

## **Powerful, independent and competing political bodies: Evidence from a broad Swiss dataset**

MARK SCHELKER\* and REINER EICHENBERGER  
University of Fribourg, Switzerland

February 2006

Very preliminary version! Comments are welcome

Newer versions can be obtained from [mark.schelker@unifr.ch](mailto:mark.schelker@unifr.ch)

JEL-Code: D70, H10

Keywords: political economy, political control institution, institutional competition, audit court

---

\* Mark Schelker is a Ph.D. candidate in Economics at the University of Fribourg, Switzerland. Reiner Eichenberger is the director of the Center for Public Finance at the same University and member of CREMA (Center of Research in Economics, Management, and the Arts).  
Address: Center for Public Finance, University of Fribourg, Blvd. de Perolles 90, CH-1700 Fribourg, Switzerland, Phone: 026 300 82 62/65/66, Email: [Mark.Schelker@unifr.ch](mailto:Mark.Schelker@unifr.ch), [Reiner.Eichenberger@unifr.ch](mailto:Reiner.Eichenberger@unifr.ch)

## **ABSTRACT**

Controlling government is a primary focus of the politico-economic literature. Recently, various political institutions have been analyzed from this perspective, most importantly balanced budget rules, fiscal federalism, and direct democracy. However, one type of institution has been neglected so far: elected competitors to the government. Such institutional competition between the government and an independent unit can be found at the Swiss local level, where audit units compete with the government. In some parts of Switzerland, local auditors (finance commissions) can ex ante criticize government projects and bring alternative policy proposals onto the political agenda, which are then voted on by the citizens. Thus, they become strong competitors to the government. We econometrically investigate this institutional setting by comparing the 26 Swiss cantons with two different datasets. We find the power of the local auditors to have an economically relevant, statistically significant and robust negative effect on the tax burden and on public expenditures.

## 1. INTRODUCTION

High taxes are a heavy burden on citizens, but the resulting revenues make governing more comfortable. Thus, there is an inborn conflict between citizens and government over taxes and the allocation of public funds. Political economists keep searching for more effective institutional designs that prevent politicians from overextending taxation and public expenditures. One strain of the literature has investigated how different decision making processes empower citizens. These analyses have focused on representative-democracy (e.g. Persson and Tabellini 2000, Mueller 2003, Besley and Case 2003), direct democracy (e.g. Matsusaka 1995, Feld and Kirchgässner 2001, Feld and Matsusaka 2003), as well as fiscal decentralization in the form of federalism (e.g. Oates 1999, Feld, Kirchgässner and Schaltegger 2003). Another part of the literature has concentrated on constitutional rules to directly constrain public spending, most importantly on balanced budget rules and the position of the Minister of Finance in the budget process (e.g. von Hagen 1991/2002, Alesina and Perotti 1996, Bohn and Inman 1996, Poterba 1996, Schaltegger 2002).

In this paper, we analyze a so far neglected option: institutionalized competition among elected bodies, i.e. consciously designed, formalized, and permanent competition between government and an independently elected political unit. Both of these bodies can make policy proposals that are then evaluated by the citizens. This type of political competition is similar to market competition where the products of different companies are in permanent competition. We presume that such institutionalized competition generates more policy alternatives, induces politicians to cater to the preferences of the citizens, reduces information asymmetries, and fosters a more efficient allocation of resources.

Although such a model might look utopian at first sight, it has existed for a long time in Switzerland. There, at the local level, institutionalized competition between government and independent audit units is a matter of fact. Many of these audit units have encompassing ex ante control and amendment rights, which make them powerful competitors to the government. We econometrically investigate whether such institutional competition results in a lower tax burden and less government expenditures. We exploit two different datasets, one at the local level containing tax data, and the other at the cantonal level containing aggregated cantonal and local tax and expenditure data for the 26 Swiss cantons (a canton is similar to a state in the U.S.). We use a whole range of different empirical models and estimate the influence of different political

institutions such as direct democracy, decentralization as well as independent and competing units (auditors) on the cantonal tax burden and government spending. Based on these findings, we offer a brief outlook for future research and applications.

Section two discusses the theoretical foundations of institutionalized competition in a direct democratic environment. The following third section presents the data and in section four we present empirical evidence that supports our theoretical hypothesis. The paper concludes with a brief summary and some future research questions in section five.

## **2. INSTITUTIONAL COMPETITION AND THE CASE OF SWITZERLAND**

To our knowledge, institutionalized competition between the government and an independent political unit has not yet been analyzed. Of course, various independent institutions have been discussed, most prominently the independence of central banks (e.g. Alesina and Summers 1993, Berger, de Haan and Eijffinger 2001) as well as supreme courts (e.g. La Porta, Lopez-de-Silanes, Pop-Eleches and Shleifer 2004, Feld and Voigt 2003). However, in these cases the focus has not been on *competition* between institutions, but on the separation of competences. Furthermore, different forms of competition in political markets have long been discussed. For instance, Breton and Wintrobe (1975) demonstrated in their response to Niskanen (1967, 1971) that even in a bureaucracy competition emerges when resources are scarce. In the “checks and balances” approach competition is a consequence of (often intentionally created) conflicts of interest between institutions (Persson, Roland and Tabellini 1997). The struggle between the conflicting interests, however, is resolved by consensus between the affected bodies themselves. Another example is committees with overlapping jurisdictions. As in the checks and balances approach, the committees mostly resolve their conflicting interests by cooperation (King 1997). But obviously, resolution of conflict through cooperation contrasts with our model of competition in which citizens decide between the competing alternatives in a popular vote. Hence, we strictly follow the market analogy, where consumers decide between different consumption alternatives.

In the following analysis of institutional competition, we focus on the very simple setting of a direct democracy in the form of a town meeting – meaning, the absence of a parliament and its committees. In this simple setting the citizens elect the government as well as a competitor to the government. In a town meeting the government presents its policy proposals for the

following period, while the competitor may analyze the government proposals and be permitted to present its counterproposal. The citizens choose in a majority vote between the status quo and the two competing proposals and delegate the policy implementation to the government. The competitor has no *direct* influence on the political outcome, because he has neither voting rights nor the power to introduce his own proposals. After the government has fulfilled its assignment, the competitor can evaluate whether the government executed the task according to the law. As the two bodies compete for the approval of their proposal, we anticipate the proposals to better reflect median voter preferences. Thus, fruitful competition can result in policy outcomes closer to the median preferences.

Such intense institutionalized competition can be observed at the Swiss local level in municipalities with town meetings. In Switzerland more than 50 percent of the total population lives in such municipalities. Citizens elect the government as well as an independent auditor (finance commission), which can take the role of the competing political unit. The cantonal legislation on municipalities defines the basic institutional design of these finance commissions, but still leaves the municipalities some autonomy in the de facto design. However, while the intra-cantonal differences are very small, the inter-cantonal variations are important. In some cantons the finance commission can only audit the accounts or, similar to an audit court, criticize the government at the end of a fiscal year (ex post). However, in other cantons finance commissions have encompassing ex ante audit competences as well as proposal and amendment rights. In addition to the standard ex post audit of the accounts, they can ex ante evaluate the budget proposal, individual investment projects, as well as the tax rate. Moreover, they are allowed to advance concrete proposals, which are then voted on by the citizens. Thus, they become strong competitors to the government. Depending on cantonal legislation, finance commissions act as simple auditors, audit courts, institutional opposition, or even as a type of ‘parallel’ government.

From a theoretical point of view, institutionalized competition has five main implications.

*a. The competitor informs citizens of financial and fiscal policy issues.* This decreases information asymmetries as well as principal-agent problems between citizens, government, and the administration, which makes political decisions to better match the preferences of the citizens (see Eichenberger and Serna 1996). The benefits are the greatest, when the additional information offered by the competitor is provided ex ante to the decision process.

*b. The competitor breaks the agenda setting monopoly of the government.* Usually, the government or committees decide on the political agenda. Thus, they significantly affect the political results (see e.g. Weingast and Marshall 1988 or Shepsle and Weingast 1994). As soon as the competitor has encompassing proposal and amendment rights, the agenda setting monopoly of the government is broken, which diminishes the asymmetric influence of the government.

*c. The proposals of the competitor and the government compete to win a majority of the votes.* Citizens can express their preferences on the proposals of the government and the competitor directly via majority vote. Such direct competition is not only an effective incentive mechanism, but also a perfect feedback mechanism. It makes it easier for all market participants to evaluate success. Simultaneously, the visibility of the preferences of the general public to politicians improves. Both mechanisms tend to reinforce the intrinsic motivation of politicians to pursue the public interest (if there is such a motivation, see Frey 1997).

*d. The competitor has incentives to break up political cartels.* The government and the opposition parties have the same incentives when it comes to political rents. A pertinent example is general tax cuts. Governments have no incentives to curb taxes; they would rather divert the revenues to their supporters. Unfortunately, political competition does not help, as the opposition parties cannot credibly commit to tax cuts, because cutting taxes will go against their interests, as soon as they are in power themselves. The competitor, however, is far more independent and does not have the same opportunity to extract rents from the political process. Firstly, the competitor has no direct influence on the political results as he has no executive powers. Therefore, he cannot directly benefit from political rents generated by, e.g., high taxes. Secondly, we observe in the Swiss case that on average the members of the competing institution emanate from another “selection” of politicians. Compared to a mandate in an executive position, the competitor mandate is less time consuming, and professional auditing know how can be transferred from the private sector to political office quite easily. Furthermore, members of the competing institution are less likely than government or parliament members to be career politicians and are far more often politicians only for a short period. Thus, they are less integrated within political networks and usually do not belong to the “classe politique”.

*e. Members of the competing institution have incentives to pursue constructive policies.* At first glance, opposition parties may appear to play a role similar to the one of competitors’. However, they have strong incentives to pursue obstructive rather than constructive strategies for two

reasons: First, political outcomes are attributed to the government rather than to the opposition parties. Second, opposition parties that choose constructive strategies run the risk that voters like their influence and thus do not elect them into government but rather want to keep them in this fruitful opposition role. Thus, taking a constructive position may worsen the electoral prospects of an opposition party. In contrast, members of the competing unit do not compete to be elected into government. They can only boost their chances to be reelected as competitors by pursuing constructive strategies and trying to improve political outcomes.

These five aspects induce the competitor to propose policy alternatives that are closer to median preferences. This, in turn, exerts competitive pressure on the government and thus, increases its incentives to cater to the citizens' demands. Of course, the beneficial effects are not dependent on auditors always becoming active to the full possible extent. As the contestable market hypothesis suggests, the incentives of the government are already affected by the potential activity of the auditors. As a consequence, the government is less willing to pursue policies that asymmetrically favor special interest groups. Therefore, we hypothesize that the allocation efficiency increases with the power of the competitor, i.e. when the competitor exhibits encompassing ex ante audit and proposal rights. We expect this to result in better fiscal performance as measured by lower government spending, deficits, public debt, tax levels etc.

### **3. SWISS DATA**

Switzerland is a federal state and has – similar to the U.S. – a much decentralized political structure. The 26 cantons (similar to U.S. states) as well as most local municipalities enjoy a high degree of autonomy and make a wide range of political decisions independently. Therefore, the institutional design differs strongly across the 26 cantons. The cantons as well as the municipalities raise their own taxes to finance cantonal and local expenditures. These characteristics make the Swiss case particularly interesting for empirical research (for details see, e.g., Feld and Matsusaka 2003, Feld and Kirchgässner 2001).

#### **3.1. The auditors' variable**

At the local level, institutionalized competition between government and an elected competitor develops in communities with town meetings, because only in this institutional setting is the auditor (finance commission) really independent. In parliamentary systems the auditor is an

ordinary committee (Weingast and Marshall 1988), with the exception of two larger Swiss cities, i.e. Olten as well as the financially most successful city of Switzerland, Zug. As this aspect has not yet been analyzed, no measure of institutional competition exists. To measure institutional competition we construct an index that captures the institutional design of the auditors in the 26 cantons. The intra-cantonal design is relatively homogenous, whereas the inter-cantonal variation is striking. In order to identify the *de facto* design, we first analyzed the (de jure) cantonal legislation on municipalities; then we investigated whether the communities made de facto use of the opportunities offered by cantonal law (see Schelker 2002, Schelker and Eichenberger 2003). In line with ordinary supreme auditing institutions such as the US General Accounting Office, the European Court of Auditors, or the German “Rechnungshöfe”,<sup>1</sup> all local auditors carry out a standard audit of the accounts, may perform an ex post evaluation of economic efficiency, and submit an auditor’s report. The auditors have no authority to enforce changes or to introduce sanctions. However, in contrast to ordinary audit courts, in many cantons the local auditor has, in addition to the ex post auditing rights, encompassing ex ante control competences. They may audit and evaluate the proposed budget, individual investment projects as well as the tax rate ex ante. Furthermore, they may have extensive rights to propose amendments to government projects. To summarize, auditors may have one or more of the following competences:

1. Audit competences

- Ex post audit of the accounts
- Ex post audit of individual government projects
- Ex ante audit and evaluation of the government’s budget proposal
- Ex ante audit and evaluation of individual government projects

2. Amendment recommendations (to the citizens)

- Right to issue opinions and recommendations on government propositions (acceptance/rejection)
- Right to advance alternative propositions

3. Independence

- Independently elected by the citizens (not appointed by government)

---

<sup>1</sup> For an economic analysis of supreme audit institutions, see e.g. Frey and Serna (1990), Frey (1994), Streim (1994), and Forte and Eusepi (1994).

The audit competences define the item to be audited and at what moment the audit takes place (before or after execution). The “Ex post audit of the accounts” is the classical audit procedure, where the audit unit examines the reliability of the accounts and their compliance with general accounting standards. Under “Ex post audit of individual projects” the commission audits individual projects by evaluating the effectiveness of its implementation and identifying any misuse of public funds. Under “Ex ante audit and evaluation of budget proposal”, the commission evaluates the budget proposal’s compliance with accounting standards. Under “Ex ante audit and evaluation of individual projects”, the commission evaluates the efficiency of individual investment projects before they are adopted and implemented. In order to effectively bring information into the political process, auditors need to have recommendation and amendment rights. We code each aspect with 1 (available) or 0 (not available) and aggregate them to form the auditors’ index. We exclude “Ex post audit of the accounts” and “Recommendation with respect to the government proposition (acceptance/rejection)” from our index because the auditors of all communities exhibit these aspects (for details see Schelker and Eichenberger 2003). Because only municipalities with town meeting feature such competing auditors, we multiply the auditors’ index by the prevalence of town meetings in each canton. Thus, our measure of institutional competition is the product of the auditors’ index and a variable measuring the fraction of people per canton living in a municipality with town meeting (for details see Appendix B).

Note that a lack of recommendation and amendment rights does not necessarily eliminate competition between the government and the auditor. All cantons require an auditor’s report in which interested citizens can obtain information about the auditor’s point of view. Therefore, relevant information may enter the political process even though recommendation and amendment rights are missing. But in this case the information and transaction costs must be borne by individual citizens. Thus, in a community where the auditor has no recommendation and amendment rights, transaction costs are higher and information asymmetries more important than in communities where the auditor enjoys encompassing recommendation and amendment rights. A related argument can be made with respect to audit competences. Even with limited audit rights, important information may be generated. But again, transaction costs for individual citizens are significantly higher. Hence, in communities with weak auditors, competition between government and the auditor will be less intensive and the benefits to the citizens’ inferior. Thus, the auditors’ indicator is interpreted as a measure of intensity of competition.

### 3.2. The two datasets

As a consequence of the extensive decentralization of Switzerland, cantons are responsible for the collection of most of the data we are interested in. Unfortunately, not all cantons use the same criteria, rules and definitions when assembling the data. Therefore, comparable data is frequently only available at the cantonal level. At the municipal level, financial data such as public expenditures, debts, mean and median household income, etc. is often not available at all and if there is some data, they are frequently not comparable across cantons. There is, for instance, no standardized dataset on the fiscal performance of municipalities. Data on local public debts is only available for the biggest cities (which are not relevant for our analysis), but not for most other municipalities. Data concerning public spending are mostly not comparable between the municipalities of different cantons. At the municipal level, the only systematic data available captures the aggregated cantonal and local tax rates of natural persons for the 730 largest municipalities. To test our hypotheses concerning other financial indicators the analysis has to focus on aggregated data at the cantonal level, where data on taxation, public expenditures, revenues and deficits are available. Thus, we assemble two sorts of datasets, one at the local level containing data for the 730 largest municipalities, and the other at the cantonal level including data on taxation, expenditures and deficits. It is important to note, that empirical research analyzing Swiss data must take the varying extent of decentralization across cantons into account. Not all cantons grant their municipalities the same financial autonomy, and duties and responsibilities between the canton and its municipalities are not similar in all cantons and therefore, e.g. low municipal spending might just reflect heavily restricted competences and not particularly efficient governance. Thus, there is a substitution effect among community and cantonal spending and, thus, also taxation (see Eichenberger 1994, Schaltegger 2001).

#### a) Municipal dataset

At the municipal level we are constrained to data on taxation. Therefore, our empirical analysis focuses on data for the aggregated cantonal and local income tax rate of a natural person, for which there is a dataset from the Swiss Federal Tax Administration. This dataset provides data on the tax rates for the 730 largest Swiss municipalities (out of a total of 2880 municipalities), but is only available for the period between 1999 and 2004. Because we also face some data limitations for various control variables, and as we do not observe any significant variation in the design of the audit institution in this period, we do not establish a proper data panel, but conduct a cross-section analysis for the years 1999. For this specific year most relevant data is

available. For some measures however, we have to use data origination from the year 2000. This should not be a big concern because usually socio-demographic variables do not change much during such a short period of time.

*i) Dependent variable: Tax rates*

The tax rate includes the taxes of the canton, the municipality, and the local official church communities (which have the power to tax) on a natural person's annual income. The dataset contains 16 income brackets between CHF 20'000 and 1'000'000 and 3 household types: "single, employed wage earner", "married, sole wage earner" and "married, sole wage earner with 2 children". We calculate the average tax rates across all income brackets between CHF 40'000 and 200'000 annual income and across the three household types. Estimations with the complete dataset controlling for the different income and household classes produce largely the same results.

*ii) Explanatory variables*

As we already presented we constructed an index capturing important aspects of the institutional design of local audit institutions. The variable features considerable variation across cantons, but the inner-cantonal design is homogenous. This variable enters the data set as the *auditors' index*, which varies between 0 and 4.

Other institutional features such as the extent of local and cantonal direct democratic rights or the degree of decentralization are important in the Swiss case (section 5). Therefore, we include different indicators for direct democratic instruments and federalism in our model. Direct democracy at the local level is captured with a dummy variable for town meeting (1) or parliamentary democracy (0). To specify the magnitude of direct democracy at the cantonal level we use the standard indicator proposed by Frey and Stutzer (2000, 2001), which includes all relevant aspects of the extent of direct democratic instruments available to the citizens.<sup>2</sup> As a robustness test we also use a sub-index focusing only on the availability of a financial referendum, and we use another indicator proposed by Pommerehne and Weck-Hannemann (1996) which measures whether the population can decide on the tax rate and the budget.

---

<sup>2</sup> Christoph Schaltegger, University of St. Gallen and Swiss Federal Tax Administration, provided the index for various other years.

To describe the degree of fiscal decentralization in a specific canton we introduce an index proposed by Ladner (1994), which captures the extent of local autonomy for each canton as reported by the local chief administrators in a systematic survey. The local chief administrators of 1856 municipalities were asked to describe the perceived extent of local autonomy on a scale between 1 and 10. A score of 1 indicates ‘no autonomy at all’ and 10 ‘very high’ local autonomy. This index is widely used to measure local autonomy and to proxy fiscal decentralization in Switzerland (e.g. Frey and Stutzer 2000, 2001, Torgler 2004). The advantage of such a measure is that it captures the de facto institutional constraints of a municipality. It reflects the federal structure of a canton; that is the division of competences between the canton and its municipalities (Frey and Stutzer 2000). This index can directly be interpreted as a measure of decentralization. Other measures like the ratio of municipal expenditures to total cantonal and local expenditures tend to be endogenous to the institutional framework and many other factors. However, as this ratio is one of the standard approaches for cross-country research and is as well used in Switzerland (e.g. Schaltegger 2001 and Feld, Kirchgässner and Schaltegger 2003), we include it as an alternative measure.

To control for specific community-characteristics, which impact on public expenditures and taxes, we include a broad set of control variables such as the average municipal income, the population size, its demographic structure, the unemployment rate, the fraction of foreign population, topographic factors such as the surface of the municipality (ha), its edificial, industrial, agricultural, and mountainous fraction, political preferences as measured by party support in federal elections, level of education, and a dummy for language affiliation (German 1, else 0), etc. (for a complete list including source and descriptive statistics see Appendix A). In contrast to the cantonal level we do not have a direct measure for fiscal preferences. Therefore, the cultural background reflected by the language affiliation serves also as a proxy measure for fiscal preferences. Pujol and Weber (2001), and Funk and Gathmann (2005) show that there is a systematic relation between cultural affiliation and fiscal preferences

To control for effects due to some specific income distribution (e.g. Meltzer and Richard 1981, 1983) it would be nice to have data on the mean and median income or gini-coefficients (pre- and after-tax). This data is however, only available for the fiscal year 1995/1996 (Ecoplan 2004). Even though the time periods do not perfectly match, we will use the data as a further robustness check at the end of the empirical section.

Of course, it would also be interesting to control for other political variables, such as the composition of the government and government fractionalization, which have been found to be relevant in explaining fiscal policy in cross-country as well as in US cross-state regressions. However, for the Swiss local level, data on the composition of the governments is neither available nor would it be very informative. As most members of Swiss local governments are elected on a personal basis in majority votes, all governments are fractionalized to a large extent. Moreover, many members of local governments are not members of a political party. Furthermore, it is difficult to compare political parties across cantons as even the cantonal sections of parties with nationwide activities largely differ between cantons, as is, e.g., evidenced in the fact that they often advance opposing recommendations for nationwide referenda. Therefore, we do not include measures for the political position as well as the composition of the government into our estimates. However, we include party support in national elections per municipality for the main national parties

For more details concerning this dataset see the data description in Appendix A, Table A1.

#### b) Cantonal dataset

As the cantonal data are available for several years, we assemble a dataset for the period between 1990 and 2000. Unfortunately we were not able up to present to get reliable information about the *de facto* design of local audit institutions further back in time.

##### *i) Dependent variable: Tax rates*

Reliable data exists for the aggregate of the local and cantonal tax burden as well as public expenditures, revenues and deficits for each canton. The aggregated tax burden is an index constructed by the Swiss Federal Statistical Office and includes the taxes of the canton, the community, and the local official church communities (which have the power to tax) on natural and legal person's annual income. We will mainly focus on data concerning natural persons, but use the tax data about legal entities to analyze Hypothesis 2. The data on aggregated local and cantonal public expenditures and revenues per capita include the cantonal government expenditures (revenues) and the aggregated government expenditures (revenues) from all municipalities in the same canton over a budget period and are provided by the Swiss Federal Tax Administration. Unfortunately, these data also include federal grants, which are used to finance federal infrastructure projects. These vertical transfers show up in cantonal expenditures even though they are financed by the federal government. In this respect the canton of Uri is an

outlier. Therefore, we have to eliminate the observations from the canton of Uri, because a large share of that budget consists of huge federal infrastructure projects that are fully funded by the federal government. The data on public deficits are just the yearly difference between revenues and expenditures. In the case of the expenditure data we dispose of additional information. We can distinguish between several expenditure categories such as expenditures used for general administration, security, education, culture, health care, social security, traffic, environment, economic policy, financial and tax administration.

## *ii) Explanatory variables*

We already discussed institutional variables for the dataset at the municipal level. These variables basically remain. However, the measure for local direct democracy cannot be the same as in the municipal dataset, where we use a dummy variable indicating whether a municipality features a town meeting or not. In this dataset at the cantonal level we use the fraction of the cantonal population living in a municipality featuring a town meeting as a measure for local direct democracy. Furthermore, our auditors' measure must also be adapted. Because powerful independent auditors only exist in municipalities with town meeting, we weight the auditors' index with the prevalence of town meetings in each canton. Thus, our measure of auditors' influence is the product of the auditors' index and the direct democracy variable that measures the fraction of the population per canton living in municipalities with town meeting.

Just as for the other dataset we include a similar set of controls at the cantonal level. However, we have some additional variables reflecting some aspects of public goods provision. The dataset contains data about primary and secondary school enrollment, class size, traffic infrastructure, medical doctors per capita, pharmacies per capita, conviction rate, prison sentences per capita and fines per capita etc. We include these variables to check the robustness of our basic results if some proxies for the availability and the level of public goods provision are included. Of course, these measures are far from being perfect proxies. However, we could not come up with better proxies because e.g. school performance measures etc. are not systematically available in Switzerland.

Furthermore, we include a measure of fiscal preferences. Fiscal preferences might be important when analyzing fiscal institutions. They could be the driving force in establishing institutions and simultaneously also directly shaping the policy outcome. Not including such a measure could result in serious endogeneity problems, where the effect of institutions could not be separated from fiscal preferences. Up to now there were no reliable measures approximating

fiscal preferences. Recently, Funk and Gathmann (2005) came up with a measure for fiscal preferences by analyzing initiatives and referenda at the national level. Using factor analysis and a broad set of direct democratic policy decisions they identify three factors that reflect different fiscal preference dimensions. Funk and Gathmann (2005) show that the influence of direct democracy is substantially reduced, if fiscal preferences are taken into account.

According to the recent literature, we expect direct democratic instruments and federalism to have a negative influence on taxes, public expenditures and deficits. For the income variables we anticipate a negative (positive) impact on taxes (expenditures). For population size we have no clear-cut expectations, as there are arguments in favor of both economies as well as diseconomies of scale. The unemployment rate can be expected to exhibit a positive impact on the tax rate as well as public expenditures since unemployment leads to higher local welfare costs. Increasing community surface, more difficult topographic conditions such as an increasing mountainous fraction or a higher value of the topography index imply higher infrastructural costs and thus, increasing public expenditures and tax burden. Furthermore, we expect the edificial and the industrial fraction to have a negative and the agricultural fraction to have a positive influence on expenditures and taxes. With respect to the demographic structure, we anticipate the working population to have a negative, and the non-working population to have a positive impact on our dependent variables. We have no specific expectations for the variable measuring the fraction of the foreign communal population or the language variable reflecting cultural background; however, as it is common for non-economists to argue that cultural background drives politics we control for this influence (for an overview of the characteristics of additional variables see Appendix A, Table A2).

#### **4. EMPIRICAL EVIDENCE AT THE SWISS LOCAL LEVEL**

Our theory assumes that stronger institutional competition will lead (*ceteris paribus*) to a reduction of the tax burden as well as public spending. Before we present the results, we shall discuss the empirical strategy we use conditional on the structure of the dataset available.

##### **4.1. Empirical strategy**

The *municipal* cross-section data provide information to test whether auditors in competition with the government lead to lower taxes. We estimate the effect by using an OLS estimator with

standard errors adjusted for clustering. Within the cantons municipalities face similar constraints and the standard errors may be correlated within groups (cantons) (Moulton 1986). Therefore, we correct the standard errors by clustering according to the 26 cantons. Without clustering we may encounter downward bias of the standard errors. Dealing with similar problems, Frey and Stutzer (2000) and Feld and Matsusaka (2003) use similar estimation methods to produce robust standard errors. Both report much larger standard errors with clustering than with uncorrected or White corrected standard errors. To account for the possibility of non-random sampling, we estimate weighted least squares (WLS) model. To get approximately unbiased estimates we include sampling weights equal to the inverse of the probability of a municipality to be included in the sample.<sup>3</sup>

The *cantonal* dataset assembles data on public expenditures, revenues, taxes and deficits for the period between 1990 and 2000. We will use these data to test the influence of independent auditors on taxes and expenditures. Furthermore, we will also use the revenue and deficit data to get a broader picture about the influence of these auditors. As we do not observe any significant variation over time of our institutional variables (institutions remain almost by definition stable over time) including the auditors' variable, we cannot estimate fixed effects models and thus, cannot take full advantage of the panel structure of the data.<sup>4</sup> Therefore, we apply several different empirical methods. We first estimate our data panel with a pooled OLS model, which is the standard way of most studies dealing with time invariant institutions and adjust standard errors for clustering (see e.g. Feld and Matsusaka 2003). In a second step we estimate a random effects (RE) model – similar to Bails and Tieslau (2000) also facing time invariant institutions – again with adjusted standard errors for clustering within a canton. We further check the robustness of our results by estimating every year in a single cross-section (results reported in Appendix B).

Our empirical strategy is to first estimate a basic regression containing only our auditors' variable, the other institutional variables, and some fairly standard controls for this kind of analysis such as income, and population measures. In the case of expenditure regressions we also need to include topographic conditions to get meaningful results. After the basic

---

<sup>3</sup> It might be possible, that the probability for a municipality to be included in the sample depends as well on its size. Therefore, we also calculated size adjusted sampling weights. Our results are widely unaffected. In the following discussion we will use the more traditional and also more conservative sampling weights.

<sup>4</sup> Besley and Case (2003) also discuss this problem and they present their results for the impact of voter initiatives (that do not vary significantly over time) on taxes and expenditures. They use OLS, RE, and regressions on state means. They report fairly large differences of the estimated coefficients when applying these methods, especially when analyzing government expenditures.

regressions we add a measure of fiscal preferences to check whether the estimates are robust to the inclusion of this variable. We then include further controls that might impact on public finance measures such as a group of socio-demographic variables, topographic and economic sector variables, public goods and political variables. We only include variables that at least in some specifications proved to be influential. In our tables we only report the effects of the most important variables. The table descriptions however, contain the included variables.

Unfortunately, we cannot estimate fixed effects (FE) models and therefore, we cannot control for unobserved heterogeneity that does not vary over time. Obviously, our estimates could suffer from simultaneity and omitted variables. Effective institutions are not necessarily exogenously given, but can be the result of specific fiscal preferences of the citizens. Thus, it could be argued that institutions such as auditors, direct democratic instruments, and federalism emerge endogenously and have no direct influence on taxes or expenditures. To address these problems we follow three different strategies. First, we introduce a measure of fiscal preferences proposed by Funk and Gathmann (2005). If the audit institution is just the result of specific fiscal preferences that also shape political outcome, then we could not make inference about the influence of local auditors. The introduction of such a measure should clarify this question. After our basic results we further address the general question of causality. We use an instrumental variables (IV) approach and run two stage least squares (2SLS) regressions (see Angrist and Krueger 2001). However, it is extremely difficult to come up with valid instruments for institutions. Cross-country research has established to use variables such as language, colonial origin, distance from the equator, legal origins, or settler mortality (see e.g. Persson and Tabellini 2004, Djankov, La Porta, Lopez-de-Silanes and Shleifer 2003, Acemoglu, Johnson and Robinson 2001). Following these approaches we will use measures reflecting culture (language) and topographic circumstances that might shape the evolution of institutions.

## 4.2. Empirical results

In this subsection we present our empirical results. Starting with the dataset at the local level, our theory suggests that if auditors become competitors to the government they reduce taxes because fewer resources are wasted for special interests. We should expect to find lower tax rates and expenditures with growing influence of the auditor.

### a) Municipal data

Table 1 presents the results of our estimates at the municipal level. Column 1 contains a simple OLS regression with standard errors adjusted for clustering. In this basic regression we include the auditors' variable, the other institutional variables, local income, and the population measure. Column two presents the same basic regression estimated with a WLS model, where we control for potential selection bias by introducing sampling weights. Columns 3 to 7 add groups of control variables to the basic regression from column 2. We first add the fiscal preference measure – in this dataset we have to use the language variable – and then include socio-demographic, topographic and economic variables, public goods and political proxies, and finally we estimate all variables simultaneously.

[Table 1 about here]

The econometric results in table 1 confirm the expected theoretical effects. The *auditors'* variable exercises a highly significant negative impact on the aggregated cantonal and communal tax rates. A one point increase of the auditors' variable implies an average reduction of the tax rate of roughly 0.5 percentage points. The results from the basic regressions are not sensitive to the inclusion of additional explanatory variables. The estimated coefficient remains stable and statistically highly significant. Since the auditors' variable ranges from 0 to 4 a maximum potential reduction of 2 percentage points results. Taking into account that the average tax rate amounts to around 11 percent, the potential effect on the individual tax rate is about 18 percent lower taxes where auditors are fully integrated during the policy process. Consequently, the effect of audit institutions is not only statistically significant, but also economically highly relevant.

*Local direct democracy* in the form of town meetings exhibits, against our prediction, a positive impact on the tax rate. The coefficient is statistically significant, and its influence is with 0.9 quite high, although its potential influence is still much smaller than the one of the auditor variable as its range is constrained from 0 to 1. This phenomenon is consistent however, with the results reported by Funk and Gathmann (2005) and could potentially be explained with two alternative arguments: Firstly, from a traditional perspective it could be argued that self-government implies high transaction costs and is, therefore, an inefficient way to organize local governance. This argument becomes more probable the larger the municipality grows. From a second, less traditional, perspective it could be argued that town meetings boost the willingness of the citizens to redistribute income and to finance projects that strongly benefit minorities. In town meetings, citizens can visually identify each other, which is a precondition for empathy

and altruism to arise as has been experimentally shown by Bohnet (1997) and Bohnet and Frey (1999). It is, moreover, plausible that the expression of preference intensity becomes easier in town meetings as voting is not anonymous. This would make it possible to adopt potentially Pareto-superior projects which otherwise could not be adopted. We are not aware of empirical research on town meetings that could help to clarify these issues.

*Cantonal direct democratic* instruments do not significantly affect tax rates. These results hold also for alternative measures of direct democracy such as the measure proposed by Pommerehne and Weck-Hannemann (1996) or the sub-index reflecting the availability of the financial referendum by Frey and Stutzer (2000). At first sight, this result is not fully in line with the emerging literature on direct democracy which tends to find beneficial impacts of direct democracy on public finance variables. However, most of the earlier studies did not focus on the influence of direct democracy on the tax burden but rather on expenditures, deficits, and debts, and did not estimate the cantonal and local level simultaneously. Funk and Gathmann (2005) use both cantonal and aggregated cantonal and local level data. When only focusing on the cantonal data, they can replicate earlier findings. As soon as they focus on local level data they find positive results when estimating on expenditures, but they cannot find an effect if using aggregated data from the local and cantonal level.

In line with the standard literature *federalism* exhibits a strong negative and significant impact on the tax rate. For every unit of increasing local autonomy, we estimate an average influence of roughly -1.3 percentage points. Considering a range from 3.2 to 6.1 we observe a potential effect of 3.7 percentage points or up to 33 percent individual tax relief.

The *local income* variable has a strong negative impact on the tax rate, while the *population* measure does never reach statistical significance. Furthermore, the results seem to be robust to the inclusion of a proxy measure of fiscal preferences (*language*) and the influence of auditors does not seem to be endogenous to fiscal preferences (column 3). The additional socio-demographic variables basically reflect the expected results; however, their impact is frequently not statistically different from zero. The fraction of the population not included in the production process (*old* and *young*) exhibit both a tax increasing effect. Including further control variables such as the *population density*, the *mountainous*, *agricultural* and *industrial area*, or the *fraction of votes for the social democrats* (which could also be interpreted as a proxy measure for fiscal preferences) or the fraction of the population using *public transportation* to commute to work do not alter our results. The control variables exhibiting a statistically

significant impact on taxes are all in line with theoretical expectations. Even though, the data is only available for the fiscal year 1995/1996, we also tested whether some specific income distribution affects our results and included the mean to median income ratio. Our results are totally robust to the inclusion of that measure.

Subsequently we present only the results of our main variable of interest and do not discuss the effect of control variables as long as they are similar as in previous regressions. We restrict our discussion on new or surprising results.

#### b) Cantonal data.

Table 2 and 3 present the results for the data for taxes and expenditures at the cantonal level respectively. With this dataset we are not only able to estimate the effect of auditors on taxes but also on expenditures. Of course, we do not expect to find results as strong as directly at the local level. First the data are aggregated at the cantonal level, which introduces more white noise, and we also face a much smaller data sample that contains only 26 cantons over several years. We start with simple cross-section estimates for the first and last year of the sample period, we then present the pooled OLS results for our basic variables, and then estimate the coefficients by using random effects models with and without time effects. We show the results for the other yearly cross-sections in Appendix B.

#### i) Tax data

[Table 2 about here]

Starting with the tax data, we see from Table 2 that the estimated *auditors'* coefficient is significantly estimated by all different regression models. The coefficient is stable around a value of about -9 and remains statistically significant even with only 26 observations (column 1 & 2). These estimates come close to the ones with the local level data. When comparing a municipality with the weakest form of auditors with a town featuring a powerful audit institution, the potential effect on taxes is about 27 percent tax relief. This results hold also for the other yearly cross-section estimates, where only for the years 1995 and 1996 statistical significance is just not reached, but the coefficients remain robust. The pooled OLS estimates (column 3 & 4) yield significant results even with clustered standard errors, and year dummies do not alter our results. Standard errors not adjusted for clustering produce much smaller standard errors. However, given our data structure it would not be reasonable to assume that the

observations are independent within a canton. In contrast to most other studies, we also estimate random effects (RE) models, which produce largely the same results. The inclusion of the fiscal preference measure and other control variables do not affect our main result. In column 6 we report the results for one of the three fiscal preference measures (factor 1). This measure reflects conservative-liberal dimensions (Funk and Gathmann 2005: 20) and is the only measure having a significant influence in some regressions.<sup>5</sup> Using the other measures produce mainly the same results. The additional variables – that we also included separately (not reported) – are socio-demographic variables (unemployment, share of young and old population, share of foreigners), structural variables (population density, topographic conditions, fraction of industrial area, rental prices) and variables reflecting public goods provision (class size in primary school, convictions per capita, and total road length). Including these measures (column 7) cannot provide evidence of spurious correlation and the estimated auditors' coefficient remains statistically significant, even though the effect gets a bit smaller if all variables are included at the same time. However, the estimates remain largely robust also to the inclusion of public goods variables.

The estimated coefficients for the influence of *direct democracy* at the local and at the cantonal level do not reach statistical significance. This finding is again also true for our alternative measures of direct democracy. Our *federalism* variable produces statistically significant results in most specifications and also comes close to the estimated effect at the local level. Our alternative measure of federalism capturing the ratio of local to total local and cantonal spending produces more or less similar results, however, often not statistically significant. When moving from the minimal to a maximal value of the variable, we report a potential effect of around 29 percent lower taxes (33 percent at local level). The *income* variable does not always reach statistical significance, while the *population* measure never comes close to significance in these estimates.

The additional control variables cannot affect our basic results in a serious way and the influence of auditors on taxes remains robust (column 7). The various control variables that we include are mostly the same as for the local dataset. However, we do have some additional data mostly concerning public goods provision. Controlling for public goods might be important if one expects that auditors do not care about public goods provision, but only about low taxes and expenditures. The available public goods proxies do not provide evidence for such an influence

---

<sup>5</sup> Factor 1: conservative-liberal attitudes, Factor 2: attitudes favourable to redistribution, Factor 3: attitudes

of auditor on the provision of public goods. Of course the controls are not perfect, but they reflect some important aspects. Even though school performance data are not available, average class size in primary school might be one of the best measures, as many studies emphasize the importance of smaller classes for school performance. Moreover, security and a functioning judicial system are important factors that we approximate with the number of convictions per capita. The provision of public infrastructure such as roads etc. might also be important public goods that we try to control for.

*ii) Expenditure data*

[Table 3 about here]

When analyzing *expenditure* data (Table 3) we find additional evidence for our theoretical predictions that *auditors'* significantly reduce total public expenditures.<sup>6</sup> We find statistically significant estimates for almost all different estimation procedures and specifications. However, the estimated coefficients are more affected by model specification compared to our estimates on taxation. Even though the effect reaches mostly statistical significance, the coefficient varies in size. As can be seen from Table 3 the estimated auditor coefficient varies between -511 and -1086. The interpretation of the coefficient is straightforward: An increase in the auditors' variable of one point induces a reduction of expenditures between 500 and 1000 CHF per capita, which results in a potential effect of around 13 to 26 percent lower expenditures.<sup>7</sup> Column 6 shows the results when including a measure for fiscal preferences (Factor 3). We use the third factor (preference for state regulation) because it is the only factor that reaches statistical significance in at least some specifications. The other factors do not exhibit a significant influence and do as well not change the results. In some RE specifications, when including larger subgroups of additional control variables, the coefficient does just not reach conventional levels of statistical significance; however, the size of the coefficient lies between -500 and -900. It is obviously not surprising that the data aggregated at the cantonal level react more sensitive when including many different variables at the same time. The dataset is not extremely large and not all observations can be considered independent (thus, we adjust the standard errors for clustering), and therefore, we face limited degrees of freedom. In this light the results are even more striking. Despite the limited sample size – even with only 26 cross-section observations –

---

favourable to regulation. For details see Funk and Gathmann (2005)

<sup>6</sup> Additional results for yearly cross-section estimates can be found in the appendix. Extensive discussions on some first results of cross-section analyses between 1995 and 1999 can be found in Eichenberger and Schelker (2005).

<sup>7</sup> We also estimated our effects using log specifications. The estimates are very similar and available upon request.

we find a large negative, and in nearly all cases statistically significant impact of auditors on government expenditures.

Sometimes we find statistically significant effects for our *democracy* variables, which imply lower expenditures with increasing degrees of direct democracy. Even though, the effect of *local direct democracy* is often insignificant the coefficient is remarkably stable also in other specifications. We always find a negative sign and a large coefficient. The estimates for the extent of *cantonal direct democracy* are not robust to changes in the specifications. This is also true for our *federalism* estimates, which suggest a negative sign, but cannot be estimated precisely. Cantonal average *income* has a significant positive effect on expenditures, while the results for the *population* measure remain inconclusive. As we already mentioned we have to control for the effect of *topographic* conditions as they considerably drive cantonal expenditures.

Summing up, more powerful auditors significantly reduce taxes and expenditures. The effects are not only mostly statistically significant, but they are also large and economically highly relevant. It seems to be that direct democracy affects expenditures but has no influence on taxation. Most studies focus on expenditures and deficits etc. and also find such patterns. Also the estimates concerning federalisms seem to be in line with the literature and other studies from Switzerland. According to our expectations income affects expenditures and taxes, whereas the population measure does not impact on our data.<sup>8</sup>

### c) Causality issues

The issue of causality is obviously a crucial one. Our theoretical considerations suggest the causal relation going from auditors to policy outcome. However, one might come up with some arguments suggesting reverse causation, or that a third unobserved factor determines both aspects simultaneously. Certainly, institutions do evolve over time and insofar, they are also partly endogenous. However, in our case, it is difficult to argue for reverse causality, because the institutional design of auditors was fairly stable over time. The second argument of simultaneity is more important for fiscal institutions. It is often argued, that fiscal institutions are shaped by certain fiscal preferences that simultaneously determine policy outcome and institutional design. To deal with this issue we already included a measure for fiscal preferences

---

<sup>8</sup> We also estimated log specifications, which did not change our findings. However, the squared term of our population measure sometimes had a small significant impact.

and we were not able to find any evidence challenging our results. This makes it more difficult to argue that a third factor drives both institutions and outcomes simultaneously in such a subtle way. Even more unconvincing becomes the argument of reverse causality. However, we also try to address the problem of causality econometrically by estimating instrumental variables.

Drawing from cross-country studies we will test geographical, topographical and cultural instrumental variables. We finally use cantonal size (km<sup>2</sup>), population density 1980, and the number of cantonal neighbors as instrumental variables. The logic behind the argument about cantonal size is that effective institutions are more difficult to establish in large jurisdictions. This can be due to high dispersion of the citizens over a large jurisdiction that makes communication and coordination difficult, or due to a large number of citizens that makes it also difficult to get organized. Directly from these arguments follow topographic conditions as an instrumental variable. For the municipal dataset we use the mountainous fraction of a municipality and in the cantonal dataset we use the topography indicator. Furthermore, additional neighbors might imply that citizens can learn from more neighboring jurisdictions and therefore, effective institutions might spread more rapidly. The language variable stems from the idea that fiscal preferences shape institutions and that they have something to do with the cultural background measured by the language variable in our context (we actually find a correlation between language and some factors of fiscal preferences). The cantonal size, number of neighbors and topographic conditions are clearly exogenous variables. We test exogeneity of our instruments applying a *J*-test of overidentifying restrictions and we find that language is not strictly exogenous. For the other instruments we cannot reject exogeneity. Therefore, we only use topography, cantonal size, and number of cantonal neighbors as instruments. They seem to be strong instruments, because the value of a *F*-test of joint-significance mostly lies above the critical value of 10 (Staiger and Stock 1997). Only for the expenditure regressions, where we cannot use the topographical variable because it is an important regressor in our second stage, we face (at the margin) problems of weak instruments. Table 4 presents the results for our 2SLS estimates.

[Table 4 about here]

We find significant effects for our instrumented auditors' variable on both tax variables at the local and cantonal level. The basic regression on taxes aggregated at the cantonal level is just marginally insignificant. The results on expenditures are less robust and but find significant effects when including additional controls. The basic 2SLS regressions on expenditures without

further controls might suffer from weak instruments. There our test statistic lies just below the critical value. However, compared to the original estimates, the size of the coefficients increase for almost all estimates. If we include further control variables, we mostly find significant effects, though our results are in some specification sensitive to the inclusion of time invariant controls (e.g. industrial area). We conclude that auditors have a causal impact on taxes and expenditures.

Summing up, the problem of reverse causality has been discussed from various perspectives. First, including fiscal preferences – one of the main sources of potential simultaneity – did not affect our results. The long persistence of these institutions makes it hard to argue in favour of serious endogeneity. Furthermore, our IV regressions present strong evidence that auditors have a causal impact on taxes and expenditures, even though our expenditure results might suffer from problems associated with weak instruments.

#### 4.3. Further evidence and discussion

In this section we discuss some further evidence regarding the influence of auditors on additional dependent variables such as total government revenue and deficits. We also take a look at migration movements. If good institutions are perceived as such, one might expect to find migration into these jurisdictions. However, this argument only holds if we are not in an equilibrium condition or if not all citizens are extremely mobile such that the differences do not disappear. We also address some critical issues that have been broad up. The main questions there concern the question if auditors just cater to the rich that have a preference for low taxes.

[Table 5 about here]

##### a) Government revenues

Let us start with some additional public finance variables. Government revenues are available as aggregated data at the cantonal level. We use this data to further evaluate the robustness of our results. We have found ample evidence that auditors involved in the policy process have a negative impact on tax rates. Table 5, columns 1 & 2 provide further evidence for the robustness of these results. Government revenues are negatively and significantly affected by increasing auditors' activity. We use the same model specifications as for the expenditure regressions, because the revenue data again include federal grants, which lead us to eliminate the outlier canton of Uri. We also apply the same set of control variables that we used all the way. These

variables have been influential at least in some earlier model specifications. Including these additional controls do not alter the results and an raise of the auditors' variable by 1 point implies a reduction of around 900 CHF per capita in government revenues. When moving from the weakest to the strongest form of auditors' this corresponds to a potential effect of up to 23 percent revenue decrease.

The other institutional variables affect revenues in a very similar way as they already did on taxes. This is not surprising. Both direct democracy measures do not have a statistically significant influence on revenues, whereas the degree of federalism in the form of local autonomy features a strong significant impact in some model specifications. From the standard control variables the income variable and the topography variable have a positive and significant impact on revenues. These results are perfectly in line with existing literature and studies for Switzerland.

#### b) Deficits

From our theoretical part we do not have any direct predictions about the impact of auditors on deficits. The results do not show a clear picture that allows drawing final conclusions. The effect is sometimes significantly estimated, however, the results for deficits depend very much on the model specification and the coefficient is not robust to the inclusion of control variables.

#### c) Migration

If 'good' institutions, in the sense that they empower citizens, are attractive, we would expect that other citizens might migrate to jurisdictions featuring such institutions. This argument draws on the 'voting by feet' hypothesis (Tiebout 1956), which suggests that citizens migrate to jurisdictions with the best cost-benefit ratio. A first glance at the empirical results suggests that an institutional arrangement with powerful auditors has attracted citizens during the 1990ies. The dependent variable is the change in the population due to migration (not birth) between 1990 and 2000. An increase of one point of the auditors' index implies an increase of 1.5 percent of the local population due to immigration. Cantonal direct democracy and income also seem to have an influence. However, such an argument requires some form of disequilibrium or reduced mobility of the citizens. In equilibrium we should not be able to find institutionally induced migration. Further investigation is needed to clarify this point.

#### d) Income distribution

A major concern seems to be that auditors are suspected to cater to the rich that prefer lower taxes. We try to deal with this problem in two distinctive ways. First, we come back to some earlier empirical results that estimated the effect of auditors on specific taxes and specific expenditure categories. Entrepreneurs did not seem to benefit from especially low taxes if auditors are powerful in a jurisdiction. We were not able to produce consistent and significant estimates in this respect. Further evidence comes from the expenditure regressions. Categories where the rich typically benefit disproportionately could be security and cultural expenditures. We could not extract systematic effects from the form of auditors on these expenditure categories.

Second, we try to get some insights on the impact of auditors on income distribution. The theoretical prediction is not clear, as we do not have a clear theory that links income with the collective action problem. However, if auditors should cater specifically to the rich, we can test such an influence by analyzing the income distribution before and after taxes. Unfortunately, we do not have these data. We only have the after tax gini-coefficients calculated for the fiscal year 1995/1996. Even though the rest of our data come from 1999 we still take a look at the results. Note, that we cannot draw definitive conclusions, as we do not observe the pre-tax income distribution. We find a statistically significant negative effect of increasing values of the auditors' index on the after-tax gini-coefficient. This result implies that auditors are unlikely to represent particularly the interests of the rich. One could however, still come up with the argument that the rich systematically segregate in communities with powerful auditors and thus, the after-tax gini would not pick up this effect.

#### 4.4. Empirical conclusions

In this section we have empirically analyzed the impact of auditors on taxes and expenditures as well as on several other measures. We followed the predictions of our theoretical model that predicted lower taxes and expenditures if auditors were involved in the policy making process. We could find strong support for our hypothesis that auditors being designed to be able to play the role of a competitor to the government have an important, negative and statistically significant *causal* influence on taxes and expenditures.

## 5. CONCLUSION AND OUTLOOK FOR FUTURE RESEARCH

An important form of political competition has been neglected so far in the economic literature: institutionalized competition between government and an independent political unit. We discuss how this form of competition works in a system of direct democracy and provide empirical evidence for its beneficial effects on public finance. At the Swiss local level we can observe institutional competition between communal governments and communal audit institutions (finance commissions) in municipalities with town meeting. After constructing an index, which maps the institutional design of these local auditors, we attempt to estimate the influence of institutional competition in a system of direct democracy. Despite the limited number of observations, we find statistically significant and economically relevant negative effects on the local and cantonal tax burden as well as public spending. The magnitude of the estimated coefficient seems to be fairly robust to changes in the equation specification.

So far, our results refer to the Swiss local level with its direct democracy. However, political inefficiency is even more pervasive in representative democracy (Feld and Matsusaka 2003), where pork-barrel politics as well as log-rolling at the expense of weakly organized interest groups are widely known phenomena (e.g. Mueller 2003 or Persson and Tabellini 2000). Thus, we intend to analyze how institutionalized competition can be established in a representative-democratic environment. In some major Swiss cities (e.g. Zug and Olten) with parliaments, this is already the case. There, the financial commission is directly elected by the citizens and is an independent body which competes with the government as well as the parliament. However, these units may only perform ex post audits of the accounts, similar to audit courts and do not have encompassing audit and amendment rights. These examples show that independently elected institutions are also feasible at the parliamentary level.

Another field, where such independent and competing institutions have been neglected, is the corporate governance literature. Analogously to town meetings in political systems, shareholder meetings face similar problems. Information asymmetries between the board of directors and the shareholders are serious issues and may be addressed in analogy to our investigation. Firstly, corporate auditing firms must be able to apply freely for a limited mandate as the firm's corporate auditor directly at the shareholder meeting. There, the shareholders may choose among different auditing firms. Secondly, at the shareholder meeting, the corporate auditor needs to have encompassing proposal rights on strategic questions of the corporate policy as well as on individual projects. Analogous to our reasoning in political systems, such

institutionalized competition may alter the incentives for the executive board to cater for shareholder interests.

## REFERENCES

- ACEMOGLU, DARON, SIMON JOHNSON and JAMES A. ROBINSON (2001): The Colonial Origin of Coparative Development: An Empirical Investigation. *American Economic Review* 91 (5): 1369-1401
- ALESINA, ALBERTO and LAWRENCE H. SUMMERS (1993): Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence. *Journal of Money, Credit and Banking* 25: 151-162
- ALESINA, ALBERTO and ROBERTO PEROTTI (1996): Fiscal Discipline and the Budget Process. *American Economic Review* 86 (2): 401-407
- ANGRIST, JOSHUA D. and ALAN B. KRUEGER (2001): Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments. *Journal of Economic Perspectives* 15 (4): 69-85
- BAILS, DALE and MARGIE A. TIESLAU (2000): The impact of fiscal constitutions on state and local expenditures. *Cato Journal* 20 (2): 255-277
- BESLEY, TIMOTHY and ANNE CASE (2003): Political Institutions and Policy Choices: Evidence from the United States. *Journal of Economic Literature* 41: 7-73
- BERGER, HELGE, JACOB DE HAAN and SYLVESTER C.V. EIJJFINGER (2001): Central Bank Independence: An Update of Theory and Evidence. *Journal of Economic Surveys* 15 (1): 3-40
- BODMER, FRANK (2004): Why Direct Democracy could not stop the Growth of Government in Switzerland during the 1990's. Working Paper, University of Basel
- BOHN, HENNING and ROBERT P. INMAN (1996): Balanced Budget Rules and Public Deficits: Evidence from the U.S. States. NBER Working Paper 5533
- BOHNET, IRIS (1997): *Kooperation und Kommunikation*. Tübingen: Mohr.
- BOHNET, IRIS and BRUNO S. FREY (1999): The Sound of Silence in Prisoner's Dilemma and Dictator Games. *Journal of Economic Behavior and Organization* 38 (1): 43-57
- BRETON, ALBERT and RONALD WINTROBE (1975): The Equilibrium Size of Budget-maximizing Bureau: A Note on Niskanen's Theory of Bureaucracy. *Journal of Political Economy* 83 (1): 195-207

DJANKOV, SIMEON, RAFAEL LA PORTA, FLORENCIO LOPEZ-DE-SILANES AND ANDREI SHLEIFER (2003): Courts. *Quarterly Journal of Economics* 118: 453-517

ECOPLAN (2004): *Verteilung des Wohlstands in der Schweiz*. Ecoplan, Berne

EICHENBERGER, REINER (1994): The Benefits of Federalism and the Risk of Overcentralization. *Kyklos* 47: 403-420

EICHENBERGER, REINER and ANGEL SERNA (1996): Random Errors, Dirty Information, and Politics. *Public Choice* 86: 137-156

FELD, LARS P. and GEBHARD KIRCHGÄSSNER (2001): The political economy of direct legislation: direct democracy and local decision-making. *Economic Policy* 16 (33): 331-367

FELD, LARS P. and JOHN G. MATSUSAKA (2003): Budget referendums and government spending: evidence from Swiss cantons. *Journal of Public Economics* 87: 2703-2724

FELD, LARS P. and STEFAN VOIGT (2003): Economic Growth and Judicial Independence: Cross-Country Evidence Using a New Set of Indicators. *European Journal of Political Economy* 19 (3): 497-527

FELD, LARS P., GEBHARD KIRCHGÄSSNER and CHRISTOPH A. SCHALTEGGER (2003): Decentralized Taxation and the Size of Government: Evidence from Swiss State and Local Governments. CESifo Working Paper No. 1087

FORTE, FRANCESCO and GIUSEPPE EUSEPI (1994): A Profile of Italian State Audit Court: An Agent in Search of a Resolute Principal. *European Journal of Law and Economics* 1: 151-160

FREY, BRUNO S. (1994): Supreme Auditing Institutions: A Politico-Economic Analysis. *European Journal of Law and Economics* 1: 169-176

FREY, BRUNO S. (1997): *Not Just For The Money. An Economic Theory of Personal Motivation*. Edward Elgar Publishing Limited, Cheltenham

FREY, BRUNO S. and ANGEL SERNA (1990): Eine politisch-ökonomische Betrachtung des Rechnungshofs. *Finanzarchiv* 48: 244-270

FREY, BRUNO S. and ALOIS STUTZER (2000): *Happiness, Economy and Institutions*. *Economic Journal* 110: 918-938

FREY, BRUNO S. and ALOIS STUTZER (2001): *Happiness and Economics. How the Economy and Institutions Affect Human Well-Being*. Princeton University Press, Princeton

- FUNK, PATRICIA and CHRISTINA GATHMANN (2005): Estimating the Effect of Direct Democracy on Policy Outcomes. Preferences Matter! Working Paper, Stockholm School of Economics
- HAGEN VON, JÜRGEN (1991): A Note on the Empirical Effectiveness of Formal Fiscal Restraints. *Journal of Public Economics* 44: 199-210
- HAGEN VON, JÜRGEN (2002): Fiscal Rules, Fiscal Institutions, and Fiscal Performance. *The Economic and Social Review* 33 (3): 263-284
- KING, DAVID C. (1997): *Turf Wars. How Congressional Committees Claim Jurisdiction.* University of Chicago Press, Chicago
- KIRCHGÄSSNER, GEBHARD (2005): Sind direkte Demokratie und Föderalismus schuld an der Wachstumsschwäche der Schweiz? In: Steinmann, L., Rentsch, H. (eds.): *Diagnose Wachstumsschwäche. Die Debatte über die fehlende Dynamik der Schweizerischen Volkswirtschaft.* Verlag Neue Zürcher Zeitung, Zürich: 175-199.
- LADNER, ANDREAS (1994): Finanzkompetenzen der Gemeinden - ein Überblick über die Praxis. In: Eng, F., Glatthard, A., Koenig, B. H. (eds.): *Finanzföderalismus, Emissionszentrale der Schweizer Gemeinden.* Bern: 64-85
- LA PORTA, RAFAEL, FLORENCIO LOPEZ-DE-SILANES, CHRISTIAN POP-ELECHES AND ANDREI SHLEIFER (2004): Judicial Checks and Balances. *Journal of Political Economy* 112 (2): 445-470
- MATSUSAKA, JOHN G. (1995): Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years. *Journal of Political Economy* 103 (3): 587-623
- MELTZER, ALLAN H. and SCOTT F. RICHARD (1981): A Rational Theory of the Size of Government. *Journal of Political Economy* 89 (5): 914-927
- MELTZER, ALLAN H. and SCOTT F. RICHARD (1983): Tests of a rational theory of the size of government. *Public Choice* 41: 403-418
- MUELLER, DENNIS C. (2003): *Public Choice III.* Cambridge University Press, Cambridge
- NISKANEN, WILLIAM A. (1968): The Peculiar Economics of Bureaucracy. *American Economic Review* 58 (2): 293-305
- NISKANEN, WILLIAM A. (1971): *Bureaucracy and Representative Government.* Aldine-Atherton, Chicago
- OATES, WALLACE E. (1999): An Essay on Fiscal Federalism. *Journal of Economic Literature* 37: 1120-1149

PERSSON, TORSTEN, GÉRARD ROLAND and GUIDO TABELLINI (1997): Separation of Powers and Political Accountability. *Quarterly Journal of Economics* 112: 1163-1202

PERSSON, TORSTEN and GUIDO TABELLINI (2000): *Political Economics: Explaining Economic Policy*. MIT Press, Cambridge, MA

PERSSON, TORSTEN and GUIDO TABELLINI (2004): Constitutional Rules and Fiscal Policy Outcomes. *American Economic Review* 94 (1): 25-45

POTERBA, JAMES M. (1996): Budget Institutions and Fiscal Policy in the U.S. States. *American Economic Review* 86 (2): 395-400

PUJOL, FRANCESC and LUC WEBER (2003): Are preferences for fiscal discipline endogenous? *Public Choice* 114: 421-444

SHEPSLE, KENNETH A. and BARRY R. WEINGAST (1994): Positive Theories of Congressional Institutions. *Legislative Studies Quarterly* 19 (2): 149-179

SCHALTEGGER, CHRISTOPH A. (2001): Ist der Schweizer Föderalismus zu kleinräumig? *Swiss Political Science Review* 7: 1-18

SCHALTEGGER, CHRISTOPH A. (2002): Budgetregeln und ihre Wirkung auf die öffentlichen Haushalte: Empirische Ergebnisse aus den US-Bundesstaaten und den Schweizer Kantonen *Schmollers Jahrbuch* 122: 369-413

SCHALTEGGER, CHRISTOPH A. and LARS P. FELD (2001): On Government Centralization and Budget Referendums: Evidence from Switzerland. CESifo, Munich

SCHELKER, MARK (2002): Öffentliche Finanzen und Rechnungsprüfungsorgane: Eine empirische Studie. mimeo, Center for Public Finance, University of Fribourg

SCHELKER, MARK and REINER EICHENBERGER (2003): Starke Rechnungsprüfungskommissionen: Wichtiger als direkte Demokratie und Föderalismus? Ein erster Blick auf die Daten. *Swiss Journal of Economics and Statistics* 139 (3): 351-373

STREIM, HANNES (1994): Agency Problems in the Legal Political System and Supreme Auditing Institutions. *European Journal of Law and Economics* 1: 117-191

STAIGER, DOUGLAS and JAMES H. STOCK (1997): Instrumental Variables Regression with Weak Instruments. *Econometrica* 65 (3): 557-586

STUTZER, ALOIS (1999): Demokratieindizes für die Kantone der Schweiz. Working Paper No. 23, Institute for Empirical Research in Economics, University of Zurich

TIEBOUT, CHARLES (1956): A pure theory of local expenditures. *Journal of Political Economy* 64: 416-424

WEINGAST, BARRY R. and WILLIAM J. MARSHALL (1988): The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets. *Journal of Political Economy* 96: 132-163

## APPENDIX A

**Table A1: Description of municipal data for the year 1999**

Variable	Range	Sample mean (Standard deviation)	Exp. sign	Description	Source
Average tax rate	5.46 - 14.59	10.92 (1.73)		Average tax rate on a natural person's annual income. Income classes: CHF 40 - 200 thousand	Swiss Federal Tax Administration
Auditor	0 - 4	1.28 (1.52)	-	Index capturing institutional design of the local audit office	Schelker/Eichenberger (2003)
Local direct democracy	0 / 1	0.70 (0.46)	-	Dummy for local direct democracy: town meeting (1); Parliament (0).	Own representation
Cantonal direct democracy	1.75 - 5.69	3.95 (1.12)	-	Cantonal direct democracy: Extent of direct democratic instruments available to the citizens	Frey/Stutzer (2000, 2001)
Federalism	3.2 - 6.1	4.86 (0.61)	-	Federalism: Extent of local autonomy	Ladner (1994)
Income	158.92 - 6980.96	831.32 (646.17)	-	Average communal income: Approximated by the communal revenue from the direct federal income tax	Swiss Federal Statistical Office
Population	1138 - 336822	7635.49 (17413.60)	+/-	Size of communal population	Swiss Federal Statistical Office
Population density	0.15 - 108.99	7.93 (10.24)	+/-	Population density (population per km <sup>2</sup> )	Swiss Federal Statistical Office
Foreigner	0.01 - 0.56	0.18 (0.09)	+/-	Fraction of foreign communal population	Swiss Federal Statistical Office
Unemployment	0.5 - 5.1	2.55 (0.97)	+	Cantonal unemployment rate	Swiss Federal Statistical Office
Tertiary education	7.2 - 51.3	19.91 (6.78)	+	Share of population with tertiary education	Swiss Federal Statistical Office
Industrial area	0.00 - 0.21	0.02 (0.02)	-	Industrial fraction of communal surface	Swiss Federal Statistical Office
Agricultural fraction	0.00 - 0.81	0.40 (0.19)	+	Agricultural fraction of communal surface	Swiss Federal Statistical Office
Mountainous fraction	0.00 - 0.43	0.04 (0.08)	+	Mountainous fraction of communal surface	Swiss Federal Statistical Office
Demography (young)	0.21 - 0.47	0.33 (0.04)	+	Share of 0 - 24 years of age on total communal population	Swiss Federal Statistical Office
Demography (old)	0.03 - 0.27	0.13 (0.04)	+	Share of 65+ years of age on total communal population	Swiss Federal Statistical Office
Public Transportation	1.6 - 49.8	15.88 (8.13)	+	Share of communal population commuting to work using public transportation	Swiss Federal Statistical Office
Social Democrats	0 - 93.32	21.20 (10.49)	+	Share of votes for social democratic party in 1999 national elections	Swiss Federal Statistical Office
Language	0 / 1	0.76 (0.43)	+/-	Language: German (1); else (0)	Own representation

**Table A2: Description of cantonal data for the period 1990 – 2000**

Variable	Range	Sample mean (Standard deviation)	Description	Source
Tax (natural)	54.8 - 155.8	103.03 (19.70)	Average cantonal and communal tax burden on a natural person's annual income (measured by an index with mean 100)	Swiss Federal Statistical Office
Tax (legal)	56.3 - 152.7	105.75 (18.22)	Average cantonal and communal tax burden on a legal entities' annual income (measured by an index with mean 100)	Swiss Federal Statistical Office
Expenditures	7983.1 - 19738.2	11652.60 (2535.77)	Aggregated local and cantonal government expenditures per capita (in real terms)	Swiss Federal Finance Administration
Revenues	7621.8 - 20895.3	11276.40 (2372.69)	Aggregated local and cantonal government revenues per capita (in real terms)	Swiss Federal Finance Administration
Deficits	-2608.2 - 3046.2	375.25 (644.51)	Aggregated local and cantonal government deficits per capita (in real terms)	Swiss Federal Finance Administration
auditor	0 - 3	1.02 (1.01)	Index capturing institutional design of the local audit office: Product of Auditors Index and prevalence of town meetings per canton	Schelker (2002), Schelker/Eichenberger (2003)
Local direct democracy	0 - 1	0.63 (0.34)	Fraction of population per canton living in municipality with town meeting	Schelker/Eichenberger (2003)
Cantonal direct democracy	1.50 - 5.83	4.28 (1.20)	Cantonal direct democracy: Extent of direct democratic instruments available to the citizens	Frey/Stutzer (2000, 2001), Schaltegger
Federalism	3.2 - 6.1	4.99 (0.77)	Federalism: Extent of local autonomy	Ladner (1994)
Income	28959.9 - 84605	44064.20 (9996.11)	Cantonal income per capita (in real terms)	Swiss Federal Statistical Office
Population	13573 - 1211647	270004.2 (277656.2)	Size of cantonal population	Swiss Federal Statistical Office
Population density	0.24 - 53.25	4.39 (9.96)	Cantonal population density (population per km <sup>2</sup> )	Swiss Federal Statistical Office
Unemployment	0 - 7.8	2.29 (1.96)	Cantonal unemployment rate	Swiss Federal Statistical Office
Young	0.145 - 0.283	0.225 (0.025)	Fraction of the young population (0-14) in a canton	Swiss Federal Statistical Office
Old	0.112 - 0.215	0.151 (0.020)	Fraction of the old population (65+) in a canton	Swiss Federal Statistical Office
Foreigner	0.061 - 0.380	0.166 (0.65)	Share of cantonal foreign population	Swiss Federal Statistical Office
Topography	0.00 - 37.57	3.85 (8.20)	Index of topographical conditions as measured by the index which is used for the new national fiscal equalization scheme (the "topographischer Lastenaus-gleichsindex des NFA"); increasing values denote more difficult conditions	Swiss Federal Finance Administration
Industrial area	0.92E-3 - 0.058	0.0086 (0.011)	Industrial fraction of communal surface	Swiss Federal Statistical Office

Roads	139 - 11883	2732.94 (2731.90)	Total road length in km of cantonal and national roads	Swiss Federal Statistical Office
Rental prices	576 - 1348	937.93 (138.80)	Average rental price for housing	Swiss Federal Statistical Office
Class size	15.3 - 22.3	19.69 (1.22)	Average class size in primary school	Swiss Federal Statistical Office
Convictions	3.4E-3 - 26.1E-3	10.01E-3 (3.61E-3)	Number of convictions per capita	Swiss Federal Statistical Office
Language	0 / 1	0.77 (0.40)	Language: German (1); else (0)	Own classification
Fiscal Preferences Factor 1	0.597 - 0.949	0.820 (0.103)	Cantonal fiscal preferences. Factor 1: conservative-liberal preferences	Funk/Gathmann (2005)
Fiscal Preferences Factor 2	-0.367 - 0.632	0.014 (0.292)	Cantonal fiscal preferences. Factor 2: redistribution preferences	Funk/Gathmann (2005)
Fiscal Preferences Factor 3	-0.537 - 0.425	-0.022 (0.203)	Cantonal fiscal preferences. Factor 2: regulation preferences	Funk/Gathmann (2005)

## APPENDIX B

**Table B1: Yearly estimates for taxation aggregated at cantonal level**

	1	2	3	4	5	6	7	8	9	10	11
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Institutional Competition	-9.07 (-2.06)*	-7.49 (-1.82)*	-9.79 (-2.40)**	-8.06 (-1.79)*	-8.07 (-1.96)*	-7.52 (-1.47)	-7.80 (-1.56)	-10.98 (-2.31)**	-10.62 (-2.15)**	-9.64 (-2.43)**	-10.47 (-2.59)**
Local Direct Democracy	12.44 (0.71)	14.50 (1.02)	12.10 (0.76)	1.09 (0.08)	-2.21 (-0.19)	-0.83 (-0.07)	-2.43 (-0.19)	3.85 (0.27)	0.15 (0.01)	-2.81 (-0.22)	-2.52 (-0.20)
Cantonal Direct Democracy	0.92 (0.18)	-4.73 (-0.96)	-1.89 (-0.36)	0.69 (0.14)	0.97 (0.22)	0.99 (0.18)	1.02 (0.20)	1.46 (0.29)	1.37 (0.28)	1.50 (0.37)	1.98 (0.47)
Federalism	-9.46 (-1.99)*	-1.31 (-0.30)	-6.47 (-1.30)	-7.82 (-1.94)*	-8.06 (-2.58)**	-6.00 (-1.68)	-6.92 (-2.06)*	-9.25 (-2.70)**	-8.67 (-2.47)**	-6.37 (-1.91)*	-6.09 (-1.64)
Income	-0.91E-3 (-1.97)*	-1.27E-3 (-3.45)***	-1.10E-3 (-2.35)**	-0.89E-3 (-2.06)*	-0.81E-3 (-2.93)***	-0.95E-3 (-2.72)**	-0.96E-3 (-2.68)**	-0.68E-3 (-1.64)	-0.68E-3 (-1.63)	-0.60E-3 (-1.71)	-0.57E-3 (-1.66)
Population	-4.35E-6 (-0.54)	-8.89E-6 (-1.05)	-9.42E-6 (-1.03)	-6.11E-6 (-0.80)	-4.46E-6 (-0.67)	-9.77E-6 (-0.14)	-2.06E-6 (-0.29)	-2.70E-6 (-0.04)	-7.04E-6 (-0.10)	5.83E-6 (0.83)	5.62E-6 (0.81)
Constant	191.16 (8.49)***	189.53 (9.07)***	197.90 (7.87)***	187.13 (9.11)***	184.01 (11.24)***	177.33 (8.20)***	184.42 (7.96)***	181.71 (7.53)***	182.19 (7.72)***	163.31 (7.83)***	160.08 (7.34)***
Adj. R <sup>2</sup>	0.503	0.561	0.556	0.624	0.697	0.579	0.585	0.618	0.640	0.656	0.633

Notes: Regressions with robust standard errors. t-statistics in parentheses. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.

Source: Own calculations

**Table B2: Yearly estimates for expenditures aggregated at cantonal level**

	1	2	3	4	5	6	7	8	9	10	11
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Institutional Competition	-1036.70 (-3.00)***	-1026.05 (-2.94)***	-1005.08 (-2.52)**	-1059.88 (-2.31)**	-1086.21 (-2.33)**	-888.24 (-2.30)**	-1106.32 (-2.52)**	-1315.20 (-2.92)***	-1095.37 (-2.11)**	-1086.66 (-2.42)**	-1086.78 (-2.43)**
Local Direct Democracy	-1662.05 (-1.15)	-2986.01 (-1.83)*	-3349.74 (-1.82)*	-3154.27 (-1.79)*	-3647.93 (-1.85)*	-3677.90 (-2.27)**	-3157.28 (-1.95)*	-2202.90 (-1.66)	-2736.69 (-1.74)*	-2420.45 (-1.76)*	-2138.94 (-1.61)
Cantonal Direct Democracy	-221.89 (-0.60)	138.40 (0.34)	316.28 (0.76)	161.38 (0.34)	302.18 (0.63)	301.67 (0.67)	446.25 (0.88)	326.08 (0.70)	415.04 (0.80)	330.80 (0.70)	224.41 (0.47)
Federalism	-988.99 (-1.65)	-1149.41 (-1.85)*	-1212.96 (-1.91)*	-1146.11 (-1.50)	-1035.70 (-1.29)	-924.76 (-1.48)	-1063.16 (-1.58)	-1415.23 (-2.36)**	-1450.14 (-2.27)**	-1381.14 (-2.47)**	-1387.37 (-2.41)**
Income	0.157 (2.59)**	0.14 (2.84)**	0.15 (3.03)***	0.16 (3.00)***	0.12 (2.67)**	0.12 (2.63)**	0.13 (2.59)**	0.16 (4.26)***	0.15 (3.35)***	0.13 (3.50)***	0.137 (3.74)***
Population	-0.59E-3 (-0.51)	-0.18E-3 (-0.14)	0.06E-3 (0.04)	-0.02E-3 (-0.02)	0.09E-3 (0.06)	0.24E-3 (0.22)	0.21E-3 (0.18)	0.08E-3 (0.07)	0.05E-3 (0.05)	0.15E-3 (0.16)	0.16E-3 (0.18)
Topography	106.95 (3.88)***	102.74 (4.18)***	100.84 (4.10)***	100.38 (2.83)**	91.56 (2.71)**	86.68 (2.76)**	96.14 (3.03)***	121.39 (3.55)***	147.40 (3.55)***	145.01 (4.19)***	148.27 (4.42)***
Constant	11536.65 (3.94)***	12573.01 (4.08)***	12160.76 (4.06)***	12362.83 (4.04)***	13405.50 (3.92)***	12407.57 (4.40)***	12061.98 (4.02)***	12367.38 (3.91)***	12889.16 (4.48)***	13335.01 (5.62)***	13234.29 (5.79)***
Adj. R <sup>2</sup>	0.763	0.754	0.742	0.719	0.666	0.730	0.718	0.776	0.774	0.811	0.804

Notes: Regressions with robust standard errors. t-statistics in parentheses. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Include a dummy for the Canton Uri.

Source: Own calculations

**Table 1: Taxation (municipal data)**

Hypothesis 1: Municipal dataset, OLS and WLS estimates

	1	2	3	4	5	6	7
	OLS Tax	WLS Tax	WLS Tax	WLS Tax	WLS Tax	WLS Tax	WLS Tax
Auditor	-0.677 (-9.13)***	-0.544 (-4.63)***	-0.554 (-5.11)***	-0.484 (-5.18)***	-0.542 (-5.23)***	-0.523 (-4.49)***	-0.483 (-5.44)***
Local Direct Democracy	1.346 (4.42)***	1.355 (5.22)***	1.268 (4.56)***	0.985 (3.83)***	1.166 (5.37)***	1.349 (5.26)***	1.025 (3.67)***
Cantonal Direct Democracy	0.081 (0.77)	0.047 (0.33)	-0.016 (-0.10)	-0.063 (-0.51)	0.087 (0.70)	0.039 (0.29)	-0.030 (-0.26)
Federalism	-1.445 (-6.31)***	-1.313 (-7.63)***	-1.327 (-7.77)***	-1.316 (-7.56)***	-1.332 (-7.33)***	-1.345 (-6.91)***	-1.290 (-6.55)***
Income	-0.861E-3 (-4.18)***	-1.016E-3 (-5.43)***	-1.017E-3 (-5.49)***	-0.910E-3 (-3.46)***	-0.963E-3 (-5.31)***	-0.951E-3 (-4.84)***	-0.85E-3 (-3.31)***
Population	-1.66E-7 (-0.05)	1.69E-6 (0.41)	8.36E-7 (0.23)	2.34E-6 (0.66)	6.41E-6 (1.25)	3.09E-6 (1.04)	2.47E-6 (0.68)
Language	-	-	0.304 (1.11)	-	-	-	-0.111 (-0.34)
Young	-	-	-	7.859 (2.63)**	-	-	7.337 (2.59)**
Old	-	-	-	7.774 (4.78)***	-	-	8.690*** (4.46)
Unemployment	-	-	-	-0.194 (-1.34)	-	-	-0.154 (-1.03)
Higher education	-	-	-	0.012 (0.55)	-	-	0.004 (0.30)
Foreigner	-	-	-	-0.741 (-1.31)	-	-	-0.237 (-0.36)
Population- density	-	-	-	-	-0.005 (-1.04)	-	-0.005 (-0.99)
Mountain	-	-	-	-	2.336 (1.81)*	-	1.238 (1.30)
Agriculture	-	-	-	-	1.198 (1.78)*	-	0.889 (2.02)*
Industry	-	-	-	-	-1.799 (1.36)	-	-0.306 (-0.28)
Public transport usage	-	-	-	-	-	-0.011 (-0.91)	0.011 (1.06)
Social democrats	-	-	-	-	-	9.96E-3 (1.15)	9.62E-3 (1.12)
Constant	18.256 (17.18)***	17.809 (16.90)***	17.989 (17.47)***	15.162 (8.27)***	17.295 (14.02)***	17.857 (14.90)***	14.155 (6.66)***
Observations	732	732	732	724	730	722	718
R <sup>2</sup>	0.723	0.675	0.678	0.727	0.706	0.684	0.741

Notes: Standard errors adjusted to clustering in 26 cantons. t-statistics in parentheses. Dependent Variable: Average aggregated tax rate including cantonal, local, and church taxes on a natural person's annual income, containing 9 income classes between CHF 40 and 200 thousand and 3 classes describing household characteristics: "single, employed wage earner", "married, sole wage earner" and "married, sole wage earner with 2 children". Weight: Inverse probability of being sampled. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.

Source: Own calculations

**Table 2: Taxation (cantonal dataset)**

Cantonal Data: Tax regressions 1990 – 2000

	1	2	3	4	5	6	7
Period	1990	2000	1990-2000	1990-2000	1990-2000	1990-2000	1990-2000
Estimation Method	OLS	OLS	Pooled OLS	Pooled OLS	RE	RE	RE
Auditor	-9.074 (-2.06)*	-10.475 (-2.59)**	-9.241 (-2.52)**	-9.229 (-2.46)**	-11.358 (-3.08)***	-10.359 (-3.22)***	-7.003 (-2.02)**
Local Direct Democracy	12.445 (0.71)	-2.524 (-0.20)	3.547 (0.32)	3.620 (0.32)	8.191 (0.89)	11.544 (1.34)	-2.258 (-0.16)
Cantonal Direct Democracy	0.924 (0.18)	1.983 (0.47)	0.399 (0.10)	0.351 (0.08)	1.666 (0.46)	3.751 (0.88)	-0.247 (-0.07)
Federalism	-9.457 (-1.99)*	-6.089 (-1.64)	-7.165 (-2.46)**	-7.128 (-2.40)**	-10.231 (-3.18)***	-6.195 (-1.88)*	-6.758 (-1.98)**
Income	-0.92E-3 (-1.97)*	-0.57E-3 (-1.66)	-0.79E-3 (-2.48)**	-0.79E-3 (-2.36)**	-0.38E-3 (-1.43)	-0.38E-3 (-1.40)	-0.36E-2 (1.60)
Population	-4.35E-6 (0.54)	5.62E-6 (0.81)	2.85E-6 (0.49)	2.80E-6 (0.47)	-3.90E-6 (-0.71)	3.16E-6 (0.46)	-15.40E-6 (-1.00)
Fiscal Prefs. Factor 1	-	-	-	-	-	-76.430 (-1.89)*	-
Additional Controls	-	-	-	-	-	-	included
Year dummies	-	-	-	included	-	-	-
Constant	191.161 (8.49)***	160.077 (7.34)***	179.785 (9.82)***	181.638 (9.59)***	171.441 (9.96)***	200.869 (8.70)***	124.878 (2.75)***
Observations	26	26	286	286	286	286	286
R <sup>2</sup>	0.504	0.633	0.566	0.571	0.534	0.701	0.706
LM Breusch/Pagan	-	-	-	-	726.25***	630.17***	293.10***

Notes: Regressions with robust standard errors, adjusted to clustering (panel estimates). t-statistics/z-statistics in parentheses. Additional control variables: unemployment, demography (young, old), topography, population density, fraction of industrial area, total roads, rental prices, class size primary school, convictions per capita. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.

Source: Own calculations

**Table 3: Expenditures (cantonal dataset)**

Cantonal Data: Expenditure regressions 1990 – 2000

	1	2	3	4	5	6	7
Period	1990	2000	1990-2000	1990-2000	1990-2000	1990-2000	1990-2000
Estimation Method	OLS	OLS	Pooled OLS	Pooled OLS	RE	RE	RE
Auditor	-1036.70 (-3.00)***	-1086.78 (-2.43)**	-1041.05 (-3.24)***	-1043.44 (-3.13)***	-584.05 (-1.81)*	-511.53 (-1.66)*	-907.272 (-3.67)***
Local Direct Democracy	-1662.05 (-1.15)	-2138.94 (-1.61)	-2869.15 (-2.21)**	-2907.28 (-2.19)**	-2594.29 (-1.49)	-2387.71 (-1.77)*	-1643.280 (-1.43)
Cantonal Direct Democracy	-221.89 (-0.60)	224.41 (0.47)	218.47 (0.60)	239.13 (0.64)	-580.64 (-1.86)*	-688.86 (-2.15)**	-255.065 (-1.11)
Federalism	-988.99 (-1.65)	-1387.37 (-2.41)**	-1143.44 (-2.25)**	-1156.28 (-2.20)**	-71.85 (-0.13)	-224.29 (-0.46)	-719.750 (-1.89)*
Income	0.157 (2.59)**	0.137 (3.74)***	0.136 (4.47)***	0.136 (4.10)***	0.060 (5.81)***	0.061 (6.38)***	0.041 (3.01)***
Population	-0.59E-3 (-0.51)	0.16E-3 (0.18)	0.02E-3 (0.03)	0.02E-3 (0.02)	1.27E-3 (1.24)	0.47E-3 (0.37)	1.62E-3 (1.19)
Topography	106.95 (3.88)***	148.27 (4.42)***	109.98 (4.36)***	110.45 (4.31)***	57.16 (1.50)	51.57 (2.43)**	95.445 (3.67)***
Fiscal Prefs. Factor 3	-	-	-	-	-	4012.28 (-1.87)*	-
Additional Controls	-	-	-	-	-	-	included
Year dummies	-	-	-	included	-	-	-
Constant	11536.65 (3.94)***	13234.29 (5.79)***	12700.42 (5.44)***	11961.83 (5.02)***	13311.18 (5.01)***	14546.17 (4.69)***	13026.41 (3.00)***
Observations	26	26	286	286	286	286	286
R <sup>2</sup>	0.763	0.804	0.725	0.739	0.603	0.717	0.846
LM Breusch/Pagan	-	-	-	-	904.52***	820.12***	469.30***

Notes: Regressions with robust standard errors, adjusted to clustering (panel estimates). t-statistics/z-statistics in parentheses. Additional control variables: unemployment, demography (young, old), topography, population density, fraction of industrial area, total roads, rental prices, class size primary school, convictions per capita. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.

Source: Own calculations

**Table 4: Causality: 2SLS regressions with municipal and cantonal dataset**

Causality: 2SLS regressions

	1	2	3	4	5	6
Dependent Var.	Taxes (municipal data) 1999		Taxes (cantonal data) 1990 – 2000		Expenditures (cantonal data) 1990 – 2000	
Auditor	-1.104 (-4.71)***	-1.252 (-2.71)**	-9.615 (-1.69)	-12.520 (-2.17)**	-580.503 (-0.55)	-2505.35 (-1.72)*
Local Direct Democracy	1.955 (3.47)***	2.232 (2.08)**	4.206 (0.28)	10.798 (0.74)	-3648.886 (-1.82)*	-1266.657 (-0.62)
Cant. Direct Democracy	0.251 (1.28)	0.443 (1.33)	0.457 (0.13)	2.078 (0.57)	116.547 (0.28)	799.264 (1.28)
Federalism	-1.497 (-6.23)***	-1.465 (-5.47)***	-7.340 (-1.85)*	-11.347 (-2.55)**	-864.235 (-1.12)	-1682.382 (-2.21)**
Income	-0.59E-3 (-3.22)***	-0.55E-3 (-2.59)**	-0.77E-3 (-2.25)**	-0.37E-3 (-1.04)	0.114 (1.90)*	0.160 (3.01)***
Population	-2.91E-7 (-0.09)	-29.50E-7 (-0.66)	-2.72E-6 (-0.58)	-13.00E-6 (-0.79)	-0.17E-3 (-0.19)	6.2E-3 (2.90)***
Topography	-	-	-	-	97.092 (2.80)***	134.902 (2.74)**
Additional Controls	-	included	-	included	-	included
Constant	17.734 (16.37)***	12.438 (4,36)***	179.715 (10.28)***	136.047 (1.72)**	12820 (4.91)***	18510.650 (2.36)**
Obs.	730	724	286	286	286	286
R <sup>2</sup>	0.643	0.598	0.565	0.610	0.707	0.677

Notes: Standard errors adjusted to clustering in 26 cantons. t-statistics in parentheses. *Auditors instrumented, Instruments*: cantonal size, number of cantonal neighbors, topography (not for expenditure regressions). *Additional controls municipal data*: unemployment, demography (old, young), tertiary education, agricultural area, public transportation. *Additional controls cantonal data*: unemployment, demography (young, old), total roads, class size primary school, convictions per capita. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.  
Source: Own calculations

**Table 5: Additional evidence: Revenue, Deficits, Migration, Income distribution**

Additional Evidence: Revenue, Deficits, Migration & Income distribution

	1	2	3	4	5	6	7	8
	Revenues (1990 – 2000)		Deficits (1990 – 2000)		Migration (local dataset)		Income GINI (local dataset)	
	RE	RE	RE	RE	WLS	WLS	WLS	WLS
Auditor	-801.90 (-2.12)**	-923.68 (-3.45)***	-16.70 (-0.26)	-128.44 (-1.74)*	1.488 (7.74)***	1.554 (7.46)***	-1.03E-2 (-2.22)**	-0.92 (-2.99)***
Local Direct Democracy	-587.96 (-0.37)	-1913.53 (-1.67)*	-713.18 (-1.82)*	-547.84 (-1.23)	0.999 (1.41)	-0.274 (-0.28)	0.58E-2 (0.37)	1.86E-2 (1.41)
Cant. Direct Democracy	-803.76 (-1.73)*	-409.54 (-1.36)	51.90 (0.48)	327.82 (2.79)***	-1.612 (-5.90)***	-0.957 (-2.44)**	-1.03E-2 (-1.71)*	-0.25 (-0.40)
Federalism	-278.58 (-0.48)	-958.44 (-2.16)**	-2.72 (-0.02)	65.36 (0.65)	-0.497 (-0.70)	-0.317 (-0.47)	1.35E-2 (1.04)	0.94E-2 (0.99)
Income	0.13 (8.70)***	0.06 (3.28)***	-2.09E-2 (-1.62)	-0.77E-2 (0.59)	3.038E-3 (3.95)***	1.40E-5 (0.02)	5.85E-5 (7.61)***	4.95E-5 (4.95)***
Population	1.62E-3 (1.34)	2.33E-3 (1.43)	0.11E-3 (0.56)	0.54E-3 (1.24)	-2.45E-5 (-1.84)*	-2.27E-5 (-0.64)	1.83E-7 (1.00)	5.61E-7 (1.98)*
Topography	79.05 (1.88)*	127.08 (7.20)***	-	-	-	-	-	-
Additional Controls	-	included	-	included	-	included	-	included
Constant	10595.56 (5.04)***	-740.07 (-0.19)	1524.90 (2.05)**	11197.99 (4.61)***	7.208 (2.13)**	-0.105 (-0.01)	0.311 (5.01)***	0.278 (3.82)***
Obs.	286	286	286	286	728	728	732	718
R <sup>2</sup>	0.574	0.815	0.064	0.364	0.164	0.271	0.488	0.599
LM Breusch/Pagan	671.82***	273.87***	12.48***	5.88**	-	-	-	-

Notes: Standard errors adjusted to clustering in 26 cantons. t-statistics/z-statistics in parentheses. *Additional controls cantonal data*: unemployment, demography (young, old), population density, industrial area, total roads, class size primary school, convictions per capita, rental prices. *Additional controls municipal data*: Population squared, demography (old, young), unemployment, tertiary education, share of foreigners, mountainous area, agricultural area, industrial area, public transportation, party support for social democrats. Weight: Inverse probability of being included in sample. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01.

Source: Own calculations