

INSTITUTIONAL APPROACHES TO PUBLIC EXPENDITURE

Empirical evidence from Swiss municipalities

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1. Introduction

This paper has three goals:

- (1) To provide an *empirical comparison of the traditional regression approach* using average per capita income with the *median voter approach* to public expenditure.
- (2) To explicitly take account of the *institutional aspects* of collective decisions – showing that differences in institutions significantly affect outcomes.
- (3) To take account of the *ideological preferences of political parties* and the influence of *public bureaucracy* where the possibility of democratic influence on public expenditure is weaker.

The paper shows that the median voter model provides a better explanation of publicly supplied goods and services under appropriate institutional conditions than the traditional average approach. If those conditions do not obtain the median voter model must be modified to allow for the possibility that governments may pursue their own goals. Moreover, the influence of bureaucracy and interest groups may be so strong that completely different models may be needed.

Part 2 discusses the median voter approach. In part 3 it is shown how far the political process in Swiss municipalities conforms to this model. Part 4 tests the performance of the models for municipalities with different institutional set-ups. Part 5 develops propositions concerning the influence of government's ideological preferences and of public bureaucracy on expenditure in municipalities where the opportunity to exert democratic influence is weaker. The last part tests these propositions.

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2. The median voter model revisited

As shown by Black (1958, ch. 5), and generalized by Rae and Taylor (1971), the median voter is decisive under simple majority rule. If the tax system remains unchanged, or is determined independently of public expenditure decision, the median voter approach enables one to derive the income and (tax-) price elasticities of the demand for publicly supplied goods and services. In such estimates, the differing degrees of 'publicness' and their consequences for the voters/taxpayers financial burden must be accounted for. With a *pure* public good (in Samuelson's sense) one person's consumption does not exclude the consumption of others. Therefore, the larger the group financing the good, the smaller is, *ceteris paribus*, the individual tax share. In the case of an *impure* public good, the quantity perceived by the median voter decreases the more the number of users increases. If x_i is the (physical) quantity of a publicly supplied good i , n the number of users and x_i^{IN} the consumable quantity as individually perceived, we have¹

$$x_i^{IN} = x_i \cdot n^{-\delta} \quad (1)$$

Where δ is the degree of publicness of good i : in the case of a pure public good, $\delta = 0$; in the case of a pure private good $\delta = 1$.² The median voter's demand for individually consumable quantities of a publicly supplied good i (\hat{x}_i^{IN}) depends on his income (\hat{Y}), and his cost of acquiring the good, which in this case corresponds to the tax price (\hat{t}).³

Using a constant elasticity demand function:

$$\hat{x}_i^{IN} = k \cdot \hat{Y}^\alpha \cdot \hat{t}^\beta \quad (2)$$

¹See, e.g., Bergstrom and Goodman (1973, p. 282) and Borchering and Deacon (1972, p. 893). It should be added that this relationship implies non-discrimination, i.e. excludes regional or groupwise discrimination of the provision of publicly supplied goods. See, however, Denzau and Mackay (1976) as an attempt to take account of such limitations of usage.

² δ is assumed to be a technical characteristic of the publicly supplied good, i.e. it does not vary with x_i or n .

³The median voter's budget constraint is

$$\sum \bar{p}_m \cdot x_m + \hat{t} \cdot \bar{p}_{x_i} \cdot \hat{x}_i = \hat{Y}$$

where $\sum \bar{p}_m \cdot x_m$ is the value (price times quantity) of the goods traded in the market; \hat{t} his tax share (i.e. his relative contribution to the costs of production of the publicly supplied good); \bar{p}_{x_i} the unit cost of production (or 'price') of the good i , assumed to be constant. Substituting eq. (1) into this equation gives

$$\sum \bar{p}_m \cdot x_m + \hat{t} \cdot \bar{p}_{x_i} \cdot \hat{x}_i^{IN} \cdot n^\delta = \hat{Y}$$

The second term of the left hand side, $\hat{t} \cdot \bar{p}_{x_i} \cdot \hat{x}_i^{IN} \cdot n^\delta$, is the amount of income taxed away in order to finance the costs of producing the publicly supplied good. The 'tax price' is $\hat{t} = \hat{t} \cdot \bar{p}_{x_i} \cdot n^\delta$.

Given that a collective decision must be taken with respect to the quantity of the physical public good, x_i , the relevant demand function of the median voter is therefore:

$$\hat{x}_i = k \cdot \hat{Y}^\alpha \cdot \hat{p}^\beta \cdot n^\delta. \quad (3)$$

Multiplying by the unit price of the publicly provided good i ,⁴ the demand function usable for empirical estimation is

$$\ln E_{ij} = c + \alpha \ln \hat{Y}_j + \beta \ln \hat{t}_j + \gamma \ln n_j + \varepsilon_{ij}, \quad (4)$$

where E_{ij} stands for the public outlay (price times quantity) for the publicly supplied good i in the community j ,⁵ $c = \ln k$, α and β are the income and price elasticity of demand, respectively, \hat{t}_j is the median voter tax share, n_j is the number of Swiss and permanent foreign residential population, $\gamma = \delta(1 + \beta)$ is the elasticity of demand with respect to this group of users, and ε_{ij} is the error term.⁶

One straightforward way of testing the performance of the model corresponding to this equation would be to compare estimates reached with eq. (4) with those of the ad hoc public finance regression approach,⁷ which uses:

$$\ln E_{ij} = c' + \alpha' \ln \bar{Y}_j + \beta' \ln \bar{t}_j + \gamma' \ln n_j + \varepsilon'_{ij}, \quad (5)$$

where \bar{Y}_j and \bar{t}_j are average income and average tax share, respectively, and which reduces to

$$\ln E_{ij} = c^* + \alpha^* \ln \bar{Y}_j + \gamma^* \ln n_j + \varepsilon^*_{ij}, \quad (6)$$

where $\gamma^* = (\gamma' - \beta')$, because $\bar{t}_j = \bar{Y} / \sum_{i=1}^n Y_{ij} = 1/n$.

Using the same data set for all other variables, the estimation function derived from the theoretical model should – if properly applied – lead to results superior to the ‘estimation without theory’ which has so long dominated this field. Correct application requires that the institutional context be captured by the model in a satisfactory way.

⁴This is one possibility, e.g. Bergstrom and Goodman (1973): the unit of the publicly provided good is defined such that each unit is equal to the physical amount corresponding one Swiss Franc. Another possibility consists of starting from the same tax prices and to account for the different input prices (per unit of the same good) between the various communities (as done, e.g., by Borcherding and Deacon (1972).

⁵As the unitary price $\bar{p}_{x_{ij}}$ is assumed to be constant over units and communities, it no longer enters equation (4).

⁶Though the specification of this model does not put any restriction on the parameters to be estimated, in order to perform the standard statistical tests on the significance of the estimated coefficients, it seems useful to assume ε_{ij} to be normally distributed with zero mean and constant finite variance.

⁷For a survey on this literature see Wilensky (1970).

3. Institutions introduced

The Swiss municipalities dealt with were characterized by considerable differences in political institutions in the period considered (around 1970).⁸ Some (mostly small, up to 20,000 inhabitants) were *direct* democracies, while others operated as a *representative* democracy.

Initially one could expect that especially in *direct* democracies there is a close correspondence to the median voter model: Only a few people are required to hand in a petition over a certain issue for that issue to be brought before the local assembly (between 2% and, in only few cases, 20% of the electorate). Here, decisions are taken by simple majority rule. Motions may be modified from the floor. The tax system is largely predetermined as the most important local tax, the income tax, is a percentage addition to the respective cantonal tax which is in most cases slightly progressive. Under these circumstances, and because with each additional expenditure proposal the changes in the income tax rate must be determined simultaneously:

- (i) each voter/taxpayer is quite well informed about the implied change in his tax price;
- (ii) strategic voting can be excluded due to the predetermined tax system;
- (iii) logrolling or side-payments among voters seems unlikely, either because of the high costs involved, both for voters and political entrepreneurs, or because of the secret ballot, which is mandatory, even if only one voter wishes it.

If one takes a closer look, however, doubts arise as to whether such favorable conditions for the application of the median voter approach exist in *all* the direct democracies considered here. Such conditions only seem to exist in those democracies where the local assembly does not have the final say on an issue, this being given to the electorate in an obligatory ballot (*Urnenabstimmung*), including the case where rejected proposals modified by the local assembly are resubmitted. In this case, agendas and local assembly outcomes seem to be a fortiori less manipulated by the committee organizing the local assembly, the special interests of the members of this committee and of other interest groups, which are often intense and have a lot of time to spend in local assemblies.

By way of contrast, where there is no obligatory referendum, it may be the case that the preferences of the median voter are not the decisive ones. Because issues are discussed on a face to face basis among participants and the possibility of negotiation and agreement exists, a median position is less likely to evolve. This

⁸The following account is based on a survey of the 111 largest Swiss cities undertaken specifically for this paper as there was no comprehensive study available of the structure and functioning of Swiss political communities. Related studies dealing with the structure of political systems in Swiss municipalities are quoted in the appendix.

possibility is further enhanced by the existence of a small committee of residents who review the proposed budgets and motions and make recommendations to the local assembly. These recommendations could easily be the result of quite explicit logrolling and coalition building among the various interests in the committee.⁹ The only countervailing threat may be the existence of an optional referendum. However, this safeguard is restricted by the absolute number of the voters needed to launch it. Moreover, to do this each voter incurs time and other costs, in addition to which there is always the well known free-rider problem.

A similar, if not stronger movement away from the median voter's preference seems possible in municipalities operating under *representative* democracy. Decisions concerning publicly provided services are made by the government. This consists of a committee of (on average) three to four parties,¹⁰ which is elected every fourth year by direct vote. In some municipalities there is no obligatory referendum and even no conditional optional referendum (the initiation of which depends on the amount of the additional expenditure proposed). This gives considerable scope for decisions which are not in accordance with the median voter's wishes.¹¹

Other municipalities, however, have the obligatory referendum. Here, one would expect decisions to be closer to the median voter preference, particularly with repetitive referenda.¹²

In dealing with the relationship between institutional set-up and the outcome of collective decision-making, some testable hypotheses can be derived concerning the question of whether the median voter is, or is not, decisive:

- (1) It might be expected that the median voter model should perform relatively well for direct democracies, with both an obligatory and an optional referendum, but relatively badly in representative democracies where such institutions do not exist. For the two other groups of municipalities we might expect that the explanatory power of the median voter model lies somewhere between these two extremes. For which of these two groups the median voter approach performs better cannot be determined by a priori reasoning: while in direct democracies with only optional referendum there is a relatively low

⁹There is at present no study of Swiss municipalities dealing with this aspect of collective decision making; for an in depth study of local budgetary decisions in the U.S., see Jackson (1972).

¹⁰In Switzerland, there is a typical multi-party system. See, for example, Henig and Pinder (1969) and Girod (1964).

¹¹Peter Bernholz (personal communication) has argued that where there exists a high degree of loyalty to both political parties and interest groups the outcome may significantly diverge from the median voter preference. However, there exists no study dealing empirically with this question. Unfortunately, it would also be very difficult to conduct such an investigation. Furthermore, discussions with municipal officials indicated that there appeared to be some kind of 'loyalty-effect' in general elections - though this was generally weak. In local decisions this effect seems to be unimportant.

¹²Particular attention is given to this topic by several studies on municipal school expenditure in the U.S. - see Peterson (1973), Holcombe (1976) and Rubinfeld (1977).

pressure to take into account the preferences of the median voter, in representative democracies with obligatory and optional referendum the formal party structure facilitates logrolling and coalitions.

- (2) Income and price elasticities are expected to be much higher and of greater significance in democracies with referenda than in those without.
- (3) The median voter model leads to results superior to those of the traditional average model, especially in municipalities with an obligatory referendum.

4. Testing the median voter model

To test these hypotheses, the 110 largest Swiss cities were grouped according to whether (in 1968–72) they were direct democracies with (32 municipalities), or without (16 municipalities) an obligatory referendum and representative democracies with an obligatory and an optional referendum (35 municipalities) or no referendum provision at all (27 municipalities).¹³

The values of the independent variables; median voter income, median voter tax share and average income per capita of the residential population for the year 1970 are calculated on the basis of Federal Income Tax statistics and the Census for 1970.¹⁴ Data concerning public expenditure by functions (cash value of current and investment expenditure) were collected from official statistics. This deals with average yearly expenditures over the period 1968–72. The use of average values serves to exclude a possible bias, due for example to bulky investments. The estimations of equations (4) and (6) use the ordinary-least-square technique; this appears to be reasonable insofar as the publicly supplied goods can be classified as public.

Table 1 shows the estimation results for the *first two* hypotheses with *aggregate* public expenditure.¹⁵ These estimates point to the high performance of the median voter model. In all cases it explains over 80% of the variance of the endogenous variables. All income elasticities have the expected positive sign and all price elasticities the expected negative sign; with two exceptions all coefficients are statistically significant. A comparison of the residual variances of the error term with the *F*-test (using a two-tailed significance level of 5%) indicates significantly inferior results for representative democracies with no referendum compared to the other three groups of municipalities. There are, however, no significant differences in the goodness of fit of the median voter model between

¹³To be precise: the last category also includes two municipalities with only an optional referendum. The city of Basel is excluded because the municipal and cantonal government are identical. Another method of testing these hypotheses would be to include all democracies in one equation to fulfill the *ceteris paribus* conditions and to account for different institutional set-ups and the existence/nonexistence of referenda by introducing dummy variables. As the various institutions not only have level effects, and as different collective decision-making processes are conjectured, this approach does not seem to be adequate and is therefore not used.

¹⁴For sources and procedures used, see the appendix.

¹⁵The results for disaggregated spending categories will be discussed further below.

Table 1
 Performance of the median voter model in Swiss municipalities (direct and representative democracies with and without obligatory/optional referendum;
 aggregate municipal expenditure; average current and investment expenditure 1968-72).^a

	Demand elasticities with respect to					Residual variances
	Income	Tax share	Residential population	Intercept	R ²	
32 direct democracies with obligatory/optional referendum	1.386** (5.284)	-0.710** (-8.279)	0.242 (1.713)	-13.598	0.874	0.041
16 direct democracies with optional referendum	1.138** (3.416)	-0.769** (-4.973)	0.575* (2.362)	-12.120	0.899	0.046
35 representative democracies with oblig./optional referendum	0.983 (1.895)	-0.516** (-4.117)	0.622** (4.361)	-10.068	0.938	0.072
27 representative democracies with no referendum	0.409 (0.955)	-0.391* (-2.662)	0.566* (2.720)	-3.928	0.834	0.144

^aFigures in parentheses below the parameter estimates indicate the *t*-values. An asterisk indicates statistical significance at the 95% level, two asterisks at the 99% confidence level.

these latter groups. Comparison of the \bar{R}^2 gives a rank order of results which was not fully expected: the sample of representative democracies with an obligatory and optional referendum has the highest \bar{R}^2 . However, representative democracies with no referendum have the lowest \bar{R}^2 , as expected. Within the direct democracies, there seems to be no difference between both groups.

For the *second* hypothesis it is interesting to note that in both groups of direct democracies there are both large and highly significant coefficients for the income and price elasticity variables. In representative democracies both with and without referendum, these elasticity values are declining, even income elasticity is not significant.¹⁶

To test the *third* hypothesis concerning the explanatory power of the median voter model in democracies with an obligatory and an optional referendum with that of the traditional average model, eq. (6) was also estimated (see table 2).

As the *first* row within each category shows, the *pure* public finance regression approach also performs well: in the worst case 70% of the variance of aggregate public expenditure is explained. Comparing these results with those of the median voter model (*second* row within each category), however, in direct democracies, the pure traditional average model leads to significantly inferior estimates, whilst in representative democracies with no referenda it is only slightly worse.¹⁷

However, in eqs. (4) and (6), the median voter model depends on three independent variables, whereas for the pure traditional average model, there are only two. This could possibly explain the differences in performance, even if it were true that the *mean* consumer gets what he wants more often than the median voter.¹⁸

Two tests which might be subject to this criticism could be the following: as an alternative hypothesis to the median voter model, regressions are used in which (i) median income is replaced by mean income but the median tax share is also used, (ii) besides median income and median tax share together with mean income are used.

Following the *first* test proposed (table 2, *row* 3 within each category); the results show that the explanatory power of the modified average model increases in all groups of municipalities – compared with the estimates of the pure

¹⁶One might argue that in representative democracies, which are mostly the larger municipalities, the correlation between mean and median income will be close, while in direct democracies, mostly the smaller municipalities, one might expect a greater degree of variation in the relationship between mean and median income since a few extremely high incomes in the latter group would substantially raise the mean without significantly affecting the median. However, as the simple correlation between mean and median income shows ($r \approx 0.6$ for representative democracies; $r \approx 0.4$ for direct democracies) this objection is not really valid.

¹⁷Using the residual variance criterion, as discussed in Theil (1971, 543–545). As an approximation the *F*-test is used (two-tailed significance level of 5%). These general results do not change if additional (ecological) variables are included (e.g. the share of population of age 65 and over), to allow for the fact that a part of the population may have different tastes from the remainder.

¹⁸However, it should be noted that the random influences of the inclusion of additional exogenous variables are excluded, considering the \bar{R}^2 , i.e. corrected by the number of degrees of freedom.

Table 2
 Comparison of the performance of the traditional average model with the median voter model (direct and representative democracies with and without obligatory/optional referendum; aggregate municipal expenditure; average current and investment expenditure 1968-72).^a

Demand elasticities with respect to							
	Median income	Mean income	Median tax share	Residential population	Intercept	R ²	Residual variances
32 direct democracies with obligatory/optional referendum	1.	-	0.781** (3.802)	-	1.005** (7.841)	0.719	0.091
	2.	1.386** (5.284)	-	-0.710** (-8.279)	0.242 (1.713)	0.874	0.041
	3.	-	0.554** (3.310)	-0.358** (-3.968)	0.806** (6.949)	0.814	0.060
	4.	1.370** (3.599)	0.012 (0.059)	-0.705** (-5.757)	0.248 (1.362)	0.870	0.042
16 direct democracies with optional referendum	1.	-	0.472 (1.638)	-	1.485** (6.500)	0.753	0.113
	2.	1.138** (3.416)	-	-0.769** (-4.973)	0.575* (2.362)	0.899	0.046
	3.	-	0.457 (2.052)	-0.515** (-3.119)	1.044** (4.606)	0.852	0.067
	4.	1.074* (2.263)	0.052 (0.196)	-0.754** (-4.252)	0.597 (2.149)	0.890	0.050
35 representative democracies with obligatory/optional ref.	1.	-	0.680* (2.344)	-	1.146** (19.048)	0.919	0.093
	2.	0.983 (1.895)	-	-0.516** (-4.117)	0.622** (4.361)	0.938	0.072
	3.	-	0.596* (2.409)	-0.365** (-3.634)	0.767** (6.608)	0.941	0.067
	4.	0.014 (0.016)	0.591 (1.385)	-0.367* (-2.257)	0.765** (4.382)	0.939	0.070
27 representative democracies with no referendum	1.	-	1.022 (1.971)	-	1.039** (10.442)	0.817	0.159
	2.	0.409 (0.995)	-	-0.391* (-2.662)	0.566* (2.720)	0.834	0.144
	3.	-	0.943 (2.027)	-0.292* (-2.644)	0.646** (3.731)	0.853	0.127
	4.	-0.227 (-0.417)	1.116 (1.772)	-0.243 (-1.485)	0.695** (3.281)	0.848	0.132

^aFor notes see table 1.

traditional average model – but only in the representative democracies does it lead to results superior to those of the median voter model. If, following the *second* proposal, mean income is also included (*row 4* within each category), one can see that this suppresses the median income variable in representative democracies (without and with the referendum). In direct democracies this variable is clearly inferior to the median income.

The average degrees of ‘publicness’ δ are not given in table 2 because the two components from which they are derived, the tax price elasticities β and the demand elasticities with respect to the size of the user group γ , were not always statistically significant. Those values of δ which could be calculated from statistically significant parameters γ and β indicate that the degree of publicness is on average about one. This, together with the negative and often highly significant price elasticities, suggests that the publicly supplied goods and services were probably better classified as private, and not as public goods.

However, the ‘private’ characteristics of publicly supplied goods may raise serious objections to the results obtained thus far:

- (1) The specification of eq. (4) is not fully correct because if δ is really 1, then γ equals $1 + \beta$ and eq. (4) becomes

$$\ln \left(\frac{E_{ij}}{n_j} \right) = c + \alpha \ln \hat{Y}_j + \beta \ln (\hat{\tau}_j \cdot n_j) + \varepsilon_{ij}. \quad (7)$$

Estimating this, the hypothesis that δ is really 1 can be simply tested by using a likelihood-ratio test to see whether one gets a significantly better fit than is given by this special form if \hat{Y}_j , $\hat{\tau}_j$, and n_j are allowed to be the independent variables and E_{ij} is the dependent variable.

- (2) It seems also to be useful to estimate the correspondingly modified eq. (6), as

$$\ln \left(\frac{E_{ij}}{n_j} \right) = c^* + \alpha^* \ln \bar{Y}_j + \beta^* \ln (\hat{\tau}_j \cdot n_j) + \varepsilon_{ij}^*. \quad (8)$$

Where in this case – because $\bar{\tau} = 1/n$, $\bar{\tau} \cdot n$ would be a constant – the mean income tax share is replaced by the median income tax share. Comparing the results of eq. (7) and (8), it is possible to check the conclusions drawn so far from a somewhat different point of view: testing hypotheses one and two, it was assumed that the initial variances were the same over all groups of municipalities. This, however, is a rather strong assumption, and as the means and standard deviations of the aggregate expenditures show,¹⁹ this assumption seems unconfirmed. Thus, estimating eqs. (7) and (8), it seems

¹⁹For a comparison of the means and standard deviations of the aggregate expenditure (per capita) see the appendix.

possible to eliminate the influence on the initial variances caused by differences in the size of the municipalities.

Dealing with the *latter* point first: the results of the estimates of the median voter model (table 3, row 2 within each category) show that our first hypothesis (the better performance of this model in democracies with referendum) seems to be fulfilled, for even where there are much more similar initial variances there are significant differences in the fit of this model between various groups. Compared with the estimates for representative democracies with no referendum, the median voter approach provides better results for direct democracies with (at the 99 % level) and better results for those with no obligatory referendum (at the 95 % level). The results for representative democracies with referenda are only better at the 90 % level. Moreover, this general rank-ordering in the results now can also be seen in the rank order of the \bar{R}^2 . With respect to the third hypothesis (the relative performance of the median to the traditional average approach) one can see that for direct democracies with an obligatory referendum application of the median voter model leads to significantly better results than with the modified average model. This is also true for direct democracies with no obligatory referendum, whereas in representative democracies with referenda, the modified average model produces slightly better results.

Dealing with the *first* point (the question whether δ really equals 1), the results of tables 2 and 3 (row 2 within each category) are compared: There are neither significant differences between the respective residual variances in both tables, nor is there a better fit in the estimates comparing eq. (4) with eq. (7), applying the likelihood-ratio test.²⁰ Thus the assumption that δ equals 1, seems to be valid, at least for aggregate expenditure.

For individual expenditure areas there are, of course, different results, using for estimation the rearranged eq. (7), eq. (9):

$$\ln \left(\frac{E_{ij}}{n_j} \right) = c + \alpha \ln \hat{Y}_j + \beta \ln \hat{t}_j + \gamma^* \ln n_j + \varepsilon_{ij}, \quad (9)$$

where $\gamma^* = \gamma - 1$ and, thus, the degree of publicness $\delta = (\gamma^* + 1)/(1 + \beta)$. As can be calculated from the significant coefficients of β and γ^* in table 4, environmental protection and health seem to be the spending categories with the largest public good characteristics as perceived by the voter. The opposite seems to be true for municipal roads.

Moreover, these results again confirm the general conclusion drawn thus far that the median voter model – if adequately applied – performs well. The question is whether the estimates on the median voter model are indeed adequate for municipalities where the opportunity to exert democratic influence is weaker, or

²⁰At a 95 % level, this test is described in Theil (1971, pp. 98–100).

Table 3
 Comparison of the performance of the modified average model with the median voter model (direct and representative democracies with and without obligatory/optional referendum; aggregate municipal expenditure per capita residential population; average current and investment expenditure 1968-72).^a

		Demand elasticities with respect to						
		Median income	Mean income	Median tax share × population	Intercept	\bar{R}^2	R^2	Residual variances
32 direct democracies with obligatory/optional referendum	1.	—	0.613** (3.495)	-0.311** (-3.616)	-5.739	0.496	0.543	0.063
	2.	1.324** (6.016)	—	-0.707** (-8.387)	-13.093	0.681	0.711	0.040
16 direct democracies with optional referendum	1.	—	0.604 (2.141)	-0.447 (-2.106)	-5.688	0.271	0.408	0.113
	2.	1.486** (4.651)	—	-0.812** (-4.757)	-14.790	0.630	0.699	0.057
35 representative democracies with obligatory/optional ref.	1.	—	0.713* (2.703)	-0.384** (-3.543)	-6.618	0.354	0.409	0.079
	2.	1.218* (2.194)	—	-0.572** (-4.328)	-11.971	0.310	0.370	0.085
27 representative democracies with no referendum	1.	—	0.904 (1.986)	-0.265* (-2.637)	-8.611	0.259	0.341	0.124
	2.	0.395 (0.942)	—	-0.368* (-2.745)	-3.920	0.168	0.260	0.139

^aFor notes see table 1.

whether they are misspecified and must be appropriately modified – or even that a completely different politico economic model must be used. These possibilities are suggested when the results of the median voter approach are compared for the various forms of democracy: the demand for publicly supplied services reacts more strongly to changes in the tax price in direct, and to a somewhat lesser degree in representative democracies with obligatory and optional referenda than in representative democracies with no referendum. There is thus evidence in favor of the hypothesis advanced above that the citizens/voters in the last group of municipalities are more strongly separated from collective decisions than are voters in democracies with the referendum.

Our analysis has so far given some evidence for the influence of the institutional set-up on the collective decision-making process and on outcomes. The arguments are, however, presented negatively, i.e. it was not enquired *from whom* and in *what way* the options open for deviations from the voters' preferences are used. The next two parts of the paper offer some propositions concerning these questions and test them empirically.²¹

5. Public expenditure under weak democratic control

A simple explanatory model of public expenditure in democracies where the opportunity to exert democratic influence seems to be weaker, distinguishes three decision-makers: voters/taxpayers, government and public bureaucracy.

Voters/taxpayers are assumed to act, as assumed so far, as if they maximized their utility of consuming goods and services provided by both the market and the public. For that purpose they have in the case where neither an obligatory nor at least an optional referendum exist, only the means of voting for those candidates at the next election from whom they expect a preferred level of publicly supplied goods.

Government is also assumed to maximize utility, a major part of which consists of putting its ideological preferences into practice. However, municipal governments are composed of various parties in Switzerland. Thus, the question arises, how this could be done in a multi-party government.

If there exists an optional and an obligatory referendum it would indeed be difficult to put the ideological goals into practice, as it is often argued [e.g. Steiner (1970, ch. 1)] that the optional referendum is sufficient to strongly restrict the pursuit of ideological goals by a party coalition in power (even if there is only a *threat* of launching a referendum from the part of minority parties in government and opposition, as well as from organized interest groups).

The situation may be quite different if there exists *no* referendum at all. Then, parties' ideological preferences may be expected to exert a stronger influence on public expenditure.

²¹It is *not* argued that the following propositions would not also hold in direct democracies. The conjecture is that the problems are less severe in these cases.

Table 4

Performance of the median voter model (direct and representative democracies with and without obligatory/optional referendum; municipal expenditures per capita residential population by functions; average current and investment expenditure 1968-72).^a

	Demand elasticities with respect to					Residual variances	
	Median income	Median tax share	Residential population	Intercept	\bar{R}^2		
<i>General administration</i>							
32 direct democracies	1.387** (5.284)	-0.710** (-8.279)	-0.758** (-5.359)	-13.598	0.672	0.713	0.041
with oblig./opt. ref.	1.496* (2.603)	-0.462 (-1.868)	-0.462 (-1.101)	-17.340	0.270	0.452	0.137
16 direct democracies with optional referendum	0.113 (0.199)	-0.366* (-2.702)	-0.359* (-2.168)	-3.430	0.153	0.250	0.087
35 repres. democracies with oblig./opt. ref.	0.729 (1.584)	-0.241 (-1.527)	-0.360 (-1.610)	-9.195	0.017	0.134	0.166
27 repres. democracies with no referendum							
<i>Education, recreation, sports</i>							
32 direct democracies	0.869* (2.327)	-0.305* (-2.496)	-0.210 (-1.040)	-9.816	0.176	0.279	0.083
with oblig./opt. ref.	1.295** (4.699)	-0.395** (-3.087)	-0.103 (-0.513)	-14.598	0.740	0.805	0.032
16 direct democracies with optional referendum	-0.037 (-0.039)	-0.379 (-1.684)	-0.236 (-0.907)	-1.035	0.081	0.186	0.239
35 repres. democracies with oblig./opt. ref.	0.491 (0.808)	-0.369 (-1.772)	-0.427 (-1.450)	-5.947	0.024	0.127	0.290
27 repres. democracies with no referendum							
<i>Health, hospitals</i>							
32 direct democracies	3.934* (2.727)	-1.338** (-2.837)	-1.302 (-1.675)	-42.973	0.193	0.294	1.232
with oblig./opt. ref.	2.506 (1.656)	-2.430** (-3.462)	-1.133 (-1.025)	-32.150	0.478	0.609	0.953
16 direct democracies with optional referendum	2.738 (1.876)	-1.523** (-4.387)	-1.341** (-3.346)	-31.140	0.358	0.432	0.568
35 repres. democracies with oblig./opt. ref.	0.160 (0.101)	-1.388* (-2.543)	-1.646* (-2.131)	-4.738	0.183	0.304	1.990
27 repres. democracies with no referendum							

<i>Social assistance</i>									
32 direct democracies	1.287	-0.560*	-0.577	-15.201	0.064	0.181	0.309		
with oblig./opt. ref.	(1.780)	(-2.369)	(-1.482)						
16 direct democracies	0.627	-1.464**	-0.358	-11.643	0.437	0.578	0.436		
with optional referendum	(0.612)	(-3.082)	(-0.479)						
35 repres. democracies	-0.700	-0.197	0.172	3.427	0.494	0.552	0.114		
with oblig./opt. ref.	(-1.071)	(-1.265)	(0.956)						
27 repres. democracies	0.265	-0.540**	-0.527	-5.395	0.275	0.382	1.995		
with no referendum	(0.504)	(-2.990)	(-2.064)						
<i>Municipal roads</i>									
32 direct democracies	2.032**	-1.094**	-1.216**	-22.124	0.533	0.591	0.164		
with oblig./opt. ref.	(3.861)	(-6.358)	(-4.286)						
16 direct democracies	0.282	-0.345	0.094	-5.802	0.149	0.362	0.108		
with optional referendum	(0.551)	(-1.458)	(0.253)						
35 repres. democracies	2.294**	-0.732**	-0.613**	-25.239	0.553	0.604	0.075		
with oblig./opt. ref.	(4.339)	(-5.817)	(-4.224)						
27 repres. democracies	-0.198	-0.455*	-0.595*	0.495	0.239	0.352	0.209		
with no referendum	(-0.382)	(-2.570)	(-2.373)						
<i>Environmental protection</i>									
32 direct democracies	2.002**	-1.080**	-0.955**	-22.054	0.484	0.548	0.203		
with oblig./opt. ref.	(3.423)	(-5.647)	(-3.030)						
16 direct democracies	1.923**	-1.553**	-1.400**	-21.292	0.600	0.700	0.188		
with optional referendum	(2.857)	(-4.974)	(-2.847)						
35 repres. democracies	2.054*	-0.538*	-0.585*	-22.058	0.108	0.209	0.197		
with oblig./opt. ref.	(2.393)	(-2.632)	(-2.481)						
27 repres. democracies	0.695	-0.364	-0.313	-9.137	0.032	0.176	0.249		
with no referendum	(1.236)	(-1.884)	(-1.145)						
<i>Aggregate^b</i>									
32 direct democracies	1.386**	-0.710**	-0.758**	-13.598	0.672	0.713	0.041		
with oblig./opt. ref.	(5.284)	(-8.279)	(-5.559)						
16 direct democracies	1.138**	-0.769**	-0.425	-12.120	0.703	0.777	0.046		
with optional referendum	(3.416)	(-4.973)	(-1.748)						
35 repres. democracies	0.983	-0.516**	-0.378*	-10.067	0.415	0.482	0.072		
with oblig./opt. ref.	(1.895)	(-4.177)	(-2.656)						
27 repres. democracies	0.409	-0.391*	-0.434*	-3.928	0.138	0.266	0.138		
with no referendum	(0.955)	(-2.662)	(-2.089)						

^aFor notes see table 1.

^bAdditional including municipal expenditures for civil defense, police and fire protection and interest payments on public debt.

Moreover, if voters/taxpayers discount the past, then general elections are likely to play a more important role in municipalities with no referendum. It is therefore expected that in these democracies the length of time before election has an effect upon expenditure: except at election time there will be too large a share of specific benefit compared with general benefit expenditure items, and the budget size will generally be too large due to (and correlated with) the intensity with which party coalitions in power play negative-sum games with interest groups [see Davis and Meyer (1969)].

It is difficult to say whether *public bureaucracy* has a significant influence on public expenditure at the local level in Switzerland. It is rather small in number in the municipalities considered here (the average share of municipal employees in the local labor force is 7.2 percent) and it is often claimed that it is strongly controlled by elected governments. If bureaucracy has any influence, it is reasonable to assume that it is stronger in municipalities with no referendum. As recently suggested by Bush and Denzau,²² there are two reasons, connected with each other, why public sector employees may have an expansionary effect on public expenditure, even in cities with a referendum. Firstly, public sector employees (in contrast to pure voters/consumers) derive an additional benefit from an increase in public expenditure, be it in the form of nonpecuniary rents (e.g. an increase in prestige) or additional income, and/or they are in so far advantaged, as the goal of 'quiet life' may be pursued more easily. Secondly, the cost of collecting and processing information on the issues to be voted upon is very low for this group of persons and its productivity in dealing with political problems is very high compared with the rest of the population [see Frey (1972)]. These and other reasons may explain why members of the public sector often have a vote participation two to three times as large as the average of the rest of the electorate.²³ Assuming that public sector employees are located more or less randomly among the population, total demand for public expenditure will increase because each one demands more public outlays until the bureaucratic benefits from additional expenditure plus the marginal value of consumption of the publicly supplied services is smaller than additional taxes.

If there is the institution of referendum it may, however, be argued that the possibility of bureaucracy to influence public expenditure is reduced. In other words, bureaucracy's influence is the strongest in those municipalities in which – due to the *nonexistence* of referenda – it can directly determine public expenditure on the supply side.

This leads to a set of testable propositions concerning the influence of different institutional arrangements and decision-making groups on the expenditure decisions in representative democracies:

²²This proposition has originally been advanced by Tullock (1972); it is also discussed in Borcherding, Bush and Spann (1977).

²³For empirical evidence see the various studies (for the U.S., France and the U.K.) mentioned in Bush and Denzau (1977).

- (1) There is a presumption that in representative democracies with no referendum *parties' ideological preferences* are reflected more strongly in the composition of public expenditure than in democracies in which referenda are used.
- (2) The *time before an election* has a stronger effect upon the size and the structure of public expenditure in representative democracies with no referendum.
- (3) It is expected that in democracies with referenda in which municipal employees have a strong *voting power*, the level of public expenditure will be high (*ceteris paribus*). However, bureaucratic influence will be relatively stronger especially under those democratic arrangements which do not have a referendum.

6. Testing democracies under weak democratic control

To test these propositions, estimation equation (9) is modified in the following way:

$$\ln \left(\frac{E_{ij}}{n_j} \right) = c + \alpha \ln \hat{Y}_j + \beta \ln \hat{t}_j + \gamma^* \ln n_j + \rho_r IP_{r_j}^w + \eta TBE_j^{-1} + \varphi VPB_j + \varepsilon_j. \quad (10)$$

The variable $IP_{r_j}^w$ gives the weighted ideological preferences of the r th party group ($r_1 = \text{left-wing}$, $r_2 = \text{centre}$, $r_3 = \text{right-wing}$) in government in the j th municipality. The weights are the voting power of each party group (VPP_{r_j}) in the respective government committee, thus $IP_{r_j}^w = IP_{r_j} \cdot VPP_{r_j}$. TBE_j represents the 'time before election' which the government of municipality j , acting at the beginning of the period considered (here Jan. 1, 1970), has available before the next election. To account for the pressure on the government coalition to adjust to median voter demand, which is increasing the less time there is before the election, the reciprocal variable (TBE^{-1}) is used (thus that the expected sign is negative). VPB_j is the bureaucrat's voting power.

The dependent variable is public expenditure for 1970. If the average over the period 1968–72 were used (as above), there would be a bias in the measurement of TBE (because there are elections in-between) and of the IP -variables (if the party composition of the government changes).

The specification of the parties in government according to left-wing, centre and right-wing is described in the appendix. It is sufficient to point out some differences in the ideological preferences which are necessary to make proposition one operational. It may be argued²⁴ that in Switzerland:

²⁴The following characterization is based on an analysis of the major party programmes and on the literature of the Swiss party system; see, in particular, Masnata (1963), Gruner (1969), Steiner (1970) and Tschaeni (1969, ch. 5).

- (1) *Left-wing parties* advocate a general increase in public expenditure, compared to other parties. This applies particularly to expenditures in the areas of education, social assistance (especially individual and family assistance) though somewhat less for the support of economic groups. They are, on the other hand, somewhat against expenditures for roads.
- (2) *Right-wing parties* (in comparison) advocate expenditure restrictions; they are particularly against high expenditure for individual and family allowances, though for the support of economic groups.
- (3) The ideological preferences of the *centre parties* are difficult to evaluate. They are, on the whole, nearer to these of the right-wing parties'.

The Banzhaf voting power index is used as the weight for the parties in the municipalities' government committee. It measures to which extent a party group has power by being an *essential member* of a *distinct* minimal winning coalition. An essential member thus makes a coalition ineffective when it resigns or defects.²⁵

The voting power index of bureaucrats is computed as

$$VPB_j = \frac{VPR_{b_j}}{VPR_{b_j} + VPR_{nb_j}(1/g_j - 1)}$$

where the VPR 's are the voting participation rates of non-bureaucrats (VPR_{nb}) and bureaucrats (VPR_b) at local referenda and g_j is the percent of bureaucrats in the labor force.²⁶ Assuming the VPR_b are the same in all representative democracies ($VPR_{b_j} = 0.80$ for all j),²⁷ the values of VPB_j can be easily calculated from the overall average participation rate.

The estimation results for aggregate public expenditure in 1970 are given in *table 5* for both groups of democracies. The *first* row within each category presents the results where ideological preferences, time before election, and voting power of bureaucrats have been excluded. The following rows present the results when each of these variables is taken into account in turn, and the *last* row shows the influence of all variables taken together. In both groups of municipalities only the estimates for the left-wing and centre parties are given. This is because there is a higher correlation between the voting power index of the left-wing and right-wing coalitions ($r = -0.9$ in democracies with, $r = -0.7$ in democracies without referendum). According to row 2, *ideological preferences* do

²⁵Besides the Banzhaf index the Shubik-Shapley index, stressing the build-up of coalitions, has also been used [Shubik and Shapley (1954)], but it did not improve the results. For a discussion of these and further indices, see Brams (1975, ch. 5).

²⁶This formula is further discussed in Borcherding, Bush and Spann (1977, p. 219). The values of g relate to 1965 (as no more recent data are available). There is no reason to expect that this share had appreciably changed by 1970.

²⁷This assumption seems restrictive as VPR_b may differ among municipalities according to the size of the electorate, income and income distribution. It is introduced here as an extreme value.

not seem to be particularly important in both groups of democracy. The coefficients have (with one exception) the expected sign but they all are statistically insignificant.

The results for the various expenditure categories are more interesting than for the aggregate, as the total may look quite different in its structure. In the 35 municipalities with an obligatory and optional referendum the detailed analysis of expenditure categories²⁸ indicates, however, that governments dominated by left-wing parties spend only in one case, namely social assistance, significantly more. In municipalities with no referendum the coefficients and the *t*-values of the variables representing ideological preferences are larger, but none of the coefficients (which in most cases have the expected sign) is statistically significant. Thus, the ideological goals of Swiss parties may be not correctly specified, are very similar (which is often claimed), or they cannot be put into operation. In the second case the reason lies in the direct influence of the electorate on the executive, in the last case there must be some other reason.

A hint about what further influences may be present is provided by the estimates including the *TBE* variable (row 3 within each category). While there is no significant influence of *TBE* in the 35 municipalities with referendum both for total and disaggregated expenditure (though the coefficients have the correct sign), this variable is of much greater importance in municipalities without referendum, as expected. The explanatory power is almost twice as high as in the original equation. Municipalities in which government is near to the election date, *ceteris paribus*, have a significantly lower expenditure level than those in which the elections have just taken place. An analysis of individual expenditure categories shows that this applies to areas with investment characteristics (roads, with a 95 % level of security) as well as to education (again with a 95 % security level), but surprisingly also to expenditures on social assistance (at the 99 % level of security).

The expected positive influence of *public sector employees* on aggregate expenditure (row 4 in democracies with referendum) is confirmed by the empirical estimate, but the coefficient of the voting power index is statistically insignificant. Considering again individual expenditure categories, this variable is of larger influence in the education and health sector (in the latter case at the 99 % confidence level).

In municipalities with no referendum the respective voting power index of bureaucrats could, of course, not be calculated. There is another possibility to test the proposition that bureaucracy may have a larger influence on public expenditure in these municipalities. It may be expected that when public sector employees directly push for an increase in public sector employment and for pay increases – expenditure categories for which there are no ideological preferences

²⁸The estimation results for the individual expenditure categories are not reproduced here for reason of space. They may be obtained on request from the author.

Table 5
Performance of the modified median voter model (representative democracies with and without obligatory optional referendum; aggregate municipal expenditure per capita residential population 1970).^a

	Demand elasticities with respect to					Ideolog. preferences					Residual variances
	Median income	Median tax share	Residential population	Left wing	centre	TBE^{-1}	V/PB	Intercept	\bar{R}^2	R^2	
35 repres. democr. with oblig. optional referendum	1. 0.876 (1.642)	0.473** (-3.723)	-0.372* (-2.262)					-9.034	0.372	0.444	0.076
	2. 0.977 (1.757)	-0.490** (-3.740)	-0.338* (-2.262)	0.001 (0.781)	-0.003 (-0.415)			-10.108	0.348	0.460	0.079
	3. 0.859 (1.577)	-0.479** (-3.488)	-0.324* (-2.146)			-0.184 (-0.312)		-8.835	0.353	0.446	0.078
	4. 0.899 (1.652)	-0.469** (-3.631)	-0.334* (-2.243)				0.260 (0.392)	-9.259	0.354	0.447	0.078
	5. 1.077 (1.747)	-0.479** (-3.448)	-0.338* (-2.158)	0.001 (0.732)	-0.003 (-0.584)	-0.111 (-0.181)	0.448 (0.592)	-10.593	0.310	0.468	0.083
27 repres. democr. with no referendum	1. 0.438 (0.974)	-0.429* (-2.782)	-0.509* (-2.335)					-4.121	0.149	0.275	0.159
	2. 0.388 (0.833)	-0.388* (-2.394)	-0.396 (-1.595)	0.003 (1.099)	0.002 (0.523)			-3.982	0.119	0.315	0.164
	3. 0.468 (0.140)	-0.305* (-2.031)	-0.266 (-1.186)			-3.002* (-2.366)		-4.593	0.291	0.422	0.133
	4. 0.419 (0.992)	-0.263 (-1.681)	-0.149 (-0.600)	0.003 (1.242)	0.002 (0.568)	-3.022* (-2.357)		-4.468	0.276	0.464	0.135

^a† or notes see table 1.

on behalf of the government – they make an effort to realize the respective demands as soon as possible after general elections. It would be unwise to do so immediately before elections take place because the government is likely to strongly resist such demands. In other words, considering expenditure for wages and salaries (a part of the aggregate expenditure) in democracies with no referendum it is to be expected that the *TBE* variable grows in relevance relative to the (already quite high) importance in the respective equation in table 5 (see table 6). This presumption is supported by the evidence shown in table 6 (row 2 within each category). While the coefficient of the *TBE* variable is still insignificant in the 35 democracies with referenda, and the voting power index of bureaucrats (row 3) adds little to the explanatory power of the original equation (row 1),²⁹ in municipalities with no referendum the *TBE* variable has the expected larger influence than in table 5. This result, together with the observation that none of the income, price, and population elasticities is statistically significant, suggests that in those municipalities without the referendum institution, bureaucracy has a stronger influence.

Of interest are also the respective estimation results for the groups of direct democracies with and without an obligatory referendum. In the 32 direct democracies with an obligatory referendum there is no larger influence of the ideological preferences, *TBE*, or *VPB* in the aggregate nor (with two exceptions) in the individual expenditure categories. Only in the case of social assistance there is again a statistically significant (at the 95 % level of security) positive influence of the left-wing party coalitions. It is also worth noting that there is a positive and highly significant (at the 99 % confidence level) influence of *TBE* in the case of environmental protection. This suggests that inputs which are well visible for all are attributed a higher symbolic value by government.³⁰ In the 16 direct democracies with only optional referendum there is as expected on the whole a somewhat stronger influence of ideological preferences and of *TBE* than in those with obligatory referendum, but none of the coefficients is statistically significant. Bureaucracy's influence here seems to be quite unimportant.

7. Concluding remarks

The estimates using the demand-oriented median voter model are superior for democracies with referenda than for representative democracies with no referendum. In particular, they yield much superior results for direct democracies than the pure traditional average model.

This suggests the explicit inclusion of the collective decision-making process and of the institutional set-up to explain differences in local politics (as far as it is

²⁹The estimation results including ideology variables are not reproduced because the respective coefficients are again statistically insignificant.

³⁰See also Edelman (1972) who stresses this point in general.

Table 6
Performance of the modified median voter model (representative democracies with and without obligatory/optional referendum; municipal wages and salaries per capita residential population 1970).^a

		Demand elasticities with respect to								
		Median income	Median tax share	Residential population	TBE^{-1}	VPB	Intercept	\bar{R}^2	R^2	Residual variances
35 repres. dem. with oblig./opt. referendum	1.	0.715 (1.137)	-0.551** (-3.681)	-0.348* (-2.013)	-	-	-8.803	0.417	0.483	0.106
	2.	0.749 (1.169)	-0.570** (-3.650)	-0.363* (-2.044)	-0.346 (-0.499)	-	-9.177	0.402	0.488	0.108
	3.	0.786 (1.244)	-0.539** (-3.597)	-0.350* (-2.052)	-	0.819 (1.065)	-9.513	0.419	0.502	0.105
27 repres. dem. with no refer.	1.	0.361 (0.562)	-0.605* (-2.745)	-0.723* (-2.317)	-	-	-4.429	0.174	0.296	0.324
	2.	0.428 (0.905)	-0.332 (-1.918)	-0.485 (-0.718)	-6.619** (-4.590)	-	-5.471	0.553	0.175	0.636

^aFor notes see table 1.

reflected in public expenditure). In the case of representative democracies, especially those without any kind of referendum, politico-economic models should be developed which account for the government's reelection constraint and bureaucracy's direct influence. Cross-section analysis is only partially suited for this task. It seems to be more promising to use time-series analysis such as in the models of politico-economic cycles [see Frey, in this issue]. The influence of bureaucracy and interest groups may be so strong that models may be needed, which emphasize more the discretionary room and the supply side of the political process.

Appendix: Data sources and procedures

1. *Public expenditure* of Swiss municipalities according to various categories are taken from the statistics of the League of Swiss Cities (Statistik der Schweizer Staedte, Schweizerischer Staedteverband, Zurich), and consist, if not stated otherwise, of the average cash value of current and investment expenditures. The values indicated in the text (footnote 19) for the mean and standard deviation for aggregate expenditure (1968–72) are as shown below.

	Aggregate expenditure (in millions)		Aggregate expenditure per capita residential population (in thousands)	
	Mean	Standard dev.	Mean	Standard dev.
32 direct dem. with oblig./opt. referendum	15.929	8.763	1.267	0.499
16 direct dem. with optional referendum	14.371	8.129	1.244	0.472
35 repres. dem. with oblig./opt. referendum	69.878	166.523	1.306	0.426
27 repres. dem. with no referendum	29.100	48.413	1.263	0.438

2. The distribution of *personal income* among the households in 1970 (median and average) has been computed from the Federal Income Tax Statistics (Eidgenoessische Wehrsteuer 16. Periode: Natuerliche Personen, and, Eidgenoessische Wehrsteuer 16. Periode: Agglomerationen, both Eidgenoessische Steuerverwaltung, Berne, 1976) and from Census figures (Eidgenoessische Volkszaehlung 1970: Gemeinden, Eidgenoessisches Statistisches Amt, Berne, 1972) using a method developed by Noth (1975, p. 50 et seqq.). In order to take account of the distribution of households with no franchised member, all seasonal (foreign) workers, and the permanent resident foreigners (i.e. those holding a permanent residence) are excluded. As the

municipalities collect various kinds of receipts, which to a large extent have the character of an income flow – such as taxes paid by disfranchised persons, Cantonal taxes which accrue partially to the municipalities in proportions fixed by law, and the unconditional grants-in-aid transferred from the cantons to the municipalities – and because the median voter/taxpayer who is confronted with a slightly progressive income tax can take advantage thereof only to the extent of his share in the total income tax, these receipts are accordingly added to his income (after Federal and Cantonal income tax).³¹

3. The corresponding *median tax share* (tax-price) has been derived from official statistics (*Steuerbelastung in der Schweiz* 1970, and, *Finanzen und Steuern* 1970, both Eidgenössisches Statistisches Amt, Berne, 1971, 1972) and from unpublished data of the Federal Bureau of Taxation. It refers to the personal income tax share, because this tax represents the main fiscal source of Swiss municipalities.³² But, in addition, wealth and some minor, mostly proportional taxes, duties and fees are raised. All these receipts are assumed to be equally proportioned to the median voter as the directly allocated income tax.

4. Since there are but few studies and statistics on the *political system* of Swiss municipalities,³³ nearly all basic information has been computed by questionnaire. The grouping of the ideological preferences of the parties in government has been made according to classifications used in the literature [see, for example, Gruner, (1969, p. 73 et seqq.) and Tschaeni (1969, ch. 5 and 6)], i.e. it consists of a left-wing right-wing scale of the parties. These parties are by no means distributed equally across the municipalities. Some municipalities are dominated by one party, in others varying mixtures can be observed. On *average*, the government of a typical 1970 municipality was composed of members of three to four parties. There arises, however, a serious problem when the *national* classification scheme is used to derive the ideological preferences of the parties in government at the

³¹It is much more difficult to account for those grants-in-aid which besides an income effect also have a price effect [see Gramlich and Galper (1973)], e.g. when the higher levels contribute to the cost of the provision of certain local services. On the municipal level this is not unimportant in Switzerland [see Pommerehne (1977)], especially in the case of very small communities (which are left out of account here on purpose). For the municipalities studied in this paper there are so far no sufficiently detailed data available which would enable to include the effects of such grants-in-aid (in the aggregate, there was no significant effect in any of the four groups of municipalities).

³²It should be noted that the calculations of local tax shares (as well as of the median income after Federal and Cantonal tax) take into account tax exemptions, income tax deductions for married, the number of children and dependent persons in the household concerned, as well as insurance premiums.

³³There exist, however, some inquiries on the kind and structure of the political system on state and national level [cf. Codding, (1965) and Henig and Pinder (1969)]. But on the local level there are only a few studies referring moreover to selected municipalities [see for example, Steiner (1963)]. The best informations on the political system of Swiss municipalities are given by Rees (1969, p. 432 et seqq.) and Meylan, Gottraux and Dahinden (1972).

municipal level. The attitudes of the representatives of the same national party may deviate substantially from each other when we move from the central to the local level. For this reason, the literature quoted above is used and the ranking of the parties in some municipalities has been changed accordingly.

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