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by Christoph Basten[2]

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Abstract

We investigate the effect of Reformed Protestantism, relative to Catholicism, on preferences for leisure and for redistribution and intervention in the economy. With a Fuzzy Spatial Regression Discontinuity Design, we exploit a historical quasi-experiment in Western Switzerland, where in the 16th century a so far homogeneous region was split and one part assigned to convert to Protestantism. We find that Reformed Protestantism reduces the fraction of citizens voting for more leisure by 13, and that voting for more redistribution and government intervention by respectively 3 and 11 percentage points. These preferences are found to translate into greater income inequality, but we find no robust effect on average income.

JEL codes: Z12, D72, H23, N33

Keywords: Max Weber, Culture, Protestant Work Ethic, Political Preferences, Regression Discontinuity Design

Non-technical summary

Does culture, and in particular religion, exert an independent causal effect on politics and the economy, or is it merely a reflection of the latter? This question is the subject of a long-standing debate in the social sciences, with Karl Marx and Max Weber among its most famous proponents. The former famously opined that while the economy did influence culture, the reverse was not true. The latter, on the other hand, rejected that view and insisted that causality runs both ways. In particular, in "The Protestant ethic and the Spirit of Capitalism", Weber claimed that Reformed Protestantism, by nurturing stronger preferences for hard work and thriftiness had led to greater economic prosperity.

Our paper provides new evidence on this fundamental question, exploiting a quasi-experiment in Switzerland. Switzerland is well suited to study how religion affects politics and the economy as it is one of the few countries exhibiting genuine within-country variation in religion. Early in the 16th century, some cantons adopted the Reformation whereas others did not, which leaves us with both a treatment and a control group. But Switzerland is also a geographically and institutionally diverse country and the decision to adopt the Reformation was indeed correlated with geography and institutions. Most of the urban Confederates adopted the Reformation whereas the rural and mountainous center remained Catholic. To address this issue we focus on an institutionally and geographically homogeneous subset of the Confederation: the area in western Switzerland that is comprised of the present day cantons of Vaud and Fribourg.

In this setting the Reformation process led to exogenous variation in religion. Until 1476, the region was ruled by the duke of Savoy. Then, however, the Swiss defeated Burgundy and its ally Savoy in the Burgundy wars. The peace negotiations awarded the eastern half of the region to the city republic of Fribourg. When Protestant ideas spread in the 1520s the Fribourg magistrates decided to stay with the old faith, whereas Berne eventually adopted the new religion. When Berne in 1536 finally conquered what is now the canton of Vaud it imposed Protestantism on its new subjects. Thereby we rule out self-selection into religious form.

Focusing on Switzerland has not only methodological but also substantive advantages. Previous work on Weber lumps together the various branches of Protestantism in Western Europe. The Protestant Ethic, however, distinguishes between different branches of Protestantism, and it is Calvinism in which the beliefs supporting a strong work ethic appear in its starkest form. Lutheranism, on the other hand, lacked the mechanisms Weber considered crucial for the spirit of Capitalism to emerge. Thus, studies based on Lutheran regions are not well suited to judge Weber's claims. Switzerland, in contrast, is the birthplace of Calvinism, which from there expanded into the Netherlands and the Anglo-Saxon world.

But our paper goes beyond providing another evaluation of the Weber hypothesis with a different sample and identification strategy. We show that Max Weber's classic includes hypotheses not only about work ethic and thriftiness, but also about political preferences, with far-ranging implications for the choice of political institutions and therewith also on economic outcomes like average income and income inequality. In particular, this literature suggests that, relative to Roman Catholicism, Reformed Protestantism has curbed preferences for redistribution and for government intervention in the economy.

Our empirical results suggest that ceteris paribus in a Reformed Protestant electorate support for increasing leisure time will be about 13 percentage points lower than in a Catholic electorate, and that support for government intervention will be about 11 percentage points lower. These results are robust to varying our methodology along all relevant dimensions. Support for redistribution is also lower in Protestant municipalities, but the significance of the results depends on the specification. We do not find an equally robust effect on average income, but we do find the Protestant municipalities to exhibit clearly higher income inequality.

1 Introduction

> *"The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness" (Karl Marx, 1859)*

> *"As far as the influence of the Puritan outlook extended, [...] it favoured the development of a rational bourgeois economic life[...]. It stood at the cradle of the modern economic man." (Max Weber, 1904)*

Does culture, and in particular religion, exert an independent causal effect on politics and the economy, or is it merely a reflection of the latter? This question is the subject of a long-standing debate in the social sciences, with Karl Marx and Max Weber among its most famous proponents. The former famously opined that while the economy did influence culture, the reverse was not true. The latter, on the other hand, rejected that view and insisted that causality runs both ways. In particular, in "The Protestant ethic and the Spirit of Capitalism", Weber claimed that Reformed Protestantism, by nurturing stronger preferences for hard work and thriftiness had led to greater economic prosperity. Hitherto less discussed, his classic can be seen to imply also a positive effect of Reformed Protestantism on preferences for self-reliance, and a tendency to nurture political systems with relatively less redistribution and less government intervention in the economy.

Weber's famous hypothesis of a "Protestant work ethic" in particular has also found much prominence in the economics literature in recent years. Yet results to this point appear somewhat mixed: Cantoni (2009) finds no effect of Protestantism on economic prosperity, as measured by city growth, in 19th century Prussia. Becker and Woessmann (2009), by contrast, do find a positive effect of Protestantism on economic prosperity in Prussia, but argue that most of that can be explained by its positive effect on education, thus leaving little scope for Weber's work ethic channel. Spenkuch (2010), finally, using survey data from present-day Germany, does find positive effects on both work attitudes and economic outcomes.

A possible reason why these results on Weber's work ethic hypothesis are rather mixed is that all three papers focus on Germany, whose Protestants adhere mostly to the Lutheran variant of Protestantism, whereas Weber makes it clear that his famous hypothesis concerns explicitly not the Lutheran, but the Reformed variant, started with the Swiss rather than the German Reformation.

This is the first dimension in which we add to the existing literature: We focus specifically on Switzerland with its Reformed variant of Protestantism. In fact, we focus precisely on that region in the South West, which was first converted to Calvinism and from where Calvinism later spread to other countries such as England or the New World. The second contribution to the economic literature on Weber is that we use voting in referenda as direct measures of preferences. Studies on Weber often examine the relation between outcomes such as economic performance and religious affiliation. But lacking data on attitudes they cannot provide evidence on the work ethic channel posited by Weber.

But our paper goes beyond providing another evaluation of the Weber hypothesis with a different sample and identification strategy: Based on an analysis of Weber (1904) as well as more recent work in the other social sciences, we show that Max Weber's classic includes hypotheses not only about work ethic and thriftiness, but also about political preferences, with far-ranging implications for the choice of political institutions and therewith also on economic outcomes like average income and income inequality. In particular, this literature suggests that, relative to Roman Catholicism, Reformed Protestantism has curbed preferences for redistribution and for government intervention in the economy.

Switzerland is well suited to study how religion affects politics and the economy as it is one of the few countries exhibiting genuine within-country variation in religion. In the early modern period, religious unity was critical for political stability. Hence, most of the emerging European territorial states enforced adherence to a single religion on what eventually became the national level. Switzerland, however, was a Confederation of largely autonomous cantons bound together by common security interests. Cantons were the most important political unit; consequently, religious uniformity was enforced

at the canton-level. Early in the 16th century, some cantons adopted the Reformation whereas others did not, which leaves us with both a treatment and control group.

Switzerland, however, exhibits not only religious variation; it is also a geographically and institutionally diverse country. As institutions and geography affect long-run economic performance, they potentially confound the results, and the decision to adopt the Reformation was indeed correlated with geography and institutions. Almost the entire rural and mountainous center of the Confederation remained Catholic. Among the urban Confederates, those ruled by patricians were more likely to remain Catholic whereas cities with a guild regime embraced Protestantism. To address this issue we focus on an institutionally and geographically homogeneous subset of the Confederation: the area in western Switzerland that is comprised of the present day cantons of Vaud and Fribourg.

In this setting the Reformation process led to exogenous variation in religion. Until 1476, the region was ruled by the duke of Savoy. Then, however, the Swiss defeated Burgundy and its ally Savoy in the Burgundy wars. The peace negotiations awarded the eastern half of the region to the city republic of Fribourg. When Protestant ideas spread in the 1520s the Fribourg magistrates decided to stay with the old faith, whereas Berne eventually adopted the new religion. By contrast, when Berne in 1536 finally conquered what is now the canton of Vaud it imposed Protestantism on its new subjects. Thereby we rule out self-selection into religious form.

Figure 1 shows that geographically the region is indeed largely homogeneous. It is located in the Swiss plateau and covers only 4,883km^2, which amounts to less that 4.5% of Swiss territory. The Eastern fringe of Fribourg appears more mountainous, but the spatial regression discontinuity design addresses this issue. Institutions are homogeneous, too. Berne and Fribourg were patrician city states, where power was in the hands of a limited number of families. The sample region is made up of their subject territories, the inhabitants of which were deprived of political rights and enjoyed little economic freedom.

Our empirical results suggest that ceteris paribus in a Reformed Protestant electorate support for increasing leisure time will be about 13 percentage points lower than in

a Catholic electorate, and that support for government intervention will be about 11 percentage points lower. These results are robust to varying our methodology along all relevant dimensions. Support for redistribution is also lower in Protestant municipalities, but the significance of the results is somewhat sensitive to bandwidth. We do not find an equally robust effect on average income, but we do find the Protestant municipalities to exhibit clearly higher income inequality.

The paper is organized as follows. The next section introduces theoretical considerations and previous work on religion, politics and the economy. Section 3 provides a brief account of the Swiss Reformation, and presents the quasi-experiment. In section 4 we introduce the data. Section 5 presents results, and section 6 concludes.

2 Religion, Politics and the Economy

As the introductory quotes illustrate, the debate on the impact of cultural factors on the economy and politics goes back at least to Karl Marx and Max Weber. Whereas Marx saw culture merely as an expression of the prevailing economic order, Weber allowed for culture to have an independent effect on the economy. For most of the past decades, the economics literature seems to have sided with Marx on this issue by simply ignoring culture as a possible causal factor in economics and politics. Culture was deemed too vague a concept to be useful in economic analysis. Recent years however have seen a resurgence of interest in cultural explanations, Guiso et al. (2006) provide an excellent introduction to work on culture in economics[1].

2.1 Weber's work ethic hypothesis

In recent years, Weber's hypothesis of a Protestant work ethic has received particular attention. In *The Protestant Ethic and the Spirit of Capitalism*, Weber (1904) argues that Ascetic Protestantism has facilitated the rise of capitalism by providing a spiritual sanction for work in a calling.

What Weber refers to as the *spirit of capitalism* is characterized by the idea that hard work and the acquisition of wealth is an end in itself: "Labour came to be considered in

[1]Earlier papers on the role of religion include Guiso et al. (2003) and McCleary and Barro (2006).

itself the end of life, ordained as such by God. St. Paul's 'He who will not work shall not eat' holds unconditionally for everyone." Weber contrasts the spirit of capitalism with the work ethic prevailing at the time and throughout most of human history, which he designates *traditionalism*. This set of work norms aims at simply maintaining the accustomed standard of living.

Crucial for the development of the work ethic of Ascetic Protestantism is Luther's concept of the calling. Luther regarded work in a calling as supreme expression of moral activity because through work the individual fulfilled the obligations that derived from his position in the world. This is in sharp contrast to traditional Catholic doctrine, which favoured monastic withdrawal from the world. Still, Weber regarded Luther to be a traditionalist as he did not justify the pursuit of material gain.

Weber sees the theological roots of the spirit of capitalism in what he refers to as Ascetic Protestantism. Ascetic Protestantism comprises Calvinism, Pietism, Methodism, and various Baptist sects, but not Lutheranism. In Calvinism, the religious motives behind worldly Asceticism appear in its starkest form. Characteristic of Calvinism was the doctrine of predestination, which holds that by his grace God elected a small share of humanity for everlasting life and by his justice condemned the rest to everlasting death. For believers the doctrine of predestination resulted in a crisis of proof. How do I know that I am one of the elect? In response, practical pastoral work declared it a duty to consider oneself chosen as doubts thereof were a sign of the devil. Secondly, it recommended intense worldly activity as the most effective means to disperse religious doubts.

> "However useless good works might be as a means of attaining salvation [...] nevertheless, they are indispensable as a sign of election.".

In practice, Ascetic Protestantism encouraged the accumulation of wealth, which it regarded as a sign of God's blessing. It severely restricted consumption especially of luxuries . Hard work in a worldly calling is sanctified as the surest means to attain certainty of salvation.

This hypothesis has recently received increased attention in the economics literature, but results remain mixed. Cantoni (2009) finds no effect of Protestantism on economic prosperity. Becker and Woessmann (2009), on the other hand, do find a positive effect of Protestantism on economic prosperity in 19th century Prussia, but argue that most of that can be explained by a positive effect on education, thus leaving little scope for Weber's work ethic channel[2]. Spenkuch (2010) on the other hand, using survey data from contemporary Germany, does find positive effects on both work attitudes and economic outcomes.

A possible reason for the above results is that all three papers focus on Germany, which is predominantly Lutheran. Weber on the other hand was clear that his hypothesis does not apply to Lutheran, but to Reformed Protestantism, This paper explicitly focuses on Calvinism which started with the Swiss rather than the German Reformation[3].

2.2 Religion and Political Preferences

But beyond suggesting to focus on a region characterized by predominantly Reformed Protestantism, the reading of Weber (1904) is illustrative also for another reason: When, as in the passages quoted above, Weber points to the emphasis in the Reformed Faith that 'He who will not work shall not eat', this suggests that those educated in this new faith should also be less sympathetic to redistribution.

Such a possible connection between religion and political preferences and systems has also been suggested in a more recent literature in political science, starting with Esping-Andersen (1990)'s comparative analysis of welfare states, in which he contrasts the "Liberal" (minimum) type of welfare state, said to be characteristic of the Anglo-Saxon countries, with two larger types, the "Social-Democratic" or "Universal" one typical of the Scandinavian countries and the "Conservative" type found in much of Continental Europe. Manow (2002) links the origins of these three stylized types ex-

[2]In subsequent work, the authors find that this positive effect on education was particularly noteworthy for girls, as it decreased the gender gap in education relative to Catholic regions (Becker and Woessmann (2008)).

[3]A recent paper which is deals more explicitly with this difference is Bai and Kung (2011), which analyzes the impact of Protestantism in China.

plicitly to the influence of respectively Reformed Protestant, Lutheran Protestant and Catholic social teaching. In particular, he argues that Reformed Protestantism had a strong anti-statist bent and in many countries retarded the development of the welfare state. Referring to Switzerland in particular, he stresses that Reformed Protestantism saw state help as subsidiary to voluntary collective self help.

Manow follows Weber in emphasizing the importance of distinguishing between the different variants of Protestantism and points out that the anti-state stance just described is characteristic of Reformed but not of Lutheran Protestantism. This implies that Switzerland is indeed the ideal testing ground for the hypotheses of Weber and Manow, because here we have within the same country a historical coexistence between Catholicism and Reformed Protestantism.

The possible relationship between culture and political preferences has also found some attention in the recent literature in economics, most of which is surveyed in Alesina and Giuliano (2009). In particular, Luttmer and Singhal (2011) established a causal effect of culture on preferences for redistribution by analyzing the attitudes of immigrants within Europe from different countries of origin. Alesina and Fuchs-Schuendeln (2007), by exploiting the natural experiment provided by German separation and reunification, show how having lived under the Communist regime of East Germany affects preferences for government intervention and redistribution. The literature dealing specifically with religion and government-run redistribution has so far mostly emphasized the possible substitutability between insurance through religion and insurance through the government: Papers in this direction include Clark and Lelkes (2005) , Chen and Lind (2006) and Dehejia et al. (2007), as well as Scheve and Stasavage (2006b) and Scheve and Stasavage (2006a). Yet these papers differentiate little between different religions, except for Arrunada (2010) who, using survey data from the International Social Survey Programme (ISSP), finds that Protestants and Catholics do not exhibit significant differences in terms of their work ethic, but do exhibit different social attitudes[4].

[4]For further sociological work on the political impact of different religions, see in particular Greeley (1989), as well as the works cited in Manow.

At last one may question whether it is reasonable to use contemporary data to study the effects of Protestantism on work ethic and political preferences. After all, most European countries have experienced multiple waves of secularization in recent decades. Geser (2008) however argues that norms of religious origin have become so ingrained in mentalities that they no longer depend on religious practice to remain in place.

3 Empirical Strategy

3.1 The Swiss Reformation

The Swiss Reformation was started in Zurich from 1519 by head priest Huldrych Zwingli. Although his theology quickly led to conflict with the Roman Church, he eventually won the support of the city's magistrates After converting Zurich, he and his friends sought to expand the new faith also into other parts of present-day Switzerland. Regional differences notwithstanding, historian Gordon (2002) discerns a common pattern of these efforts:

> *"The Swiss would have remained Catholic, had not a small minority succeeded in persuading them that the old religion was wrong [...].success was dependent on winning over the magistrates, who would then impose the new religion. "*

In the late 1520s tension between Catholics and Protestants increased and in 1531, Protestants and Catholics clashed in the Second War of Kappel, which ended with Protestant defeat and Zwingli's death. The peace confirmed each canton's right to abide by its own faith, thus anticipating the "cuius regio, eius religio"principle which at the 1555 Peace of Augsburg was established also for the Holy Roman Empire . The resulting spatial distribution of the two religions - with Protestantism in Zurich, Berne, Basel and Schaffhausen, Catholicism in Lucerne, Uri, Schwyz, Unterwalden, Zug, Fribourg, and Solothurn, and Bi-Confessionalism in Appenzell and Glarus – then remained largely untouched until 1848, when freedom of movement was granted and between-canton migration started to somewhat loosen confessional milieus (Greyerz and Bischof (2007)).

3.2 Determinants of the adoption decision

The success of the Reformation depended on the magistrates, but why had the local elites of different cantons made different choices of religion in the first place? At first sight, their choices depended largely on geo-political considerations, as some cantons feared that Zurich would exploit the Reformation to pursue her hegemonic interests. As a result the key battlegrounds lay not in any of the Confederates, but rather in their subject territories, such as the area of our quasi-experiment to be introduced below (For details, see Gordon (2002))

Yet beyond geopolitical considerations, analysis reveals that the more mountainous regions were more likely to remain Catholic. A major reason for this was Zwingli's condemnation of mercenary service, on which however the more rural regions depended for their income. This poses a challenge for identification of a causal effect of religion on attitudes and outcomes today: Thus hard life in the mountains may always have required harder work and hence fostered a strong ethic of work and self-reliance (or, for that matter, of relying for support on the immediate family as opposed to larger social groups), implying a downward-bias in our estimates of the effect of Catholicism. Or it may to the contrary have fostered a spirit of solidarity, and of accepting that given the relatively lower returns to work one may as well take out more leisure, leading instead to an upward bias in our estimates.

Another channel through which different geography may have led to different religions are institutions: City republics in the Swiss Confederations were either governed by a guild regime or ruled by patricians. Though in either case power was in the hands of an oligarchy, guild regimes exhibited a higher degree of social mobility. It turned out that all city republics with a guild regime became Protestant whereas all patrician towns except Berne remained Catholic. Thus, institutions predict the outcome of the Reformation process and we cannot rule out that cities with institutions more conducive to economic development were also more likely to become Protestant.

A final concern stems from the fact that, since the Reformation was initially and during most of the territorial competition with Catholicism a German-speaking movement[5], its spread is largely restricted to the German-speaking parts of Switzerland, whereas the French- and Italian-speaking areas are predominantly Catholic. This might lead one to worry that differences in political preferences might at least partly be due to different cultural influences from respectively the German- and the French- or Italian-speaking neighboring countries, which were found to matter for preferences for leisure in Bruegger et al. (2009).

Just trying to control for these factors or initial outcomes is unlikely to constitute a satisfactory solution because of imperfect measurement. For instance, while we can measure each municipality's altitude above sea level, this is unlikely to capture all relevant aspects of geography, such as mountains separating a municipality from potential trading partners, quality of the soil, rivers or lakes and so on. What we need therefore is a quasi-experiment, i.e. a quasi-random assignment of different religions to two otherwise identical regions. This is indeed what we use in this paper, and explain in the following subsections[6].

3.3 Exogenous Assignment in the South-West

We focus on a region in the South-West of Switzerland that, as we shall show, was homogeneous until the beginning of the 16th century, but was then split into two parts, with the West being forced to adopt Reformed Protestantism, and the East to remain Catholic.

The region we are concerned with was in its entirety subject territory of the Roman Catholic kingdom of Burgundy until the late 15th century. When however in 1469, in the Treaty of Saint-Olmer, Burgundy formed an alliance with Hapsburg, this was perceived as a threat by the members of the Swiss Confederacy, then a lose self-defense association. It also disturbed French and German interests in maintaining the existing balance-of-

[5]The Swiss Reformation was started by Zwingli in German-speaking Zurich, and French-speaking John Calvin became involved only after the Zwingli's death.

[6]Further accounts of the assignment of religion in Switzerland in general can be found in Moeller(1978), Schaab (1993), and Schindling (1989).

power. The French king Louis XI thus declared war on Burgundy, who in turn allied also with Savoy and Milan. Once the Swiss were fighting Burgundy and its allies, the French withdrew from the conflict, but the Swiss ultimately won the Burgundy war and at the 1476 Peace Congress they were granted most of what is now the South-Western part of Switzerland. The part furthest in the West was initially given to the duke of Savoy, but was also conquered by Berne in 1536. After the conquest, the new territories were initially jointly ruled by all Swiss Confederates, but then the two strongest members of the alliance, the city republics of Berne and Fribourg, decided to pay the others off and divide the region amongst the two of them: The Eastern part thus fell to Fribourg and the Western one to Berne.

As the latter had recently become Protestant, the new rulers - in order to facilitate governance of their new territories - imposed Zwinglian Protestantism everywhere, so that the new religious authorities would all be based in Berne rather than Rome, and could more easily be persuaded to preach citizens to obey also the worldly authorities of Berne. Of course the question arises whether the region would not have become Protestant anyway, but the historical accounts suggest otherwise: In fact, as late as in 1534 the deliberative assembly of Vaud, meeting at Moudon, decided explicitly that they would like to remain Catholic[7]. When they were nonetheless forced to become Protestant, peasants initially started rioting, and the hitherto powerful local authorities lost their jobs, as Berne preferred to replace them with loyal authorities educated in the new Protestant faith. According to Bruening (2005) the inhabitants of the Vaud did not even appear to be aware of the Reformation before 1525.

A major reason for the ignorance of the Reformation until that point was language: Most of the Reformation documents had been published in German, and those few (Lutheran) Protestant pamphlets published in French had all been printed in either Paris or Antwerp, but none in French-speaking Switzerland. Furthermore, the Catholic duke of Savoy, while defeated by Berne, lingered constantly on the horizon, threatening to take back the territory and to restore religious obedience to Rome, which encouraged resistance against the conversion attempts of the Bernese[8].

[7]For details, see Feller (1953), p.379

[8]See Bruening (2005), as well as Holenstein (2006).

3.4 Equality at the Baseline

For our region to constitute a valid quasi-experiment, Protestant treatment and Catholic control region must have been statistically identical at the baseline, i.e. before the assignment of different religions took place.

To assess the potential impact of geography it is helpful to examine a satellite image of the region as provided by Figure 1. As Figure 1 shows, the area is rather small, with a maximum East-West extension of only about a 100km. It is largely situated on the Swiss Plateau, a mostly hilly region bounded by the Jura Mountains in the North-East and the Alps in the South. The Swiss Plateau constitutes the most densely populated region of Switzerland, important for both economic activity and transportation.

But Figure 1 points also towards some differences; The East of the region appears more mountainous. Furthermore, in the West the Vaud shares a common border with a foreign country, France, whereas Fribourg is surrounded by Swiss regions only. However, Figure 1 also suggests how to address the potential impact of differential geography at the fringes of the sample region. Fribourg and the Vaud share a common border. The municipalities on the Vaud side of the frontier have traditionally been Protestant whereas those on the Fribourg side have been Catholic. Econometrically, this set-up can be exploited for a spatial regression discontinuity design. Figure 2 confirms that average altitude is indeed higher in the East of the sample region, but shows no difference close to the border.

As outlined above, we have to ensure that also institutional differences between our treatment and control region were ignorable. In general, political institutions in the 16th century evolved towards the territorial state. All of the area considered in our analysis however was subject territories of patrician city states, the West of Berne and the East of Fribourg. Inhabitants of subject territories were deprived of political rights, with no access to the governing bodies of the city states. Though the authorities would occasionally consult their subjects on sensitive issues, they were not bound by their views. Economic freedom was severely curtailed, too, with the primary goal of securing the supply of food to the ruling cities and shielding the guilds from unwanted competition (see Holenstein (2009)).

Furthermore, both areas considered are homogeneously French-speaking, except for the Lake District and parts of the Sense district, both in the Catholic part. To keep our baseline sample homogeneous with regard to language, the municipalities affected by this have been dropped.

Finally, one may worry about the fact that since 1803 the treatment and control regions used for our baseline results correspond to two different cantons (states), Fribourg and Vaud. If some factor not related to religion had struck at the canton level after that date, our results could be biased and present-day differences in preferences be due to factors other than Protestantism. In the Appendix, we exploit a separate natural experiment in which the former district of Murten, in the North of the otherwise Catholic canton of Fribourg did remain predominantly Protestant.

The remaining concern is that of self-selection on the basis of initial economic prosperity. Data on per capita income in this period are difficult to come by and therefore studies such as Acemoglu et al. (2002) use population density to proxy for historical economic development. Ammann (1937) has compiled data on the number of fireplaces per parish in the 15th century, based on parish visitations in the dioceses of Geneva and Lausanne. Their great advantage over other commonly used sources such as Bairoch (1988) is their low level of aggregation. Multiplying the number of fireplaces by four yields roughly the number of inhabitants. The number of fireplaces is therefore a measure of population density, which in turn proxies economic development. Table 1 shows that there is no significant difference in fireplaces between the Vaud and Fribourg. We thus can rule out that the initially more prosperous region became Protestant.

3.5 A Spatial Fuzzy Regression Discontinuity Design

The Spatial Fuzzy Regression Discontinuity Design (RDD) exploits the fact that the assignment of Protestantism in the 16th century and therefore also the "treatment" of present-day Protestantism change discontinuously at the historical religious border, whereas the confounding factors described above can be expected to change only continuously, i.e. in about equal steps for each km we move from East to West or from North to South. This allows us to identify the causal effect of Protestantism as the discontinuous change in outcomes at this border, while controlling with sufficient flexibility for

the effect correlated with the "forcing variable" distance from the border per se. For a recent summary of papers implementing such a design with various forcing variables, see for instance Imbens and Lemieux (2008) or Lee and Lemieux (2009). The paper methodologically closest to ours is Bruegger et al. (2009) who analyze the impact of Latin languages (French, Italian or Romansch), relative to German, on work attitudes in Switzerland using distance to the language frontier as forcing variable.

As the share of Protestants does not jump from zero to one at the border we have what Trochim (1984) has called a "Fuzzy Regression Discontinuity Design", in which the causal effect of present-day Protestantism is identified by instrumenting the latter with the indicator for whether a municipality had been assigned Protestantism in the 16th century. Put differently, the hypothetical effect on our outcomes of interest of moving from a municipality with 0% Protestants to one with 100% Protestants is given by the jump at the border in those outcomes (the "Reduced-Form or "Intention-to-Treat" effect), divided by the jump at the border in the share of Protestants (the "First-Stage effect").

To implement the SRDD we have to decide how to measure distance from the border. The paper by Dell (2010) on forced labor in Peru uses simple air-line distance, whereas Bruegger et al. (2009) use driving distance,. We think that driving or walking distance better proxies economic distance than great circle distance as the latter does not take into account the barriers posed by mountain ranges or rivers. In the end we consider walking distance the best possible proxy for historical travel distance and use great circle distance as a robustness check. In particular, we use walking as opposed to driving distance, because this seems to us the best proxy also for historical travel networks: Thus historic paths that have not been transformed into bigger roads will still be counted if they constitute the shortest connection to the border.

A second issue to consider is whether to use distance to the nearest municipality across the border as in Bruegger et al (2009) or distance to the nearest point right on the border. While the two measures are of course highly correlated and regression results differ only little when we use one or the other, we think that a priori distance to the border itself is the preferable measure. While indeed this choice does not affect which municipalities

are in the treatment and which ones are in the control group, the choice will still affect our estimates of the control functions on both sides and hence will affect our estimator of the treatment effect. Since we think that what should matter here is distance to the nearest houses inhabited by members of the other confession, as opposed to distance to the official municipality midpoint, we have thus chosen distance to the border as our preferred measure.

4 Data

To measure both "self-regarding" preferences about the choice between more leisure and more income, and "other-regarding" or "social" preferences about political issues like redistribution and government intervention in the economy, we use the fraction of citizens in each municipality voting for different policy proposals on these issues in 15 different Swiss referenda. Here we explain first the general advantages of using Swiss referenda as a measure of preferences, and then discuss the content of each of the referenda used.

The Swiss system of direct democracy, with its many referenda, is one of the rare cases that come close to the system of "Pure Majority Rule" often assumed in political economy models (for an example, see Persson and Tabellini (2002)): First, rather than only electing representatives who then choose policies, citizens vote directly on specific policy proposals and every citizen has one vote. Second, in the referenda discussed below citizens' choice set comprised only two alternatives, for or against, thus excluding the possibility of strategic voting. And third, the setup can validly be considered as one with an "Open Agenda", given that in Switzerland many issues must by constitution automatically be submitted for referendum, and many other issues can and frequently are demanded by citizens to be submitted for referendum. As a result, the referenda provide a measure of preferences in the spirit of the Paradigm of Revealed Preferences, a measure that may be considered more meaningful than those that can be obtained from mere survey data. The Swiss Federal Office of Statistics provides data on voting at the municipality level for all referenda held from 1980 onwards, and an overview of these referenda is available in the "Political Atlas of Switzerland" (2004).

As a measure of Preferences for Leisure, or "work ethic" in the terminology of Max Weber, we use the same six referenda as Bruegger et al. (2009), when they analyze the relationship between work ethic and Switzerland's different linguistic groups. Summary statistics on these measures can be found in the first six rows of Table 2. The first three of them deal with what can be called the "intensive margin" of the labor leisure choice. The first, held in 1985, proposes longer vacations, while the other two, held in respectively 1988 and 2002, propose to reduce the statutory number of weekly working hours. Three referenda deal with the extensive margin of working time. They either propose to lower or to not raise the retirement age. The referenda were held in 1988 and 2000.

In addition, we have identified five referenda dealing with issues of redistribution, summarized in rows (7)-(11) of Table 2. The referendum in row (7), held in 1992, asked citizens whether to lower the health insurance contributions payable by the poor, and can thus be interpreted as a measure of solidarity on the basis of income. Referendum (8), held in 1997, proposed cuts in unemployment benefits and thus dealt with redistribution on the basis of employment status. Referendum (9), of 1995, put to a vote the expansion of an obligatory and universal insurance for the old, widows and handicapped, and can thus be interpreted as dealing with redistribution on the basis of age, widow and health status. Referendum (10), put to the vote in 2007, proposed to solve funding shortages in the disability benefit scheme by cutting benefits for the disabled, as opposed to raising the required level of contributions. Finally, referendum (11), held in 2007, dealt with the introduction of an obligatory and progressively financed health care system.

Finally, a set of four referenda are concerned with government intervention. Referendum (12) of 1981 suggested that firms were inherently tempted to abuse the market at the cost of consumers, implying a need for the government to intervene. Number (13), of 1986, focused more specifically on the market for housing, asking the government to prevent the charging of excessive rents. Number (14), of 1998, suggested that the market for agricultural products could, if left to itself, neither provide sufficient quality nor fair prices to consumers, and demanded that the government step in and pay subsidies for ecological farming. Finally, referendum (15) of 2003 proposed to regulate more strongly how and which rental prices could be charged.

For all 15 referenda, Table 2 gives the fraction of votes in favor of respectively more leisure, more redistribution or more government intervention. The subsequent analysis is based on the averages over the three categories of referenda. The summary statistics are shown in Table 1. In the Protestant area, support for work time cuts, redistribution, and government intervention is on average lower than in the Catholic region. As Table 2 shows this pattern is not driven by a few outliers but holds for most individual referenda too.

The explanatory variable of interest is given by a municipality's share of Protestants. Religious affiliation is recorded every ten years by the Swiss census, and since our referenda go back to 1981 we use the 1980 census. Today, of course not all inhabitants of Switzerland are affiliated with either the Catholic or the Protestant Church, and since our quasi-experiment provides us with only one instrument, for Protestantism, we use as "treatment" variable the share of Protestants out of those either Catholic or Protestant. This amounts to assigning those with neither affiliation to the two confessions in the same proportion as is found amongst those with either affiliation.

The analysis below considers also economic outcomes: Data on average income and the Gini coefficient come from appendix D of Ecoplan (2004) and refer to 1996.

5 Results

5.1 First stage

Table 3 and Figure 3 present first stage results. The econometric specifications differ only in terms of bandwidth. Column (1) and the first panel of Figure 3 show results for the Imbens and Kalyanaraman (2009) optimal bandwidth. The remaining columns present results for fixed bandwidths of 5km, 10km, and 20 km respectively, which the graphs suggest as sensible bandwidth numbers . Figure 3 clearly shows that the share of Protestants changes discontinuously at the border. The IK estimate of the effect equals 65 percentage points, based on a bandwidth of 2.26km. The larger bandwidths result in slightly larger estimates ranging from 69 percentage points to 71 percentage points.

The results testify to the strong persistence of religion. Municipalities where in 1536 Berne had imposed Protestantism had a 65 to 71 percentage points higher share of Protestants in 1980, almost 450 years after the initial assignment. It is therefore safe to conclude that the IV estimates do not suffer from a weak instruments problem.

5.2 Main outcomes

Table 4 presents estimates of the intention-to-treat effect. Column (1) and Figure 4 are concerned with Weber's thesis. Figure 4 shows that support for referenda proposing reductions in working time is considerably higher on the Catholic side of the border. The IK estimate of the effect equals 9.4 percentage points and is significant at the one percent level. The evidence on preferences for redistribution is weaker. Though column (2) and Figure 5 show that support for referenda in favor of increased redistribution is somewhat lower among Protestants, the IK estimate is not statistically significant at conventional levels. However, as the lower panels of Figure 5 indicate, the results are sensitive with respect to bandwidth. Indeed, Table 6 shows that the difference is statistically significant for bandwidths of 10km and 20km. Column (3) and Figure 6 deal with preferences for intervention. Figure 6 shows that popular support for intervention is considerably higher in Catholic Fribourg than in Protestant Vaud. Indeed, the IK estimate of the intention-to-treat effect equals 7.9 percentage points and is statistically significant at the one percent level.

Results on per capita income are shown in column (4). While Table 1 showed that as a whole the Protestant area had higher average incomes, a result likely distorted by the many rich foreigners living near Geneva, our RDD analysis shows that average income is slightly higher on the Catholic side of the border, but the difference is small and becomes statistically insignificant at larger bandwidths. Figure 7 shows that indeed income evolves rather smoothly around the border. If our measure of work ethic favors Protestants, why is there no corresponding gap in earnings? A likely reason is that working time regulation in Switzerland is made at the federal level, hence even if voting behavior differs across areas, in practice has to follow the decisions made by the Swiss average voter.

The final column of Table 4 deals with inequality. As column (7) and Figure 8 show, inequality as represented by the Gini coefficient is higher in the Protestant region than in the Catholic region. The difference is statistically significant even at the small bandwidth chosen by the Imbens and Kalyanaraman (2009) algorithm. Actual inequality is thus consistent with our measure of preferences for redistribution.

Table 5 presents the corresponding IV estimates. The IV estimate is simply the ITT estimate scaled by the first stage. The exact size of the first stage coefficient depends on the IK bandwidths in the individual regressions but equals about 0.7. The IV estimates are thus about 40% larger than the ITT results. Substantively, they should be interpreted with caution as they assume that the Reformation affects the present only through the current share of Protestants.

Table 6 examines the robustness of the results with respect to bandwidth. In particular, it presents reduced form and second stage estimates for bandwidths 5km, 10km, and 20km as shown in the lower panels of RD graphs. With the exception of preferences for redistribution, the significance of the results does not depend on the particular bandwidth chosen. The difference in preferences for redistribution is significant only for bandwidths 10km and 20km. Quantitatively, the impact on preferences for intervention is somewhat sensitive to bandwidth choice.

6 Discussion and Conclusion

We have shown that in a 100% Reformed Protestant municipality, support for more leisure is predicted to be about 13 percentage points or more than 1.5 standard deviations lower than in a 100% Roman Catholic municipality. This lends empirical support to Max Weber's famous hypothesis of a "Protestant work ethic", thus deviating from earlier work in this literature such as Becker and Woessmann (2009) or Cantoni (2009). A plausible explanation for these differences is that the latter two papers looked at Lutheran Protestantism, whereas we focus on Reformed Protestantism. Though income in the Protestant region of our sample is on average higher, there is no discontinuity corresponding to those in voting behavior. It appears likely that federal working time regulation and general equilibrium effects constrain income differentials in a region as

economically integrated as our sample.

Looking beyond the "work ethic" literature, we have argued that the works of Max Weber as well as the more recent literature in sociology can be seen to imply also predictions whereby Reformed Protestantism nurtures preferences for smaller government, and our empirical results confirm such predictions. Correspondingly, we also find Protestantism to lead to greater income inequality.

On a more general level, our results imply that religion is not just, as Karl Marx would have us believe, "People's Opium", but can, by its own force, significantly change people's preferences, both self-regarding and social ones. To what extent such different preferences do then also translate into different economic outcomes will certainly depend on the framework of political institutions: Our results in this respect are at best a lower bound on the importance of different preferences for economic outcomes in general, seeing that our treatment and control groups are and for a long time have been based in the same country, and that furthermore we have examined merely two confessions of the same, Christian religion, as opposed to two religions further away from each other. It is all the more noteworthy that even in this set-up we have still found significant effects on preferences and, indeed, on income inequality.

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A Robustness Checks

A.1 Smoothness of Covariates

One question that arises in the context of any Regression Discontinuity Design is whether individuals are able to manipulate the side of the threshold they are on. In our case, the units of observation are municipalities that cannot move, but it is possible that migration in recent decades has been selective, in particular immigration of foreign residents. To check whether there is any evidence on this, Table 7 extends our Regression Discontinuity analysis based on the Imbens-Kalyanaraman Optimal Bandwidth to a range of demographic variables. We find no statistically significant differences at the border in population density, the share of foreign or married residents as well as in participation in general elections. The share of male inhabitants who is lower in the Protestant part and the difference is statistically significant at the 10% level, but economically, the difference of 1.6 percentage points seems rather small.

A.2 Coincidence of the Assignment with Present-Day Cantons: Exploiting the "Common Lordships"

The validity of the identification mechanism may be questioned because the assignment described above has led not only to differences in present-day religion, but has in addition implied that the two areas became separate Swiss cantons (states) in 1803. To the extent to which present-day differences between the two cantons are a consequence of the different assignment of religions, this is part of what we are investigating. We do however need to ask whether at any point between the natural experiment and today there were shocks that affected one canton differently from the other and that could cause voting behavior to differ across the two regions for reasons other than religion. If so, the exclusion restriction of our instrumental-variable design would be violated.

Fortunately, we can examine this issue empirically: While in general the agreement between the city republics Berne and Fribourg was that within its subject territory each could choose which religion its citizens were supposed to follow, the territory under consideration knew three exceptions from this rule in the "Common Lordships" Grandon, Echallens-Orbe and Murten. These were places where the Swiss Confederates had won

major battles of the Burgundy Wars. In 1476 they thus became joint territories of all Swiss Confederates, and with the 1484 Treaty of Beromuenster of Berne and Fribourg who paid the others off. Henceforth the two cities ruled them jointly by taking five-year-turns in nominating the bailiff.

Importantly, the agreement implied, at least initially, that the citizens of these territories would remain free to choose their religion, rather than having to choose that of either of their two rulers. Later developments were then somewhat asymmetric. In Grandson and Echallens-Orbe, both surrounded by Protestant Vaud, citizens remained free to choose, but the more powerful Berne managed to enforce a clear bias toward Protestantism: If the majority of citizens voted for abolishing the Catholic mass, it would be irrevocably abolished; if by contrast they voted for keeping it, then the Protestant minority remained free to practise Protestantism and could after some time ask for a new vote. As a consequence, in the course of the 16th and early 17th century most municipalities did nonetheless adopt the same Protestant religion as the rest of the Vaud.

Things were different in the bailiwick of Murten[9], situated in the Northern part of the present-day canton of Fribourg. Despite being largely surrounded by Catholic territory – except for the North, where it bordered Protestant Berne – pressure from Berne meant that this territory did soon also adopt the Reformation. At the same time, it became a regular part of the canton of Fribourg, when that was formed in 1803.

This provides us with an area whose religious situation was very much like that of Vaud, but which nonetheless became a part of the canton of Fribourg, thus allowing us to separate the effect of Protestantism from that of being situated in the canton of Vaud. We do so by conducting a within-canton comparison, first of the share of Protestants in 1980 and then of our three preference measures as well as income mean and inequality, between Murten and Catholic Fribourg. Since all of Murten has traditionally been German-speaking, we use as comparison group only the other German-speaking municipalities

[9]The bailiwick of Murten comprised the present-day municipalities of Haut-Vully, Bas-Vully, Fraeschels, Kerzers, Galmiz, Ried bei Kerzers, Muntelier, Buechslen, Gempenach, Murten, Lurtigen, Ulmiz, Jeuss, Courlevon, Courgevaux, Meyriez and Greng.

of Fribourg, although a comparison with the entire canton yields qualitatively the same results. For further details on the three Common Lordships, see the entries on Murten, Grandson and Echallens in der Schweiz (2009), as well as the longer list of references given therein.

Table 8 shows the summary statistics of this comparison. Since we are now talking of a rather small sample, comprising only 18 Protestant and 28 Catholic municipalities, all of which are situated in the two Nothern-most districts (Lake District and Sense District) of the canton of Fribourg, these summary statistics do effectively give us the local intention-to-treat effect of Protestantism within the canton of Fribourg. The resulting coefficients on Protestantism go all in the same direction as those in our main paper, except for that on income which is now positive, providing some support for the hypothesis that their stronger work ethic and individualism makes Protestants economically more prosperous. The sizes of these differences are if anything slightly larger than those obtained on our full sample. Thus overall these comparisons suggest that our results are indeed due to the effect of Protestantism and cannot be explained by some unobserved other factors effective at the canton level.

A.3 Triangular Kernel

Instead of assigning equal weight to all observations, as we have done in the baseline specification underlying all results in our main paper, one may choose to assign greater weight to observations closer to the threshold. Results from using such a triangular or edge kernel, which Fan and Gijbels (1996) showed to be optimal for estimating local linear regressions at the boundary, are presented in Table 9 and are found not to differ significantly from the results obtained with the simple rectangular or uniform kernel.

A.4 Forcing Variable Great-Circle Distance

While we have argued in the paper and above for using walking distance as preferred forcing variable, Table 10 shows that in our specific context the results based on bee-line distance do not differ much from those based on walking distance: The coefficients for Preferences for Leisure, Preferences for Intervention and Preferences for Redistribution are all slightly larger and the latter now becomes statistically significant also at the

Imbens-Kalyanaraman Optimal Bandwidth. The coefficient for average income also becomes slightly larger and that for income inequality becomes somewhat smaller, but the qualitative results remain unchanged.

When we follow Dell (2010) in controlling separately for longitudinal and latitudinal distance from the border, as displayed in Table 11, our results also remain qualitatively unchanged, but the coefficients for our three preference measures become about 50% larger. We think that this does likely reflect insufficiencies in the control function for our present context and prefer to stick with the more conservative estimates presented and discussed in the main part of our paper.

A.5 Alternative Income Measure

To ensure that our results on average income and income inequality are not specific to our income measure, Table 12 presents results based on 2003 data kindly shared with us by Jeitziner and Peters (2007)[10]. In contrast to the 1996 data from Ecoplan, Jeitziner and Peters have excluded individuals "taxed at source", typically recently immigrated foreigners.

[10] Jeitziner, B. and R. Peters (2007). *Regionale Einkommens-und Vermoegensverteilung in der Schweiz: Was sagen die Steuerdaten.* Die Volkswirtschaft.

B Tables and Figures

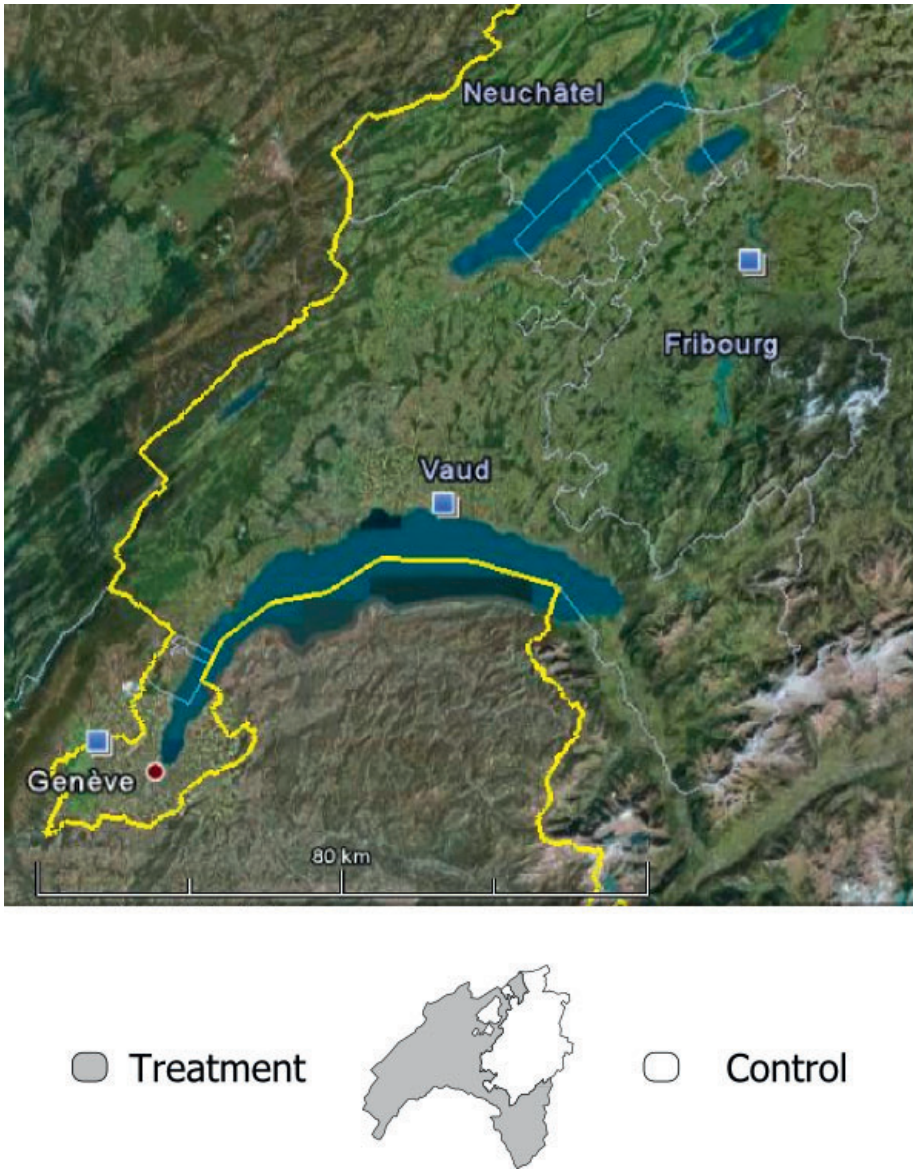

Figure 1: Satellite view of the area with Protestant Vaud in the West and South, and Catholic Fribourg in the Northeast. © 2011 Google.

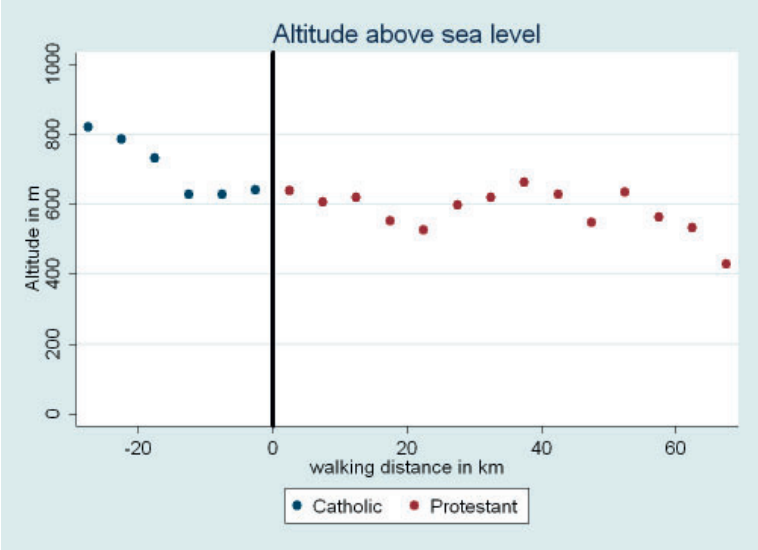

Figure 2: Average altitude in meters above sea level conditional on walking distance to the border. Binwidth 5km.

Table 1: Summary statistics

	Protestant			Catholic				
	Mean	SD	N	Mean	SD	N	Difference	t
Share Protestants 1980	0.78	0.14	382	0.09	0.11	127	0.69	58.47
Preferences for leisure	37.75	8.05	382	43.39	7.79	127	-5.64	-7.01
Preferences for redistribution	38.4	6.59	382	41.53	4.88	127	-3.13	-5.7
Preferences for intervention	35.32	7.74	382	44.27	6.09	127	-8.95	-13.36
Mean net income 1996 in 1000 CHF	37.92	8.32	382	34.19	5.03	127	3.74	6.06
Gini coefficient 1996	0.38	0.07	382	0.31	0.04	127	0.08	15.86
Altitude in m above sea level	600	162	382	669	121	127	-68.51	-5.05
Distance to closest border point in km	21.94	17.16	382	-9.06	7.41	127	31	28.27
Fireplaces per parish in 1416	62.98	95.44	142	76.05	127.24	72	-13.07	-0.84

The table presents summary statistics for both the Protestant and the Catholic subregion. The last column presents the t-statistic from a test for the equality of means. The summary statistics refer to the the French speaking parts of the entire region, i.e. also municipalities that are far from the border and hence not included in the Regression Discontinuity Design (RDD). A "border point" is an intersection of the border line with a road or path.

Table 2: Summary statistics: individual referenda

		Protestant			Catholic				
		Mean	SD	N	Mean	SD	N	Difference	t
(1)	Longer vacation (1985)	30.74	12.18	382	35.56	12.2	127	-4.83	-3.86
(2)	Shorter weekly hours (1988)	26.68	9.39	382	34.42	11.34	127	-7.74	-6.94
(3)	Shorter weekly hours (2002)	29.07	7.7	382	31.96	7.97	127	-2.89	-3.57
(4)	Earlier retirement (1988)	31.51	11.1	382	39.91	11.91	127	-8.4	-7
(5)	Earlier retirement (2000)	50.41	10.54	382	54.72	8.72	127	-4.3	-4.56
(6)	No rise in female retirement age (2000)	58.07	10.25	382	63.78	8.22	127	-5.71	-6.36
(7)	Lower health insurance cost for poor (1992)	23.14	8.97	382	27.28	7.87	127	-4.14	-4.95
(8)	No cut of unemployment benefits (1997)	58.95	10.17	382	63.37	8.73	127	-4.42	-4.74
(9)	Universal old age and disability insurance (1995)	25.44	9.1	382	26.8	7.88	127	-1.36	-1.62
(10)	No cut of benefits for disabled (1995)	43.8	8.5	378	51.14	8.65	110	-7.34	-7.87
(11)	Universal health insurance (1995)	40.85	8.72	378	40.42	6.3	110	0.43	0.57
(12)	Prevent firm from market abuse (1981)	47.95	13.4	382	62.45	13.2	126	-14.5	-10.65
(13)	Regulation of rental market (1986)	50.77	12.66	382	65.88	9.12	127	-15.11	-14.58
(14)	Regulation of food market (1998)	10.05	4.77	382	11.82	4.77	127	-1.77	-3.62
(15)	Regulation of rental market (2003)	32.51	9.88	382	37.14	7.23	127	-4.63	-5.67

The table presents summary statistics for both the Protestant and the Catholic subregion. The last column presents the t-statistic from a test for the equality of means. The summary statistics refer to the French speaking parts of the entire region, i.e. also municipalities that are far from the border and hence not included in the Regression Discontinuity Design (RDD). Referenda (1)-(6) refer to preferences for leisure, (7)-(11) to preferences for redistribution and (12)-(15) to preferences for intervention.

Table 3: First stage results

	(1) Share of Protestants	(2) Share of Protestants	(3) Share of Protestants	(4) Share of Protestants
T	.66***	.69***	.73***	.75***
	(.06)	(.03)	(.02)	(.02)
Distance	.02	.02***	.00	.00
	(.03)	(.01)	(.00)	(.00)
T*Distance	.00	-.01	-.00	-.01***
	(.04)	(.01)	(.00)	(.00)
Constant	.14***	.13***	.10***	.10***
	(.04)	(.02)	(.01)	(.01)
BW	2	5	10	20
N	72	133	208	305

T is an indicator for whether a municipality is on the historically Protestant side of the border; "Distance" is walking distance to the closest border point in km. In column (1) bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). Columns (2)-(4) show results for bandwidths of 5km, 10km, and 20km. Robust standard errors in parentheses. * P<0.10, ** P<0.05, *** P<0.01.

Table 4: Reduced form results

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
T	-9.41***	-2.36	-7.91***	-1.81*	.10***
	(2.24)	(1.86)	(1.90)	(1.02)	(.03)
Distance	.32	-.30	-.37	.25	-.03
	(.56)	(.41)	(.33)	(.18)	(.02)
T*Distance	-.41	-.33	.01	.72**	.04
	(.70)	(.64)	(.55)	(.36)	(.03)
Constant	44.38***	41.24***	42.35***	32.87***	.27***
	(1.66)	(1.12)	(1.33)	(.66)	(.02)
IK OB	7.01	5.60	7.00	5.64	1.54
N	166	143	165	144	56

T is an indicator for whether a municipality is on the historically Protestant side of the border; "Distance" is walking distance to the closest border point in km; Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). Preferences in columns (1), (2) and (3) based on the share of yes votes averaged across respectively referenda (1)-(6), (7)-(11) and (12)-(15) in Table 2. Robust standard errors in parentheses. * P<0.10, ** P<0.05, *** P<0.01.

Table 5: Second stage results

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
Share Protestants	-13.25***	-3.37	-11.20***	-2.59*	.15***
	(3.03)	(2.57)	(2.62)	(1.43)	(.05)
Distance	.43	-.25	-.26	.29	-.04*
	(.56)	(.42)	(.35)	(.19)	(.02)
T*Distance	-.51	-.37	-.10	.68**	.04
	(.68)	(.61)	(.52)	(.35)	(.03)
Constant	45.91***	41.67***	43.69***	33.20***	.25***
	(1.92)	(1.33)	(1.59)	(.79)	(.03)
IK OB	7.01	5.60	7.00	5.64	1.54
N	166	143	165	144	56

"Share Protestants" is the share of Protestants amongst those either Protestant or Catholic, as of the 1980 census. Scaled to the unit interval the coefficients give the estimated difference between a fully Protestant and a fully Catholic municipality. It is instrumented with T, an indicator for whether a municipality is on the historically Protestant side of the border; "Distance" is walking distance to the closest border point in km; Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). Preferences in columns (1), (2) and (3) based on the share of yes votes averaged across respectively referenda (1)-(6), (7)-(11) and (12)-(15) in Table 2. Robust standard errors in parentheses. * P<0.10, ** P<0.05, *** P<0.01.

Table 6: Varying bandwidth

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
BW 5km					
ITT	-8.47***	-1.85	-7.76***	-1.69	.07***
	(2.58)	(1.97)	(2.13)	(1.08)	(.01)
IV	-12.30***	-2.69	-11.28***	-2.45	.11***
	(3.61)	(2.79)	(3.03)	(1.54)	(.02)
N	133	133	133	133	133
BW 10km					
ITT	-9.06***	-4.15***	-8.42***	-.06	.07***
	(1.84)	(1.42)	(1.61)	(.91)	(.01)
IV	-12.46***	-5.71***	-11.58***	-.08	.10***
	(2.45)	(1.90)	(2.17)	(1.25)	(.01)
N	208	208	208	208	208
BW 20km					
ITT	-10.28***	-4.98***	-9.80***	1.22	.07***
	(1.50)	(1.12)	(1.27)	(.76)	(.01)
IV	-13.62***	-6.61***	-12.99***	1.62	.10***
	(1.92)	(1.43)	(1.62)	(1.00)	(.01)
N	305	305	305	305	305

The Table presents reduced form (ITT) and second stage (IV) estimates for bandwidths 5km, 10km, and 20km as alternative to the IK bandwidth used in Tables 4 and 5. "Distance" is walking distance to the closest border point in km. Preferences in columns (1), (2) and (3) based on the share of yes votes averaged across respectively referenda (1)-(6), (7)-(11) and (12)-(15) in Table 2. Robust standard errors in parentheses. * P<0.10, ** P<0.05, *** P<0.01.

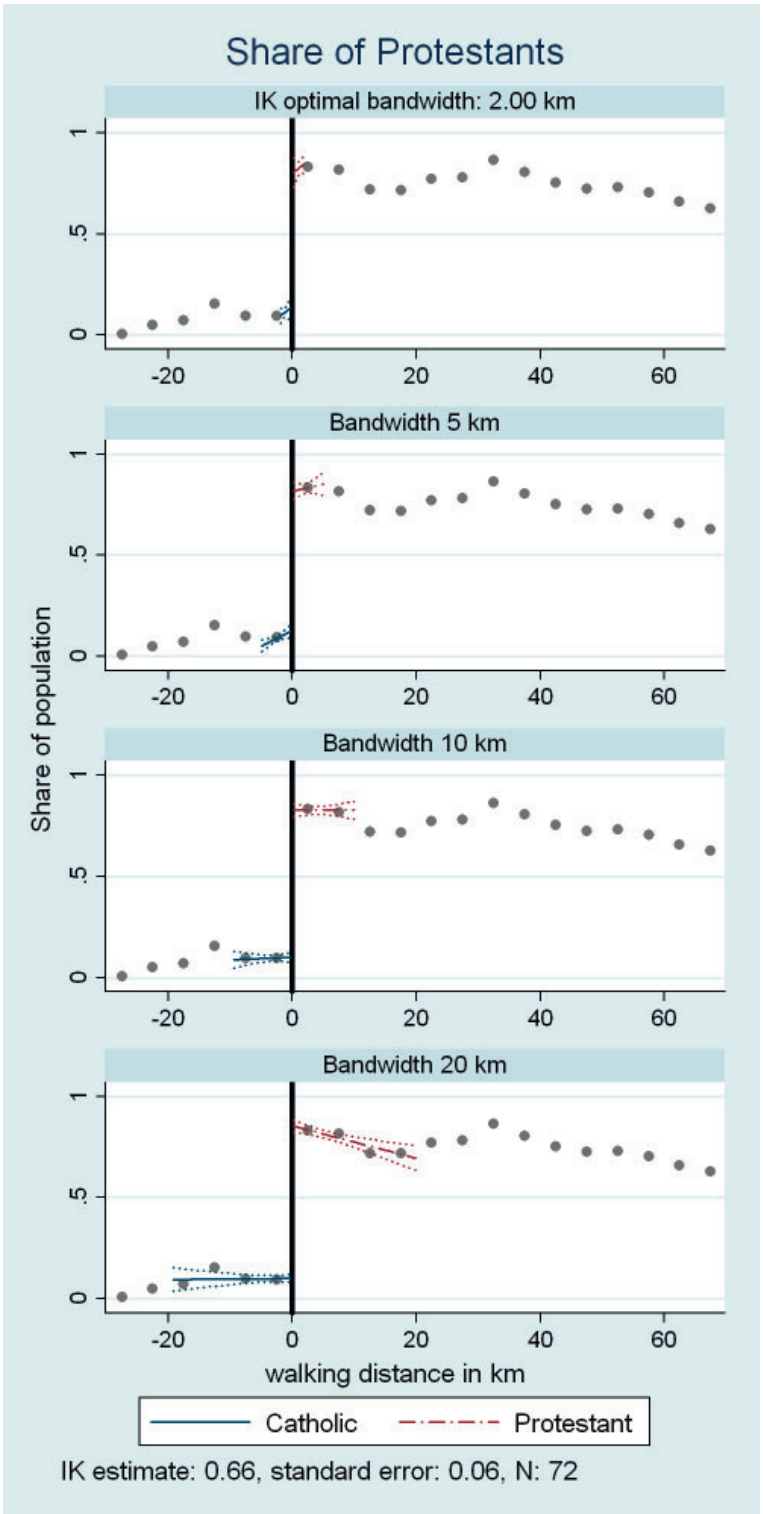

Figure 3: Share of Protestants conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

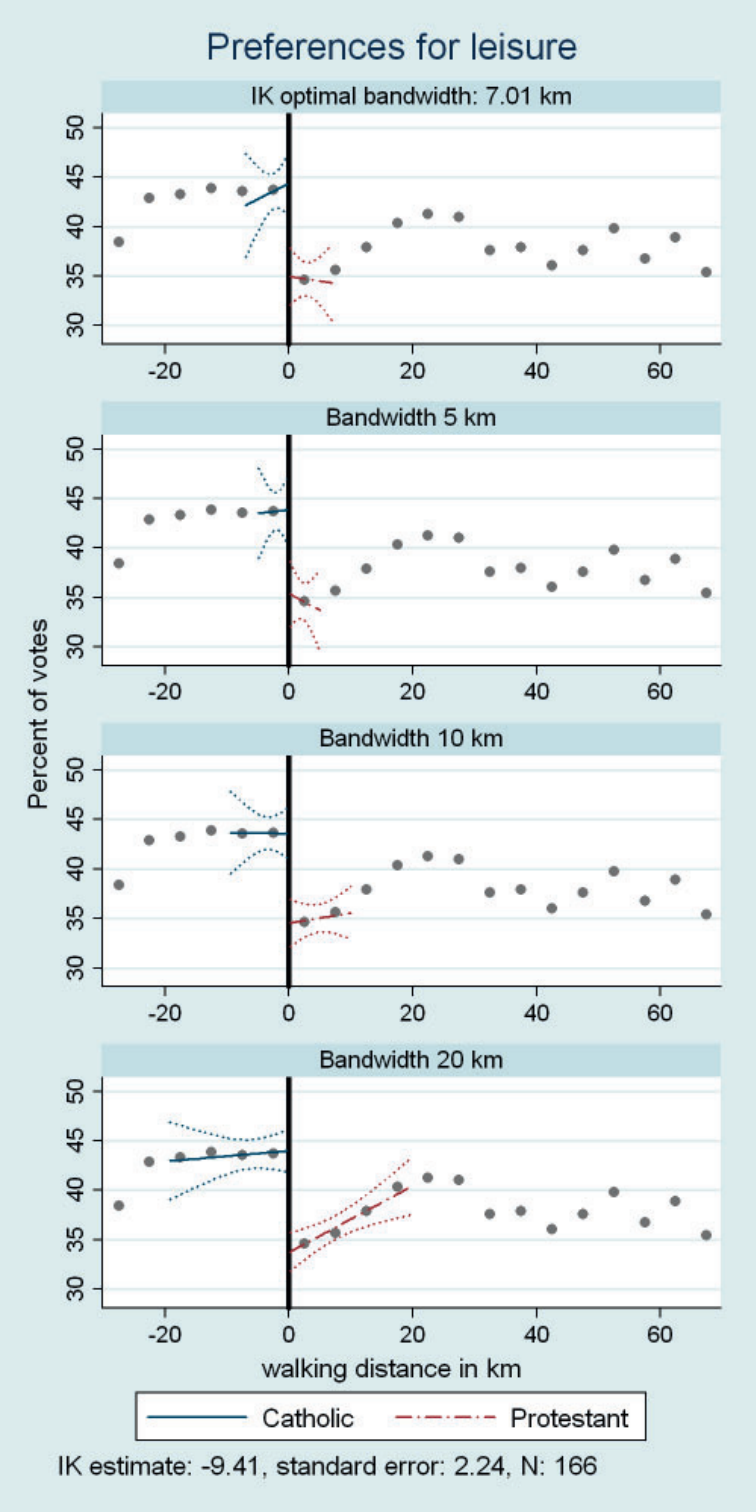

Figure 4: Preferences for leisure conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

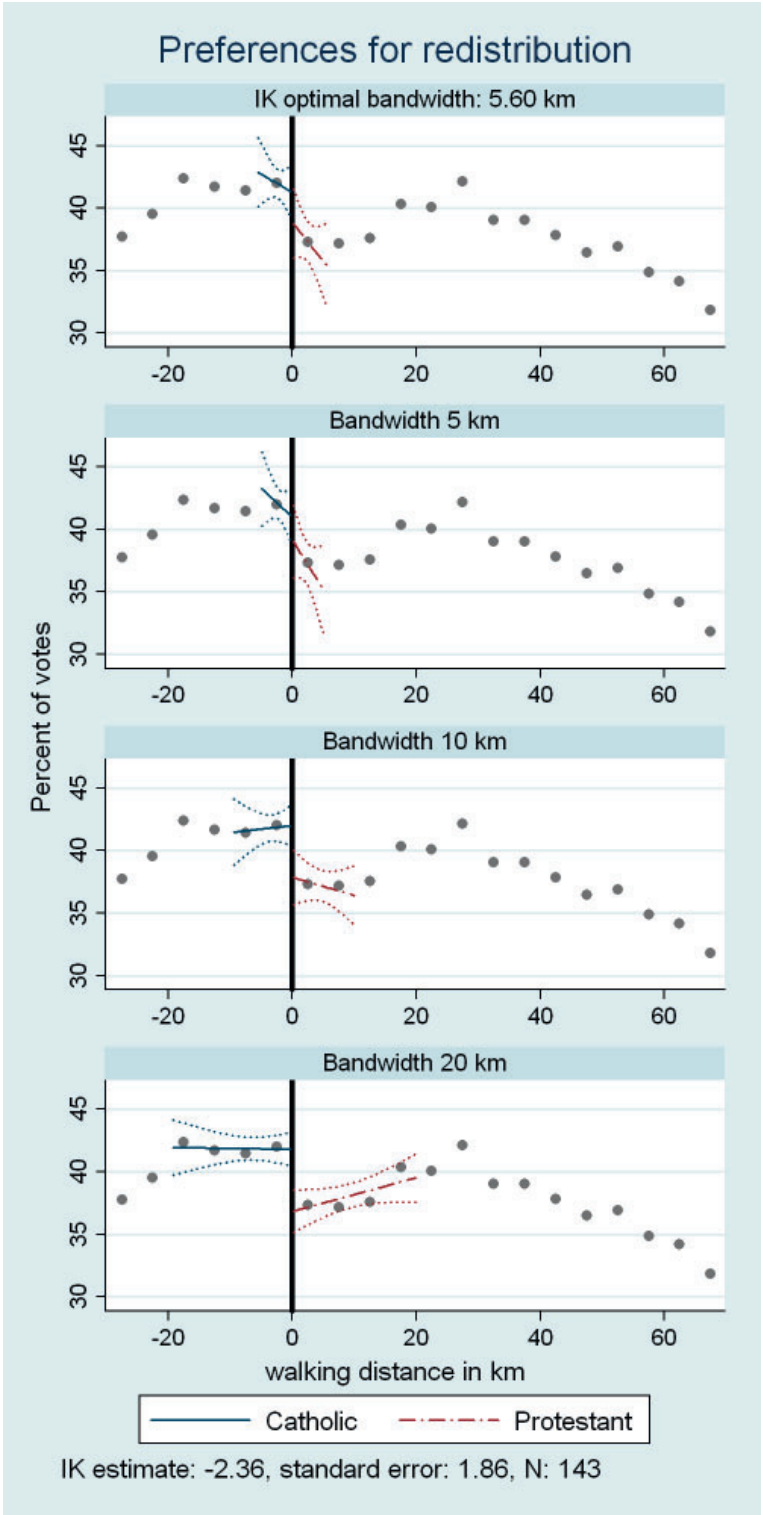

Figure 5: Preferences for redistribution conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

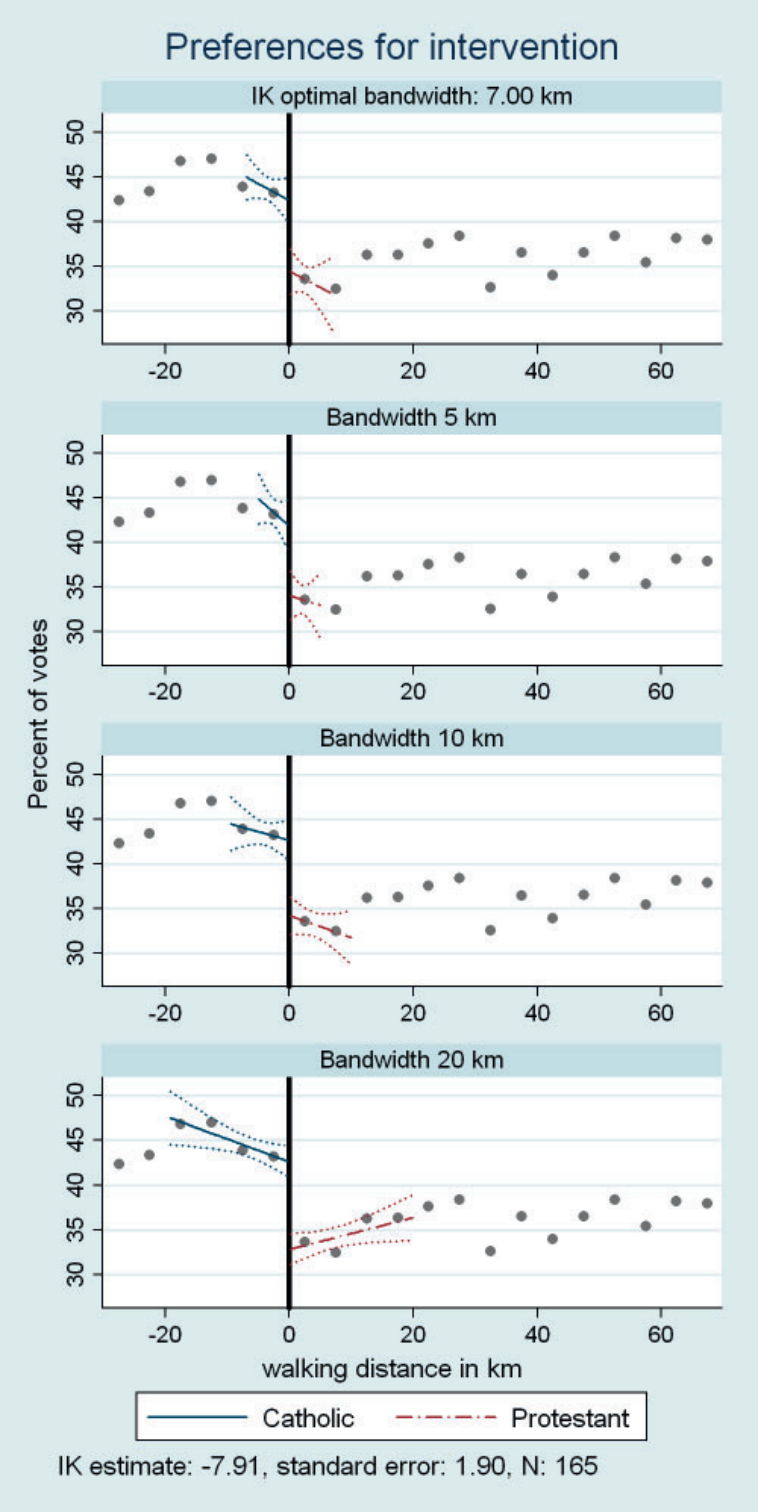

Figure 6: Preferences for intervention conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

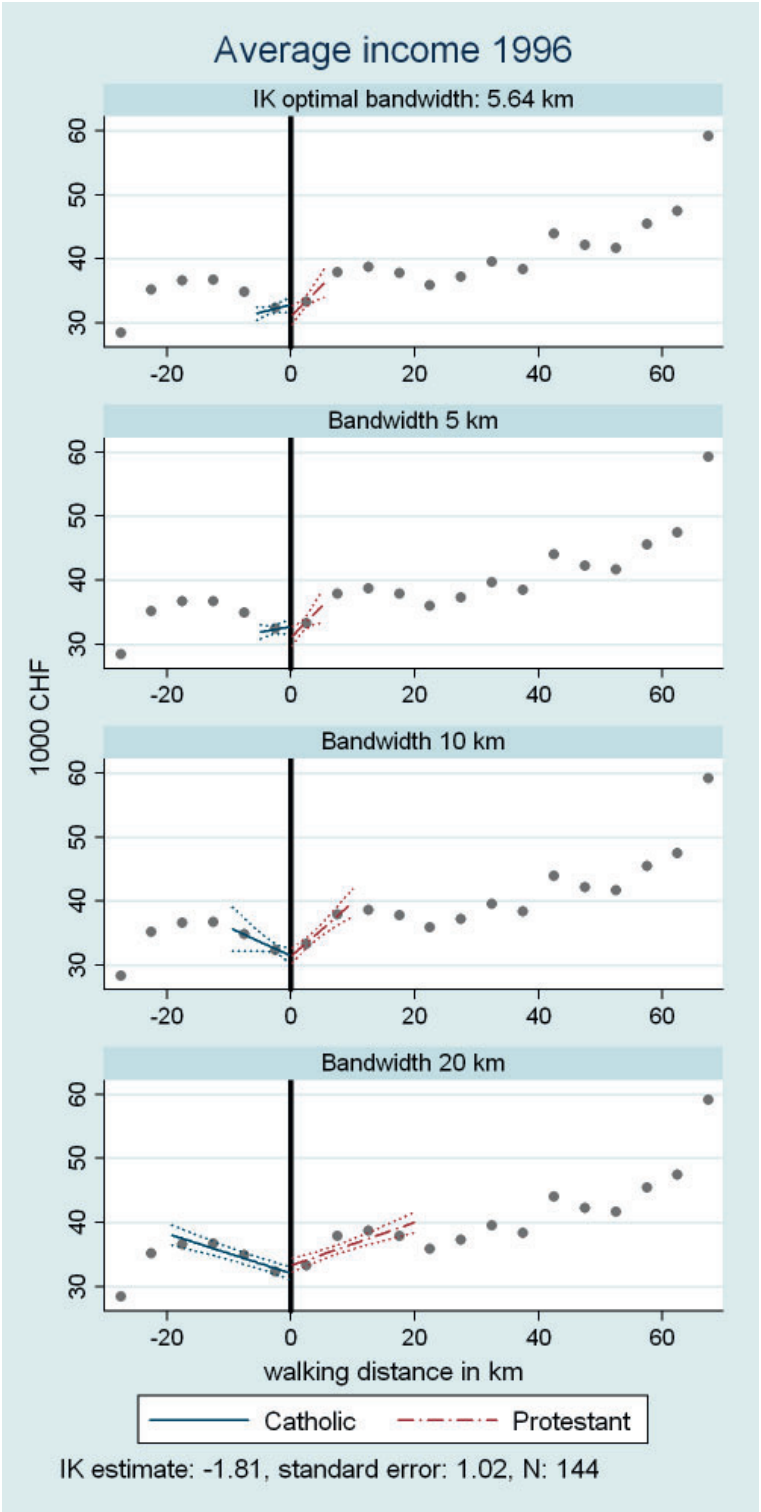

Figure 7: Average net income per head conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

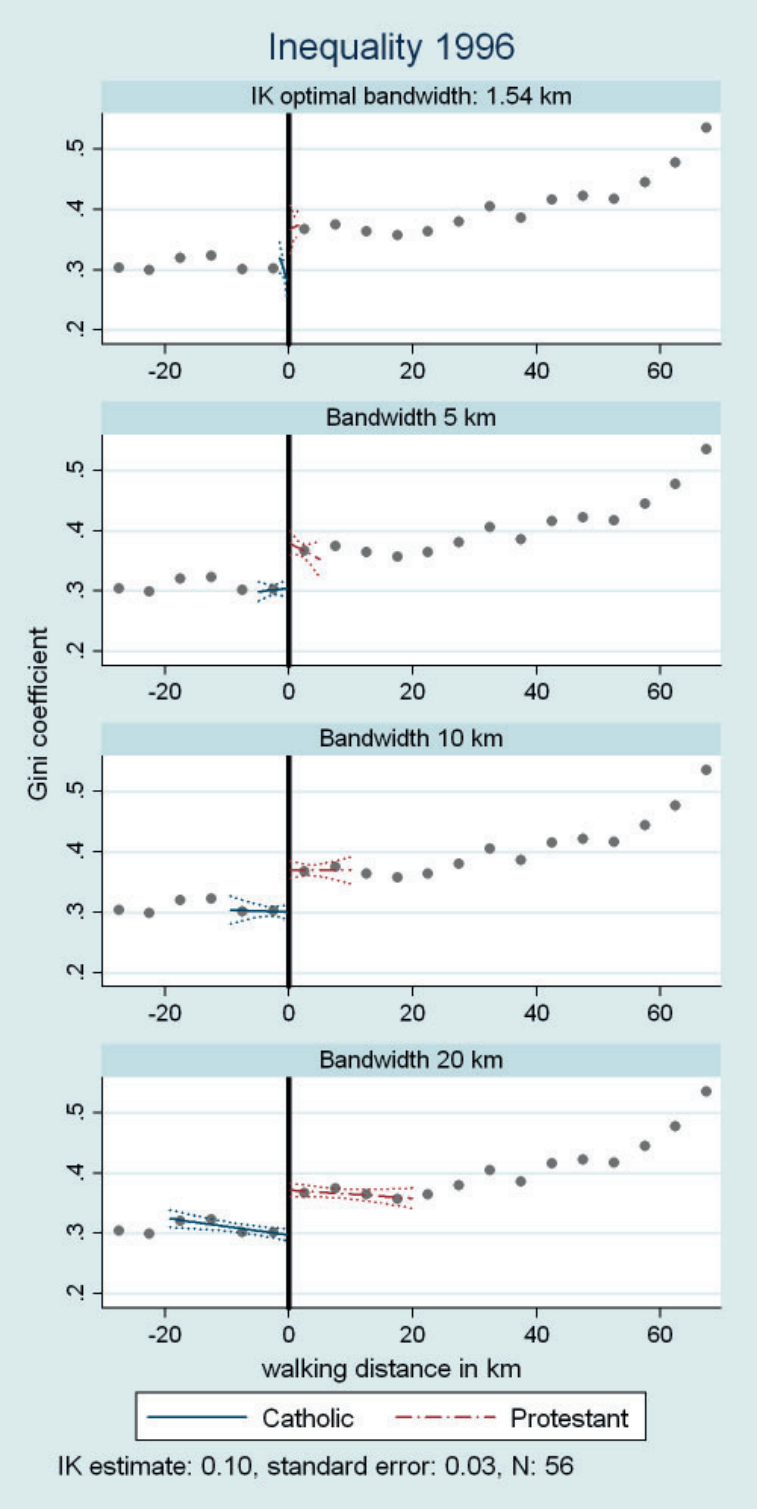

Figure 8: Gini coefficient conditional on walking distance to the border, binwidth 5km. Prediction from linear regression, including 95% prediction interval.

C Tables for the Robustness Checks

Table 7: Smoothness of covariates

	(1) Population per km2 (2000)	(2) Share of inhabitants foreign (2000)	(3) Share of inhabitants married (2000)	(4) Share of inhabitants male (2000)	(5) Participation in general election (1999)
ITT	112.62	-1.36	1.89	-1.60*	-4.81
	(82.95)	(1.85)	(1.32)	(.92)	(2.99)
FS	.75***	.70***	.70***	.68***	.71***
	(.03)	(.03)	(.03)	(.04)	(.02)
IV	150.48	-1.96	2.71	-2.35*	-6.76
	(112.26)	(2.62)	(1.89)	(1.38)	(4.28)
IK OB	12.62	5.35	5.85	3.20	6.75

The Table presents reduced form (ITT) and second stage (IV) estimates of the effect of the treatment on placebo outcomes. Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). * P<0.10, ** P<0.05, *** P<0.01.

Table 8: Intracantonal variation of religion in Fribourg

	Protestant Common Lordship Murten			Catholic German speaking FR				
	Mean	SD	N	Mean	SD	N	Difference	t
Share Protestants 1980	0.85	0.12	18	0.15	0.10	28	0.70	20
Preferences for leisure	24.16	7.68	18	37.01	8.56	28	-12.85	-5.29
Preferences for redistribution	30.30	7.61	18	38.07	4.11	28	-7.77	-3.97
Preferences for intervention	38.25	6.42	18	43.57	4.01	28	-5.32	-3.15
Mean net income 1996 in 1000 CHF	42,128	18,950	18	33,416	3,007	28	8712.11	2
Gini coefficient 1996	0.35	0.08	18	0.30	0.02	28	0.05	2.43

The table presents summary statistics for Protestant and Catholic areas in the German speaking part of Fribourg. The common lordship of Murten was jointly administered by Berne and Fribourg. As a result of Bernese influence the common lordship of Murten became eventually predominantly Protestant. The last column presents the t-statistic from a test for the equality of means.

Table 9: Triangular kernel

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
ITT	-8.99***	-2.39	-8.52***	-1.43	.09***
	(2.10)	(1.75)	(1.79)	(.94)	(.03)
FS	.71***	.70***	.71***	.70***	.63***
	(.02)	(.03)	(.02)	(.03)	(.06)
IV	-12.65***	-3.43	-11.99***	-2.05	.15***
	(2.89)	(2.48)	(2.53)	(1.35)	(.05)
IK OB	8.92	7.13	8.91	7.18	1.96

The Table presents reduced form (ITT) and second stage (IV) estimates of the main outcomes based on a triangular kernel. Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). * P<0.10, ** P<0.05, *** P<0.01.

Table 10: Great-circle distance

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
ITT	-8.80***	-3.81**	-8.43***	-2.01**	.06**
	(1.84)	(1.49)	(1.68)	(.99)	(.03)
FS	.74***	.73***	.74***	.72***	.67***
	(.02)	(.02)	(.02)	(.02)	(.05)
IV	-11.94***	-5.22***	-11.44***	-2.80**	.09**
	(2.42)	(2.01)	(2.24)	(1.37)	(.04)
IK OB	6.78	6.19	6.48	4.83	1.66

The Table presents reduced form (ITT) and second stage (IV) estimates of the main outcomes based the great-circle distance between a municipality and the closest border point. A border point is an intersection of the border line with a road or path. Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). * P<0.10, ** P<0.05, *** P<0.01.

Table 11: Latitude & longitude

	(1) Preferences for Leisure	(2) Preferences for Redistribution	(3) Preferences for Intervention	(4) Mean Income in 1996	(5) Income Inequality in 1996
Share Protestants	-12.68***	-6.16***	-13.34***	1.24	.10***
	(1.79)	(1.34)	(1.41)	(.78)	(.01)
Longdis	-33.92	2.24	7.63	-21.88*	-.00
	(32.66)	(22.42)	(21.04)	(11.80)	(.34)
Latdis	12.81	-10.21	24.93	-24.02**	-.59
	(43.76)	(27.06)	(31.11)	(11.44)	(.37)
T*Longdis	33.45	-14.94	20.21	-18.61	.62
	(37.57)	(29.86)	(28.88)	(21.84)	(.58)
T*Latdis	-25.65	7.93	-48.46	-52.70**	.07
	(47.40)	(33.11)	(37.23)	(25.31)	(.60)
Constant	45.26***	42.35***	44.84***	32.18***	.29***
	(1.12)	(.62)	(.78)	(.37)	(.01)
IK OB	6.78	6.19	6.48	4.83	1.66
N	199	189	193	159	77

The Table presents reduced form (ITT) estimates of the main outcomes controlling separately for longitudinal and latitudinal distance between the municipality and the closest border point. A border point is an intersection of the border line with a road or path. Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). * P<0.10, ** P<0.05, *** P<0.01.

Table 12: Income and inequality in 2003

	(1) Mean Income in 2003	(2) Income Inequality in 2003
ITT	-2.73**	.05*
	(1.17)	(.03)
FS	.71***	.66***
	(.03)	(.07)
IV	-3.84**	.07*
	(1.64)	(.04)
IK OB	6.31	1.77

The Table presents reduced form (ITT) and second stage (IV) estimates using data on income and inequality for 2003. Bandwidth in km is chosen optimally following Imbens-Kalyanaraman (2009). * P<0.10, ** P<0.05, *** P<0.01.