UNIVERSITÄT BERN

Faculty of Economics and Social Sciences

Department of Economics

The Participation Gap
Evidence from Compulsory Voting Laws

Dominik Hangartner
Lukas Schmid

11-01

December 2010

DISCUSSION PAPERS

Schanzeneckstrasse 1
Postfach 8573
CH-3001 Bern, Switzerland
http://www.vwi.unibe.ch

The Participation Gap
Evidence from Compulsory Voting Laws

Dominik Hangartner* and Lukas Schmid**

December 15, 2010

Abstract

Why do some people go to the polling station, sometimes up to several times a year, while others always prefer to stay at home? This question has launched a wide theoretical debate in both economics and political science, but convincing empirical support for the different models proposed is still rare. The basic rational voting model of Downs (1957) predicts zero participation because each individual vote is extremely unlikely to be pivotal. One prominent modification of this model is the inclusion of a civic duty term into the voter's utility function (Riker and Ordeshook, 1968) which has been the basis of structural ethical voting models such as Coate and Conlin (2004) and Feddersen and Sandroni (2006). Another branch of structural models looks at informational asymmetries among citizens (Feddersen and Pesendorfer, 1996, 1999). This paper tests the implications of these two branches of structural models by exploiting a unique variability in compulsory voting laws in Swiss federal states. By analyzing a newly compiled comparative data set covering the 1900-1950 period, we find large positive effects of the introduction of compulsory voting laws on turnout. Along with the arguably exogenous treatment allocation, several specification and placebo tests lend support to a causal interpretation of this result. The findings of this study lend support to the ethical voting models since citizens do react to compulsory voting laws only if it is enforced with a fee. At the same time, the informational aspect of non-voting is questioned as "new" voters do not delegate their votes.

JEL classification: D72
Keywords: Compulsory Voting, Voter Turnout, Structural Voting Models

*Department of Social Sciences, University of Bern, Lerchenweg 36, CH-3000 Berne, Switzerland. email: dominik.hangartner@ipw.unibe.ch
**Department of Economics, University of Bern, Schanzeneckstrasse 1, P.O. Box 8573, CH-3001 Berne, Switzerland. email: lukas.schmid@vwi.unibe.ch
We thank Reto Foellmi and the participants of the doctoral conference for useful comments and Yvan Rielle for the indispensable data support. Fabian Morgenthaler, Christian Vogt and Nils Bürk were instrumental for the data collection.

1 Introduction

Electoral participation constitutes an important research topic in both political science and economics. Most of the literature can be divided in two branches: the normative or the positive camp. From a normative vantage point, the decreasing political participation rates constitute an important legitimacy problem for democracy and might even imply a class bias (Lijphart, 1997). In contrast, from a positive point of view we still lack a consistent explanation why people go to the polling station at all. The basic model of Downs (1957) is a starting point to think about voting in a structured manner but predicts zero participation—which is inconsistent with positive turnout rates.

A prominent modification of the Downsian model is the introduction of civic duty and social costs in the utility function of voters (Riker and Ordeshook, 1968). The idea is that people derive utility from the act of voting since they fulfill their duty as a citizen[1]. This assumption is underneath the structural voting models of Coate and Conlin (2004) and Feddersen and Sandroni (2006). Apart from modifying individuals decision rule, a strand of this literature argues that there exists a swing voters curse (Feddersen and Pesendorfer, 1999). Under incomplete information less informed voter can be decisive and know this. As a consequence they decide rather to abstain than to vote for a non-preferred alternative.

This paper cannot answer the question why people vote, since this is a question about the *causes of an effect*. But it makes several contributions about the *effect of a cause*, namely the effect of the introduction of several compulsory voting laws. First, it makes a clear statement about whether unfrequent participants react to cost or duty. Second, it shows that unfrequent voters do not delegate their votes which questions the model assumptions of (Feddersen and Pesendorfer, 1996, 1999). We use data of Swiss cantons (federal states) to separate the effects of costs and civic duty by analyzing compulsory voting laws. Both Vaud (1920) and Ticino (1924) changed their voting laws in the 1920ies. Vaud charged a fee of 2 Swiss francs on non-voters, Ticino did not introduce a punishment. The fee in Vaud is more than an average hourly wage for a worker in the steel, machine and metal industry[2] (Siegenthaler and Ritzmann, 1996) and thus more than just a symbolic sanction.

We find that turnout only reacts in the canton Vaud where voting laws were

[1]Riker and Ordeshook (1968, 28) list several dimensions of civic duty such as "the satisfaction from compliance with the ethic of voting, which if the citizen is at all socialized into the Democratic tradition is positive when he votes and negative (from guilt) when he does not."

[2]Nominal wages in the year 1921 range from 1.49SFR to 1.78SFR depending on the regional wage level. The overall average is 1.60SFR.

enforced by a fee, but not in the canton without a financial punishment. Furthermore, it can be shown that empty and non-valid ballots, which are indicators for vote delegation and little information, did not increase in the canton Vaud.

The paper is organized as follows. Section 2 states the theoretical background of the voting literature. Section 3 presents historical details of compulsory voting in Switzerland. In Section 4 our research design is described. Section 5 presents the results. Section 6 concludes.

2 Theory

2.1 The Paradox of Voting

Since Downs (1957) seminal contribution to political theory in democratic systems, economists try to explain why there is even a single voter participating in democratic elections. In the basic model of two-candidates-election, citizens compare costs and benefits of voting. Costs (C) include information and time efforts whereas the benefits of a single vote are pB; where p is the probability that the vote is pivotal and B is the utility difference of the two political alternatives. Voters vote if

$$pB > C$$

but since p is assumed to go to zero as the population size gets large, this implies that nobody is expected to vote. The equilibrium in this general model contrasts with the simple empirical observation that still a considerable fraction of people go to the polling station. To account for this drawback, there have been various modifications of the Downsian model[3].

2.2 Modifications of the Downsian Model

2.2.1 Civic duty

Riker and Ordeshook (1968) modify the Downsian model to include a utility of civic duty denoted by D. The condition to vote changes to

[3]Laboratory studies of of the pivotal voting models such as Duffy and Tavits (2008) show that individuals seem to overestimate that their decision of participation or non-participation would be pivotal. Furthermore, the relationship between perceived pivotality and participation is very weak even in small-scale-elections.

$$pB - C + D > 0 \ .$$

As pB tends to zero, people vote if their civic duty benefit D is higher than their cost C. In this case, a citizen derives utility from the act of voting independent of the alternative she chooses. Blais (2000) shows that many citizens think about voting as a moral obligation. The drawback of this approach is that the value of D is exogenous and not determined by the model.

2.2.2 Structural Voting Models with Ethical Voters

The structural models of Coate and Conlin (2004) and Feddersen and Sandroni (2006), based on the work of Harsanyi (1980), incorporate so called ethical voters and endogenize the voting decision. Individuals do not directly derive utility from the act of voting. In contrast, they derive utility by following a decision rule which maximizes the payoff of an aggregate (ie. of their group in the model of Coate and Conlin or of the society in Feddersen and Sandroni). An important feature of both models is that citizens differ in their cost levels and since some individuals face relatively high costs it is not optimal to push them to the voting booth. In equilibrium there is an optimal cost level $\bar{D}$ which is a cut-off point stating that all group members with voting costs lower than $\bar{D}$ should vote and all others abstain.[4]

The model of Coate and Conlin is slightly more general because supporters and opposers can have different valuation of the outcome. On the other hand, Feddersen and Sandroni allows a certain (random) fraction to be non-ethical voters. They receive zero payoff from following the group's decision rule and hence always abstain. In our view, this is a nice feature since it makes the population even more heterogenous and captures the fact that some individuals just do not care about politics.

2.2.3 Structural Voting Models with Asymmetric Information

Feddersen and Pesendorfer (1996, 1999) develop a model with costless voting where people are uncertain about a state variable that shapes their preferences. Informed citizens know about the state of the world while uninformed citizens only have a prior about it. In a large electorate, uninformed voters delegate their vote because they fear to elect the not-preferred candidate (or alternative) in the relative

[4] We use the notation $\bar{D}$ to relate it to relate the structural voting models of Riker and Ordeshook (1968). Coate and Conlin (2004) name this cut-off point γ^* while Feddersen and Sandroni (2006) call it $\sigma_i \bar{c}$.

improbable state. It is therefore an equilibrium outcome that uninformed people do not go to the polling station although they have strict preferences about the alternatives. This is in line with the empirical evidence that the likelihood to vote increases with higher education and higher information levels. In analogy with the *winner's curse* in auction theory this effect of asymmetric information is called *swing voter's curse* (Feddersen and Pesendorfer, 1996).

2.2.4 Predictions from Structural Voting Models

Structural voting models deviate from pivotal voting models with a representative agent by introducing heterogeneity among citizens. This allows to model non-zero and varying participation rates. But models differ in terms of their mechanisms why people go to the poll stations. Two important implications can be tested in the context of compulsory voting.

First, according to the ethical voting models, turnout should increase if there is a shock to voting cost because in this case the critical threshold $\bar{D}$ changes. We expect $\bar{D}$ to increase since voting costs decrease for all individuals as non-voting is punished by a fee. Furthermore, both models assume that civic duty is an individual rule and cannot be enforced by a central authority: only making voting compulsory should not increase turnout.

Second, structural voting models with asymmetric information say that some voters do not go to the polling station as they delegate their vote. If voting is punished with a fee, participation should rise but among the "new" voters one expects many uninformed voters. This is in line with survey evidence that voters are more informed than non-voters. As a consequence, one would expect that empty ballots or non-valid votes would increase if some uninformed voters are enforced to vote by a fee[5].

[5]Feddersen and Pesendorfer (1996, 1999) reduce the problem to a information/non-information trade-off and neglect cost aspects by assuming that voting is not costly. However, they do not dispute that voting is costly but the analysis wants to show informational aspects of voting "independent of costs to vote and pivot probabilities." (Feddersen and Pesendorfer, 1996, 409)

3 Compulsory Voting in Switzerland

Switzerland is a federal country consisting of 26 cantons. Its current administrative structure dates back to the Act of Mediation in 1803 when Napoleon ended the violent conflict between Unitarists and Federalists. A consequence of this treaty was the reinstallation of the 13 old cantons and the creation of six new cantons[6]. After the Congress of Vienna there were six more regions joining the Federation as cantons. The Act of Mediation gave the cantons the right to establish requirements for suffrage by themselves (Jorio and Sonderegger, 2007). As a consequence, the right to vote was constrained by economic, religious and gender attributes. During the regeneration liberal ideas forced the cantons to extend the suffrage to all solvent Swiss men. In 1848, the Swiss constitution finally gave all male Swiss citizens the right to vote.

The central state guarantees the right to vote in the constitution and tries to unify the cantonal voting systems. Nevertheless, cantons enjoy several degrees of freedom in the exact design of the voting system. Several federal unities manifested an obligation to vote. This duty varied in its scope (communal, cantonal, federal) and in the manner of punishment. The canton of Basel-Land for instance had a law on compulsory voting from 1863 to 1892 (see table 10 in appendix for an overview). The last two cantons making voting mandatory were Ticino and Vaud in 1920 and 1924, respectively (Kley, 1989, 163).

The law on political rights 113/49 from 11/17/1924 was approved by the cantonal parliament of Vaud. It stated that participation in federal referenda is compulsory for all citizens under 65 years. Unauthorized absences were punished by a fee of two Swiss francs which was collected by local police authorities. The revenues from non-voters varied between 8.000 and 16.000 Swiss francs and were spent on a fund for poor people and a hospital pool with equal shares [7]. The canton of Vaud abolished its compulsory voting law for the war period between 1940 and 1945. After the end of WWII in 1945, Vaud quickly re-established compulsory voting only to permanently abolish it after three years in 1948. This repeated treatment pattern allows as to disentangle short- from long-term effects on turnout and also gives us leverage to conduct several post-treatment falsification tests (see section 5.2).

The reason why Vaud introduced compulsory voting was twofold. First, politicians sought to improve civic spirit in Vaud. Second, the cantonal government saw Vaud as the voice of the French-speaking minority and thus sought to increase its

[6] The new cantons were former tributary regions of the union *Alte Eidgenossenschaft*.

[7] The law as well as a document showing federal revenues from fee collection can be found in the appendix.

weight in federal elections.

Ticino was another canton that introduced compulsory voting in this period. The partial revision of the cantonal constitution from 1920 ruled that voting is a civic duty[8] (Kley, 1989, 163). However, in contrast to Vaud, there was no sanction for non-voters. It is important to note that this constitutional change was approved in a cantonal referenda and thus had popular support from the majority of the affected citizens.

Several cantons did not have compulsory voting laws during the treatment period of Vaud and Ticino. This allows us to construct a (synthesized) control group. We use two specifications for the analysis. In the limited specification we include only cantons without any obligation on the level of constitution or law. The second specification also includes cantons with written obligation but without sanctions. We argue that this does not violate the assumption of Abadie, Diamond, and Hainmueller (2010) since we apply a generalized difference-in-difference procedure.

4 Research Design

4.1 Measurement

We use cantonal data from a database that contains every federal referendum in Switzerland from 1866 to 2009. It provides information on turnout, closeness (ie. the difference between the two alternatives), and the number of referenda at election day. The database also includes the number of eligible voters which is a proxy for the (unconditional) probability of being pivotal. All information was collected by a research team from the Institute of Political Science of the University of Bern (Bolliger, Linder, and Rielle, 2010).

To control for other factors driving the participation rate, we collected information on a set of covariates[9]. In most micro and macro studies education has a positive and strong effect on turnout (Mueller 2005, 314). We use the population share of secondary students as a measure for educational level of a canton. Furthermore, it is often argued that urban people have higher political interest than rural people. We use the rate of the urban population to control for this effect. Some studies also find that elder citizens are more likely to participate. The variables for the share of people older than 50 respectively 60 take this into account.

[8]Details were organized in article 34/2 of the cantonal constitution from 1920 which replaced the cantonal constitution from 1892.

[9]Table 4 in the appendix shows an overview of the data sources.

Since data on the economic output at the cantonal level is unavailable,[10] we use the number of motor vehicles per person as a proxy instead. Controlling for the economic output or a correlated proxy is instrumental since many studies show a positive impact of income on voting turnout (Ashenfelter and Kelley 1975; Knack 1995). In addition, we include public spending and revenues into our specification.

4.2 Identification Strategy

To identify the causal effect of compulsory voting laws in Swiss states, the empirical analysis relies on a particular variant of the difference-in-differences (DID) strategy: the synthetic control method (Abadie and Gardezabal (2003) and Abadie, Diamond, and Hainmueller (2010)). The synthetic control method is designed to compare the evolution of an aggregate outcome (i.e. turnout) for the unit (i.e. state) affected by the intervention (i.e. compulsory voting law) to the evolution of the same aggregate for some control group (i.e. states where voting is voluntary). Let there be $J+1$ states in periods $1, 2, \dots, T$, where state "one" is exposed to the intervention, that is, enact a compulsory voting law during periods $T_0+1, \dots, T$. Let Y_{it}^N be the level of turnout that would be observed for state i at time t in the absence of the intervention. Let Y_{it}^I be the outcome that would be observed for state i at year t if state i is exposed to the intervention in the years T_0+1 to T. We aim to estimate the effect of the compulsory voting law on the treated state $(\alpha_{1T_0+1}, \dots, \alpha_{1T})$, where $\alpha_{1t} = Y_{1t}^I - Y_{1t}^N = Y_{1t} - Y_{1t}^N$ for $t > T_0$. Intuitively, the synthetic control method imputes the counterfactual control response for the treated state i using a weighted average of the control states ($j = 2 \dots J+1$). To compute this weighted average, we define the convex weights $W = (w_2, \dots, w_{J+1})'$ with $w_j \geq 0$ for $j = 2, \dots, J+1$ and $w_2 + \dots + w_{J+1} = 1$. Each value of W represents a potential synthetic control. Let $\bar{Y}_i^{K_1}, \dots, \bar{Y}_i^{K_M}$ be M linear functions of pre-intervention outcomes. Suppose that we can choose W^* such that:

$$\sum_{j=2}^{J+1} w_j^* Z_j = Z_1, \ \sum_{j=2}^{J+1} w_j^* \bar{Y}_j^{K_1} = \bar{Y}_1^{K_1}, \ \cdots \ , \ \sum_{j=2}^{J+1} w_j^* \bar{Y}_j^{K_M} = \bar{Y}_1^{K_M}.$$

Then, for $t \in \{T_0+1, \dots, T\}$, an unbiased estimator of α_{1t} is given by:

$$\widehat{\alpha}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}$$

Let $X_1 = (Z_1, \bar{Y}_1^{K_1}, \dots, \bar{Y}_1^{K_M})'$ be a $(k \times 1)$ vector of pre-intervention characteristics containing all relevant predictors of the outcome variable. Similarly, X_0 is a

[10] Official data on Swiss GDP is available since 1980. Cantonal output is available since 1998.

$(k \times J)$ matrix which contains the same variables for the control units. The vector W^* is chosen to minimize $\|X_1 - X_0W\|$, subject to the convexity constraint on the weights. We consider $\|X_1 - X_0W\|_V = \sqrt{(X_1 - X_0W)'V(X_1 - X_0W)}$, where V is the $(k \times k)$ symmetric and positive semidefinite matrix which minimize MSPE in the pre-treatment period (see Abadie, Diamond, and Hainmueller (2010) for implementation details). The synthetic control method generalizes the DID in the sense that it relaxes the DID's parallel trends assumption and thereby allows for heterogeneous responses to multiple unobserved factors and thereby. However, it is important to note the linearity assumption for the relationship of Y_j^K and X_0 and, then, to be aware of potential bias due to linear interpolation.

Vaud introduced compulsory voting with a fee. Various authors such as Blais (2000) argue that the effect of compulsory voting stems from the costs of non-voting but also from stipulating civic duty. Thus, the treatment effect $\alpha_{1t} = \theta_{1t} + \delta_{1t}$ includes two components. To isolate the effect of the fee (θ_{1t}) from the civic duty effect of the law (δ_{1t}) we can calculate $\alpha_{1t} = \delta_{1t}$ for a case where $\theta_{1t} = 0$. We use Ticino, which introduced compulsory voting without a fee, to calculate δ_{1t}. Several arguments can be made to justify that δ_{1t} are likely to be equal in Ticino and Vaud. First, both cantons introduced the law in the 1920's. Second, average participation rates vary in both cantons between 20% and 60% in the period 1900 to 1920. Third, both cantons belong to the Latin-descent language minority in Switzerland and thus cultural factors towards civic duty are similar.

4.3 Estimation

Using the method described above to construct a control group, we estimate the causal effect of the compulsory voting law in the canton of Vaud. Since some cantons also had a variant of compulsory voting laws in the relevant time-period, we have to exclude these cantons from the donor pool; namely Zurich, Aargau, Thurgau, and Saint Gallen. This leaves us with a donor pool of 17 cantons. We define the pre-treatment period as the years from 1900 to 1924. We employ a rich set of controls aggregated at the cantonal level—population size, population share over 50 and 60 years, respectively, the share of urban population, share of people working in sector one and two, respectively, per capita public revenues and spending, the proportion of students attaining a secondary education, and the per capita number of motorized vehicles—as well as the turnout rates for the pre-treatment period to make the identifying assumptions described in the section 4.2 above highly plausible. To attain the closes possible match of the first moments of the treated and re-weighted control distributions of the covariates and pre-treatment outcomes, we use the several different starting points for the V matrix, followed by a nested optimization which combines the interior point method to solve the constrained quadratic programming problem with the Newton-Raphson algorithm. For all estimation results, Abadie, Diamond, and Hainmueller (2010)'s Synth package for Stata was used.

5 Results

5.1 Descriptive Statistics

Figure 1 displays a boxplot of participation for Vaud and the unweighted control cantons. The average turnout rates in Vaud doubled after the introduction of compulsory voting in 1924. In contrast, the abolishment in 1949 decreased participation to a lower level than prior to the treatment. The control cantons also show a higher turnout during the treatment period, although this is less pronounced than in the canton Vaud. We also note a decrease of the turnout variance in the treatment period. In the control group, there has been a small increase in average participation during the treatment period followed by a substantial decrease in the post-treatment period. Overall participation in Switzerland increased from 58.89% in the period 1911 to 1930 to 60.4% in the period 1931 to 1950 and then substantially declined to 48.28% in in the period 1951 to 1970.

The values of the covariates also change over time. Tables 1 and 3 shows that the population average in Vaud and in the control groups increases over time. Furthermore, it can be seen that the amount of elder people rises. Between 1950 and 1970, the share of people over 50 years is already 29% in Vaud and 26% in the control group. The transformation of the Swiss economy from an agrarian to service scope can be seen in the decling share of people working in the first sector. In Vaud this number declines from 14% to 7%, in the control group from 14% to 8%. Interestingly, the average minimal closeness of results in referenda decreased over time from 28.9% to 16.7 % (Vaud), respectively from 25.39% to 15.27% (control group). Furthermore, the nominal amount of public revenue and public spendings in per capita terms rises extensively from pre- to post-treatment from about 80 to around 670 Swiss francs in Vaud and from 60 to 580 in the controls (see also figure 8).

A comparison of the covariates is presented in figures 7, 8 and 9. In contrast to the control cantons, Vaud has a large population. Moreover, the share of urban population is relatively high. In terms of people working in the first and second sector Vaud lies in the mid-range of the control group. The same applies to the share of older people although this share is growing faster in Vaud than in the other cantons. We note that Vaud has relatively high public revenues and spendings per capita.

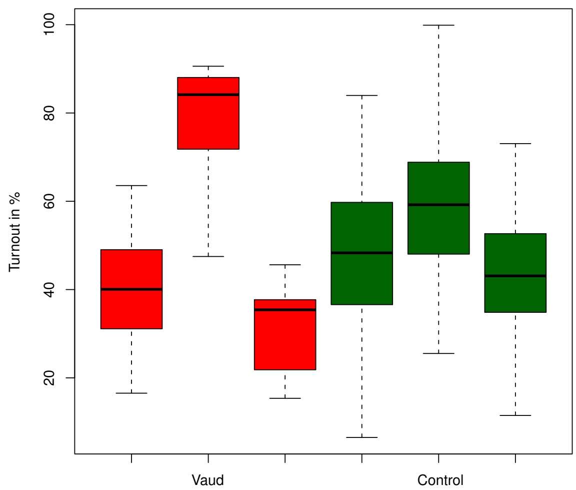

Figure 1: Boxplot of Turnout in Pre-Treatment, Treatment and Post-Treatment-Period

5.2 Synthetic Control

As can be seen from table 2, the balance in terms of the pre-treatment participation considerably improves between Vaud and the control group when moving from the unweighted donor pool to the synthesized control group. Furthermore, the balance in terms of public finance variables such as revenues and spendings as well as the balance in terms of education imrproves. But these improvements come at cost of losing some balance in the sectoral structure of the economy which is – according to the literature – not a central variable driving aggregate turnout.

The cantons receiving positive weights, namely Neuchatel (.55), Bern (.26), Lucerne (.11), Fribourg (.06), and Glarus (.02), are only a small subset of the donor. This result is very common among applications using the synthetic control method. Also, it is interesting to note that without using proximity as a covariate, three of the four cantons receiving the largest weights are immediate neighbors to Vaud.

Except for population size—Vaud has the largest population of all cantons but for the excluded Zurich—the balance between treated and synthesized control group is very high. The imbalance in population size cannot invalidate our results, since the differences in population size between cantons is fairly time-constant and therefore unable to act as a time-varying confounder. The high balance is also reflected in the close alignment of the pre-treatment turnout trajectories of Vaud and its synthesized counterfactual. Figure 2 displays the result of the synthetic control method for Vaud. The blue lines on the time line mark the beginning and the end of compulsory voting in canton Vaud. Turnout in the synthetic control group and in Vaud differ only slightly during the pre-treatment period. The good quality of the approximation is expressed by the relatively small mean squared error of 1.4%. In the treatment period, the gap depicts the causal effect α_{1t} of compulsory voting on turnout and varies between 15% and 50%. The large treatment effect variation can be attributed to a relatively stable participation in Vaud combined with a varying turnout in the control group. Participation during the treatment period ranges from 47.5% to 91% in Vaud[11] and from 26% to 76% in the synthetic control canton. After the cancelation of the bill, turnout in Vaud returns to the level of the control group. The quality of the approximation is not as good as in the pre-treatment period due to the fact that the approximation was performed for the pre-treatment period and covariates in treatment and control group might change over time.

To disentangle the treatment effect $\alpha_t = \theta_t + \delta_t$ into a cost (θ_t) and a civic duty (δ_t) component, we do the synthesization for Ticino. Table 6 shows that the approximation is not as good as for the canton of Vaud. There are two cantons with positive weights in the control group, namely Geneva (.52) and Schwyz (.48). Figure 3 displays the result of the synthetic control method. We see that the control group overestimates turnout in Ticino for the whole period and thus our estimate $\hat{\delta}_{1t} = 0$. Therefore, the treatment effect of compulsory voting comes from the cost component.

Figure 6 shows the treatment effect with and without including empty and invalid ballots. It can be seen that there is an increase of empty and invalid ballots (from 1.4% to 4.5%) after the treatment[12]. In terms of the treatment effect with mean 27.1% ,this quantity is relatively small (11.4%) and thus the number of people who delegate their votes to better informed citizens provides a minor explanation of our treatment effect. This finding questions the mechanism proposed by structural voting models that asymmetric information plays a major role in explaining political participation rates (Feddersen and Pesendorfer (1996,

[11] We exclude the temporary suspension from 1940 to 1945.

[12] Empty ballots increased from 1.1% to 3.8% while invalid ballots increased from 0.3% to 0.7%.

1999)).

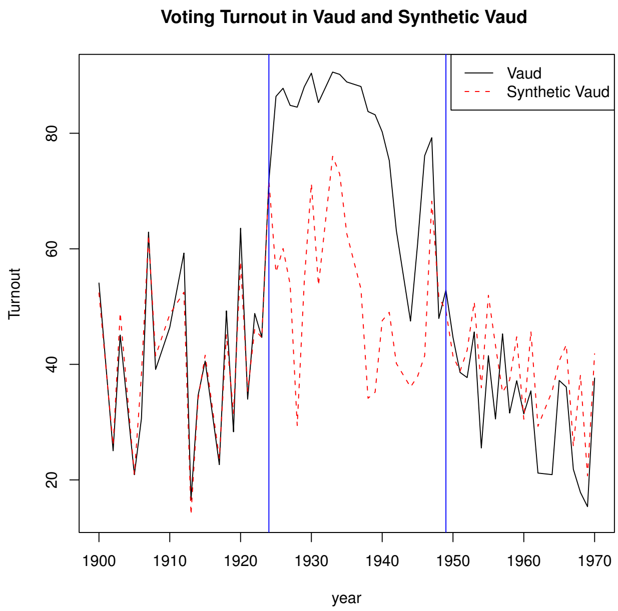

Figure 2: Vaud: Participation in Treatment and Synthetic Control Group

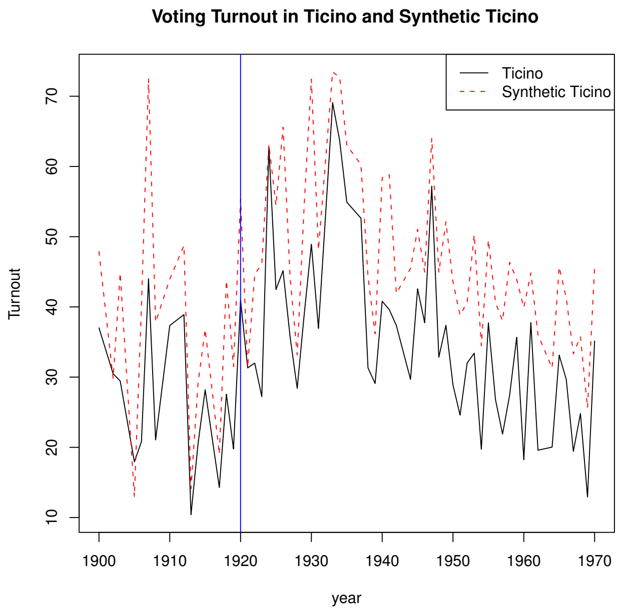

Figure 3: Ticino: Participation in Treatment and Synthetic Control Group

5.3 Robustness Tests

In the previous section we clearly established a big turnout difference in the treatment period between Vaud and its synthesized counterfactual, but we still have to establish the likelihood of this difference being causal. Following the suggestions of Abadie, Diamond, and Hainmueller (2010), we perform a variant of a permutation test particularly designed for the synthetic control method. For each canton in the donor pool, we synthesize a control canton. Obviously, the treatment effect between the actual control canton and its synthesized counterpart should be zero, hence the name placebo test. Then, we rank the (absolute) size of the treatment effect for the treated canton Vaud relative to the placebo effects for all units in the donor pool. Intuitively, the treatment effect for Vaud should be larger than all the placebo effects.

As can be seen from figure 4, the treatment effect during the 1925 to 1940 period is larger than any of the placebo effects. Based on our donor pool consisting of 17 cantons, this gives minimal achievable p-value for this sample which is highly significant ($p < .028$, one-sided).

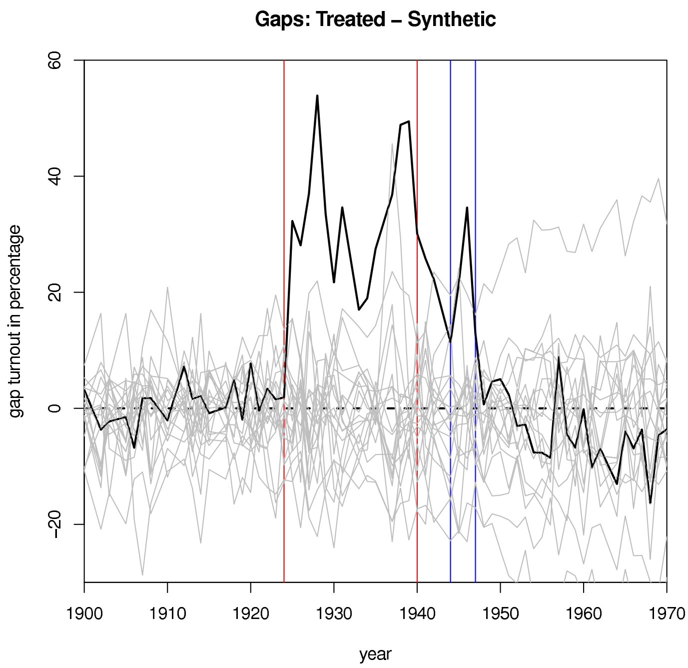

Figure 4: Placebo Test in Space

An alternative to this placebo test in space (i.e. with control units) is a placebo test in time. For this test, we re-define the pre-treatment period and only use a subset for the pre-treatment years to compute the weights for the donor pool. As a robustness check, we only use the 1900 to 1914 period to compute the weights and compare the difference between the turnout trajectories of Vaud and its counterfactual for the 1915 to 1924 period. While large differences in the latter period would question the findings of the previous sections, a small gap between the treated and synthesized control unit further strengthens a causal interpretation of our results. As displayed in figure 5, we find a) only minor differences which are, in absolute terms, of the same size in the 1900 to 1914 and 1915 to 1925 period and b) absolutely no differences over the gap in the outcome trajectories when the full pre-treatment period is used as in figure 4 and when only the first 15 years are used. Hence, this additional placebo test in time further supports a causal interpretation of our results.

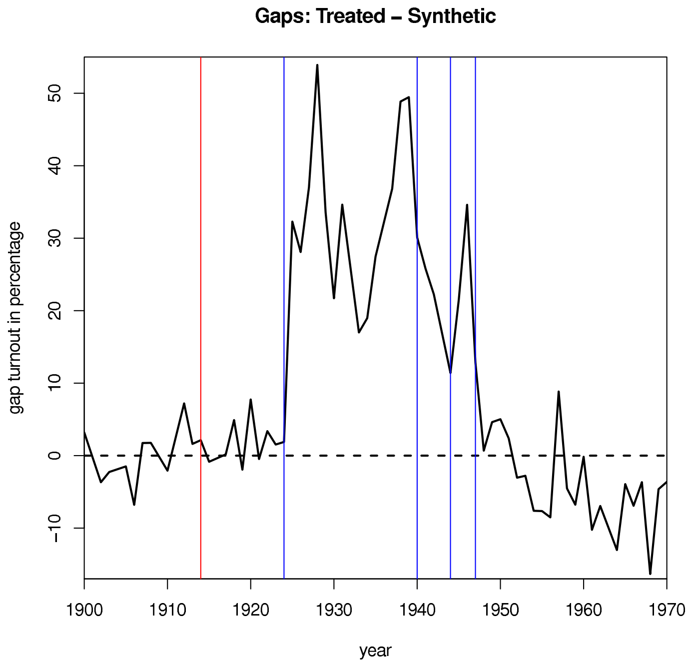

Figure 5: Placebo Test in Time

Exploiting the long post-treatment period after Vaud definitely abolished compulsory voting in the year 1948, we can perform a third kind of robustness check. Focusing on the temporary suspension of the compulsory voting law between 1940 and 1945, we recognize that any effects of the law are extremely short-living and seem to completely cease immediately after abolishment. Based on this pattern, we expect the turnout gap between Vaud and its synthesized counterfactual to quickly vanish after the definite abolishment in 1948. Again inspecting figure 2 this is exactly what we find: Immediately in 1948, the turnout gap sharply falls to zero and only very small and erratic differences persist for the next 22 years. This short-lived nature of the turnout effect is not only theoretically interesting and bad news for the literature which considers voting to be a habit, but also lends further credence to the causal interpretation of the estimates.

6 Conclusion

Conventional pivotal voting models cannot explain why people go to the polling station at all. A popular modification of Downs' (1957) basic model is the introduction of civic duty as a consumption benefit in voter's utility function (Riker and Ordeshook, 1968). It is supported by empirical studies showing that moral aspects play a central role according to voters' self-perception (Blais, 2000). This is the starting point of structural voting models with ethical voters. A very important modification of Coate and Conlin (2004) and Feddersen and Sandroni (2006) is to incorporate ethical voting as heterogenous rule and not as a constant (D) that varies across individuals. On the other hand, Feddersen and Pesendorfer (1996, 1999) model the informational asymmetries across individuals and state that uninformed citizens delegate their votes to informed citizens.

We show that participation levels in Vaud rise after the introduction of compulsory voting with a fee on non-voters in 1924. Turnout during the treatment period is relatively stable at 85%. The gap between treatment and control group varies between 15% and 50%. This result is robust in both placebo tests in space and time. In contrast, turnout remained stable in Ticino where compulsory voting was introduced without sanctions in 1920. This supports the view of structural voting models that ethical voting is a rule rather than just an exogenous term that can be manipulated by a central authority. We also test whether empty or invalid ballots increased during the treatment period. We find an effect for some referenda but the effect size is too small to conclude that informational asymmetries would play a major role and lead non-informed voters to delegate their votes.

References

Abadie, A., A. Diamond, and J. Hainmueller (2010): "Synthetic control methods for comparative case studies: Estimating the effect of California's Tobacco Control Program," *Journal of the American Statistical Association, forthcoming.*

Abadie, A., and J. Gardezabal (2003): "The Economic Costs of Con ict: A Case Study of the Basque Country," *American Economic Review*, 93(113-133).

Ashenfelter, O., and S. J. Kelley (1975): "Determinants of participation in presidential elections," *Journal of Law and Economics*, 18, 695–731.

Blais, A. (2000): *To Vote or not to Vote - The Merits and Limits of Rational Choice Theory.* University Press, Pittsburgh.

Bolliger, C., W. Linder, and Y. Rielle (2010): "Swissvotes - Database of Swiss Federal Referenda," .

Coate, S., and M. Conlin (2004): "A Group Rule? Utilitarian Approach to Voter Turnout: Theory and Evidence," *American Economic Review*, 94(5), 1476–1504.

Downs, A. (1957): "An economic theory of political action in a democracy," *The Journal of Political Economy*, 65(2), 135–150.

Duffy, J., and M. Tavits (2008): "Beliefs and Voting Decisions: A Test of the Pivotal Voter Model," *American Journal of Political Science*, 52(3), 603–618.

Feddersen, T., and W. Pesendorfer (1996): "The swing voter's curse," *The American economic review*, 86(3), 408–424.

——— (1999): "Abstention in elections with asymmetric information and diverse preferences," *The American Political Science Review*, 93(2), 381–398.

Feddersen, T. J., and A. Sandroni (2006): "A theory of participation in elections," *American Economic Review*, 96(4), 1271–1282.

Harsanyi, J. (1980): "Rule utilitarianism, rights, obligations and the theory of rational behavior," *Theory and Decision*, 12(2), 115–133.

Hofferbert, R. I. (1976): "Comparative Socio-Economic, Public Policy, and Political Data,1900-1960," *ICPSR Inter-University Consortium for Political and Social Research.*

Jorio, M., and C. Sonderegger (eds.) (2007): *Stimm- und Wahlrecht*Verlag Schwabe AG, Basel.

Kley, A. (1989): “Grundpflichten Privater im schweizerischen Verfassungsrecht,” Phd thesis, Hochschule St. Gallen.

Knack, S. (1995): “Does” motor voter” work? Evidence from state-level data,” *The Journal of Politics*, 57(3), 796–811.

Lijphart, A. (1997): “Unequal participation: Democracy’s unresolved dilemma,” *The American Political Science Review*, 91(1), 1–14.

Mueller, D. C. (2005): *Public Choice III*. Cambridge University Press, New York, 2 edn.

Riker, W., and P. Ordeshook (1968): “A Theory of the Calculus of Voting,” *The American Political Science Review*, 62(1), 25–42.

SFS Swiss Federal Office For Statistics (2010): “Wohnbevölkerung nach Volkszählungsjahr seit 1900 sowie Geschlecht sowie Zivilstand und Fünfjahresaltersklassen in absoluten Zahlen,” .

Siegenthaler, H., and H. Ritzmann (1996): *Historische Statistik der Schweiz/Historical Statistics of Switzerland*. Chronos, Zurich.

A Balance between Treatment and Control Group

	Pre-Treatment Period		Treatment Period		Post-Treatment Period	
	Vaud	Controls	Vaud	Controls	Vaud	Controls
turnout	44.45	51.06	78.13	56.83	32.83	44.90
population	311516	121108	342957	135677	430115	168485
over50	0.19	0.18	0.24	0.22	0.29	0.25
over60	0.10	0.09	0.13	0.12	0.17	0.14
urbanpop	0.27	0.20	0.34	0.24	0.41	0.28
worksector1pop	0.14	0.13	0.11	0.11	0.07	0.07
worksector2pop	0.17	0.21	0.16	0.20	0.18	0.21
pubrevenuepop	0.00008	0.00006	0.00017	0.00017	0.00067	0.00058
pubspendingspop	0.00009	0.00007	0.00018	0.00017	0.00070	0.00059
secondaryscholarspop	0.00009	0.00007	0.00018	0.00017	0.00070	0.00059

Table 1: Means for Vaud and (unweighted) control group

	Pre-Treatment Period		Treatment Period		Post-Treatment Period	
	Vaud	Controls	Vaud	Controls	Vaud	Controls
turnout	44.45	45.92	78.13	51.00	32.83	51.00
population	311516	268753	342957	287273	430115	287273
over50	0.19	0.18	0.24	0.24	0.29	0.24
over60	0.10	0.09	0.13	0.13	0.17	0.13
urbanpop	0.27	0.39	0.34	0.42	0.41	0.42
worksector1pop	0.14	0.10	0.11	0.08	0.07	0.08
worksector2pop	0.17	0.23	0.16	0.23	0.18	0.23
pubrevenuepop	0.00008	0.00008	0.00017	0.00019	0.00067	0.00019
pubspendingspop	0.00009	0.00009	0.00018	0.00019	0.00070	0.00019
secondaryscholarspop	0.00009	0.00009	0.00018	0.00019	0.00070	0.00019

Table 2: Means for Vaud and weighted control group

	Pre-Treatment Period		Treatment Period		Post-Treatment Period	
	Min	Max	Min	Max	Min	Max
population	13803	651283	13716	722256	13144	866144
over50	0.16	0.22	0.18	0.30	0.20	0.34
over60	0.08	0.12	0.09	0.17	0.11	0.21
urbanpop	0.00	0.97	0.00	0.96	0.00	1.00
worksector1pop	0.01	0.27	0.01	0.20	0.00	0.16
worksector2pop	0.10	0.34	0.11	0.32	0.15	0.33
pubrevenuepop	0.00002	0.00020	0.00008	0.00047	0.00031	0.00124
pubspendingspop	0.00002	0.00022	0.00008	0.00048	0.00031	0.00126
secondaryscholarspop	0.00002	0.00022	0.00008	0.00048	0.00031	0.00126

Table 3: Maximum and minimum means for (unweighted) control group

B Data Source

Variable	**Description**	**Source**
turnout	Voting Turnout in %	Bolliger, Linder, and Rielle (2010)
voters	Number of Voters	Bolliger, Linder, and Rielle (2010)
numelections	Number of Referenda	Bolliger, Linder, and Rielle (2010)
diffmin	minimal difference between alternatives	Bolliger, Linder, and Rielle (2010)
over50	Share of People over 50 years on Population	SFS (2010)
over60	Share of People over 60 years on Population	SFS (2010)
population	Population	Siegenthaler and Ritzmann (1996)
primaryscholars	Share of Primary Students on Population	Siegenthaler and Ritzmann (1996)
secondaryscholarspop	Share of Primary Students on Population	Siegenthaler and Ritzmann (1996)
urbanpop	Share of People living in City	Hofferbert (1976)
pubrevenue	Public Revenue	Siegenthaler and Ritzmann (1996)
pubspendings	Public Spendings	Siegenthaler and Ritzmann (1996)
worksec1pop	Share of Population Working in First Sector	Siegenthaler and Ritzmann (1996)
worksec2pop	Share of Population Working in Second Sector	Siegenthaler and Ritzmann (1996)
motorpop	Number of Motor Vehicle per Person	Siegenthaler and Ritzmann (1996)

Table 4: Data on Cantonal Aggregation Level

C Figures

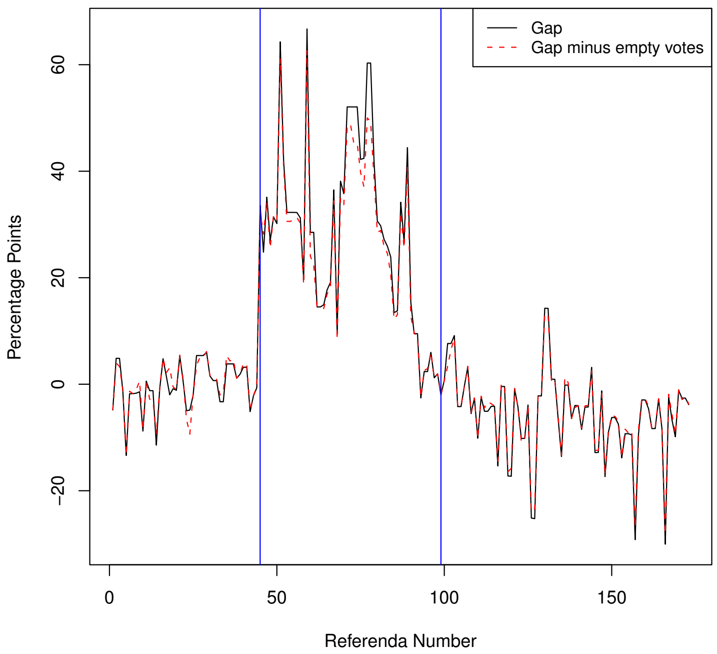

Figure 6: Gap between Treatment and Synthetic Control Group with and without Empty Votes

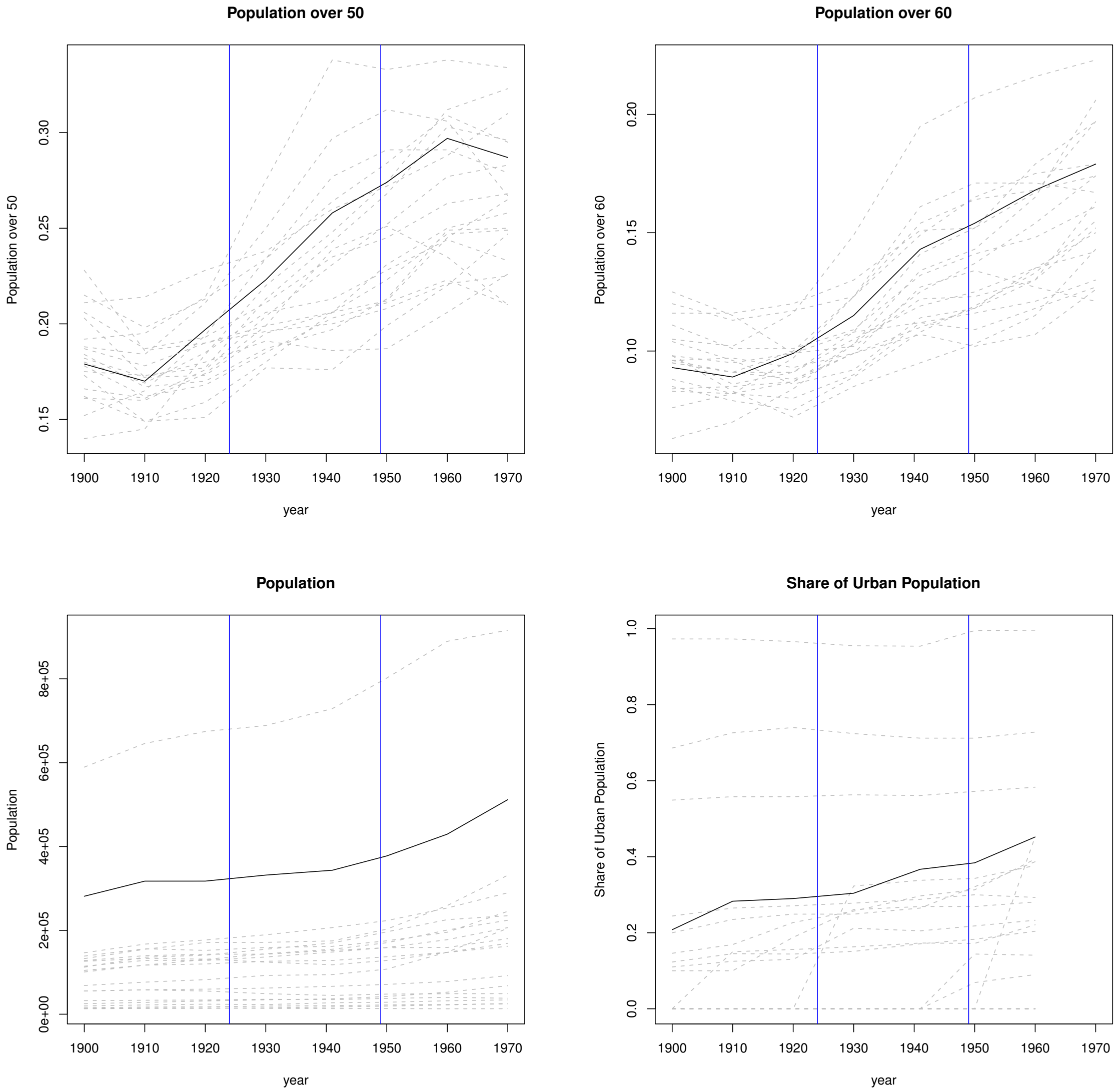

Figure 7: Time plot of Covariates

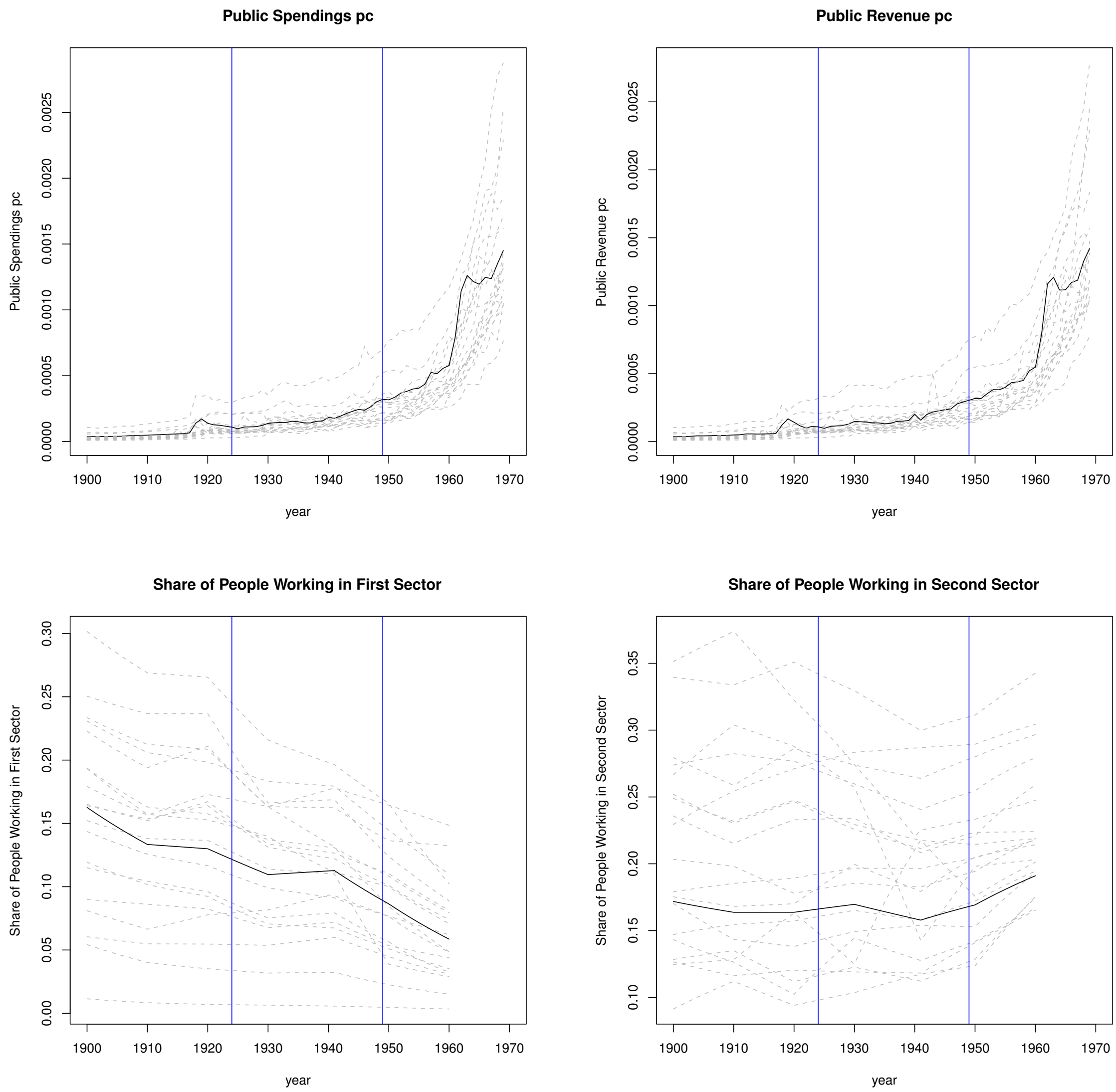

Figure 8: Time plot of Covariates

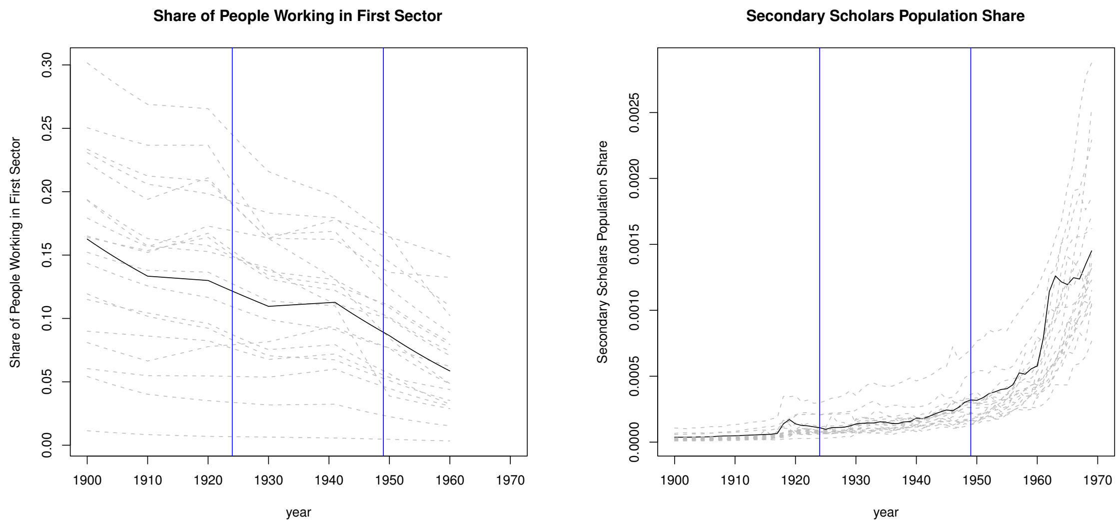

Figure 9: Time plot of Covariates

TABLEAU

indiquant la participation des électeurs à la votatiou fédérale des 4 et 5 décembre 1926 (vote obligatoire).

Districts	Electeurs inscrits	Votants	Citoyens n'ayant pas voté	Citoyens âgés de plus de 65 ans	Citoyens Excusés	Citoyens Soumis à la contribution de Fr. 2.—
Aigle	6282	5255	1027	311	213	503
Aubonne	2287	2100	187	119	36	32
Avenches	1483	1347	136	71	21	44
Cossonay	3560	3303	257	147	45	65
Echallens	2712	2619	93	29	29	35
Grandson	3893	3442	451	230	67	154
Lausanne	21348	17704	3644	421	1085	2138
La Vallée	1757	1465	292	142	48	102
Lavaux	2993	2598	395	198	78	119
Morges	4928	4485	443	201	108	134
Moudon	3133	2936	197	92	46	59
Nyon	3977	3542	435	174	69	192
Orbe	5081	4556	525	208	77	240
Oron	1847	1710	137	59	31	47
Payerne	3473	3246	227	104	21	102
Pays d'Enhaut	1456	1174	282	73	67	142
Rolle	1804	1613	191	91	58	42
Vevey	9009	7800	1209	326	269	614
Yverdon	5499	5077	422	197	94	131
Totaux	86522	75972	10550	3193	2462	4895

Figure 10: Original document listing number of voters and issued fees

D Synthetic Control: Unit and Variable Weights

Canton	**Weight**
BE	0.26
LU	0.11
UR	0.00
SZ	0.00
OW	0.00
NW	0.00
GL	0.02
ZG	0.00
FR	0.06
SO	0.00
BS	0.00
BL	0.00
AR	0.00
GR	0.00
VS	0.00
NE	0.55
GE	0.00

Table 5: Unit Weights for Synthetic Control of Canton Vaud

Canton	**Weight**
BE	0.00
LU	0.00
UR	0.00
SZ	0.48
OW	0.00
NW	0.00
GL	0.00
ZG	0.00
FR	0.00
SO	0.00
BS	0.00
BL	0.00
AR	0.00
GR	0.00
VS	0.00
NE	0.00
GE	0.52

Table 6: Unit Weights for Synthetic Control of Canton Ticino