
| 1968 | 26.504*** | (1.226) | 406 | 23.047*** | (2.534) | 40 | 27.984*** | (1.351) | 308 | -4.937 | (2.472) |
| 1972 | 25.927*** | (1.219) | 406 | 23.538*** | (2.486) | 40 | 27.356*** | (1.341) | 308 | -3.818 | (2.534) |
| 1976 | 23.913*** | (1.147) | 406 | 21.878*** | (2.374) | 40 | 25.64*** | (1.233) | 308 | -3.762 | (2.259) |
| 1979 | 24.004*** | (1.119) | 406 | 22.323*** | (2.236) | 40 | 25.806*** | (1.23) | 308 | -3.483 | (2.243) |
| 1983 | 21.012*** | (1.048) | 416 | 20.443*** | (2.031) | 40 | 23.411*** | (1.149) | 316 | -2.968 | (1.992) |
| 1987 | 21.006*** | (1.043) | 406 | 18.985*** | (2.224) | 40 | 23.597*** | (1.129) | 308 | -4.612 | (2.064) |
| 1992 | 13.042*** | (0.861) | 406 | 14.341*** | (1.571) | 40 | 15.598*** | (0.887) | 308 | -1.257 | (1.574) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 25.099*** | (1.148) | 416 | 24.458*** | (2.856) | 40 | 27.399*** | (1.259) | 316 | -2.942 | (2.227) |
| Abortion (1981 referendum) | 22.862*** | (0.975) | 416 | 23.585*** | (2.353) | 40 | 24.721*** | (1.081) | 316 | -1.136 | (1.975) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Democrazia Cristiana*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

**Table E.14:** GRD and DIG estimates with $w = 0.25$

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 26.712*** | (2.028) | 212 | 25.446*** | (3.661) | 40 | 23.377*** | (1.986) | 160 | 2.069 | (2.817) |
| 1953 | 23.422*** | (1.317) | 386 | 19.984*** | (3.001) | 40 | 24.642*** | (1.457) | 294 | -4.658 | (2.502) |
| 1958 | 24.85*** | (1.344) | 390 | 22.839*** | (2.997) | 40 | 26.619*** | (1.502) | 296 | -3.781 | (2.454) |
| 1963 | 26.663*** | (1.276) | 402 | 23.558*** | (2.705) | 40 | 28.516*** | (1.417) | 306 | -4.959 | (2.524) |
| 1968 | 26.504*** | (1.226) | 406 | 24.674*** | (2.727) | 40 | 28.057*** | (1.352) | 308 | -3.383 | (2.321) |
| 1972 | 25.927*** | (1.219) | 406 | 25.344*** | (2.655) | 40 | 27.412*** | (1.341) | 308 | -2.067 | (2.404) |
| 1976 | 23.913*** | (1.147) | 406 | 23.674*** | (2.536) | 40 | 25.66*** | (1.236) | 308 | -1.985 | (2.105) |
| 1979 | 24.004*** | (1.119) | 406 | 24.025*** | (2.457) | 40 | 25.855*** | (1.239) | 308 | -1.83 | (2.108) |
| 1983 | 21.012*** | (1.048) | 416 | 22.084*** | (2.227) | 40 | 23.399*** | (1.171) | 316 | -1.315 | (1.971) |
| 1987 | 21.006*** | (1.043) | 406 | 20.441*** | (2.326) | 40 | 23.656*** | (1.135) | 308 | -3.215 | (1.981) |
| 1992 | 13.042*** | (0.861) | 406 | 14.886*** | (1.605) | 40 | 15.729*** | (0.896) | 308 | -0.843 | (1.520) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 25.099*** | (1.148) | 416 | 26.544*** | (3.059) | 40 | 27.282*** | (1.273) | 316 | -0.737 | (2.215) |
| Abortion (1981 referendum) | 22.862*** | (0.975) | 416 | 25.98*** | (2.627) | 40 | 24.558*** | (1.094) | 316 | 1.422 | (1.959) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Democrazia Cristiana*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

**Table E.15:** GRD and DIG estimates with $w = 0.75$

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 26.712*** | (2.028) | 212 | 29.762*** | (4.571) | 40 | 24.71*** | (2.1) | 160 | 5.053 | (3.102) |
| 1953 | 23.422*** | (1.317) | 386 | 24.025*** | (3.871) | 40 | 25.997*** | (1.497) | 294 | -1.973 | (2.795) |
| 1958 | 24.85*** | (1.344) | 390 | 26.781*** | (3.769) | 40 | 27.58*** | (1.526) | 296 | -0.798 | (2.652) |
| 1963 | 26.663*** | (1.276) | 402 | 27.509*** | (3.515) | 40 | 29.251*** | (1.443) | 306 | -1.742 | (2.507) |
| 1968 | 26.504*** | (1.226) | 406 | 27.97*** | (3.27) | 40 | 28.878*** | (1.373) | 308 | -0.908 | (2.582) |
| 1972 | 25.927*** | (1.219) | 406 | 28.27*** | (3.16) | 40 | 28.325*** | (1.369) | 308 | -0.055 | (2.485) |
| 1976 | 23.913*** | (1.147) | 406 | 26.083*** | (2.997) | 40 | 26.523*** | (1.264) | 308 | -0.44 | (2.222) |
| 1979 | 24.004*** | (1.119) | 406 | 26.024*** | (2.963) | 40 | 26.637*** | (1.258) | 308 | -0.613 | (2.181) |
| 1983 | 21.012*** | (1.048) | 416 | 24.242*** | (2.786) | 40 | 23.946*** | (1.177) | 316 | 0.296 | (2.052) |
| 1987 | 21.006*** | (1.043) | 406 | 22.721*** | (3.002) | 40 | 24.003*** | (1.141) | 308 | -1.282 | (2.124) |
| 1992 | 13.042*** | (0.861) | 406 | 16.601*** | (1.974) | 40 | 15.693*** | (0.91) | 308 | 0.908 | (1.725) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 25.099*** | (1.148) | 416 | 28.654*** | (3.392) | 40 | 27.641*** | (1.293) | 316 | 1.012 | (2.528) |
| Abortion (1981 referendum) | 22.862*** | (0.975) | 416 | 26.935*** | (2.866) | 40 | 24.591*** | (1.108) | 316 | 2.344 | (2.186) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Democrazia Cristiana*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

**Table E.16:** GRD and DIG estimates with $w = 1$

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 26.712*** | (2.028) | 212 | 42.522*** | (4.553) | 40 | 42.756*** | (1.973) | 160 | -0.233 | (3.174) |
| 1953 | 23.422*** | (1.317) | 386 | 29.958*** | (4.088) | 40 | 32.092*** | (1.403) | 294 | -2.135 | (3.13) |
| 1958 | 24.85*** | (1.344) | 390 | 31.793*** | (3.998) | 40 | 33.502*** | (1.407) | 296 | -1.71 | (3.017) |
| 1963 | 26.663*** | (1.276) | 402 | 32.926*** | (3.884) | 40 | 34.531*** | (1.35) | 306 | -1.606 | (2.844) |
| 1968 | 26.504*** | (1.226) | 406 | 31.969*** | (3.538) | 40 | 34.336*** | (1.355) | 308 | -2.367 | (2.743) |
| 1972 | 25.927*** | (1.219) | 406 | 32.417*** | (3.502) | 40 | 33.74*** | (1.353) | 308 | -1.323 | (2.773) |
| 1976 | 23.913*** | (1.147) | 406 | 29.856*** | (3.207) | 40 | 30.963*** | (1.311) | 308 | -1.107 | (2.476) |
| 1979 | 24.004*** | (1.119) | 406 | 30.258*** | (3.379) | 40 | 30.788*** | (1.279) | 308 | -0.53 | (2.527) |
| 1983 | 21.012*** | (1.048) | 416 | 28.126*** | (3.119) | 40 | 27.01*** | (1.158) | 316 | 1.116 | (2.389) |
| 1987 | 21.006*** | (1.043) | 406 | 26.743*** | (3.318) | 40 | 26.715*** | (1.142) | 308 | 0.027 | (2.371) |
| 1992 | 13.042*** | (0.861) | 406 | 19.111*** | (2.463) | 40 | 16.037*** | (0.889) | 308 | 3.074 | (2.122) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 25.099*** | (1.148) | 416 | 31.398*** | (3.489) | 40 | 29.307*** | (1.294) | 316 | 2.09 | (2.604) |
| Abortion (1981 referendum) | 22.862*** | (0.975) | 416 | 30.615*** | (3.091) | 40 | 25.532*** | (1.126) | 316 | 5.083 | (2.187) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. The overall GRD, $\widehat{\tau}_W(\boldsymbol{b})$ and $\widehat{\tau}_E(\boldsymbol{b})$ are obtained by DAPSm. The overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$ on Catholic votes. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of conservative culture (absent confounders), $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_{DIG}$ identifies the ATT of conservative institutions. The Catholic party is *Democrazia Cristiana*. All estimates control for altitude, urban population in 1300, and longitude along the river in the propensity score component of the DAPSm estimator. DIG standard errors are obtained by non-parametric bootstrapping.

### E.3 Using Dell as underlying GRD estimator

I replicate results using Dell (2010)'s estimator instead of DAPSm. Since it requires to specify a bandwidth, I replicate the results twice, with bandwidths of 100km and 50km. Within the bandwidth, Dell estimates by OLS the following model:

$$Y_m = \alpha + \gamma_{GRD} T_m + f(lat_m, long_m) + \phi_m + \boldsymbol{X'_m}\boldsymbol{\beta} + \varepsilon_m$$

Where $m$ indexes municipalities, $\phi_m$ is a factor variable indicating the closest segment of the river, and $f(lat_m, long_m)$ is a local polynomial. To avoid inconsistency driven by high-order polynomials, I use a quadratic specification for $f(lat_m, long_m)$ (Gelman and Imbens, 2019; Pei et al., 2018):

$$f(lat_m, long_m) = lat_m + long_m + (lat \times long)_m + lat_m^2 + long_m^2 + (lat^2 \times long)_m + (long^2 \times lat)_m$$

Dell's estimator is not ideal in this setting, where the border is a line, because it suffers from collinearity between longitude terms in the local polynomial and the inclusion of border fixed effects, especially with smaller bandwidths

(as shown below). The intuition is that smaller bandwidths reduce the variance of latitude, which loses predictive power and correlates more strongly with $\phi_m$. However, Dell's GRD has the advantage of using all observations within the bandwidth to estimate results. This is particularly useful for two reasons. First, DAPSm does not select municipalities in the west-most province south of the Po: these were not part of the Papal States and belonged to the Duchy of Parma and Piacenza (i.e. $I = 0$). The DIG estimator assumes the absence of spillovers between south-Po municipalities in the west and east samples: should there be any spillovers, the zero DIG estimates could simply indicate that Papal States also affected areas outside of their domain, rather than a zero effect. Historical evidence is already reassuring this regard. During the Middle Ages, communications and movements between these provinces were not common: in particular the main communication artery, the Roman-built via Emilia, was abandoned after the fall of the Empire (Vth century). Numerous interruptions occurred at the site of bridges: the main one crossed river Secchia, which separated the provinces of Parma and Piacenza from the rest of Emilia. Moreover, from the moment in which they reached their maximum expansion in the XVth century, the Papal States strengthened control of their border (Prodi, 1982).

The Dell estimator allows me to add some quantitative evidence of the absence of spillovers. If present, they should impact more the provinces closer to the Papal States, and, in turn, DAPSm estimates. The stability of DIG estimates at zero when using Dell's estimator suggests that such spillovers are not a concern. The use of the entire sample with Dell's estimator is also reassuring with respect to the size of the west sub-sample selected by DAPSm to compute $\tau_W(\boldsymbol{b})$ (N=40), which identifies the effect of conservative culture. With such a small sample size, DAPSm estimates are necessarily more sensitive to outliers. In this sense, note that the 100km Dell bandwidth resemble more closely DAPSm estimates, where the 75th percentile of distance from the Po is 75km and the maximal distance is greater than 100km.

**Table E.17:** GRD and DIG using Dell's GRD estimator (bw=100km)

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 29.983*** | (2.725) | 688 | 26.305*** | (3.816) | 612 | 24.747*** | (3.797) | 526 | 1.558 | (2.429) |
| 1953 | 30.569*** | (2.316) | 733 | 23.468*** | (3.6) | 619 | 29.409*** | (3.02) | 570 | -5.941 | (2.516) |
| 1958 | 32.545*** | (2.328) | 736 | 24.944*** | (3.663) | 621 | 31.489*** | (3.008) | 572 | -6.545 | (2.501) |
| 1963 | 33.508*** | (2.212) | 742 | 25.695*** | (3.628) | 622 | 32.66*** | (2.828) | 578 | -6.965* | (2.381) |
| 1968 | 33.316*** | (2.185) | 743 | 26.886*** | (3.605) | 622 | 31.635*** | (2.793) | 579 | -4.749 | (2.351) |
| 1972 | 31.525*** | (2.197) | 743 | 26.167*** | (3.664) | 622 | 29.504*** | (2.798) | 579 | -3.337 | (2.486) |
| 1976 | 29.231*** | (2.148) | 743 | 24.541*** | (3.577) | 622 | 26.666*** | (2.736) | 579 | -2.125 | (2.405) |
| 1979 | 28.837*** | (2.131) | 743 | 24.506*** | (3.538) | 622 | 25.965*** | (2.717) | 579 | -1.459 | (2.268) |
| 1983 | 26.367*** | (2.02) | 747 | 23.262*** | (3.412) | 622 | 23.972*** | (2.548) | 583 | -0.71 | (2.234) |
| 1987 | 26.411*** | (1.959) | 743 | 23.61*** | (3.29) | 622 | 24.126*** | (2.484) | 579 | -0.516 | (2.196) |
| 1992 | 22.365*** | (1.57) | 743 | 20.981*** | (2.61) | 622 | 21.008*** | (1.94) | 579 | -0.027 | (1.685) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 36.103*** | (2.137) | 747 | 33.835*** | (3.604) | 622 | 32.98*** | (2.684) | 583 | 0.855 | (2.594) |
| Abortion (1981 referendum) | 32.932*** | (1.794) | 747 | 31.906*** | (2.98) | 622 | 31.035*** | (2.252) | 583 | 0.871 | (2.17) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. For each election, the overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of $C$, $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_D IG$ identifies the ATT of $I$. The Catholic party is *Democrazia Cristiana*. All estimates include as PS covariates altitude, urban population in 1300, and longitude along the river. DIG standard errors are obtained by non-parametric bootstrapping.

**Table E.18:** GRD and DIG using Dell's GRD estimator (bw=50km)

| | Overall GRD | | | $\widehat{\tau}_W(\boldsymbol{b})$ | | | $\widehat{\tau}_E(\boldsymbol{b})$ | | | $\widehat{\tau}_{DIG} = \widehat{\tau}_W(\boldsymbol{b}) - \widehat{\tau}_E(\boldsymbol{b})$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | ATT | s.e. | N | ATT | s.e. | N | ATT | s.e. | N | **DIG** | s.e. |
| **(%) votes for the catholic party in year:** | | | | | | | | | | | |
| 1948 | 15.863*** | (3.327) | 355 | 12.251 | (5.211) | 314 | 12.467 | (5.4) | 234 | -0.215 | (2.723) |
| 1953 | 15.92*** | (2.998) | 362 | 12.942 | (4.758) | 320 | 14.591** | (4.381) | 240 | -1.648 | (2.512) |
| 1958 | 17.288*** | (3.044) | 363 | 11.518 | (4.853) | 321 | 16.58*** | (4.365) | 241 | -5.062 | (2.553) |
| 1963 | 18.544*** | (2.872) | 368 | 12.895 | (4.768) | 321 | 18.311*** | (3.806) | 246 | -5.416 | (2.329) |
| 1968 | 18.1*** | (2.869) | 369 | 15.178** | (4.799) | 321 | 17.176*** | (3.755) | 247 | -1.998 | (2.369) |
| 1972 | 18.018*** | (2.839) | 369 | 15.889** | (4.752) | 321 | 16.591*** | (3.756) | 247 | -0.702 | (2.339) |
| 1976 | 15.225*** | (2.704) | 369 | 12.726* | (4.495) | 321 | 13.145*** | (3.545) | 247 | -0.418 | (2.238) |
| 1979 | 15.235*** | (2.635) | 369 | 14.012** | (4.375) | 321 | 12.447*** | (3.453) | 247 | 1.565 | (2.129) |
| 1983 | 14.882*** | (2.512) | 371 | 13.47** | (4.252) | 321 | 12.339*** | (3.265) | 249 | 1.131 | (2.068) |
| 1987 | 15.227*** | (2.457) | 369 | 12.09* | (4.091) | 321 | 13.341*** | (3.262) | 247 | -1.251 | (2.007) |
| 1992 | 13.073*** | (1.997) | 369 | 8.87 | (3.31) | 321 | 11.805*** | (2.687) | 247 | -2.935 | (1.609) |
| **(%) votes against legalization of:** | | | | | | | | | | | |
| Divorce (1972 referendum) | 21.448*** | (2.905) | 371 | 20.009*** | (4.908) | 321 | 18.641*** | (3.72) | 249 | 1.369 | (2.64) |
| Abortion (1981 referendum) | 23.566*** | (2.343) | 371 | 23.623*** | (3.958) | 321 | 21.494*** | (2.98) | 249 | 2.129 | (2.069) |

Notes: *p<0.1; **p<0.05; ***p<0.01, Bonferroni-adjusted p-values. For each election, the overall GRD is the traditional regression discontinuity estimated at river Po for the entire sample. It identifies the compound effect of $C$ and $I$. $\widehat{\tau}_W(\boldsymbol{b})$ identifies the ATT of $C$, $\widehat{\tau}_E(\boldsymbol{b})$ is again a compound effect, and their difference $\widehat{\tau}_D IG$ identifies the ATT of $I$. The Catholic party is *Democrazia Cristiana*. All estimates include as PS covariates altitude, urban population in 1300, and longitude along the river. DIG standard errors are obtained by non-parametric bootstrapping.

## E.4 Distance-Adjusted-Propensity-Score matching and balance

For all three GRDs (overall, $\tau_W(\boldsymbol{b})$ and $\tau_E(\boldsymbol{b})$), this section will show a balance table. For each baseline covariate $X$ in the table, the Absolute Standardized Difference (ASD) is computed in the entire sample and in the matched one as:

$$ASD(X) \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$$

Balance tables also report sample size both before and after matching.

### E.4.1 Overall sample

**Table E.19:** Balance table: overall GRD sample

| | | **Pre-match** ($N = 923$) | | | **Post-match** ($N = 398$) | | |
|---|---|---|---|---|---|---|---|
| | | **ASD** | **Mean, (C)** | **Mean, (T)** | **ASD** | **Mean, (C)** | **Mean, (T)** |
| **Baseline Covariates** | Minimum altitude (m) | 0.064 | 109.493 | 126.1 | 0.433 | 107.857 | 32.857 |
| | Maximum altitude (m) | 0.091 | 503.625 | 599.045 | 0.45 | 507.655 | 181.857 |
| | Urban inhabitants in year 1300 | 0.036 | 16950.147 | 18266.071 | 0.218 | 20591.133 | 30541.872 |
| | River longitude (UTM32N) | 0.770 | 654229.79 | 713053.039 | 0.106 | 697833.241 | 703912.414 |
| | Distance to river (km) | 0.390 | 46.864 | 66.462 | 0.761 | 61.083 | 33.096 |
| **Outcomes** | Votes to DC (%) in 1979 | 1.397 | 32.765 | 57.213 | 1.506 | 30.022 | 54.027 |
| | Votes against abortion (%) | 1.491 | 27.45 | 49.665 | 1.613 | 25.654 | 48.362 |
| | Votes against divorce (%) | 1.380 | 35.515 | 59.868 | 1.507 | 33.428 | 58.553 |

Notes: the overall sample is used to estimate the overall GRD at the Po river. Denoting treated units (north of the Po river) as $T$ and control units as $C$ (south of the river), the Absolute Standardized Difference (ASD) for variable $X$ is computed as: $ASD \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$.

### E.4.2 West subsample (used to estimate $\tau_W(\boldsymbol{b})$)

**Table E.20:** Balance table: West sample

| | | **Pre-match** ($N = 769$) | | | **Post-match** ($N = 40$) | | |
|---|---|---|---|---|---|---|---|
| | | **ASD** | **Mean, (C)** | **Mean, (T)** | **ASD** | **Mean, (C)** | **Mean, (T)** |
| **Baseline Covariates** | Minimum altitude (m) | 0.254 | 65.519 | 126.1 | 0.227 | 65.519 | 35.948 |
| | Maximum altitude (m) | 0.235 | 369.045 | 599.045 | 0.333 | 369.045 | 169.675 |
| | Urban inhabitants in year 1300 | 0.198 | 26103.896 | 18266.071 | 0.103 | 26103.896 | 22064.935 |
| | River longitude (UTM32N) | 0.074 | 716671.475 | 713053.039 | 0.248 | 716671.475 | 705190.74 |
| | Distance to river (km) | 0.030 | 64.898 | 66.462 | 0.997 | 64.898 | 27.531 |
| **Outcomes** | Votes to DC (%) in 1979 | 1.866 | 27.858 | 57.213 | 1.683 | 27.858 | 54.096 |
| | Votes against abortion (%) | 1.726 | 24.603 | 49.665 | 1.785 | 24.603 | 49.142 |
| | Votes against divorce (%) | 1.672 | 31.771 | 59.868 | 1.706 | 31.771 | 59.184 |

Notes: the overall sample is used to estimate the $\tau_W(\boldsymbol{b})$ GRD at the Po river. Denoting treated units (north of the Po river) as $T$ and control units as $C$ (south of the river), the Absolute Standardized Difference (ASD) for variable $X$ is computed as: $ASD \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$.

### E.4.3 East subsample (used to estimate $\tau_E(\boldsymbol{b})$)

**Table E.21:** Balance table: East sample

| | | **Pre-match** ($N = 736$) | | | **Post-match** ($N = 308$) | | |
|---|---|---|---|---|---|---|---|
| | | **ASD** | **Mean, (C)** | **Mean, (T)** | **ASD** | **Mean, (C)** | **Mean, (T)** |
| **Baseline Covariates** | Minimum altitude (m) | 0.073 | 145.706 | 126.1 | 0.219 | 92.5 | 39.8 |
| | Maximum altitude (m) | 0.014 | 614.455 | 599.045 | 0.118 | 235.9 | 151.4 |
| | Urban inhabitants in year 1300 | 0.274 | 9411.765 | 18266.071 | 0.106 | 7000 | 5300 |
| | River longitude (UTM32N) | 2.075 | 602807.225 | 713053.039 | 0.14 | 662531.166 | 666785.098 |
| | Distance to river (km) | 0.781 | 32.013 | 66.462 | 0.248 | 31.286 | 24.486 |
| **Outcomes** | Votes to DC (%) in 1979 | 1.143 | 36.806 | 57.213 | 1.983 | 26.958 | 53.214 |
| | Votes against abortion (%) | 1.342 | 29.795 | 49.665 | 2.128 | 22.53 | 49.915 |
| | Votes against divorce (%) | 1.198 | 38.598 | 59.868 | 1.883 | 29.547 | 57.867 |

Notes: the overall sample is used to estimate the $\tau_E(\boldsymbol{b})$ GRD at the Po river. Denoting treated units (north of the Po river) as $T$ and control units as $C$ (south of the river), the Absolute Standardized Difference (ASD) for variable $X$ is computed as: $ASD \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$.

### E.4.4 Balance tables with $w = 0, 1$

**Table E.22:** Balance table when $w = 0$ (no weight given to propensity scores)

| | | **Pre-match** ($N = 923$) | | | **Post-match** ($N = 398$) | | |
|---|---|---|---|---|---|---|---|
| | | **ASD** | **Mean, (C)** | **Mean, (T)** | **ASD** | **Mean, (C)** | **Mean, (T)** |
| **Baseline Covariates** | Minimum altitude (m) | 0.064 | 109.493 | 126.1 | 0.546 | 108.574 | 21.642 |
| | Maximum altitude (m) | 0.091 | 503.625 | 599.045 | 0.607 | 510.667 | 117.76 |
| | Urban inhabitants in year 1300 | 0.036 | 16950.147 | 18266.071 | 0.239 | 20490.196 | 31151.961 |
| | River longitude (UTM32N) | 0.77 | 654229.79 | 713053.039 | 0.147 | 697459.028 | 705958.223 |
| | Distance to river (km) | 0.39 | 46.864 | 66.462 | 0.81 | 61.144 | 31.916 |
| **Outcomes** | Votes to DC (%) in 1979 | 1.397 | 32.765 | 57.213 | 1.537 | 30.078 | 53.737 |
| | Votes against abortion (%) | 1.491 | 27.45 | 49.665 | 1.613 | 25.654 | 48.362 |
| | Votes against divorce (%) | 1.380 | 35.515 | 59.868 | 1.507 | 33.428 | 58.553 |

Notes: the overall sample is used to estimate the $\tau_E(\boldsymbol{b})$ GRD at the Po river. Denoting treated units (north of the Po river) as $T$ and control units as $C$ (south of the river), the Absolute Standardized Difference (ASD) for variable $X$ is computed as: $ASD \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$.

**Table E.23:** Balance table when $w = 1$ (no weight given to geographic distance)

| | | **Pre-match** ($N = 923$) | | | **Post-match** ($N = 398$) | | |
|---|---|---|---|---|---|---|---|
| | | **ASD** | **Mean, (C)** | **Mean, (T)** | **ASD** | **Mean, (C)** | **Mean, (T)** |
| **Baseline Covariates** | Minimum altitude (m) | 0.064 | 109.493 | 126.1 | 0.048 | 103.959 | 114.093 |
| | Maximum altitude (m) | 0.091 | 503.625 | 599.045 | 0.196 | 493.777 | 689.088 |
| | Urban inhabitants in year 1300 | 0.036 | 16950.147 | 18266.071 | 0.066 | 21554.404 | 24673.575 |
| | River longitude (UTM32N) | 0.77 | 654229.79 | 713053.039 | 0.031 | 701655.038 | 703408.436 |
| | Distance to river (km) | 0.39 | 46.864 | 66.462 | 0.136 | 62.049 | 55.599 |
| **Outcomes** | Votes to DC (%) in 1979 | 1.397 | 32.765 | 57.213 | 1.547 | 29.635 | 54.582 |
| | Votes against abortion (%) | 1.491 | 27.45 | 49.665 | 1.531 | 25.403 | 48.035 |
| | Votes against divorce (%) | 1.38 | 35.515 | 59.868 | 1.511 | 33.019 | 58.298 |

Notes: the overall sample is used to estimate the $\tau_E(\boldsymbol{b})$ GRD at the Po river. Denoting treated units (north of the Po river) as $T$ and control units as $C$ (south of the river), the Absolute Standardized Difference (ASD) for variable $X$ is computed as: $ASD \equiv \frac{|\bar{X}_T - \bar{X}_C|}{\sqrt{Var_T(X) + Var_C(X)}}$.

# F Additional figures

**Figure F.6:** Catholic votes (%) in 1953

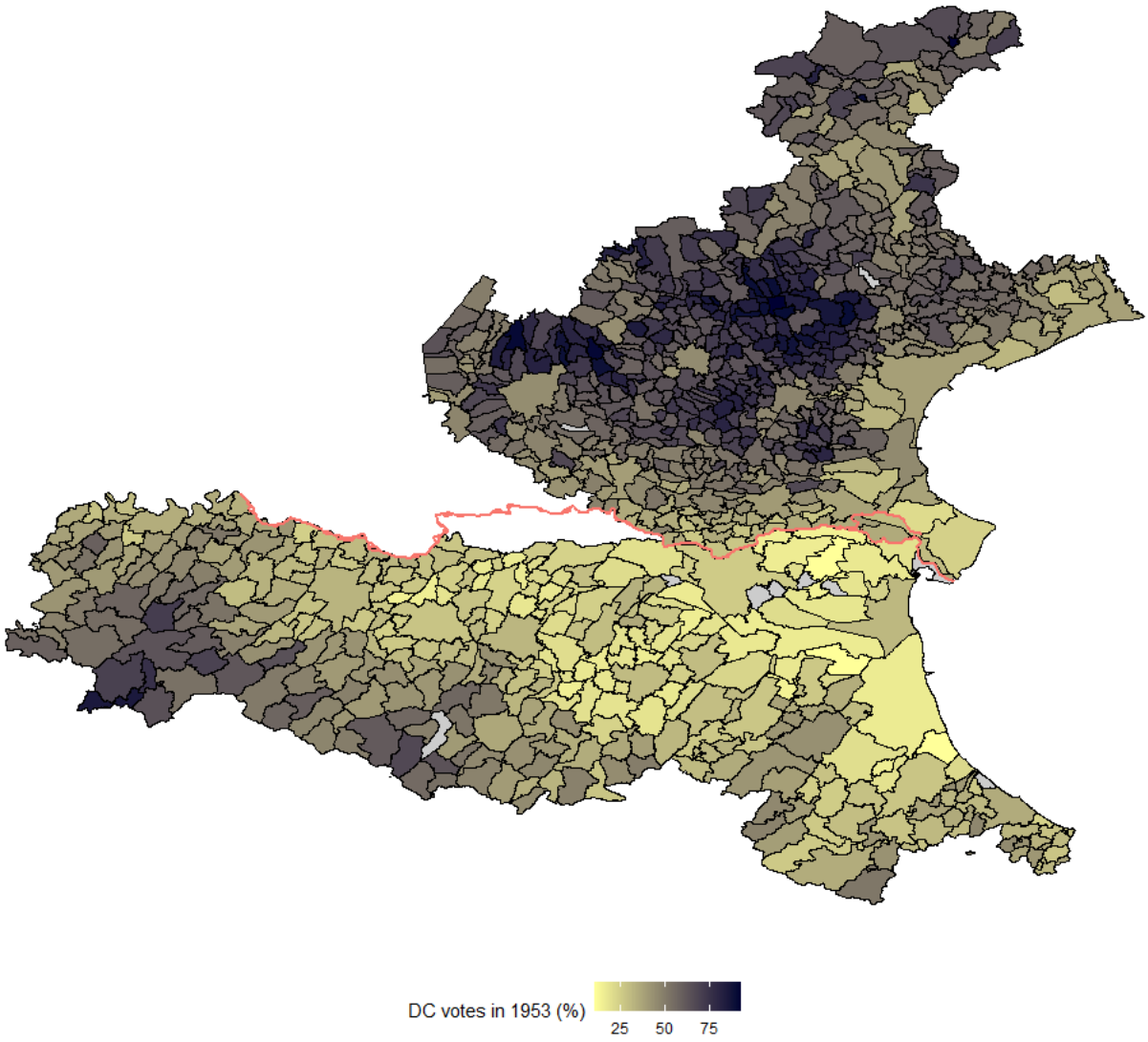


**Figure F.7:** Catholic votes (%) in 1979, plotting Po and Piave rivers

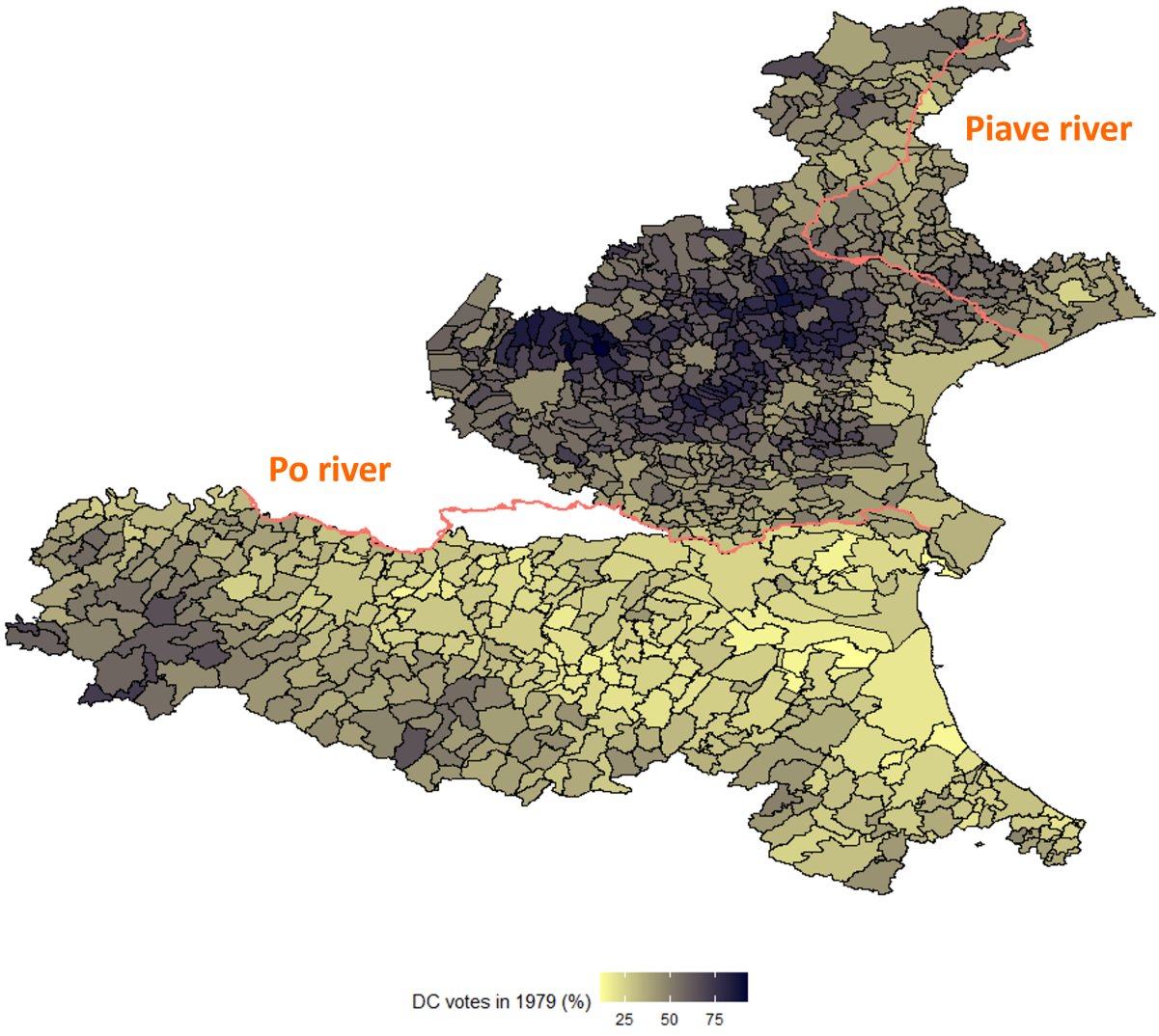


**Figure F.8:** Catholic votes (%) in 1979, including Mantua

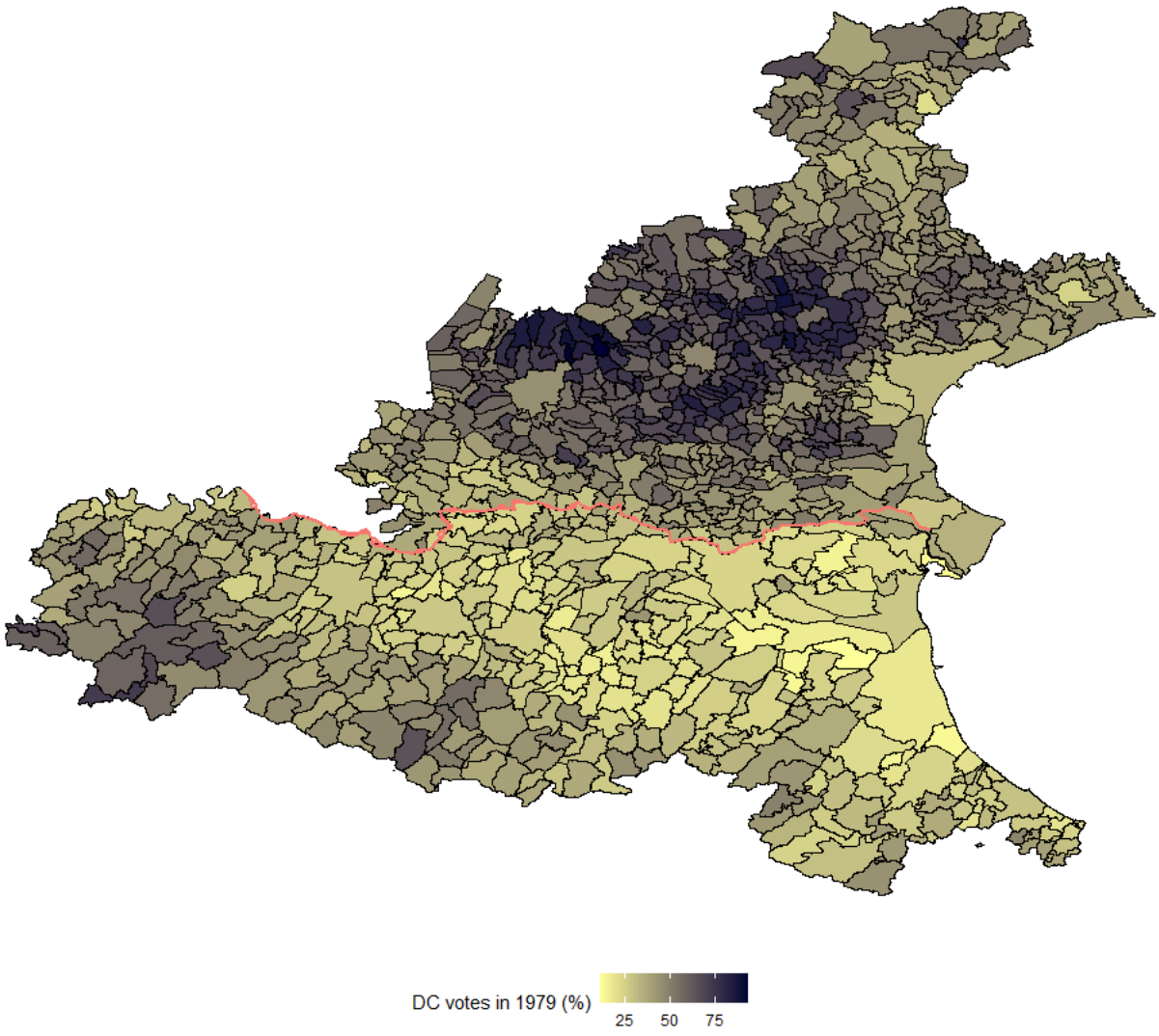


**Figure F.9:** Average family size in 1953

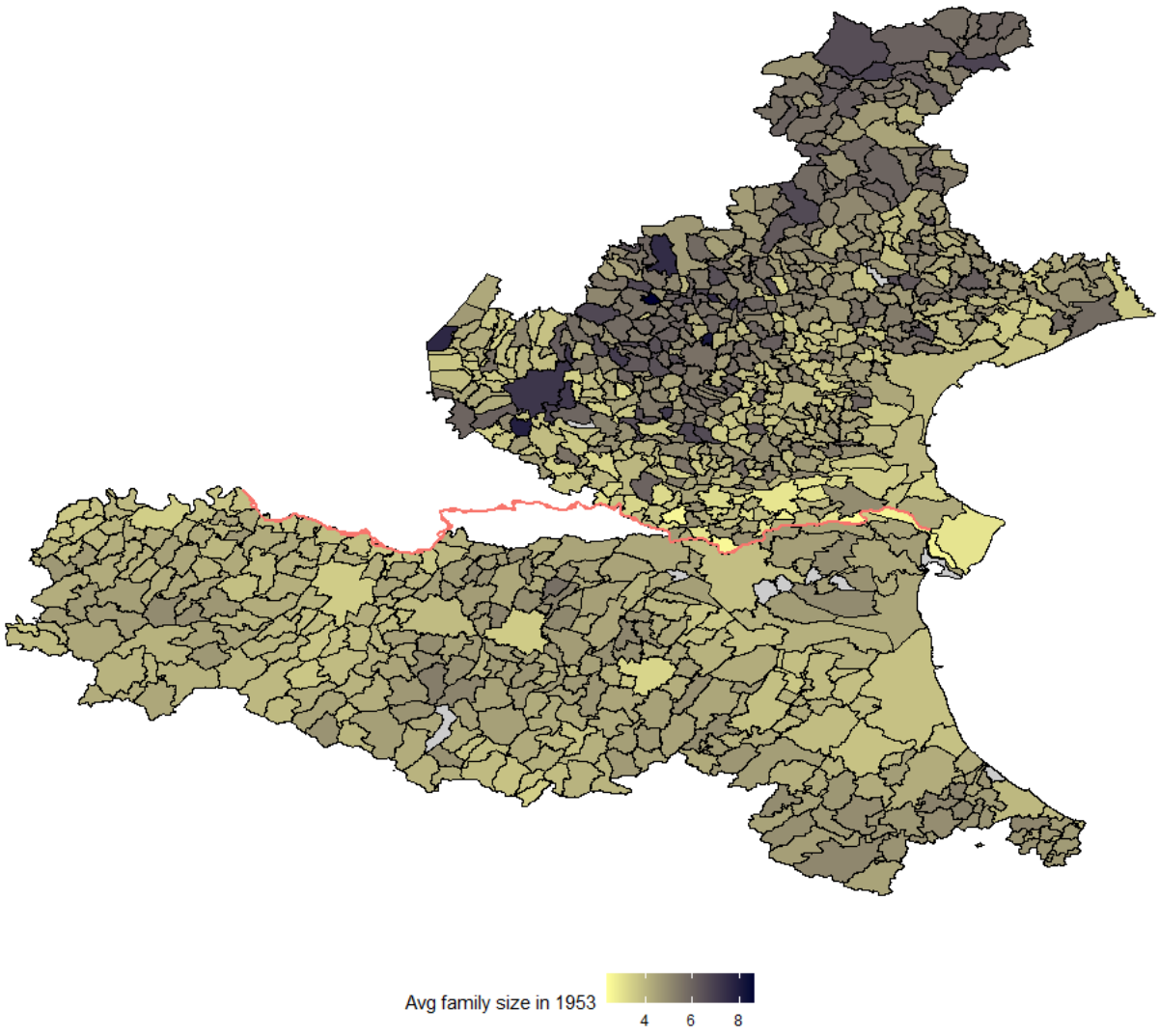


**Figure F.10:** Average family size in 1971

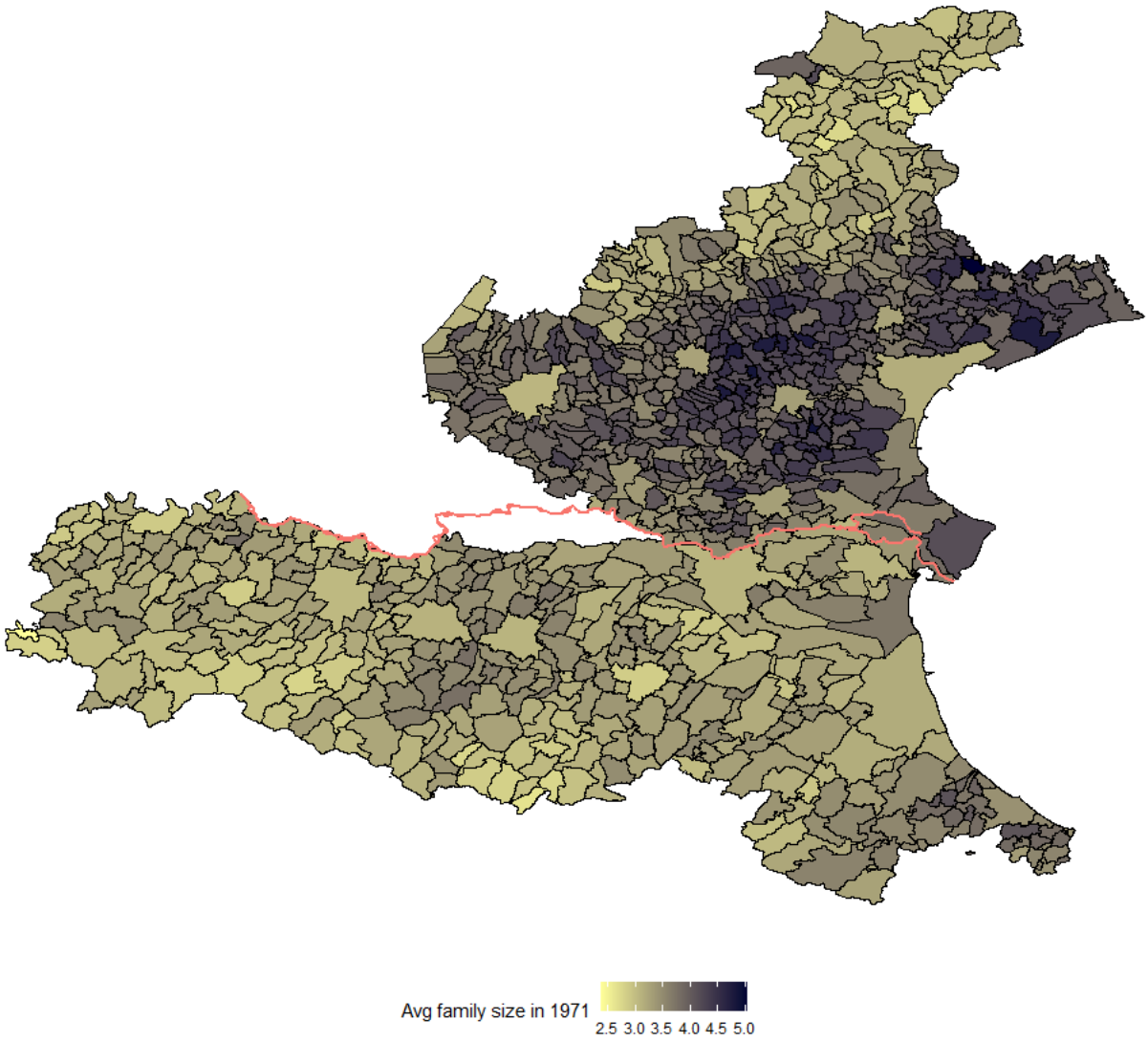


**Figure F.11:** Maximum altitude (m)