



Voter preferences, direct democracy and government spending



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ABSTRACT

This article uses unique voting data on 331 federal propositions to estimate voter preferences in Swiss cantons. We document that preferences vary systematically with cantonal characteristics. In particular, cantons whose voters are more conservative, less in favor of redistribution and less supportive of public spending tend to have stronger direct democracy. We show that voter preferences have a stable and sizable effect on government spending even conditional on many observable cantonal characteristics. We then revisit the relationship between direct democracy and public spending. Once we fully control for voter preferences, the cross-sectional correlation between direct democracy and government spending declines by roughly 20%. The results in this article provide empirical support for models, in which both voter preferences and direct democratic institutions are important determinants of the size of government.

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1. Introduction

Direct democracy has become increasingly popular in recent decades as a complement for purely representative forms of government. In the United States, for instance, more than two-thirds of the population live in a state or city with popular initiative or referendum (Matsusaka, 2004). Direct democracy has also been popular in Europe, especially in Switzerland, and increasingly so in Eastern Europe. Most recently, several European countries have held referendums on the new European constitution.

An important motivation for granting direct democratic participation rights is to give citizens more weight in the political process. Its attractiveness is rooted in part in the belief that direct voter control would improve the quality of policy-making or could slow down the rapid growth in government spending observed over the past decades. Theoretical models only predict that direct democracy brings policies closer to the preferences of voters (Gerber, 1996; Besley and Coate, 2008). How direct democracy will affect policy outcomes then depends crucially on the policies preferred by the majority of voters.

In this paper, we make use of unique ballot data from Switzerland to provide direct evidence on voter preferences and how they vary across time and space. Since Switzerland allows for referendums and initiatives at the federal level, we can use data from federal ballot propositions to characterize voter preferences in each canton. Our setting has a number of attractive features: Switzerland is the world leader in the use of direct democracy. At the federal level alone, 331 votes have been held between 1950 and 2000. The ballots cover a wide variety of policy proposals from taxes, environmental policy, immigration, to membership in

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international organizations or subsidies for agriculture. The data on ballot votes therefore provides a rich source to characterize voter preferences expressed at the ballot box over several decades.

Even more importantly, voter preferences are comparable across cantons as all citizens vote on the same federal ballot. We can therefore analyze for the first time how preferences expressed at the ballot box vary across states with alternative political institutions, e.g. different direct democratic institutions. Our results show that voter preferences differ substantially across cantons. Cantons with strong direct democratic institutions have a substantially lower taste for government spending. Further, our measures of voter preferences can better capture heterogeneity in preferences than observable state characteristics (like the strength of left-wing parties, for example).

That preferences vary by political institutions seems to be a more general phenomenon visible also for alternative measures of preferences and other political institutions. Several channels could account for this correlation between institutions and voter preferences. Most plausibly, direct democracy has been adopted by fiscally conservative voters in the past. If political preferences are transmitted across generations (see [Dohmen et al., 2012](#) for evidence), citizens will be more fiscally conservative in cantons with stronger direct democracy today. Selective migration of citizens with preferences for low government spending to cantons with stronger direct democracy would be a second explanation for preference heterogeneity across cantons. Finally, preferences of the electorate might be strengthened by institutions through positive experiences, for instance. We provide suggestive evidence that voter preferences are important determinants of institutional change as shifts in preferences precede reforms in political institutions. We find little support, in contrast, that institutional reforms shift preferences in the years after reforms. Hence, preferences appear to shape institutional choice in our context.

To illustrate the importance of voter preferences for the study of political institutions, we reconsider the relationship between direct democracy and fiscal policy in Switzerland. We hereby focus on the mandatory budget referendum, which gives citizens direct control over cantonal spending. If a canton has a mandatory budget referendum in place, voters need to approve individual projects that exceed a monetary threshold. In other cantons, citizens cannot decide on expensive projects or need to collect signatures to call an optional referendum.¹ Budget referendums in Switzerland are similar to tax and expenditure limitations in the United States which require the electorate in some states to approve tax increases or expenditure growth above a certain threshold. They are also similar to budget approvals for local school districts in the United States and other countries. In our analysis, we classify cantons as strongly direct democratic with respect to fiscal policy if their constitutions require a mandatory budget referendum. In contrast, cantons with only an optional or no budget referendum have a weaker or no direct influence on fiscal policy.

We find that a stronger taste for government in a canton is associated with substantially higher cantonal spending and revenues per capita. Many previous studies, in contrast, found no discernible effect of proxies for voter preferences on spending.² As we argue, the most likely explanation for this pattern is that previously employed proxies for voter preferences are insufficient. Furthermore, our estimates suggest that the impact of the mandatory budget referendum on spending declines by about 20% once we control for voter preferences.

The rest of this article is structured as follows. The next section briefly discusses the related literature. [Section 3](#) provides background information on the structure of direct democracy and fiscal policy in Switzerland. The data are described in [Section 4](#). Estimates of voter preferences are reported in [Section 5](#), while [Section 6](#) shows how institutional rules and voter preferences affect fiscal policy. Finally, [Section 7](#) concludes.

2. Related literature

Our article contributes to a sizable literature, especially in political science, on the estimation and analysis of voter preferences. Most studies rely on public opinion polls or survey data to study aggregate voter preferences (for example, [Ansolabehere et al., 2008](#); [Camobreco, 1998](#); [Erikson et al., 2002](#); [Evans et al., 1996](#); [Gerber, 1996](#); [Lascher et al., 1996](#)).³ Some studies rely on preferences estimated from ballot data but these are typically from a single state ([Gerber and Lewis, 2004](#); [Lewis, 2001](#); [Snyder, 1996](#)). We can estimate voter preferences for each canton in Switzerland and study how they vary across cantons and by political institutions. In addition, we show that voter preferences are related to public spending decisions in a consistent way.

Our second contribution is to the large literature on the relationship between direct democracy and public spending using cross-sectional variation (e.g. [Besley and Case, 2003](#); [Farnham, 1990](#); [Feld and Matsusaka, 2003](#); [Matsusaka, 2004](#); [Zax, 1989](#)).⁴ Here, we show that voter preferences are an important omitted variable in studies without state fixed effects. We then show that the effectiveness of a mandatory budget referendum in cutting public spending is reduced by between 10 and 30% (depending on the controls included), once we condition on our measure of voter preferences.

The article is also related to a small but growing empirical literature that attempts to address concerns of endogeneity of institutions. [Tyrefors and Pettersson-Lidbom \(2012\)](#) use a regression-discontinuity design to compare spending in communities with town meetings to those with purely representative forms of government. [Olken \(2010\)](#) uses an experimental design to study

¹ Typically, the mandatory budget referendum gives more power to the electorate because voting is required by law and occurs automatically for all projects exceeding the monetary threshold. In the empirical analysis below, we find that the mandatory budget referendum, but not the optional referendum, cuts public spending.

² In the United States, NOMINATE scores or the median on a Liberal/Conservative score are used as measures for voter ideology (see e.g. [Matsusaka, 2004](#)). In Switzerland, cantonal characteristics and the share of left wing parties in parliament are often used to approximate voter ideology (see e.g. [Feld and Matsusaka, 2003](#)).

³ [Peltzman \(1992\)](#) relies on indirect evidence from election behavior to show that voters are more fiscally conservative than legislators.

⁴ [Feld and Kirchgässner \(2000\)](#) provide a good summary of the studies using Swiss data.

popular decision-making over public goods and satisfaction in Indonesia. Knight (2000) and Rueben (1997) use instrumental variable techniques to estimate causal effects of taxation rules on taxation levels. Brühlhart and Jametti (2008) exploit economic theory to establish a causal link between direct democracy and local spending through its interaction with fiscal externalities.

This study is related, but differs in focus and approach from our earlier study (Funk and Gathmann, 2011). In Funk and Gathmann (2011), we combine historical panel data with an instrumental variable approach to estimate a causal effect of direct democracy on the size of government and decentralization. Our analysis there focuses on fixed effects and instrumental variables but did not study voter preferences in detail. Our main contribution here is how to estimate voter preferences consistently and explore their variation over time and across institutional regimes. We focus on the post-war period because more ballots are available for estimating voter preferences. We find that preferences are quite stable over the five decades we study and evolve only slowly over time. We demonstrate that voter preferences are important determinants of public spending which is not surprising if politicians adjust their policy platforms to voter preferences.⁵ Using the results here, we can also assess the size of omitted variable bias in existing studies using cross-sectional variation in direct democratic institutions. Our results suggest that existing studies using post-war data overstate the constraining effect of direct democracy by around 20%.⁶ For these reasons, we view this article as complementary to our earlier study.

3. Institutional background

Switzerland has a strong federalism where all political responsibilities remain with the canton unless they were granted to the federal government in a national referendum. Cantons thus play a dominant role in the provision of public services, the redistribution of wealth and as a generator of revenues.

In 1998, 34% of all government spending was undertaken by cantons, 39% by the federal and 27% by local governments. Cantons spend 50% of all education, 60% of health and around 27% of social welfare expenditures. These three categories account for almost 60% of the cantonal budget. The distribution of revenues across government levels is equally decentralized. Cantons have the authority to tax labor and capital income, which account for roughly 50% of cantonal and local revenues. As a consequence, there is substantial variation in the tax burden across cantons.⁷

In addition, citizens have considerable autonomy to design and change political institutions in their canton. Here, we will focus on direct democratic participation rights which have always played a dominant role in Swiss politics. Citizens in a canton can propose new laws or changes to the constitution through the voter initiative. In addition, some cantons require new laws and expensive projects to be approved by the electorate in a referendum.

In our analysis, we pay special attention to the budget referendum as it represents an important and direct tool to influence fiscal policy.⁸ In most cantons, voters have direct influence on the approval of expensive projects, for example, whether a new hospital is built or not. In 2000, fifteen cantons had a mandatory budget referendum in place, which requires citizens to approve all projects that exceed a certain monetary value. Eleven cantons in turn only allow for an optional budget referendum. Here, citizens need to collect between 100 and 10,000 signatures to initiate a vote on a project above a monetary threshold.⁹ In Valais and Fribourg, the budget referendum is restricted to extraordinary (rather than recurrent) expenditures alone.

In principle, control over the budget is stronger with a mandatory budget referendum since voter approval is required by law. However, optional budget referendums might also have an effect on spending if the monetary thresholds and the costs to citizens to call an optional referendum are low. Below, we first analyze a simple indicator whether the canton has a mandatory budget referendum in place; the indicator is zero if only an optional or no budget referendum is allowed. We later separate the effect of the mandatory and optional budget referendum and also work with the monetary thresholds.

Table 1 provides an overview which cantons allow for a mandatory or optional budget referendum. The table shows that provisions for the budget referendum are highly persistent over time. Between 1950 and 2000, we observe very few changes in the mandatory budget referendum: six cantons abolished the mandatory budget referendum while four cantons adopted it. In addition, thirteen cantons adopt the optional budget referendum over our sample period.

It is important to note that direct involvement of citizens in political decision-making has a very long tradition in Switzerland. The mandatory referendum and voter initiative to change the constitution have been in place since the Confederation was founded in 1848. Direct democracy in the cantons is even older. By 1831, the initiative to propose new laws was in place in Thurgau, Aargau and Schaffhouse and the referendum on new laws in St. Gallen. In cantons like Uri or Schwyz, direct participation

⁵ In Funk and Gathmann (2011), we only use preferences to demonstrate that it does not change the relationship between direct democracy and government spending once we control for canton fixed effects. This result suggests that most of the correlation between voter preferences and direct democratic institutions is permanent and persistent over time.

⁶ This conclusion cannot be drawn from Funk and Gathmann (2011), who analyze the causal effect of direct democracy on government spending over a different time period (1890–2000). As shown in Matsusaka (2004), the quantitative effect of direct democracy may vary over time.

⁷ For example, the tax burden in 2000 varied from 126.7 in Neuchatel to 58.2 in Zug with the average normalized to 100.

⁸ While budget referendums in Switzerland can be about expenditures, government bonds, taxes, enterprise holdings and real estate, we focus on public expenditures. Referendums about public spending are by far the most common and even if a canton has other types of referendums, it always has a referendum on expenditures. Between 1980 and 1999, citizens in the 26 cantons voted on 461 budget referendums and approved 86% of the projects (Treichsel and Serdült, 1999).

⁹ Budget referendums are on single projects only, not the cantonal budget. They apply to both recurring and non-recurring expenditures with the thresholds for recurring expenditures being around one-tenth of those for non-recurring expenditures. Thresholds for non-recurring expenditures range between 25 Million Swiss Francs (SFr) in Lucerne and 250,000 SFr in Schwyz (1999). This implies that a project of on average 6.8 Million SFr or just less than one percent of average expenditures mandates a referendum. For recurring expenditures, thresholds are between 50,000 (Appenzell-Innerrhoden, Basel County, Nidwalden, Ticino and Uri) and 400,000 SFr (Berne).

Table 1The budget referendum in Swiss cantons in 2000^a.

	Mandatory budget referendum	Change in budget referendum	Optional budget referendum
Aargau (AG)	No	Abolish (1982)	Yes (Adopt 1982)
Appenzell Ausserrhoden (AR)	Yes	No	No
Appenzell Innerrhoden (AI)	Yes	Adopt (1979)	Yes (Adopt 1966)
Basel County (BL)	No	No	Yes
Basel City (BS)	No	No	Yes
Berne (BE)	No	Abolish (1995)	Yes (Adopt 1970)
Fribourg (FR)	Yes	Adopt (1972)	Yes
Geneva (GE)	No	No	Yes
Glarus (GL)	Yes	No	No
Grisons (GR)	Yes	No	Yes (Adopt 1965)
Jura (JU)	Yes	No	Yes
Lucerne (LU)	Yes	Adopt (1969)	Yes
Neuchatel (NE)	No	Abolish (2000)	Yes (Adopt 1992)
Nidwalden (NW)	Yes	No	Yes (Adopt 1965)
Obwalden (OW)	No	Abolish (1998)	Yes (Adopt 1968)
Schaffhouse (SH)	Yes	No	Yes (Adopt 1989)
Schwyz (SZ)	Yes	No	No
Solothurn (SO)	Yes	No	Yes (Adopt 1989)
St. Gallen (SG)	Yes	No	Yes
Ticino (TI)	No	No	Yes
Thurgau (TG)	Yes	No	Yes (Adopt 1965)
Uri (UR)	Yes	No	Yes (Adopt 1972)
Vaud (VD)	Yes	Adopt (1998)	Yes
Valais (VS)	No	Abolish (1994)	Yes (Adopt 1994)
Zurich (ZH)	No	Abolish (1999)	Yes (Adopt 1951)
Zug (ZG)	No	No	Yes

^a The table shows whether cantons have a mandatory or optional budget referendum in 2000; and whether and when cantons changed their provisions for the budget referendum between 1950 and 2000. Two cantons, Appenzell-Innerrhoden and Glarus still held town meetings in 2000 where most political decisions are made directly by citizens. Appenzell-Ausserrhoden and Obwalden abolished town meetings in 1997, Nidwalden in 1995.

in town meetings goes back even further to the 13th and 14th century. Therefore, Swiss citizens are used to and regularly participate in direct democratic decision making.

Note however that cantons with a mandatory budget referendum (i.e. stronger direct democracy) differ from other cantons along a number of dimensions. For example, direct democracy is more widespread in German-speaking parts of Switzerland, which includes large urban centers like Basel, Zurich or Berne. Cantons with predominantly French- or Italian-speaking populations rely much more on representative forms of government. Cultural or socio-economic differences across cantons with strong and weak direct democracy are likely to translate into differences in voter preferences for public services, redistribution and government spending. It is this heterogeneity in voter preferences that we want to measure and explore in our analysis below.

4. Data

4.1. Data on federal ballots

To characterize voter preferences and the demand for government, we use the fact that Switzerland has direct democratic participation also at the federal level. Citizens can initiate a partial or total revision of the federal constitution, which allows for a wide variety of policy proposals. In addition, any changes to the federal constitution and international treaties need to be approved by voters in a mandatory referendum. Further, all federal laws and executive orders are subject to an optional referendum if 50,000 signatures are collected within 100 days of the publication of the legal document.

We collected data from all 331 federal ballots held between 1950 and 2000. On average, the Swiss electorate decides on 6 to 10 issues per year. The number of propositions has increased over time from a mere 42 in the 1950s to 116 in the 1990s. Our data contains the date, title and type of ballot, whether the canton approved the proposition as well as the percentage of yes votes in each canton.¹⁰

The ballot data has several advantages: first, we can characterize political preferences from actual votes cast in propositions that have real political consequences. Second, the federal ballots cover a broad range of topics from the introduction of fuel taxes, government finances, environmental protection, membership in international organizations, price controls, subsidies for education, the financing of health insurance or the provisions of disability insurance. Finally, our estimated preferences are easily comparable across cantons as citizens in all cantons vote on the same proposition.

Note that we can measure voter preferences only as revealed at the ballot box. Our analysis will not capture preferences that are never subject to an initiative or referendum. In our view, this restriction is less severe than it first appears. One reason is that our data contain both propositions that are approved and those that fail. Hence, our data are not restricted to propositions that are

¹⁰ The data are available online at <http://www.admin.ch/ch/d/pore/va/liste.html>.

successful, i.e. supported by the majority of the electorate. Further, barriers to call a referendum or initiative are very low in Switzerland: calling a federal referendum requires only 50,000 signatures (requiring less than 0.6% of the population to sign) and an initiative 100,000 signatures (requiring less than 1.2% of the population to sign). Therefore, it comes as no surprise that 62% of all federal votes (109 optional referendums and 102 initiatives) are initiated by the electorate. Finally, the list of propositions makes clear that the Swiss electorate decides on a broad range of policies, which increases the odds that the propositions span all relevant dimensions of the policy space.

Given its long direct democratic tradition mentioned above, voters in Switzerland are very experienced in expressing their preferences at the ballot box. In addition, information about arguments in favor and against each ballot are readily available to the voters. Interest groups like unions or churches regularly publish their recommendations for the votes in newspapers as well as online. In addition, all voters receive extensive information material by the government (containing both the parliamentary debates and the arguments of lobby groups) prior to each vote. It is therefore not surprising that most voters (around 80%) state that they are well informed before making a choice at the ballot box.

Finally, we estimate preferences from federal propositions, which assume that voter preferences are independent of the level of government. That same assumption is also employed in studies using roll call votes of national legislators in the United States to proxy for ideology or voter preferences at the state level. Such an approach would be problematic if, for example, voters dislike spending at the federal level but support spending at the cantonal level.

To check whether voter preferences in cantonal ballots are comparable to those expressed in federal ballots, we use data on 3315 canton-level propositions from the 21 cantons that do not hold town meetings.¹¹ Between 1970 and 2000, we identified forty sets of similar propositions held at both the federal and cantonal level. Table A1 shows that voter support for subsidies to public transport, environmental protection, cultural activities and education in a canton is very consistent irrespective of whether the ballot is at the cantonal and federal level. Some differences are found in the area of taxation, where voters in Basel City and Schaffhouse were more supportive of a wealth tax at the national level.¹² In the area of housing, voters in Schwyz and Grisons also showed more support at the cantonal level than for the ballot at the federal level. However, the cantonal votes were targeted at mountain areas, while the federal vote promoted housing construction more generally. Yet, it is reassuring that the outcome of the votes is the same in 82.5% of the cases.

In sum, the available evidence suggests that policy preferences at the cantonal level are broadly consistent with voting behavior in federal propositions. One possible reason for this congruence is that federal and cantonal governments share many responsibilities, for example, raising taxes, subsidies, and regulating agriculture and civil and criminal law. In several other policy areas like social security, roads, environmental policy and industrial and labor regulation, the federal government provides the legal basis, while cantons are responsible for its execution.

Hence, the federal ballot data provides in our view an unusually rich (and underexploited) source of information about voter preferences for public policies. We show below that our preference measures indeed reveal interesting differences among cantons and are more informative than other proxies for voter ideology.

4.2. Canton-level panel data

To relate voter preferences to observable cantonal characteristics, we complement our ballot data with comprehensive information on socio-economic characteristics, political institutions and government spending in each canton from 1950 to 2000.¹³ Table 2 shows summary statistics separately for cantons with a mandatory budget referendum and those with only an optional or no budget referendum.

The data show that cantons with a mandatory budget referendum have very different socio-economic characteristics compared to cantons without one. Cantons with strong direct voter control have a much higher fraction of rural population and lower population density. Their residents are less likely to be Catholic or divorced. Unemployment rates, the share of university graduates and income are lower in cantons with mandatory budget referendum. Since cantonal income is available since 1965 only, we also use a proxy variable, the number of physicians per 1000 people, in our empirical analysis. This variable (together with the other control variables and year dummies) captures almost 70% of the variation in income. Finally, both the French- or Italian-speaking population as well as linguistic fragmentation (calculated as one minus the Herfindahl index of three language groups) is much lower in cantons with a mandatory budget referendum.

The documented heterogeneity across cantons suggests that voter preferences might vary systematically across cantons with stronger or weaker forms of voter control over the budget. Finally, government spending and revenues are lower in cantons with a mandatory budget referendum. The question is whether these spending differences are the result of direct democratic institutions or heterogeneity in preferences for government. To answer this question, we now discuss how we estimate voter preferences.

¹¹ The data are available from the Center for Research on Direct Democracy (C2D) at <http://www.c2d.ch/votes.php?table=votes>.

¹² This discrepancy in the support for redistributive measures is consistent with economic theory if geographic mobility impedes redistribution at the sub-national level. Differential turnout could also explain this pattern if voters with a preference for redistribution participate in the federal ballot but not the cantonal proposition. In the data, turnout for the wealth tax is higher at the federal level in Aargau but lower in Schaffhouse; the reversed turnout pattern suggests that differential participation bias cannot explain the discrepancy in voter support. A final explanation could be measurement error as the propositions are not exactly the same.

¹³ For our analysis, we drop the canton Jura, which was only founded in 1977. See Appendix A for a more detailed description of the data sources and variables.

Table 2
Summary statistics by institutional regime^a.

	Mandatory ref.		No mandatory ref.		T statistic difference
	Mean	Std. dev	Mean	Std. dev	
<i>Cantonal Demographics</i>					
Population density (log)	4.79	0.86	5.80	1.36	16.1
Unemployment rate	0.70	1.16	1.21	1.77	6.1
Population above 65 (%)	12.45	2.69	12.43	3.10	−0.1
High skilled (% university degree)	8.16	4.49	11.37	7.43	9.6
Physicians (per 1000 people)	1.01	0.34	1.44	0.70	14.9
Annual income	6668.98	10827.97	9496.17	8936.63	3.7
Canton French- or Italian-speaking	0.15	0.35	0.44	0.50	12.0
Catholics (%)	57.63	26.21	59.05	24.41	0.9
Divorced population (%)	3.01	1.82	3.96	2.41	7.8
Single parents (%)	20.81	8.34	23.55	10.75	5.0
Urban population (%)	24.98	19.87	46.40	28.55	15.5
Age 0 to 19 (%)	30.33	4.83	27.38	5.93	−9.5
Age 20 to 39 (%)	29.10	2.22	30.13	2.57	7.4
Age 40 to 64 (%)	28.12	2.03	30.06	2.77	14.1
Age 65 to 79 (%)	9.98	1.73	9.98	2.04	0.0
80 and older (%)	2.47	1.09	2.45	1.22	−0.3
Linguistic fragmentation	0.25	0.25	0.30	0.13	3.5
Religious fragmentation	0.4	0.2	0.4	0.2	3.5
<i>Political system</i>					
Monetary threshold mandatory referendum	1.63	2.43	5.90	4.14	23.0
Optional budget referendum?	0.47	0.50	0.96	0.19	19.1
Signature requirement optional referendum	127.94	133.51	14.81	59.61	−16.4
Left-wing parties (%)	19.05	12.22	26.30	11.50	9.7
Mandatory law referendum?	0.74	0.44	0.24	0.43	−19.2
Signature requirement initiative	0.02	0.02	0.03	0.01	7.5
Proportional representation?	0.73	0.44	0.93	0.26	8.4
Executive leader directly elected?	0.31	0.46	0.07	0.26	−9.9
Size of executive	6.49	1.35	6.51	1.14	0.3
Size of legislative	115.34	50.41	116.51	48.26	0.4
Female suffrage adopted?	0.59	0.49	0.61	0.49	0.7
Constitutional constraint: Balanced budget	0.07	0.25	0.10	0.31	2.3
Constitutional constraint: Deficit	0.03	0.18	0.00	0.00	−3.8
<i>Fiscal policy per capita</i>					
Cantonal expenditures (log)	1.32	0.68	1.51	0.77	4.6
Cantonal revenues (log)	1.29	0.69	1.47	0.78	4.3
Federal subsidies (log)	−0.59	0.91	−0.92	0.87	−6.0
Observations	411		864		

^a The table reports summary statistics over the whole sample period (1950–2000) separately for cantons with a mandatory budget referendum and those without. The last column reports the t-statistic for differences in means between the two groups of cantons. Mean annual household income at the cantonal level is reported since 1965. Log population density is the log of people per square kilometer and divorced is the percentage of divorced people above 20. Urban population is measured as the population share living in cities above 10,000 people. Fragmentation is measured as a Herfindahl index (0 = no fragmentation, 1 = maximum fragmentation) between three linguistic and religious groups respectively. The monetary threshold for the mandatory budget referendum applies to extraordinary expenditures and is measured in real Swiss Francs per capita. The signature requirement for the optional budget referendum and voter initiative is calculated as a fraction of the population over 20. Left-party seats are measured as share of the seats in the cantonal parliament. Expenditures, revenues and federal subsidies are measured in real Swiss Francs per capita and reported in logs.

5. Estimation of voter preferences

5.1. Votes with fiscal consequences

Our first approach starts from the official documents prepared by the federal government, which are distributed to each citizen before the vote. The documents contain the arguments for and against a proposition, an overview of the parliamentary debate (if any) and outside opinions by interest groups. Most importantly for our purposes, they also outline the fiscal consequences for expenditures, taxes or subsidies if the ballot gets approved.¹⁴

Based on these documents, we identify 50 ballots since 1950 which would have unambiguously increased government spending if approved (see Table A2 for a detailed list of these propositions). We find an additional 48 ballots that would have increased taxes or subsidies and hence, the size of government if approved (see Table A3 for a detailed list of these additional propositions). Using this subset of ballots with fiscal consequences, we calculate two measures of voter preferences: preferences

¹⁴ These documents are available at <http://www.ads.bar.admin.ch/ADS/showHome.do>.

for government activity (including taxes, subsidies and spending) and a more narrow measure of preferences for government spending. Each measure is calculated as a canton's support for a ballot (in percent) in the specified category.

To adjust for differences in approval rates across ballots, we calculate each canton's support relative to the Swiss average for that proposition. For example, if support for a ballot raising expenditures in a canton was 40% but the average approval rate was 55%, our measure of the canton's (relative) support for government spending is $40 - 55 = -15\%$. This standardization focuses attention on the relative support of a canton for government spending, not its absolute level. If more than one vote in a category occurred in a given year, we take the average over all ballots in each category in a year. Our measure has missing values for years in which there was no vote with clear fiscal consequences.

Fig. 1 shows how voter support for more spending varies between the Swiss cantons. The map plots the average approval rate in federal ballots with implied higher spending between 1950 and 2000. A light shade indicates that voters in a canton are fiscally conservative and less supportive of more government spending than the average voter. Darker shades indicate that voters in a canton were more supportive of higher federal spending.

Table 3 explores in more detail how voter support for government activity varies with cantonal characteristics. The first specification includes a large set of political and socio-demographic characteristics, while the second specification adds the log of cantonal income per capita (which is not available prior to 1965). All estimations include year fixed effects and account for clustering at the cantonal level. The results show that cantons with a more educated and younger population are more in favor of government spending. Voters in cantons in which the majority is French- or Italian-speaking are also more supportive of government spending though the results are statistically weaker. Interestingly, neither cantonal income nor the political strength of left-wing parties, often used as proxies for voter preferences, is systematically related to voter support for more public spending or government activity more generally. The low R^2 in the last row reveals that there is substantial variation left in our

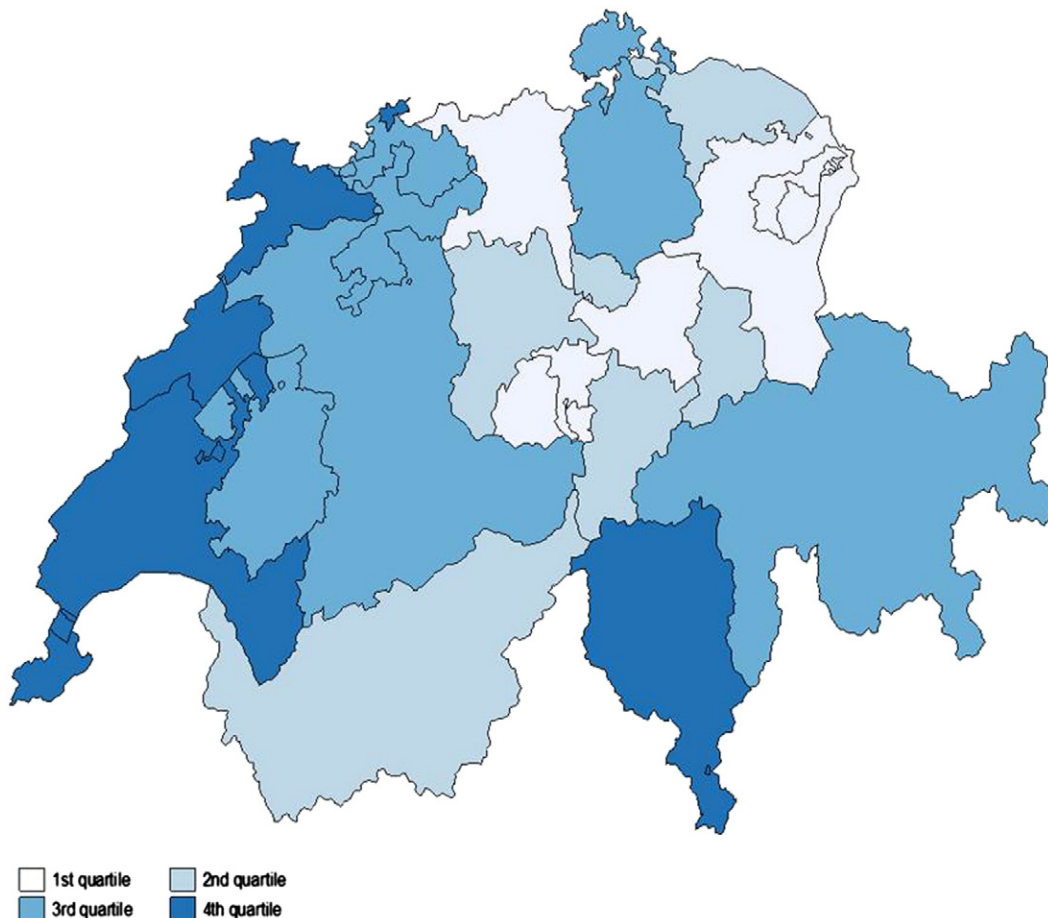


Fig. 1. Support for more government spending in the Swiss cantons. Notes: The map shows the average support for higher government spending in federal ballots relative to the Swiss average over the period 1950–2000. Lighter shades indicate that voters in a canton were more fiscally conservative than the average Swiss voter. Darker shades indicate that voters in a canton were more in favor of higher government spending than the Swiss average. See main text for a detailed explanation of the measure of support for higher government spending.

Source: Swiss Federal Statistical Office; authors' own calculation.

Table 3
Voter support for government activity and cantonal characteristics^a.

	% support for more government		% support for more spending	
	(1)	(2)	(3)	(4)
Left party seats in cantonal parliament (%)	0.001 [0.088]	0.024 [0.078]	−0.030 [0.110]	0.126 [0.100]
Unemployment rate	0.226 [0.356]	−0.0290 [0.271]	0.271 [0.417]	−0.274 [0.331]
Canton French- or Italian-speaking	1.749 [2.212]	2.764 [2.046]	7.250*** [2.485]	3.526 [2.705]
Catholics (%)	−0.026 [0.051]	−0.027 [0.045]	−0.052 [0.063]	−0.006 [0.063]
Divorced population (%)	−1.472* [0.736]	−1.899** [0.690]	−1.783* [1.033]	−1.717* [0.954]
% high skilled (university degree)	0.266** [0.111]	0.365*** [0.108]	0.360*** [0.114]	0.751*** [0.124]
Population density	−1.000 [1.044]	−0.370 [0.681]	0.336 [1.215]	−0.240 [0.940]
Urban population (%)	0.039 [0.027]	0.025 [0.030]	0.047 [0.041]	0.032 [0.043]
Age 20 to 39 (%)	0.824*** [0.248]	1.010*** [0.267]	1.015*** [0.318]	1.208*** [0.319]
Age 40 to 64 (%)	0.639** [0.298]	0.517 [0.345]	0.794** [0.373]	0.181 [0.447]
Age 65 to 79 (%)	0.657* [0.377]	1.612*** [0.433]	0.909** [0.425]	1.920*** [0.611]
Age 80 and older (%)	1.216 [0.805]	−0.125 [0.830]	1.204 [0.956]	−0.326 [0.853]
Log cantonal income		0.264 [0.323]		0.715 [0.447]
Year fixed effects	Yes	Yes	Yes	Yes
Observations	897	621	621	437
R squared	0.13	0.20	0.37	0.43

^a The table reports least-squares estimates where the dependent variable is support for government activity (columns (1) and (2)) and government spending (columns (3) and (4)) in federal ballots from 1950 to 2000. The omitted age group is 0–19 years. The income variable is measured in logs and missing for the first decade. All specifications contain year dummies. Standard errors are clustered at the canton level.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

preference measures even after controlling for a large set of cantonal characteristics (see Gerber and Lewis (2004) for a similar result based on Californian data).

5.2. Voter preferences estimated from factor analysis

One issue with the above preference measures is that they are available only for a subset of years (i.e. 27 out of 50 years). By focusing on spending with direct fiscal consequences, we might miss other potentially informative differences in voter preferences across cantons. Most importantly, ballot support for spending by the federal government is quite volatile, presumably because ballot support is a noisy measure of the underlying voter preferences.

As an alternative approach, we use factor analysis to reduce the dimensionality and noise contained in federal propositions (see e.g. Snyder, 1996; Heckman and Snyder, 1997; Ansolabehere et al., 2008 for similar approaches). Factor analysis uses the correlation between the aggregate voting outcomes in each canton to isolate the unobserved factors that best explain the common components of ballot votes. The loading on each factor identifies each canton's valuation of the latent policy attribute in the neighborhood of the median voter. One additional advantage of factor analysis is that it is easy to estimate when voter preferences are multi-dimensional.¹⁵

Altogether, we have 331 federal propositions over the period from 1950 to 2000. In the factor analysis, the dependent variable is a simple binary indicator whether the majority of voters in a canton approved or disapproved of each ballot. We find, however, similar results if we use the actual percentage support of voters for each ballot instead. To allow aggregate cantonal preferences to shift over our 50 year period, we run the factor analysis separately for each decade.¹⁶ Allowing preferences to change over time

¹⁵ The factor-analytic approach comes at the cost of strong assumptions on the error structure. One alternative approach would be to use the estimation approach by Poole and Rosenthal (1985). However, the estimates are much more difficult to compute, especially in a multidimensional setting like ours, and inconsistent in small samples (see Heckman and Snyder, 1997).

¹⁶ For the length of the time window, we need to trade off a long time window which could mask changes in preferences and a very short time window which would yield jumpy estimates (just like in nonparametric estimation). We choose a time window of ten years because this ensures we have at least 50 votes in each decade available to estimate the factors.

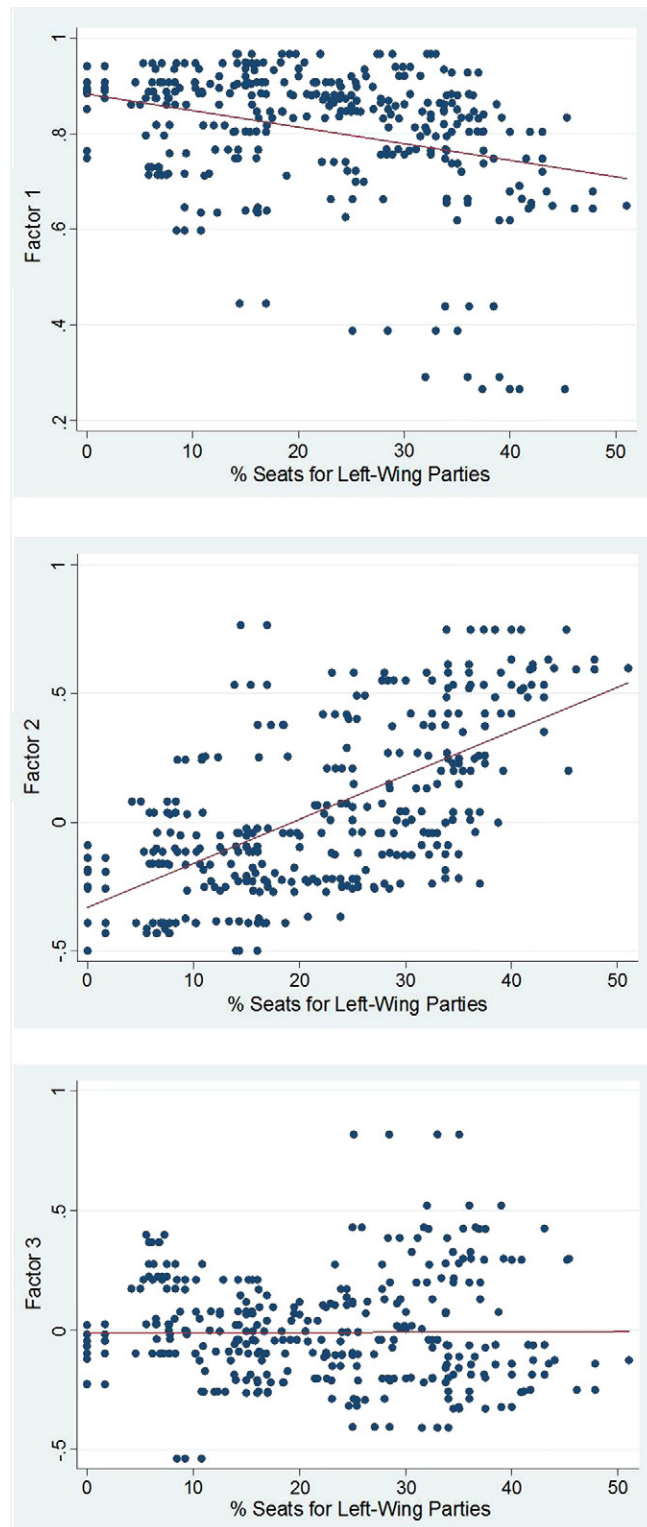


Fig. 2. Correlation of factor loadings with left-party seats. Notes: The figures report bivariate correlations between factor loadings (y-axis) and the percentage of seats for left parties in cantonal parliaments (x-axis).

raises the issue on how to compare factors estimated on a different set of ballots over time. Following the literature, we use voting recommendations from interest groups (in our case: the Evangelical Party) to make the factors comparable across decades (see Gerber and Lewis, 2004 for a similar approach).¹⁷

Table A4 reports the estimates of the factor analysis. The first three (unrotated) factors have eigenvalues above one and account for more than 80% of the overall variance. The variance explained by additional factors is small. Our results suggest that voter preferences are multi-dimensional which is not surprising given that voters decide on a large range of policy issues over half a century.

A well-known difficulty of factor analysis is how to interpret the estimated factors. Our analysis does not depend on the actual interpretation of the factors. All we need is that our latent variables called “factors” summarize preferences as expressed at the ballot box in a canton. Nevertheless, we provide here one possible interpretation of the factors.

As a first piece of evidence, we plot in Fig. 2 the factor loadings against the strength of left-wing parties in cantonal parliaments, which typically support more redistribution and government spending (Tavares, 2004). Fig. 2 shows that factor 2 is strongly correlated with left-wing parties. The share of left-wing parties alone can explain almost 50% of the variation in the second factor across cantons and time. The strength of left-wing parties is also negatively correlated with factor 1 and 3 though the relationship is much weaker. The pattern suggests that the second factor may be associated with a preference for more spending or more redistribution.

Another way to look at the factors is to analyze the voting recommendations of major parties that are published before the vote. We can use these voting recommendations as ‘hypothetical’ voting records to estimate separate factor loadings for the major parties. For example, we expect the conservative party (‘Christlichdemokratische Volkspartei’) to represent conservative values and possibly fiscal prudence. We find that the conservative party has indeed a high loading on the first factor and a low loading on the second factor. We also used the voting recommendations of the major left-wing party (‘Sozialdemokratische Partei der Schweiz’), which showed the opposite pattern: a high loading for factor 2 and low loading for factor 1.

We can also use the factor scores to interpret the factors (not reported). Though not consistently estimated, they signal how important the factors are for each ballot (see Heckman and Snyder, 1997). The first factor has high scores on ballots about home construction, trade of weapons, extension of the franchise, a new federal constitution and regulatory issues like speed limits on highways or cultural activities. Many ballots with high scores for factor 1 cover policy issues which do not explicitly imply government spending. Factor scores for the second dimension are high for rent protection, for the protection of the family and mothers, and for financial support of agriculture and technical universities. Finally, propositions with high scores on the third dimension cover many regulatory issues in various areas such as education, public transport or the military.

Together, these patterns suggest that the second factor may represent support for redistribution (or government spending more generally) and the first factor captures a conservative attitude. The third factor might capture some sort of preferences for state intervention. Again, we want to stress that this is just one possible interpretation and that our estimation strategy is not dependent of the particular labels we give to the factors.¹⁸

Finally, we show that our factors are more informative about voter preferences than other observables often used to control for voter ideology. Table 4 shows regression results of the factor loadings on a large set of socio-demographic and political characteristics of the canton. Observations are pooled across decades and standard errors are corrected for clustering at the canton level. In line with our interpretation, the results show that cantons with stronger left-wing parties and lower income have higher loadings for factor 2 (columns (3) and (4)); the opposite pattern is observed for factor 1 (columns (1) and (2)). In contrast, observable cantonal characteristics are not much related to factor 3 (columns (5) and (6)). As before, we find that there is a lot of variation left in the factor loadings even conditional on a large set of cantonal characteristics. Hence, our measures seem to provide richer information on voter preferences than available in earlier studies.

5.3. Voter preferences differ by direct democracy

A first look at voting patterns supports the conjecture that voters in cantons with stronger direct democratic institutions are generally less supportive of government spending. For example, 32% of voters supported a pay raise for federal politicians in 1992 in cantons without mandatory budget referendum, but only 23% in cantons with stricter voter control over the budget (T-statistic: 3.55). Similarly, a ballot in 1998 to invest in public transport was approved by 66.5% of the voters in cantons without a mandatory budget referendum but by only 56.6% of voters in cantons with a mandatory budget referendum (T-statistic: 2.72).

Table 5 compares voter preferences between cantons with a mandatory budget referendum to those without. Voters in cantons with strong direct democracy are less supportive of government spending and less in favor of government and

¹⁷ The basic assumption is that interest groups have stable preferences largely determined by their own political ideology. The Evangelical Party is a small political party, which had more voting recommendations than any other group. Using the voting recommendations of labor unions yields very similar results.

¹⁸ As we will show in Table 4, the factor loadings for the first factor are high for German-speaking cantons, and the factor loadings for the second factor are high for French- or Italian-speaking cantons. An alternative interpretation of the first two factors could be linguistic or regional preferences which are highly correlated with left-wing representation in cantonal parliaments.

Table 4Voter preferences estimated from factor analysis and cantonal characteristics^a.

	Factor 1		Factor 2		Factor 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Left party seats in cantonal parliament (%)	−0.003 [0.002]	−0.003 [0.002]	0.009** [0.004]	0.010*** [0.003]	−0.003 [0.003]	−0.005* [0.003]
Unemployment rate	0.008* [0.005]	−0.005 [0.005]	0.014 [0.010]	0.0297** [0.013]	−0.016 [0.010]	−0.027** [0.012]
Canton French- or Italian-speaking	−0.091** [0.035]	−0.132*** [0.039]	0.192** [0.072]	0.226*** [0.069]	−0.148** [0.059]	−0.115* [0.061]
Catholics (%)	−0.002 [0.001]	−0.001 [0.001]	0.001 [0.002]	0.001 [0.001]	−0.001 [0.002]	−0.002 [0.002]
Divorced population (%)	−0.017 [0.014]	−0.010 [0.015]	−0.043 [0.032]	−0.031 [0.033]	−0.016 [0.030]	−0.061** [0.027]
% high skilled (university degree)	−0.006*** [0.002]	0.000 [0.002]	0.010* [0.005]	0.008 [0.007]	0.007 [0.005]	0.010 [0.007]
Population density	0.042** [0.018]	0.029 [0.019]	−0.049 [0.041]	−0.049 [0.039]	−0.066* [0.036]	−0.017 [0.029]
Urban population (%)	−0.001 [0.0005]	−0.001 [0.001]	0.001 [0.001]	0.003* [0.001]	0.003*** [0.001]	0.003** [0.001]
Age 20 to 39 (%)	−0.020*** [0.005]	−0.023*** [0.005]	0.071*** [0.015]	0.069*** [0.016]	0.007 [0.011]	−0.002 [0.013]
Age 40 to 64 (%)	−0.004 [0.005]	−0.009 [0.006]	0.048*** [0.012]	0.039** [0.014]	0.018 [0.013]	0.036*** [0.013]
Age 65 to 79 (%)	−0.044*** [0.009]	−0.037*** [0.008]	0.077*** [0.024]	0.067*** [0.023]	−0.022 [0.018]	−0.017 [0.025]
Age 80 and older (%)	0.064*** [0.021]	0.045** [0.016]	−0.083* [0.045]	−0.087** [0.039]	0.106* [0.061]	0.115* [0.059]
Log cantonal income		0.029** [0.013]		−0.062* [0.032]		0.027 [0.018]
Decade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	115	92	115	92	115	92
R squared	0.60	0.66	0.73	0.71	0.18	0.27

^a The table reports least-square estimates where the dependent variables are the factor loadings for each canton and decade from 1950 to 2000. The independent variables are the decennial canton means. The omitted age group is 0–19 years. The income variable is measured in logs and missing for the first decade. All specifications contain decade dummies. Standard errors are clustered at the canton level.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

redistributive measures. The bottom panel of Table 5 confirms this pattern: cantons with a mandatory budget referendum are more conservative (higher loadings of factor 1) and are less in favor of redistribution (lower loadings on factor 2). There is less heterogeneity in the preference for regulation (factor 3). Differences in preferences are (with one exception) statistically highly significant. These strong and persistent differences in preferences across cantons are not a feature of our ballot data. Similar differences can be found in Swiss survey data (see Table A5 in the appendix).¹⁹

Are these differences in preferences persistent or do they change over time? Fig. 3 plots the factor loadings and confidence intervals for each decade separately for cantons with and without a mandatory budget referendum. The figure shows that differences in our preference measures across cantons are quite persistent over time. Cantons with a mandatory budget referendum are less supportive of redistribution (factor 2) and this difference is very stable over time. Cantons without a mandatory budget referendum seem to have become more supportive of redistribution over time, a fact also reflected in an increasing vote share of left-wing parties in their cantonal parliaments (rising from 20% in the 1950s to over 28% in the 1990s).

A clear pattern emerges: voters in cantons with a mandatory budget referendum are fiscally more conservative than voters in cantons with weaker forms of direct democracy – and these differences persist (but slowly evolve) over time.²⁰ But do preferences affect institutional reform, or do institutions shape voter preferences? The direction of influence is important because it affects how we should analyze the policy consequences of political institutions.

If both preferences and institutions shape policy outcomes (like public spending) and preferences also determine institutional choice, we need to control for voter preferences when studying the effects of political institutions. Otherwise, we would

¹⁹ We find the same pattern if we look at differences in the voter initiative across cantons. That preferences vary systematically by political institutions is also not a feature specific to Switzerland. Using the European Values Survey, we compared political attitudes of citizens in countries with a proportional or majoritarian electoral system. We again find strong differences suggesting that preferences vary systematically by institutional regime in other countries as well.

²⁰ Appendix Table A6 confirms that our preference measures vary between cantons as well as within cantons over time. Hence, canton fixed effects might capture a substantial part, but not all heterogeneity of preference across cantons over time.

Table 5
Variation of voter preferences by institutional regime^a.

	Mandatory referendum		No mandatory referendum		T statistic difference	Observations (# years)
	Mean	Std. dev	Mean	Std. dev		
% support for more government	1.35	7.42	1.93	9.42	5.9	975 (39)
% support for higher spending	−2.45	8.21	3.47	9.99	8.4	725 (29)
Factor 1 (“conservative values”)	0.84	0.10	0.76	0.16	−10.7	
Factor 2 (“redistribution”)	−0.07	0.28	0.18	0.37	13.5	
Factor 3 (“regulation”)	−0.02	0.20	0.01	0.24	2.5	

^a The table reports the weighted mean and standard deviation of voter preferences. The summary statistics are shown separately for cantons with and without a mandatory budget referendum and weighted by the size of a canton's electorate. The top panel shows voter support for more government (higher spending, taxes or subsidies) and higher public spending. Voter support in federal propositions is calculated as the support (in percent) in each canton's electorate for a proposition with higher implied spending or taxes and as a deviation from the Swiss average. Hence, cantons with negative numbers show less than average support for the proposition while positive numbers indicate a higher voter support than the average canton. The last column reports the number of observations and number of years (in brackets) for which the data is available. In the bottom panel, the measures for voter preferences are the factor loadings derived from factor analysis.

overestimate the effect of a mandatory budget referendum, for example, because the coefficient on the mandatory budget referendum captures heterogeneity in voter preferences as well.²¹

Since preferences and institutions are highly persistent over time, we use the timing of reforms and voter preferences to provide suggestive evidence whether preferences affect institutional choice or vice versa in Table 6. The top panel shows that voter preferences in years before a reform affect the decision to abolish or adopt a budget referendum in later years. In particular, a more conservative attitude reduces the likelihood of institutional reform. The bottom panel shows that our estimated voter preferences are not themselves affected by the timing of institutional reform. Both results continue to hold when we include a large number of cantonal characteristics.²² In sum, our context suggests that preferences vary systematically by direct democratic regime and that preferences seem to be important for institutional reforms (but not vice versa).

6. Application: The link between direct democracy and public spending

6.1. Voter preferences, direct democracy and fiscal policy

Our results thus far show that voters in cantons with a mandatory budget referendum are more fiscally conservative than voters without such a referendum. We would expect that this preference heterogeneity is reflected in public spending because voters elect more fiscally prudent representatives, or, because electoral competition forces politicians to spend less, for example. We would also conjecture that controlling for voter preferences will reduce the correlation between direct democracy and government spending.

To illustrate this, we match the estimated preference parameters to the panel of fiscal policy outcomes, political institutions and cantonal characteristics. All variables except for the estimated factor loadings are measured at an annual frequency. We then estimate variants of the following model

$$\log Y_{ct}^p = \alpha + \beta DD_{ct} + \gamma \widehat{\lambda}_{ct} + \delta Z_{ct} + \varepsilon_{ct} \quad (1)$$

where $\log Y_{ct}$ is our fiscal policy outcome like expenditures or revenues per capita (in logs) in canton c and year t , $\widehat{\lambda}_{ct}$ denotes estimated voter preferences and DD_{ct} is one if canton c has a mandatory budget referendum in place in year t and zero otherwise.²³ Z_{ct} contains year dummies and other observable variables that affect the demand or supply of government

²¹ In contrast, if preferences are shaped by political institutions (but preferences have no effect on institutional choice), then the coefficient on the political institution picks up the direct effect on spending as well as any indirect effect via changes in voter preferences. In that case, we should not control for voter preferences when estimating the relationship between institutions and policy outcomes. It seems unlikely however, that voter preferences would not affect political institutions, especially since we deal with the direct participation rights of citizens. The additional evidence in Table 6 also suggests that preferences shape institutions but that there is little feedback effect in our context.

²² The same pattern also holds when we use data over a longer time period (1890–2000). Lagged voter preferences still affect institutional choice, but we find little evidence that in our setting past institutional reform affects voter preferences later on. The drawback of using data further back is that voter preferences are estimated less precisely.

²³ There are several reasons why we choose the log specification: first, cantonal expenditures are log normally distributed. Also, spending 1000 SFr weighs more if the overall budget is smaller. Finally, the log specification allows a simple interpretation of the coefficient on the institutional variable. The results with expenditure levels as the left-hand side variable were qualitatively similar and are available upon request.

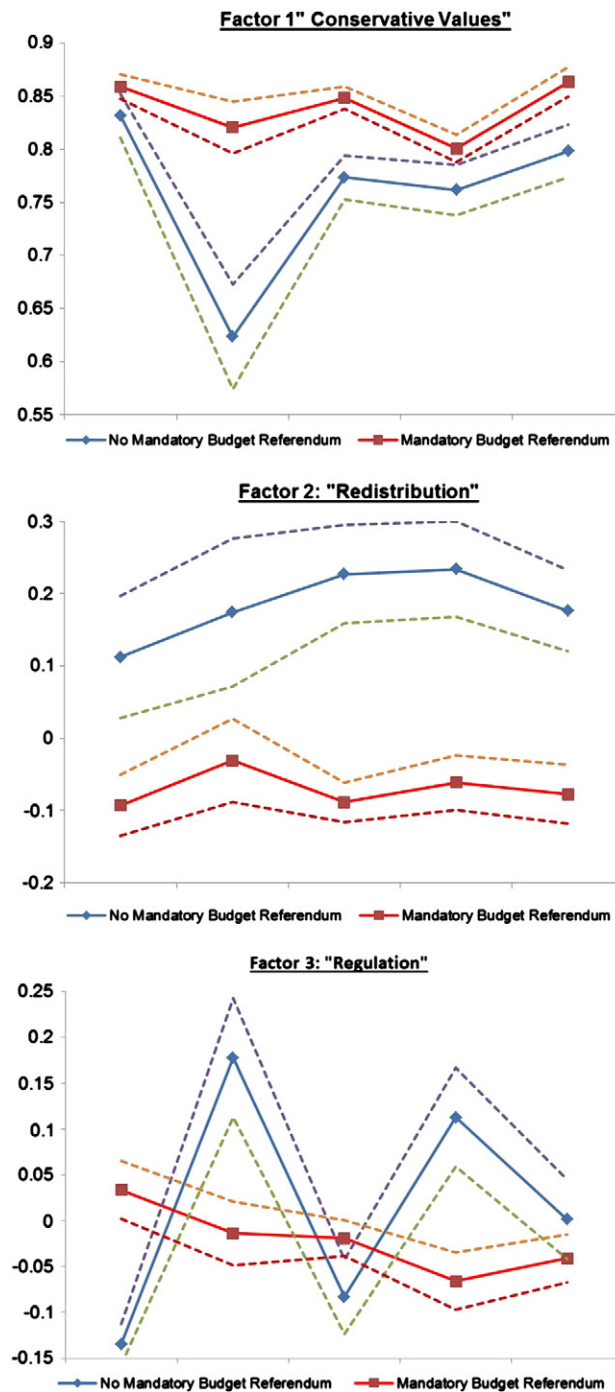


Fig. 3. Evolution of voter preferences by direct democratic regime.

activity. We cluster standard errors at the canton level to account for persistent canton-specific shocks.²⁴ Since the number of clusters is relatively small in our case ($N = 25$), we also implement a wild bootstrap procedure to estimate the standard errors (see Cameron et al., 2008).

²⁴ We need to cluster by canton for two reasons. First, public spending and our institutions and preferences exhibit strong serial correlation. Hence, shocks to spending today affect both current and future spending. Second, clustering standard errors adjusts for other canton-level shocks (e.g. shocks to voter preferences).

Table 7 estimates the relationship between public spending and a mandatory budget referendum using the factor loadings as our measure of voter preferences (λ_{ct}).²⁵ Preferences have a strong influence on spending behavior, in particular factor 2, which seems to capture tastes for redistribution, and factor 3, which seems to represent preferences for regulation or state intervention.²⁶

Our second result is that the association between strong direct democracy and spending becomes substantially weaker once we control preferences. Controlling for cantonal characteristics (column (4)), the coefficient on the mandatory budget referendum suggests 18.3 percentage points less spending (which is similar to estimates reported in other cross-sectional studies). Controlling for our measures of voter preferences as well, the coefficient on the mandatory budget referendum declines to 13.7 percentage points or about 680 Swiss Francs lower expenditures per capita. Hence, the fact that cantons with strong direct democracy also prefer less government reduces the relationship between direct democratic institutions and fiscal policy by roughly 25%.²⁷

We also investigate whether preferences are more strongly correlated with spending in cantons with a mandatory budget referendum but find little evidence for an interaction effect (see column (6)). The interaction effect is statistically significant for just one factor; when we evaluate the net effect at mean factor levels, we find that the mandatory budget referendum is associated with 12 percentage points lower spending, fairly close to the 13.7 percentage points reported for the linear specification (column (5)).²⁸

The results for log cantonal revenues are consistent with the findings on expenditures: without including preferences, a mandatory budget referendum decreases revenues by 16.3 percentage points (column (4)). Including voter preferences reduces the coefficient on the budget referendum by 28% (to 11.7 percentage points), and the coefficient is only borderline statistically significant.

Table A7 reports very similar patterns when we use the voter support for more government spending as our measure of cantonal preferences instead. We again find that voter preferences have a significant and sizable effect on government spending and revenues: a one percentage point higher approval rate for more federal expenditures translates into 1.6 percentage points higher expenditures at the canton level. Controlling for preferences, the coefficient on the mandatory budget referendum declines from 18.7 percentage points to 14.8 percentage points less spending – a decline of 21%. For revenues, the estimated coefficient on the mandatory budget referendum falls from 16.6 percentage points to 12.8 percentage points, a decline of 23%.

Heterogeneity in preferences is thus an important determinant of differences in fiscal policy and needs to be accounted for – in the absence of credible variation or good instruments for institutions (see e.g. Schelker and Eichenberger, 2010).²⁹ Our results confirm that previous studies relying on cross-sectional variation overestimate the relationship between direct democratic instruments and fiscal policy. Since differences in political institutions are strongly correlated with preferences for government, the coefficient on the institutional variable picks up a combination of heterogeneity on the demand side and institutional constraints on the supply side. Even after accounting for differences in the demand for government, direct democracy is associated with lower spending.

6.2. Robustness tests

This section presents a range of robustness checks to control for additional socio-demographics or political institutions that might be correlated with both spending and the budget referendum and investigate alternative measures of the budget referendum.

All tests reported in Table 8 first show the augmented specification without preference measures (odd columns) and then add our preference measures (even columns). For all specifications, the dependent variable is log expenditures per capita and preferences are measured using the three factors. All specifications include year dummies and the same controls as before, i.e. population density, federal aid, unemployment, age structure and education.

First, differences in cantonal wealth and income might bias our estimates. Unfortunately, information on income at the canton level is only available since 1965. Columns (1) and (2) reestimate the baseline for the subset of years with valid income data; columns (3)–(4) then add average cantonal income (in logs). Adding income has little effect on our estimates. To use the longer time period, we include in all subsequent specifications a proxy for income differences: the number of physicians per 1000 people. As explained in the data section, this variable captures a large fraction of the variance in income. Columns (5)–(6) confirm

²⁵ Recall that we need three factors to characterize the voting decisions in the 331 federal propositions (though not all three factors might be important determinants of public spending in a canton).

²⁶ One might worry about reverse causation, i.e. that voter preferences respond to spending shocks. We think this is not a major concern. First, our preference measures are recovered from ballots at the federal level. Hence, citizens are not able to punish cantonal politicians for overspending by strategically manipulating their federal vote. Second, voter preferences, especially the estimates from factor analysis, are remarkably stable over time (see Fig. 3). Spending, in contrast, is much more volatile; it is hence unlikely that preferences respond to temporary spending shocks. Finally, using an instrumental variable approach (with culture measured by language and religion as instruments), we find that preferences still exert a statistically significant effect on spending, and the estimated coefficient is of a similar magnitude. Though we pass the overidentification test, the instrument might be invalid if culture has a direct effect on spending.

²⁷ These conclusions remain valid when we further adjust the standard errors for the small number of clusters using the wild bootstrap: factor 2 and factor 3 continue to have a statistically significant effect on spending ($p = 0.000$ and $p = 0.048$, respectively). The standard error for the budget referendum increases such that it is just below conventional significance levels ($p = 0.068$).

²⁸ Given that preferences and spending are not measured in the same unit, we cannot test whether preferences are 'better' or 'worse' represented in a direct democracy than in a more representative form of government.

²⁹ The only setting in which we would not expect a correlation is when there is random or quasi-random variation of direct democratic institutions at hand (see Olken, 2010; Tyrefors and Pettersson-Lidbom, 2012 for recent examples).

Table 6The relationship between mandatory budget referendum and voter preferences^a.

	Abolishing or adopting a mandatory budget referendum							
	(1)		(2)		(3)		(4)	
Factor 1 (“conservative values”) in t-5	−0.047** [0.021]		−0.055** [0.022]					
Factor 2 (“redistribution”) in t-5	−0.02 [0.010]		−0.02 [0.015]					
Factor 3 (“regulation”) in t-5	−0.02 [0.014]		−0.01 [0.012]					
Factor 1 (“conservative values”) in t-10					−0.032 [0.025]		−0.031 [0.031]	
Factor 2 (“redistribution”) in t-10					−0.014 [0.011]		−0.014 [0.015]	
Factor 3 (“regulation”) in t-10					−0.021 [0.014]		−0.014 [0.010]	
cantonal characteristics	No		Yes		No		Yes	
year fixed effects	Yes		Yes		Yes		Yes	
Observations	1150		1150		1025		1025	
R squared	0.04		0.06		0.04		0.05	
	Factor 1		Factor 2		Factor 3			
	(1)	(2)	(3)	(4)	(5)	(6)		
Reform of budget referendum in t-5	−0.003 [0.020]		0.041 [0.043]		0.030 [0.036]			
Reform of budget referendum in t-10			−0.023 [0.032]		0.117 [0.103]		−0.037 [0.069]	
cantonal characteristics	No		Yes		No		Yes	
Decade fixed effects	Yes		Yes		Yes		Yes	
Observations	1150		1150		1150		1025	
R squared	0.51		0.51		0.23		0.28	

^a The upper part of the table shows regressions of a dummy variable “change mandatory budget referendum” (taking a value of 1, in case of a change, and 0 otherwise) on past preferences, canton characteristics and year fixed-effects. The lower part of the table regresses preferences on past reforms on the mandatory budget referendum. Standard errors are clustered at the canton level. *p < 0.1, **p < 0.05 and ***p < 0.01.

Table 7
Voter preferences and the size of government^a.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Log Cantonal Expenditures</i>						
Mandatory budget referendum	−0.262* [0.134]		−0.138 [0.097]	−0.183** [0.071]	−0.137** [0.062]	−0.470 [0.338]
Factor 1 (“conservative values”)		−0.239 [0.311]	−0.176 [0.317]		0.06 [0.245]	−0.08 [0.334]
Factor 2 (“redistribution”)		0.468*** [0.164]	0.410*** [0.128]		0.435*** [0.096]	0.652*** [0.158]
Factor 3 (“regulation”)		0.248* [0.122]	0.216* [0.114]		0.198** [0.086]	0.155 [0.144]
Factor 1 × referendum						0.436 [0.412]
Factor 2 × referendum						−0.354* [0.177]
Factor 3 × referendum						0.050 [0.199]
Population density (log)				0.161** [0.062]	0.120* [0.063]	0.1 [0.062]
Federal subsidies (log)				0.309*** [0.076]	0.303*** [0.078]	0.275*** [0.075]
Unemployment rate				0.05 [0.032]	0 [0.025]	0 [0.025]
Population 65 and older				0 [0.028]	−0.01 [0.024]	−0.01 [0.023]
% high skilled (university degree)				0 [0.008]	0 [0.007]	0 [0.006]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1272	1272	1272	1272	1272	1272
R-squared	0.82	0.86	0.86	0.87	0.89	0.90
<i>Log Cantonal Revenues</i>						
Mandatory budget referendum	−0.246* [0.136]		−0.123 [0.0985]	−0.163** [0.0735]	−0.117* [0.0647]	−0.565 [0.348]
Factor 1 (“conservative values”)		−0.176 [0.315]	−0.120 [0.320]		0.0965 [0.255]	−0.118 [0.361]
Factor 2 (“redistribution”)		0.476*** [0.165]	0.425*** [0.131]		0.449*** [0.106]	0.647*** [0.182]
Factor 3 (“regulation”)		0.236* [0.119]	0.207* [0.110]		0.187** [0.0846]	0.149 [0.151]
Factor 1 × referendum						0.577 [0.430]
Factor 2 × referendum						−0.323 [0.200]
Factor 3 × referendum						0.0298 [0.203]
Population density (log)				0.168** [0.0649]	0.126* [0.0663]	0.105 [0.0665]
Federal subsidies (log)				0.306*** [0.0817]	0.301*** [0.0830]	0.274*** [0.0816]
Unemployment rate				0.0334 [0.0316]	−0.0191 [0.0259]	−0.0195 [0.0261]
Population 65 and older				0.00117 [0.0291]	−0.00797 [0.0252]	−0.0103 [0.0248]
% high skilled (university degree)				−0.00277 [0.00814]	−0.00192 [0.00639]	−1.70e-05 [0.00572]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1272	1272	1272	1272	1272	1272
R-squared	0.786	0.817	0.822	0.828	0.853	0.863

^a The table reports least-square estimates of cantonal preferences, whether the canton has a mandatory budget referendum in place and controls on cantonal expenditures per capita (top panel) and cantonal revenues per capita (bottom panel). Estimation is pooled across year and canton and all regressions include year dummies (not reported). Voter preferences are estimated using factor analysis. Standard errors are clustered at the canton level.

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

that income does not affect the basic pattern in the coefficients. Second, direct democracy might play a more important role in cantons with more linguistic and religious heterogeneity. Hence, columns (7)–(8) add the French- and Italian-speaking population (in percent) as well as the share of Catholics. Again, this does not affect our results.

Table 8
Additional specification tests^a.

	Baseline valid income, then add income				Add income proxy		Add language, religion		Mandatory vs. optional ref			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mandatory budget referendum	−0.151** [0.064]	−0.109 [0.070]	−0.151** [0.064]	−0.103 [0.077]	−0.119** [0.056]	−0.105* [0.054]	−0.176** [0.067]	−0.135** [0.063]	−0.085 [0.063]	−0.070 [0.061]	−0.077 [0.059]	−0.073 [0.057]
Optional budget referendum									0.065 [0.072]	0.069 [0.068]		
Signature required optional ref.											−0.0003 [0.0003]	−0.0003 [0.0003]
Factor 1 (“conservative values”)		0.028 [0.224]		0.038 [0.232]		0.046 [0.215]		0.006 [0.271]		0.031 [0.201]		0.066 [0.214]
Factor 2 (“redistribution”)		0.324*** [0.111]		0.373*** [0.126]		0.290*** [0.075]		0.483*** [0.127]		0.289*** [0.072]		0.286*** [0.074]
Factor 3 (“regulation”)		0.226** [0.102]		0.268** [0.124]		0.090 [0.076]		0.198** [0.093]		0.079 [0.074]		0.082 [0.075]
cantonal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	875	875	875	875	1272	1272	1272	1272	1272	1272	1272	1272
R squared	0.67	0.71	0.67	0.71	0.90	0.91	0.87	0.89	0.90	0.91	0.90	0.91
	Monetary threshold		Add direct democracy		Add other institutions		Female suffrage at cantonal level			Add all institutions		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mandatory budget referendum	0.0002* [0.0001]	0 [0.0001]	−0.147*** [0.052]	−0.135*** [0.044]	−0.113** [0.046]	−0.100** [0.046]	−0.113* [0.059]	−0.092* [0.053]	−0.119** [0.055]	−0.103* [0.053]	−0.133*** [0.043]	−0.119** [0.045]
Factor 1 (“conservative values”)		0.04 [0.212]		−0.02 [0.198]		0 [0.194]		−0.04 [0.256]		0.01 [0.220]		0.11 [0.201]
Factor 2 (“redistribution”)		0.291*** [0.078]		0.288*** [0.065]		0.304*** [0.073]		0.303*** [0.073]		0.296*** [0.074]		0.349*** [0.089]
Factor 3 (“regulation”)		0.1 [0.075]		0.08 [0.083]		0.12 [0.072]		0.12 [0.089]		0.1 [0.079]		0.145* [0.074]
cantonal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1271	1271	1272	1272	1272	1272	1203	1203	1272	1272	1272	1272
R squared	0.90	0.91	0.90	0.91	0.91	0.92	0.90	0.91	0.90	0.91	0.92	0.93

^a The table reports least-square estimates where the dependent variable is log cantonal expenditures. All specifications contain year fixed effects, the same controls as before and our income proxy (doctors per capita). Odd columns only include the indicator for mandatory budget referendum, even columns add voter preferences. In the top panel, columns (1)–(2) rerun the baseline for the subset of years with valid information on income (1965–2000); columns (3)–(4) add annual cantonal income. Columns (5)–(6) use the number of physicians per 1000 people as an income proxy. Columns (7)–(8) add the % French- and Italian-speaking and the % Catholics in a canton. Columns (9)–(10) include separate indicators for the mandatory and optional budget referendum, while (11)–(12) use the signature requirement for the optional referendum. In the bottom panel, columns (1)–(2) use the monetary threshold for the mandatory budget referendum as an alternative institutional measure. Columns (3)–(4) add whether the canton has a mandatory law referendum and the signature requirement for the voter initiative in percentage of the eligible population. Columns (5)–(6) include controls for proportional representation, constitutional constraints, the size of the executive and legislative and whether the leader of the executive is directly elected. Columns (7)–(8) reestimate the baseline specification for the set of cantons that adopted female suffrage at the cantonal and federal level simultaneously. Columns (9)–(10) include a binary indicator whether female suffrage was introduced at the canton level, while columns (11)–(12) include all institutions simultaneously. Standard errors are clustered at the canton level. See also notes to previous tables.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Third, our simple binary measure for the mandatory budget referendum might be too coarse to capture all relevant variation in the budget referendum. To address this issue, we first test whether the mandatory and the optional budget referendum have independent effects on spending. Since the monetary thresholds to call an optional referendum are lower than for the mandatory budget referendum, the optional referendum might constrain spending more than a mandatory budget referendum. Columns (9) and (10) show in contrast that the optional budget referendum has no significant effect on spending while the coefficients exhibit a similar pattern than before. One issue we face is that simple binary indicators for the two referendums are not independent. In columns (11)–(12), we therefore use the number of signatures to call an optional referendum instead. We find again that the results are the same and that low signature requirements (i.e. low barriers to launch a referendum), if anything, increase spending.

An alternative way to operationalize the mandatory budget referendum is to exploit the more continuous monetary thresholds. Columns (1) and (2) at the bottom panel confirm that higher thresholds, which make fewer costly projects subject to voter approval, raise public spending as expected.³⁰

Fourth, other political institutions might be correlated with both spending and the mandatory budget referendum. For example, cantons with a mandatory budget referendum are more likely to have a mandatory law referendum or low signature requirements for the voter initiative in place. Columns (3) and (4) show that controlling for these institutions does not affect our conclusions. Columns (5) and (6) instead control for a number of other political institutions that might affect spending: whether the canton has a constitutional constraint on deficit spending or requires a balanced budget, whether the president of the executive is directly elected, whether the cantonal parliament is elected under proportional representation as well as the size of the legislative and executive. Again, our results remain unchanged.

Fifth, changes in the size of the electorate over time could affect our results. The most important reform in voting rights in our sample period is female suffrage. Since women's suffrage was adopted in different years at the federal and cantonal level, our measures of voter preferences might include female voters even though women did not yet have the right to vote in the canton. The opposite is true if the canton adopted suffrage prior to the federal level. In columns (7) and (8), we add a binary indicator whether women had the right to vote or not in a canton in a given year. The results remain unchanged. In addition, we reestimate our specification for cantons that adopted female suffrage in 1971, the same year it was adopted at the federal level (columns (9) and (10)). As before, the results remain unchanged.

Finally, the last two columns include the most comprehensive set of institutional controls for direct democracy, constitutional constraint, proportional representation, women's suffrage and the structure of the executive and legislative – but the results are not affected. In sum, the evidence presented here shows that our estimates are robust to the inclusion of additional socio-demographic and institutional controls as well as alternative specifications of the direct democratic institution. Across all specifications, a comparison of odd and even columns shows that voter preferences still exert a significant effect on spending in all our specifications. Even in the most comprehensive specification (columns 11 and 12), our preference measures still reduce the estimated effect of the mandatory budget referendum by at least 10%.

7. Conclusion

This article outlines an empirical strategy to estimate voter preferences from ballot data. Using data on all federal propositions held in Switzerland between 1950 and 2000, we recover aggregate policy preferences in each canton. Our evidence suggests that preferences vary a lot across cantons; these differences are persistent, but also evolve slowly over time. We also find that voter preferences are systematically correlated with political institutions. In particular, citizens in cantons with stronger direct democratic institutions are more conservative, prefer less public spending and less redistribution than voters in cantons with weaker direct democratic institutions.

The heterogeneity of preferences across alternative institutional regimes seems to be a general phenomenon present in other countries and for political institutions other than direct democracy as well. The results of this article then suggest that comparative studies of institutions need to account for voter preferences as an important mediator between institutions and policy outcomes.

Using our data on voter preferences, we revisit the relationship between direct democracy and public spending. Not surprisingly, we find that spending is higher in cantons in which voters have a stronger demand for government and redistribution. We also show that previous studies systematically overestimate the constraining effect of direct democracy on government spending. Controlling for the heterogeneity in preferences, we find that the influence of direct democratic institutions on government spending declines by 20%. These results are found to be very robust to alternative definitions of the institutional variable, alternative measures of preferences, additional controls for socio-demographic characteristics or other political institutions that could restrain public spending. We also show that variables commonly used in the literature to control for heterogeneity in the demand for government do not eliminate the bias from omitted voter preferences.

Even after controlling for voter preferences, however, direct democracy decreases revenues or spending by 12–14 percentage points. Hence, direct democracy has real consequences for the policy-making process: either directly by preventing the realization of expensive projects or by changing political decision-making in the parliaments. Overall, the results in this article

³⁰ We also test whether our results change if we use an institutional index variable instead. The index combines the various provisions of the budget referendum: monetary thresholds for the mandatory and optional referendum, the days to collect and number of signatures required for an optional referendum. The results are very similar to the ones reported here and available upon request.

provide empirical support for the notion that both voter preferences and direct democratic institutions have independent effects on fiscal policy and the size of government.

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Appendix A. Canton-level panel data

The canton-level data on expenditures and revenues are taken from the annual collections on public finances in Switzerland ([Federal Department of Finance, various years](#)). Expenditures for cantons and communities are reported together in 1967 and 1968. Federal subsidies are available for all years except 1950–52, 1968–77 and 1990–93. All values for missing years were obtained by linear interpolation. Both expenditure and revenue categories are expressed per capita and deflated to 2000 Swiss Francs using the annual consumer price index.

The data on direct democracy are taken from [Trechsel and Serdült \(1999\)](#), who collected information for cantons without a town-meeting from 1970 to 1996. For cantons with town meetings and years not covered in Trechsel and Serdült, we gathered data from the cantonal Public Record Offices and supplemented missing information from old cantonal laws and constitutions. Our most important measure is a binary indicator equal to one if the canton had a mandatory budget referendum in place in that year and zero if the budget referendum was optional or the canton does not have one at all. Prior to 1978, the cantons Vaud, Valais, and Fribourg only allowed a referendum on extraordinary expenditures not specified in the budget. Since this type of referendum is much weaker than one that covers all types of expenditures, these cantons are classified as having no mandatory budget referendum. We also extracted information on the monetary threshold when a budget referendum becomes mandatory in a canton. In a few places, the threshold is reported in percent of the budget. We converted all thresholds into real Swiss Francs per capita using the consumer price index, current population and current budget (where needed). We also coded information on the optional budget referendum from the same sources. In 2000, 23 out of the 25 cantons allow for an optional budget referendum and further have information on the monetary threshold when an optional referendum can be called, the number of signatures required to call it and the days permitted to collect those signatures.

In addition, we constructed two variables measuring the strength of other direct democratic instruments in a canton: whether the canton had a law referendum in place in a given year and the signature requirement for the voter initiative as a share of the population aged 20 or above. All cantons except Vaud allow for the voter initiative at the cantonal level.

The variables on the percentage of left-wing parties and the number of seats in the cantonal parliament were provided by Professor Ladner at the University of Berne. The size of the executive, whether the president of the executive is directly elected, the year of adopting female suffrage or proportional representation are taken from the cantonal constitutions and the respective cantonal laws. If in doubt, we contacted the cantonal archives to confirm our coding.

For the cantonal characteristics, most variables are from the decennial population census with intermediate values interpolated. Data for the urban population is calculated in percent of the population living in cities above 10,000 people. The education variable is measured as the percentage of people with a university degree in percentage of the population above 19. Data on average cantonal income is available since 1965. In order to avoid losing these observations, we also use a proxy for cantonal income in our robustness analysis: the number of physicians per 1000 people. Together with our other canton-level variables and year fixed effects, we capture 90% of the variation in income. The unemployment rate was calculated as the number of registered unemployed relative to the active population from the State Secretariat for Economic Affairs after 1975 and as the number of unemployed in percentage of employed persons from the population census before 1975. Population density is measured as the log of the number of people (in 1000) per square kilometer. We also collected information on the age structure of the canton, the share of divorced people in the age group above 20, the population share of the major language groups (German, French and Italian) and the share of Catholics (relative to Protestants and Jews). Finally, we calculated linguistic and religious fragmentation as one minus Herfindahl indices for the three groups respectively. The indices vary from 0 to 1 where larger values represent more fragmentation.

Appendix B. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.ejpolco.2013.09.003>.

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