Does Direct Democracy Reduce the Size of Government? New Evidence from Historical Data, 1890-2000*

Short Title: Direct Democracy and the Size of Government

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Abstract

Using new historical data from Swiss cantons, we estimate the effect of direct democracy on government spending. We use fixed effects to control for unobserved heterogeneity and new instruments to address potential endogeneity concerns. We find that direct democracy constrains canton spending but its effect is more modest than previously suggested. The instrumental variable estimates shows that a mandatory budget referendum reduces canton expenditures by 12%. Lowering signature requirements for the voter initiative by 1% reduces canton spending by 0.6%. We find little evidence that direct democracy at the canton level results in higher local spending or decentralization.

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1 Introduction

Direct democracy has experienced a remarkable renaissance in recent decades. The latest referendums on the new European constitution in France, the Netherlands and Ireland are a few prominent examples. Direct voter participation has also become increasingly popular at the local level in Germany; and its introduction is debated in countries like the Netherlands, South Africa and even the European Union.

The popularity of direct democracy is fueled in part by the belief that direct voter control could slow down or even reverse the rapid growth in government spending observed over the past decades.[1] To evaluate the merit of these arguments and policy proposals in favor of direct voter participation requires first a clear understanding of how direct democracy influences public policies. Our goal in this article is to empirically identify the effect of direct democracy on public spending. Specifically, we analyze two questions: does direct democracy reduce government spending? And does direct democracy affect the vertical structure of government?

In a representative democracy, incentives of elected politicians might not always be aligned with the preferences of voters. Theory shows that referendums and initiatives give citizens more control over the politicians and may bring actual policies closer in line with the preferences of the median voter (Romer and Rosenthal 1979; Gerber, 1996; Moser 2000). If voters are fiscally more conservative than politicians (e.g. Peltzman, 1992), access to direct democratic institutions could reduce spending. Whether direct democracy also affects the vertical structure of government is an open question. It might increase spending at lower

[1] Another argument advanced in favor of direct voter participation is that it may improve political decision-making and the quality of government because representatives are better informed about voter preferences; or, that citizens are more satisfied with political decisions because they are actively involved in policy-making.

levels of government if politicians at the state level shift responsibilities for public services to the local level; however, it might also decrease spending if budgetary constraints also reduce resources for local governments.

To empirically identify the effect of direct democracy on government spending, we collect new historical data covering all Swiss cantons from 1890 to today. Our setting has a number of attractive features. Over the past 100 years, a number of substantial changes in direct democratic institutions took place which we identified from a careful examination of each canton's past and present constitutions. As a consequence, we can control for all permanent differences across cantons by including canton fixed effects. Second, we construct a novel measure of voter preferences for government derived from federal ballots. Third, we propose two new instruments to address the bias from observed feedback effects (and other omitted variables) between spending trends and the strength of direct democracy in a canton.

We find that direct democracy reduces public spending at the same level of government. Our fixed effect estimates suggest that the mandatory budget referendum reduces canton spending by 8.4%. An increase in the signature requirement for the voter initiative by 1% (of the eligible population) raises expenditures by 0.4%. In all specifications, the canton fixed effects are highly statistically significant suggesting that cantons differ in other time-invariant institutions or voter preferences. We find little evidence that direct democracy at the canton level shifts spending to the local level or is associated with decentralization. If anything, the voter initiative seems to be associated with more centralized spending, not less. Hence, the estimated effect of direct democracy on canton spending are not offset by countervailing effects at the local level. We conclude from our evidence that direct democracy plays a minor role for the vertical structure of government.

Recognizing that fixed effects will not address all concerns of omitted variable bias, we construct a new comprehensive measure of voter preferences derived from voting behavior in all federal ballots held since 1890. In particular, we use average support for ballots that would have increased or decreased government spending, revenues or subsidies in each canton as our measure of voter demand for government. As expected, cantons with stronger direct democratic institutions are fiscally more conservative than voters in cantons with weaker direct democracy. Controlling for this heterogeneity in preferences (and other shocks or demographic shifts) *in addition* to canton fixed effects does not affect our qualitative results. However, we do find some evidence that periods of high spending (i.e. overspending in the eye of the voter) increase the likelihood of adopting stronger direct democratic institutions in a canton.

To address this potential endogeneity of direct democratic institutions (and other omitted variables), we use an instrumental variables approach. Since direct democratic reforms require a revision of the canton constitution, we use the barriers to launch a constitutional initiative in the past as a candidate instrument. Historical examples illustrate that direct democracy has frequently been shaped by the constitutional initiative which enables citizens to revise or amend the constitution. Reforms in direct democratic institutions might also be influenced by experiences in neighboring cantons. If citizens in neighboring cantons have a predominantly positive experience with the mandatory budget referendum, for example, this might induce a canton to imitate its neighbors. However, if neighboring cantons adopt direct democracy, for instance, this might induce the canton to postpone institutional reforms to learn more about the institution's effectiveness. We discuss the identifying assumptions and present anecdotal and more formal evidence that the constitutional initiative and provisions

in neighboring cantons do not affect spending directly. The instrumental variable estimates show that the budget referendum decreases canton governments by 12%. In addition, a 1% lower signature requirement for the initiative decreases canton spending by 0.4-1.4%.

We are not the first to study the role of direct democracy; an extended literature has analyzed its link to public spending. Previous studies are predominately based on cross-sectional variation as direct democratic institutions, like most institutions laid down in a country's constitution, rarely change over time. The earlier literature reports a large negative correlation between direct democracy and spending at the same level of government and a large positive correlation with spending at lower levels of government.[2] The article closest to ours is by Feld and Matsusaka (2003) which also study Swiss cantons. We differ from their analysis (and most other papers) along at least four dimensions: first, we can control for permanent differences across cantons using fixed effects, which is empirically important. Second, we use a novel approach to control for voter preferences based on voting behavior in federal ballots. Third, we propose two new instruments to purge estimates from feedback effects (and other potential omitted variable bias). Finally, we also study the effect of direct democracy on spending at lower levels of government and the degree of decentralization. Overall, our results suggest that the constraining effect of direct democracy on public spending at the canton across a variety of specifications is more modest than suggested by previous cross-sectional studies.[3] In addition, we find that direct democracy has little effects, if any, on the vertical structure of government spending.

[2]Farnham (1989); Zax (1989); Matsusaka (1995, 2000, 2004); Bails and Tieslau (2000); Besley and Case (2003), for the United States; Pommerehne (1978); Feld and Kirchgässner (2001); Feld and Matsusaka (2003); Feld et al. (2008), among others, for Switzerland.

[3]See also Petterson-Lidbom and Tyrefors (2007) who use a regression-discontinuity design to compare spending in communities with town meetings to those with purely representative forms of government; and Olken (2008) who uses a field experiment to study popular decision-making over public goods in Indonesia.

We also contribute to a small, but growing literature that uses instrumental variables to address institutional endogeneity at the subnational level (Rueben, 1997; Knight, 2000). Our study is unique in this literature because our instrumental variables approach combines instrumental variables with state fixed effects to control for permanent differences across cantons.

The paper is organized as follows. In the next section, we discuss the institutional background in Switzerland, and derive some theoretical predictions on the effect of direct democracy on spending. We describe our new historical data set in section 3. The main results are presented in section 4. Section 5 reports additional results as well as the instrumental variable estimates. Section 6 concludes.

2 Direct Democracy and Fiscal Policy

2.1 Institutional Background

Direct democracy has always played an important role in Switzerland (Curti, 1900; Trechsel and Serdült, 1999; Vatter 2002). The referendum and voter initiative (*Begehren*) for a revision of the federal constitution have been in place since the Swiss Confederation was founded in 1848 (Kölz, 1992). Direct democracy has an even longer political tradition at the canton level. In cantons like *Appenzell*, *Glarus* or *Uri*, direct participation of citizens in town meetings goes back to the thirteenth and fourteenth century. The right to propose new laws through initiatives, for example, was in place in *Glarus, Vaud* and *Nidwalden* already by 1850.

Cantons not only differ in the degree of direct democracy, but also in the degree of decentralization, i.e. the share of public goods that are provided at the local level. The 2899 communities (in 2000) have their own source of revenues and provide public services either independently or jointly with the canton.[4]

Furthermore, Swiss federalism gives canton governments and local governments a lot of fiscal autonomy to provide public goods and to redistribute wealth. For example, 34% of all government expenditures in 1998 were made at the canton level compared to 39% at the federal and 27% at the local level. Revenues are equally decentralized. In fact, all political rights and responsibilities remain at the canton level, unless a specific right or responsibility is ceded to the federal government in a national referendum.

Our main empirical analysis uses variation in the provision of direct democracy at the canton level and relates it to total spending and the vertical structure of government. The direct democratic institutions most relevant for fiscal policy are the budget referendum and the voter initiative.

In a budget referendum, citizens approve or reject government projects if its (one-time or recurring) expenditures exceed a certain monetary threshold (which is defined in the canton constitution). In principle, budget referendums may cover public expenditures, public sector bonds, taxes, enterprise holdings or real estate. We restrict attention to budget referendums on public expenditures because they are by far the most common. The construction of a new canton hospital is one example of a project falling under the mandatory budget referendum. Between 1980 and 1999 alone, citizens voted on 461 expenditure referendums and approved

[4]Some local responsibilities are explicitly listed in canton constitutions, for example, local government decide on spending for police, primary education, health and public transport. In other areas like secondary education or social welfare, local governments share responsibilities with the canton.

86% of the proposed projects (Trechsel and Serdült, 1999).

While these referendums on public spending in Switzerland are quite unique, they closely resemble referendums on school budgets in several US states including California or New York. A second related institution are legal tax and expenditure limitations, commonly found in the United States. Like the budget referendum, tax and expenditure limitations require voters to approve tax increases or growth in public spending above a certain threshold (Von Hagen, 1991; Poterba, 1994; Bohn and Inman, 1996; Rueben, 1997; Feld and Kirchgässner, 2001).

At present, fifteen cantons have a mandatory budget referendum in place.[5] Ten cantons allow only for an optional budget referendum. Here, citizens need to collect between 100 and 10,000 signatures to vote on a large spending project. Control over the budget is stronger in cantons with mandatory budget referendum because voter approval is mandated by law. Hence, our variable for the budget referendum is coded as one if a canton has a mandatory budget referendum in place and zero otherwise.[6]

In contrast, the voter (or law) initiative allows citizens to propose entirely new laws, for example, limits on spending growth. Most cantons adopted the voter initiative several decades prior to the beginning of our study period in 1890 (see table 1). We have, however, substantial variation in the number of signatures required to get an initiative on the ballot. In 2000, *Glarus* required only a single signature, while *Vaud* required 12,000 signatures. The barriers to launch an initiative are higher the more signatures need to be collected. Hence, we

[5]Thresholds for non-recurring expenditures range between 25 Millions Swiss Francs (SFr) in *Lucerne* and 250,000 SFr in *Schwyz* (1999). Hence, a project of on average 6.8 million SFr or just less than 1% of average expenditures mandates a referendum. For recurring expenditures, thresholds range between 50,000 (*Appenzell-Innerrhode, Basle County, Nidwalden, Ticino* and *Uri*) and 400,000 SFr *Berne*.

[6]Table A2 in the online appendix shows that we do not find an independent effect of the optional budget referendum on spending.

expect that low costs to launch an initiative increase voter influence over political decisions, while high signature requirements reduce their political influence.

2.2 Theory

How can the referendum and the voter initiative affect public policies? If the assumptions of the median voter theorem hold, politicians implement the median voter's preferences and there is little additional benefit from direct democracy.[7] With imperfect electoral competition, however, preferences of legislators and voters may diverge and actual policies need not reflect the median voter (Romer and Rosenthal, 1979; Gerber, 1996). This divergence could arise, for example, as a consequence of career concerns by politicians, lobbying by special interest groups or log-rolling in the legislature. Referendums and initiatives then give citizens tools to influence policies above and beyond general elections which should bring actual policies closer to those preferred by the median voter.

In a referendum, politicians propose the project and hence the amount of additional spending that citizens can then approve or not. If voters agree with the project and the associated spending proposed by the legislators, the project is implemented. If voters decline the project in the referendum, the status quo budget (without the particular project) is implemented instead. Romer and Rosenthal (1979) show that referendums restrain government spending when politicians are expenditure maximizers. As a consequence of the agenda setting power of politicians actual spending might still be higher than the median voter's preferred level (because voters cannot vote for their preferred spending level directly).

[7]Direct democracy could still matter if voters in general elections are a very selected sample of the electorate.

Therefore, the theoretical effect of the mandatory budget referendum on spending is non-positive.

The effect of the voter initiative on spending is, in contrast, less clear. When legislators spend more than desired by the median voter, the mere threat of an initiative can force legislators to implement policies closer to the median voter (see Gerber 1996). Otherwise, voters can always launch an initiative to force a reduction in public spending (as they did with Proposition 13 in California, for example). A second argument why initiatives might affect spending directly is that they allow citizens to select their preferred choice for individual policy proposals. In a purely representative democracy, citizens can only elect candidates representing a whole bundle of policy proposals. Legislators' choices on non-salient issues might therefore differ from actual preferences of the median voter (Weingast, Shepsle and Johnson, 1981; Besley and Coate, 2002). By launching an initiative, citizens can effectively 'unbundle' a political issue from the set of policies proposed by their representatives. If the costs of launching an initiative are sufficiently small, legislators find it optimal to adopt policies that are closer (though not necessarily identical) with the median's preferences. While the initiative benefits voters, the total effect on spending is ambiguous, because it depends on the spending levels desired by voters relative to politicians. If voters prefer less spending for a policy proposal than their representatives, lower costs to launch an initiative should decrease spending.[8]

Theories of direct democracy typically analyze the effect of direct democracy on policy

[8]Theoretical models typically analyze referendum and initiative separately. There might however exist some interactions between the two different institutions of direct democracy (see Feld and Matsusaka, 2003). For instance, a low signature requirement for the voter initiative (and hence low costs to implement policies by the electorate, e.g. to require a balanced budget) decreases the importance of the budget referendum. However, we do not find any significant interactions between the institutions of the voter initiative and the referendum (see online appendix table A2).

outcomes at the same level of government, for example, how the voter initiative affects state level spending. Citizen control at the canton level might however, affect spending behavior at the local level as well: fewer canton resources might constrain local budgets, or might affect citizens' willingness to delegate responsibilities to the canton (rather than local) level.[9] Direct democracy could also increase local spending if canton politicians, constrained by voter control at the canton level, delegate responsibilities to the local level. In that case, direct democracy would increase local spending. The effects at lower levels of government could thus partially offset the impact of direct democracy on canton spending. To identify the overall effect of direct democracy on public spending, we analyze both canton and local spending as well as the degree of decentralization.

3 A New Historical Dataset

For our empirical analysis, we collected a new dataset for all twenty-five cantons in Switzerland between 1890 and 2000.[10] First, we extracted comprehensive measures of direct democratic institutions in each canton from all past and current constitutions as well as the relevant canton laws. In addition, we used published sources to validate and cross-check our coding of the institutional variables (Monnier, 1996; Ritzmann-Blickernstorfer, 1996; Trechsel and Serdült, 1999; Vatter, 2002; Kölz, 2004). If in doubt, we contacted the respective cantonal Public Record Offices (*Staatsarchive*) to clarify any inconsistencies.

We measure direct democratic institutions by two variables: a binary indicator equal to

[9]When revenues are shared among all districts, centralized spending might result in overspending as citizens have an incentive to elect legislators with extreme preferences (Besley and Coate, 2003). If direct democratic institutions like the mandatory budget referendum help to effectively control this overspending bias, citizens might be more willing to delegate responsibilities to higher levels of government.

[10]The canton *Jura* was founded in 1978 and is excluded from the analysis.

one if a canton has a mandatory budget referendum in place; the variable is zero if the canton allows only an optional or no budget referendum in a certain year. Since the voter initiative is available in all cantons for most of our study period, we use the number of signatures required to get an initiative on the ballot. The signature requirement is calculated as a percentage of eligible voters. Thus, we assume that the collection of 1,000 signatures is more costly in a canton with only 5,000 citizens than in a canton with 100,000 citizens.[11] For the few cantons that adopted the voter initiative after 1890, we assign a signature requirement of 100% before adoption.

Table 1 provides an overview of the direct democratic institutions in 2000. The cantons with a mandatory budget referendum are shown in column (1) while column (4) lists the number of signatures required to get an initiative on the ballot. Cantons with a mandatory budget referendum often have lower signature requirements as well. In general, direct democracy is stronger in the German-speaking parts of Switzerland: these include the large urban centers of *Basle*, *Zurich* or *Berne* and the more rural interior. The French- and Italian-speaking cantons in the South and West, in contrast, have weaker direct democratic institutions (see figure A1 in the online appendix for the distribution of direct democracy in Swiss cantons).

Institutions like direct democracy exhibit a strong persistence over time. A unique feature of our long panel is that we observe substantial variation in both the budget referendum and signature requirement over our 110 years period. Columns (2) and (5) in table 1 show that thirteen cantons adopt the mandatory budget referendum and nine cantons abolish it in favor

[11] Alternatively, collection costs might be fixed in which case the absolute number of signatures is the relevant statistic. Table A2 in the online appendix shows that the absolute number of signatures yields very similar results.

of an optional referendum. Also, six cantons adopt the voter initiative after 1890, nineteen cantons increase the signature requirement for the voter initiative while four cantons reduce it.

We complement our institutional variables with detailed statistics on public finances and socio-demographic characteristics. For each canton, we digitized printed information contained in the *Statistical Yearbook of Switzerland*, the *Historical Statistics of Switzerland* and information from the decennial Census. The data appendix provides a detailed description of the data sources and the construction of variables. Our main outcome variables are annual canton expenditures and revenues per capita as well as expenditures per capita by local governments. All expenditure and revenues variables are deflated to 2000 Swiss Francs. To investigate the relationship between direct democracy and decentralization, we calculate the centralization of spending as the percentage of local and canton expenditures that is spent at the canton level.

The means and standard deviations of all variables are shown in table 1 separately for cantons with and without a mandatory budget referendum. The last column reports the t-statistic for equality of means across the two groups. In the raw data, canton expenditures and revenues (in logs) are not statistically different between cantons with and without a mandatory budget referendum. However, cantons with a mandatory budget referendum seem to have significantly higher local spending and less centralized expenditures.

Cantons with stronger direct democracy also differ in their political structure from other cantons. They have a lower signature requirement for the voter initiative and a smaller executive. In addition, they are more likely to have a mandatory law referendum in place, less likely to elect their parliaments using proportional representation and more likely to

impose deficit or debt limitations in their constitution.

Table 2 also shows an extensive list of socio-demographic variables. Yet, one control variable that is not contained in our data set is canton income which is available only since the 1960s. We use several variables to control for differences in wealth in our empirical analysis: the overall labor force participation rate, how many people own a car, the number of doctors per capita and the infant mortality rate. Together, these four variables account for 47% of the variation in canton income since 1965.[12] Once we include our other control variables like the share of employment in manufacturing and agriculture, the age structure of the population, the share of the urban population and canton and year fixed effects, we account for 93% of the variation in canton income. Hence, the absence of a precise measure of canton income is not a major limitation of our study. We next turn to our main results.

4 Direct Democracy and Fiscal Policy: Basic Results

4.1 Canton Expenditures and Revenues

The descriptive statistics show that cantons with strong direct democratic institutions differ substantially in their observable characteristics from cantons with weaker direct democracy. Hence, they might also differ along other, unobservable dimensions. Our detailed study of the canton constitutions revealed permanent differences across cantons, for instance, whether citizens can recall the executive or directly elect the president of the executive. The first increases the control of citizens over politicians, while the second strengthens the position of

[12]Car ownership would not be a good proxy for income if it was used more heavily in agriculture and hence, in the poorer, rural areas. In Switzerland, however, this is not the case: the correlation between car ownership and urbanization is strongly positive.

the president relative to the legislature and executive (Persson and Tabellini, 2003). Since institutions are persistent and more prevalent in cantons with strong direct democracy, a cross-sectional analysis is likely to overestimate the effect of direct democracy on public spending.[13]

A unique feature of our long panel is that we can control for all permanent differences across cantons using fixed effects. In particular, we estimate the following empirical model:

$$\log Y_{ct} = \alpha + \beta \text{Referendum}_{ct} + \gamma \text{Initiative}_{ct} + \lambda' X_{ct} + t_t + \theta_c + \varepsilon_{ct} (1)$$

where the subscript c denotes the canton and t the year. LogY_{ct} is expenditures or revenues measured in logs, X_{ct} denotes other control variables, t_t and θ_c the year and canton fixed effects. ε_{ct} is assumed to be an *iid* error term reflecting measurement error in expenditures or revenues. The main parameters of interest are β and γ; they capture the effect of the budget referendum and signature requirement on expenditures or revenues. Based on our discussion above, we expect that $\beta < 0$ and possibly $\gamma > 0$. To account for serial correlation in the spending and revenue variables, all standard errors are clustered at the canton level.Below, we also consider wild bootstrap (Miller et al., 2008) and the before-after estimators (Bertrand et al., 2004) to account for the small number of clusters.

The basic results with annual expenditures per capita (in logs) as the dependent variable are shown in table 3.[14] We report p values from the wild bootstrap below the clustered

[13]Controlling for persistent unobserved heterogeneity is also important because fiscal policy and political institutions vary substantially between German- and French- or Italian-speaking cantons. These differences persist even after controlling for a large number of observable canton characteristics.

[14]We choose the log specification for several reasons: first, canton expenditures are log normally distributed. Second, spending 1,000 Swiss Francs weighs more if the overall budget is smaller. Third, the log specification allows a simple interpretation of the coefficient on the institutional variable.

standard errors of the institutional variables. Including only year dummies, the first specification shows a substantial (albeit not statistically significant) negative relationship between the mandatory budget referendum and government spending. A higher signature requirement for the voter initiative is not correlated with canton expenditures. The second column adds our set of variables to control for observable differences across cantons. The coefficient on the budget referendum drops to 13.5% (though not significant) while the signature requirement is again not correlated significantly with spending.

Our preferred specification in column (3) accounts for permanent unobservable differences across cantons. The coefficients are now identified from cantons that adopt or abolish a mandatory budget referendum or change their signature requirement for the voter initiative. The fixed effects are statistically highly significant (see the bottom of table 3) and change the main coefficients substantially. The budget referendum reduces total spending to 8.4%. A higher signature requirement by 1% now raises expenditures by 0.4% suggesting that voters use the initiative primarily to constrain public spending.

Is the picture similar on the revenue side? The fixed effects specification in column (6) shows that revenues are 6.5% lower, though not statistically significant, in cantons with a mandatory budget referendum. Since the effect of the mandatory budget referendum is larger for expenditures, cantons without a mandatory budget referendum are more likely to finance their higher public expenditures in part by running deficits. An increase in the signature requirement by 1% is associated with 0.4% more revenues.

The regressions highlight the importance of accounting for unobserved time-invariant heterogeneity across cantons. The coefficient on the mandatory budget referendum declines by 38% when we include fixed effects (compare columns (2) and (3) of table 3). Based on

the fixed effects estimates, we conclude that budget referendum and voter initiative have a constraining, yet more moderate effect on expenditures and revenues than suggested by earlier studies.

4.2 Substitution to Local Governments and Decentralization?

Direct democratic institutions at the canton level might decrease spending at the local level because of resource constraints (canton and local spending are complements) or increase local spending because politicians at the canton level delegate responsibilities to the local level (canton and local spending are substitutes). The previous literature finds strong evidence that direct democracy at the state level increases spending at the local level (Matsusaka, 1995; Feld et al., 2008). Our descriptive statistics in table 2 also suggests that cantons with mandatory budget referendum rely more on local spending.

Table 4 shows the result where the dependent variable is now the (log of) per capita spending by local governments in each canton. If we only include year effects (column (1)) and observable canton characteristics (column (2)), the mandatory budget referendum appears to increase spending at the local level by 15% (though the coefficient is not statistically significant). Once we include canton fixed effects, the coefficient becomes negative but is again not statistically significant (column (3)). Higher costs to launch a voter initiative, in contrast, have a consistent positive effect on local spending: a 1% higher signature requirement at the canton level implies 0.8% more local spending.

The results at the canton and local raise the question whether direct democracy leads to less centralized spending. We measure centralization of government spending as $\frac{CantonExp}{Canton+LocalExp}$.

If stronger direct democracy decentralizes public spending, the coefficient would be negative for the budget referendum and positive for the voter initiative. As before, we find no statistically significant effect of the mandatory budget referendum on government centralization once we include fixed effects. For the voter initiative, higher signature requirements actually decrease government centralization (see column (6) of table 4). One possible explanation is that citizens are more supportive of centralized spending when direct democratic institutions allow them to better control politicians as well (see Section 2).

In sum, we find that the budget referendum constrains expenditures at the canton level but has no effect on local spending or decentralization. Low signature requirements and hence, low barriers to launch an initiative reduce spending at both levels of government and increase centralization. Overall, our results suggest that direct democracy has little influence on the vertical structure of government spending (and does certainly not decentralize public spending).[15]

Our fixed effects approach might not capture all unobservable differences across cantons. We next show a variety of informal tests suggesting that shifts in voter preferences and changes in other political institutions are unlikely to explain our results.

4.3 Accounting for Changes in Voter Preferences

A major concern is that the fixed effects approach does not control for changes in voter preferences over our 110 years period (e.g. because of compositional changes in the population or shifts in the preferences of the electorate). For example, internal migration of Swiss

[15]The fact that we do not find a relationship between direct democracy and decentralization suggests that the positive correlation in the raw data and earlier studies is driven by time-invariant omitted variables, such as differential preferences for spending at the local level or other political institutions that govern the division of labor between canton and local level.

citizens might change the position of the median voter. If migrants are young and prefer less spending than the native population, we expect cantons with a large inflow of migrants to have less spending. Table 5 (column (1)) however shows that controlling for the share of internal migrants with voting rights (Swiss citizens born outside the canton they currently live in) does not affect our results. More generally, demographic shifts might have raised the heterogeneity of voter preferences, which in turn could lower the willingness to provide public goods or increase politicians' uncertainty about the preferences of the electorate. Including additional controls for population heterogeneity along religious and linguistic lines (by computing heterogeneity measures as one minus the Herfindahl indices for Protestants, Catholics and other religions in the population as well as the share of German-, French-or Italian-speaking population), does not change the results (see column (2) in table 5).

Preferences of the electorate might change over time even for a stable electorate. If voters in cantons with strong direct democracy were fiscally more conservative (and these preferences evolve over time), we would overstate the effect of direct democratic institutions on public spending. One way to control for voter preferences is to use the strength of left-wing parties elected into canton parliaments as a proxy for the demand for redistribution. Left-wing parties are often associated with more redistribution and a larger government (for example, Tavares, 2004). Since representatives are elected by voters, we expect that party affiliation reflects voter preferences. Both the baseline for the subset of years with non-missing observations for voter ideology (column (3)) and adding left-wing parties in column (4) show similar results.

Voters might elect left-wing parties for many reasons unrelated to redistribution. The Swiss setting provides, however, a unique opportunity to control for voter preferences more

directly. We use the fact that direct democracy plays an important role at the federal level in Switzerland as well.[16] Between 1890 and 2000, citizens decided on 452 ballots at the federal level. To measure voter preferences for government spending, we use the average voter support in each canton for the subset of ballots that would have increased or decreased public spending, taxes, revenues or subsidies. We extracted the information on the fiscal consequences of each ballot from the official documents prepared by the government and sent to each citizen before the vote. After careful study, we identified 108 propositions with an unambiguous increase in expenditures, subsidies or taxes. Table A1 in the online appendix provides a list of all votes (both successful and unsuccessful) and their predictable fiscal consequences. The table shows that our ballots span a broad range of political issues: from the introduction of fuel taxes, government finances and environmental protection to education and health policy.

Our preference measure is calculated as the percentage support for a ballot that would increase government spending if approved. To adjust for differences in approval rates across ballots, we calculate our measure as deviation from the mean approval rate of each ballot. Negative numbers thus imply that a canton was less supportive of higher spending than the average canton in that ballot.[17] The ballot preference measure reveals that cantons with stronger direct democratic institutions are much less supportive of government spending (see also Funk and Gathmann, 2010). Citizens in cantons with a mandatory budget referendum are 1.6% less likely on average to approve federal propositions that increase spending or

[16] Citizens can initiate a partial or total revision of the federal constitution, vote on changes to the federal constitution or international treaties; if 50,000 signatures are collected, they can also request a referendum on all federal laws.

[17] Alternative measures for voter support, such as the raw approval rate instead of its deviation from the mean or the voter support in ballots that increase expenditures alone yield very similar results.

taxes. In contrast, the approval rate in cantons without a mandatory budget referendum is 2.1% higher than the average canton (t-statistic: 5.3).

Since our measure of preferences shows substantial variation over time and are correlated with direct democracy as well, they could be an important source of omitted variable bias. A comparison of the baseline for the subset of years with non-missing observations on voter preferences (in column (5)), and the specification with our comprehensive measure of voter preferences (in column (6)), show however, very similar results. The final specification in table 5, column (7) controls for all four dimensions of time-varying preference heterogeneity (internal migration, population heterogeneity, preferences for redistribution and preferences for government spending) simultaneously. Our qualitative results are not affected suggesting that time-varying voter preferences might not be a major source of bias.

4.4 Changes in Political Institutions and Other Robustness Tests

Reforms of other political institutions, rather than changes in voter preferences, could be another, potentially important source of omitted variables. Our study period saw important changes to voting rights: women were enfranchised and many cantons switched to proportional representation. Female suffrage is especially important because it roughly doubles the electorate and hence, mechanically reduces the signature requirement for the voter initiative (measured in percentage of the eligible population). If women differ in their demand for government from men, our estimate for the voter initiative would confound changes in the median voter with the effect of stronger direct democracy. Since female suffrage was first adopted at the canton level in 1959, we can use the subset of years prior to its introduc-

tion to shed light on this alternative explanation. Column (1) in table 6 shows that the budget referendum has a quantiatively similar, though not statistically significant effect on public spending in the subset of years prior to female suffrage. The adoption of proportional representation for canton parliaments could also affect the set of preferences represented in parliament or the incentives of politicians to present the median voter. Column (2) in table 6 shows that adding an indicator if a canton has switched to proportional rule for its parliamentary elections does not affect the results (compared to the baseline in table 3, column (3)).

Other changes in political institutions might be correlated with spending and the budget referendum or the voter initiative. In some cantons, for example, citizens decide on each law passed by the government in a law referendum. In other cantons, the constitution imposes limits on expenditure growth or deficit spending in each year. We therefore add controls for fiscal restraints, the provision of the mandatory law referendum as well as controls for female suffrage and proportional representation (in column (3) of table 6). Again, controlling for other institutional reforms has little effect on our basic results.

Instead of controlling for preferences and institutions explicitly, we may also include canton-specific linear trends or decade dummies to capture general unobservable trends or changes. We thus add canton-specific linear trends (in column (4)) to absorb smooth shifts to voter preferences, for example, a declining trend in support for more government. Alternatively, we include separate decade dummies for each of the seven regions in Switzerland (in column (5) of table 6) to control for other shifts in preferences like more demand for government during the Depression or the two World Wars.[18]. The results are very similar to

[18]If we use institutional reforms within a specific canton and decade instead, the results are economically

the baseline indicating that unobserved trends are unlikely to explain our results. The only exception is a small positive effect for local expenditures suggesting that local expenditures are substitutes for canton expenditures.

Another concern relates to the correct standard errors of our estimates since we have a small number of clusters. As an alternative to the wild bootstrap, we also implement the before-after estimator (Bertrand et al., 2004) which does not affect our inference (in column (6)).

We also check whether our results are sensitive to alternative definitions of our direct democratic variables (see table A2 in the online appendix). The absolute number of signatures for the voter initiative has a slightly weaker effect on spending. Allowing the signature requirement to affect spending nonlinearly, we add variables equal to one if a canton's signature requirement is less than 2% (the omitted category), 2-6% and above 6% respectively, and zero otherwise. Very high signature requirements (above 6%) increase spending more than a 2-6% signature requirement). This result is noteworthy because signature requirements in Switzerland are on average lower than in the United States. We also find that coding the signature requirement as zero for cantons without a voter initiative (by interacting the actual signature requirement with a dummy variable whether the signature requirement has been adopted) does yield weaker but qualitatively similar results. We further test whether the two direct democratic institutions are possibly substitutes (see Feld and Matsusaka, 2003) but fail to find evidence for such an effect. We also do not find support for the conjecture that the effect of direct democratic institutions varies over time: the coefficients are the same

and statistically insignificant with a R2 of close to one. This results suggests that canton-specific decade dummies absorbes the available variation resulting in an overparameterized model.

before and after 1945.

In sum, we find that the paper's main findings are largely robust to the inclusion of comprehensive controls for time-varying voter preferences, changes in other political institutions, methods to compute accurate standard errors and alternative specifications of the institutional variables.

5 Endogeneity and Instrumental Variable Approach

5.1 Policy Endogeneity

Our results thus far suggest that shocks to voter preferences and other institutional changes are unlikely to explain the observed negative relationship between direct democracy and public spending. An alternative way to test for the presence of omitted variables is to check for trends in spending prior to reforms of direct democratic institutions (inducing a correlation between the institutional variables and the residual in equation (1)). We add dummy variables denoting intervals four to six and one to three years prior to institutional reforms, and zero to four and more than five years after the reforms to the specification in equation (1). Table 7 reveals no trends in spending prior to adopting or abolishing a mandatory budget referendum, or prior to changing the signature requirement for the voter initiative. Spending shifts do emerge, however, zero to four years or five years after the change in the direct democratic institutions.

An alternative way to test for the endogeneity of direct democratic institutions is to study feedback effects from spending to policy reforms. For example, citizens may demand

more voter control over the budget after periods of overspending in the eye of the voter. We checked whether spending shifts can predict changes to direct democratic institutions. Table A3 in the online appendix shows results from a linear probability model of changing provisions for the mandatory budget referendum (column (1) and (2)) or changing the signature requirement for the voter initiative (column (3)).[19] The table demonstrates that higher spending two and three years before increases the likelihood of adopting the mandatory budget referendum. Similarly, higher spending growth increases the probability of adopting a mandatory budget referendum three years later. In line with the evidence of no prior trends, we find that neither past spending levels, nor growth rates affect the decision to abolish the budget referendum or the decision to change the signature requirement. Taken together, the evidence suggests that policy endogeneity is a concern for the mandatory budget referendum (and in particular, the decision to adopt a mandatory budget referendum) but less of a concern for the voter initiative.

5.2 Using the Constitutional Initiative and Neighboring Cantons as Instruments

To address these endogeneity concerns, we use an instrumental variable approach. In Switzerland, the rights of direct democratic participation are laid down in the canton constitution. If citizens want to increase their influence over politicians, for example, they could launch a constitutional initiative to strengthen direct democratic institutions. A candidate instrument is therefore how costly it is to revise or amend the canton constitution through a constitutional initiative. Our instrument is in the spirit of Poterba (1996) who advocates

[19] Estimates based on a probit model yield very similar results.

the use of constitutional rules to identify the causal effect of political institutions.

Swiss constitutional history provides many examples where the constitutional initiative was a powerful tool to expand democratic participation rights for its citizens (see Curti, 1900; Kölz, 1992, 2004). One example is the "Democratic Movement" in the 1860s; it initiated the adoption of the voter initiative and law referendum in *Basle County* in 1863. A similar campaign followed in *Grisons* where the political opposition of young Democrats launched a constitutional initiative to lower the signature requirement for the voter initiative. The constitutional initiative to reduce the number from 5,000 to 3,000 signatures was approved by the electorate in 1891 (Metz, 1991). In *Schaffhouse*, a constitutional initiative was launched in 1894 to introduce the mandatory budget referendum. The draft of the new constitution included the mandatory budget referendum for projects with extraordinary expenditures of 150,000 or recurrent expenditures of 15,000 and was approved by the electorate in 1895 (Schneider, 1993).[20]

The constitutional initiative was mandated for all cantons by the new federal constitution of 1848. Cantons differ however, in the number of signatures required to launch such an initiative. High signature requirements impose significant barriers for constitutional reform and hence make direct democratic reform by the electorate less likely.[21] Our fixed effects specification then exploits periods with below or above average signature requirements for the constitutional initiative to instrument for changes in the budget referendum and voter initiative. To rule out common preference shocks that lead to reforms of the constitutional

[20]Other examples of the role of the constitutional initiative for the expansion of the voter initiative and mandatory budget referendum after 1890 can be found in *Lucerne*, *Sankt Gallen*, *Schwyz*, *Uri, Valais* and *Zug* (Möckli, 1987; Kölz, 2004).

[21]In fact, all four cantons adopting direct democracy without a constitutional initiative had high signature requirements for a constitutional revision: *Berne* required 15,000 signatures and *Fribourg* 6,000 signatures, for example, already in 1900.

and voter initiative simultaneously, we lag the signature requirements for the constitutional initiative by 10 years. With the lagged instrument, iid (or mildly persistent) preference shocks can affect the constitutional initiative, but not the voter initiative (or vice versa). We expect that lower costs of launching a constitutional initiative (a decade ago) make it easier for voters to adopt the mandatory budget referendum (a negative effect) and lower the signature requirement for the voter initiative (hence, a positive effect).

A second instrument is required to distinguish the effect of the mandatory budget referendum from the effect of the voter initiative. We build on the idea that cantons are differentially affected by direct democratic reforms around them. In particular, we use changes in the strength of direct democracy in neighboring cantons as an instrument.[22] The basic idea is that citizens may use reforms in neighboring cantons as clues to learn about the costs and benefits of direct democratic institutions. Fiscally conservative voters in a canton might learn from neighboring cantons that stronger direct democracy is an effective way to lower neighboring expenditures. Imitation might then induce a positive correlation in institutional reforms. However, one can also imagine the opposite scenario: voters may adopt direct democratic institutions if the experience in neighboring cantons reveals that the benefits are higher or the perceived costs lower than expected (or, if cantons want to preserve their distinct canton identity). In that case, we would get a negative correlation between institutional reforms. In any case, we expect that the spillover from neighboring cantons is nonlinear, i.e. cantons might not respond to a reform by a single neighbor. Instead, learning effects are more likely if the majority of neighboring cantons have implemented a

[22] An alternative strategy based on geography would be to use changes in direct democratic provisions in neighboring countries (interacted with distance) as instruments. Unfortunately, France, Italy, Germany and Austria had little scope for direct democracy at the local level prior to the end of World War II; the referendum or initiative at the federal level in turn are highly persistent (though rarely used) over time.

reform of direct democracy. Hence, our second instrument is a dummy variable whether the majority of neighboring cantons has a mandatory budget referendum or not.[23] For identification, we rely on variation in the mandatory budget referendum of neighboring cantons as an instrument for reforms to a canton's own direct democratic institutions.

The result of the first stage regressions are shown in table 8. The dependent variable is whether the canton has a budget referendum in place (column (1)) and the signature requirement of the voter initiative (column (2)). As expected, a decline in the costs of revising the constitution a decade earlier lowers the signature requirement for the voter initiative and makes it more likely that a mandatory budget referendum is adopted. Both first stage relationships are consistent with the idea that voters use the constitutional initiative to strengthen direct democracy (and hence, their control over politicians). The provisions of a canton's neighbors are negatively correlated with the mandatory budget referendum. Hence, when neighboring cantons abolish their mandatory budget referendum, this increases the probability of adopting a mandatory budget referendum in adjacent cantons.

There are several mechanisms that could explain this negative relationship. Suppose first that citizens cannot learn about the performance of politicians by comparing policy outcomes to neighboring cantons. Yard-stick competition might, for example, not be informative if cantons are very heterogeneous or face uncorrelated shocks. Suppose further that a canton now abolishes the budget referendum (because costs of direct voter participation increased or its benefits decreased) and as a result, public spending and the deficit go up. The reform would then signal to neighbors that the mandatory budget referendum is indeed an effective

[23] We could have also used the average signature requirement for the voter initiative in neighboring cantons. The second-stage results based on this instrument are similar though the first stage is weaker.

instrument to keep spending and deficits low. In response, citizens might consider adopting the mandatory budget referendum in their canton as well. Alternatively, suppose there is a positive trend in adopting a mandatory budget referendum because its benefits are revealed over time. In our data, we indeed observe a positive trend in adoption between 1890 and 1980. If a neighboring cantons adopts the mandatory budget referendum, a canton might actually be less likely to imitate its neighbor because the effectiveness turns out to be lower than expected, or because costly reforms are postponed until more knowledge is accumulated about the possible effects. Finally, Swiss cantons are known for their distinct identity (*Kantönligeist*). Consequently, politicians might have even less incentives to imitate neighboring cantons than in other countries. All three scenarios generate the negative correlation we observe in our data.

How strong are the first-stage relationships? If we raised the costs of launching a constitutional initiative by one standard deviation, the signature requirement for the voter initiative would be 3.5% higher. Similarly, abolishing the mandatory budget referendum in the majority of neighboring cantons increases the likelihood of adopting one by 30.8%. The statistics at the bottom of the table show that we have independent variation in the instruments: Shea's partial R^2 is 0.03 for the voter initiative and 0.05 for the budget referendum. The F-statistics of the instruments suggest, however, that our instruments are relatively weak (Stock and Yogo, 2005).

5.3 Instrumental Variable Results

Given the correlation in the first stage, can we also plausibly exclude the instruments from the spending equation? There are three scenarios in which the constitutional initiative would not be a valid instrument: first, it is invalid if the constitutional initiative is used to directly influence spending or revenue decisions conditional on our control variables. An examination of each canton's constitutions, however, reveals that the constitutional initiative cannot be used to set spending levels, spending growth or limit public debt at the canton level directly.[24] Second, the instrument would also be invalid if the reforms to other political institutions are correlated with spending and the constitutional initiative. For example, the constitutional initiative could be used to extend voting rights (affecting spending through changes in the median voter). We therefore include in our specification (in addition to our other control variables): whether the canton has a mandatory law referendum, female suffrage, proportional representation and whether the constitution requires the government to run a balanced budget. Finally, the costs of launching an initiative (a decade earlier) is also invalid if there are persistent shocks to voter preferences for spending which first induce a reform of the constitutional initiative and then later lead to a change in the signature requirement of the voter initiative. While this possibility cannot be ruled out conclusively, we think that this scenario is unlikely conditional on our comprehensive set of control variables, fixed effects and our earlier evidence that shocks to preferences do not appear to be important.

What about the plausibility of our second instrument? Here, the identifying assumption

[24]Since 2000, three cantons have amended their constitutions to incorporate debt and deficit limitations; these prescribe rules and sanctions if canton deficits exceeds a prescribed threshold. These differ from constitutional balanced budget rules because they do not determine a specific procedure or sanction if deficits occur. However, explicit rules to restrict deficits and hence indirectly affect spending decisions did not exist in our study period from 1890 to 2000.

is that direct democratic reforms in neighboring cantons do not directly influence spending. One thing to note is that cantons in Switzerland (unlike subnational units in many other countries) are politically and fiscally very autonomous units: they have their own political responsibilities, their own constitution, independent institutions (such as parliament, executive and courts) and their own sources of revenues. Nevertheless, our assumption would be violated if common shocks to preferences for government spending, for example, lead to simultaneous reforms in neighboring cantons. Yet, given the negative correlation in the first stage, these preference shocks need to be negatively correlated (such that voters prefer more spending or direct democracy in one canton and less spending or direct democracy in a neighboring one). The second instrument would also be invalid if an increase (decrease) in neighbors' spending induced by abolishing (adopting) the mandatory budget referendum decreases (increases) public spending in the original canton. Reasons could be resource constraints at the federal level or cooperations between cantons such that declining resources in one canton are offset by increasing spending in a neighboring canton. However, cooperation between governments in Switzerland is mostly vertical, i.e. cantons cooperate with the federal government rather than with neighboring cantons.[25] Also, financial transfers (e.g. subsidies) from the federal government to the cantons are not tied to transfers to neighboring cantons or the particular region. And where cooperation between cantons exists (for example, between a city canton and its surrounding neighbors), changes therein are unlikely to coincide precisely with the timing of direct democratic reform.

Given these caveats, the second-stage results are shown on the right-hand side of table 8.

[25]Formal cooperation between cantons in the (*Kantonskonferenz*) began only in 1993, a few years before the end of our study period (and even today, the cooperation is mainly about the relationship between the federal state and the cantons).

Since our set of control variables and sample size differs from our baseline, we first report the least squares results for canton (column (3)) and local expenditures (column (6)). Both are very similar to the results reported in table 3 and 4. If feedback effects bias the OLS results downward (in absolute terms), we expect the instrumental variable estimates to be larger in absolute magnitude than least squares (since higher spending in the past increases the likelihood of stricter direct democratic institutions). Our first set of instrumental variable estimates is shown in columns (4) and (7). Since our instruments are relatively weak, we also use interactions with canton dummies (shown in columns (5) and (8)); hence, the instruments might lead to more direct democracy in one region and to less direct democracy in another region.

The instrumental variable estimates indicate that canton spending is 10.7-11.8% lower if a budget referendum is mandatory. For the voter initiative, a 1% higher signature requirement increases spending by 0.4-1.4 percent. Hence, stronger direct democracy lowers spending at the same level of government and has limited effects on spending at lower levels of government. As expected, the instrumental variable estimates are larger in magnitude than least squares which is consistent with our earlier result that feedback effects bias our estimates downward (in particular, for the mandatory budget referendum). Finally, we use our expanded instrument set to shed some light on the validity of our instruments. The overidentification test reported at the bottom of table 8 shows that we cannot reject the null hypothesis that our instruments can be excluded from the second stage.

6 Conclusion

This article presents new evidence on the effect of direct democracy on public spending. We find that both mandatory budget referendum and voter initiative reduce canton spending. The constraining effects of both institutions are more moderate than suggested by existing cross-sectional studies. Our findings highlight the importance of accounting for unobservable differences across cantons and for the bias from potential endogeneity and omitted variables.

We also show that direct democratic institutions at the canton level play a limited role for the vertical structure of government. Neither the budget referendum nor the voter initiative decentralizes spending to the local level (which is in contrast to earlier studies that found a strong positive correlation between direct democracy and decentralization).

Finally, we would like to point out that our results do not imply that direct democracy improves welfare. To do so, we would need to compare the desired spending levels of the median voter with voters' costs of direct democratic participation. While such an analysis is feasible in principle, we leave an exploration of these welfare effects for future research.

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A Data Appendix

The appendix describes the data sources and construction of variables. Our outcome variables are canton expenditures, revenues and local expenditures. All expenditure and revenue categories are expressed per capita and deflated to 2000 Swiss Francs using the annual consumer price index reported in Studer and Schuppli (2008). Canton expenditures and revenues are taken from the annual publication *Statistisches Jahrbuch der Schweiz* for the years 1890 to 1950 (Bundesamt für Statistik, 1891-2000) and from *Öffentliche Finanzen der Schweiz* for 1950 to 2000 (Federal Department of Finance, various years). Government expenditures and revenues are interpolated for missing observations in 1967 and 1968. Local expenditures are taken from *Historical Statistics of Switzerland* and available for 1863, 1900, 1910, 1938 and annually since 1950. Data are missing in *Nidwalden*, *Uri* and *Schaffhouse* for 1863, 1900 and 1910 as well as in *Obwalden, Solothurn, Appenzell-Innerrhode* and *Appenzell-Outerrhode* in 1900 and 1910. Data for all cantons are missing in 1967 and 1968. Federal subsidies are revenues for cantons comprised of subsidies by the federal state for roads, education, welfare, agriculture and other areas. This control variable is obtained from *Historical Statistics of Switzerland* prior to 1955 and *Öffentliche Finanzen der Schweiz* thereafter. The data are available for 1893, annually between 1915 and 1926, 1928, 1930, 1931, 1933, 1935-1937, 1940, 1942, 1943, 1945, 1946, 1949 and annually since 1953, but missing between 1968 and 1977. Missing years were obtained by linear interpolation.

Our main institutional variable is the mandatory budget referendum and the signature requirement for the voter initiative. We gathered this information from each canton's past and current constitutions (available at http://www.verfassungen.de/ch) and relevant canton laws. We employed published sources to validate and cross-check our coding of the institutional variables (Monnier, 1996; Ritzmann-Blickenstorfer, 1996; Trechsel and Serdült, 1999; Vatter, 2002; Kölz, 2004;). If in doubt, we contacted the cantonal Public Record Offices (*Staatsarchive*) to clarify any inconsistencies. Our first measure is a binary indicator equal to one if the canton had a mandatory budget referendum in that year. The indicator is zero if the canton had an optional or no budget referendum. For the voter initiative, we use the signature requirement for launching an initiative measured in percentage of the eligible population. We assigned a signature requirement of 100% if the voter initiative was not adopted in that year. Three cantons adopted the voter initiative shortly after 1890: *Geneva* in 1891, *Ticino* in 1892 and *Berne* in 1893. The remaining three cantons adopted it in 1906 (*Lucerne*), 1907 (*Valais*) and 1921 (*Fribourg*). We examine the influence of the mandatory law referendum that requires all canton laws to be approved by the electorate. The variable

is a binary indicator if a canton has a mandatory law referendum in place and zero otherwise. We also construct two measures of fiscal constraints: first, a binary indicator equal to one if the canton has a balanced budget rule in their constitution in a given year and zero otherwise. Second, a binary indicator equal to one if the canton has constitutional or statutory deficit or debt limitations in place in a year and zero otherwise. Both were coded from the canton constitutions and Stauffer (2001).

Information on voter support for more spending is collected from the online database of all federal propositions by the Federal Statistical Office (http://www.admin.ch/ch/d/pore/va/). We calculate our measure of voter preferences as the percentage of votes for propositions that would increase spending if approved. To identify votes with fiscal consequences, we use the official documents by the federal government (http://www.ads.bar.admin.ch/ADS/). They contain the arguments for and against each proposition as well as its estimated financial consequences, i.e. whether and by how much expenditures or taxes would increase if the proposition was approved. Our second preference measure is calculated from the number of seats held by left-wing parties divided by the number of seats in the canton parliament. Both are compiled from Hofferbert (1967), the *Statistisches Jahrbuch der Schweiz*, all past and current constitutions and information provided by each canton's Public Record Office. Left-wing party seats are missing for two cantons (*Appenzell-Innerrhode* and *Appenzell-Outerrhode*). No party seat information is available for *Nidwalden* prior to 1943 and *Obwalden* prior to 1966. Party affiliations were often not well-defined in the late 19th and early 20th century. For seven cantons (*Basle City*, *Geneva*, *Neuchatel*, *Lucerne, Solothurn, Schwyz* and *Zug*), we have party affiliation over the whole period; for seven more (*Aargau*, *Saint Gallen*, *Zurich*, *Basle County*, *Fribourg, Thurgau* and *Grisons*) we have information since the 1910s. Information in four cantons (*Berne*, *Glarus*, *Ticino* and *Valais*) is available since the 1920s and for the remaining three since the early 1930s.

Our control variables are taken from the decennial Census as reported in *Historical Statistics of Switzerland*, Hofferbert (1976) and *Statistisches Jahrbuch der Schweiz*; the data are available for 1888, 1900, 1910, 1920, 1930, 1941, 1950, 1960, 1970, 1980, 1990 and 2000. The population in each canton is from *Statistisches Jahrbuch der Schweiz* and available annually since 1888. Population density is measured as the log of a canton's population. Urban population is calculated as the share living in cities with more than 10,000 inhabitants. The data is taken from *Historical Statistics of Switzerland* and *Statistisches Jahrbuch der Schweiz* and available for 1890, 1894, 1898, 1903, for each decade between 1910 and 1960 as well as 1962, 1969, 1974, 1979, 1984, 1990 and 2000. The information on the population in the various age groups (below 20, between 20 and 64 and above 65), the number of foreigners and religious affiliation is from the decennial Census. All three variables are expressed as percentage of the total population. Religious affiliation is calculated as the share of the population that is Protestant as opposed to being Catholic or another religion. We collected several labor market indicators to control for differences in economic activity across cantons. Total employment and employment shares in agriculture and manufacturing are from the decennial Census. The labor force participation rate is then calculated by dividing the number of people employed by the canton's total population.

We use three additional variables to control for income differences across cantons. The number of doctors is calculated per 1,000 inhabitants. The data is from *Historical Statistics of Switzerland*, Hofferbert (1976) and *Statistisches Jahrbuch der Schweiz* and available for

1890, 1895, 1900, 1910, 1917, 1920, 1926, 1930, 1935, 1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975. 1980. 1985, 1990, 1995 and 2000. Infant mortality denotes the number of children that died before reaching age one and is expressed per 100,000 births. The data for births and infant mortality is available annually since 1890 and taken from *Historical Statistics of Switzerland*. Car ownership is calculated as number of cars per population and is from *Historical Statistics of Switzerland* and *Statistisches Jahrbuch der Schweiz*. It is zero before the first cars emerged in 1910 and positive thereafter. Data on cars owned is available for 1910, 1914, 1917, 1923, 1929, 1934, 1939, 1945, 1947, 1950, 1954, 1958, 1962, 1966, 1970, 1975, 1978, 1982, 1986 and annually since 1990. We used linear interpolation for missing years between two data points; data before 1910 are set to zero.

Table 1
Direct Democracy in Swiss Cantons, 1890-2000

	Mandatory Budget Referendum*	Changes in Mandatory Budget Referendum†	Year since Voter Initiative In Place‡	Signature Requirement Voter Initiative§	Changes in Provision and Signature Requirement of Voter Initiative‖
Aargau (AG)	No	Abolish (1982)	1852	3,000	Decrease (1982)
Appenzell Outerrhode (AR)	Yes	No	1876	300	Increase (1995)
Appenzell Innerrhode (AI)	Yes	Adopt (1979)	1872	1	No
Basle County (BL)	No	Adopt (1892), Abolish (1944)	1863	1,500	No
Basle City (BS)	No	No	1875	4,000	Increase (1950; 1975)
Berne (BE)	No	Adopt (1893), Abolish (1993)	1893	15,000	Adopt (1893), Increase (1993)
Fribourg (FR)	Yes	Adopt (1972)	1921	6,000	Adopt (1921)
Geneva (GE)	No	Adopt (1927), Abolish (1931)	1891	10,000	Adopt (1891), Increase (1936, 1964)
Glarus (GL)	Yes	No	1836	1	No Changes
Grisons (GR)	Yes	No	1880	3,000	Decrease (1893)
Lucerne (LU)	Yes	Adopt (1969)	1906	4,000	Adopt (1906)
Neuchatel (NE)	Yes	Adopt (1949), Abolish (2000)	1882	6,000	Increase (1959)
Nidwalden (NW)	Yes	Adopt (1913)	1850	250	Increase (1996)
Obwalden (OW)	No	Adopt (1902), Abolish (1998)	1867	500	Increase (1998)
Schaffhouse (SH)	Yes	Adopt (1895)	1876	1,000	No Changes
Schwyz (SZ)	Yes	No	1876	2,000	No Changes
Solothum (SO)	Yes	No	1869	3,000	Increase (1977)
St. Gallen (SG)	Yes	Adopt (1929)	1890	4,000	No Changes
Ticino (TI)	No	No	1892	7,000	Adopt (1892), Increase (1970)
Thurgau (TG)	Yes	No	1869	4,000	Increase (1987)
Uri (UR)	Yes	No	1888	600	Increase (1928, 1955, 1997)
Vaud (VD)	No	Abolish (1948), Adopt (1998)	1845	12,000	Increase (1961)
Valais (VS)	No	Adopt (1907), Abolish (1994)	1907	4,000	Adopt (1907), Increase (1973), Decrease (1994)
Zurich (ZH)	No	Abolish (1999)	1869	10,000	Increase (1979)
Zug (ZG)	No	No	1873	2,000	Decrease (1894), Increase (1990)

*Indicates whether cantons have a mandatory budget referendum in place at the end of our sample period in 2000.

† Lists whether and when a canton adopted or abolished the canton budget referendum over our sample period. The budget referendum in Fribourg after 1972 and Valais between 1920 and 1994 applies to extraordinary expenditures only which we code as no mandatory referendum. Obwalden's referendum applied to spending on roads only prior to 1902 which we code as no mandatory budget referendum.

‡ Indicates the year since the law initiative has been in place for sure. Note that in some cantons, similar provisions might have been in place even earlier than the year indicated.

§ Signature requirements define the absolute number of signatures required to launch a voter initiative in 2000.

‖ Lists the changes in the required number of signatures over our sample period. In the empirical analysis, we use the signature requirement in percentage of the eligible population, not the absolute number of signatures required, as measure of the voter initiative.

Table 2
*Summary Statistics by Institutional Regime**

	Mandatory Referendum		*No Mandatory Referendum*		T Statistic
	Mean	Std. Dev	Mean	Std. Dev	Difference†
Fiscal Policy					
Expenditures per capita (log)	7.15	1.24	7.18	1.31	0.5
Revenues per capita (log)	7.13	1.25	7.15	1.31	0.4
Local expenditures in canton (log)	7.07	1.19	6.63	1.13	-9.5
Degree of Centralization‡	53.72	12.45	61.38	17.15	-2.9
Political Institutions					
Signature requirement law initiative (%)§	4.60	9.86	9.96	21.91	8.8
Signature requirement constitutional initiative (%)	5.47	4.83	7.39	6.21	8.9
Signatures for constitutional initiative (#)	3794.42	3950.40	4418.53	3582.48	4.1
Mandatory law referendum	0.84	0.37	0.26	0.44	-40.4
Size of canton parliament	115.67	55.74	111.42	43.19	-2.0
Size of canton executive	6.44	1.44	6.75	1.32	5.7
Proportional representation adopted?	0.53	0.50	0.76	0.43	11.7
Women's suffrage adopted?	0.28	0.45	0.26	0.44	-1.5
Balanced budget rule	0.03	0.18	0.04	0.21	1.6
Deficit or debt limitations	0.06	0.25	0.01	0.11	-6.3
Control Variables					
Age 0 to 19 (%)	34.22	6.11	32.99	7.83	-4.6
Age 20 to 39 (%)	29.66	2.25	30.58	2.94	9.3
Age 40 to 64 (%)	26.50	3.07	27.33	4.04	6.1
Age 65 and Above (%)	9.63	3.47	9.10	3.70	-3.7
Log population	11.61	1.13	11.69	1.06	1.7
Urban population (%)	19.01	19.07	37.77	31.02	19.7
Federal subsidies (log)	5.43	1.21	5.16	1.07	-5.7
Employment in primary sector (%)	21.04	12.91	18.89	15.44	-3.9
Employment in secondary sector (%)	44.66	11.96	41.54	9.81	-7.0
Labor force participation	39.92	7.15	42.13	8.36	6.9
Doctors per 1,000 inhabitants	0.81	0.35	1.05	0.64	12.6
Car ownership (%)	12.58	16.50	11.70	17.01	-1.3
Infant mortality rate ||	59.77	106.05	61.20	89.29	0.4
Protestants (%)	44.10	29.75	31.52	26.58	-11.0
Internal Migrants (%)	31.02	11.40	35.88	16.92	8.5
Foreigners (%)	9.74	5.16	14.27	10.31	15.4
Linguistic heterogeneity **	0.20	0.23	0.21	0.16	1.9
Religious heterogeneity **	0.34	0.20	0.34	0.20	-0.3
Seats for Left-Wing Parties in Parliament (%)††	16.19	13.64	15.40	12.94	-1.4

* Summary statistics over the whole period (1890-2000) are reported separately for cantons with mandatory budget referendum and those without.

† Reports the T-value for differences in means between the two groups of cantons.

‡ The degree of centralization is the percentage of local and canton expenditures that are undertaken at the canton level.

§ The signature requirement for the voter initiative and constitutional initiative are calculated as percentage of the eligible population over 20. Both variables are set to 100% if no law or constitutional initiative were in place.

|| Infant mortality is calculated as number of children dying before age 1 among 100,000 births.

** Linguistic and religious heterogeneity are calculated as one minus the Herfindahl index for three language and religious groups.

†† Left-wing ideology is measured as the percentage of seats of left-wing parties in each canton's parliament.

Table 3

Direct Democracy and Fiscal Policy: Fixed Effects

	*Canton Expenditures**			*Canton Revenues**		
	(1)	(2)	(3)	(4)	(5)	(6)
Budget Referendum	-0.294	-0.135	-0.084**	-0.274	-0.117	-0.065
	(0.183)	(0.083)	(0.041)	(0.180)	(0.081)	(0.042)
	p=0.16	p=0.12	p=0.09	p=0.11	p=0.20	p=0.15
Signature Requirement Initiative	-0.003	0.003	0.004***	-0.003	0.003	0.004***
	(0.004)	(0.002)	(0.001)	(0.004)	(0.002)	(0.001)
	p=0.12	p=0.22	p=0.12	p=0.14	p=0.22	p=0.16
Log Population		-0.132*	0.012		-0.025***	0.205***
		(0.066)	(0.194)		(0.009)	(0.052)
% Urban Population		0.001	0.003		0.003***	0.002**
		(0.002)	(0.002)		(0.000)	(0.001)
Federal Subsidies (log)		0.190***	0.170***		0.147***	0.147***
		(0.032)	(0.022)		(0.014)	(0.011)
% Employed Agriculture		-0.014	0.014**		-0.018***	0.009***
		(0.009)	(0.007)		(0.002)	(0.002)
% Employed Industry		-0.010	0.021**		-0.006***	0.025***
		(0.007)	(0.009)		(0.001)	(0.002)
Labor Force Participation (%)		-0.011*	-0.013**		-0.014***	-0.021***
		(0.006)	(0.006)		(0.002)	(0.002)
Doctors (per 1,000 inhabitants)		0.102	-0.143*		0.007	-0.267***
		(0.132)	(0.082)		(0.029)	(0.032)
Car Ownership (%)		0.025**	-0.009		0.026***	0.008***
		(0.012)	(0.008)		(0.003)	(0.003)
Infant Mortality Rate		-0.004**	-0.000		-0.004***	-0.000
		(0.002)	(0.001)		(0.001)	(0.001)
% Protestants		0.003*	0.005**		0.004*	0.006**
		(0.002)	(0.002)		(0.002)	(0.002)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Age Structure of Canton	No	Yes	Yes	No	Yes	Yes
Size Legislature and Executive	No	Yes	Yes	No	Yes	Yes
Canton Fixed Effects	No	No	Yes	No	No	Yes
Observations	2395	2395	2395	2395	2395	2395
R-squared	0.90	0.96	0.98	0.90	0.96	0.98
Joint Significance Canton FE†			120.1			700.0
(p value)			<0.001			<0.001

The dependent variable in columns (1)-(3) is log annual canton per capita expenditures and log annual canton per capita revenues in columns (4)-(6).

*The first specification (columns (1) and (4)) controls only for the mandatory budget referendum and the signature requirement for the voter initiative as well as year dummies. The second specification adds log population, the percentage of the population in different age groups (20-39, 40-64, 65 and above, age 0-19 being the omitted category), the percentage of the population living in cities with more than 10,000 inhabitants, the percentage of workers employed in agriculture and industry, the log per capita federal subsidies to a canton, labor force participation rate, infant mortality rate, the per capita ownership of cars, the number of doctors per 1,000 inhabitants, the percentage of Protestants, the size of the canton parliament and the size of the canton executive. The third specification also adds canton fixed effects.

†Shows the F-statistic and p-value for the joint significance of the canton fixed effects.

Standard errors are clustered at the canton level. * p<0.1, ** p<0.05 and *** p<0.01. We also report p values for the main institutional variables generated using the wild bootstrap below the standard errors.

Table 4
Direct Democracy and Decentralization: Fixed Effects

	*Local Expenditures**			*Centralization Measure**		
	(1)	(2)	(3)	(4)	(5)	(6)
Budget Referendum	0.267	0.150	-0.041	-10.096*	-6.040*	-0.630
	(0.203)	(0.125)	(0.058)	(5.553)	(3.010)	(1.640)
	p=0.13	p=0.11	p=0.24	p=0.06	p=0.09	p=0.12
Signature Requirement Initiative	0.008***	0.011***	0.008***	-0.230**	-0.190**	-0.119**
	(0.003)	(0.003)	(0.002)	(0.098)	(0.074)	(0.044)
	p=0.03	p=0.09	p=0.04	p=0.09	p=0.10	p=0.21
Log Population		0.292**	-0.674**		-8.680**	9.238
		(0.131)	(0.318)		(3.134)	(7.909)
% Urban Population		-0.002	0.004		-0.003	-0.011
		(0.005)	(0.003)		(0.104)	(0.095)
Federal Subsidies (log)		0.074	-0.047		3.219*	4.639***
		(0.073)	(0.050)		(1.718)	(1.178)
% Employed Agriculture		-0.010	-0.012		-0.229	0.355*
		(0.017)	(0.009)		(0.452)	(0.203)
% Employed Industry		-0.002	0.003		-0.419	0.049
		(0.012)	(0.010)		(0.340)	(0.229)
Labor Force Participation (%)		0.023*	0.014*		-0.606*	-0.462**
		(0.013)	(0.008)		(0.349)	(0.193)
Doctors (per 1,000 inhabitants)		-0.532**	-0.530**		4.733	-0.758
		(0.206)	(0.204)		(4.824)	(3.075)
Car Ownership (%)		0.039*	0.025**		-0.925	-0.571**
		(0.023)	(0.011)		(0.546)	(0.245)
Infant Mortality Rate		-0.005	-0.002		0.208**	0.023
		(0.003)	(0.002)		(0.094)	(0.031)
% Protestants		0.003	0.002		0.044	0.047
		(0.003)	(0.004)		(0.058)	(0.100)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Age Structure of Canton	No	Yes	Yes	No	Yes	Yes
Size of Legisulature and Executive	No	Yes	Yes	No	Yes	Yes
Canton Fixed Effects	No	No	Yes	No	No	Yes
Observations	2310	2310	2310	2310	2310	2310
R-squared	0.79	0.86	0.95	0.25	0.518	0.837
Joint Significance Canton FE†			37.1			152.8
(p value)			<0.001			<0.001

*The dependent variable in columns (1)-(3) is log per capita expenditures of local communities in each canton; in columns (4) to (6), it is the percentage of per capita expenditures at the canton level calculated as canton spending/(canton+local spending). For three cantons (*Uri, Schaffhouse* and *Nidwalden*), local expenditures were only available since 1938. See notes to table 3 for details on the independent variables included in the estimation.

†The last two rows in columns (3) and (6) report the F-statistic and p-value for the joint significance of the canton fixed effects.

Standard errors are clustered at the canton level. * p<0.1, ** p<0.05 and *** p<0.01. We also report p values for the main institutional variables generated using the wild bootstrap below the standard errors.

Table 5
Controlling for Changes in Voter Preferences

	With % Internal Migrants (1)	With Population Heterogeneity (2)	Baseline with Valid Ideology Observations (3)	With Redistributive Ideology (4)	Baseline for Observations on Preferences (5)	With Preferences for Government (6)	With All Controls for Preferences (7)
Y: Canton Expenditures							
Budget Referendum	-0.087**	-0.089**	-0.106**	-0.091*	-0.066*	-0.065*	-0.097**
	(0.041)	(0.039)	(0.047)	(0.048)	(0.036)	(0.036)	(0.043)
Signature Requirement Initiative	0.004***	0.004***	0.004***	0.004***	0.004***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Voter Preferences for Spending						0.003***	0.003***
						(0.001)	(0.001)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2395	2395	2270	2270	1317	1317	1192
R Squared	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Y: Local Expenditures							
Budget Referendum	-0.039	-0.043	-0.052	0.012	-0.057	-0.055	-0.074
	(0.058)	(0.056)	(0.070)	(0.060)	(0.047)	(0.048)	(0.063)
Signature Requirement Initiative	0.008***	0.008***	0.008***	0.004*	0.011***	0.011***	0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Voter Preferences for Spending						0.001	0.001
						(0.002)	(0.002)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2310	2310	2185	2185	1298	1298	1173
R Squared	0.95	0.95	0.95	0.95	0.96	0.96	0.96

The dependent variable is the log of canton expenditures in the top panel and the log of local expenditures in the bottom panel. Column (1) controls for the percentage of Swiss migrants (born in a different canton), column (2) adds Herfindahl indices for religious and liguistic heterogeneity, column (3) and (5) rerun the baseline for valid observations of left-wing seats and voter support for more spending respectively. Columns (4) and (6) then add the share of seats for left-wing parties and ballot support for public spending as controls for voter preferences. Finally, column (7) includes all preference measures simulatenously. All specifications include year and canton fixed effects and the same controls as in column (3) in table 3. Standard errors are clustered at the canton level. * p<0.1, ** p<0.05 and *** p< 0.01.

Table 6
Additional Robustness Tests

	Use Years prior to Female Suffrage (1)	Control for Proportional Representation (2)	Control for Institutional Changes (3)	With Canton-Specific Linear Trends (4)	With Region x Decade FE (5)	Before-After Estimator (Std. Errors) (6)
Y: Canton Expenditures						
Budget Referendum	-0.114	-0.079*	-0.098**	-0.071***	-0.058**	-0.028***
	(0.082)	(0.042)	(0.042)	(0.017)	(0.027)	(0.009)
Signature Requirement Initiative	0.003***	0.004***	0.004***	0.002***	0.003***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1640	2395	2395	2395	2395	1603
R Squared	0.97	0.98	0.98	0.99	0.99	
Y: Local Expenditures						
Budget Referendum	0.034	-0.015	-0.006	0.054**	-0.005	0.001
	(0.088)	(0.058)	(0.058)	(0.022)	(0.082)	(0.012)
Signature Requirement Initiative	0.006***	0.009***	0.009***	0.001*	0.003	0.004***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1555	2310	2310	2310	2310	1540
R Squared	0.91	0.95	0.95	0.97	0.97	

The dependent variable is the log of canton expenditures in the top panel and the log of local expenditures in the bottom panel. Column (1) uses the subset of years prior to the adoption of female suffrage in each canton; column (2) adds the year when proportional representation was adopted; column (3) controls for a comprehensive set of institutional changes over our study period (proportional representation, female suffrage, mandatory law referendum, balanced budget rules in the constitution and statutory or constitutional limits on deficits and debts). Column (4) includes canton-specific linear trends, while column (5) uses region-specific decade dummies. Column (6) implements the before-after estimator proposed by Bertrand et al. (2004) to deal with serial correlation in the case of a small number of clusters. All specifications include year and canton fixed effects and the same controls as in column (3) in table 3. Standard errors are clustered at the canton level (except in column (6)). * p<0.1, ** p<0.05 and *** p< 0.01.

Table 7
Dynamic Effects

	4-6 Years before Change (1)	1-3 Years before Change (2)	0-4 Years after Change (3)	More than 5 Years after Change (4)	p value* 4-6 and 1-3 yrs. (5)	p value* 0-4 and 5+ yrs. (6)
Y: Log Canton Expenditures						
Adopt Budget Referendum	-0.069	0.039	-0.124**	-0.103***	0.21	0.02
	(0.045)	(0.025)	(0.045)	(0.034)		
Abolish Budget Referendum	-0.008	0.013	0.049	0.184*	0.91	0.26
	(0.029)	(0.033)	(0.035)	(0.097)		
Change Signatures Law Initiative	0.027	0.047	0.050	0.316***	0.37	0.01
	(0.034)	(0.045)	(0.039)	(0.102)		
Y: Log Local Expenditures						
Adopt Budget Referendum	0.040	0.051*	0.125	0.026	0.18	0.21
	(0.091)	(0.027)	(0.113)	(0.096)		
Abolish Budget Referendum	0.071	0.058	0.076	-0.002	0.09	0.72
	(0.056)	(0.058)	(0.095)	(0.159)		
Change Signatures Law Initiative	0.100*	0.108	0.121	-0.015	0.14	0.33
	(0.057)	(0.072)	(0.079)	(0.131)		

The table reports estimates for dummy variables denoting time periods relative to changes in direct democratic institutions. The dependent variable is the log of canton expenditures in the top panel and log local expenditures in the bottom panel. All specifications control for canton and year fixed effects and the same canton characteristics as in column (3) of table 3.
*Reports p values of the F-test that the coefficients in columns (1) and (2) (columns (3) and (4) respectively) are zero.
Standard errors are clustered at the canton level. *p<0.10, **p<0.05, ***p<0.01.

Table 8

Direct Democracy and Fiscal Policy: Instrumental Variables

	First Stage Results*		Second Stage (Canton Expenditures)†			Second Stage (Local Expenditures)†		
	Budget Referendum	Voter Initiative	OLS Estimates	IV Estimates	IV plus Estimates	OLS Estimates	IV Estimates	IV plus Estimates
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mandatory Budget Referendum			-0.097**	-0.107**	-0.118***	-0.007	0.151	0.166
			(0.042)	(0.043)	(0.044)	(0.058)	(0.095)	(0.112)
Signature Requirement Initiative			0.004***	0.014**	0.004*	0.009***	0.023***	0.022***
			(0.001)	(0.006)	(0.002)	(0.002)	(0.007)	(0.005)
Mandatory Budget Referendum in the Majority of Neighboring Cantons	-0.308***	1.863						
	(0.081)	(1.703)						
Signatures Constitutional Initiative (t-10)	-0.000	0.654**						
	(0.007)	(0.316)						
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2355	2355	2355	2355	2355	2310	2355	2355
Partial R Squared of Instruments	0.14	0.08	0.98			0.95		
Shea's Partial R Squared of First-Stage	0.05	0.03						
F-Statistic Excluded Instruments	7.63	2.1						
Sargan statistic					19.0			21.5
(p value)					0.39			0.2

The table reports instrumental variable results where the signature requirement to launch a constitutional initiative (10 years earlier) and whether the majority of neighboring cantons have a mandatory budget referendum in place are used as instruments. All specifications include year and canton fixed effects, all controls as in column (3) of table 3 and in addition: whether the canton has a mandatory law referendum, women's suffrage, proportional representation or constitutional fiscal restraints in place.

* The dependent variable in the first stage is whether a canton has a mandatory budget referendum (column (1)) and the signature requirement for the voter initiative (column (2)).

† The dependent variable are log canton expenditures (columns (3-(5)) and log local expenditures (columns (6) to (8)). Columns (3) and (6) show the least squares regression results for the same set of control variables and the subset of years with valid information on the instrument. Columns (4) and (7) show the second-stage instrumental variable estimates. Columns (5) and (8) show the second-stage instrumental variables results where the effects of the constitutional initiative and the mandatory budget referendum of neighboring cantons are allowed to vary by canton.

Standard errors are clustered at the canton level. * p<0.1, ** p<0.05 and *** p<0.01.

Table A1: Federal Propositions inducing More Federal Spending, 1891-2000

Number*	Title of Proposition	Year	% Yes†	Outcome‡	Number*	Title of Proposition	Year	% Yes†	Outcome‡
35	Disability Insurance for Civil Servants and Public Employees	1891	21%	No	302	Removal of Canton Share in Stamp Duties	1980	67%	Yes
43	Share Customs Revenues with Cantons [lessexp]	1894	29%	No	303	Redistribution of Revenues from Alcohol Tax	1980	71%	Yes
46	Revision of Military Provisions	1895	42%	No	305	For a new Immigration Policy	1981	16%	No
52	Trade with Food (Revise Article 24, Constitution)	1897	65%	Yes	308	Improving Federal Finances	1981	69%	Yes
53	Nationalisation of Swiss Railways	1898	68%	Yes	312	Regulation of Gas Taxes	1983	53%	Yes
56	Health and Accident Insurance	1900	30%	No	313	Energy Article	1983	49%	No
60	Revision of Tariffs on Foreign Products [lessexp]	1903	60%	Yes	316	Introduction of User Fee for Heavy Traffic	1984	59%	Yes
66	Change in Organization of Swiss Military	1907	55%	Yes	317	User Fee for Highways (Nationalstrassen)	1984	53%	Yes
71	Health and Accident Insurance	1912	54%	Yes	323	Protection Motherhood	1984	15%	No
99	Initiative for Old Age, Widow and Disability Insurance	1925	42%	Yes	324	Regulation of Radio and Television	1984	69%	Yes
101	Federal Law on Old Age, Widow and Disability Insurance	1925	65%	Yes	331	Removal of Canton Share in Stamp Duties	1985	67%	Yes
102	Constitutional Amendment Regarding Corn Supply	1926	50%	No	332	Redistribution of Revenues from Alcohol Tax	1985	72%	Yes
115	Old Age and Widow Insurance	1931	40%	No	335	Subsidies for Small and Medium-Sized Firms	1985	43%	No
117	Temporary Decrease in Salaries of Public Employees	1933	45%	No	339	Culture Initiative	1986	43%	No
119	Change in Organization of Military Training	1935	54%	Yes	340	Secure Vocational Training and Retraining	1986	17%	No
121	Fight Economic Crisis	1935	43%	No	341	Domestic Sugar Industry Regulation	1986	38%	No
131	Loans for Military Investment and Reduce Unemployment	1939	69%	Yes	342	Protection of Renters	1986	63%	Yes
132	Change in Insurance for Civil Servants	1939	44%	No	348	Railway 2000	1987	56%	Yes
139	Protecting the Family	1945	76%	Yes	349	Protection of the Moor	1987	57%	Yes
141	Establishing a Right of Holding a Job	1946	19%	No	350	Reform Health Insurance	1987	28%	No
142	Economic Reforms and Right of Holding a Job	1947	31%	No	351	Constitutional Basis for Transport Policy	1988	46%	No
143	Revision of Economic Laws in the Constitution	1947	53%	Yes	352	Decrease Retirement Age	1988	35%	No
145	Regulation of Swiss Sugar Industry	1948	36%	No	363	Regulation of Wine Industry	1990	46%	No
150	Subsidies for Housing Construction	1950	46%	No	367	Energy Supply Article	1990	71%	Yes
157	Contribution to Costs of National Defense	1951	33%	No	368	Change in Traffic Law	1990	52%	Yes
159	Subsidies for Agriculture	1952	64%	Yes	370	Promoting Public Transport	1991	37%	No
168	Changes in Federal Finances	1953	42%	No	371	Reform of Federal Finances	1991	46%	No
171	Subsidies for Swiss War Veterans Living Abroad	1954	44%	No	373	Financing of Health Insurance	1992	39%	No
177	Subsidy for Canton Grisons	1956	43%	No	377	Protection of Waters	1992	66%	Yes
178	Changes in Order for Wheat Production	1956	39%	No	381	Saving the Waters	1992	37%	No
187	Improving the Road Infrastructure	1958	85%	Yes	382	Building Railway through the Alps	1992	63%	Yes
194	Subsidies for Milk Producers	1960	56%	Yes	386	Raise Salary of Parliamentary Members	1992	27%	No
196	Gas Tax for Financing Highway Construction (Nationalstrasse	1961	47%	No	387	Improve Infrastructure for Parliamentary Members	1992	30%	No
201	Salaries of Representatives and Government Members	1962	32%	No	389	Increase in Gas Tax	1993	55%	Yes
205	Scholarships and Other Training Subsidies	1963	79%	Yes	398	Unemployment Insurance	1993	70%	Yes
207	Vocational Training	1964	67%	Yes	399	Federal Finances	1993	67%	Yes
219	Subsidies for Domestic Sugar Industry	1970	54%	Yes	400	Improving Federal Finances	1993	58%	Yes
222	Housing Guarantee and Protection of Families	1970	49%	No	401	Maintenance of Social Security	1993	63%	Yes
223	Changes in Federal Finances	1970	55%	No	405	Continuing Highway Fee	1994	69%	Yes
227	Subsidies for Apartment Construction	1972	30%	No	406	Continuing Heavy Traffic Fee	1994	72%	Yes
232	Changes in Old Age and Disability Insurance	1972	16%	No	407	Introduction of User Fee for Heavy Traffic	1994	67%	Yes
235	Subsidies for Scientific Research	1973	65%	Yes	410	Promote Culture	1994	50%	No
240	Restriction on Deductions of Income Tax	1973	68%	Yes	415	Change in Health Insurance	1994	51%	Yes
245	Socially Acceptable Health Insurance	1974	27%	No	416	For a new Health Insurance	1994	23%	No
248	Financing Highway Construction (Nationalstrassen)	1975	54%	Yes	423	Securing Invalidity/Age Insurance	1995	27%	No
249	Changes in General Customs Tariffs	1975	48%	No	430	For an Environmentally Oriented Agriculture	1996	77%	Yes
258	Loan to International Development Agency	1976	44%	No	431	Re-Organisation Administration	1996	39%	No
268	Changes in Sales Tax and Direct Federal Tax	1977	41%	No	442	Introduction of User Fee for Heavy Traffic	1998	57%	Yes
281	Decrease Retirement Age	1978	21%	No	444	Reform of Age Insurance	1998	41%	No
286	Subsidies for Universities/Technical Colleges	1978	43%	No	445	Infrastructure for Public Transportation	1998	63%	Yes
289	Milk Production	1978	69%	Yes	458	Law on Insurance of Motherhood	1999	38%	No
291	Federal Responsibility for Security	1978	44%	No	465	Subsidies for Solar Energy (Solarrappen)	2000	31%	No
294	Subsidize Hiking Trails	1979	76%	Yes	469	For a flexible Age Insurance	2000	39%	No
297	Changes in Sales Tax and Direct Federal Tax	1979	35%	No	470	For a flexible Retirement Age	2000	46%	No

The table lists the federal propositions, which would have increased the size of government through higher spending, taxes or subsidies. The financial consequences of a proposition were assessed using the official documents by the federal government (available at http://www.ads.bar.admin.ch/ADS/showHome.do), which are distributed to each citizen before the vote.

* The number corresponds to the official number of the vote.

† The column shows the percentage of voters supporting the proposition

‡ The column reports the final outcome. For vote no. 223, the majority of the electorate voted in favor but the Council of States rejected it.

Table A2: Additional Specification Tests

	Use # of Signatures for Voter Initiative (1)	Use Discrete Signature Requirement (2)	With Dummy Existence of Voter Initiative (3)	With Budget Referendum*Signature Voter Initiative (4)	Effect by Subperiods (before 1945) (5)	Optional Budget Referendum Dummy Variable (6)	Optional Budget Referendum Signature Requirement (7)
Y: Canton Expenditures							
Budget Referendum	-0.087**	-0.084**	-0.074*	-0.11*	-0.077*	-0.076*	-0.076*
	(0.040)	(0.040)	(0.043)	(0.057)	(0.041)	(0.038)	(0.038)
Signature Requirement Initiative (%)				0.012	0.020**	0.004***	0.004***
				(0.011)	(0.009)	(0.001)	(0.001)
# Signatures Required Initiative/100	0.043***						
	(0.014)						
Signature Requirement 2 to 6%		0.094***					
		(0.029)					
Signature Requirement More than 6%		0.112**					
		(0.043)					
Existence Initiative*Sig. Requirement			0.015				
			(0.010)				
Budget Referendum*Sig. Requirement				0.008			
				(0.014)			
Budget Referendum before 1945					-0.027		
					(0.048)		
Signature Requirement before 1945					-0.016		
					(0.009)		
Optional Budget Referendum						0.025	-0.000
						(0.047)	(0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2395	2395	2395	2395	2395	2395	2395
R Squared	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Y: Local Expenditures							
Budget Referendum	-0.039	-0.062**	-0.035	0.122	-0.028	-0.018	-0.018
	(0.024)	(0.025)	(0.024)	(0.102)	(0.029)	(0.068)	(0.068)
Signature Requirement Initiative				0.014	0.005	0.008***	0.008***
				(0.019)	(0.005)	(0.002)	(0.002)
# Signatures Required Initiative/100	0.001***						
	(0.000)						
Signature Requirement 2 to 6 %		-0.051*					
		(0.026)					
Signature Requirement More than 6 %		-0.112***					
		(0.040)					
Existence Initiative*Sig. Requirement			-0.006				
			(0.006)				
Budget Referendum*Sig. Requirement				-0.037			
				(0.023)			
Budget Referendum before 1945					-0.023		
					(0.034)		
Signature Requirement before 1945					0.001		
					(0.005)		
Optional Budget Referendum						0.082	-0.001
						(0.063)	(0.001)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canton Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2310	2310	2310	2310	2310	2310	2310
R Squared	0.93	0.93	0.93	0.93	0.93	0.950	0.950

The table reports results for log canton expenditures (top panel) and log local expenditures (bottom panel). Column (1) uses the absolute number of signatures required to launch a law initiative; column (2) includes a discrete measure for the signature requirement (signature requirements below 2 percent are the omitted category). Column (3) interacts the signature requirement with an indicator for the existence of the law initiative, while column (4) includes the interaction between mandatory budget referendum and the signature requirement for the law initiative. Column (5) allows the coefficients for the direct democratic institutions to vary before and after the end of World War II. Columns (6) and (7) control for the provisions of the optional mandatory budget referendum as well: whether the canton also allows for an optional budget referendum (column (6)) and the signature requirement of the optional budget referendum (column (7)). All specifications include canton and year fixed effects and the same controls as in column (3) of table 3. Standard errors are clustered at the canton level. * p<0.01, ** p<0.05 and *** p<0.01.

Table A3: Feedback Effects

	Adopt Mandatory Budget Referendum	*Abolish Mandatory Budget Referendum*	*Change Signatures Voter Initiative*
	OLS	OLS	OLS
	(1)	(2)	(3)
Log Expenditures T-2	0.028**	-0.008	0.014
	(0.012)	(0.006)	(0.042)
Log Expenditures T-3	-0.020*	0.006	0.032
	(0.011)	(0.005)	(0.038)
Log Expenditures T-5	-0.011	-0.002	0.048
	(0.007)	(0.004)	(0.039)
Observations	2395	2395	2395
R Squared	0.06	0.05	0.25
Δ Log Expenditures T-2	-0.003	-0.004	0.013
	(0.013)	(0.006)	(0.022)
Δ Log Expenditures T-3	0.027**	-0.007	-0.023
	(0.011)	(0.005)	(0.037)
Observations	2395	2395	2395
R Squared	0.06	0.05	0.24

The dependent variables are whether a mandatory budget referendum was adopted (column (1)), the mandatory budget referendum was abolished (columns (2)) or whether the signature requirement for the voter initiative was changed (column (3)). The top panel adds log expenditures two, three and five years prior to the institutional change. The bottom panel includes growth rates in expenditures two and three years prior to the institutional reform. All specifications include canton and year effects as well as the same canton characteristics as in previous tables. Standard errors are clustered at the canton level. * p<0.1, ** p<0.05 and *** p<0.01.

Fig. A1: Map of Swiss Cantons