The Effect of Direct Democratic Institutions on Income Redistribution:
Evidence for Switzerland

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Abstract

There is an intensive dispute in political economics about the impact of institutions on income redistribution. While the main focus is on comparison between different forms of representative democracy, the influence of direct democracy on redistribution has attracted much less attention. In this paper, employing both a composite index and measures of single institutions, we find that direct democracy is particularly associated with lower welfare spending. Moreover, we estimate a model which explains the determinants of achieved redistribution measured by Gini coefficients using panel data provided by the Swiss Federal Tax Office from 1981 to 1997. While our results indicate that less public funds are used to redistribute income and actual redistribution is lower, inequality is not reduced to a lesser extent in direct than in representative democracies for a given initial income distribution.

JEL-Classification: D7, D78, I30, H75, H11

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1 Introduction

In recent political economy analyses, the impact of constitutional differences on income redistribution has been discussed intensively. Most prominently, PERSSON and TABELLINI (2000) compare majoritarian systems with systems of proportional representation as well as presidential with parliamentarian systems to find out whether they differently affect income redistribution. They argue that majoritarian elections lead to more targeted spending (local public consumption) due to pork barrel politics, less non-targeted spending (broad social spending like unemployment insurance) and a larger size of government (higher taxes) than proportional elections. For a panel of OECD countries since the 1960's, MILESI-FERRETI, PEROTTI and ROSTAGNO (2002) find that transfer payments are indeed strongly positively related to the degree of proportional representation. PERSSON and TABELLINI (1999, 2003) support these findings and also report evidence that welfare spending is lower in presidential systems.

The comparative impact of direct and representative democracy on income redistribution has however not been analyzed yet. This holds despite the fact that discussions about direct democracy are often accompanied by hopes and fears as to its influence on fiscal and social policies. For example, when the Progressive Movement succeeded to introduce citizen initiatives in the first state constitutions at the turn to the 20th century, opponents argued that this institutional change would lead to socialism. CRONIN (1989, p. 52), e.g., quotes the Los Angeles Times asserting that "radical legislation would result, and business and property rights would be subject to constant turmoil at the hands of the agitators". This perception was influenced by an existing relationship between the proponents of the initiative and leftist factions (CRONIN, 1989, p. 50). Similarly, the discussions about the introduction of direct democracy in Germany have been mainly originating from left-wing social movements (see the assessment by NEUMANN 1999, pp. 17). However, the restrictions which direct democratic decisions about financial issues face according to German constitutional law also stem from the fear that selfish voting behavior in referendums on tax laws would endanger general interests (SIEKMANN, 1999, p. 183), i.e. pose problems for governments' aims to redistribute income.

Theoretically, the impact of direct democracy on income redistribution is also contested. Although it could be argued on the basis of MELTZER and RICHARD (1981) that the median voter would redistribute more income than could be accomplished in legislative decisions, this result depends on strong assumptions which do not necessarily hold (BOADWAY and KEEN 2000). In this paper, a first attempt is thus made to provide systematic empirical evidence on

the impact of direct democracy on income redistribution. There already exists an extensive literature on the economic effects of referendums and initiatives (see MATSUSAKA 2004, FELD and KIRCHGÄSSNER 2006 for surveys), which has mainly focused on public expenditure, revenue and debt and found that these are substantially lowered by referendums or initiatives. This particularly holds for the U.S. states (and local jurisdictions) for which MATSUSAKA (2004) provides the most convincing evidence as well as for Swiss cantons (states) and local jurisdictions for which comparable evidence is provided by FELD and KIRCHGÄSSNER (1999, 2001, 2001a) and by FELD and MATSUSAKA (2003). With respect to the components of public spending, SCHALTEGGER (2001) as well as VATTER and FREITAG (2002) find that mainly cantonal and local welfare, culture, police and educational spending, and cantonal administrative spending are reduced by direct democracy. FELD and MATSUSAKA (2003a) report that cantons with stronger direct democratic institutions on fiscal issues rely more strongly on user charges than on broad-based taxes to finance spending (see also MATSUSAKA 1995 for the U.S.).

These empirical findings suggest that direct democratic institutions reduce income inequality to a lesser extent through the public sector because less public funds are available and allocated for redistributive purposes. However, reducing the size of these funds does not necessarily lead to a decrease in distributive gaps between the affluent and the needy if redistribution programs are better targeted in direct than in representative democratic systems. In this study, we thus first analyze the impact of direct democracy on welfare and non-welfare spending in order to provide a more differentiated analysis on public spending components than in previous studies.[1] In particular, we have a closer look at both, the cantonal and local spending structure as well as the cantonal spending structure. Moreover, we consider different instruments of direct democracy explicitly. In a second step, we estimate a model to explain the effect of direct democracy on income redistribution as measured by Gini coefficients using panel data from the Swiss Federal Tax Office to assess to what extent income redistribution is effectively affected in a direct democracy. After a brief review of political economy models of income redistribution in *Section 2*, the Swiss institutions of direct democracy are introduced in *Section 3*. In *Section 4*, the impact of direct democracy on welfare and non-welfare spending is econometrically analyzed. The estimation results of the impact of direct democracy on income redistribution are presented in *Section 5.* Conclusions follow in *Section 6.*

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1. Because total cantonal and local as well as cantonal spending have been extensively studied, often using the same sample, we refer the reader to these papers (see FELD and KIRCHGÄSSNER 2006 for a survey).

2   Political Economy Models of Income Redistribution

Models describing the determinants of income redistribution in a democracy have in common that they mainly built upon the median voter theorem. According to MELTZER and RICHARD (1981), income redistribution through taxes and transfers is the higher in a median voter model the more skewed the income distribution is.[2] Skewness of the income distribution could be measured by the ratio of mean to median income which provides a good intuition for the political mechanism underlying redistribution: The higher the mean as compared to median income the more the median income taxpayer (supposed to be identical with the median voter) can gain from taxing the rich.[3] The direction in which income is redistributed, and the resulting net income distribution are, however, not fully determined. The median voter might form a coalition with the poor in order to exploit the rich, or engage in a coalition with the rich in order to exploit the poor such that income redistribution occurs toward the median income position, a finding that is called Director's Law (STIGLER 1970). The rich might, however, also form a coalition with the poor against the middle income class which has the advantage for the rich of acquiring votes most cheaply and for the poor of getting higher transfers than in a coalition with the middle income class. Given the possibility of these different coalitions, no clear-cut predictions on voting outcomes over income redistribution can be made (BOADWAY and KEEN 2000, HARMS and ZINK 2003).

Since most countries in the world are not constituted as pure direct democracies – even U.S. states or Swiss cantons are representative democracies – the political economy analysis of income redistribution in representative democracies is more relevant than the median voter models summarized before. In a citizen candidate model, BESLEY and COATE (1997) argue that candidates can follow their own interests between elections even though there is an attachment to citizens' preferences through the political/candidate selection process. Aside other personal motives of office holders, such interests may stem from ideological dispositions (DIXIT and LONDREGAN 1998, ROEMER 1998) such that left wing party members impose higher marginal tax rates in progressive income tax schedules than right wing party followers. Second, representatives follow the interests of their constituencies (WEINGAST, SHEPSLE and JOHNSEN 1981), as they are eager to obtain benefits geographically concentrated in their elec-

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2. Skewness of the income distribution is however not synonymous to income inequality. See LEE and ROEMER (1998) and BOADWAY and KEEN (2000). For example, two near symmetric income distributions having the same mean but different variances may have the same skewness (close to zero). The less dispersed income distribution could easily be more equal than the other.

3. For empirical evidence supporting this hypothesis see BORGE and RATTSØ (2004).

toral district while spreading the costs over the whole population. Logrolling among representatives in parliaments (under a rule of universalism) ensures that such pork barrel politics remains stable and income redistribution occurs from the districts of the losing coalition to those of the winning coalition. Third, representatives can be captured by special interest groups that engage in rent seeking activities.[4] Rent seeking as such involves redistributing income from those groups in society which are not successfully lobbying the government to those which are. Fourth, bureaucrats may be able to induce deviations of policy outcomes from median voter preferences (NISKANEN 1971, ROMER and ROSENTHAL 1978, 1979), because they have an information advantage (compared to voters and politicians) as to the real costs of public projects. These considerations suggest that, from a societal point of view, income redistribution in representative democracies is inefficient as actual redistribution deviates from the preferred level, and, also, as those groups might benefit which are not the neediest ones.

A general argument could thus be made as to different policy outcomes in systems with and without instruments of direct democracy as far as the latter can be supposed to correct policies towards median voter preferences. Referendums and initiatives provide instruments to selectively control representatives and override their decisions (ROMER and ROSENTHAL 1978, 1979, FELD and KIRCHGÄSSNER 2001). Under complete information, representatives (and bureaucrats) have reduced possibilities to follow their selfish or ideological goals, or to favor their constituencies or special interest groups. Assuming asymmetric information, such an outcome may not necessarily obtain (GERBER and LUPIA 1995, MATSUSAKA and MCCARTY 2001). Influential interest groups can threaten representatives to start an initiative process in order to challenge a political decision to be taken in the legislature. If interest groups can successfully pretend that they are better informed about citizens' preferences than representatives, policies might be implemented that are farther away from median voter outcomes. Empirical results by POMMEREHNE (1978), GERBER (1999) or MATSUSAKA (2004, 2007), however, support the contention that public policies are more in line with median voter preferences in direct than in representative democracies. MATSUSAKA (2007a) provides further evidence for the U.S. that indirect (threatening) effects are of minor quantitative importance.[5]

Additional arguments speak in favor of differences in redistributive policies between direct (with referendums or initiatives) and representative democracies. Compared to pure represen-

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4. For surveys on rent seeking see EKELUND and TOLLISON (2001), MCCHESNEY (2001) and MUELLER (2003).

5. A correction of public spending towards median voter preferences does not necessarily imply less spending as MATSUSAKA (2000, 2004) shows for the early 1900s in the U.S. See also SASS (1991).

tative democratic systems with majoritarian elections, institutions of direct democracy restrict pork barrel politics and logrolling. This contention applies either to referendums, in which statutes or constitutional amendments decided in the representative part of the democratic system can be rejected or accepted by the electorate, or popular initiatives, in which citizens formulate legislation directly and are able to induce a decision at the ballots if a pre-specified number of signatures is collected. With respect to referendums, it could be argued that transaction costs of trading votes in logrolling exercises are prohibitively high (BRETON 1996). Moreover, as referendum outcomes are not attached to outcomes in particular constituencies, citizens consider the general (marginal) cost and (marginal) benefits of a spending project instead of comparing the geographically concentrated (marginal) benefits with nationally dispersed (marginal) cost. REDOANO and SCHARF (2004) and SCHNELLENBACH, FELD and SCHALTEGGER (2006) derive similar results by showing that referendums prevent representatives from centralizing government activities via logrolling.

Compared to representative democratic systems with proportional representation (PR), it is important to emphasize the role of referendums as a possibility to veto policies that are too far from citizens' preferences. In PR systems, representatives gain a seat in the legislature by entering their party's lists in higher and more promising ranks. In order to get such a position on the party list, past performance of representatives, but also the congruence of that performance with party ideology play a role. Such partisan deviations from citizens' preferences occur less frequently if policies have to pass a referendum. Similar to partisan considerations, partial interests of particular groups could be less easily enforced in systems of direct democracy than in pure PR systems as long as the direct effects of direct democratic institutions over-compensate their indirect (threatening) effects (as evidence for the U.S. suggests). Popular initiatives then enable citizens to question spending projects that entail particular redistributive coalitions as they could be frequently observed in shaping the social welfare programs dominant in European countries. LIEFMANN-KEIL (1974) already demonstrates how special interest groups are able to influence social welfare programs initially designed to redistribute income from the rich to the poor such that those partial interests benefit.

In majoritarian systems, it could therefore be expected that referendums and initiatives negatively affect the ability of legislatures for targeting spending to their electoral districts. As welfare spending can be less easily concentrated in electoral districts than (industrial or agricultural) subsidies and particular infrastructural projects, referendums and initiatives less probably reduce welfare spending. In PR systems, instruments of direct democracy suppos-

edly affect those elements in general redistribution programs negatively that are included due to partisan considerations or the influence of special interest groups. If preferences for redistribution exist in the electorate (see CORNEO and GRÜNER 2002) and large programs of social welfare are designed, instruments of direct democracy may well reduce overall welfare spending and induce a redistribution policy that is targeting the needy.[6] Finally, decentralization of spending (and revenue) will reduce the size of income redistribution programs independently from the electoral system. If instruments of direct democracy lead to decentralization of government activities, e.g. because vote trading is more difficult (SCHNELLENBACH, FELD and SCHALTEGGER 2006), the resulting fiscal competition negatively affects income redistribution.

These predictions are partly supported by empirical evidence for Switzerland. In Switzerland, legislatures at the cantonal level are almost exclusively elected by proportional representation (SCHALTEGGER and FELD 2007). It is thus not surprising that SCHALTEGGER (2001) and VATTER and FREITAG (2002) find that welfare spending is lower in direct than in representative democratic cantons.[7] While the decentralization and the differential impact of different institutions of direct democracy is carefully analyzed in the latter study, the studies on spending structure provide less differentiated evidence. We thus start the empirical analysis by focusing on different spending components before explicitly investigating income redistribution.

3   Swiss Data on Direct Democracy and the Income Distribution

Before proceeding to the empirical analysis, it is however necessary to briefly introduce the Swiss political system. Switzerland is an ideal laboratory to study the impact of direct democracy on policy outcomes. Aside from its pronounced structure of fiscal federalism, Switzerland is known for its institutions of direct democracy – both at the federal, state and local levels. All cantons have some form of semi-direct democracy with a parliamentary system with legislators elected according to a system of proportional representation, but the extent of these popular rights varies between cantons (TRECHSEL and SERDÜLT 1999, FELD and MATSUSAKA 2003). Only two cantons (*Appenzell-Innerrhoden* and *Glarus*) still take political decisions in cantonal meetings (*Landsgemeinde*), while in the remaining cantons people's will is exercised exclusively through different institutions of political participation at the polls. In all cantons, proposals can be initiated via the voter initiative, and new laws passed by the legislature are, to different degrees, subject to an optional or a mandatory popular referendum. Moreover,

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6. The prediction is less clear-cut if a social welfare state does not exist.

fiscal referendums on new spending projects of sub-national governments have been of particular interest in the literature. Finally, the rarely used constitutional initiative and referendum complement the set of institutions of direct legislation.

In our empirical analysis, we use a composite index of direct democracy as proposed by FREY and STUTZER (2000) which consists of many different instruments of direct democracy, but also study the impact of specific institutions of direct democracy. In order to contrast the index with some of its components, we have a closer look at the data for the fiscal referendum, the legislative initiative, the optional legislative referendum, and the index values of the year 1992 (see *Table* 1). There exists no fiscal referendum at the federal level, but with the exception of the canton of Vaud (VD) all cantons have some kind of a fiscal referendum. 13 cantons have a mandatory as well as an optional fiscal referendum. In seven other cantons (BE, BS, BL, AG, TI, VS, GE) only the optional fiscal referendum exists, whereas in SZ, GL, ZG, AR, NE new spending projects have to pass a mandatory, but not an optional fiscal referendum. Comparing the different forms of fiscal referendums and their spending thresholds with the index of direct democracy, there is a some correspondence, but the index contains additional information as the correlation coefficient between the index of direct democracy and a dummy variable for mandatory fiscal referendums is 0.30 only (see Appendix *Table* A3).

When it comes to particular components of public spending, however, the institutional logic of Swiss direct democracy must be taken into account. The fiscal referendum is designed to give citizens control on new spending projects exceeding a pre-specified spending threshold. In the case of non-recurring spending, mainly large infrastructural projects or public buildings are affected. In the case of recurring spending, public employment is most probably influenced. Welfare spending is however resulting from legal statutes which are most strongly affected by the optional legislative referendum as an instrument to veto spending projects, or by the legislative initiative as an instrument to induce new legislation, which potentially increases or decreases welfare spending. The index of direct democracy also reflects these instruments as the correlation coefficient between the signature requirement for the legislative initiative and the direct democracy index is -0.74, and that between the signature requirement for the optional legislative referendum and the direct democracy index is -0.68. The latter indicates that a higher signature requirement coincides with less direct democracy.

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7. Single referendum decisions do not provide clear-cut evidence as the analyses of referendums on the Swiss old age pension system by POMMEREHNE and SCHNEIDER (1985) or BÜTLER (2002) illustrate.

Table 1: Direct Democracy in Swiss Cantons

Canton	Fiscal Referendums on Non-recurring expenditures[a]		Fiscal Referendums on Recurring expenditures[a]		Signature Requirement Legislative Initiatives	Signature Requirement Optional Legislative Referendum	Frey-Stutzer Index[b] (1992)
	Optional	Mandatory	Optional	Mandatory			
ZH	2-20	20	0.2-2	2	10000	0	4.2
BE	2	–	0.4	–	15000	10000	3.7
LU	3-25	25	Specific stipulations		4000	3000	4.5
UR	0.5	1	0.05	0.1	300	300	5.4
SZ	–	0.25	–	0.05	2000	2000	4.9
OW	0.5	1	0.1	0.2	1	1	5.6
NW	0.25	5	0.05	0.5	250	250	4.9
GL	–	0.5	–	0.1	1	1	5.5
ZG	–	0.5	–	0.05	2000	1500	4.4
FR	0.25 %	1 %	0.25 %	1 %	6000	6000	2.5
SO	1-2	2	0.1-0.2	0.2	3000	1500	5.7
BS	1	–	0.2	–	4000	2000	4.4
BL	0.5	–	0.05	–	1500	0	5.7
SH	0.3-1	0.3	0.05-0.1	0.05	1000	1000	5.2
AR	–	5%	–	1%	300	300	5.5
AI	0.25	0.5	0.05	0.1	1	1	5.3
SG	3-15	15	0.3-1.5	1.5	4000	4000	3.6
GR	1-5	5	0.3-0.5	0.5	3000	0	4.8
AG	3	–	0.3	–	3000	0	4.5
TG	1	3	0.2	0.6	4000	2000	4.2
TI	0.2	–	0.05	–	7000	7000	2.1
VD	–	–	–	–	12000	12000	2.4
VS	0.75%	–	0.25%	–	4000	3000	3.4
NE	–	1.5%	–	1.5%	6000	6000	2.2
GE	0.125	–	0.06	–	10000	7000	1.8
JU	0.5 %	5%	0.05%	0.5%	2000	2000	3.7

Source: LUTZ and STROHMANN (1998); TRECHSEL and SERDÜLT (1999); FREY and STUTZER (2000).

a) In million Swiss Francs if not indicated otherwise.

b) The index is constructed as an unweighted average of the indexes of the legislative initiative, the legislative referendum, the constitutional initiative, and the fiscal referendum, referring to their existence and the respective signature requirement as the number of signatures relative to the number of voters, the days within which the signatures have to be collected and the financial threshold as the per capita spending limit allowing for referendum (the values correspond to the year 1992).

4   The Impact of Direct Democracy on Welfare Spending and Taxation

4.1. The Model

In order to test the impact of direct democracy on income redistribution, we follow a two step strategy. First, we analyze welfare and non-welfare expenditure as a function of direct democracy and controls in order to get some insights on differences between direct and representative democratic cantons with respect to that spending component most important for income redistribution in PR systems. This analysis is conducted for the sum of cantonal and local welfare and non-welfare spending as well as for cantonal spending categories in order to capture

the effect of fiscal decentralization. Second, we analyze income distribution as measured by Gini coefficients of the (approximated) pre- and post-tax personal income distribution as well as the *difference* between these two distributions that accounts for effective income redistribution. We thus propose the following basic model:

$$ID_{it} = \beta_0 + \beta_1 DIRDEM_{it} + \beta_2'V_{it} + u_{it} \qquad (1)$$

where ID_{it} stands for the different dependent variables that are of interest for income redistribution. More precisely, in this section we take a closer look at the *real per capita welfare and non-welfare spending at the cantonal and local levels*. All spending variables are *in logs*. In the next section, we consider Gini coefficients of the pre- and post-tax income distribution.

The model implies that ID_{it} is a function of direct democracy, as measured by the Frey-Stutzer index ($DIRDEM_{it}$), and a vector of control variables V_{it}. The parameter of interest is β_1, while u_{it} denotes the error term. As a robustness test, we also estimate this model replacing the index with measures of several important institutions of direct legislation which constitute components of the index of direct democracy and pertain to the daily policy-making, such as those institutions that affect the legislative process at the cantonal level. With this approach, we exclude the constitutional referendums and initiatives only. Through this robustness test we intend to disentangle the potentially contrasting effects of the single institutions that are submerged in the composite index because of its 'kitchen-sink' nature.

The vector of the single direct democratic institutions contains (1) a dummy for the availability of a mandatory fiscal referendum on new spending projects, (2) the financial threshold per capita that triggers the mandatory fiscal referendum (set to zero for cantons without this institution) and, (3) the signature requirement (per capita) for the optional fiscal referendum in those cantons where no mandatory fiscal referendum exists (set to zero for those cantons in which the mandatory fiscal referendum exists).[8] To a certain extent, the third determinant constitutes a 'mirror image' of the first and the second. Finally, the required signatures per capita for (4) triggering the optional legislative referendum or (5) launching a legislative initiative belong to this vector. Given the institutional logic described in *Section 3*, we do not expect the fiscal referendum to exert a clear-cut impact on welfare expenditure, while the legislative referendum and initiative can be expected to be most influential for social welfare.

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8. Given the construction of the threshold variables, both can be viewed as an interaction between the financial threshold of either fiscal referendum and its availability. The underlying idea is that the optional referendum has an influence particularly in those cantons in which it substitutes the non-existent mandatory referendum.

In line with previous empirical work by SCHALTEGGER (2001) as well as VATTER and FREI-TAG (2002), and with our theoretical considerations in *Section 2*, we expect a negative impact of direct democracy on welfare and non-welfare spending. We could also predict the optional legislative referendum to reduce welfare spending and the mandatory fiscal referendum to reduce non-welfare spending. A higher spending threshold may then be positively associated with those expenses. Analogously, the optional fiscal referendum might lower expenditures, most strongly in those cantons in which no mandatory fiscal referendum exists. In contrast, the previous findings for the initiative suggest an overall expenditure rising impact of stronger initiative rights (lower signature requirements), often termed 'fiscal gas pedal' effect.[9]

The vector of control variables V_{it} consists, first, of variables capturing the fiscal federalism (see Appendix *Tables* A1 and A2 for descriptive statistics): fiscal decentralization, measured by the share of local in total cantonal and local spending; tax competition, measured by the inverse of the average of all other cantons' income tax rates in the highest income tax bracket, weighted by the inverse of geographical distance between cantonal capitals; and the log of unconditional grants which address the impact of vertical transfer payments from the federal government to cantonal governments. The more fiscally decentralized a canton and the more intensive tax competition are, the less leeway exists for income redistribution because of migration incentives. In addition, a variable incorporating fiscal constraints at the cantonal level is included. They can be seen as a supplementary instrument to limit the spending possibilities of policymakers and hence their ability to redistribute income (SCHALTEGGER, 2002). Direct democracy, tax competition and fiscal constraints impose particular restrictions on cantonal budgets such that cantons are induced to shift responsibilities to the local level. It is thus necessary to have a look at cantonal and local as well as cantonal spending structure to understand how redistribution is affected by these institutions. Finally, unconditional grants help to finance additional spending and relax cantonal budget constraints.

Moreover, political determinants are captured by a coalition variable in order to empirically evaluate the effect of broad-based coalition governments on the exploitation of the budget as a fiscal commons (SCHALTEGGER and FELD 2007). Moreover, the net share of conservative parties in the government is considered in order to control for the ideological disposition to redistribute income. In line with the literature, we expect this variable to have a negative impact on (the policy instruments of) income redistribution.

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9. See FELD and KIRCHGÄSSNER (2001) for a 'gas pedal' effect in cantons where mandatory fiscal referendums is a counterbalancing spending dampening institution, while otherwise the initiative serves as 'fiscal break'.

Socio-economic factors of influence are reflected by the log of national income, disaggregated to the cantonal level, that captures a possible income effect on the demand for public goods (WAGNER 1892), but also accounts for income redistribution as an insurance against risk. The log of the ratio of urban population in a canton reflects the impact of agglomeration on fiscal policy decisions of governments. In urban areas, a concentration of poor people often occurs such that additional income redistribution has to be undertaken. On the other hand, the log of population might take into account economies of scale for achieving an identical level of supply of public goods. Finally, the logs of the shares of young and senior populations are included in order to reveal the influence of the two groups which (supposedly) most strongly benefit from income redistribution measures by the state. We also employ a French and Italian language dummy to account for cultural differences between Swiss language areas. Finally, year effects are included in the regressions (not reported).

The analysis uses annual data from 1980 to 1998 deflated to the year 1980. As the canton of Jura, created by a secession from the canton of Bern in 1977, is recorded in the statistics in the years 1979 and 1980 for the first time, the earliest date for a balanced panel of the current 26 cantons is the year 1980. The subscript $i = 1, ..., 26$ denotes cantons and $t = 1980, ..., 1998$ indexes years. The empirical analysis is performed using a pooled cross-section time-series model. As in FELD and KIRCHGÄSSNER (2001), we argue that despite the panel structure of the data the inclusion of cantonal fixed effects in the cross-section domain is inappropriate because the institutional variables vary only very little over time in most cantons. Accordingly, cantonal intercepts do not make sense as the captured impact on fiscal outcomes is either solely driven by the time variation or, in case of time invariant variables, fixed effects are likely to hide the impact of institutional variables and render them insignificant. Moreover, OLS estimation with panel-corrected standard errors has the advantage over a random effects method that it yields efficient estimates with an error variance-covariance estimator robust to three of the common problems associated with panel data: heteroscedasticity across panels, and serial correlation within and across panels. In our case, we employ autocorrelation and heteroscedasticity consistent standard errors according to the Newey-West method. A drawback of the OLS method is, however, that the model specification must be as complete as possible to prevent an omitted variable bias.[10]

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10. An application of a GMM estimator which is efficient in the presence of heteroscedastic and autocorrelated errors did not yield substantially different results form the ones reported here. The small sample size, however, did not permit to rely on this estimator exclusively.

Table 2: Cantonal and Local Welfare and Non-Welfare Expenditure per Capita, in logs, 1980 – 1998, 494 Observations

	(1) Welfare Expenditure	(2) Non-welfare Expenditure	(3) Welfare Expenditure	(4) Non-welfare Expenditure
Direct democracy index	-0.178**	-0.037*	–	–
	[7.50]	[2.45]		
Signature requirement for optional legislative referendum	–	–	0.079**	-0.043**
			[3.80]	[4.50]
Signature requirement for legislative initiative	–	–	-0.122**	0.080**
			[4.06]	[5.53]
Fiscal decentralization	-0.065	-0.592**	-0.285+	-0.551**
	[0.47]	[5.71]	[1.96]	[5.35]
Tax competition	-0.062	-0.084*	-0.163*	-0.009
	[1.05]	[2.13]	[2.36]	[0.22]
Fiscal constraints	-0.055**	-0.011	-0.027*	-0.006
	[4.76]	[1.40]	[2.31]	[0.79]
Log of unconditional grants	-0.015	0.157**	0.021	0.155**
	[0.30]	[4.75]	[0.38]	[4.86]
Number of parties in the cantonal government	0.040*	0.005	-0.019	-0.001
	[2.14]	[0.31]	[1.13]	[0.06]
Net share of conservative parties in the government	-0.184*	0.122+	-0.079	0.112+
	[2.14]	[1.80]	[0.88]	[1.72]
Log of national income	0.485**	0.224*	0.729**	0.321**
	[3.75]	[2.38]	[5.39]	[3.99]
Urbanization	0.019	-0.001	0.046**	-0.029**
	[1.31]	[0.12]	[2.71]	[2.68]
Log of population	-0.037	0.023	0.062**	0.047**
	[1.53]	[1.40]	[3.05]	[4.00]
Share of young population	-0.738*	-0.191	-0.488	-0.124
	[2.52]	[0.95]	[1.61]	[0.70]
Share of old population	0.856**	0.377**	1.148**	0.521**
	[4.88]	[3.08]	[6.31]	[5.24]
Dummy for French and Italian language	-0.200**	-0.007	0.188**	0.070+
	[2.69]	[0.14]	[3.41]	[1.66]
Constant	2.776	5.327**	-3.542	3.189*
	[1.07]	[2.80]	[1.37]	[2.13]
Obs.	494	494	494	494
Adj. R^2	0.8663	0.6922	0.8488	0.7089
Jarque Bera test	3.86	9.294**	8.042*	13.92**
F-test on inst. vars.			9.60**	18.29**

Notes: Coefficients are estimated by OLS and Newey-West autocorrelation-and heteroscedasticity consistent standard errors. Time dummies included but not reported. The numbers in parentheses are the absolute values of the estimated t-statistics. ''**', '*' or '+' indicates significance at the 1, 5, or 10 percent levels, respectively.

The consistency of the estimates equally depends on the exogeneity of the regressands. The variables accounting for direct democracy, however, although potentially endogenous, are not instrumented. There is a dispute among Swiss historians and constitutional law scholars

whether Swiss direct democracy was created in the middle ages (WILI 1988, BLICKLE 2000) or after the French revolution (KÖLZ 1992, 2004, AUER 1996). ADLER (2006) takes an intermediate position by arguing that direct "democracy" existed in pre-modern forms in some cantons since the middle ages, but became widespread after the French revolution. While it is possible that direct democracy and the fiscal variables are driven by a third unobserved factor, for example population preferences, a true analysis of the endogeneity of direct democracy needs to look very carefully into the history of direct democracy of each Swiss canton separately. As a consequence, simple strategies to instrument direct democracy are not available.

Also with respect to remaining control variables endogeneity might be present – at least in the long run. Candidates for such a simultaneity are not only government structure variables such as the degree of fiscal decentralization, or political variables like the ideology of the cantonal government, but also measures of population characteristics, as a canton's spending policy might well affect mobility decisions and fertility behavior of its residents. Hence, there is no determinant in our model that can be said to be truly exogenous, and trying to account for all potential simultaneities through an instrumental variable technique is impractical.[11] As regards fiscal decentralization, its low correlation (in absolute terms) with the dependent variable, particularly for welfare spending (about 0.3), justifies assuming exogeneity.

4.2. Results

Tables 2 and 3 contain the estimation results for the components of (I) combined local and cantonal welfare and non-welfare expenditure per capita (*Table* 2), and (II) cantonal expenditure measures solely (*Table* 3). In *Table* 2, in all equations for combined local and cantonal budget components reported, the coefficient of the composite index of direct democracy has the expected negative sign and is significant at least at the 5 percent level. Thus, in cantons with stronger direct democratic institutions less money is spent on welfare transfers as well as on non-welfare budget components. Comparing coefficient sizes across the estimated models, the coefficient of direct democracy achieves a value of -0.178 in the welfare expenditure regression (1) that is more than four times larger than that observed in the non-welfare spending regression (2) and also stronger in statistical significance (0.1 versus 5 percent level of significance). This finding suggests that direct democracy reduces the log of sub-federal welfare

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11. In addition, as a robustness test, we have estimated the spending regressions using instruments for the fiscal decentralization variable, government ideology and pre-tax income distribution measures in the income (re-) distribution regressions. In general, selection of suitable instruments was difficult and most of them turned out to be weak, according to the J-statistics and the F-statistics of the excluded instruments in the first stage

spending much more strongly than that of non-welfare expenditure. Thus, direct democracy puts a stronger restraint on sub-federal welfare than on non-welfare spending. Moreover, the impact of direct democracy is more decisive than that of most of the other fiscal policy variables, particularly fiscal constraints and tax competition, the point estimates of which are insignificant at least in one case. The budget restraining results reported by SCHALTEGGER (2001) and VATTER and FREITAG (2002) are in line with the results reported here. We conclude that in a direct democracy the government allocates considerably less funds for redistribution purposes (welfare transfers) than in pure representative democracies (with PR).

In general, the remaining controls exhibit expected influences.[12] More specifically, fiscal decentralization is associated with significantly less non-welfare spending, but does not significantly affect welfare spending. Tax competition leads to significantly less non-welfare expenditures, but does not significantly impact social transfer payments. These findings are important in light of the discussion whether decentralization and tax competition restrain the ability of the government to redistribute income. Unexpectedly, fiscal constraints restrict welfare expenditure solely, but do not affect the remaining budget components. Hence, balancing the budget comes at the expense of welfare spending. Similarly, unconditional grants from the federal level significantly relax the cantonal budget constraints for non-welfare expenditure, but do not significantly influence welfare spending. The results for these two fiscal instruments suggests that welfare recipients are those who have to financially bear the costs of balanced budget policies but do not profit from its expansion, perhaps reflecting their marginal lobbying power or even social exclusion from the active electorate.

Among the political variables, the number of parties is positively associated with welfare expenditure. Interestingly, non-welfare expenditure does not appear to be affected. As expected, the net share of conservative parties in cantonal governments is associated with significantly less means for redistribution via welfare transfers, despite its weakly positive association with non-welfare spending. Among the economic variables, national income exerts a significant positive impact on all spending items, being in line with Wagner's Law. Hence, the more affluent a canton is the higher are welfare and non-welfare spending.

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regression (HANSEN 1982, HANSEN and SINGLETON 1982, STAIGER and STOCK 1997). However, most of the results are qualitatively similar. Results are available on request.

12. The results are robust to the inclusion of additional control variables. In particular the unemployment rate does not prove to be significant in any of the regressions. This might be due to the fact that the unemployment insurance scheme is allocated to the federal level. Results can be obtained upon request.

As regards the socio-demographic determinants of fiscal policy, the degree of urbanization does not have any significant impact on welfare expenditure.[13] Economies of scale, indicated by the negative coefficient on population size, do not appear to exist for any of the spending measures. The share of young people is significantly associated with lower levels of welfare expenditure (although not observed for non-welfare spending), possibly reflecting the fact that they, on the one hand, have not yet entered the labor market, and, on the other hand, still rely on their parents' resources. The share of senior residents has significantly positive effects on welfare payments, but also on public non-welfare expenditure. In French- and Italian-speaking cantons less welfare spending per capita is observed, while the remaining budget components appear unaffected.

Generally speaking, the model explains the variation in cantonal spending quite well, as the adjusted R^2's of 0.69 and higher indicate. The Jarque-Bera test on normality of the residuals rejects the null hypothesis for model (2). Results with outliers excluded based on 2 standard deviations of the residuals are reported in *Table* A4 of the Appendix.[14] The estimation outcomes reveal qualitatively the same budget constraining impact of direct democracy for all budget components as already observed in *Table* 2, again with welfare spending being affected to the largest extent by far.[15]

In columns (3) and (4) of *Table* 2, we report the estimation results of the same model replacing the composite index of direct democracy with the legislative initiative and the optional legislative referendum. For cantonal total expenditure, the fiscal referendum and the legislative initiative had previously been found to decisively constrain spending at the cantonal level (FELD and MATSUSAKA, 2003). However, the institutional logic inherent in Swiss budgetary law requires to focus on the optional legislative referendum and the legislative initiative here. As described in the introduction to the model, these measures of direct democratic institutions account for, on the one hand, their availability in general, as well as, on the other hand, their institutional characteristics in particular that determine their strength with respect to realizing the median voter's preferences (signature requirement). In general, a higher signature requi-

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13. This result, however, appears sensitive to the chosen functional form. For a significant welfare spending increasing influence of urbanization, see FELD, FISCHER and KIRCHGÄSSNER (2006).
14. This rather systematic method of tackling the outliers leaves us with some estimated equation with non-normally distributed residuals. When we excluded outliers by individually choosing them, the results remained qualitatively the same. This also holds for subsequent regressions excluding outliers.
15. As robustness test, we have estimated the model with fiscal decentralization instrumented. Although the instruments are weak, as indicated by their F-test in the first stage regression, we observe again a qualitatively similar pattern with respect to the effect of direct legislation. The results are available on request from the authors. For estimation outcomes of a similar model using IV, see FELD, FISCHER and KIRCHGÄSSNER (2006).

rement indicates a lower level of direct democracy and less citizen empowerment as it is more difficult for the electorate to make use of them.

Table 3: Cantonal Welfare and Non-Welfare Expenditure per Capita, in logs, 1980 – 1998, 494 Observations

	(1) Welfare Expenditure	(2) Non-welfare Expenditure	(3) Welfare Expenditure	(4) Non-welfare Expenditure
Direct democracy index	-0.164**	-0.028+	–	–
	[7.04]	[1.81]		
Signature requirement for optional legislative referendum	–	–	0.079**	-0.047**
			[4.60]	[4.85]
Signature requirement for legislative initiative	–	–	-0.091**	0.080**
			[3.02]	[5.47]
Fiscal decentralization	-1.181**	-2.066**	-1.385**	-2.016**
	[10.03]	[19.51]	[10.67]	[19.22]
Tax competition	-0.093+	-0.076+	-0.174*	0.000
	[1.91]	[1.87]	[2.59]	[0.01]
Fiscal constraints	-0.041**	-0.011	-0.017	-0.007
	[3.41]	[1.36]	[1.53]	[0.88]
Log of unconditional grants	0.021	0.153**	0.048	0.151**
	[0.43]	[4.47]	[0.89]	[4.59]
Number of parties in the cantonal government	-0.074**	0.014	-0.129**	0.011
	[4.24]	[0.89]	[8.00]	[0.82]
Net share of conservative parties in the government	-0.235**	0.165*	-0.119	0.148*
	[3.48]	[2.44]	[1.58]	[2.26]
Log of national income	0.273**	0.249*	0.513**	0.331**
	[2.64]	[2.55]	[3.91]	[4.04]
Urbanization	0.023+	-0.004	0.039*	-0.031**
	[1.86]	[0.36]	[2.30]	[2.85]
Log of population	-0.019	0.025	0.078**	0.044**
	[0.94]	[1.46]	[4.90]	[3.53]
Share of young population	-1.362**	-0.02	-1.122**	0.033
	[5.80]	[0.09]	[4.22]	[0.18]
Share of old population	0.442**	0.392**	0.718**	0.520**
	[3.25]	[3.10]	[4.55]	[5.15]
Dummy for French and Italian language	-0.018	0.008	0.307**	0.071+
	[0.30]	[0.15]	[6.47]	[1.66]
Constant	8.140**	3.833+	2.052	2.052
	[4.14]	[1.92]	[0.87]	[1.33]
Obs.	494	494	494	494
Adj. R^2	0.9200	0.8476	0.9073	0.8571
Jarque Bera test	28.3**	7.107*	25.48**	12.34**
F-test on inst. vars.	–	–	10.76**	19.05**

Notes: See Table 2

The results in *Table* 2 indicate that there are differential impacts by type of institution. On the one hand, a less costly available legislative initiative is associated with higher welfare spending, while lower costs to induce an optional legislative referendum rise non-welfare expenditures. These findings for the two law-making institutions of direct democracy are in line with the 'gas pedal' effect of the initiative reported in FELD and KIRCHGÄSSNER (2001). On the other hand, a spending lowering influence is observable for the initiative on non-welfare expenditures, and for the optional legislative referendum on outlays for welfare transfers. Thus, the two legislature-relating institutions appear to complement each other with respect to their direction of influence. As the F-statistics at the bottom of *Table* 2 indicate, both variables together significantly affect welfare or non-welfare spending without canceling each other out. The results for the optional legislative referendum and the legislative initiative are therefore in line with those obtained for the direct democracy index.

Table A6 in the Appendix contains the estimation results also including the different variables measuring the fiscal referendum. In both equations, the availability of the mandatory fiscal referendum has an unexpected positive sign, indicating that stronger popular rights on spending matters increase both, welfare and non-welfare spending at the Swiss cantonal and local levels (at least at the 5 percent level of significance). However, in line with the expectations, a stronger mandatory referendum as indicated by a lower per capita spending threshold is associated with lower levels of almost all investigated budget components (significant at the 1 percent level). Similarly, in cantons in which no mandatory fiscal referendum is available, the optional fiscal referendum exerts a significant spending lowering impact on all budget components under investigation. Overall, the impact of the fiscal referendum can thus not easily be assessed because of these countervailing effects.

Generally speaking, the model explains the variation in cantonal spending quite well, as the adjusted R^2's of 0.71 and higher indicate. The Jarque-Bera test on normality of the residuals rejects the null hypothesis in model (4). Results obtained for samples with outliers excluded (*Table* A4 of the Appendix) based on 2 standard deviations of the residuals reveal a qualitatively similar pattern with respect to the institutions of direct democracy as already observed in *Table* 2. Qualitatively, the results for the single institutions remain unchanged.

As second step in our analysis, the same model is employed to analyze cantonal budgets, neglecting the financial contribution of the local level. The results in *Table* 3 show that direct democracy is associated with lower levels of cantonal welfare and non-welfare expenditure.

As before, the coefficient of the direct democracy index is more than five times larger in the welfare spending regression than in the non-welfare spending regression, suggesting that in more direct democratic cantons a shrinking budget comes at the expense of the welfare state.[16] The Jarque-Bera test rejects the hypothesis of normally distributed residuals for regressions (1) and (2), but an analysis with outliers excluded yields a qualitatively identical pattern with respect to our variable of interest (see *Table* A5). Again, the coefficient of direct democracy is substantially larger for welfare than non-welfare spending. With values of 0.85 and above the adjusted R^2 indicates a good fit of the model to the data. Thus, it can be concluded that direct democratic institutions that are established at the cantonal level, restrains both *overall (cantonal and local)* as well as *cantonal* welfare and non-welfare spending.

Again, we have analyzed the impact of the single institutions of direct legislation on cantonal budgets replacing the composite index. As the results in columns (3) and (4) of *Table* 3 suggest, the optional legislative referendum, as the first instrument to influence the law-making process, increases cantonal non-welfare spending. The higher the signature requirement, and thus the less effective the legislative referendum could be, the lower is non-welfare spending and the higher is welfare spending. The legislative initiative, however, does not restrain welfare expenditure, but affects non-welfare spending negatively. Again, the legislative initiative and the optional legislative referendum appear as institutional complements with respect to non-welfare spending at the cantonal level corroborated by the F-statistics at the bottom of *Table* 3. This finding is in line with our results when the composite index is employed. In other words, controlling for the differences among direct democratic institutions of a canton, we observe that in more direct democratic cantons less welfare transfers per capita occur. While the adjusted R^2 indicates that more than 67% of the variance can be explained by the model, the Jarque-Bera statistics suggest that the results might be driven by outliers. However, excluding outliers based on 2 of the residual's standard deviations (*Table* A5), shows roughly qualitatively identical results.

In Appendix *Table* A6, the results including fiscal referendums are reported. Because the fiscal referendum is the most important variable affecting fiscal centralization in the Swiss cantons (FELD, SCHALTEGGER and SCHNELLENBACH 2007), the measure of fiscal decentralization has been omitted in order to demonstrate the pure effect of fiscal referendums on cantonal welfare and non-welfare spending. The availability of the mandatory fiscal referendum exerts a restraining impact on non-welfare spending, but not on welfare payments per capita.

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16. For the effect exerted by the remaining controlling variables the reader is advised to consult *Table* 3.

Equally, we observe a budget reducing effect of the financial threshold that becomes the more pronounced the lower the signature requirement is. In contrast, a stronger optional fiscal referendum restrains only welfare expenditure, while showing no relation with the remaining budget components.[17] Again, the fiscal referendum appears to serve as a 'fiscal break' to welfare transfers from the cantonal government in all Swiss cantons irrespective of whether it exists in its mandatory or its optional form. The findings for these institutions broadly corroborate the results reported in FELD and MATSUSAKA (2003), using a model specification that breaks the composite index up into additional components.

Comparing the findings across government tiers but within the identical budget category, direct democracy as measured by the Frey-Stutzer index is observed to lower spending per capita both across budget categories as well as across government tiers likewise. Equally, the effect of the optional legislative referendum and the legislative initiative appear qualitatively quite identical across government tiers, indicating that local expenses do not counterweight the institutional effects on the cantonal budget. In contrast, opposing effects of the mandatory fiscal referendum across government tiers are identified as, on the one hand, its availability dampens the cantonal budget, but, on the other hand, it increases expenditures of the combined cantonal and local budget. It might well be that direct democracy shifts spending from the cantonal government tier to the local level,[18] where an overcompensating effect occurs. An analogous argument might explain the heterogeneous impacts of the legislative initiative and the optional fiscal referendum within the same budget category across government tiers. More specifically, the estimation results for the statutory initiative suggest that it rises welfare expenditure at the local level.

5 The Impact of Direct Democracy on the Redistribution on Income

As contended above, lower levels of welfare spending do not necessarily imply that less income redistribution is achieved in direct democracies. If direct democracy has a more efficiently working government, these instruments may be more effectively targeted to the needy such that lower funds are necessary to achieve a specific level of income (re-) distribution. We therefore turn to the analysis of income distribution and redistribution as measured by Gini coefficients and their difference.

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17. This result justifies the omission of this institution from the study in FELD and MATSUSAKA (2003) which analysed only total cantonal expenditures.
18. This interpretation is in congruence with the observation that restraining the budget at a higher government tier triggers a spending shift to lower levels (FELD, SCHALTEGGER and SCHNELLENBACH 2007).

We use panel data on the share of taxpaying households and their incomes in different income classes for the period 1980 – 1997 from the Swiss Federal Tax Office that are aggregated at the cantonal level. FLÜCKIGER and ZARIN-NEJADAN (1994) use quite similar data for their analysis of the impact of macroeconomic policy on the income distribution in Switzerland. Since Swiss tax collection until recently has taken place on a biennial basis, the data set is a two years panel. Tax liability for periods t and t + 1 (taxation period) have been calculated on the basis of the average income of periods t – 1 and t – 2 (calculation period). After 1998, the Swiss cantons switched to annual tax collection, though not all at once, so that more recent data is not available yet. This is the reason why the final year used in the panel is 1997/98. Both pre-tax and post-tax distributions can only be approximated because the FTA data do not cover the true gross or taxable income, but are limited to the 'adjusted gross income' ('Reineinkommen')[19] and the actual tax payments. Therefore, we view the 'adjusted gross income' as proxy for gross income and calculate a hypothetical net income by deducing the tax payment from the 'adjusted gross income'. More specifically, information is given on the number of households in the different 'adjusted gross income' brackets and their (aggregated) tax payments. While thus the impact of cantonal the tax and transfer systems on all house-holds in one income bracket can be observed, no information on how the single household is affected is available, so that the calculated pre-tax and post-tax Gini coefficients are fairly rough measures of the actual cantonal income distribution. Between cantons there is consider-able variation in whether a person is entitled to financial support and how big the size of the actual transfer is. Some of these social transfers directly affect the gross income and the ad-justed gross income, some impact only the after-tax income of the needy households.[20] More specifically, the differences between the two Gini coefficients as a measure of the factual re-distribution, is calculated as:

$$\text{Ginidiff} = \text{abs}(\text{ginipost-ginipre}) = \text{ginipre - ginipost}^{[21]} \qquad (2)$$

The estimation method and the basic model to be estimated is the one already described in *Section* 4.[22] The estimation results are presented in *Tables* 4a and 4b, where the suffices 'a' and 'b' indicate whether the composite index of direct democracy or the single institutions of

19. For a more precise definition and description of the relation between gross income ('Reineinkommen') and taxable income according to the Swiss laws of taxation, see HÖHN and WALDBURGER, 2001, p. 358.

20. We thank E. LAUBER, tax inspector of the ESTV/FTA for clarification (personal speech, June 1, 2004).

21. For all cantons in all years, post-tax income distribution minus pre-tax distribution has a negative sign.

direct legislation have been employed. The first column contains the results for the pre-tax Gini coefficient (in percentage points), the second for income inequality after the government has redistributed income via taxes and transfers, while columns (3) and (4) contain the results for the effective income redistribution, analyzed both as unconditional and conditional on the pre-tax income distribution. In column (1), the direct democracy index is negatively associated with the pre-tax Gini coefficient, with significance at the 0.1% level. Consequently, in cantons with a higher degree of direct democracy, income distribution before the governments begin to redistribute income via taxes and further allowances is more equal. This observed impact may be possibly induced by welfare payments at the sub-federal level which already affect the (adjusted) gross income of Swiss households.

Among the governance structure determinants, fiscal decentralization does not appear to affect the pre-tax income distribution, while tax competition is associated with a more unequal distribution of income (at the 1 percent level). In contrast, fiscal constraints are significantly negatively related with inequality of the pre-tax income distribution. The two political determinants 'size of coalition in the cantonal government' and 'ideology of government' are not decisive for the pre-tax income distribution. Among the economic determinants, as expected, higher cantonal income is associated with more pronounced inequality, while federal transfers prove not influential. In contrast to expectations, urbanization is not associated with a particular income distribution, while income is more equally distributed in the less populous cantons. A larger share of older persons is related to a more equal income distribution, which might reflect the highly redistributive nature of the Swiss pension system. Income distribution is also negatively affected by the ratio of young residents, who to a large extent have not entered the labor market yet, and a more equal income distribution is also observed in French- or Italian-speaking cantons.[23]

The regression outcomes for the income distribution measured by post-tax Gini coefficients shows the same qualitative pattern of results (column (2) of *Table* 4a): With respect to our variable of interest, stronger popular rights appear to decrease post-tax income inequality (at the 0.1 percent level). For the remaining determinants we observe similar impacts on the post-tax income distribution as already detected for the pre-tax distribution (except for fiscal de-

22. Again, results of a similar model with the composite index estimated with IV, instrumenting fiscal decentralisation, government ideology and the pre-tax income distribution, is reported in FELD, FISCHER, and KIRCHGÄSSNER (2006). The estimates for the institutional variable are qualitatively identical.

23. The results are again robust to the inclusion of additional control variables, in particular the unemployment rate does again not prove to be significant in any of the regressions.

centralization which appears weakly inequality increasing, being in line with the hypothesis that decentralization limits income redistribution through the government).

Estimating the same model for the pre- and post-tax income distribution with the single institutions replacing the composite index reveals a pattern of influence that is in line with that obtained for the spending regressions (columns (1) and (2) of *Table* 4b). More specifically, an easier use of the legislative initiative is associated with higher pre- and post-tax income inequality, while a stronger optional legislative referendum is negatively linked to income inequality, corroborating the estimation results for the composite index. In addition to the effects observed in the composite index model, federal grants are now associated with higher income inequality, as are conservative government ideology, degree of urbanization as well as cantonal size in terms of population. In contrast, coalition governments as well as fiscal decentralization are now associated with a more equal income distribution reflecting the correlation between fiscal decentralization and direct democracy.

A look at the difference between pre- and post-tax income distributions indicates to what extent the closing of the gap in income inequality is due to the different variables in our model. Note that a positive (negative) sign in the difference equation in columns (3) and (4) means that a variable has a positive (negative) impact on the size of income redistribution, measured by the absolute difference between the pre- and the post-tax income inequalities. Thus, a positive (negative) sign indicates that more (less) income is redistributed and also implies that redistribution is more (less) equalizing because the direction of redistribution in all cantons is inequality decreasing. The estimation results in column (3) of *Table* 4a reveal that significantly less income redistribution occurs in direct democratic cantons if measured by the composite index (at the 0.1% level). The remaining variables show the same pattern of results as before in models (1) and (2), except for fiscal decentralization the coefficient of which is not significant. There is significantly less effective income redistribution in cantons with stronger fiscal constraints, with a higher share of senior or younger residents, in smaller cantons, and in the French- and Italian-speaking cantons. Wealthier cantons and cantons with a stronger tax competition engage more in redistribution activities. Column (3) of *Table* 4b reports the estimation results when the index is decomposed into its single components. Qualitatively identical results with respect to the institutional variables as observed in models (1) and (2) are obtained, with the legislative initiative triggering more effective redistribution and the optional legislative referendum lowering it.

Table 4a: Inequality and Redistribution, 1981 – 1997, 208 Observations
(Gini-Coefficients in Percentage Points)

	(1) Pre-Tax Gini-Coefficient	(2) Post-Tax Gini-Coefficient	(3) Difference	(4) Difference
Pre-Tax Gini-Coefficient	–	–	–	0.078**
				[28.71]
Direct democracy index	-2.041**	-1.888**	-0.152**	0.007
	[9.17]	[9.19]	[7.96]	[0.72]
Fiscal decentralization	2.812	2.696+	0.112	-0.108+
	[1.63]	[1.71]	[0.71]	[1.94]
Tax competition	1.892**	1.736**	0.156**	0.009
	[2.81]	[2.79]	[2.83]	[0.47]
Fiscal constraints	-0.492**	-0.449**	-0.043**	-0.004
	[4.34]	[4.30]	[4.38]	[1.07]
Log of unconditional grants	0.789	0.783	0.003	-0.058**
	[1.04]	[1.12]	[0.05]	[3.25]
Number of parties	-0.272	-0.256	-0.016	0.005
in the cantonal government	[1.16]	[1.18]	[0.80]	[0.66]
Net share of conservative	1.068	1.049	0.022	-0.062*
parties in the government	[0.97]	[1.04]	[0.23]	[2.15]
Log of national income	3.946*	3.612*	0.337*	0.029
	[2.08]	[2.06]	[2.13]	[0.55]
Urbanization	0.069	0.067	0.003	-0.003
	[0.37]	[0.39]	[0.17]	[0.62]
Log of population	-1.341**	-1.247**	-0.095**	0.01
	[4.14]	[4.19]	[3.43]	[0.97]
Share of young population	-9.807**	-9.025**	-0.786**	-0.021
	[3.15]	[3.15]	[3.09]	[0.23]
Share of old population	-9.090**	-8.234**	-0.860**	-0.151*
	[4.57]	[4.48]	[5.30]	[2.31]
Dummy for French	-3.283**	-2.992**	-0.290**	-0.033
and Italian language	[3.14]	[3.10]	[3.33]	[1.17]
Constant	69.940*	65.344*	4.621+	-0.875
	[2.13]	[2.15]	[1.76]	[0.92]
Obs.	208	208	208	208
Adj. R^2	0.6637	0.6633	0.6574	0.9596
Jarque Bera test	25.22**	5388**	10.5**	19.81**

For notes see *Table* 2.

It is most interesting to finally analyze the impact of the different variables on income redistribution *conditioned on* the pre-tax income distribution as reported in the fourth column of *Table* 4a. This method allows identification of those variables that affect income redistribution when it may be most needed to close the gap between the rich and the poor. As expected, a high pre-tax income inequality triggers more redistribution (significance at the 0.1 percent level). Again, the effect of direct democracy is very instructive: Conditioned on the pre-tax income distribution, cantons with direct democracy exhibit nearly the same amount of income redistribution as cantons with a more representative political system, as the insignificant coef-

ficient indicates.[24)] In column (4), most of the political and economic determinants prove insignificant, as their effect might be captured by the initial pre-tax income distribution. A less effective income redistribution is associated weakly with fiscal decentralization, but strongly with transfers from the federal government, the share of conservative parties in the government, and the share of the senior population. Overall, the model employing the composite index of direct democracy explains the variation in income distribution and redistribution quite well: At least 65% of the variance can be explained. The rejection of the null hypothesis of the Jarque-Bera test in models (1) through (4) might indicate the presence of potentially influential outliers. Estimation results when outliers are excluded (Appendix *Table* A7a) reveal no qualitative changes for the impact of Swiss direct democracy at the cantonal level.[25)]

Similar results are obtained if the composite index is replaced by measures pertaining to concrete institutions of direct democracy (column (4) *Table* 4b). As observed for the composite index, the previous significances break down when the measure of the initial income distribution is included, equally suggesting that in direct democratic cantons effective income redistribution conditional on the given pre-tax income inequality is only weakly affected. Neither the optional legislative referendum nor the legislative initiative have any significant effect on income redistribution if the initial income distribution is controlled for. Also, exclusion of outliers does not alter these findings substantially (Appendix *Table* A7b). When the variables capturing the fiscal referendum are also included (Appendix *Table* A8), a more diverse picture emerges with the mandatory referendum leading to less equal income distributions, to more income redistribution without controlling for the initial income distribution which breaks down when the latter is included. Its financial threshold corroborates these findings. The financial threshold for the optional fiscal referendum reveals opposite signs being in line with the effects of the optional legislative referendum and the direct democracy index.

Taking the results of *Tables 2, 3* and *4* together, the impact of direct democracy is very intriguing: There are significantly less funds in terms of welfare transfers (composite index and single institutions) available for income redistribution, and the estimation with the composite index shows that there is evidently less effective equalization of income inequality. But if the pre-tax income inequality is taken into account, income redistribution in direct democratic

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24. The inclusion of an interaction term between direct democracy and the initial income distribution did not change our estimation results. Both interaction term and political institution were (jointly) insignificant.
25. In addition, as robustness test the models have been estimated with each institution separately included. According to the results, in all cases qualitatively identical impacts in terms of direction of influence and significance levels can be observed.

cantons is as high as in all other cantons, or, as the results for the single institutions suggest, might even be higher than in more representative political systems. This supports the arguments that welfare payments in direct democratic cantons are better targeted than in more representative cantons: the available means are more effectively used in direct than in representative democratic cantons.

Table 4b: Inequality and Redistribution, 1981 – 1997, 208 Observations
(Gini-Coefficients in Percentage Points)

	(1) Pre-Tax Gini-Coefficient	(2) Post-Tax Gini-Coefficient	(3) Difference	(4) Difference
Pre-Tax Gini-Coefficient	–	–	–	0.077**
				[34.52]
Signature requirement for optional legislative referendum	0.682**	0.636**	0.045**	-0.007
	[4.27]	[4.30]	[3.57]	[1.37]
Signature requirement for legislative initiative	-1.416**	-1.306**	-0.110**	-0.001
	[5.35]	[5.33]	[5.25]	[0.16]
Fiscal decentralization	0.318	0.384	-0.071	-0.095*
	[0.20]	[0.26]	[0.52]	[2.26]
Tax competition	0.677	0.614	0.064	0.012
	[0.94]	[0.92]	[1.14]	[0.71]
Fiscal constraints	-0.14	-0.124	-0.015*	-0.005
	[1.64]	[1.57]	[2.18]	[1.53]
Log of unconditional grants	1.262+	1.218+	0.041	-0.056**
	[1.74]	[1.83]	[0.71]	[3.94]
Number of parties in the cantonal government	-0.923**	-0.858**	-0.064**	0.007
	[4.59]	[4.64]	[3.76]	[1.13]
Net share of conservative parties in the government	1.601	1.555+	0.049	-0.075**
	[1.59]	[1.68]	[0.60]	[3.01]
Log of national income	6.775**	6.233**	0.544**	0.022
	[4.02]	[4.01]	[3.94]	[0.51]
Urbanization	0.386+	0.358+	0.029+	-0.001
	[1.78]	[1.79]	[1.66]	[0.22]
Log of population	-0.214	-0.203	-0.013	0.004
	[0.91]	[0.94]	[0.64]	[0.65]
Share of young population	-6.619*	-6.074*	-0.550*	-0.04
	[2.19]	[2.18]	[2.26]	[0.59]
Share of old population	-5.488**	-4.903**	-0.589**	-0.167**
	[2.78]	[2.69]	[3.78]	[3.54]
Dummy for French and Italian language	1.528+	1.446+	0.084	-0.034+
	[1.83]	[1.88]	[1.21]	[1.85]
Constant	-5.416	-4.379	-0.989	-0.586
	[0.18]	[0.16]	[0.42]	[0.86]
Obs.	208	208	208	208
Adj. R^2	0.5831	0.5818	0.5951	0.9598
Jarque Bera test	78.41**	74.2**	105.4**	4.474
F-test on inst. vars.	17.84**	17.86**	15.43**	1.26

For notes see *Table* 2.

6 Concluding Remarks

Does direct democracy lead to less redistribution? Taking into account that it is associated with lower welfare expenditure, one might draw such a conclusion. That public welfare expenditure is somewhat lower might, however, not necessarily compromise redistribution. Because public expenditure could be better tailored to the needs of the electorate in direct democracies, given the amount of public welfare expenditure its redistributive effect might be larger than in purely representative systems. Taking these two countervailing effects into account, it is theoretically open which of them dominates.

Our results provide an interesting picture. Looking just at the differences between the income distributions before and after taxation, it is shown that direct democracy is negatively associated with redistribution. But taking into account that redistribution is needed the more unequal the pre-tax income distribution is, direct democracy looses its negative effect on redistribution completely. This indicates two things: first, efficiency gains are present in direct democracies when it comes to reducing income inequality; second, redistribution is the more effective the more the electorate assesses it as being justified by unequal starting conditions.

The results which are presented in this paper provide, however, only for a first step. Further analyses must follow. One obvious shortcoming of this study is that by using tax data those who do not pay taxes (and might be the poorest citizens in the society) are not included in our analysis. Another shortcoming of these tax data is that they are rather based on household than personal income and do not take into account the number of persons living in the same household. Finally, one should consider that we only deal with the cantonal and local level. On the other hand, a large part of redistribution is done by the federal level.[26] Moreover, the perhaps strongest redistributive part of the Swiss welfare state is the first pillar of the old age pension system (AHV) which is assigned to the federal level. It is much more redistributive as, e.g., the corresponding German pension system. Nevertheless, not only its introduction but also all of its revisions have finally been accepted in nationwide popular referenda. Thus, Switzerland with its direct democracy at all governmental levels can hardly be seen as an example where the welfare state is endangered by the existence of direct popular rights.

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26. See for this the corresponding estimates in KIRCHGÄSSNER and POMMEREHNE (1996) and FELD (2000).

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Appendix

Table A1: Descriptive Statistics for Cantonal Budget Sample, 494 observations

Variable	Mean	Std. Dev.	Min	Max
Public revenue (cantonal)	4125.71	1559.56	2264.18	10768.41
Log of	8.27	0.32	7.72	9.28
Public revenue (cantonal + local)	10344.57	2363.41	6766.88	18922.76
Log of	9.22	0.21	8.82	9.85
Public tax revenue (cantonal)	1916.15	1094.98	148.99	6119.94
Log of	7.45	0.44	5.00	8.72
Public tax revenue (cantonal + local)	3237.19	1006.91	1830.00	7340.00
Log of	8.04	0.27	7.51	8.90
Welfare expenditure (cantonal)	504.73	343.05	170.40	2003.27
Log of	6.05	0.56	5.14	7.60
Welfare expenditure (cantonal + local)	694.45	368.93	218.09	2226.95
Log of	6.42	0.48	5.38	7.71
Non-Welfare expenditure (cantonal)	3712.09	1397.95	2062.86	9130.56
Log of	8.16	0.32	7.63	9.12
Non-Welfare expenditure (cantonal + local)	9886.83	2321.66	6434.98	17203.38
Log of	9.17	0.22	8.77	9.75
Direct democracy	4.29	1.22	1.5	5.83
Mandatory fiscal referendum	0.72	0.45	0	1
Financial threshold for mand. ref.	6.17	9.85	0	42.72
Financial threshold for optional ref.	0.27	0.87	0	9.07
Signature requ. for legislative ref.	2.69	5.95	0	44.37
Signature requ. for statutory initiative	1.46	1.06	0.00	3.88
Fiscal decentralization	0.33	0.11	-0.01	0.49
Tax competition	-1.50	0.37	-2.30	-0.87
Fiscal constraints	0.37	1.08	0	4
Log of unconditional grants	6.07	0.33	5.41	7.18
Number of parties in the cantonal government	3.25	0.86	1	5
Net share of conservative parties in the government	-0.10	0.18	-0.6	0.4
Log of national income	10.68	0.20	10.32	11.44
Urbanization (log)	-1.79	1.46	-4.61	-0.01
Log of population	11.93	1.11	9.45	13.99
Share of young population (log)	3.30	0.14	2.85	3.58
Share of old population (log)	2.95	0.12	2.62	3.30
Dummy for French or Italian language	0.27	0.44	0	1

Table A2: Descriptive Statistics for Tax Data Regression Sample, 208 observations

Variable	Mean	Std. Dev.	Min	Max
Pre-tax Gini coefficient	30.18	2.53	24.12	39.49
Post-tax Gini coefficient	29.13	2.34	23.53	37.81
Difference in Gini coefficients	1.05	0.21	0.57	1.68
Direct democracy	4.30	1.22	1.5	5.83
Mandatory fiscal referendum	0.72	0.45	0	1
Financial threshold for mand. ref.	6.10	9.66	0	39.03074
Financial threshold for optional ref.	0.28	0.76	0	5.60587
Signature requ. For legislative ref.	2.63	4.85	0	35.43058
Signature requ. For statutory initiative	1.46	1.07	0.00	3.88
Fiscal decentralization	0.33	0.11	-0.01	0.49
Tax competition	-1.50	0.37	-2.30	-0.87
Fiscal constraints	0.37	1.08	0	4
Log of unconditional grants	6.05	0.32	5.45	7.13
Number of parties in the cantonal government	3.26	0.86	1	5
Net share of conservative parties in the government	-0.10	0.18	-0.6	0.4
Log of national income	10.68	0.20	10.33	11.40
Urbanization (log)	0.31	0.24	0.01	0.99
Log of population	11.92	1.11	9.46	13.98
Share of young population (log)	27.22	3.53	17.39	35.08
Share of old population (log)	19.26	2.44	13.90	26.95
Dummy for French or Italian language	0.27	0.44	0	1

Note: Values of the explanatory variables are two-year averages, following the biannual structure of the Tax data on which the Gini coefficients are based.

Table A3: Correlation of measures of direct democracy, 1980 - 1998

	Frey-Stutzer index	Mandatory fiscal referendum	Threshold mandatory fiscal referendum	Threshold optional fiscal referendum	Signature requirement optional legislative referendum	Signature requirement legislative initiative
Frey-Stutzer index	1					
Mandatory fiscal referendum	0.3007	1				
Threshold mandatory fiscal referendum	-0.2193	0.3942	1			
Threshold optional fiscal referendum	-0.4515	-0.7617	-0.3003	1		
Signature requirement optional legislative referendum	-0.6811	-0.1206	0.1711	0.2329	1	
Signature requirement legislative initiative	-0.7376	-0.1555	0.2537	0.2658	0.7788	1

Table A4: Cantonal and Local Welfare and Non-Welfare Expenditure per Capita, in logs, 1980 – 1998, Outliers Excluded

	(1) Welfare Expenditure	(2) Non-welfare Expenditure	(3) Welfare Expenditure	(4) Non-welfare Expenditure
Direct democracy index	-0.169**	-0.035*	–	–
Signature requirement for optional legislative referendum	–	–	0.080**	-0.045**
			[3.59]	[5.11]
Signature requirement for legislative initiative	–	–	-0.099**	0.072**
			[3.61]	[5.54]
Fiscal decentralization	0.049	-0.507**	-0.073	-0.449**
	[0.41]	[5.63]	[0.52]	[5.11]
Tax competition	-0.032	-0.076*	-0.04	0.002
	[0.59]	[2.15]	[0.68]	[0.04]
Fiscal constraints	-0.047**	-0.01	-0.029**	-0.002
	[4.72]	[1.32]	[2.91]	[0.27]
Log of unconditional grants	-0.004	0.180**	0.052	0.183**
	[0.08]	[5.96]	[1.05]	[6.33]
Number of parties in the cantonal government	0.043**	0.002	-0.026+	-0.001
	[2.63]	[0.18]	[1.66]	[0.08]
Net share of conservative parties in the government	-0.179*	0.102+	0.019	0.118*
	[2.26]	[1.68]	[0.23]	[2.04]
Log of national income	0.490**	0.228**	0.624**	0.327**
	[4.41]	[2.60]	[5.41]	[4.39]
Urbanization	0.021	-0.002	0.027+	-0.024*
	[1.63]	[0.17]	[1.81]	[2.44]
Log of population	-0.037	0.024	0.075**	0.045**
	[1.65]	[1.54]	[4.31]	[4.24]
Share of young population	-0.718**	-0.245	-0.556*	-0.125
	[2.77]	[1.27]	[2.13]	[0.74]
Share of old population	0.914**	0.408**	1.281**	0.598**
	[5.81]	[3.76]	[9.44]	[6.86]
Dummy for French and Italian language	-0.180**	0.006	0.184**	0.093**
	[2.69]	[0.13]	[3.48]	[2.65]
Constant	2.361	5.183**	-2.865	2.740+
	[1.03]	[2.90]	[1.35]	[1.95]
Obs.	473	474	475	472
Adj. R^2	0.8876	0.766	0.8783	0.7753
Jarque Bera test	3.259	7.008*	7.52**	11.38**
F-test on inst. vars.	–	–	8.915**	19.21**

For notes see Table 2

Table A5: Cantonal Welfare and Non-Welfare Expenditure per Capita, 1980 – 1998, in logs, Outliers Excluded

	(1) Welfare Expenditure	(2) Non-welfare Expenditure	(3) Welfare Expenditure	(4) Non-welfare Expenditure
Direct democracy index	-0.174**	-0.031*	–	–
	[8.61]	[2.15]		
Signature requirement for optional legislative referendum	–	–	0.088**	-0.048**
			[5.65]	[5.24]
Signature requirement for legislative initiative	–	–	-0.106**	0.075**
			[5.39]	[5.53]
Fiscal decentralization	-1.284**	-1.978**	-1.315**	-1.905**
	[13.21]	[21.13]	[12.66]	[20.65]
Tax competition	-0.119**	-0.080*	-0.167**	0.001
	[2.94]	[2.21]	[3.44]	[0.04]
Fiscal constraints	-0.031**	-0.009	-0.004	-0.005
	[3.48]	[1.25]	[0.49]	[0.68]
Log of unconditional grants	0.026	0.173**	0.109**	0.165**
	[0.73]	[5.52]	[3.13]	[5.49]
Number of parties in the cantonal government	-0.060**	0.011	-0.135**	0.009
	[4.07]	[0.77]	[10.63]	[0.72]
Net share of conservative parties in the government	-0.255**	0.153*	-0.077	0.168**
	[4.50]	[2.50]	[1.19]	[2.84]
Log of national income	0.259**	0.234*	0.359**	0.335**
	[3.19]	[2.57]	[4.39]	[4.37]
Urbanization	0.031**	-0.004	0.041**	-0.024*
	[3.00]	[0.37]	[3.43]	[2.48]
Log of population	-0.022	0.021	0.087**	0.040**
	[1.24]	[1.32]	[6.57]	[3.53]
Share of young population	-1.241**	-0.114	-1.255**	0.009
	[6.57]	[0.57]	[6.29]	[0.05]
Share of old population	0.405**	0.398**	0.692**	0.580**
	[3.64]	[3.48]	[6.30]	[6.37]
Dummy for French and Italian language	-0.039	0.002	0.308**	0.082*
	[0.74]	[0.04]	[7.71]	[2.21]
Constant	8.008**	4.205*	3.756*	1.857
	[4.93]	[2.26]	[2.34]	[1.28]
Obs.	464	474	459	477
Adj. R^2	0.9499	0.8832	0.9452	0.8828
Jarque Bera test	0.5896	6.341*	3.655	10.71**
F-test on inst. vars.	–	–	18.62**	20.01**

For notes see Table 2.

Table A6: Welfare and Non-Welfare Expenditure per Capita, in logs, 1980 – 1998, 494 Observations

	Cantonal and Local		Cantonal	
	(1)	(2)	(3)	(4)
	Welfare Expenditure	Non-welfare Expenditure	Welfare Expenditure	Non-welfare Expenditure
Mandatory fiscal referendum	0.409**	0.075*	-0.080	-0.334**
	[7.51]	[2.11]	[1.39]	[6.43]
Financial threshold for mandatory fiscal referendum	0.004**	0.003**	0.005**	0.010**
	[3.14]	[2.89]	[3.79]	[9.70]
Financial threshold for optional fiscal referendum	0.178**	0.031+	0.109**	-0.030
	[7.48]	[1.87]	[2.81]	[0.79]
Signature requirement for optional legislative referendum	0.100**	-0.035**	0.025	-0.102**
	[4.36]	[3.60]	[1.28]	[5.94]
Signature requirement for legislative initiative	-0.232**	0.047**	-0.011	0.185**
	[6.99]	[2.73]	[0.29]	[6.04]
Fiscal decentralization	-0.802**	-0.656**	–	–
	[5.42]	[5.33]		
Tax competition	-0.223**	-0.068	-0.13	-0.114
	[3.28]	[1.53]	[1.47]	[1.48]
Fiscal constraints	-0.052**	-0.008	0.012	0.054**
	[4.95]	[0.95]	[1.14]	[6.92]
Log of unconditional grants	-0.04	0.123**	0.033	0.128*
	[0.82]	[4.13]	[0.51]	[2.35]
Number of parties in the cantonal government	-0.033*	-0.005	-0.110**	0.038+
	[2.12]	[0.41]	[5.78]	[1.93]
Net share of conservative parties in the government	-0.158+	0.067	-0.164+	0.017
	[1.93]	[1.04]	[1.79]	[0.17]
Log of national income	0.950**	0.378**	0.522**	0.227
	[8.73]	[4.91]	[3.10]	[1.53]
Urbanization	0.096**	-0.018	-0.030+	-0.133**
	[5.82]	[1.57]	[1.67]	[6.68]
Log of population	0.073**	0.035*	0.004	-0.102**
	[3.40]	[2.56]	[0.15]	[4.92]
Share of young population	-0.375	-0.189	-1.696**	-1.283**
	[1.42]	[1.06]	[4.81]	[4.59]
Share of old population	0.910**	0.409**	0.859**	0.476**
	[5.09]	[4.08]	[3.97]	[2.69]
Dummy for French and Italian language	0.286**	0.068	0.297**	-0.061
	[5.33]	[1.47]	[4.31]	[0.73]
Constant	-5.357*	3.390*	3.753	8.443**
	[2.47]	[2.31]	[1.15]	[3.23]
Obs.	494	494	494	494
Adj. R^2	0.8996	0.7308	0.8815	0.6743
Jarque Bera test	1.662	17.6**	24.81**	75.21**
F-test on inst. vars.	30.74**	19.58**	7.75**	34.46**

For notes see Table 2

Table A7a: Inequality and Redistribution, 1981 – 1997, (Gini-Coefficients in Percentage Points) (Outliers Excluded)

	(1) Pre-Tax Gini-Coefficient	(2) Post-Tax Gini-Coefficient	(3) Difference	(4) Difference
Pre-Tax Gini-Coefficient				0.080**
				[39.36]
Direct democracy index	-2.032**	-1.880**	-0.155**	0.008
	[11.64]	[11.64]	[10.60]	[1.15]
Fiscal decentralization	4.327**	4.071**	0.232*	-0.128**
	[3.78]	[3.88]	[2.21]	[3.28]
Tax competition	1.919**	1.751**	0.170**	0.000
	[4.01]	[3.96]	[4.28]	[0.03]
Fiscal constraints	-0.444**	-0.405**	-0.041**	-0.003
	[5.35]	[5.30]	[5.67]	[0.81]
Log of unconditional grants	0.469	0.499	-0.026	-0.054**
	[1.03]	[1.20]	[0.67]	[3.97]
Number of parties	-0.351*	-0.324*	-0.023+	0.007
in the cantonal government	[2.21]	[2.22]	[1.67]	[1.42]
Net share of conservative	1.509*	1.435*	0.063	-0.060**
parties in the government	[2.22]	[2.30]	[1.12]	[2.74]
Log of national income	4.448**	4.048**	0.378**	0.021
	[3.39]	[3.34]	[3.59]	[0.54]
Urbanization	0.113	0.105	0.006	0.000
	[0.91]	[0.91]	[0.60]	[0.12]
Log of population	-1.509**	-1.400**	-0.105**	0.009
	[6.52]	[6.56]	[5.34]	[1.18]
Share of young population	-11.317**	-10.421**	-0.899**	-0.012
	[4.88]	[4.85]	[4.89]	[0.18]
Share of old population	-9.277**	-8.418**	-0.898**	-0.155**
	[6.33]	[6.20]	[7.84]	[3.11]
Dummy for French	-3.011**	-2.758**	-0.266**	-0.037+
and Italian language	[4.26]	[4.23]	[4.62]	[1.69]
Constant	75.665**	70.901**	5.164**	-0.842
	[3.00]	[3.03]	[2.69]	[1.16]
Obs.	202	202	202	199
Adj. R^2	0.756	0.7549	0.7548	0.968
Jarque Bera test	154.2**	150.1**	142.6**	1.708

For notes see Table 2.

Table A7b: Inequality and Redistribution, 1981 – 1997
(Gini-Coefficients in Percentage Points) (Outliers excluded)

	(1) Pre-Tax Gini-Coefficient	(2) Post-Tax Gini-Coefficient	(3) Difference	(4) Difference
Pre-Tax Gini-Coefficient				0.078**
				[37.64]
Signature requirement for op-	0.676**	0.631**	0.046**	-0.010+
tional legislative referendum	[4.32]	[4.34]	[3.78]	[1.91]
Signature requirement	-1.686**	-1.551**	-0.138**	-0.008
for legislative initiative	[8.33]	[8.24]	[8.43]	[1.09]
Fiscal decentralization	1.834	1.754	0.085	-0.080*
	[1.32]	[1.38]	[0.69]	[2.16]
Tax competition	0.506	0.449	0.067	0.004
	[0.76]	[0.73]	[1.27]	[0.30]
Fiscal constraints	-0.078	-0.068	-0.01	-0.003
	[1.03]	[0.96]	[1.52]	[0.90]
Log of unconditional grants	1.297*	1.264*	0.017	-0.049**
	[2.30]	[2.43]	[0.37]	[3.49]
Number of parties	-1.015**	-0.939**	-0.082**	0.009+
in the cantonal government	[6.03]	[6.08]	[5.68]	[1.75]
Net share of conservative	2.188*	2.076**	0.134+	-0.071**
parties in the government	[2.57]	[2.64]	[1.93]	[2.98]
Log of national income	6.865**	6.293**	0.570**	0.014
	[5.17]	[5.15]	[5.05]	[0.37]
Urbanization	0.520**	0.477**	0.049**	0.005
	[2.93]	[2.91]	[3.54]	[1.14]
Log of population	-0.372+	-0.344+	-0.032+	-0.002
	[1.86]	[1.87]	[1.85]	[0.38]
Share of young population	-8.545**	-7.841**	-0.742**	-0.057
	[3.34]	[3.33]	[3.44]	[0.91]
Share of old population	-5.894**	-5.284**	-0.635**	-0.181**
	[3.31]	[3.21]	[4.46]	[4.18]
Dummy for French	2.139**	1.990**	0.164**	-0.024
and Italian language	[3.39]	[3.44]	[2.99]	[1.42]
Constant	3.228	3.666	0.187	-0.403
	[0.13]	[0.16]	[0.09]	[0.66]
Obs.	201	201	203	200
Adj. R^2	0.6872	0.6846	0.7028	0.9683
Jarque Bera test	3.468	3.452	0.966	1.296
F-test on inst. vars.	26.35**	35.77**	35.99**	5.38**

For notes see Table 2.

Table A8: Inequality and Redistribution, 1981 – 1997, 208 Observations
(Gini-Coefficients in Percentage Points)

	(1) Pre-Tax Gini-Coefficient	(2) Post-Tax Gini-Coefficient	(3) Difference	(4) Difference
Pre-Tax Gini-Coefficient				0.075**
				[31.94]
Mandatory fiscal	2.987**	2.744**	0.244**	0.019
referendum	[5.50]	[5.48]	[5.35]	[1.09]
Financial threshold for man-	-0.071**	-0.064**	-0.007**	-0.002**
datory fiscal referendum	[4.99]	[4.89]	[5.68]	[3.09]
Financial threshold for	1.330**	1.215**	0.113**	0.013+
optional fiscal referendum	[4.93]	[4.88]	[5.11]	[1.79]
Signature requirement for op-	0.603**	0.567**	0.036**	-0.010+
tional legislative referendum	[3.92]	[3.96]	[2.97]	[1.70]
Signature requirement	-1.616**	-1.498**	-0.118**	0.003
for legislative initiative	[5.43]	[5.43]	[5.13]	[0.38]
Fiscal decentralization	-3.062+	-2.730+	-0.338*	-0.108*
	[1.75]	[1.69]	[2.35]	[2.53]
Tax competition	2.381**	2.148**	0.232**	0.053*
	[3.26]	[3.16]	[4.43]	[2.58]
Fiscal constraints	-0.440**	-0.398**	-0.042**	-0.008*
	[4.39]	[4.30]	[5.02]	[2.56]
Log of unconditional grants	1.828*	1.728*	0.098	-0.039**
	[2.29]	[2.34]	[1.53]	[2.64]
Number of parties	-0.921**	-0.858**	-0.064**	0.006
in the cantonal government	[4.89]	[4.94]	[4.15]	[1.01]
Net share of conservative	2.368*	2.239*	0.131+	-0.047+
parties in the government	[2.37]	[2.42]	[1.67]	[1.78]
Log of national income	7.534**	6.935**	0.600**	0.033
	[4.47]	[4.46]	[4.53]	[0.78]
Urbanization	0.631**	0.585**	0.047**	-0.001
	[3.34]	[3.35]	[3.09]	[0.12]
Log of population	0.481+	0.428+	0.052*	0.016*
	[1.81]	[1.75]	[2.31]	[2.36]
Share of young population	-2.259	-2.131	-0.136	0.034
	[0.77]	[0.79]	[0.60]	[0.50]
Share of old population	-4.385*	-3.940*	-0.452**	-0.122*
	[2.27]	[2.19]	[3.15]	[2.52]
Dummy for French	3.035**	2.820**	0.216**	-0.012
and Italian language	[4.18]	[4.20]	[3.71]	[0.57]
Constant	-40.536	-36.221	-4.248+	-1.197+
	[1.43]	[1.38]	[1.96]	[1.88]
Obs.	208	208	208	208
Adj. R^2	0.6351	0.6326	0.6565	0.9618
Jarque Bera test	142.8**	134.6**	134.6**	4.492
F-test on inst. vars.	24.56**	23.89**	26.46**	3.22**

For notes see Table 2.