

Compulsory Voting and Political Participation: Empirical Evidence from Austria

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Abstract

We examine whether compulsory voting influences political participation as measured by voter turnout, invalid voting, political interest, confidence in parliament, and party membership. In Austria, some states temporarily introduced compulsory voting in national elections. We investigate border municipalities across two states which differ in compulsory voting legislation using a difference-in-differences approach. The results show that compulsory voting increased voter turnout by 3.5 percentage points but we do not find long-run effects. Once compulsory voting was abolished, voter turnout returned to pre-compulsory voting levels. Microdata evidence suggests that compulsory voting tends to crowd out intrinsic motivation for political participation which may explain why compulsory voting is not found to be habit-forming.

JEL Code: D72, P16

Keywords: Compulsory voting, election, voter turnout, difference-in-differences, Austria

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1 Introduction

Voter turnout has declined in many industrialized countries. In German and Austrian national elections, for example, voter turnout decreased from around 90% in the 1970s to around 70% in the 2000s (see figure 1 for Austria). An important issue is whether electoral institutions influence voter turnout. Research has shown that extended opening hours at polling stations and prepaid postage serve to increase voter turnout (Garmann, 2017; Schelker and Schneider, 2017; Potrafke and Roesel, 2020). An alternative policy measure to increase voter turnout is compulsory voting. Countries with compulsory voting include, for example, Australia, Luxembourg, Belgium and countries in Latin America. Previous studies have shown that compulsory voting increased voter turnout substantially (Hirczy, 1994; Lijphart, 1997; Mackerras and McAllister, 1999; Funk, 2007; Fowler, 2013; Ferwerda, 2014; Bechtel *et al.*, 2016, 2018; de Leon and Rizzi, 2016; Hoffman *et al.*, 2017).

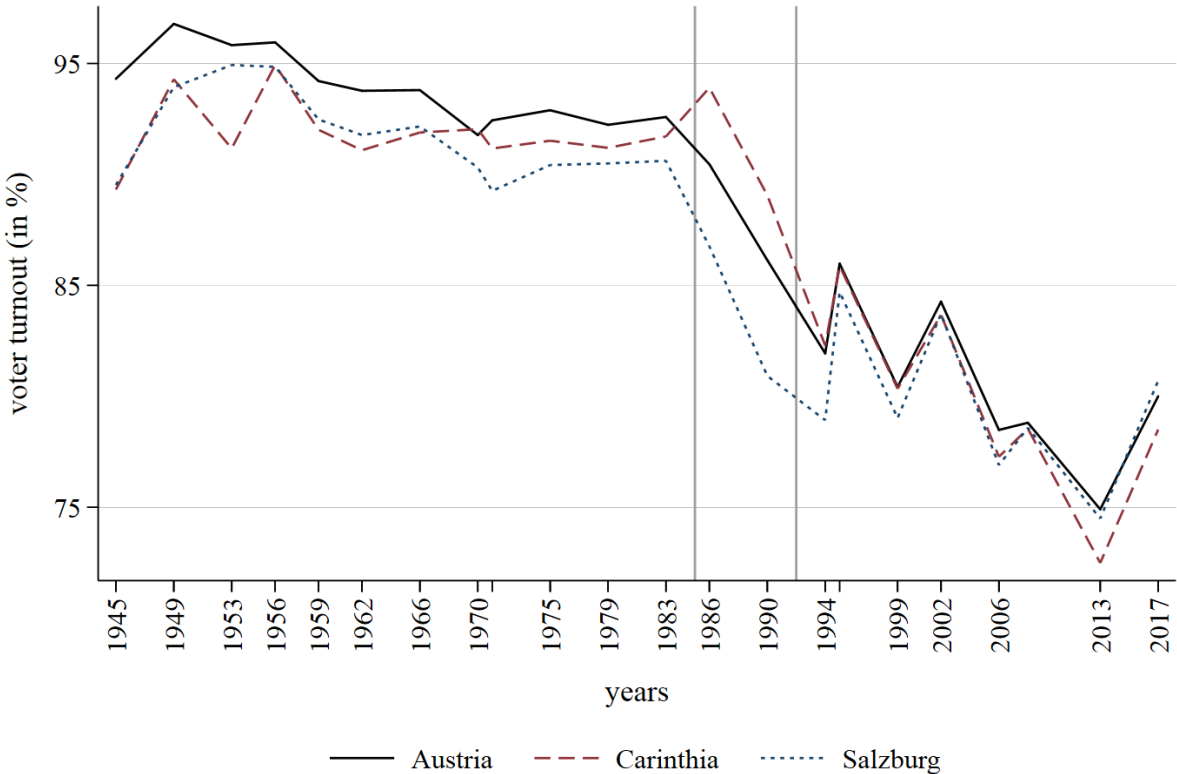


Figure 1: Voter turnout in national elections in Austria, 1945-2017

Notes: The graph shows voter turnout in Austrian national elections between 1945 and 2017. Grey vertical lines indicate the period of compulsory voting in Carinthia.

Scholars examine how compulsory voting influences voter turnout and party vote shares in the short-run. There is still limited evidence as to whether compulsory voting spills over into other forms of political participation and into future voting behavior. On the one hand, voters may get used to participating in elections in the course of compulsory voting. When they get used to participating in elections, voters may also rediscover voting as a civic duty.¹ If compulsory voting influences habits, citizens may continue to participate in elections even when compulsory voting gets abolished. On the other hand, if political participation is intrinsically rather than extrinsically motivated, electoral institutions may have few lasting effects. Once the extrinsic motivation for compulsory voting is abolished, voters return to their intrinsic preferences when it comes to participating in elections. In this case, compulsory voting may have only temporary effects. Against the background of ambiguous theoretical predictions, empirical evidence is scarce. One empirical study has investigated the long-run effects of compulsory voting so far. Bechtel *et al.* (2018) investigate compulsory voting in federal referendums in the Swiss canton of Vaud between 1900 and 1970. The authors find some small spillover effects into voter turnout in other elections (voter turnout in federal elections and cantonal referendums), but little evidence of habit-formation. There is, however, no study that has yet examined the long-run effects of compulsory voting on voter turnout and other intrinsically motivated forms of political participation.

We exploit a unique setting of temporal compulsory voting in Austria to investigate how compulsory voting influences political participation. After World War II, the nine Austrian state governments were allowed to introduce compulsory voting in national elections (see figure 2). The federal states of Styria, Vorarlberg and Tirol introduced compulsory voting by 1949, Carinthia followed much later, in early 1986. By 1992, national legislation had abolished compulsory voting in all Austrian states. While Hoffman *et al.* (2017) focus on variation at the state level, Ferwerda (2014) examines the abolition of compulsory voting at the municipality level. We exploit the fact that (a) the federal state of Carinthia had compulsory voting over the period 1986-1992 (but not before or afterwards) and (b) Carinthia shares a border with the federal state of Salzburg which never had compulsory voting. We use two datasets and difference-in-differences estimations to investigate how compulsory voting influences political participation. First, we collect election data at the municipality level between 1975 and 1999 and compare border municipalities of the states of Carinthia and Salzburg. Adjacent municipalities in the border region of two states are relatively more compa-

¹On voting and civic duty see Bonoldi *et al.* (2019) and François and Gergaud (2019).

rable in unobservable characteristics than the average of all municipalities. The border region we use is alpine and rural in both states. The alpine border reduces concerns about self-selection into treatment; citizens cannot move easily between Carinthia and Salzburg if they disagree with compulsory voting. The effect of compulsory voting is measured by the difference in the state-border difference in voter turnout and invalid votes before, under, and after compulsory voting. We investigate whether the effects of the introduction and abolition are similar in magnitude to examine the long-run effects of compulsory voting. Second, we employ data from the European Values Study (EVS) and investigate whether political values and actions such as political interest, confidence in parliament, or party membership change in Austrian federal states after compulsory voting was abolished, compared to states which never had compulsory voting.

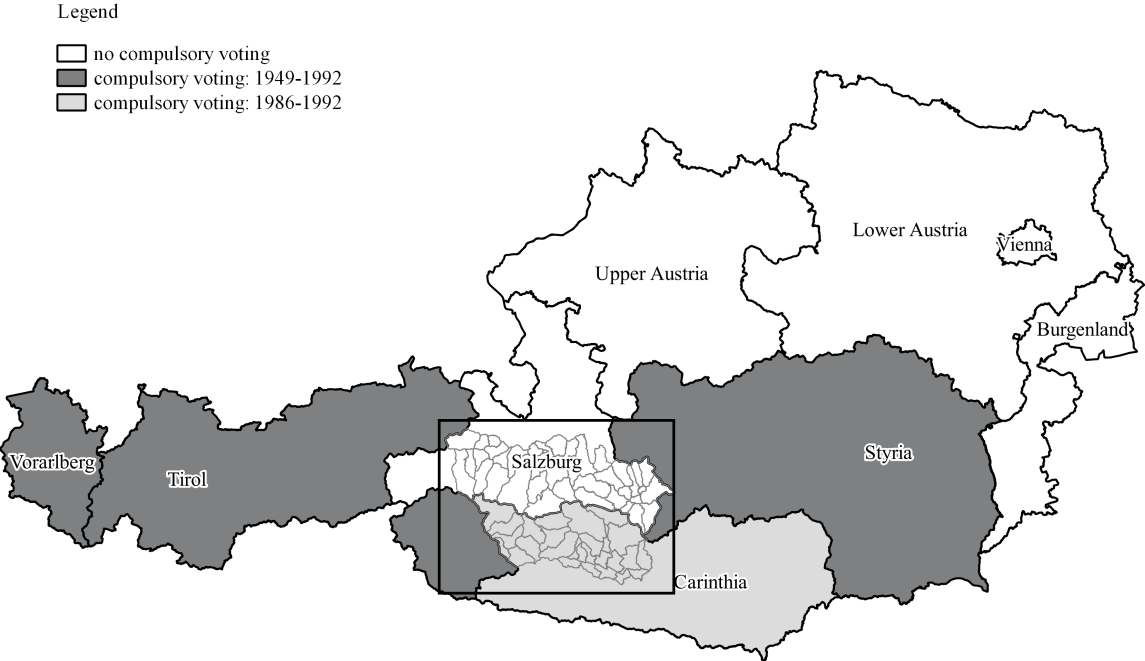


Figure 2: Compulsory voting in national elections (federal states of Austria)

Notes: The map shows the nine federal states of Austria (bold boundaries). Dark gray states had compulsory voting in national elections between 1949 and 1992. In Carinthia (light gray) voting in national elections was compulsory between 1986 and 1992. White shaded states never had compulsory voting. We focus on municipalities of the border region between the states of Salzburg and Carinthia (lighter boundaries), highlighted by the bold rectangle.

Our results show that compulsory voting increased voter turnout by 3.5 percentage points but did not influence invalid votes. Once compulsory voting was abolished, however, voter turnout returned to the pre-compulsory voting level and had no long-run effects. This finding is well in line with the results by Bechtel *et al.* (2018) on compulsory voting for Switzerland and Potrafke and Roesel (2020), showing only temporary effects of longer opening hours of polling stations in Austria. However, we also use EVS microdata evidence on political values and actions to investigate the mechanisms behind our results. We find that compulsory voting tends to crowd out intrinsic motivation for political participation which is a new explanation for the lack of habit-forming.

2 Related studies

The magnitude of direct compulsory voting effects on voter turnout differs substantially across countries. Early studies use cross-country variation and show that compulsory voting increased voter turnout by about 10 and 13 percentage points (Powell, 1986; Jackman, 1987). In Australia, compulsory voting drastically increased voter turnout by around 30 percentage points in the 1925 federal elections and by around 24 percentage points in state assembly elections (Hirczy, 1994; Fowler, 2013). In the Swiss canton of Vaud, voter turnout in referendums increased during compulsory voting periods by some 30 percentage points (Bechtel *et al.*, 2018). Funk (2007) also investigates Switzerland and finds that voter turnout decreased after compulsory voting was abolished. In Argentina, compulsory voting increased voter turnout by 18 percentage points (Jaitman, 2013). Reducing the fine for not participating in elections by 75% decreased voter turnout by 5.3 percentage points in Peru (León, 2017).

Austria is also a prominent case in point. The abolition of compulsory voting laws in some Austrian states in 1992 decreased voter turnout in national elections, compared to states that had never introduced compulsory voting, by 8.6 percentage points (Ferwerda, 2014). In a similar vein, Hoffman *et al.* (2017) investigate parliamentary, state, and presidential elections in Austria between 1949 and 2010. The results suggest that voter turnout increased by around 10 percentage points. Compulsory voting is expected to increase the share of invalid votes (Hirczy, 1994). Citizens who abstained because they are just not interested in elections, or are indifferent in party selection, are likely to cast blank ballots that are considered invalid. In Austria and Australia, compulsory voting

increased the share of invalid votes (Hirczy, 1994; Hoffman *et al.*, 2017).² Shineman (2012) uses a micro-data cross-section for 1999 and finds that Austrian citizens who were exposed to compulsory voting laws were more politically interested.

Scholars also conjecture that compulsory voting influences voting habits in the long run. Habitual voting implies that voting today influences the probability of voting in the next election (Brody and Sniderman, 1977; Miller *et al.*, 1996; Green and Shachar, 2000; Plutzer, 2002; Gerber *et al.*, 2003; Fowler, 2006; Öhrvall, 2018). Empirical studies show that measures like voting campaigns influenced voting habits. Cutts *et al.* (2009) find a habit-forming effect of a Get Out The Vote (GOTV) campaign where the aim was to motivate citizens via a phone call or a personal visit to vote in English local elections. The GOTV campaign increased voter turnout in the year it was conducted by 3% and had a habit-forming effect in the subsequent election of 50%. Hence, voting in the next election was approximately 1.5% higher in the treatment group who were part of the GOTV campaign in the previous election, compared to the control group. A similar result is obtained by Gerber *et al.* (2003). A GOTV campaign with direct mail and personal canvassing in general and local US elections had a habit-forming effect of around one half.

Other measures have also been described to have long-run effects on voter turnout. For example, precipitation on election day reduced voter turnout at the election in question and the subsequent election (Fujiwara *et al.*, 2016). The results show that a 1 percentage point decrease in voter turnout translates into a 0.6 to 1 percentage point decrease in voter turnout in the next election. Meredith *et al.* (2009) uses a discontinuity in the voting-age restriction and shows that young citizens who were just over 18 in the 2000 U.S. presidential election were more likely to vote again four years later than citizens who were just under 18 and not eligible to vote in 2000. The results suggest a small habit-forming effect: Voting in 2000 increased the likelihood of voting in 2004 by 3 to 4.5%, while voting in 2004 increased the likelihood of voting in 2006 by 11 to 11.3%. Whether the first election usually has a low or high voter turnout also influences future voting behavior (Franklin and Hobolt, 2011). Young individuals were more likely to vote in an election to the European Parliament when they had previously experienced a national election. Voter turnout was about 6 percentage points lower in elections to the

²Empirical evidence on the effect of compulsory voting on party vote shares is somewhat mixed. Some studies suggest that left-wing parties benefit from compulsory voting (Fowler, 2013; Ferwerda, 2014; Bechtel *et al.*, 2016; de Leon and Rizzi, 2016). The study by Hoffman *et al.* (2017) does not suggest that compulsory voting has any effect on party vote shares. On voter turnout and party vote shares, see McAllister (1986); Pacek and Radcliff (1995); Nagel and McNulty (1996); Aguilar and Pacek (2000); Bohrer II *et al.* (2000); Lutz and Marsh (2007); Pettersen and Rose (2007); Rubenson *et al.* (2007).

European Parliament when it was the first vote cast by young individuals compared to young individuals who participated in a national election previously. In Sweden, however, the first election after becoming eligible to vote barely influenced citizens' voting behavior in future elections (Öhrvall, 2018).

But why should there be a habit-forming effect and why should voting in one election affect the probability of voting in a subsequent election? The act of voting itself might be habit-forming. On the one hand, going to the polls decreases the costs of voting in the next election, because voters gain knowledge about the voting procedure and the location of the polling station. On the other hand, voting subtly alters the way citizens see themselves. Civic participation confirms and reinforces an identity of having a sense of civic duty (Milbrath and Goel, 1977; Coppock and Green, 2016). The more often citizens participate in elections, inertia might set in and voting becomes just "what people like me do on Election Day" (Green and Shachar, 2000, p. 571; Gerber *et al.*, 2003, p. 548; Cutts *et al.*, 2009, p. 252). However, previous empirical studies do not show that electoral institutions form habits permanently. Bechtel *et al.* (2018) investigate compulsory voting in federal referendums in the Swiss canton of Vaud between 1900 and 1970 and find some small spillover effects into turnout in other elections but limited persistence. Potrafke and Roesel (2020) show that longer opening hours of polling stations increased voter turnout but did not influence subsequent elections when longer opening hours were not in place. Only the results obtained by Shineman (2012) indicate some long-term effects of compulsory voting on political interest. However, previous studies were mainly limited to voter turnout; no study has yet been conducted on spillovers into other forms of political participation.

3 Institutional background

We focus on Austrian national elections where federal states vary substantially in compulsory voting legislation.³ Voter turnout decreased in Austrian national elections

³National elections take place on the same day in all Austrian municipalities. As of 2007, the national parliament is elected for a term of five years (previously: four years). We focus on national elections, because although the President is the federal head of the state of Austria, s/he mainly administrates ceremonial events like receptions and gives addresses of welcome (on presidential elections in Austria, see Potrafke and Roesel (2019)). State elections are held at different points in time across the nine Austrian states. National elections and state elections do not coincide. One may well want to examine the spill-over effects of compulsory national elections on state and local elections. However, local and state elections have also been compulsory in Carinthia and have taken place at different points in time than in Salzburg (control group).

from 97% in 1949 to 80% in 2017 (see figure 1). Voting in national elections was compulsory if directed by state law. Compulsory voting was introduced in 1949 in the federal states of Tirol, Styria and Vorarlberg. In February 1986, Carinthia followed and introduced compulsory voting in parliamentary, presidential, state and local elections. Compulsory voting in national elections was abolished by national legislation in all Austrian states by 1992.⁴

Compulsory voting in Carinthia was introduced for four reasons: to increase voter turnout, to promote attitudes towards democracy of especially young citizens, to make citizens aware of their rights and duties, and to increase the legitimacy of political representatives.⁵ The social democratic SPÖ was in favor of introducing compulsory voting and used its absolute majority in parliament (20 out of 36 seats) to pass the law. The conservative ÖVP and the populist right-wing FPÖ were not advocating compulsory voting.

We focus on border municipalities in the federal states of Carinthia and Salzburg highlighted in figure 2; figure A1 in the online appendix zooms in on the region in detail. This region is of particular interest because this is the only Austrian region where municipalities that have never had compulsory voting (Salzburg) share a border with regions that had temporary compulsory voting between 1986 and 1992, but not before or afterwards. In Styria, Vorarlberg and Tirol, no compulsory voting applied only to the first post-WWII election in November 1945, where voter turnout was at 94.3% and - compared to 1949 - about 1 million citizens were not eligible to vote (e.g., former Nazis, war prisoners, displaced persons or not yet registered expellees from Eastern Europe). We therefore focus on the border region between Salzburg and Carinthia in our main analysis and extend the sample to other Austrian states in section 5.2.

The state law of Carinthia defined fines for non-voting in parliamentary and presidential elections during the period of compulsory voting. The maximum fine was 3,000 Schilling (around 750 USD in 2017 prices) and, if not paid, two weeks of imprisonment. There is, however, no information on the exact amount of fines charged because local authorities were responsible for enforcing the fine. There were also several exceptions

⁴There were other reforms of the electoral system. The voting age was lowered in 1949, 1970 and 1994. Since the national elections in 2008, citizens have had the right to vote as of the age of at least 16 years. Citizens can vote at the polling station or do early voting by using a voting card (Wahlkarte), if they cannot go to the polls on election day. By using the voting card, citizens can vote in any municipality. Since the parliamentary election in 1990, Austrian citizens living abroad can participate in elections by using voting cards. Postal voting in national elections was introduced during the election in 2008.

⁵Protocol of the plenary session of the Carinthian parliament, 6th February 1986, page 1419.

from compulsory voting. Valid excuses for non-voting included illness, professional commitments or other duties, being outside the state, e.g. due to travel, urgent family matters, traffic disruption or other compelling circumstances. Due to these various excuses, sanctions were only weakly enforced (International Institute for Democracy and Electoral Assistance, 2019).

The landscape of political parties represented in the national parliament changed very little between 1945 and the 1970s. The major political parties SPÖ (the Social Democratic Party), and the conservative ÖVP (the Austrian People's Party) won a combined total of around 90% of the votes in national elections. The far-right populist FPÖ (Freedom Party of Austria) entered the national parliament in all elections since 1949.⁶ However, vote shares of the individual parties have changed dramatically since the 1980s. The vote shares of the SPÖ and ÖVP began to decrease in the 1980s when the Green Party (Grüne) entered the political arena and the populist FPÖ started to gain electoral support. In the parliamentary election of 2017, SPÖ and ÖVP jointly gained only 58% of the votes. Before 1986, the FPÖ had vote shares of around 6%. After shifting the political agenda to the far-right and the appointment of Jörg Haider as party chairman in 1986, the FPÖ experienced a rise in its vote shares, which reached a peak of 26% in 1999 and 2017.⁷ The vote shares of the Green Party have varied between 5 and 12% since 1983. There were few minor parties in represented in the Austrian national parliament.⁸

4 Empirical Strategy

4.1 Data

We use two datasets in our study: municipality-level data on election outcomes between 1975 and 1999 and micro-level survey data from the European Values Study waves of 1990, 1999, and 2008. First, we describe our election data. We digitize municipality-level data sets on voter turnout, invalid voting, and party vote shares

⁶In the elections of 1949 and 1953 the predecessors of the FPÖ, VdU/WdU, ran for mandates.

⁷The FPÖ has Neo-fascist roots (Ochsner and Roesel, 2016, 2017).

⁸The left-wing and communist party KPÖ was represented in the National Assembly of the Second Republic between 1945 and 1959. With the election of 1959, the KPÖ became a minor party with a vote share of around 1%. Other minor parties represented in the National Assembly during the Second Republic are the liberal LIF (elections 1994, 1995), the nationalist BZÖ (elections 2006, 2008), Team Stronach (election 2013) and the liberal NEOS in an electoral alliance with LIF (election 2013).

from hardcopy for all 65 municipalities within a maximum distance of 30 kilometers of the border between the Austrian states of Carinthia and Salzburg. 24 municipalities in Carinthia, where voting became compulsory in 1986 and voluntary again in 1992, are the treatment group. 41 municipalities in the state of Salzburg, where citizens have never had any obligation to vote, are the control group. Our data include two elections with compulsory voting in Carinthia (1986 and 1990), three elections prior to compulsory voting (1975, 1979, 1983), and three elections after compulsory voting was abolished (1994, 1995, 1999). Salzburg never had compulsory voting. We consider all municipal mergers since 1975 and transform the data into a consolidated territorial status.⁹ We use the standard definitions for election outcomes: voter turnout describes the share of eligible voters casting valid or invalid ballots. The invalid vote share is the ratio of invalid votes across all ballots cast.¹⁰ Party vote shares are the share of valid votes cast for an individual party.¹¹ Table 1 includes summary statistics of the election data. Average voter turnout was at around 84%; maximum voter turnout is more than 100% because voters were allowed to cast their vote using a voting card in other municipalities than the one in which they reside.¹² Around 1.3% of all voters cast invalid votes. In around 9% of all observations, compulsory voting applies.

Our second source of data is the European Values Study (EVS). We use the 1990, 1999, and 2008 Austrian wave from the EVS Longitudinal Data Files 1981-2008 and extract 10 variables indicating political participation. Respondents were asked about their political values and beliefs (political interest, importance of politics, frequency of political discussions, party membership), political actions (participation in petitions, boycotts, demonstrations), confidence in parliament and subjective feelings of freedom and patriotism. Table A1 in the online appendix portrays the individual questions and variables. Our sample pooled from three EVS waves includes a maximum of 4,477 observations from all nine Austrian states. Four out of nine states had compulsory voting by 1990, five had voluntary participation in elections. In 1999 and 2008, compulsory

⁹Municipalities in Carinthia were merged to large extent by 1973 including multiple splits of pre-existing municipalities. For a balanced panel, we do only consider national elections after 1973. However, we later use also data until the 2017 election.

¹⁰Votes are invalid if the ballot card is empty, more than one party list is chosen, the will of the electorate is not identifiable or the submitted envelope does not contain a ballot card.

¹¹We also compute party vote shares for the main political camps within our period of interest. Following Hoffman *et al.* (2017), we label the populist right-wing FPÖ and the conservative ÖVP as right-wing parties, and the social democratic SPÖ and the Green party Grüne as left-wing parties.

¹²At the municipality level, we cannot disentangle “resident” and “external” voters. However, the share of “external” voters was always small and fairly similar in Salzburg and Carinthia, varying between 2.3 and 5.5%. Inferences do not change when we exclude the four municipalities in which voter turnout was 99% and higher. In any event, voters may also use voting cards in other municipalities.

	Obs. (1)	Mean (2)	SD (3)	Min (4)	Max (5)
<i>Dependent variables</i>					
Voter turnout	520	84.47	6.09	65.28	113.75
Invalid votes	520	1.31	0.74	0.00	4.30
Left-wing vote share	520	41.69	11.11	13.91	74.00
Right-wing vote share	520	56.75	10.97	24.61	85.51
<i>Compulsory voting</i>					
CV (yes = 1)	520	0.09	0.29	0.00	1.00
<i>Control variables</i>					
Eligible voters (log)	520	7.16	0.85	5.02	9.36
Growth rate eligible voters	520	1.15	1.10	-3.28	4.68

Table 1: Summary statistics

Notes: The table reports descriptive statistics of the variables used in the empirical analysis. 65 border municipalities in the federal states of Carinthia and Salzburg are the unit of observation; the dataset includes eight national elections in the period 1975 to 1999. The dummy variable CV is 1 for municipalities in Carinthia during compulsory voting (years 1986 and 1990) and 0 otherwise.

voting was abolished in all states. We exploit the differences across time and states using all observations; we cannot identify more granulated locations of respondents other than their resident federal state.

4.2 Identification

In our baseline analysis, we use adjacent border municipalities in the states of Carinthia (temporary compulsory voting between 1986 and 1992) and Salzburg (never compulsory voting) to identify the effects of compulsory voting in a difference-in-differences (DD) model. We estimate a DD models that take the following form:

$$Y_{it} = \alpha_i + \theta_t + \gamma(\text{Carinthia}_i \cdot CV_t) + X'_{it}\lambda + \epsilon_{it} \quad (1)$$

where Y_{it} describes either voter turnout, invalid vote shares or party vote shares in municipality i ($n=65$) and in election t (1975-1999). Carinthia_i is a dummy variable that takes on the value 1 for Carinthian municipalities, and 0 for municipalities in Salzburg. CV_t is a dummy variable that equals 1 for the elections of 1986 and 1990, and 0 otherwise. Therefore, the interaction ($\text{Carinthia}_i \cdot CV_t$) takes on the value of 1 for Carinthia in the national elections in 1986 and 1990; γ is the corresponding difference-in-differences estimate. We also include municipality fixed effects α_i , year fixed effects

θ_t and a vector of control variables X'_{it} . We use the number of eligible voters and the average annual growth rate of eligible voters to control for municipality size and economic growth.¹³ Municipality fixed effects eliminate time-invariant differences across municipalities and states. Year fixed effects absorb national trends and shocks. We estimate the model by Ordinary Least Squares (OLS) and cluster standard errors at the municipality level. To disentangle the effect of introducing and abolishing compulsory voting, we modify our baseline model in equation 1 by including an interaction term measuring the difference-in-differences for the period after compulsory voting (1992 to 1999), compared to the time before compulsory voting (1975 to 1985), which is then the base category:

$$Y_{it} = \alpha_i + \theta_t + \gamma(\text{Carinthia}_i \cdot \text{CV}_t) + \delta(\text{Carinthia}_i \cdot \text{AfterCV}_t) + X'_{it}\lambda + \epsilon_{it} \quad (2)$$

γ describes the difference-in-differences estimate measuring the direct (short-term) effects of compulsory voting. δ represents the estimate for any long-run (or habit-forming) effects of compulsory voting. In our robustness checks, we also include further interactions with the distance to the state border between Carinthia and Salzburg (difference-in-discontinuity specification).¹⁴ Municipalities in Carinthia directly bordering municipalities in Salzburg should, however, be even more comparable; while municipalities situated further away from the border may differ due to their more distant location. Table A3 in the online appendix shows that municipalities become more and more similar in observables the smaller we define the maximum distance to the border. By including the distance to the border in our empirical model, we assign more weight to municipalities close to the border to consider unobserved heterogeneity. The model may well be interpreted as a regression discontinuity design (RDD) in a panel framework. We also estimate pooled OLS, exclude control variables, jackknife the standard errors, and include municipality-specific time trends. Inferences hardly change.

When using micro-level data from the EVS, we also apply a difference-in-differences specification. Because we do not observe respondents in a panel, we pool the time

¹³Data on demographic or social characteristics such as gender, age, employment or education, are not included as control variables, because they are only available for census years (1981, 1991 and 2001) at the municipality level. Therefore, we conduct tests on compound treatments using the census data (see table A2 in the online appendix).

¹⁴See, for example, Grembi *et al.* (2016); Foremny and Solé-Ollé (2016) for applications of the differences-in-discontinuity estimator and especially Grembi *et al.* (2016) for a detailed derivation.

dimensions and estimate the following model using ordered probit (answers are not metric) and clustered standard errors at the federal state level:

$$\Pr(Y_{kjt}) = \alpha_k + \theta_t + \mu CVState_j + \tau CV_t + \gamma(CVState_j \cdot CV_t) + X'_{kjt}\lambda + \epsilon_{kjt} \quad (3)$$

where Y_{kjt} is one of the ten political values reported by respondent k in state j and year t . θ_t is the wave fixed effect. $CVState_j$ is a dummy variable taking on the value of 1 for Carinthia, Styria, Tirol and Vorarlberg which had compulsory voting until 1992, and 0 for all other states. CV_t is a dummy which is one for the period of compulsory voting (until 1992) and zero otherwise. The coefficient for the interaction of both dummy variables γ is the difference-in-differences estimate. X'_{kjt} are control variables including sex, age, town size and employment status.

Our main identification assumptions are that sorting into treatment was exogenous and Carinthian and Salzburg municipalities would have followed a common trend in the absence of compulsory voting. A major concern might be that previous voting behavior may have influenced the introduction of compulsory voting in Carinthia. Carinthia introduced compulsory voting when voter turnout was high and constant at around 91% (voter turnout in national elections was between 91 and 92% over the period 1959 to 1983). Thus, the law was not primarily changed to respond to decreasing voter turnout. Instead, compulsory voting was intended to increase democratic legitimacy (Ferwerda, 2014, p. 243; see our discussion in section 3). Austria's federal government decided to abolish compulsory voting by 1992 for all states. Characteristics of individual municipalities in Carinthia are very unlikely to have influenced this decision. We also focus on those municipalities that are very close to the border between Carinthia and Salzburg. By contrast, Hoffman *et al.* (2017) mainly used data at the state level, while Ferwerda (2014) uses all municipalities within a state and focuses on the abolition of compulsory voting only. The advantage of including municipalities close to the border only, and not all municipalities in Salzburg and Carinthia, is that adjacent border municipalities are more comparable regarding unobserved characteristics than state averages. The border region between Salzburg and Carinthia is alpine and rural. The alpine border reduces concerns about self-selection into treatment; citizens cannot move easily between Carinthia and Salzburg if they disagree with compulsory voting.

The second key identification assumption is that voting behavior in border municipalities in the state of Carinthia would have evolved like voting behavior in border

municipalities in Salzburg if there had not been compulsory voting. The conventional common trend assumption applies, i.e. that there is no interaction between groups and time before the treatment. In our case, in the absence of compulsory voting, border municipalities in both states should experience the same trend, which should be distinct for the municipalities in Carinthia under compulsory voting in the national elections in 1986 and 1990. We check the common trend assumption in two ways. First, graphical inspection of the pre-treatment trends does not reveal diverging trends. Figure 3 shows average voter turnout and invalid votes in national elections between 1975 and 1999 in Carinthia and Salzburg. We use several maximum distances to the state border and average them over municipalities. Municipalities on both sides of the state border seem to follow similar trends in the time before 1986. Event study estimations are well in line with the descriptive investigations. Figure A2 in the online appendix shows that differences between Carinthian and Salzburg municipalities in 1975 and 1979 are hardly statistically significant, compared to the difference in the last pre-treatment year 1983. Thus, we have good reasons to believe that the common trend assumption holds.

Another main condition for our difference-in-differences approach is that compound treatments did not play a role. Carinthia and Salzburg did not experience other changes in the electoral law at the same time. Thus, our treatment effect should not be influenced by policy changes other than compulsory voting. Observable characteristics also do not change under compulsory voting. Table A2 in the online appendix shows that compulsory voting did not influence observable characteristics in municipalities close to the border. We use socioeconomic characteristics from election and census data and run the difference-in-differences estimations similar to equation (1). We use municipalities located within a linear distance of less than 10, 15, and 30 kilometers to the state border. We use the observable characteristics (controls) as dependent variables (logged number of eligible voters, growth rate of eligible voters) and socioeconomic characteristics from census data (population, sex, age categories, education). Census data cover the years 1981 (before compulsory voting was introduced), 1991 (when compulsory voting was in place), and 2001 (when compulsory voting was already abolished). Compulsory voting did not influence any observable characteristic. The sole exception is the share of citizens aged above 75, but only when we consider municipalities within a linear distance of less than 15 kilometers to the state border. We find no significant effects for a distance of 10 or 30 kilometers. The results therefore do not suggest that there are any confounding trends in socioeconomic characteristics. Against the background of common pre-compulsory voting trends in both states, the

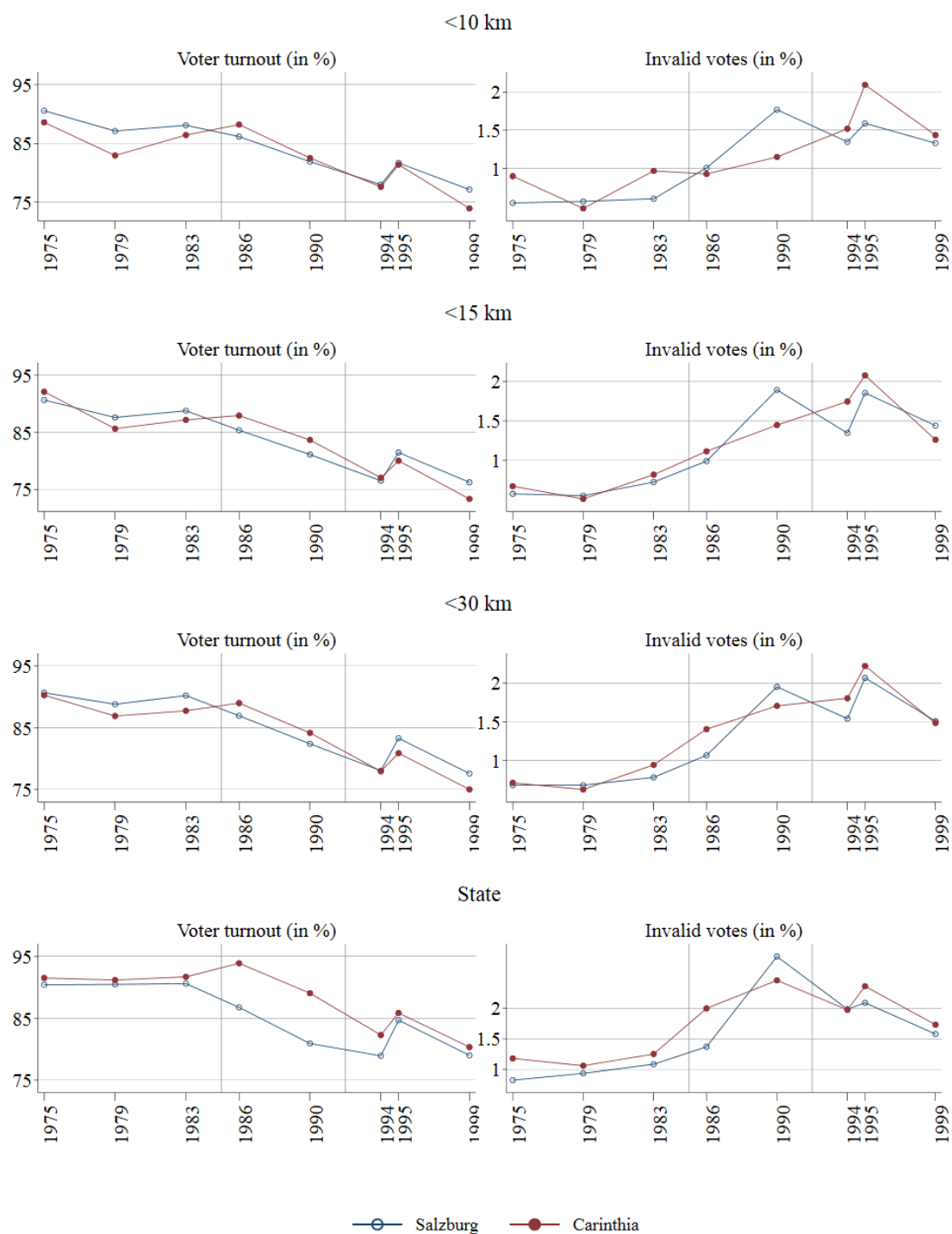


Figure 3: Voter turnout and invalid votes in national elections

Notes: The graphs compare voting behavior (voter turnout, invalid votes) in our sample municipalities in the Austrian federal states of Carinthia (compulsory voting between 1986 and 1992, solid dot) and Salzburg (no compulsory voting, hollow dot). We use municipalities with a maximum distance of 10, 15 and 30 kilometers to the state border as well as the state averages for comparison.

arguably exogenous selection into treatment with little scope for self-selection and the absence of compound trends in observables, we are confident that our difference-in-differences estimates allow a causal interpretation.

5 Results

5.1 Baseline

We first run the estimations using the election data as described in equation (1) and (2). Table 2 shows the results. The results of the baseline DD model (panel A) suggest that compulsory voting increased voter turnout by around 3.5 percentage points. The effect is fairly substantial because voter turnout in the border municipalities was already high at around 88% in 1983. Magnitude and significance levels barely change when we use other bandwidths of municipalities around the state border of 10, 15, and 30 kilometers.

Graphical evidence in figure 3 is well in line with our baseline difference-in-differences results. While voter turnout started to decline in the parliamentary election in 1986 in Salzburg, voter turnout in Carinthia increased in 1986. In this context, (Hirczy, 1994, p. 74) concludes “that the decline in 1990 was a national problem and that Carinthia benefited from a sustained impact of mandatory voting”. Increasing differences across states are also clearly visible in the 1990 election. However, figure 3 also shows that after compulsory voting was abolished, the differences between Salzburg and Carinthia returned to the pre-1986 levels. We include dummy variables for the post-compulsory voting years in panel B. Again, voter turnout increased by some 3.5 to 4 percentage points under compulsory voting. However, when compulsory voting was abolished, voter turnout immediately returned to the former difference between Salzburg and Carinthia from the time before compulsory voting was introduced. In figure A2 in the online appendix, we extend our analysis to the national election until 2017 and use event study specifications. We do not find that state differences in elections until 2017 differ from differences in 1983 to a significant extent; the elections in 1986 and 1990 are the sole exceptions. The results suggest substantial direct effects when compulsory voting was in place, but no long-term effects at least on the aggregate of voters after compulsory voting was abolished.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A</i>						
CV	3.47*** (0.85)	3.71*** (0.58)	3.52*** (0.39)	-0.56** (0.24)	-0.26 (0.18)	-0.05 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.85	0.78	0.80	0.47	0.51	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B</i>						
CV	4.23*** (1.19)	3.25*** (0.97)	3.41*** (0.61)	-0.53* (0.26)	-0.21 (0.21)	-0.00 (0.12)
After CV	1.50 (1.10)	-0.94 (1.34)	-0.20 (0.82)	0.08 (0.20)	0.10 (0.17)	0.09 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.87	0.80	0.82	0.50	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table 2: Baseline results

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as the dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Additional controls are the logged number and the annualized growth rate of eligible voters. Significance levels (standard errors clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

The obligation to vote forces citizens to participate in elections who may otherwise be uninterested in elections and politics. Forcing citizens to vote may also provoke resistance and protest. Thus, compulsory voting may increase both voter turnout and invalid votes. However, the results in table 2, panels A and B, provide little evidence that compulsory voting increased invalid votes. The estimated treatment coefficient even has a negative sign, and lacks statistical significance at conventional levels when we consider municipalities within a linear distance of less than 15 and 30 kilometers to the state border. It is only statistically significant at the 5% level in panel A and at the 10% level in panel B when we consider municipalities within a linear distance of less than 10 kilometers to the state border. We therefore conclude that there is no robust evidence that compulsory voting changes the share of invalid ballots.

We also examine how compulsory voting influenced party vote shares. Following Hoffman *et al.* (2017), we label the far-right populist FPÖ and the conservative ÖVP

as right-wing parties, and the Social Democratic SPÖ and the Green party Grüne as left-wing parties. The results suggest that the vote shares of left-wing parties decreased while those of right-wing parties increased when compulsory voting was introduced (see table A4 in the online appendix), and effects are persistent. However, we generally call for caution in interpreting the party vote share results. Most importantly, the rise of right-wing populism in Austria may explain why left-wing party vote shares decreased and right-wing party vote shares increased over the entire period. In 1986, Jörg Haider became the chairman of the right-wing populist FPÖ and shifted the party to the far right (Luther, 1987, p. 393). Under Haider, party's vote shares doubled. Carinthia was among the main FPÖ strongholds, where Haider even became the state governor in 1989 (Hirczy, 1994, p. 74). The FPÖ succeeded because it received electoral support from voters with manifold political preferences and backgrounds (Luther, 1987, p. 394: "the FPÖ's gains from the two major parties were roughly equal (about 130,000 from each)"). It is therefore unclear whether compulsory voting or Jörg Haider's activities in Carinthia gave rise to the FPÖ's electoral success.

5.2 Robustness

We test the robustness of our baseline results for voter turnout and invalid voting in various ways; the results are mainly presented in the online appendix. First, we have shown that our results are not sensitive to several maximum distances to the state border. Inferences even barely change when we use municipalities within a bandwidth of 10 kilometers at both sides of the border. However, we also explicitly consider municipalities' distances to the border and extend the analysis to a difference-in-discontinuities estimation. When we use the sample of municipalities within a bandwidth of 30 kilometers which fits higher polynomial orders best, the results suggest that compulsory voting increased voter turnout and did not influence invalid votes (table A5 in the online appendix).¹⁵

Second, the results should not be sensitive to the inclusion or exclusion of individual control variables. We have already shown that we do not observe compound treatments (table A2 in the online appendix). However, we have also estimated our base-

¹⁵Inferences are less clear when we combine difference-in-discontinuities models with a smaller bandwidth. However, using linear or quadratic polynomial orders with small bandwidths is likely to give rise to over-specified estimations (Gelman and Imbens, 2019).

line model excluding control variables. Inferences do not change (table A6 in the online appendix).

Third, our results are derived from a comparably small sample of observations and may cause some concerns regarding the standard errors. We therefore compute Jackknife inferences. Table A7 in the online appendix shows that inferences do not change. We also ignore the time dimension and estimate pooled OLS, as proposed by Bertrand *et al.* (2004), to account for a possible inconsistency in the standard errors. The standard errors become larger, as expected, but the main results remain unchanged (table A8 in the online appendix).

Fourth, even if we are confident that the common trend assumption holds (section 4.2), average trends may veil heterogeneities across municipalities. Therefore, we replace municipality fixed effects by municipality-specific time trends. Again, all main results are fairly robust (table A9 in the online appendix). We also include data on all national elections after 1999. The event study results shown in figure A2 in the online appendix corroborate the fact that we do not observe persistent effects or long-run trends of compulsory voting.

Fifth and finally, we reshuffle the treatment in two quasi-random ways. First, we reassign compulsory voting by name of municipality, which should give random variation. We use the last character of the name of the municipality and assign “pseudo compulsory voting” from the original 24 municipalities in Carinthia to the first 24 municipalities of Salzburg and Carinthia in alphabetical order. Figure A3 in the online appendix shows that this procedure reassigned municipalities into the treatment in a quasi-random way, compared to the original treatment shown in figure A1. Second, we assume a vertical “pseudo border” between Carinthia and Salzburg. Figure A4 in the online appendix shows the corresponding map. Table 3 shows the regression results when we use pseudo treatments instead of the original treatment. As expected, neither panel A (alphabetical pseudo treatment) nor panel B (pseudo border) suggest any significant effect of quasi-randomly reshuffled treatments on voter turnout and invalid votes during the period of compulsory voting or afterwards. We conclude from pseudo treatments that our results are unlikely to be driven by chance.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A: Alphabetical pseudo treatment (last letter)</i>						
CV	-0.01 (1.41)	-0.15 (0.95)	-0.64 (0.60)	0.21 (0.27)	-0.02 (0.18)	-0.17 (0.10)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.85	0.78	0.80	0.47	0.51	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B: Pseudo treatment (pseudo border)</i>						
CV	1.61 (1.53)	1.11 (1.05)	-0.52 (0.60)	-0.35 (0.30)	-0.30 (0.18)	-0.02 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.85	0.79	0.80	0.48	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table 3: Pseudo treatments

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as dependent variables. We replace original measures for compulsory voting by pseudo variables. The coefficient of interest is CV taking on the value of 1 when (pseudo) compulsory voting applies. In panel A, we allocate CV according to the last letter of the name of municipalities. In panel B, we assume a state border cutting through our sample from North to South instead of East to West. For illustrating maps, see figure A3 and A4 in the online appendix. Additional controls are the logged number and the annualized growth rate of eligible voters. Significance levels (standard errors clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

5.3 Microdata results

Our election data has shown that compulsory voting increased voter turnout until it was abolished. Afterwards, voter turnout quickly returned to its pre-compulsory voting levels and has had no persistent effects. Bechtel *et al.* (2018) observe similar patterns for the case of Switzerland. One intriguing question is why compulsory voting has no long-term “footprint” despite the fact that participation in the previous election well predicts participation in the next election (see the literature discussed in section 2). We use data from the European Values Study (EVS), which may describe the mechanisms at work. We pool the 1990, 1999 and 2008 Austrian waves of the EVS and use all federal states. In 1990, four out of nine federal states had compulsory voting which was abolished in all states in 1999, and 2008. We use difference-in-differences estimations and employ the answers to questions on political values, actions and beliefs as the

dependent variables. Table A1 in the online appendix portrays all variables and the coding. Respondents were not asked in all waves about their participation in national elections. However, our ten variables well complement our election data because we observe dimensions of political participation that are more related to intrinsic motivation. Compulsory voting is an extrinsic factor for voter turnout because voters may fear punishments for not participating in elections.

Table 4 shows the results. In panel A, we investigate how values of citizens changed during compulsory voting, compared to citizens in Austrian federal states that never had compulsory voting. The larger the coefficient estimate of the compulsory voting variable, the higher the probability that respondents agree on a political value or participated in a form of political action. The results suggest that extrinsic motivations for political participation such as compulsory voting tends to crowd out intrinsic motivation. If anything, we find negative effects of compulsory voting on all forms of political participation other than voter turnout. Columns (3) and (4) indicate that compulsory voting may have changed the form of political participation. Citizens may participate more often in elections (see the results above) but discuss political issues with friends less often and are less frequently members of political parties under compulsory voting.¹⁶ Forcing citizens to participate in elections may therefore come at the cost of more voluntary, intrinsically motivated forms of political participation. We also find that compulsory voting seems to harm identification and satisfaction with the state. Columns (9) and (10) show that compulsory voting reduces the feeling of having free choice in life and reduces the sense of national identity. Mandatory measures of political participation such as compulsory voting do not strengthen the links between citizens and the state, quite the opposite. Values such as “civic duty” and national identity grow from the inside. However, effects on political actions are comparably weak and do not turn out to be statistically significant. Columns (5) to (7) do not show that compulsory voting changes the likelihood of participating in petitions, boycotts, or demonstrations. We also do not observe significant effects of compulsory voting on confidence towards the national parliament. Compulsory voting also has little impact on the subjective interest in or importance of politics (columns (1) and (2)).

One intriguing question is whether effects of compulsory voting on political values are also only visible in the short-run or persistently shape habits. We cannot use microlevel data for the period before compulsory voting was introduced in Carinthia to

¹⁶This contrasts with Shineman (2012) who finds that a longer exposure to compulsory voting comes with more political interest in Austria.

examine this issue. However, there is information about the age of the respondent, which we use to identify citizens who were entirely socialized under compulsory voting and citizens who had experienced elections without compulsory voting. Citizens in Carinthia who were born before 1965 were able to cast their vote in national elections before 1986 where no compulsory voting applied. In Styria, Tirol and Vorarlberg, voters born before 1924 had at least one national election without compulsory voting (1945). Later born citizens grew up entirely under compulsory voting. We investigate how compulsory voting influenced both groups. If socialization and long-term habit forming plays a role, later born citizens may react less to the abolition of compulsory voting than citizens who are already experienced with voluntary voting. However, the difference-in-differences estimates differ only slightly from the baseline results; coefficient magnitudes and confidence intervals are very similar among both groups (panel B in table 4). We therefore find no evidence that compulsory voting formed habits in political participation or political values in the long run. Effects are very much limited to the period when compulsory voting was in place.

	Political value				Political action			Confidence	Freedom	Proud
	Interest (1)	Importance (2)	Discussion (3)	Party member (4)	Petition (5)	Boycotts (6)	Demonstration (7)	in parliament (8)	of choice (9)	on nationality (10)
<i>Panel A</i>										
CV	-0.08 (0.14)	-0.03 (0.13)	-0.14* (0.08)	-0.42*** (0.13)	-0.07 (0.13)	0.15 (0.10)	0.04 (0.10)	-0.07 (0.13)	-0.18** (0.09)	-0.28*** (0.10)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.04	0.02	0.03	0.06	0.02	0.06	0.06	0.02	0.01	0.04
Number of states	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Observations	4461	4436	4464	4470	4342	4218	4301	4330	4450	4248
<i>Panel B</i>										
Always CV	-0.04 (0.14)	-0.02 (0.07)	-0.03 (0.11)	-0.49*** (0.13)	-0.13 (0.15)	0.14 (0.12)	-0.01 (0.10)	-0.10 (0.12)	-0.15** (0.06)	-0.33*** (0.07)
Experienced elections w/o CV	-0.17 (0.30)	-0.05 (0.28)	-0.38* (0.19)	-0.30* (0.16)	0.07 (0.12)	0.16 (0.13)	0.16 (0.22)	-0.01 (0.14)	-0.25* (0.14)	-0.19* (0.11)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.04	0.02	0.03	0.06	0.02	0.06	0.06	0.02	0.01	0.04
Number of states	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Observations	4461	4436	4464	4470	4342	4218	4301	4330	4450	4248

Table 4: European value study

Notes: This table reports the results of difference-in-differences estimations where we use answers from the European Value Study in the waves 1990, 1999 and 2008 as dependent variables. For a detailed list of the questions and answer categories from the European Value Study, see table A1 in the online appendix. The coefficient of interest in panel A is CV taking on the value of 1 in the states of Carinthia, Vorarlberg, Styria, and Tirol when compulsory voting applies. In panel B the coefficient CV is split into “Always CV” taking on the value of 1 for citizens in Carinthia, Vorarlberg, Styria, and Tirol who experienced only elections with CV until 1990 and “Experienced elections w/o CV” taking on the value of 1 for citizens in Carinthia, Vorarlberg, Styria, and Tirol who also experienced elections without CV until 1990. We control for age, sex, town size and employment status. Significance levels (standard errors clustered at the state level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

6 Discussion

The signs of our estimated effects of compulsory voting on voter turnout are in line with the results of Hirczy (1994) and Hoffman *et al.* (2017) but differ substantially in magnitude. Hirczy (1994) reports the effect of introducing compulsory voting on voter turnout in national elections in Carinthia to be around 5 percentage points by comparing average voter turnout rates. Hoffman *et al.* (2017) consider national elections in Austria between 1949 and 2010 using state level data. They report that compulsory voting increased voter turnout by around 6.5 percentage points. We show that these effects might be overstated because of unobservable differences across states. In our rather homogeneous border sample, compulsory voting effects on voter turnout amount to 3.5 to 4 percentage points, which is clearly less than the spread of around 6 to 7 percentage points when looking at state-level averages (see figure 1 and the bottom panel of figure 3).¹⁷ Unlike Hirczy (1994) and Hoffman *et al.* (2017), we use municipality instead of state level data and consider municipalities close to the border between Salzburg and Carinthia. The municipalities close to the border are likely to be more similar to each other than municipalities that are far from the border. As a result, our approach should capture unobserved heterogeneity better than using state averages. In line with Hoffman *et al.* (2017), our results do not show that compulsory voting increased invalid votes. Hoffman *et al.* (2017) find a small increase in invalid votes for presidential and state elections. For national elections, however, the estimate lacks statistical significance.

Compulsory voting does not seem to have persistent effects on voting behavior. Once compulsory voting was abolished, pre-compulsory voting differences between Salzburg and Carinthia reappear. We do not observe a long-term increase of voters in the aggregate. However, we cannot rule out the possibility that the composition of the voters may have changed under compulsory voting. In contrast to previous studies, our results indicate some shift in party vote shares. Shineman (2012) and Hoffman *et al.* (2017) do not find that compulsory voting has any effect on left-wing and right-wing party vote shares. Ferwerda (2014) investigates the abolition of compulsory voting in 1992 and finds a small shift from minor parties to the SPÖ, but the results for all other parties do not turn out to be statistically significant. By contrast, our results suggest that voters were quite inclined to vote for right-wing parties when compulsory voting

¹⁷When we regress state average turnout on a dummy for compulsory voting and on state and year fixed effects, the compulsory voting effect is 6.19 with a standard error robust to heteroscedasticity of 0.58.

was present. However, these results should be interpreted with great caution because the raise of Jörg Haider and his FPÖ somewhat overlaps with compulsory voting in Carinthia.

7 Conclusion

We examine the short-term and long-term effects of compulsory voting on political participation as measured by voter turnout, invalid voting, political interest, confidence in parliament, and party membership. In our baseline specification, we focus on municipalities at the border between the Austrian states of Carinthia and Salzburg. Voting in parliamentary elections was compulsory in Carinthia between 1986 and 1992, but always remained voluntary in Salzburg. The results from comparing the period before, during and after compulsory voting applied in Carinthia show that compulsory voting increased voter turnout by 3.5 percentage points, a numerically important effect because voter turnout was already pronounced (88% in 1983). Compulsory voting hardly influenced invalid votes. We also investigate whether compulsory voting had long-lasting effects after its abolition. Our results do not indicate that this was the case. After the abolition of compulsory voting in 1992, differences across the state border in voter turnout returned to their pre-compulsory voting levels. Microdata shed some light on the mechanisms at work. We find that compulsory voting tends to crowd out intrinsic motivation for political participation.

Future research should examine in more detail why some policy measures such as precipitation or GOTV campaigns are habit-forming in voting, but other measures do not seem to have long-lasting effects. Moreover, if further microdata on values, political actions and also on voting data becomes available, scholars may well examine how compulsory voting influences habits of citizens distinguished by sociodemographic characteristics (e.g. by political identification, education, age, etc.).

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Appendix (for online publication only)



Figure A1: Sample municipalities in Carinthia and Salzburg

Notes: The map shows our sample municipalities in the Austrian federal states of Carinthia (compulsory voting between 1986 and 1992) and Salzburg (no compulsory voting). We use municipalities with a maximum distance of 30 kilometers to the state border. Bold lines are state borders, thin lines describe municipality boundaries.

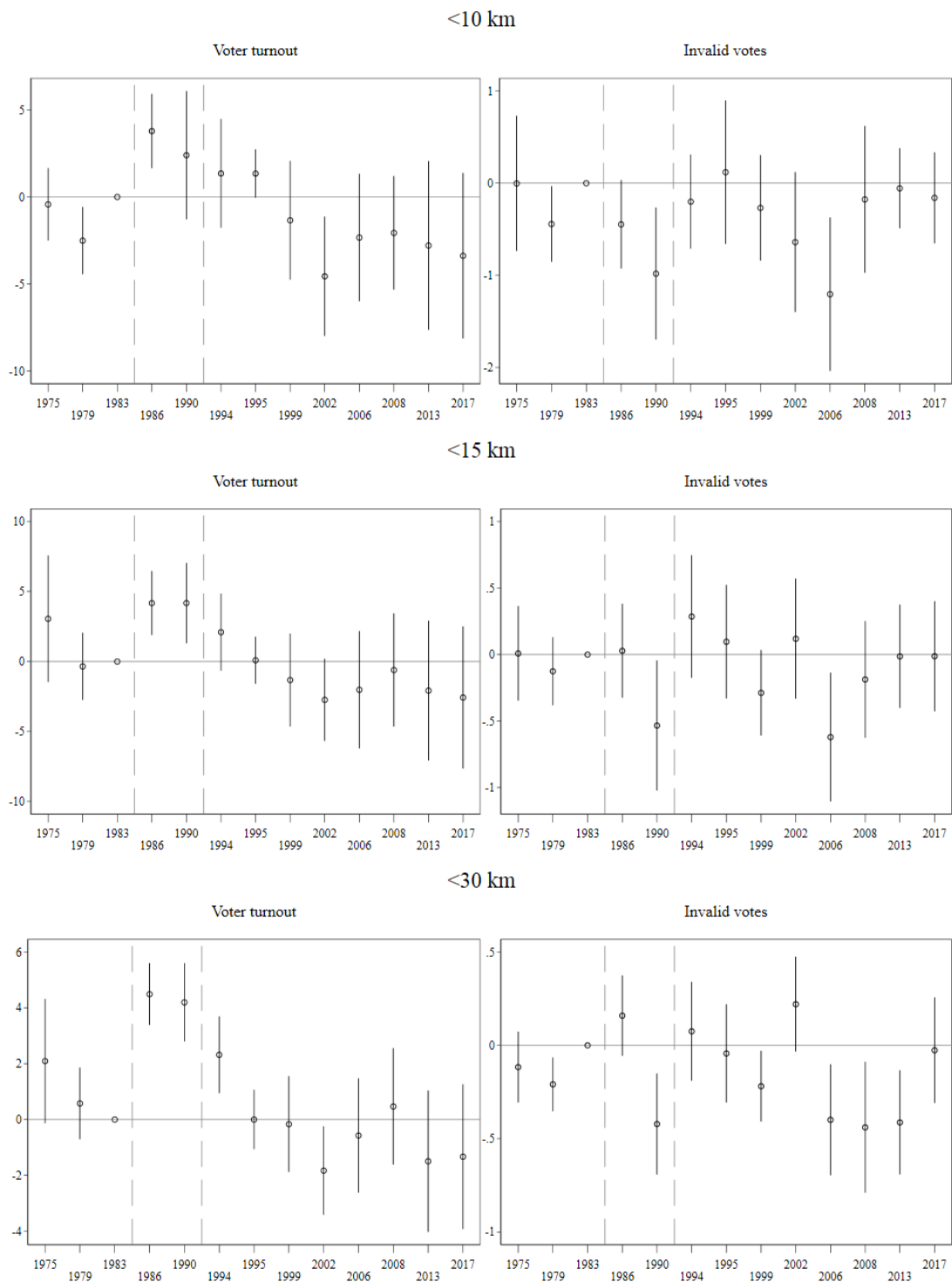


Figure A2: Testing the common trend assumption

Notes: The graph shows event study estimations where we use voter turnout and invalid vote shares as dependent variables. The election in 1983 serves as the base category. Vertical dashed lines represent the period of compulsory voting in Carinthia. Circles are point estimates, black lines represent the 90% confidence interval. We include time fixed effects and control variables similar to our baseline specification. We cluster standard errors at the municipality level.

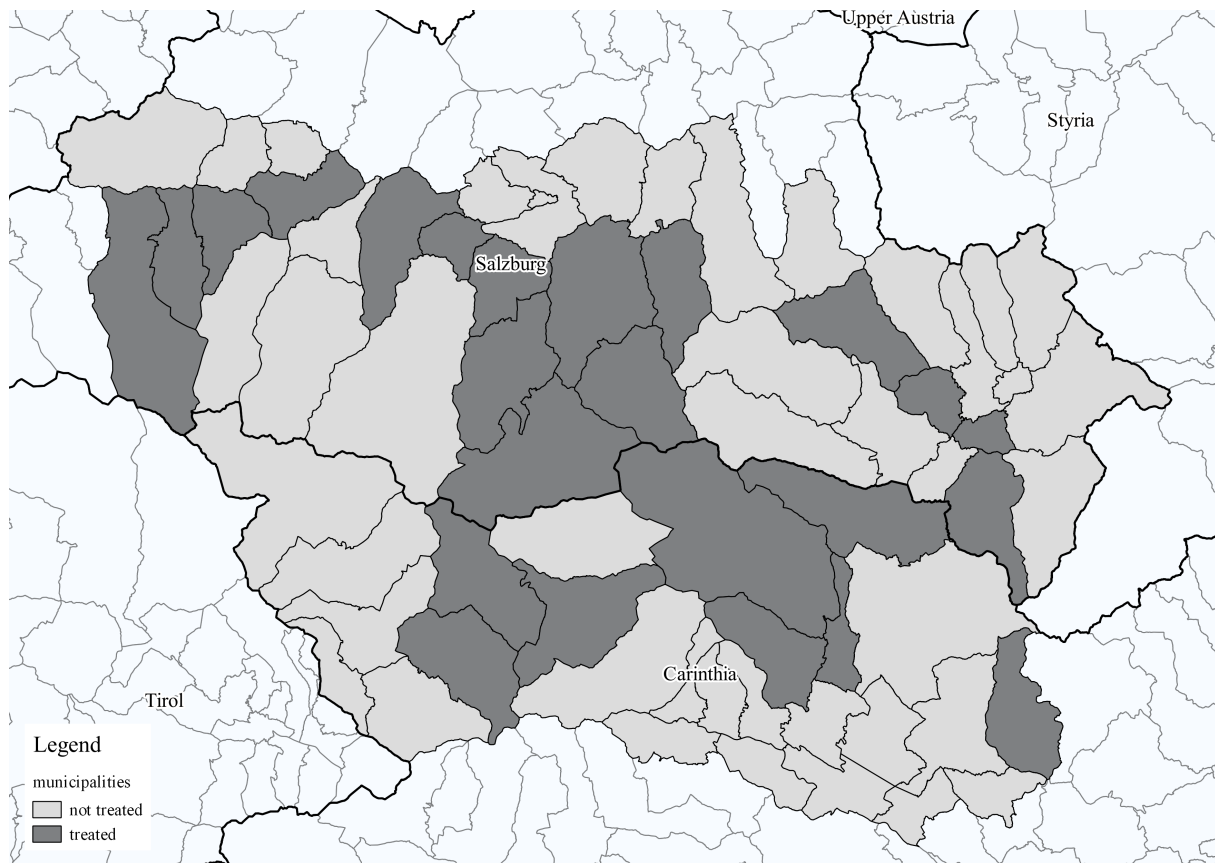


Figure A3: Alphabetical pseudo treatment (last letter of municipality name)

Notes: The map shows how we reallocate alphabetical pseudo treatments. Dark gray municipalities are assumed to be treated in 1986 and 1990; light gray municipalities are not treated. Compulsory voting is assigned to the first 24 municipalities according to the alphabetical order of the last letter of the municipality name.

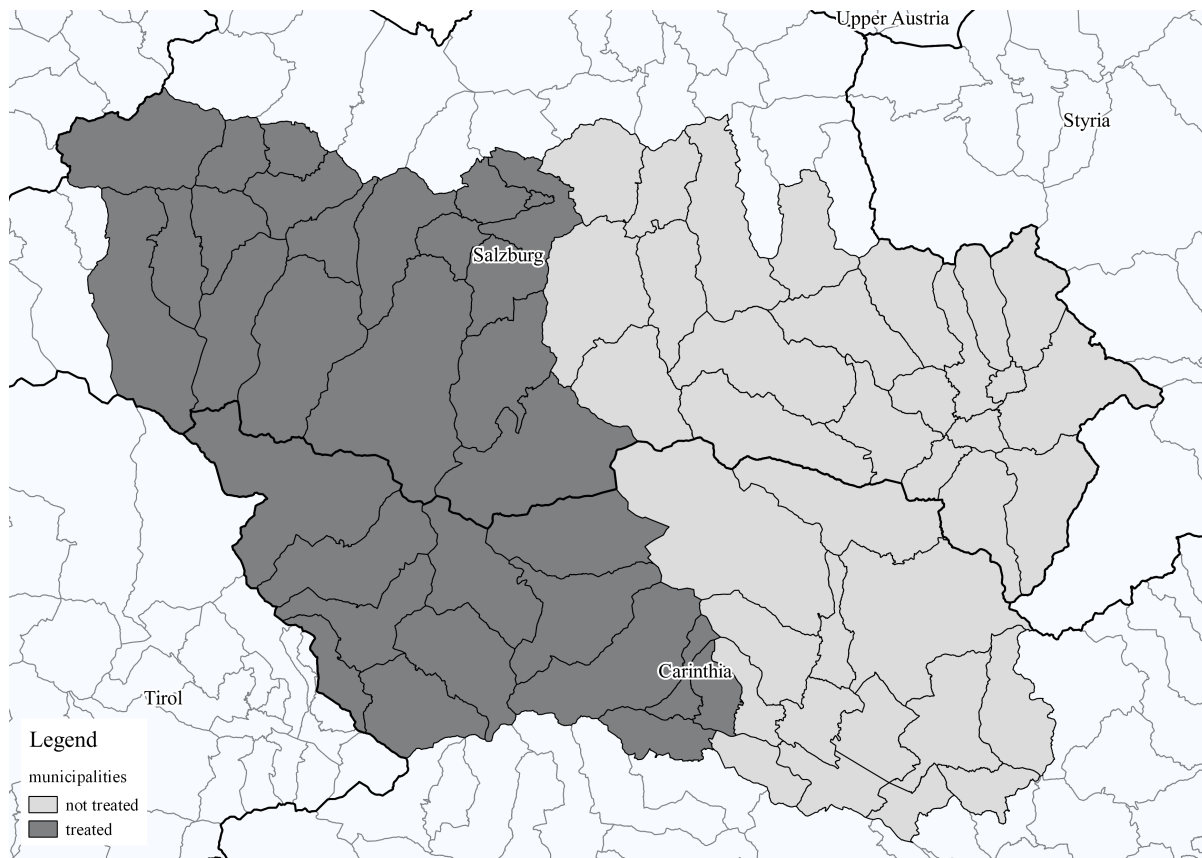


Figure A4: Pseudo treatment (pseudo state border)

Notes: The map shows how we reallocate treatments when we use a pseudo state border between the state of Salzburg and Carinthia. Dark gray municipalities are assumed to be treated in 1986 and 1990; light gray municipalities are not treated.

Label	Question	Answer categories	Variable	Note
Political value: Interest	How interested would you say you are in politics?	1 Very interested 2 Somewhat interested 3 Not very interested 4 Not at all interested	E023	For the analysis answer categories were multiplied by -1
Political value: Importance	Please say, for each of the following, how important it is in your life Politics	1 Very important 2 Quite important 3 Not important 4 Not at all important	A004	For the analysis answer categories were multiplied by -1
Political value: Discussion	When you get together with your friends, would you say you discuss political matters frequently, occasionally or never?	1 Frequently 2 Occasionally 3 Never	A062	For the analysis answer categories were multiplied by -1
Political value: Party member	Please look carefully at the following list of voluntary organisations and activities and say ... a) which, if any, do you belong to? Political parties or groups	0 Not mentioned 1 Mentioned	A068	
Political action: Petition	Now I'd like you to look at this card. I'm going to read out some different forms of political action that people can take, and I'd like you to tell me, for each one, whether you have actually done any of these things, whether you would/might do it or would not/never, under any circumstances, do it/any of them. Signing a petition	1 Have done 2 Might do 3 Would never do	E025	For the analysis answer categories were multiplied by -1
Political action: Boycotts	Joining in boycotts	1 Have done 2 Might do 3 Would never do	E026	For the analysis answer categories were multiplied by -1
Political action: Demonstration	Attending lawfull demonstrations	1 Have done 2 Might do 3 Would never do	E027	For the analysis answer categories were multiplied by -1
Confidence in Parliament	Please look at this card and tell me, for each item listed, how much confidence you have in them, is it a great deal, quite a lot, not very much or none at all? Parliament	1 A great deal 2 Quite a lot 3 Not very much 4 None at all	E069_07	For the analysis answer categories were multiplied by -1
Freedom of choice	Some people feel they have completely free choice and control over their lives, and other people feel that what they do has no real effect on what happens to them. Please use the scale to indicate how much freedom of choice and control you feel you have over the way your life turns out?	1 None at all 2 3 4 5 6 7 8 9 10 A great deal	A173	
Proud on nationality	How proud are you to be a [COUNTRY] citizen?	1 Very proud 2 Quite proud 3 Not very proud 4 Not at all proud	G006	For the analysis answer categories were multiplied by -1

Table A1: European value study (II)

Notes: The tables describes the variables we use in table 4. Data from the EVS Longitudinal Data Files 1981-2008.

<i>Panel A</i>	Eligible voters (log)			Growth rate eligible voters		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
CV	-0.00 (12.29)	8.06 (12.73)	11.62 (15.67)	0.43 (0.35)	0.24 (0.21)	-0.10 (0.15)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.53	0.52	0.51	0.42	0.40	0.35
Number of municipalities	13.00	28.00	65.00	13.00	28.00	65.00
Observations	104	224	520	104	224	520
<i>Panel B</i>	Population (log)			Female (%)		
	<10 km	<15 km	<30 km	<10 km	<15 km	<30 km
CV	0.01 (0.01)	0.02 (0.01)	0.01 (0.01)	-0.20 (0.36)	0.09 (0.25)	-0.19 (0.17)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.04	0.08	0.29	0.06	0.09	0.06
Number of municipalities	13	28	65	13	28	65
Observations	39	84	195	39	84	195
<i>Panel C</i>	Age under 15 (%)			Age over 75 (%)		
	<10 km	<15 km	<30 km	<10 km	<15 km	<30 km
CV	-0.25 (0.98)	0.26 (0.64)	0.47 (0.36)	0.57 (0.41)	0.64** (0.30)	0.18 (0.21)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.84	0.82	0.83	0.71	0.55	0.57
Number of municipalities	13	28	65	13	28	65
Observations	39	84	195	39	84	195
<i>Panel D</i>	Tertiary education (%)			Economically active (%)		
	<10 km	<15 km	<30 km	<10 km	<15 km	<30 km
CV	-0.13 (0.29)	0.14 (0.17)	-0.04 (0.09)	-0.78 (1.45)	0.37 (0.93)	0.12 (0.52)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.73	0.79	0.79	0.27	0.25	0.38
Number of municipalities	13	28	65	13	28	65
Observations	36	77	185	39	84	195

Table A2: Test for compound treatments

Notes: The table reports the results of difference-in-differences estimations where we use the logged number and annualized growth rate of eligible voters (panel A) between 1975 and 1999 and logged population and population shares based on census data of 1981, 1991, and 2001 (panels B to D) as dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. Significance levels (standard errors at the municipal level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

	Carinthia				Salzburg			
	<10 km (1)	<15 km (2)	<30 km (3)	State (4)	<10 km (5)	<15 km (6)	<30 km (7)	State (8)
<i>Panel A</i>								
Eligible voters (log)	6.84	7.03	7.38	7.52	6.61	6.67	6.94	7.15
Growth rate eligible voters	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
<i>Panel B</i>								
Population (log)	7.25	7.40	7.69	7.82	7.07	7.12	7.42	7.66
Female (%)	50.92	50.24	50.46	50.62	50.34	50.41	50.58	50.57
Age under 15 (%)	21.60	21.91	21.12	20.14	22.60	22.33	22.57	22.28
Age over 75 (%)	5.58	5.28	5.48	5.85	4.68	4.77	4.51	4.47
Tertiary education (%)	1.73	1.74	2.04	2.55	1.84	2.41	2.27	2.78
Working population (%)	39.02	39.49	39.83	40.40	41.49	42.24	43.26	45.10

Table A3: Summary statistics (II)

Notes: The table reports mean values for the logged number and annualized growth rate of eligible voters (panel A) in 1983 and logged population population shares based on census data of 1981, 1991 and 2001 (panels B to D) for our sample municipalities and the state average.

	Left-wing vote share			Right-wing vote share		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A</i>						
CV	-1.74* (0.92)	-1.45** (0.68)	-1.71*** (0.54)	1.75** (0.78)	1.30* (0.72)	1.50** (0.57)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.69	0.66	0.64	0.57	0.48	0.48
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B</i>						
CV	-4.21*** (1.25)	-4.41*** (0.98)	-5.10*** (0.82)	3.69** (1.32)	4.29*** (1.00)	5.08*** (0.82)
After CV	-4.89** (1.86)	-6.02*** (1.36)	-6.73*** (0.97)	3.84* (2.00)	6.10*** (1.38)	7.12*** (0.93)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.74	0.74	0.72	0.63	0.61	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table A4: Party vote shares

Notes: The table reports the results of difference-in-differences estimations where we use party vote shares as dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Additional controls are the logged number and the annualized growth rate of eligible voters. Significance levels (standard errors clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A: Linear difference-in-discontinuities</i>						
CV	0.75 (1.49)	5.74*** (1.10)	2.96** (1.17)	0.21 (0.34)	-0.56 (0.45)	-0.34 (0.26)
After CV	-1.79 (1.94)	3.78** (1.49)	-1.47 (1.83)	0.10 (0.40)	-0.06 (0.34)	-0.00 (0.17)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.88	0.81	0.82	0.51	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B: Quadratic difference-in-discontinuities</i>						
CV	-0.58 (4.60)	3.98 (3.88)	3.69*** (1.21)	1.99** (0.76)	0.13 (1.04)	-0.69 (0.46)
After CV	-0.47 (6.88)	3.24 (5.58)	1.85 (1.72)	2.44*** (0.75)	0.08 (0.62)	-0.22 (0.33)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.88	0.81	0.82	0.52	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table A5: Differences-in-discontinuities

Notes: The table reports the results of difference-in-discontinuities estimations where we use voter turnout and invalid vote shares as dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Polynomials measuring the distance to the state border are not shown here. Additional controls are the logged number and the annualized growth rate of eligible voters. Significance levels (standard errors clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A</i>						
CV	3.28*** (0.89)	3.55*** (0.61)	3.55*** (0.39)	-0.59** (0.22)	-0.26 (0.18)	-0.04 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.86	0.79	0.81	0.50	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B</i>						
CV	3.93*** (1.25)	3.26*** (0.99)	3.50*** (0.58)	-0.56** (0.24)	-0.21 (0.21)	0.00 (0.12)
After CV	1.30 (1.14)	-0.57 (1.25)	-0.10 (0.71)	0.05 (0.20)	0.10 (0.16)	0.09 (0.10)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	No	No
Within R2	0.87	0.79	0.81	0.50	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table A6: Excluding control variables

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Significance levels (standard errors clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A</i>						
CV	3.47*** (0.87)	3.71*** (0.60)	3.52*** (0.39)	-0.56** (0.26)	-0.26 (0.19)	-0.05 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.87	0.80	0.82	0.50	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B</i>						
CV	4.23*** (1.25)	3.25*** (1.03)	3.41*** (0.63)	-0.53* (0.29)	-0.21 (0.22)	-0.00 (0.12)
After CV	1.50 (1.22)	-0.94 (1.45)	-0.20 (0.85)	0.08 (0.24)	0.10 (0.18)	0.09 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.87	0.80	0.82	0.50	0.52	0.60
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table A7: Jackknife test

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as dependent variables. Jackknife inferences apply. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Additional controls are the logged number and the annualized growth rate of eligible voters. Significance levels (jackknifed standard errors): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
CV	3.15** (1.42)	3.83*** (0.96)	3.53*** (0.61)	-0.51** (0.25)	-0.25 (0.19)	-0.05 (0.11)
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.67	0.67	0.67	0.45	0.48	0.54
Number of municipalities	13	28	56	13	28	56
Observations	104	224	520	104	224	520

Table A8: Pooled time dimension

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. Observations with and without CV are pooled and the time dimension is ignored. Significance levels (standard errors clustered at municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

	Voter turnout			Invalid votes		
	<10 km (1)	<15 km (2)	<30 km (3)	<10 km (4)	<15 km (5)	<30 km (6)
<i>Panel A</i>						
CV	3.27*** (0.91)	3.54*** (0.63)	3.57*** (0.39)	-0.56** (0.23)	-0.25 (0.18)	-0.04 (0.11)
Municipality fixed effects	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific time trend	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.72	0.70	0.67	0.49	0.48	0.56
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520
<i>Panel B</i>						
CV	8.06*** (2.60)	5.21*** (1.56)	3.51*** (0.89)	-0.44 (0.26)	0.23 (0.24)	0.13 (0.13)
After CV	9.01** (3.54)	3.12 (2.47)	-0.10 (1.43)	0.23 (0.27)	0.92*** (0.25)	0.34** (0.15)
Municipality fixed effects	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific time trend	Yes	Yes	Yes	Yes	Yes	Yes
Within R2	0.76	0.71	0.67	0.49	0.51	0.57
Number of municipalities	13	28	65	13	28	65
Observations	104	224	520	104	224	520

Table A9: Municipality-specific time trend

Notes: The table reports the results of difference-in-differences estimations where we use voter turnout and invalid vote shares as the dependent variables. The coefficient of interest is CV taking on the value of 1 when compulsory voting applies. After CV refers to elections after CV was abolished. Additional controls are municipality-specific time trends, the logged number and the annualized growth rate of eligible voters. Significance levels (standard errors are clustered at the municipality level): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.