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# Compulsory Voting, Voter Turnout and Asymmetrical Habit-formation

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## Abstract

We examine whether compulsory voting influences habit-formation in voting asymmetrically across parties. In Austria, some states temporarily introduced compulsory voting in national elections. We exploit border municipalities across two states that differ in compulsory voting legislation using a Differences-in-Differences and a Differences-in-Discontinuity approach. We investigate the long-term effects of compulsory voting on voter turnout, party vote shares and invalid votes. The results show that compulsory voting increased voter turnout by 3.4 percentage points, but did not influence invalid votes and party vote shares. When compulsory voting was abolished, voter turnout returned to the pre-compulsory voting level. We find little evidence for compulsory voting influencing voting asymmetrically across left-wing and right-wing parties. We conclude that compulsory voting was not habit-forming at all and may have crowded out intrinsic motivation.

*JEL-Classification:* D72, P16

*Keywords:* Compulsory voting, voter turnout, party vote shares, Regression-in-Discontinuity design, habit-formation, Austria

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# 1 Introduction

Voter turnout has declined in many industrialized countries. In German and Austrian general elections, for example, voter turnout decreased from about 90% in the 1970s to about 70% in the 2000s. Scholars examine the extent to which electoral institutions such as compulsory voting influence voter turnout. Compulsory voting has been shown to increase voter turnout, to support left-wing parties, and to be a cost-efficient policy measure (Bechtel *et al.*, 2015a,b; de Leon and Rizzi, 2016; Ferwerda, 2014; Fowler, 2013; Hirczy, 1994; Hoffman *et al.*, 2017; Lijphart, 1997; Mackerras and McAllister, 1999). Countries with compulsory voting are, for example, Australia, Luxembourg, Belgium and countries in Latin America.

Scholars examine effects of compulsory voting on voter turnout and party vote shares and elaborate on voting as a habit-forming process. There is, however, only a single study yet examining how compulsory voting influences habit-formation in voting: Bechtel *et al.* (2015a) examine over 20 years of compulsory voting in federal referendums in the Swiss canton of Vaud between 1900 and 1970. The hypothesis to be investigated is that compulsory voting is habit-forming: in the course of compulsory voting, voters get used to participate in elections. Successful habit-formation would imply that citizens continue to participate in elections even when compulsory voting is abolished. When getting used to participating in elections, some voters may also rediscover voting as a civic duty. By using a synthetic control group design and a Differences-in-Differences estimator, Bechtel *et al.* (2015a) find small spillover effects on other forms of political participation (voter turnout in federal elections and cantonal referendums), but do not find evidence for habit-formation. The authors, however, do not discuss whether introducing and abolishing compulsory voting may affect voters of individual parties differently. For example, compulsory voting forced non-voters with manifold political ideologies to cast their ballot, but only conservatives may stick to participate in elections after abolishing compulsory voting. We examine the extent to which compulsory voting has asymmetrical habit-forming effects across individual parties.

We investigate the effects of compulsory voting on voter turnout, invalid votes and party vote share using municipality-level data from Austria between 1975 and 1999. After World War II, the nine Austrian state governments were allowed to introduce compulsory voting in national elections. Styria, Vorarlberg and Tyrol introduced compulsory voting in 1949, Carinthia followed in 1986. In 1992, compulsory voting in national elections was abolished at the federal level and overwrote state law. We exploit that (a) Carinthia had compulsory voting over the period 1986-1992 (but not before and afterwards) and (b) shares a border with Salzburg which never had compulsory voting. We apply a Difference-in-Difference and a Difference-in-Discontinuity framework to border municipalities of the states of Carinthia (compulsory voting over the period 1986-1992) and Salzburg (no compulsory voting). We exploit that municipalities close to the state border are similar in terms of unobservable characteristics. We identify the effect of compulsory voting as the difference in the spatial state-border discontinuity in voter turnout, invalid votes and party vote shares before, under, and after compulsory voting. We use a Differences-in-Differences-in-Differences setup to examine whether effects of introducing and abolishing compulsory voting are symmetrical.

Our contribution is twofold. First, compared to the closely related study of Hoffman *et al.* (2017), we use municipality-level data instead of state-level data and explore municipalities in the border region only. Adjacent municipalities in the border region are fairly more comparable in unobservable characteristics than the mean of all municipalities in Carinthia and Salzburg. The border region 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. Second, we examine how both introducing and abolishing compulsory voting influenced voter turnout and party vote shares. Corroborating the results of Bechtel *et al.* (2015a), we find that when compulsory voting was abolished, voter turnout decreased to the same extent as it had increased when it was introduced. This result does not suggest that compulsory voting was habit-forming. Moreover, we find little evidence for compulsory voting influencing voting asymmetrically across left-wing and right-wing parties. We propose that compulsory voting crowded out intrinsic motivation. Politicians may use less incentive measures such as longer opening hours of polling stations (Garmann, 2016; Potrafke and Roesel, 2016) if they wish to increase participation in elections.

## 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 raised voter turnout by about 10 and 13 percentage points (Jackman, 1987; Powell, 1986). 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 (Fowler, 2013; Hirczy, 1994). In the Swiss canton Vaud, voter turnout raised in referendums during compulsory voting periods by 33 percentage points (Bechtel *et al.*, 2015b). In Argentina, compulsory voting increased voter turnout by 18 percentage points (Jaitman, 2013). In Austria, the abolishment of compulsory voting laws in some Austrian states in 1992 reduced voter turnout in national elections, compared with states which never had compulsory voting, by 8.6 percentage points: Ferwerda (2014) uses a Differences-in-Differences setup to arrive at this conclusion. 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 approximately 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. In Austria and Australia, compulsory voting increased the share of invalid votes (Hirczy, 1994; Hoffman *et al.*, 2017).

Compulsory voting is expected to benefit left-wing parties. Citizens with high education and income are more likely to vote if voting is voluntary than citizens with low education and income (Lijphart, 1997). Theory suggests that citizens with low education and income tend to not support right-wing parties; therefore, forcing citizens to the polls should raise the vote share of left-wing parties (Fowler, 2013; Pacek and Radcliff, 1995). In Australia, for example, compulsory voting increased the vote share of left-wing parties by about 10 percentage points (Fowler, 2013). In the Swiss canton Vaud, compulsory voting increased support for left-wing policy positions by about 20 percentage points;

which, in turn, influenced policy outcomes (Bechtel *et al.*, 2015b). In Austria, however, compulsory voting hardly influenced the individual party vote shares (Ferwerda, 2014; Hoffman *et al.*, 2017). In Brazil, compulsory voting increased the vote shares of quite extreme political parties (de Leon and Rizzi, 2016). The overall empirical evidence on the effect of compulsory voting on party vote shares is, however, mixed (Aguilar and Pacek, 2000; Bohrer *et al.*, 2000; Ferwerda, 2014; Hoffman *et al.*, 2017; Lutz and Marsh, 2007; McAllister, 1986; Nagel and McNulty, 1996; Pacek and Radcliff, 1995; Pettersen and Rose, 2007; Rubenson *et al.*, 2007).

Compulsory voting might also influence voting habits in the long run. The theory of habitual voting describes that citizens develop a habitual behavior as voters or non-voters (Fowler, 2006; Franklin, 2004; Plutzer, 2002). Especially younger individuals are likely to be influenced in their voting behavior because their belief system and preferences are not as well established as of older individuals (Franklin, 2004; Plutzer, 2002). Empirical studies show that voluntary policy measures influence habit-forming of voting. For example, Fujiwara *et al.* (2016) show that precipitation at the previous election day reduces voter turnout at the current election and also at the next election. Cutts *et al.* (2009) find a habit-forming effect of a Get Out The Vote (GOTV) campaign were citizens should be motivated to vote with a phone call or a personal visit. The GOTV campaign raised voter turnout in the year it was conducted and in the subsequent election. Meredith (2009) uses a discontinuity at the voting-age restriction, 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. A related study is from Franklin and Hobolt (2011), who show that young individuals are less likely to vote in subsequent elections when their first election was an election for the European Parliament which usually have low voter turnout. Coppock and Green (2016) suggest three reasons for persistent and distinct interpersonal voter turnout levels. Firstly, the act of voting itself is habit-forming (Gerber *et al.*, 2008; Green and Shachar, 2000). Secondly, views of family members, friends, and neighbors influence individual voting behavior (Huckfeldt and Sprague, 1992; Rosenstone and Hansen, 1993). Thirdly, voting may well be intrinsically motivated (Milbrath, 1965). In the United States, GOTV campaigns with social pressure (using messages about civic duty and a promise that participation in the election will be checked and publicized) have been shown to have a larger influence than other GOTV programs (Davenport, 2010; Gerber *et al.*, 2008). Coppock and Green (2016) conclude that social pressure messages do seem to have significant downstream consequences for turnout in subsequent elections (p. 4). Therefore, if the act of voting is habit-forming itself and if a law that forces citizens to the polls generates social pressure, compulsory voting should have a persistent effect among the citizens exposed to it.

We combine the strands of literature on direct short-term and long-term habit-forming effects of compulsory voting. Our hypotheses to be tested empirically are (1) that compulsory voting directly increased voter turnout and left-wing party vote shares, and (2) that compulsory voting gave rise to persistently higher voter turnout and left-wing party vote shares even after compulsory voting was abolished.

### 3 Institutional Background in Austria

We focus on Austrian national elections.<sup>1</sup> Voting in national elections was compulsory, if directed by state law. Compulsory voting was introduced in 1949 in the states Tirol, Styria and Vorarlberg. In 1986, Carinthia followed and introduced compulsory voting in parliamentary, presidential, state and local elections. Compulsory voting in national elections was abolished in all Austrian states in 1992.<sup>2</sup>

The state law of Carinthia declared that fines for non-voting in parliamentary and presidential elections during the period of compulsory voting apply as regulated by federal law. In 1970, federal law introduced a fine with a maximum of 3.000 Schilling (around 750 USD in 2017 prices) and, in the case of not paying, two weeks of imprisonment. There is however no information on the exact amount of charged fines, because the responsibility for the enforcement was carried by the authorities of the place of election. There were several exceptions from compulsory voting. Excuses for non-voting included illness, professional commitments or other duties, being outside the state, e.g. due to traveling, urgent family matters, traffic disruption or other compelling circumstances. Because of these various excuses, sanctions were only weakly enforced (International Institute for Democracy and Electoral Assistance, 2016).

Voter turnout decreased in national elections from 97% in 1949 to 75% in 2013 (see Figure 1). In 1945 the number of eligible voters was low for two reasons. Firstly, National Socialists were not eligible to vote, and secondly, the majority of war prisoners and evacuees due to World War II had not yet returned. In 1949, the number of eligible voters increased by around 27% compared to 1945. After 1949, the number of eligible voters increased quite moderately.

The average share of invalid votes was 1.5% over the period 1945-2013. The share of invalid votes was especially pronounced in 1990 with almost 3%.

The landscape of political parties represented in the national parliament hardly changed between 1945 and the 1970s. The major political parties SPÖ, the Social Democratic Party, and the conservative ÖVP - the Austrian Peoples Party - achieved together around 90% of the votes and more in national elections. The political landscape has 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 right-wing Freedom Party of Austria, FPÖ, gained more and more electoral support. In the parliamentary election of 2013, SPÖ and ÖVP jointly received only 50% of the votes. The populist right-wing FPÖ entered the national parliament in 1949 and has been represented ever since.<sup>3</sup> Before 1986, the FPÖ had vote shares of around 6%. After shifting the political agenda to the

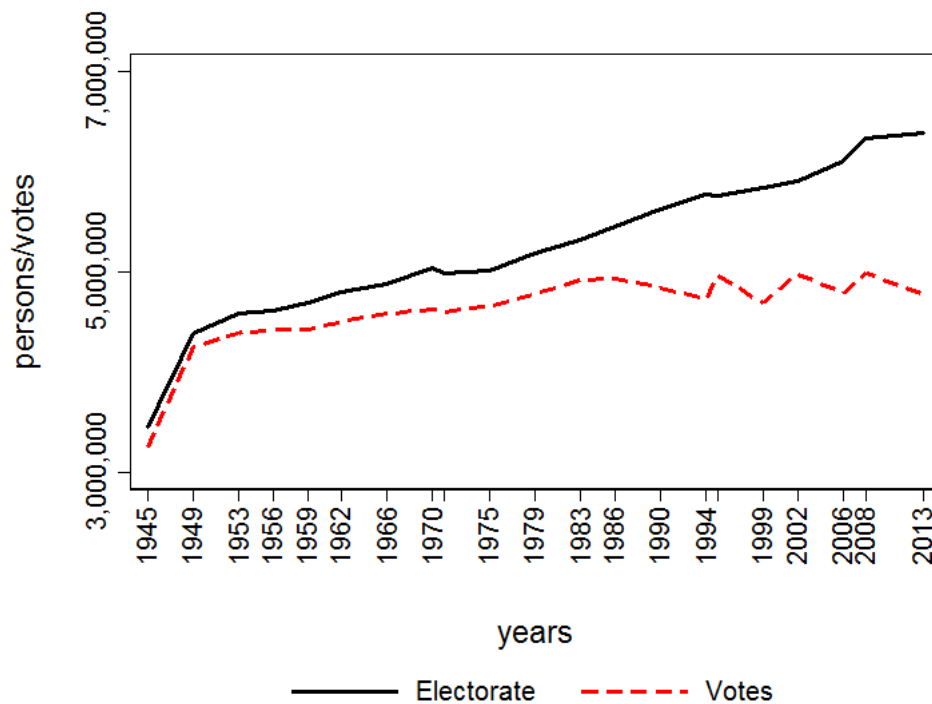
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<sup>1</sup>The directly elected Austrian president has mainly a symbolic position and state elections are held at different points in time across the nine Austrian states. National elections take place at the same day in all Austrian municipalities. Since 2007, the National Assembly is elected for five years (before: four years).

<sup>2</sup>There were other reforms of the electoral system. The voting age was reduced in 1949, 1970, 1994. Since the national elections in 2008, citizens had the right to vote when they were at least 16 years old. Citizens are allowed to 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 are allowed to vote in any municipality. Since the parliamentary election in 1990, Austrian citizens living abroad are allowed to participate in elections by using voting cards. Postal voting in national elections was introduced in course of the election in 2008.

<sup>3</sup>In the elections of 1949 and 1953 the predecessors of the FPÖ - VdU/WdU ran for mandates.

Figure 1: Electorate and votes in national elections in Austria, 1945-2013



far-right in 1986, the FPÖ experienced rising vote shares with a maximum of 26% in 1999.<sup>4</sup> Members from two separate green parties (VGÖ and ALÖ) founded the contemporary Green party of Austria after a defeat in the 1983 election. Vote shares of the Green party vary between 5% and 12%. Finally, there have been few minor parties in Austria.<sup>5</sup>

## 4 Empirical Analysis

### 4.1 Data and Sample

We compare voting behavior in municipalities across the border of the Austrian states of Carinthia and Salzburg. Municipalities in Carinthia are the treatment group, where voting became compulsory in 1986.<sup>6</sup> Carinthia shares a common border with a state where citizens never had an obligation to vote - Salzburg. Thus, we use municipalities in Salzburg as the control group. The treatment is the change in the electoral law, that is introducing compulsory voting in 1986 and abolishing

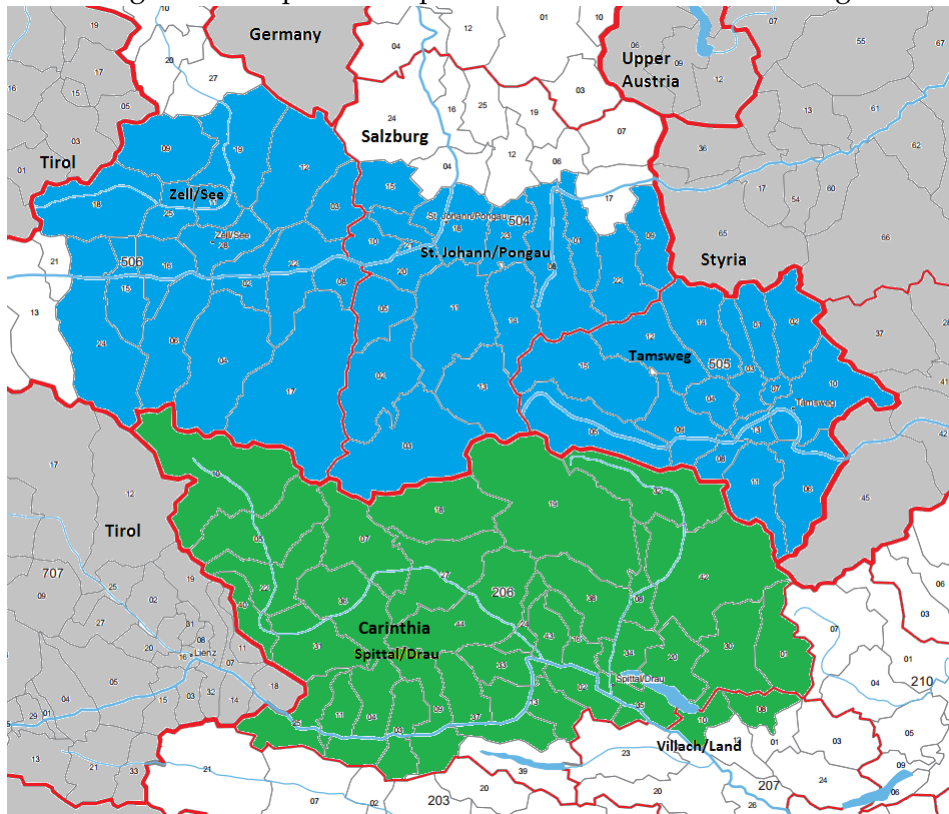
<sup>4</sup>The FPÖ has Neo-fascist roots (Ochsner and Roesel, 2016) and questions the membership of Austria in the European Union.

<sup>5</sup>The left 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 Stornach (election 2013) and the liberal NEOS in an electoral alliance with LIF (election 2013).

<sup>6</sup>The appendix includes a map of the Austrian states and a list of the compulsory voting periods (figure 5).

compulsory voting in 1992. The time periods for the treatment period are the two national elections under compulsory voting in Carinthia, 1986 and 1990. As the period without any treatment, we use three elections before and after compulsory voting in 1975, 1979, 1983 and 1994, 1995, 1999. The sample includes 31 municipalities in Carinthia and 47 in Salzburg. Figure 2 shows the municipalities in each sample. We consider all municipal mergers since 1945 and transform data to a consolidated territorial status.

Figure 2: Sample municipalities in Carinthia and Salzburg



The Austrian Federal Ministry of the Interior provided historical brochures for all national elections between 1919 and 2013. We digitalized municipal-level information on eligible voters, votes cast, valid and invalid votes and votes per party for each election between 1975 and 1999. We compute voter turnout and party vote shares. Voter turnout is the number of votes cast divided by the number of eligible voters, and party vote shares is the proportion of votes per party among all valid votes. 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<sup>7</sup> as left-wing parties. Summary statistics of the main variables are shown in table 1. The maximum turnout is above 100%, because voters using a voting card are allowed to cast their vote in any municipality. In the parliamentary election of 1986, for example, 118,426 votes were not casted in home municipalities.<sup>8</sup>

<sup>7</sup>Also including the Kärntner Grüne, which were electable in Carinthia in 1986 and ALÖ and VGÖ, the predecessor of the Grüne, electable in 1983.

<sup>8</sup>Four municipalities in the sample had a turnout of 99 percentage points or above (1975: Bad Kleinkirchheim and Malta, 1979: Schwarzach im Pongau, 1983: Tweng).



Table 1: Summary statistics

	N	Mean	SD	Min	Max
turnout	624	84.80	5.96	65.28	113.75
invalid vote share	624	1.34	0.75	0.00	4.30
left-wing vote share	624	42.24	10.97	13.91	74.00
right-wing vote share	624	56.22	10.82	24.61	85.51
dummy Carinthia	624	0.40	0.49	0.00	1.00
dummy compulsory voting	624	0.25	0.43	0.00	1.00
electorate	624	1787.35	1761.68	151.00	11611.00
growth rate electorate	624	0.01	0.01	-0.03	0.07

Note: dummy Carinthia equals one for municipalities in Carinthia and zero for municipalities in Salzburg; dummy compulsory voting equals one for the years 1986 and 1990 and zero otherwise.

## 4.2 Identification Strategy

We use adjacent border municipalities in the states of Carinthia (temporary compulsory voting) and Salzburg (no compulsory voting) to identify the effects of compulsory voting in a Differences-in-Differences (DD) model. The advantage of including only municipalities close to the border, and not Salzburg and Carinthia as a whole, is that adjacent border municipalities are more comparable in terms of 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 that easily between Carinthia and Salzburg, if they disagree with compulsory voting.

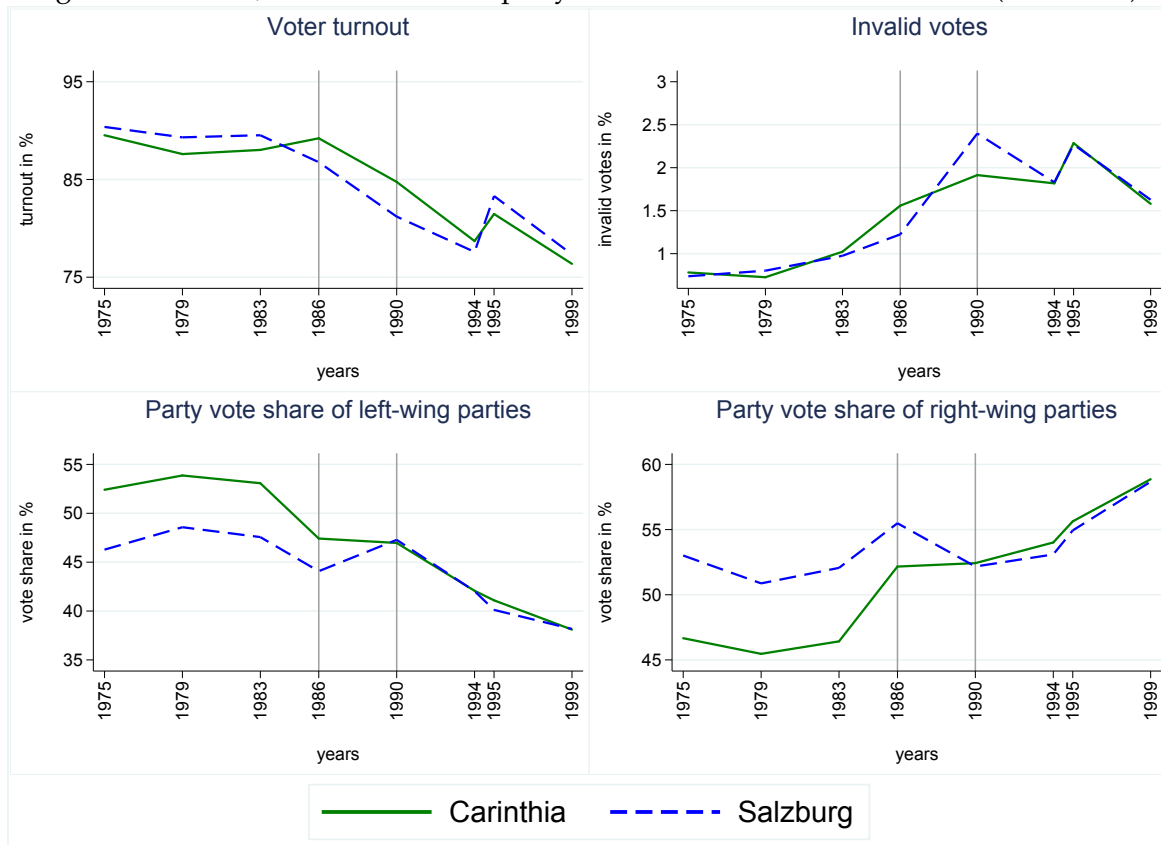
Our main identification assumption is that voting in border municipalities in the state of Carinthia would have evolved like border municipalities in Salzburg in the absence of compulsory voting. The common trend assumption describes that there is no interaction between groups and time, except for the treatment. In other words, 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 1992. The common trend assumption cannot be tested but evaluated graphically. The development of voter turnout, invalid ballots and party vote shares in national elections between 1975 and 1999 for the municipalities in Salzburg and Carinthia is shown in figure 3. We highlight the elections under compulsory voting in Carinthia. In the national elections in 1975, 1979 and 1983, voter turnout in the municipalities close to the border between Carinthia and Salzburg was around 90%. Figure 3 indicates that the common trend assumption seems to be met. Voter turnout in the border municipalities in Salzburg followed the same trend as voter turnout in the border municipalities in Carinthia in the elections between 1986 and 1999. While the voter turnout started to decline in the parliamentary election in 1986 in Salzburg, voter turnout in Carinthia increased in 1986. Hirczy (1994) concludes “that the decline in 1990 was a national problem and that Carinthia benefited from a sustained impact of mandatory voting” (p. 74).

Figure 3 does not suggest that compulsory voting increased the share of invalid votes in the border municipalities between Carinthia and Salzburg. The municipalities in Salzburg and Carinthia follow a common trend in the elections prior to 1986. Afterwards, the share of invalid votes increased in

Carinthia to a larger extent than in Salzburg in 1986, but this relationship turned around in 1990.

The common trend assumption seems also to be fulfilled for party vote shares before 1986. The vote share for left-wing and right-wing parties stagnated between 1975 and 1983. In 1986, the vote share of left-wing parties started to decline, whereas the vote share of right-wing parties increased. The vote share of left-wing parties stagnated in Carinthia but somewhat increased in Salzburg over the period 1986-1990.

Figure 3: Turnout, invalid votes and party vote shares in national elections (1975-1999)



A further key identification assumption is that sorting into treatment was exogenous. A major concern might be that previous voting behavior may have influenced introducing 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 1959-1983). Thus, the law was not changed to respond to decreasing voter turnout, but compulsory voting was rather intended to increase democratic legitimacy (Ferwerda, 2014, p.243). The federal government decided to abolish compulsory voting in 1992 and hence individual characteristics of municipalities in Carinthia are not likely to have influenced abolishing compulsory voting. We also focus on municipalities close to the border between Carinthia and Salzburg only. The change in the voting law was very likely to be exogenous: the municipalities close to the border do not have a large political power. For example, the 31 Carinthian municipalities close to the border to Salzburg accounted only for approximately 15% of the electorate in Carinthia in 1986. Furthermore, Carinthia did not experience other changes in the electoral law at the same time. Thus, our treatment coefficient should not be driven by policy changes other than compulsory voting.

We estimate a Difference-in-Difference (DD) model that takes the following form:

$$Y_{mst} = \alpha_m + \theta_t + \beta_1 Ca_s + \beta_2 CV_t + \gamma(Ca_s \cdot CV_t) + X'_{mst}\lambda + \epsilon_{mst} \quad (1)$$

where  $Y_{mst}$  describes voter turnout, invalid ballots, or party vote share in municipality  $m$ , in state  $s$  (Carinthia or Salzburg) and in election  $t$  (1975-1999).  $Ca_s$  is a dummy that takes on the value 1 for Carinthian municipalities, and 0 for Salzburg.  $CV_t$  is a dummy variable that equals 1 for the elections of 1986 and 1990, and 0 otherwise.  $\gamma$  measures the interaction and thus the treatment effect. We also include municipality fixed effects  $\alpha_m$ , year fixed effects  $\theta_t$  and a vector of control variables  $X'_{mst}$ . We use the number of eligible voters and the average annual growth rate of the eligible voters to control for municipality size and economic growth. The fixed effects account for different idiosyncratic effects. Year fixed effects, for example, absorb a national trend to implement or abolish compulsory voting, which is municipality invariant but year specific. Municipality fixed effects capture differences between Salzburg and Carinthia that are time invariant. We estimate the model by Ordinary Least Squares (OLS) and standard errors robust to heteroscedasticity (Huber, 1967; White, 1980).

To disentangle the effect of introducing and abolishing compulsory voting on the dependent variables, we modify our baseline model by including dummy variables for the periods before and after compulsory voting:

$$Y_{mst} = \alpha_m + \theta_t + \beta_1 Ca_s + \sum_{i=1}^2 \rho_i time_i + \sum_{i=1}^2 \delta_i (Ca_s \cdot time_i) + X'_{mst}\lambda + \epsilon_{mst} \quad (2)$$

where  $time_i$  are two dummy variables ( $i = 1, 2$ ) that identify the periods before (1975-1983) and after (1994-1999) compulsory voting was in place.  $\rho_i$  and  $\delta_i$  are the corresponding coefficients.  $\delta_1$  measures the effect of introducing compulsory voting,  $\delta_2$  measures the effect of abolishing compulsory voting. The period of compulsory voting is the reference period and is compared (a) to the period before compulsory voting and (b) to the period after compulsory voting.

To investigate whether the effects of introducing and abolishing compulsory voting have the same magnitude in absolute terms, we extend the DD model to a Difference-in-Difference-in-Difference (DDD) framework:

$$Y_{mst} = \alpha_m + \theta_t + \beta_1 Ca_s + \beta_2 CV_t + \sum_{i=1}^2 \rho_i time_i + \gamma(Ca_s \cdot CV_t) + \sum_{i=1}^2 \delta_i (Ca_s \cdot time_i) + X'_{mst}\lambda + \epsilon_{mst} \quad (3)$$

where  $\delta_1$  measures the difference of introducing and abolishing compulsory voting describing the long term or habit-forming effects of compulsory voting.

To increase the precision of the estimator, we extend the DD regression by a polynomial which

captures the distance of each municipality to the border between Salzburg and Carinthia. We consider municipalities close to the state border because they are close to each other and should be comparable in their unobservable characteristics. Municipalities directly at the border, sharing a frontier with municipalities from the other state, should, however, be even more comparable, while municipalities away from the border may differ because they are further away. Therefore, by including the distance to the border in our empirical model, we put more weight on municipalities close to the border to consider unobserved heterogeneity. Doing so gives rise to the Differences-in-Discontinuity (DC) model, with the distance to the border as the running variable (Grembi *et al.*, 2016).<sup>9</sup> The model can also be interpreted as a RDD in a panel framework. Thus, we investigate discontinuities in voter turnout across the state border over time. We estimate the DC regression in a global approach with a linear and quadratic polynomial model.

We examine the validity of the Differences-in-Differences and Regression-in-Discontinuity Design by using a placebo specification, in which the dependent variable is replaced by an additional outcome measure that should not be affected by the treatment. We use the number of the electorate and growth of the electorate. The results are shown in table 2. Compulsory voting did not have an effect on the control variables.

## 5 Results

### 5.1 Baseline

The results of the DD model over the entire period including fixed municipality and fixed time effects suggests that compulsory voting increased voter turnout by around 3.4 percentage points (table 3, column (1)). The effect is rather substantial, because voter turnout in the border municipalities was already high at around 88% in 1983. Column (4) shows the effect of the introduction and abolishment of compulsory voting. Voter turnout increased with the introduction of compulsory voting by 3.6 percentage points and decreased with the abolishment by 3.2 percentage points. The magnitude of the changes in voter turnout in the course of abolishing compulsory voting parallels the effect of introducing compulsory voting. In column (7), we test whether the difference of the two effects is statistically different from zero within a DDD framework.<sup>10</sup> A positive sign indicates that the effect of the introduction was larger than the effect of the abolishment which would imply that compulsory voting had a persistent effect on voter turnout in the three elections after its abolishment. The difference of the effects, however, does not turn out to be statistically significant. Therefore, the results do not suggest that compulsory voting was habit-forming in terms of participation in elections.

The obligation to vote draws voters to the poll who might be uninterested in elections and the

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<sup>9</sup>See for example Grembi *et al.* (2016) and Foremny and Solé-Ollé (2016) for applications of the Differences-in-Discontinuity estimator and especially Grembi *et al.* (2016) for a detailed derivation.

<sup>10</sup>To calculate the difference between the introduction and abolishment effect, the introduction effect has to be multiplied by  $(-1)$ , so that for both, the introduction and abolishment the period with CV is the baseline period. For column (7) this would imply:  $3.605 \cdot (-1) - (-3.237) = -0.368 \cdot (-1) = 0.368$ .

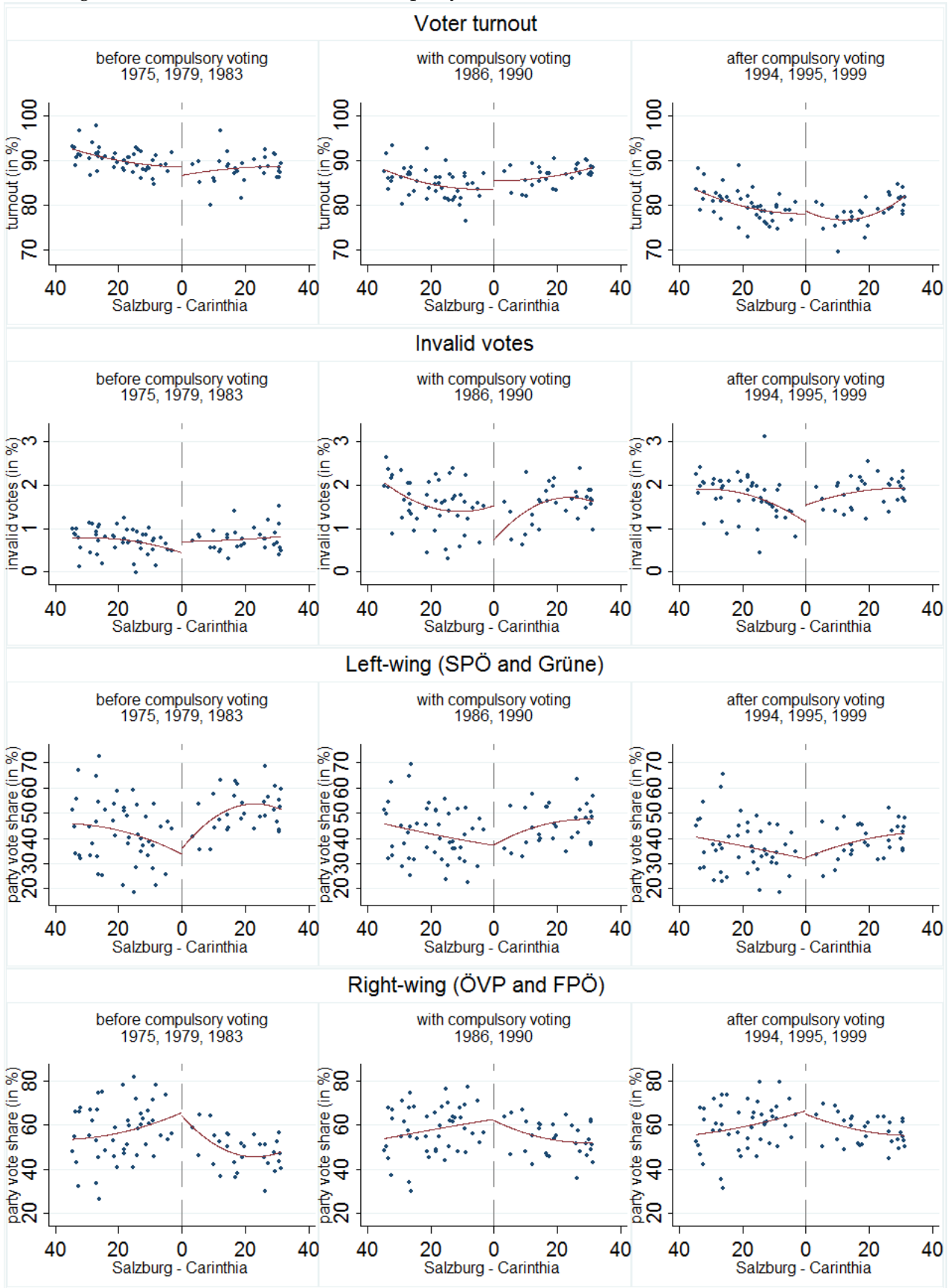
consequent political results. Thus, one may expect that compulsory voting increases invalid votes. The results in table 4 column (1), by contrast, do not show that compulsory voting increased invalid votes. The estimated treatment coefficient has even a negative sign but lacks statistical significance. As we do not see any DD effects in invalid votes, we also do not observe any habit-forming (column (7)).

The results of the effect of compulsory voting on party vote shares are shown in table 5 for the left-wing parties (SPÖ and Grüne) and table 6 for the right-wing parties (ÖVP and FPÖ). The overall effect of compulsory voting on the party vote share of left-wing parties was slightly negative (column (1) in table 5). Splitting the effect into the introduction and abolishment shows that the party vote share of left-wing parties decreased by 4.7 percentage points when compulsory voting was introduced and decreased further by 1.2 percentage points when compulsory voting was abolished (column (4)). Taking together, the left-wing parties lost votes over the entire period (column (7)). The difference between the two effects is statistically significant. The pattern is reversed for right-wing parties. The coefficient estimate of the compulsory voting variable over the entire period is positive and statistically significant (column (1) in table 6). Considering only the introduction of compulsory voting shows that the right-wing party vote share increased by around 4.7 percentage points when compulsory voting was introduced (column (4)), while the vote share of right-wing parties increased even more in the period after compulsory voting was abolished. Similarly to the left-wing parties, the difference of the effects is statistically significant (column (7)). The vote shares of left-wing and right-wing parties developed in a coherent way while introducing and abolishing compulsory voting: left-wing parties lost vote shares over the entire period while right-wing parties gained vote shares. Even though the difference between the two effects is statistically significant, we hesitate to interpret the results as habit-formation. The coherent development might rather indicate that party vote shares followed unobservable regional trends: when we account for proximity to the Carinthia-Salzburg border, however, also habit-forming effects in party vote shares lack statistical significance, an issue we discuss in some more detail below.

We now consider the municipalities' distance to the border. Figure 4 shows voter turnout, invalid votes and party vote shares in the periods before, during and after compulsory voting, while the municipalities are ordered by their distance to the state border. When the distance to the border is taken into account, the difference in party vote shares on both sides of the border seems to vanish.

The results of the DC models support the DD results of compulsory voting on voter turnout. Compulsory voting increased voter turnout by around 3.7 and 2.7 percentage points (table 3 linear DC in column (2) and quadratic DC in column (3)). The effect of introducing compulsory voting on voter turnout is statistically significant in both DC specifications. The effect of the abolishment is statistically significant in the linear DC model (column(5)) but lacks statistical significance in the quadratic specification (column (6)). The difference of the effects also does not turn out to be statistically significant once the distance to the border is considered. Therefore, the results do not suggest that compulsory voting induced habit-formation in voting. The results for invalid votes are unchanged in the linear DD model, the quadratic DC model being the exception (table 4, columns (2), (3), (5), (6)). However, the difference in the effects does not turn out to be statistically significant throughout all specifications. The estimated effect of compulsory voting on party vote shares remains

Figure 4: Turnout, invalid votes and party vote shares in national elections (1975-1999)



Remarks: the x-axis displays the distance of the municipalities to the border between Salzburg and Carinthia; left side: Salzburg, right side: Carinthia.

similar in the linear DC model, compared to the DD estimation. Left-wing parties constantly lost votes during the entire period, while right-wing parties expanded their vote share (tables 5 and 6). The coefficients lack statistical significance in the quadratic DC specification. In general, the effects of compulsory voting on the party vote shares sometimes lack statistical significance when we account for the distance to the border, and hence, for unobserved heterogeneity. With the quadratic polynomial the effects always lack statistical significance. This indicates that compulsory voting did not have an asymmetrical long-term habit-forming effect.

Taking together, the results do not support that left-wing parties benefit from higher voter turnout levels. The rise of right-wing populism in Austria may explain this finding. 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). Haider managed to double the vote share of his party in Austria (1983: 4.98%; 1986: 9.73%). The strongest FPÖ bases were Carinthia, where Haider became the governor in 1989 (Hirczy, 1994, p. 74), but also Salzburg. In Carinthia and Salzburg, the FPÖ received 20.9% and 15.9% in the 1986 national elections. The FPÖ succeeded because it received electoral support from voters with manifold political preferences and with various backgrounds.<sup>11</sup> Luther (1987) maintains that in 1986 only around a third of the FPÖ voters shared the same ideology, some of them with far right, racists and anti-Semitic views. The remaining two thirds were protest voters, attracted by Haider's campaigning, but not the political ideology. However, our results not suggesting that compulsory voting was habit-forming indicate that the increase in the right-wing party vote share cannot entirely be attributed to Jörg Haider, but also to compulsory voting.

## 5.2 Robustness

We test the robustness of our results in various ways. The results should not be sensitive to including or excluding individual control variables. Therefore, we estimated the model excluding control variables (table 7 in the appendix). Inferences do not change.

The municipalities that are further away from the state border may differ from the municipalities closer to the border. We estimate the DD model only for the municipalities which are directly located at the border and share a frontier with a municipality from the other state (table 8 in the appendix). The results show that compulsory voting increased voter turnout by around 3.8 percentage points. Introducing and abolishing compulsory voting influenced voter turnout by approximately the same magnitude, the difference in the effects of introducing and abolishing compulsory voting again lack statistical significance. However, the effects of compulsory voting on the left-wing and right-wing party vote shares do not turn out to be statically significant. We find some evidence for habit-forming effects in the DDD model (columns (4) and (5)). But, as the party vote shares developed similarly when compulsory voting was introduced and abolished, this might indicate unobservable regional trends. In any event, we believe that our quadratic DC model balances the number of observations and accounting for unobservable heterogeneity better than the border subsample because the number

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<sup>11</sup>The FPÖ attracted conservative voters and also voters from the left-wing SPÖ (see, e.g., Ochsner and Roesel (2017)). Potrafke and Roesel (2016) show that extending opening hours of polling stations in Austria increased both the vote shares of the SPÖ and the FPÖ. Both the populist right-wing FPÖ and the left-wing SPÖ rely on blue-collar voters.

of border municipalities decreases to only 17. In the more suitable quadratic DC model, we do not find habit-forming effects of compulsory voting on party vote shares.

Another problem may arise if there is municipality specific clustering or serial correlation. In this case, robust standard errors might be downward-biased. Therefore, we clustered the standard errors at the municipality level (table 9 in the appendix). The inferences do not change. We also ignore the time dimension and pool the data before, during and after compulsory voting was in place to account for a possible inconsistency of the standard errors, as proposed by Bertrand *et al.* (2004) (table 10 in the appendix). The standard errors become, as expected, larger, but the main results remain unchanged.

## 6 Discussion

Our estimated effects of compulsory voting on voter turnout are in line with the results of Hirczy (1994) and Hoffman *et al.* (2017), but merely somewhat smaller. 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 to some extent because of unobservable differences across states. 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; however, for national elections between 1949 and 2010 the estimate lacks statistical significance. Hoffman *et al.* (2017) and Ferwerda (2014) corroborate that compulsory voting does not necessarily favor left-wing parties in Austria. Hoffman *et al.* (2017) do not find an effect of compulsory voting on left-wing and right-wing party votes shares. Ferwerda (2014) investigates the abolishment of compulsory voting in 1992 and finds a small shift from small parties to the SPÖ, but the results for all other parties do not turn out to be statistically significant.

Our results do not support the expectation of habit-formation in voting. An explanation may be that the two elections in 1986 and 1990 with compulsory voting in Carinthia were not sufficient to change voting habits of citizens in the long-run. However, Bechtel *et al.* (2015a) examine over 20 years of compulsory voting in federal referenda in the Swiss canton of Vaud and also do not find any habit-formation of compulsory voting. Moreover, short-term interventions as voter mobilization programs, precipitation on election days, or voting age restrictions are shown to influence the habit of voters. Thus, compulsory voting as such may explain the lack of habit-formation. Compulsory voting forces citizens to the polls, while precipitation, GOTV campaigns or the first election being a U.S. presidential or European Parliament election do not force the citizens to anything but rather appeal to their intrinsic motivation. Frey and Jegen (2001) describe that punishments are likely to weaken or crowd-out intrinsic motivation. Our results are fully in line with these considerations: compulsory voting does not induce habit-formation; intrinsic motivation may play a far more important role than forced voting experiences.



## 7 Conclusion

We examine the short-term and long-term (habit-forming) effects of compulsory voting on voter turnout, party vote shares and invalid votes. We focus on municipalities at the border between the Austrian states of Carinthia and Salzburg. Voting in parliamentary election was compulsory in Carinthia between 1986 and 1992, but remained voluntary in Salzburg. The results show that compulsory voting increased voter turnout in the border municipalities in Carinthia by 3.4 percentage points, a numerically important effect because voter turnout was already pronounced (88% in 1983). Compulsory voting did not influence invalid votes and our findings do not show that left-wing parties benefit from increases in voter turnout.

We also investigate whether compulsory voting had long lasting effects and was habit-forming. The results however do not indicate any long-term effects. After the abolishment of compulsory voting, voter turnout immediately returned to the pre-compulsory voting level. Hence, the effect of compulsory voting did not fade out over time, as would be expected, since voting is seen as a habit-forming process. Forcing citizens to the polls seems to crowd out intrinsic motivation to voting. Future research may well explain the extent to which non-compulsory policy measures such as precipitation and GOTV are habit-forming.

Table 2: Test for confounding trends

	(1)			(2)		
	coefficient	electorate standard error	p-value	coefficient	growth rate of the electorate standard error	p-value
CV overall effect	DD	1.123	0.933	-0.002	0.001	0.111
	linear DC	16.041	0.433	0.005	0.003	0.133
	quadratic DC	-4.507	36.049	0.901	0.008	0.414
CV introduction effect	DD	-48.325	0.374	-0.004	0.002	0.031**
	linear DC	80.408	92.970	0.004	0.004	0.293
	quadratic DC	-125.133	176.184	0.004	0.009	0.646
CV abolishment effect	DD	-50.570	0.150	0.001	0.002	0.567
	linear DC	48.327	62.913	-0.006	0.004	0.120
	quadratic DC	-116.119	123.427	-0.009	0.008	0.287
CV habit forming effect	DDD	-98.895	0.259	-0.003	0.002	0.096*
	linear DDC	128.735	153.422	-0.002	0.004	0.660
	quadratic DDC	-241.252	295.481	-0.005	0.006	0.439

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: the regressions are the same as in tables 3 to 6 but with the electorate and the growth rate of the electorate as the dependent variables; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999.

Table 3: Effect of compulsory voting on voter turnout in national elections

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	DD	linear DC	quadratic DC	DD	linear DC	quadratic DC	DDD	linear DDC	quadratic DDC
CV overall effect	3.418*** (0.349)	3.687*** (0.816)	2.687** (1.226)						
CV introduction effect				3.605*** (0.552)	2.876** (1.247)	3.808** (1.763)			
CV abolishment effect				-3.237*** (0.500)	-4.497*** (1.143)	-1.535 (1.471)			
CV habit forming effect							0.368 (0.786)	-1.621 (1.746)	2.273 (2.104)
Electorate (log)	-1.878 (2.987)	-1.886 (2.996)	-1.887 (3.002)	-1.250 (3.541)	-1.713 (3.519)	-0.823 (3.528)	-1.250 (3.541)	-1.713 (3.519)	-0.823 (3.528)
Growth rate electorate	-27.28* (14.75)	-27.65* (14.99)	-27.61* (14.97)	-27.18* (14.81)	-27.85* (15.07)	-27.41* (15.21)	-27.18* (14.81)	-27.85* (15.07)	-27.41* (15.21)
Constant	104.0*** (20.87)	104.1*** (20.94)	104.1*** (20.98)	92.95*** (25.47)	96.29*** (25.31)	89.88*** (25.37)	86.40*** (25.66)	89.77*** (25.50)	83.31*** (25.58)
Observations	624	624	624	624	624	624	624	624	624
R-squared	0.811	0.811	0.811	0.811	0.817	0.820	0.811	0.817	0.820
Number of municipalities	78	78	78	78	78	78	78	78	78

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: voter turnout is the dependent variable; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1)-(3) follow equation (1), columns (4)-(6) refer to equation (2) and columns (7)-(9) refer to equation (3) (extended with a linear (quadratic) discontinuity at the border in the case of linear (quadratic) DDC).

Table 4: Effect of compulsory voting on invalid votes in national elections

VARIABLES	(1) DD	(2) linear DC	(3) quadratic DC	(4) DD	(5) linear DC	(6) quadratic DC	(7) DDD	(8) linear DDC	(9) quadratic DDC
CV overall effect	-0.0978 (0.0986)	-0.111 (0.246)	-1.093** (0.468)						
CV introduction effect				-0.0576 (0.107)	-0.0267 (0.278)	-1.028* (0.527)			
CV abolishment effect				0.137 (0.114)	0.195 (0.259)	1.158** (0.493)			
CV habit forming effect							0.0790 (0.101)	0.168 (0.215)	0.130 (0.403)
Electorate (log)	0.0497 (0.431)	0.0493 (0.429)	0.0532 (0.431)	0.185 (0.464)	0.0476 (0.434)	0.00864 (0.442)	0.185 (0.464)	0.0476 (0.434)	0.00864 (0.442)
Growth rate electorate	-2.710 (3.058)	-2.622 (3.024)	-2.553 (3.048)	-2.689 (3.063)	-2.587 (3.014)	-2.530 (3.053)	-2.689 (3.063)	-2.587 (3.014)	-2.530 (3.053)
Constant	0.390 (2.983)	0.392 (2.970)	0.364 (2.984)	0.619 (3.323)	1.604 (3.106)	1.884 (3.165)	0.177 (3.365)	1.172 (3.141)	1.455 (3.201)
Observations	624	624	624	624	624	624	624	624	624
R-squared	0.616	0.618	0.624	0.616	0.621	0.627	0.616	0.621	0.627
Number of municipalities	78	78	78	78	78	78	78	78	78

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: share of invalid votes is the dependent variable; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1)-(3) follow equation (1), columns (4)-(6) refer to equation (2) and columns (7)-(9) refer to equation (3) (extended with a linear (quadratic) discontinuity at the border in the case of linear (quadratic) DDisc.

Table 5: Effect of compulsory voting on party vote share of left-wing parties in national elections

VARIABLES	(1) DD	(2) linear DC	(3) quadratic DC	(4) DD	(5) linear DC	(6) quadratic DC	(7) DDD	(8) linear DDC	(9) quadratic DDC
CV overall effect	-1.682*** (0.477)	-1.804* (1.045)	-1.316 (2.482)						
CV introduction effect				-4.700*** (0.767)	-5.165*** (1.548)	-2.101 (3.194)			
CV abolishment effect				-1.226** (0.582)	-1.767 (1.408)	0.322 (2.855)			
CV habit forming effect							-5.926*** (0.966)	-6.932*** (2.090)	-1.779 (3.477)
Electorate (log)	10.18* (5.118)	10.19* (5.134)	10.21* (5.137)	0.0521 (5.089)	0.901 (5.382)	2.710 (5.250)	0.0521 (5.089)	0.901 (5.382)	2.710 (5.250)
Growth rate electorate	-11.46 (15.14)	-11.55 (15.27)	-11.40 (15.15)	-13.05 (13.77)	-13.47 (13.33)	-12.64 (12.97)	-13.05 (13.77)	-13.47 (13.33)	-12.64 (12.97)
Constant	-26.44 (35.71)	-26.49 (35.82)	-26.66 (35.84)	44.22 (36.61)	38.12 (38.74)	25.09 (37.80)	35.55 (36.91)	29.40 (39.03)	16.26 (38.07)
Observations	624	624	624	624	624	624	624	624	624
R-squared	0.645	0.645	0.647	0.708	0.710	0.724	0.708	0.710	0.724
Number of municipalities	78	78	78	78	78	78	78	78	78

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: party vote share of left-wing parties is the dependent variable, this includes the SPÖ and Grüne as well as the Kärntner Grüne, ALÖ and VGO; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1)-(3) follow equation (1), columns (4)-(6) refer to equation (2) and columns (7)-(9) refer to equation (3) (extended with a linear (quadratic) discontinuity at the border in the case of linear (quadratic) DDisc.

Table 6: Effect of compulsory voting on party vote share of right-wing parties share of the ÖVP and FPÖ in national elections

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	DD	linear DC	quadratic DC	DD	linear DC	quadratic DC	DDD	linear DDC	quadratic DDC
CV overall effect	1.414*** (0.506)	1.793* (1.053)	1.134 (2.342)						
CV introduction effect				4.704*** (0.757)	4.783*** (1.580)	0.956 (3.273)			
CV abolishment effect				1.758*** (0.592)	1.436 (1.377)	-1.060 (2.651)			
CV habit forming effect							6.461*** (0.907)	6.219*** (2.098)	-0.104 (3.761)
Electorate (log)	-12.83** (4.991)	-12.85** (5.014)	-12.88** (5.015)	-1.789 (4.864)	-2.083 (5.185)	-3.712 (4.964)	-1.789 (4.864)	-2.083 (5.185)	-3.712 (4.964)
Growth rate electorate	14.54 (15.23)	14.48 (15.33)	14.30 (15.22)	16.27 (13.79)	16.37 (13.64)	15.52 (13.14)	16.27 (13.79)	16.37 (13.64)	15.52 (13.14)
Constant	144.2*** (34.81)	144.3*** (34.96)	144.5*** (34.98)	67.75* (34.97)	69.87* (37.30)	81.61** (35.73)	74.40** (35.26)	76.53** (37.60)	88.37** (35.99)
Observations	624	624	624	624	624	624	624	624	624
R-squared	0.489	0.490	0.494	0.596	0.598	0.617	0.596	0.598	0.617
Number of municipalities	78	78	78	78	78	78	78	78	78

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: party vote share of right-wing parties is the dependent variable, this includes the ÖVP and FPÖ; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1)-(3) follow equation (1), columns (4)-(6) refer to equation (2) and columns (7)-(9) refer to equation (3) (extended with a linear (quadratic) discontinuity at the border in the case of linear (quadratic) DDisc.

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# 9 Appendix

Figure 5: Compulsory voting in parliamentary elections, states of Austria

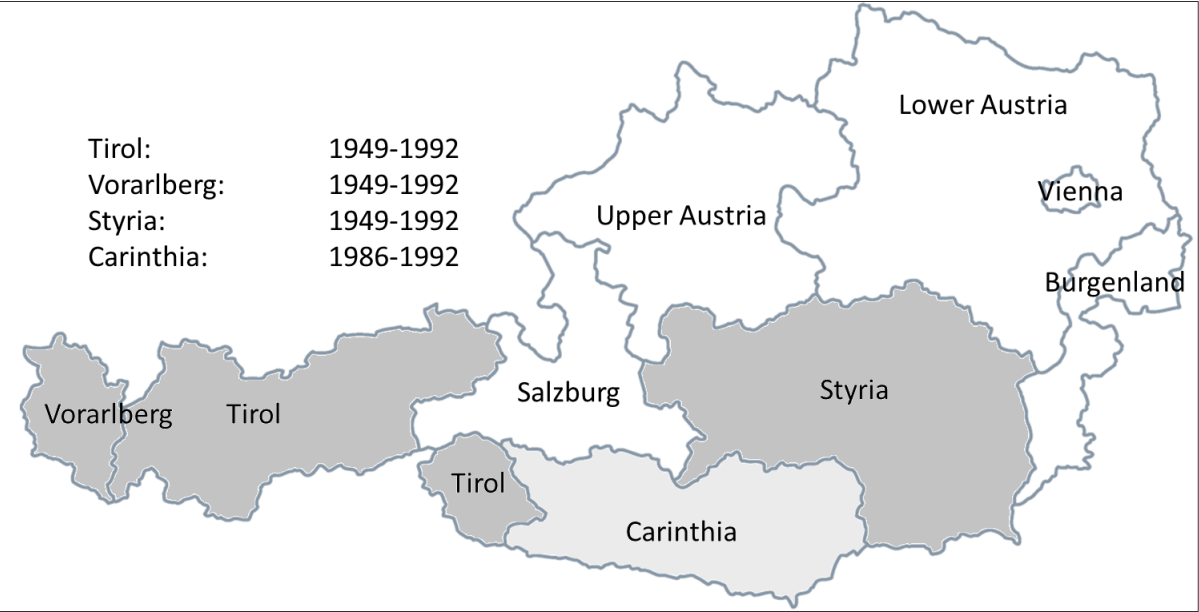


Table 7: Robustness check: effect of compulsory voting in national elections (without control variables)

	(1)		(2)		(3)		(4)	
	turnout	invalid votes	vote share left-wing parties	vote share right-wing parties	coefficient	standard error	coefficient	standard error
CV overall effect	DD	3.489***	0.353	-0.092	-1.707***	0.472	1.445***	0.501
	linear DC	3.530***	0.823	-0.123	-1.757**	1.031	1.734*	1.032
	quadratic DC	2.487*	1.276	-1.109	-1.257	2.433	1.058	2.267
CV introduction effect	DD	3.757***	0.508	-0.056	-4.655***	0.730	4.723***	0.732
	linear DC	2.753**	1.263	-0.037	-5.217**	1.523	4.842***	1.549
	quadratic DC	3.716**	1.780	-1.038*	-2.204	3.089	1.090	3.128
CV abolishment effect	DD	-3.220***	0.460	0.128	-1.240**	0.590	1.833***	0.603
	linear DC	-4.307***	1.124	0.209	-1.702	1.429	1.374	1.403
	quadratic DC	-1.258	1.480	1.180**	0.310	2.886	-1.027	2.707
CV habit forming effect	DDD	-0.538	0.663	0.072	-5.895***	0.934	6.556***	0.890
	linear DDC	-1.554	1.729	0.172	-6.920***	2.109	6.215***	2.111
	quadratic DDC	2.458	2.039	0.142	-1.894	3.446	0.063	3.672

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: the regressions are the same as in tables 3 to 6 but without control variables; turnout, invalid ballots and party vote share of left-wing and right-wing parties are the dependent variables; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999.

Table 8: Robustness check: DD estimate for municipalities directly at the border

	(1)		(2)		(3)		(4)		
	coefficient	standard error	turnout	invalid votes coefficient	standard error	left-wing vote share coefficient	standard error	right-wing vote share coefficient	standard error
CV overall effect	3.785***	0.680		-0.293	0.241	-0.163	1.006	-0.147	1.004
CV introduction effect	3.289**	1.423		-0.319	0.269	-2.414	1.387	2.212	1.398
CV abolishment effect	-4.287***	0.984		0.267	0.271	-2.109	1.241	2.528*	1.279
CV habit forming effect	-0.998	2.040		-0.053	0.238	-4.523**	1.707	4.740**	1.782

\*\*\* p<0.01. \*\* p<0.05, \* p<0.1

Note: turnout, invalid votes and party vote share of left and right-wing parties are the dependent variables; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1) follow equation (1), column (2) refers to equation (2) and columns (3) refers to equation (3); number of municipalities are 17, number of observations: 136.

Table 9: Robustness check: standard errors clustered at the municipality level

	(1)		(2)		(3)		(4)		
	turnout	invalid votes	vote share left-wing parties	vote share right-wing parties	coefficient	standard error	coefficient	standard error	
CV overall effect	DD	3.418***	0.349	-0.098	0.099	-1.682***	0.477	1.414***	0.506
	linear DC	3.687***	0.816	-0.111	0.246	-1.803*	1.045	1.793*	1.053
	quadratic DC	2.687**	1.226	-1.093**	0.468	-1.316	2.482	1.134	2.342
CV introduction effect	DD	3.605***	0.552	-0.058	0.107	-4.700***	0.767	4.704***	0.757
	linear DC	2.876**	1.247	-0.027	0.278	-5.165***	1.548	4.783***	1.580
	quadratic DC	3.808**	1.763	-1.028*	0.527	-2.101	3.194	0.956	3.273
CV abolishment effect	DD	-3.237***	0.500	0.137	0.114	-1.226**	0.582	1.758***	0.592
	linear DC	-4.497***	1.143	0.195	0.259	-1.767	1.408	1.436	1.377
	quadratic DC	-1.535	1.471	1.158**	0.493	0.322	2.855	-1.060	2.651
CV habit forming effect	DDD	0.368	0.786	0.079	0.101	-5.926***	0.966	6.461***	0.907
	linear DDC	-1.621	1.746	0.168	0.215	-6.932***	2.090	6.219***	2.098
	quadratic DDC	2.273	2.104	0.130	0.403	-1.779	3.477	-0.104	3.761

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

Note: turnout, invalid votes and party vote share of left and right-wing parties are the dependent variables; time and municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1) follow equation (1), column (2) refers to equation (2) and columns (3) and (4) refer to equation (3); standard errors are clustered at the municipality level.

Table 10: Robustness check: pooled data

	(1)		(2)		(3)		(4)	
	turnout	invalid votes	vote share left-wing parties	vote share right-wing parties	coefficient	standard error	coefficient	standard error
CV overall effect	DD	3.389***	0.530	-0.112	-1.582**	0.624	1.324**	0.598
	linear DC	3.722***	1.426	-0.076	-2.055	1.482	2.014	1.393
	quadratic DC	2.730	2.933	-1.049***	-1.635	3.026	1.416	2.846
CV introduction effect	DD	3.154***	0.665	-0.042	-4.389***	0.558	4.468***	0.566
	linear DC	2.960*	1.633	-0.003	-5.273***	1.339	4.902***	1.353
	quadratic DC	3.651	3.067	-0.981*	-2.093	2.848	1.005	2.879
CV abolishment effect	DD	-3.549***	0.637	0.173	-1.059*	0.554	1.667***	0.587
	linear DC	-4.707***	1.667	0.170	-1.565	1.342	1.236	1.421
	quadratic DC	-2.077	3.497	1.144**	0.713	2.757	-1.407	2.909
CV habit forming effect	DDD	-0.395	0.697	0.131	-5.447***	0.569	6.135***	0.588
	linear DDC	-1.747	1.609	0.168	-6.837***	1.348	6.138***	1.421
	quadratic DDC	1.573	2.700	0.163	-1.381	2.565	-0.402	2.790

\*\*\* p &lt; 0.01, \*\* p &lt; 0.05, \* p &lt; 0.1

Note: turnout, invalid votes and party vote share of left and right-wing parties are the dependent variables; municipality fixed-effects are included; observations are municipalities in Salzburg and Carinthia in the eight national elections between 1975 and 1999; the regressions in column (1) follow equation (1), column (2) refers to equation (2) and columns (3) and (4) refer to equation (3); observations for the periods before, during and after compulsory voting are pooled and the time dimension is ignored.