Budget referendums and government spending: evidence from Swiss cantons

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Abstract

In many Swiss cantons, new government programs must be approved by a referendum of citizens before money can be spent. Referendums seem like a natural way to address citizen–legislator agency problems, yet statistical evidence on how referendums affect spending decisions is almost nonexistent. We estimate regressions for Swiss cantons using panel data from 1980 to 1998 and find that mandatory referendums reduced government spending by 19% for the median canton after controlling for demographics and other determinants of spending.
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1. Introduction

A central question in political economy is, do governments spend the right amount of money from the voters' point of view? In a pure median voter world, the answer is yes: competition drives spending to the level preferred by the median voter. Yet many believe that real political markets are riddled with frictions that cause governments to

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systematically overspend.[1] The suspicion that government officials ignore the wishes of citizens has motivated scholars and policymakers to search for institutions— decision rules—that constrain the ability of legislatures to make decisions.

Formal tax and expenditure limitations (TELs) such as California's Proposition 13 are among the more popular of these institutions in the United States. However, TELs have turned out to be less effective than expected, and it has proven surprisingly difficult to find significant fiscal differences in the data between governments with and without TELs.[2] The difficulty in finding measurable effects could be a statistical problem or it could mean that the actual effects are modest. If TELs really have no bite, it suggests that legislators can evade them through legal loopholes, or perhaps that the median voter model applies and there is no overspending problem to solve.

An entirely different approach to the perceived problem of overspending by elected officials is to require direct citizen approval of spending decisions via referendums.[3] Mandatory referendums on spending in the United States are most often seen in local school districts, where voters are sometimes asked to approve annual budgets or new buildings. However, in Switzerland, mandatory referendums on a variety of fiscal policies are common at both the canton (roughly equivalent to a US state) and local level. In contrast to TELs, little research is available regarding the effect of mandatory referendums on government spending.

The purpose of this paper is to investigate the effect of mandatory referendums on spending decisions in Swiss cantons. Given the widespread interest in government growth and legal institutions a careful empirical study of this institution seems relevant from a policy perspective. We believe the evidence may also shed light on two fundamental issues in political economy. The first is the applicability of the median voter model. The median voter theorem is perhaps the best-known formal result in political economy, and is the foundation of a huge empirical and theoretical literature. In a pure median voter world, elected officials would adopt the position of the median voter, and their spending decisions would always be approved in referendums. If the median voter model is a good explanation for spending decisions in Swiss cantons, then mandatory referendums will have no effect on spending.

A second issue is whether institutions matter at all, or are simply veils that government officials can evade. Swiss legislators certainly have a big legal loophole available if they wish to avoid a referendum: referendums are required only when expenditure on a new project exceeds a predetermined amount that we refer to as the *spending threshold*. To evade a referendum on an unpopular project, legislators can simply split it nominally into

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[1] For example, on the theory side, Niskanen (1971) suggests that bureaucracies use their monopsony power to extract rents, and Tullock (1959) argues that the tax base is a fiscal commons exploited to fund pork barrel projects. The most compelling evidence that voters dislike government spending at the margin is Peltzman (1992): he found that voters punished incumbents who increased spending when they stood for re-election during 1950–1988. Matsusaka (1995, 2002) provides corroborating evidence for 1960–1999: spending was lower in states with voter initiatives than states where representatives had a monopoly on legislation. Polls typically show that a majority of ordinary citizens also believe that government spending is too high (Matsusaka, 2002).

[2] The literature is voluminous. For evidence and references, see Abrams and Dougan (1986), Cox and Lowery (1990), Bails (1990), Rueben (1995), Dye and McGuire (1997), and McGuire (1999).

[3] We follow most of the modern literature (and the *Oxford English Dictionary*) and use referend*ums* rather than referend*a* as the plural of referendum. Butler and Ranney (1994, Footnote 1) explain why this is not a grammatical mistake.

several smaller projects, all of which fall beneath the spending threshold. For example, if the threshold is $1 million, then a road project costing $1.5 million could be divided into two separate connecting roads costing $.75 million each. If institutions are merely veils that clever politicians can evade, then we should not observe an effect of mandatory referendums on spending policy.

Our main finding, based on panel data for all 26 cantons from 1980 to 1998, is that cantons with mandatory referendums spend significantly less than other cantons. We estimate that the presence of a mandatory referendum with a spending threshold of 2.5 million Swiss francs (the sample median) is associated with 19% less expenditure per capita, holding constant other determinants of spending such as income. The magnitude of this effect is remarkably large, and suggests that the spending choices of Swiss legislators are far from the preferred policy of the median voter. It also seems clear that this particular institution is more than a veil—government officials apparently find it too costly to routinely subdivide projects and evade referendums.

We also document an interaction between the mandatory referendum and voter initiative: as it becomes easier for citizens to initiate referendums on new laws, the impact of the mandatory referendum declines. This suggests that the initiative process is a substitute way to restrain government spending, and is consistent with evidence in Matsusaka (1995, 2002) that American states with the initiative spend less than those without it.[4]

Our paper contributes to the growing literature on fiscal consequences of decisionmaking institutions.[5] A number of studies in this literature have investigated 'direct democracy' institutions, but the question of how a mandatory expenditure referendum affects the level of spending has not been addressed.[6] Romer and Rosenthal developed a theoretical framework in an influential series of papers.[7] They used the theory to study local school district budgets, documenting the importance of reversion points for spending proposals. However, they did not compare the spending behavior of districts with and without mandatory referendums. The only study we know that attempted such a comparison was Megdal's (1983) investigation of 177 New Jersey school districts. Unfortunately, the particular referendum she studied was almost toothless—if the voters rejected the school board's budget proposal, then the decision simply passed to the city council—and she could not find an effect on spending. We would like to know about referendums that actually allow the voters to shut down a project.

Our paper also contributes to the substantial empirical literature on direct democracy in Switzerland pioneered by Pommerehne and other Switzerland-based economists.[8] The message from this literature is that direct democracy matters, but as far we can tell, no

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[4] The evidence in Matsusaka (1995, 2002) is from 1960 to 1999, which partially overlaps the present study. Matsusaka (2000) reports that initiative states spent more than non-initiative states in the early part of the twentieth century.

[5] For example, see Poterba and von Hagen (1999).

[6] Several recent papers have studied mandatory referendums on *borrowing*. For example, Feld and Kirchgaessner (1999) report that debt referendums reduce borrowing and spending in Swiss municipalities, and Bohn and Inman (1996) and Kiewiet and Szakaly (1996) find they restrict borrowing in US states. See also McEachern (1978). Schaltegger and Feld (2001) study the effect of mandatory referendums on the centralization of expenditure.

[7] The seminal paper is Romer and Rosenthal (1979). See Romer et al. (1992) for references.

[8] Pommerehne (1990), Frey (1994), and Feld and Kirchgaessner (2000) contain surveys.

study investigates whether direct democracy (broadly defined) or mandatory referendums (specifically) reduce spending.[9] Many studies combine several institutional features into an ad hoc index of direct democracy. This makes it easy to answer general questions about the consequences of direct democracy, but limits the policy relevance of the results since policymakers need to know precisely what institutional features are important.[10] We add to the literature by documenting that direct democracy does in fact reduce spending, by tracing the cause to the mandatory referendum and the voter initiative, and by quantifying the impact of both institutions.

The paper is organized as follows. Section 2 describes the institutional structure of canton decisions. Section 3 analyzes a simple model to motivate the empirical work. Section 4 specifies the empirical model and data sources. The main results appear in Section 5. Section 6 discusses alternative interpretations of the evidence and concludes.

2. Description of institutions

Switzerland has a federal structure similar to the United States. Total spending in the 26 cantons exceeds spending by the federal government or local governments. Canton spending is concentrated on education (about a quarter of all expenditure), health, social security, and roads. All cantons have a parliamentary legislature elected in a proportional representation system, except for five cantons that used a 'town-meeting' form of government (the entire cantonal electorate meets to set the budget) for at least part of the sample period.

Decisions to initiate a new spending program in the cantons are made in the shadow of a web of institutions that facilitate popular participation. Table 1 and Fig. 1 summarize some of the key institutions. We have not attempted to be exhaustive here, but rather to capture the most important features for our purposes. The data are drawn from the detailed study of Swiss institutions by Trechsel and Serduelt (1999).

2.1. Mandatory referendums

The most important institution for our purposes is the mandatory referendum, available in 17 cantons in 1996 (and 72% of the observations in the full sample). The mandatory referendum applies to new spending projects that have been approved by parliament (or proposed by elected officials in town meeting cantons). If the cost of a project exceeds a predetermined amount—the spending threshold—then the proposal must be approved by a majority of all voters in a referendum before the money is spent. For example, in 1996 the voters in Schaffhausen rejected a 34 million SFR bond issue for construction of buildings in the canton's Psychiatry Center. Spending thresholds are usually specified in nominal

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[9] The important study by Pommerehne (1978) is sometimes cited as showing that direct democracy results in lower spending, but that is neither the focus of the paper, nor can such a conclusion be drawn from the reported results. Pommerehne and Schneider (1982) perform a simulation that suggests slower spending growth in cities with high index values of direct democracy, but do not test for statistical significance.

[10] Our finding that budget referendums and the initiative process are substitutes also suggests that the usual additive indexes are misspecified.

Table 1
Provisions for budget referendums in Swiss cantons, 1996

Canton	Referendums on new projects	Spending threshold for mandatory referendum	Spending threshold for optional referendum	Signature requirement for initiative	Population in 1000s	Town meeting?
Zurich (ZH)	M,O	20 000 000	2 000 000	10 000	1179	No
Bern (BE)	O	...	2 000 000	15 000	941	No
Lucerne (LU)	M,O	25 000 000	3 000 000	4000	342	No
Uri (UR)	M,O	1 000 000	500 000	300	36	No
Schwyz (SZ)	M	250 000	...	2000	124	No
Obwalden (OW)	M	1 000 000	...	1	31	Yes
Nidwalden (NW)	M,O	250 000	125 000	1	37	Yes
Glarus (GL)	M	500 000	...	1	39	Yes
Zug (ZG)	O	...	500 000	2000	94	No
Fribourg (FR)	M	1% of budget	...	6000	228	No
Solothurn (SO)	M,O	2 000 000	1 000 000	3000	241	No
Basle City (BS)	O	...	1 000 000	4000	195	No
Basle County (BL)	O	...	500 000	1500	254	No
Schaffhausen (SH)	M,O	1 000 000	300 000	1000	74	No
Appenzell ER (AR)	M	5% of budget	...	1	54	Yes
Appenzell IR (AI)	M,O	500 000	250 000	1	15	Yes
St. Gallen (SG)	M,O	10 000 000	3 000 000	4000	444	No
Grisons (GR)	M,O	5 000 000	1 000 000	3000	186	No
Aargau (AG)	O	...	3 000 000	3000	532	No
Thurgau (TG)	M,O	3 000 000	1 000 000	4000	225	No
Ticino (TI)	O	...	200 000	7000	305	No
Vaud (VD)	...	...	...	12 000	606	No
Valais (VS)	O	...	0.75% of budget	4000	272	No
Neuchatel (NE)	M,O	1.5% of budget	0.3% of budget	6000	165	No
Geneva (GE)	O	...	125 000	10 000	395	No
Jura (JU)	M,O	5% of budget	0.5% of budget	2000	69	No

'M' means mandatory referendum is available, and 'O' means optional referendum is available. Spending thresholds are in Swiss francs. Signature requirements apply to the 'statutory' initiative. For town meetings, an initiative is defined as a vote of all people at the meeting on a proposal. This table is derived from raw data in Trechsel and Serduelt (1999). Cantons are listed in historical order as is conventional.

dollars, but in a few cases as a percentage of the canton's previous budget.[11] Nominal spending thresholds ranged from 150 000 to 25 million Swiss francs (SFR) in 1996. The thresholds tend to be adjusted upward periodically over time to account for inflation. During our sample period (1980–1998), citizens voted on 461 mandatory referendums, and approved the project 86% of the time.

2.2. Optional referendums

The second institution is the optional referendum (or 'petition referendum'), available in 20 cantons in 1996. In cantons with an optional referendum, voters can call for a

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[11] Most cantons also set a threshold in terms of the implied repeating yearly expense of the project. This annual expenditure threshold is usually one-tenth of the regular spending threshold.
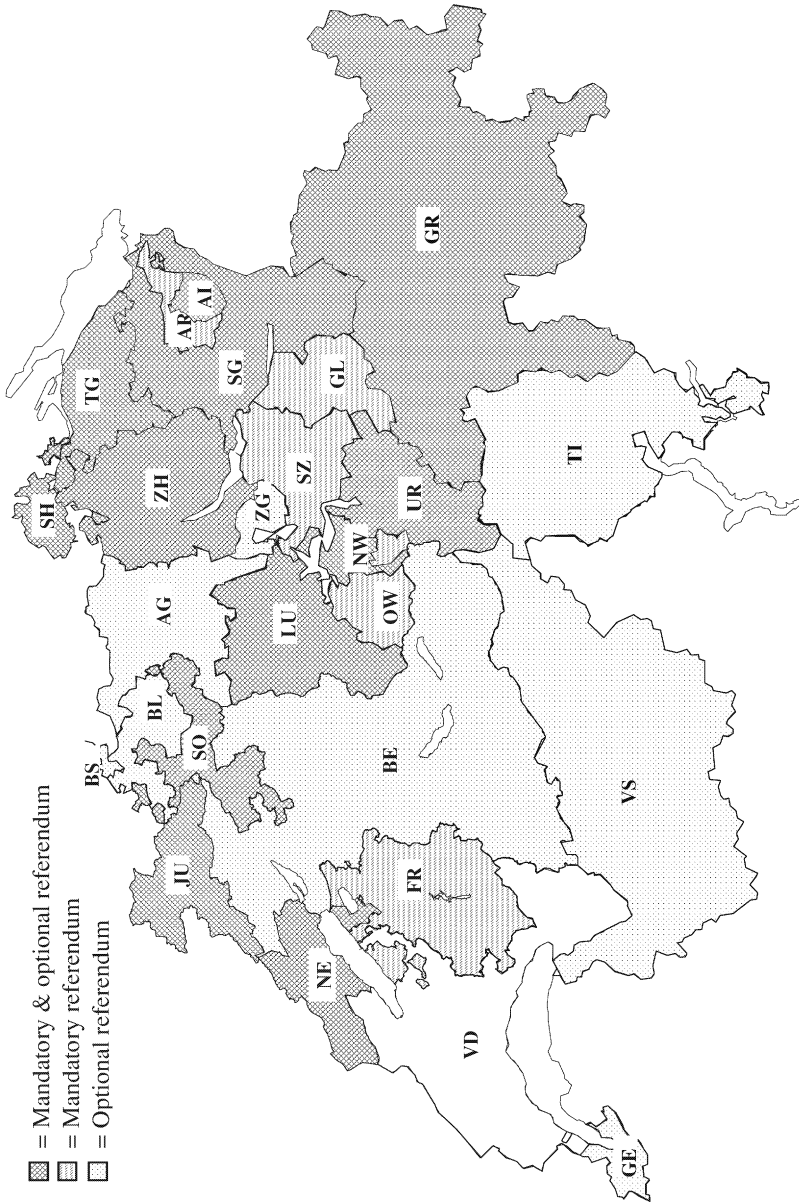
Fig. 1. Provisions for Budget Referendums in Swiss Cantons, 1996.

referendum on a new spending proposal by collecting signatures from a predetermined number of citizens. As with mandatory referendums, the optional referendum becomes available when a spending proposal exceeds some minimum level. Recent examples include a proposal to build a bridge over Lake Geneva (approved) in the canton of Geneva, and a proposal to build a 51 million SFR waste incinerator in the canton of Ticino in 1993 (rejected). Twelve cantons provided for both optional and mandatory referendums in 1996, with the optional referendum available for spending levels below the threshold of the mandatory referendums. Ninety optional referendums were put before the voters during our sample period, and 53% of the proposals were approved.

2.3. Initiatives

The third institution is the initiative process, available in all cantons. The initiative process allows citizens to propose an entirely new law that goes into effect if approved by a vote of the electorate at large. The key difference between the initiative and the two referendums is that the initiative allows *new* laws to be proposed while the referendums only permit negation of existing laws. The initiative provides a way for citizens to cancel spending programs that fall short of the referendum spending thresholds—they can simply pass a law that eliminates the program. An initiative goes to the voters for consideration when sponsors collect a predetermined number of signatures. The more signatures required, the harder it is to propose an initiative. As Matsusaka (1995, 2000) has shown for the United States, the signature requirement is an important determinant of the effectiveness of the initiative. Signature requirements in 1996 ranged from a low of 1 in some of the town meeting cantons to a high of 15 000 in Bern.[12] A total of 373 initiatives reached the ballot from 1970 to 1996; only 27% of them were approved.

3. A theoretical framework

To frame the empirical analysis, we develop a simple agenda setting model adapted from Romer and Rosenthal (1979). The purpose is to identify the theoretical effect of the institutions we consider under the assumption that government officials want to spend more than the median voter does. We omit the case where officials want to spend less than the median voter since it is an obvious extension and inconsistent with our evidence.

A canton must choose an amount $x \geq 0$ to spend on a new project (Fig. 2). The median voter's optimal spending level is V, and his utility is $U(x) = - \mid V - x \mid$, indicated as the heavy 'tent' in the figure. In a median voter world, the government would propose $x = V$, and the mandatory referendum would be superfluous. We suppose instead that the government (parliament, bureaucracy, etc.) has a preferred spending level of $G > V$, with utility decreasing as spending differs from this amount. Here G should be interpreted as the

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[12] The signature requirement can differ for initiatives that propose new statutes and those that amend the constitution. Either type of initiative can cancel a spending program, so we use the signature requirement for statutory initiatives, which is always lower (or the same). The 'signature requirement' for the town meeting cantons is set to 1 when a single person at the meeting (or before) can call for a vote on a measure.
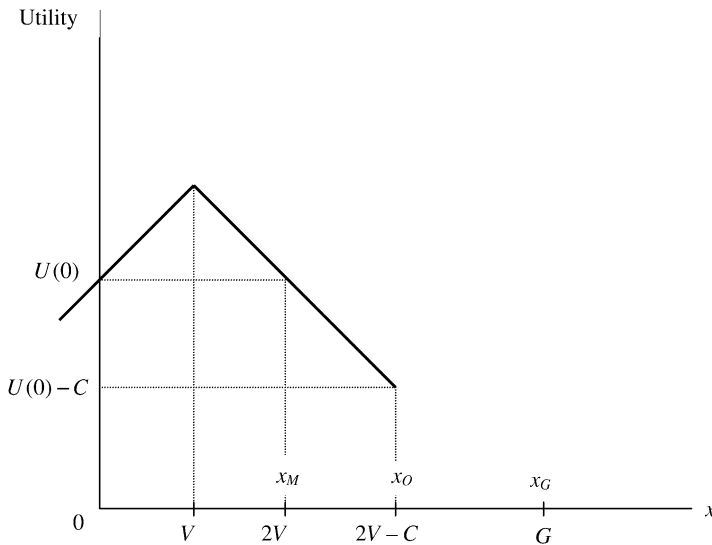
Fig. 2. A simple agenda setting model.

government's preference factoring in the possibility of losing re-election and other political costs.

To begin, note that with when referendums and initiatives are unavailable, the government chooses $x_G = G$ and that becomes the amount actually spent. What happens when a referendum is required? The voter will reject any spending proposal that yields less utility than $U(0)$ since $x = 0$ is the reversion point. Therefore, the maximum spending proposal that the voter will approve is $x_M = 2V$. If $x_M < x_G$ as drawn in Fig. 2, then the mandatory referendum matters: the government proposes x_M or the spending threshold, whichever is greater, and that becomes the policy. Otherwise, the government proposes x_G. The conclusion is that a mandatory referendum reduces spending (or leaves it unchanged), and the size of the reduction is larger when the spending threshold is smaller. As an aside, it is useful in interpreting the empirical results to keep in mind that the observed spending level with a mandatory referendum is not equal to the voter's ideal point unless $V = 0$, so the difference between x_G and x_M understates the amount of 'overspending.'

When it comes to the data, it is difficult for us to compare x_G and x_M since so few cantons have pure representative governments. Instead, we will be comparing mandatory referendum cantons to a benchmark group that includes cantons with optional referendums as well as those with no referendums as all. Therefore, we need to understand the theoretical implications of an optional referendum. With an optional referendum, the government's spending proposal can be put to a vote only if the voter pays a cost in terms of collecting signatures. If the utility cost of collecting signatures is C, then the government must make the voter indifferent between its proposal and $U(0) - C$. The maximum proposal that achieves this is $x_O = 2V + C$. When the constraints are binding, $x_G > x_O > x_M$. The important point here is that a mandatory referendum cuts spending

relative to an optional referendum if there is an overspending problem. In addition, the difference between x_M and x_O is an understatement of $x_G - x_M$.

Finally, suppose that the initiative is available. Now the voter can achieve his optimal spending level ($x = V$) if he pays the cost of collecting signatures to make a proposal. The voter will use the initiative if it promises to increase his utility by more than the cost of collecting signatures, K. Therefore, the government can propose to spend at most $x_I = V + K$ without triggering an initiative. Since all cantons permit initiatives, our key empirical variable will be K, measured as the signature requirement. Observe that x_I is increasing in K, and can lie anywhere to the right of V. If $x_I < G$ then the initiative reduces spending. If $x_I < x_M$, then the mandatory referendum has no effect. Two implications follow: (1) all else equal, spending is lower (not higher) as K falls, and (2) mandatory referendums cut spending more as K rises.[13]

4. Empirical model and data

The empirical model is:

$$E_{it} = a \cdot M_{it} + b \cdot I_{it} + c \cdot M_{it} \cdot I_{it} + d \cdot X_{it} + e_{it},$$

where E is expenditure per capita, M is a vector of variables describing the mandatory referendum, I is the initiative signature requirement, X is a vector of demographic and political variables that control for non-institutional determinants of spending, e is an error term, and a, b, c, and d are the (vector-valued) coefficients to be estimated. The subscript $i = 1, \ldots, 26$ indexes cantons and $t = 1980, \ldots, 1998$ indexes years. The interaction term between the mandatory referendum and the voter initiative is motivated by the preceding theoretical discussion.

Summary statistics for expenditure and the control variables are reported in Table 2.[14] Expenditure, income, and federal aid are expressed in 2001 Swiss francs per capita.[15] Our list of controls is fairly standard for the literature. Income and federal aid are the main sources of funds, and are positively related to expenditure in most studies. Large and dense populations may create economies of scale in spending. The age distribution of the population captures one source of variation in demand for government services. The unemployment rate is a proxy for the business cycle.

The nonstandard control is a language dummy. Switzerland has four official national languages. We include a dummy variable equal to 1 for the 19 German-speaking cantons (including Grisons, where some speak Romantsch) and 0 for the seven 'Latin' (French and

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[13] A limitation of this model is that no referendums or initiatives occur in equilibrium. Referendums and initiatives would occur in many models with asymmetric information—say, about the preferences of the voter as in Matsusaka and McCarty (2001)—without changing the policy implications.

[14] Basle City is the highest spending canton. This is partly a statistical artifact since the canton budget integrates both state and some local expenditure. We estimated all our regressions without this canton to check for robustness, and nothing of significance changes.

[15] For comparison, in December 2001 one US dollar traded for 1.6 Swiss francs. So to convert the numbers in this paper to 2001 dollars, multiply by 0.6.

Table 2
Summary statistics

Variable	Mean	S.D.	Minimum	Maximum
Expenditure per capita	7232	2870	3868	19 302
Income per capita	44 194	9826	29 843	92 858
Federal grants per capita	458	183	222	1341
Population	258 549	271 083	12 757	1 187 609
Population/km^2	27	12	13	78
Population older than 65, % of total	19	2	14	27
Population younger than 20, % of total	27	4	17	36
Unemployment rate as %	1.8	1.9	0	7.8
Fraction of parliament seats held by left-wing parties	21	13	0	51

All statistics are computed for 494 observations (26 cantons from 1980 to 1998). Financial numbers are expressed in 2001 Swiss francs.

Italian speaking) cantons to capture variations in preferences that might escape our other controls. It *is* conventional when studying Switzerland to control for language groups.

An important concern in a study like ours is the endogeneity of institutions. We would like to view the institutions as constraints, and make inferences about how they affect political outcomes. If institutions were easy to change, however, they would be policy choices rather than constraints, and it would be difficult to infer causality running from institutions to policy. A priori, it is unclear how exogenous the institutions are. Referendums are incorporated in canton constitutions, which is presumed to give them some durability. In more than half of the cantons, however, the constitutions can be changed by initiative where a simple majority rules.

To get some insight on institutional change, Table 3 summarizes the evolution of mandatory referendum provisions during our sample period and the preceding 10 years. As can be seen, cantons can and do change their institutions over time. Three cantons eliminated the mandatory referendum (Aargau, Bern, and Valais), and two adopted it in the decade before our sample (Fribourg, and Jura when it became a canton in 1977). The spending thresholds were changed even more often: 13 cantons made at least one modification, and three cantons made two modifications. Most of the threshold revisions were done to adjust the nominal numbers for inflation. In two cases, the thresholds were changed when the canton shifted from a town meeting to a parliamentary form of government.

Despite the clear evidence of change, the broad picture is one of inertia in institutions punctuated about once every 30 years by a modification, typically to keep the real value of the threshold constant. Nevertheless, there is some reason to be wary of endogeneity problems. The main concern is that an omitted variable may drive both the spending decision and the choice of institutions. In principle, this problem could bias the coefficients in either direction: for example, upwards, if anti-spending cantons are more likely to adopt the mandatory referendum, and downwards, if cantons adopt referendums in response to excessive spending. The omitted variable of most concern is voter ideology.

Table 3
Adoption and modification of mandatory budget referendum provisions, 1970–1998

Canton	Adopted	Eliminated	Threshold changed
Zurich (ZH)	1869	–	1971
Bern (BE)	1921	1995	–
Lucerne (LU)	1969	–	–
Uri (UR)	1955	–	1972, 1994
Schwyz (SZ)	1898	–	–
Obwalden (OW)	1291	–	–
Nidwalden (NW)	1291	–	1997*
Glarus (GL)	1352	–	1990
Zug (ZG)	–	–	–
Fribourg (FR)	1972	–	1986
Solothurn (SO)	1887	–	1988
Basle City (BS)	–	–	–
Basle County (BL)	–	–	–
Schaffhausen (SH)	1895	–	1980, 1989
Appenzell ER (AR)	1513	–	1996*
Appenzell IR (AI)	1513	–	–
St. Gallen (SG)	1929	–	1974
Grisons (GR)	1880	–	1973
Aargau (AG)	1885	1982	–
Thurgau (TG)	1869	–	1990
Ticino (TI)	–	–	–
Vaud (VD)	–	–	–
Valais (VS)	1921	1994	1973
Neuchatel (NE)	1949	–	1972, 1995
Geneva (GE)	–	–	–
Jura (JU)	1977	–	–

The table lists the year the mandatory budget referendum was adopted and eliminated, and the year the spending threshold was changed. Only changes during 1970–1998 are noted. Jura seceded from Bern and became its own canton in 1977. An asterisk means the change was associated with a change from a town meeting to a parliamentary system. This table is derived from raw data in Trechsel and Serduelt (1999).

We follow the literature and include a variable in the regression that should be correlated with voter ideology—the fraction of seats held in the parliament by left wing parties—to try to control for this possibility.[16] Since the cantons allocate seats using a proportional representation system, our variable should give a good indication of the strength of left wing interests. The downside of including this variable is its own endogeneity, which biases the standard errors of the other coefficients. We also try to address endogeneity with instrumental variables, again following the literature. As instruments, we use lagged values of the institutions and the inflation rate (which exogenously moves the spending thresholds). As it turns out, the results are substantially the same with or without the ideology variable and instrumental variables.

The data were collected from several sources. Expenditure and federal aid came from publications of the Federal Finance Administration. The Federal Statistical Office

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[16] The left wing parties are defined to be the Social Democratic Party, the Labor Party, and the Green Party.

provided the demographic and income numbers. The unemployment rate numbers were supplied by the State Secretariat for Economic Affairs. The partisan makeup of the parliament was collected from various issues of *Annee Politique Suisse/Schweizerische Politik* by Hirter et al. (various years). And, as noted above, the information on institutions came from Trechsel and Serduelt (1999).

5. Results

5.1. First cut

As a first cut, we estimate a regression that does not include interaction terms between the institutional variables. This specification gives the unconditional effect of the institutions, and is more transparent than the one with interactions.

Table 4 presents the results. The dependent variable is expenditure per capita and the explanatory variables are listed. Column (1) of Panel A reports the coefficient estimates, and columns (2)–(4) report standard errors of the estimates under various assumptions.

The mandatory referendum effect is captured with two variables: (1) a dummy variable equal to 1 if a canton has a mandatory referendum, and (2) the spending threshold that triggers a referendum (set to zero for cantons without mandatory referendums).[17] The coefficient on the dummy variable is negative, indicating that cantons with mandatory referendums spent less, and the coefficient on the threshold is positive, as expected if the spending reduction effect is not spurious. The two coefficients are difficult to interpret in isolation because the implied effect is a linear combination of the two coefficients and varies with the threshold:

$$\text{Effect of Mandatory Referendum} = -1408.14 + 37.58 \times \text{Threshold}.$$

Column (1) of Panel B reports the estimated effects for various thresholds. For reference, the median spending threshold in the sample is a bit more than 2.5 million SFR, the 25th percentile is about 500 000 SFR and the 75th percentile is a little less than 15 million SFR. The estimates indicate that a canton with a mandatory referendum and a 500 000 million SFR threshold spent 1389 SFR per capita less than a canton without a mandatory referendum, all else equal. A canton with the median threshold of 2.5 million SFR spent 1314 SFR per capita less than one without a mandatory referendum. This works out to an 18% reduction in spending compared to the average expenditure level of 7232 SFR per capita during the sample period. It is worth keeping in mind that the omitted cantons include those with optional referendums as well as those with no referendums at

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[17] Note that cantons with mandatory and optional referendums are included in the mandatory referendum category. One could argue that the trigger point should be specified in per capita terms since voters care about their tax share, not the overall size of projects. The main effects continue to appear under such a specification, but the estimates become noisier. We conjecture that the absolute levels might fit better because projects are somewhat indivisible—a bridge over a lake—and what matters is whether the threshold is crossed.

Table 4

Regression of expenditure on mandatory referendum, initiative, and control variables: simple specification

	Coefficient (1)	Standard Error		
		Uncorrected (2)	White (3)	Clustered (4)
Panel A. Regression coefficients and standard errors				
Dummy = 1 for mandatory referendum	− 1408.14	314.29	238.62	717.72
MR dummy × Spending threshold (millions SFR)	37.58	10.83	9.29	23.46
Initiative signature requirement (% of population)	380.56	138.01	136.74	531.24
Income	0.35	0.07	0.07	0.20
Income^2	− 2.97	0.61	0.64	1.58
Federal aid	0.11	0.71	0.83	2.07
Population, % older than 65	342.45	60.03	48.67	137.37
Population, % younger than 20	179.59	71.69	64.51	143.67
Ln(Population)	− 680.34	129.16	106.81	284.52
Population/km^2	140.32	11.84	12.62	46.69
Unemployment rate	− 132.28	103.36	110.34	158.95
Dummy = 1 for German-speaking	− 2040.09	366.62	398.55	1530.95

Panel B. Estimated effect of mandatory referendum on expenditure, by threshold

Threshold (millions SFR)	Effect	*F*-statistic for hypothesis: Effect = 0
		Clustered
0.5 (25th percentile)	− 1389	3.8
1	− 1371	3.8
2.5 (Median)	− 1314	3.7
5	− 1220	3.5
10	− 1032	2.9
15 (75th percentile)	− 845	2.1

The sample covers 26 cantons from 1980 to 1998. The dependent variable is expenditure per capita. Panel A reports regression coefficients and standard errors under three different assumptions. The regression included 19 year dummies whose coefficients are not reported. The R^2 is 0.959. Financial numbers are expressed in 2001 Swiss francs (SFR) per capita. The estimates for Income^2 are multiplied by 1 000 000. Panel B reports the estimated effect of a mandatory referendum on expenditure (compared to an otherwise identical canton without a mandatory referendum) using the coefficients in Panel A. The *F*-statistics are calculated allowing for clustering in the errors (i.e, corresponding to column (4) in Panel A).

all so the point estimate probably understates the effect of a mandatory referendum compared to having no referendum at all.

To capture the effect of the initiative, the regression includes a variable equal to the signature requirement for placing a measure on the ballot. Recall that all cantons allow initiatives, and that initiatives differ from mandatory referendums in that they allow voters to make entirely new proposals, not just reject the proposals of the legislature. The theoretical discussion above suggests that the effect of the initiative is conditional on the cost of using it. Our measure of the cost of an initiative is the signature requirement required to qualify a proposal for a referendum, expressed as a percentage of the

population. We follow the literature in normalizing the signature requirement by population rather than using the absolute number of signatures. We expect that the cost of using the initiative rises as the percentage increases, holding constant the canton's population (as our regressions do).[18] The signature requirement has been shown to influence the fiscal effect of the initiative (Matsusaka, 1995, 2000) and the number of initiatives (Matsusaka and McCarty, 2001) in the United States.

The coefficient on the initiative variable is positive—as the signature requirement rises, spending goes up. The point estimate indicates that each percentage point increase in the signature requirement is associated with 380.56 SFR per capita more spending, about 5% compared to the sample average. Thus, availability of both direct democracy institutions appears to push down spending, consistent with our simple theoretical model.

We have not said anything about statistical significance so far. This turns out to be a somewhat complicated issue in a study like ours, and the literature has not settled on a standard approach. In columns (2)–(4) of Panel A we report standard errors three different ways. In column (2) we report the uncorrected standard errors, which assume that the true errors are independent and identically distributed. The three institutional variables are statistically significant at very high confidence levels. Many researchers employ heteroskedasticity-consistent standard errors following White (1980), which relax the assumption that the error process is identically distributed. Column (3) reports the White standard errors. As can be seen, the White standard errors are fairly similar to the uncorrected standard errors, and all of the estimated coefficients remain highly significant.

The estimates in column (3) still assume the observations are independent, however. This is unlikely to be true: we expect the errors will be correlated within a canton. Intuitively, if within-canton errors are correlated, we do not have as many actual degrees of freedom as we have observations, and the standard errors will be biased down. Moulton (1986) has shown that the downward bias is especially large in regressions like ours where some of the regressors do not vary over time. Column (4) reports the standard errors taking into account within-canton clustering of errors. The procedure essentially imposes a block diagonal structure on the variance–covariance matrix; see Moulton (1986) and Rogers (1993) for details. As can be seen, the standard errors when corrected for clustering are much larger—by about a factor of 10 in our sample—than the uncorrected or White standard errors. This point is not new; Moulton (1986), for example, illustrated it very clearly 15 years ago. We provide another illustration of the bias only because so few studies in public economics correct for clustering. The importance of clustering may not be widely appreciated—indeed, we were surprised to see how large the biases were.[19]

We are really interested in the substantive results, however, and these appear to be robust. Panel B reports the *F*-statistic for the net effect allowing for clustering in the errors (the *F*-statistics are an order of magnitude larger without the clustering correction). The mandatory referendum effects are statistically significant up to a 10 million SFR spending

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[18] We also estimated all regressions using the absolute signature requirement instead. The conclusions with respect to the mandatory referendum are the same: spending is cut. But the initiative effects become unstable, varying from specification to specification.

[19] We also estimated the regression with heteroskedasticity and autocorrelation consistent standard errors *a la* Newey and West (1987) for good measure. The standard errors for the first three variables, respectively, were 483.44, 18.88, and 298.27.

threshold even with the clustering correction. The initiative effect becomes too noisy to distinguish from zero. With this as background, the next section reports a more involved and theoretically justified specification that includes interaction terms.

5.2. A more general specification

In theory, the effect of the mandatory referendum should depend on the cost of using initiatives, and conversely. We next estimate the model using a specification tied more closely to the theory, with interaction terms. Table 5 contains the regression estimates.

One thing to observe is that the signature requirement coefficient remains positive and is now significant at better than the 5% level. This coefficient indicates the effect of the signature requirement in cantons without mandatory referendums (since all the other variables are zero if mandatory referendums are not present.) The implied effect is large. This fits with theory: in cantons without mandatory referendums, the initiative is the only vehicle to address objectionable spending projects, and should be potent at the margin.

The other coefficients are difficult to interpret on their own because the full effect of a mandatory referendum now depends on four terms and both the spending threshold and the signature requirement. In particular, the implied full effect of a mandatory referendum is

$$\text{Effect of Mandatory Referendum} = 1258.64 - 43.11 \times T - 1944.48 \times S + 52.59 \times T \times S,$$

where T is the spending threshold (in millions SFR) and S is the signature requirement (as a percent).

Table 6 reports the estimated effect of the mandatory referendum for several thresholds and signature requirements. For signature requirements, we use 0.7% (the 25th percentile of the distribution), 1.4% (roughly the median), and 2.1% (the 75th percentile). The main entries indicate how spending in a canton with a given threshold and signature requirement compares to a canton with the same initiative signature requirement but without a mandatory referendum. That is, the table reports the effect of having a *mandatory referendum* available, holding constant other canton characteristics *including the initiative signature requirement*. For example, the first cell shows that a canton with a 0.5 million SFR spending threshold and a 0.7% signature requirement spent 106 SFR per capita less than an otherwise identical canton (with a 0.7% signature requirement) that did not have a mandatory referendum. We report the F-statistic for the hypothesis that the effect is zero in square brackets below.

There are several interesting patterns. First, as we saw above, the effect of a mandatory referendum is negative for the threshold/signature requirement pairs we calculate. Looking down the columns we see that the effect diminishes as the spending threshold rises (except for the first column, where the effect is roughly independent of the threshold and never significant.) This is consistent with the previous regressions and with theory.

Looking across the rows, we see that the effect of a mandatory referendum rises as the initiative signature requirement rises. That is, the mandatory referendum cuts more deeply into spending as the initiative becomes more difficult to use. This is the pattern predicted by theory. It suggests that when the cost of using an initiative is sufficiently low, there is

Table 5
Regression of expenditure on mandatory referendum, initiative, and control variables: a more general specification

	Coefficient (standard error)
Dummy = 1 for mandatory referendum (MR)	1258.64 (989.20)
MR dummy × Spending threshold (in millions SFR)	− 43.11 (47.11)
Initiative signature requirement (% of population)	2011.84 (936.83)
MR dummy × Initiative signature requirement	− 1944.48 (607.90)
MR dummy × Spending threshold × Initiative signature requirement	52.59 (24.47)
Income	0.35 (0.18)
Income^2	− 3.09 (1.48)
Federal aid	− 0.24 (1.75)
Population, % older than 65	247.36 (141.84)
Population, % younger than 20	168.28 (147.30)
Ln(Population)	− 468.33 (341.88)
Population/km^2	129.50 (43.09)
Unemployment rate	− 126.35 (147.52)
Dummy = 1 for German-speaking	− 612.48 (144.99)

The sample is 494 observations: 26 cantons from 1980 to 1998. The dependent variable is expenditure per capita. Standard errors are adjusted for clustering within cantons. The regression included 19 year dummies whose coefficients are not reported. The R^2 is 0.963. Financial numbers are expressed in 2001 Swiss francs (SFR) per capita. The estimates for Income^2 are multiplied by 1 000 000.

little need for mandatory referendums. Indeed, none of the full effects can be distinguished from zero at conventional confidence levels when the signature requirement is at the 25th percentile. When signature requirements are at the median or higher, the mandatory referendum has a huge effect on spending, and the estimated effects are statistically significant for all thresholds in the table. To put the estimates in perspective, the 2791 SFR spending reduction from a mandatory referendum with a 0.5 million SFR threshold and a signature requirement of 2.1% works out to a 39% reduction compared to the mean. For a canton with the median threshold and signature requirement, the estimates imply a 19% reduction in spending compared to the mean. It is interesting that even a mandatory referendum with a 15 million SFR threshold cuts spending when initiative signature requirements are at the median or higher.

Table 6
Effect of mandatory referendum and initiative on canton expenditure conditional on spending threshold and signature requirement

Threshold (millions SFR)	Initiative signature requirement, % of population			d(Expenditure)
	0.7 (25th %)	1.4 (Median)	2.1 (75th %)	d(Signature req.)
0.5 (25th %)	− 106	− 1448	− 2791	94
	[0.0]	[3.7]	[8.5]	[0.0]
1	− 109	− 1433	− 2757	120
	[0.0]	[3.7]	[8.4]	[0.0]
2.5 (Median)	− 118	− 1387	− 2656	199
	[0.0]	[3.7]	[7.9]	[0.1]
5	− 134	− 1311	− 2488	330
	[0.0]	[3.8]	[7.1]	[0.4]
10	− 165	− 1158	− 2152	593
	[0.1]	[3.7]	[5.5]	[1.4]
15 (75th %)	− 197	− 1006	− 1815	856
	[0.2]	[3.5]	[10.1]	[3.1]
d(Expenditure)	− 6	31	67	
d(Threshold)	[0.0]	[1.9]	[8.8]	

This table reports the effect on canton expenditure of a mandatory referendum with the indicated spending threshold compared to an otherwise identical canton, given an initiative signature requirement. Estimates are based on the regression in Table 5: $E_{it} = a \cdot M_{it} + b \cdot M_{it} \cdot T_{it} + c \cdot I_{it} + d \cdot M_{it} \cdot I_{it} + e \cdot M_{it} \cdot T_{it} \cdot I_{it} + f \cdot X_{it} + u_{it}$, where E is expenditure per capita, M is a mandatory referendum dummy, T is the spending threshold, I is the initiative signature requirement, X is all other control variables, a, b, c, d, e, f are estimated coefficients, and u is the error term. The main entries are $a + bT + dI + eTI$. Expenditure is expressed in 2001 Swiss francs (SFR) per capita. The last row reports the marginal effect on expenditure associated with a 1 million SFR increase in the threshold ($b + eI$). The last column reports the marginal effect associated with a 1% increase in signature requirements ($c + d + eT$). In square brackets is the F-statistic for the hypothesis that the effect is equal to zero (adjusted for clustering of errors within cantons).

The last column of Table 6 reports the marginal effect of an increase in the signature requirement for a given spending threshold. We see that when spending thresholds are small, changes in signature requirements have little effect on spending. When spending thresholds are high, a reduction in signature requirements leads to quantitatively and statistically large reductions in spending. The effect achieves statistical significance in the table when the threshold is 15 million SFR. This is just another way of documenting that mandatory referendums and initiatives are substitutes to some extent. Similarly, the bottom row shows that the marginal effect of a change in the spending threshold is greatest when the initiative is costly to use.

5.3. Institutional endogeneity

We have two main results: (1) mandatory referendums are associated with lower spending, and (2) mandatory referendums and initiatives appear to be substitute methods to restrain government spending. Table 7 summarizes the evidence from two regressions we estimated to address the issue of institutional endogeneity. Except where noted, each

Table 7
Effect of mandatory referendum on spending in regressions that account for institutional endogeneity

	Specification	Effect (Threshold = 2.5 million SFR)		n
		Signatures = 1.4%	Signatures = 2.1%	
(1)	Added control variable:	− 1395	− 2662	494
	seats held by left-wing parties	[3.9]	[8.4]	
(2)	Instrumental variables	− 1444	− 2917	494
		[2.9]	[7.1]	

Each row reports estimates derived from a regression $E_{it} = a \cdot M_{it} + b \cdot M_{it} \cdot T_{it} + c \cdot I_{it} + d \cdot M_{it}it + e \cdot M_{it} \cdot T_{it} \cdot I_{it} + f \cdot X_{it} + u_{it}$, where E is expenditure per capita, M is a mandatory referendum dummy, T is the spending threshold, I is the initiative signature requirement, X is all other control variables (as in Table 3 or 5), a, b, c, d, e, f are estimated coefficients, and u is the error term. The regression coefficients themselves are not reported. The main entries indicate the effect of a mandatory referendum on spending (in 2001 Swiss francs per capita) compared to a canton without a mandatory referendum (that is, $a + bT + dI + eTI$) for a 2.5 million SFR threshold and 1.4 and 2.1% signature requirement. For example, the first entry indicates that a canton with a mandatory referendum and a 1.4% initiative signature requirement spent 1395 SFR per capita less than an otherwise identical canton without the mandatory referendum. F-statistics for the hypothesis that the effect is zero are in square brackets; they are adjusted for clustering of errors within cantons. 'Signatures' is the signature requirement to put an initiative on the ballot, expressed as a percentage of the population. The sample includes all 26 cantons from 1980 to 1998.

regression has the same specification as the one in Table 5. For each regression, we report the implied effect of a mandatory referendum with a 2.5 million SFR threshold for two initiative signature requirements. The estimate for the 1.4% signature requirement represents the median institutional arrangement. The estimate for the 2.1% signature requirement comes closer to giving the full effect of the mandatory referendum since at such a high signature requirement the initiative becomes a less viable alternative.

We first attempt to address the endogeneity problem by adding a variable to the regression equal to the share of seats in parliament held by left-wing parties. The hope is that this will capture omitted voter ideology with regard to spending. The party coefficient itself turns out to be statistically insignificant. The mandatory referendum effects are reported in row (1). Neither effect is much different from Table 6.

We also tried to address endogeneity with instrumental variables. Our instruments for the four mandatory referendum variables are the same variables 10 years earlier, and the consumer price index. We have in mind that today's institutions are affected by two factors that are unlikely to be correlated with the current error term. The first is institutions 10 years ago, because institutions only change periodically (see Table 3). The second is inflation— increases in the price level cause the real value of the spending threshold to decline. The estimated effects of the mandatory referendum that arise are in row (2). With instrumental variables, the mandatory referendum appears to cut government spending even more, reaching 2917 SFR per capita when the initiative signature requirement is 2.1%.

The anti-spending effect of the initiative also survived both endogeneity corrections. A larger signature requirement was associated with more spending in both regressions, for cantons with and without a mandatory referendum, and the effect was statistically significant.

We also estimated but do not report a series of regressions to assess the robustness of the results. First, we estimated the main regression after deleting the town meeting cantons. These cantons may be fundamentally different because they lack parliaments. The mandatory referendum effects shrunk but were still significant. Second, we estimated the regressions separately for German-speaking and non-German-speaking cantons. The language dummy is large and somewhat ad hoc, so we wanted to be sure it was not concealing something important. The anti-spending effects continued to appear in both subsamples, and were statistically significant for a 2.1% signature requirement. Third, we estimated the regressions separately for the 1980s and 1990s. Matsusaka (2002) shows that institutional effects can vary quite a bit over time. In this case, however, the effects were quite similar in both periods.

6. Discussion and conclusion

This paper presents evidence that government spending is lower in Swiss cantons with mandatory referendums. And the effect of these referendums on spending is larger as the spending thresholds fall and as initiatives become more costly for voters to use. The magnitudes are remarkably large, implying 19% lower spending for a mandatory referendum with the median spending threshold and initiative signature requirement.[20] To the best of our knowledge, this is the first systematic study of what happens to spending when voters are given the right to reject individual projects.

It seems clear that these decisionmaking institutions have teeth—legislatures cannot simply evade them, say, by splitting big projects into smaller projects that fall below spending thresholds. In this respect, mandatory referendums appear to be different from tax and expenditure limitations that are popular in US, but for which there is inconclusive evidence that they control spending.[21] One should be careful about generalizing from the case of Switzerland, but our evidence suggests that other jurisdictions seeking to control spending may wish to consider mandatory referendums.

The evidence is also broadly consistent with the findings of a series of studies on the initiative process in the United States (Matsusaka, 1995, 2002; Matsusaka and McCarty, 2001). These studies document that states with the initiative process available spent less in the postwar period than states without the initiative process. A uniform pattern seems to be emerging: government spending is lower when voters participate directly in policy decisions.

On a more theoretical level, our findings appear to be inconsistent with the median voter model. In a pure median voter world, representatives implement the preferred spending levels of the median voter, and a mandatory referendum or voter initiative would have no effect. The fact that spending levels in cantons with mandatory referendums can be so different from cantons without mandatory referendums, suggests that legislatures (in

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[20] And it should be kept in mind, that this is probably an understatement of the full effect.

[21] Again, this difference may be more apparent than real. Some scholars argue that the most recent studies on TELs have found consistent effects. See McGuire (1999), for example.

this country and time period) tend to spend much more than the median voter wants. In this respect, our results reinforce Peltzman's (1992) finding that (US) voters tend to be more fiscally conservative than their representatives.

The open question is why do some legislatures tend to spend more than voters want? Here we offer a few conjectures that should be taken as speculative and primarily food for thought for future research. One benign view is that legislatures are able to logroll multidimensional projects that would be rejected individually, and thereby maximize gains from trade. Such logrolls cannot be supported in project-by-project referendum elections. In this view, referendums work against the voters' interests, and result in spending levels that are inefficiently low.

There are several reasons to doubt this explanation. First, there is some evidence that Swiss cantons with direct democracy use their government monies more efficiently. Pommerehne (1983) shows that trash collection is conducted more efficiently and at a lower cost in cantons with direct democracy. Less direct evidence comes from Feld and Savioz (1997). They estimate a neoclassical production function for Swiss cantons, and document greater production for a given amount of inputs in cantons with more direct democracy. While the source of the efficiency is unclear, one possibility is better roads, schools, etc. Less traditional evidence appears in Frey and Stutzer (2000). They make use of survey data on self-reported 'happiness' and document that citizens are happier (in the a specific sense) in cantons with more direct democracy, after controlling for other determinants of happiness. None of this is conclusive, but it gives little reason to be enthusiastic about the view that mandatory referendums are cutting spending that voters really want.

A more plausible way to view the evidence, it seems to us, is in terms of a theory in which government officials tend to spend more than the electorate wants, and that spending is wasteful at the margin. This could happen because of budget-maximizing bureaucracies (Niskanen, 1971) or logrolls that treat the tax base as a common pool (Tullock, 1959), to name just two of the more popular theories. We should be a bit circumspect about adopting this view since it begs the question why some cantons do not have mandatory referendums, but it seems like a reasonable starting point for further inquiry.[22]

Acknowledgements

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[22] We suspect that in order to explain the distribution of mandatory referendums, we will ultimately need a theory that has both benefits and costs. The literature is remarkably short of theories in which institutions have both benefits and costs, however. Matsusaka and McCarty's (2001) study of the voter initiative is a step in this direction.

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