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Chapter 13

Politico-economic interdependence in a direct democracy: The case of Switzerland

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1. Introduction

This paper presents a theoretical model of the interaction between the economy and the policy in a direct democracy — Switzerland — and empirically tests the model for the postwar period. The authors' motivation is twofold. First, politico-economic interdependence is of great consequence in all modern societies, including Switzerland (Frey, 1978a, 1978b). As such, Switzerland constitutes a useful test case for the general theory. Secondly, as a direct democracy Switzerland is also unique. It is a challenging task to develop and quantify a theoretical model of a democratic political system which differs fundamentally from the usual form (representative democracy).

In modelling politico-economic interdependence in Switzerland we have combined two distinct types of models previously developed by the authors.

(a) Polito-metric studies of representative democracies having a macro orientation with the political sector restricted to the central government (in one case including the central bank) and using time series data. Models of this type have been developed for Australia, the Federal Republic of Germany, the United Kingdom, and the United States in particular (Schneider and Pommerehne, 1980; Frey and Schneider, 1978a, 1978b, 1979, 1981).

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2. General outline of the politico-economic model

2.1. The Swiss political system

Switzerland is one of the oldest democracies with a constitution dating back to 1848. Its political system has some peculiar characteristics not found in representative democracies.\(^1\) The two main differences that are relevant to a politico-economic model are as follows.

(a) The federal government consists of a council (Bundesrat) of seven members whose re-election is virtually guaranteed until they choose to resign of their own free will.\(^2\) Parliament (following the example of the United States) is composed of two houses, the Nationalrat (corresponding to the American House of Representatives) and the Staenderat (the Senate). Compared to representative democracies, parliament is not very important since most political battles are fought out through the referendum process. Consequently, there is little competition between the political parties and little difference in their ideologies, and the election and partisan composition of parliament have only minor consequences for political activity.

(b) Voters express their preferences mainly via referenda which may be brought up for a vote several times during the year. This institution

\(^1\) See, for example, Codd (1965). The typical features of the Swiss referendum system are contrasted to representative democracies in Stolz (1972a, 1972b).

\(^2\) In Switzerland’s history only one member of the Bundesrat has not been re-elected although he sought another term. It is common for federal councillors to stay in office for several four-year terms.
forms the real opposition that the government faces, as most important public decisions are subject to the voters' approval. Referenda are required when the government and parliament propose a change in the constitution; they are optional in the case of federal laws, i.e., held only when called for by 50,000 voters. One hundred thousand voter signatures may bring initiatives which then have to be decided on by the entire electorate. Women have been eligible to vote at the federal level since 1971.

The institution of referendum is often used, as may be seen from table 13.1. 271 referenda have been held since the present constitution came into existence 129 years ago (with 128 of them being accepted and the other 143 rejected). The frequency of referenda has, if anything, increased over the past few years: 1977, 14 referenda; 1976, 10; 1975, 9; 1974, 4; and 1973, 8. The average over this period was 9 referenda per year.

Swiss voter participation in referenda is quite low compared to that for parliamentary elections in representative democracies. In the last few years it has dropped to about 40 percent of the electorate, versus about 60 percent in the last century. This lower participation rate is at least partly due to the much higher frequency of voting events today.

This paper is exclusively concerned with political-economic interdependence at the federal level. The relationship at other levels of government must be left to a future paper.

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3 The population eligible to vote is about 3.8 million, i.e. a small proportion suffices to effect a referendum.

The Bundesrat may make a counterproposal (Gegenvorslag) of its own when an initiative is launched. This has happened in 18 of the cases considered here. Both proposals are offered to the electorate at the same time, and so we have not considered it in this paper as an independent referendum.
2.2. **Theory of government behavior**

Following the tradition of economic theory, we assume that government maximizes its utility, subject to constraints. The main goal of the members of the Bundesrat is a desire to minimize conflict. Since there are few ideological differences between the parties, pressure groups are relatively more active here than in representative democracies. They make their demands directly on the Bundesrat which then has to find solutions. Conflict is minimized by meeting as many of the demands made by interest groups and the public bureaucracy as possible, usually at the cost of the general consumer/taxpayer. If left to itself, the Bundesrat tends to increase public expenditure in order to satisfy these demands. The quiet life is also served by pursuing a steady policy without erratic fluctuations and changes in the structure of expenditures. This policy can, however, only be pursued within the limits set by three major types of constraints.

(a) **Political constraints.** The government must make sure that it has the voters' support for its actions. Referenda issues are usually closely identified with the government in the eyes of most voters, regardless of what the government's actual position on the issue may be. Voting "no" on a referendum is viewed by voters as an opportunity to indicate their discontent with the government and, moreover — as the government is a coalition of virtually all important parties — with the existing political system as a whole. Conversely, a large share of "yes" votes is interpreted by the government as indicating support. When too large a share of proposed referenda is voted down by the electorate within a certain time period, the government becomes aware of discontent in the population with its policies as well as with general political conditions. The Bundesrat is thus induced to pursue policies which receive an adequate level of support from the voters in order to maintain its position.\(^5\)

(b) **Economic and financial constraints.** The government is forced to act within the limits set by tax income and borrowing possibilities. The constitution formally limits the extent to which expenditures may exceed tax receipts (budget constraint). The balance of payments constraint (which is of great importance in some countries such as the United Kingdom) is not very important in Switzerland since the country has consistently had a surplus of foreign currency due to high receipts from

\(^5\) This does not hold for initiatives which generally propose legislation against the wishes of the government and the parliamentary majority. Very often parliament explicitly proposes to the electorate to reject the initiative, and brings forward its own proposition for a change in legislation (see footnote 4). For this reason, initiatives are not considered.
invisibles and capital inflows. The main problem instead has been how to keep away unwanted foreign capital.

(c) Legal constraints. A government's action is restricted by existing laws. Often considerable time is needed to change laws. This constraint also applies to public expenditures, a large share of which is based on legal or sometimes even constitutional provisions. The inflexibility of the legal structure is an additional factor contributing to the continuity of government policy.

In our model the government is confronted with a difficult dynamic optimization problem: namely, to maximize its utility subject to the various constraints. Being unable to solve it formally, it resorts to a satisficing strategy: it concentrates its attention on the most important constraint (the political one) and differentiates between two states of the world. When the Bundesrat feels that it is insufficiently supported by the voters (support deficit), it undertakes policies designed to increase its support. When it feels that its support from the electorate is above the minimum needed for long-term survival (support surplus), it can allow itself to serve its own utility, i.e. to lead a quiet, conflict-free life.

2.3. Theory of voting behavior

Voters are also assumed to be utility maximizers. They attach relatively great importance to the state of the economy. As their information and calculating capacity is limited, and as there is little incentive to incur high costs in order to make rational decisions, voters tend to blame the government when economic conditions worsen, and to support the government when economic conditions improve. It is therefore hypothesized that the better the state of the economy, the smaller the share of voters rejecting a referendum. This hypothesis is tested empirically in the next section.

3. Referendum function

The referendum function describes the influence of economic conditions on voting behavior as hypothesized above.

3.1. The estimation equation

The variable to be explained by the referendum function is the extent of the support received by the government. The Bundesrat realizes that its
policy is opposed by the electorate if the share of “yes” votes is small. The dependent variable is therefore defined as the percentage of “yes” votes among the total vote.

“Referenda” include obligatory and optional referenda, and cover all types of subjects. Government looks particularly hard at the support that it receives on the economic referenda that it proposes to help it shape guidelines for its future economic policies. Because of this special interest of government, we have estimated the equation for “economic” referenda alone to test whether the electorate reacts differently when economic problems are concerned.

The explanatory variables which are of central importance in politico-economic models belong to the macro-economic domain:

(i) the rate of increase in the consumer price index;
(ii) increase in real income, reflected by the real wage rate in industry and construction;
(iii) Tightness of the labor market, measured by the surplus of vacancies over jobs searched. It should be noted that there was virtually no unemployment in Switzerland up until the worldwide recession of 1974. Thereafter, unemployment has been exported by sending back foreign workers, so that the statistical rate of unemployment in Switzerland is extremely low. For these reasons, we can expect the state of the labor market to have little influence on referenda outcome.

In order to correctly capture the influence of economic factors on referenda outcomes, additional factors that may have an effect on the share of “yes” votes cast should be taken into account. Variables are introduced in order to account for the number of referenda issues passed on any particular voting weekend, and long-run sociological factors outside the realm of the present approach. For the sake of simplicity, the last is represented by a single time trend.

The estimation equation for the referendum function is thus:

\[ \text{YES}_t = \alpha_0 + \alpha_1 \text{PI}_{t-1} + \alpha_2 \text{WI}_{t-1} + \alpha_3 \text{TL}_{t-1} + \alpha_4 \text{RD}_t + \alpha_5 \text{T}_t + u_t. \]

The symbols are:

\( \text{YES}_t \) = share of “yes” votes, in percent, in time \( t \);
\( \text{PI}_{t-1} \) = percentage rate of increase in consumer price index over previous year;

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6 But see the adjustments made following table 13.2.
7 There are no quarterly series for national income in Switzerland.
8 It may be expected that the more issues there are to decide upon, the more citizens have an incentive to participate in the vote which may have an effect on the approval share if there is a systematic difference in preferences and behavior between the citizens according to their participation rate.
\( W_{t-1} \) = percentage rate of increase of real wage rate in industry and construction over previous year;
\( TL_{t-1} \) = tightness of labor market measured by number of vacancies minus number of jobs searched, in thousand persons;
\( RD_t \) = number of referenda issues per voting weekend;
\( T_t \) = time trend; and
\( u \) = random disturbance term.

The economic variables are assumed to affect voting with a time lag of one-quarter. The share of “yes” votes is expected to decrease when inflation is high (\( \alpha_1 < 0 \)) and to increase when real income grows (\( \alpha_2 > 0 \)) and the labor market becomes tighter (\( \alpha_3 > 0 \)).

No hypothesis is advanced concerning the influence of the number of referenda per election weekend on vote outcome (\( \alpha_4 \not= 0 \)). It is also not possible to hypothesize about the sign of the time trend (\( \alpha_5 \not= 0 \)) as it reflects a great number of unidentified variables.

### 3.2 Estimation results

The period covered extends from 1951 to 1976. During this time there were 116 referenda including such issues as the legalization of abortion and the abolition of a prohibition against Jesuit activity. Seventy-one referenda were economic in the broad sense (i.e., concerned with such things as construction, agriculture, and subsidies that have an economic effect although it may not be obvious at first glance). Thirty-eight issues were economic in the narrow sense (i.e., were issues concerned with economic policy such as the reform of federal finances, value-added tax, and price controls).

As the economic variables relate to specific quarters of the year, the referenda have been grouped by averaging the share of the “yes” vote in each quarter in which referenda were held. This reduced the number of referenda observations to 61 overall, with 40 widely and 25 narrowly economic. There is on average one observation every quarter; the maximum gap is one year. All the equations were estimated by OLS.

Table 13.2 gives the estimation results for the various types of referenda. Eqs. (1)–(3) show the influence of only macroeconomic variables. The estimates reported explain a high share of the variance in each equation (the corrected \( R^2 \) is between 0.60 and 0.70 and the individual economic variables have a statistically significant effect on the share of “yes” votes, with the expected signs).\(^9\) The Durbin–Watson coefficients (D.W.)

\(^9\) The economic variables are intercorrelated. In order to see the independent effect of each variable in the presence of multicollinearity, one of the economic
indicate that there is in general an absence of serial correlation. Eqs. (4)–(6) include the two noneconomic variables. The share of the variance explained increases slightly, and the ecological variables exert a statistically significant effect on "yes" votes — the more referenda there are per weekend, the higher the approval share, and there is a downward trend of approval over time. There is thus some indication that the electorate's support for the established political system has been slowly eroding over the past 25 years.

The economic variables show the theoretically expected effects. The estimates confirm that price increases reduce ($\hat{a}_1 < 0$), and growth in the real wage rate and in the net number of job vacancies increase ($\hat{a}_2 > 0$, $\hat{a}_3 > 0$) the share of "yes" votes cast in all types of referenda. A 1 percent increase in the rate of inflation tends, ceteris paribus, to decrease the share of "yes" votes marginally by somewhat more than 4 percentage points; a 1 percent increase in the real wage rate (real income) tends to increase the approval rate by somewhat more than 3 percentage points; and an increase in net vacancies by 1,000 increases the approval rate by about 0.5 of a percentage point. Unlike popularity and vote function studies (Frey, 1978b), the conditions in the labor market have little effect on the citizens' political behavior in Switzerland, for the reasons mentioned above. It should, in particular, be noted that the rate of inflation has a sizeable marginal effect on the approval share.

Comparing eq. (4) with eq. (6), there is some indication that economic variables have a somewhat stronger effect on vote outcome in narrowly economic than in other referenda. This is particularly true for inflation and labor market tightness. In the period from 1950 to the mid-1960s, Switzerland was characterized by regular development with very low inflation and no unemployment. The rate of inflation gradually rose thereafter, reaching an unprecedented high of 10 percent in 1974. It is therefore useful to investigate whether the choice of estimation period affects the results reported so far (see table 13.3).

Variables was excluded sequentially and the other two economic variables were retained. The coefficients remained quite stable indicating that multicollinearity does not constitute a serious problem.

10 The average yearly value of the economic variables was:

<table>
<thead>
<tr>
<th></th>
<th>Price increase (%)</th>
<th>Rate of increase in real wage rate (%)</th>
<th>Labor market tightness (thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950–64</td>
<td>1.62</td>
<td>0.82</td>
<td>0.91</td>
</tr>
<tr>
<td>1965–75</td>
<td>6.39</td>
<td>1.15</td>
<td>83.97</td>
</tr>
</tbody>
</table>
Table 13.2
Referendum function for Switzerland, 1951–76 (quarterly).

<table>
<thead>
<tr>
<th>Eq.</th>
<th>Referenda concerned</th>
<th>Constant</th>
<th>Economic variables</th>
<th>Number of referenda per day</th>
<th>Time trend</th>
<th>Test statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$\alpha_0$</td>
<td>$\alpha_1$</td>
<td>$\alpha_2$</td>
<td>$\alpha_3$</td>
<td>$\alpha_4$</td>
</tr>
<tr>
<td>(1)</td>
<td>All</td>
<td>34.9</td>
<td>-4.02&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.02&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.55&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Economic (wide)</td>
<td>36.47</td>
<td>-4.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.07&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.55</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Economic (narrow)</td>
<td>38.52</td>
<td>-4.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.24&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.59&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>(4)</td>
<td>All</td>
<td>30.41</td>
<td>-4.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.55&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.38&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Economic (wide)</td>
<td>33.54</td>
<td>-4.12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.10&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.56&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.41&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Economic (narrow)</td>
<td>38.47</td>
<td>-4.65&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.29&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.61&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.42&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note: The figures in parentheses below the coefficients indicate the t-values. $R^2$ is the $R^2$ corrected for the degrees of freedom. Parameters with a subscript a or b indicate coefficients that are statistically significantly different from zero at the 99 and 95 percent level of significance, respectively.
Table 13.3

<table>
<thead>
<tr>
<th>Eq.</th>
<th>Referenda concerned</th>
<th>Constant</th>
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<th>Time trend</th>
<th>Test statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Price increase (%)</td>
<td>Rate of increase in real wage rate (%)</td>
<td>Labor market tightness (vacancies-job searchers) (thousand)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\alpha_0$</td>
<td>$\alpha_1$</td>
<td>$\alpha_2$</td>
<td>$\alpha_3$</td>
<td>$\alpha_4$</td>
</tr>
<tr>
<td>Period 1951–64</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td>All</td>
<td>36.21</td>
<td>-2.10&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.14</td>
<td>0.48&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.41&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>(Economic wide)</td>
<td>37.53</td>
<td>-2.13&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.17</td>
<td>0.49&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.42&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>(Economic narrow)</td>
<td>40.96</td>
<td>-2.22&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.21</td>
<td>0.52</td>
<td>0.42&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Period 1965–76</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10)</td>
<td>All</td>
<td>45.74</td>
<td>-4.56&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.68&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.35&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>(Economic wide)</td>
<td>47.16</td>
<td>-4.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.70&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.37&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>(Economic narrow)</td>
<td>50.43</td>
<td>-4.72&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.73&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.38</td>
</tr>
</tbody>
</table>

For notes see Table 13.2.
The first set of equations (7)–(9) shows the estimates for 1951–64. They statistically explain about half the variance. The estimates for the second period, 1965–76, are able to explain a much higher share of the variance with the corrected $R^2$ above 0.70 in each case. The reason for the improved performance of the referendum function may be the increased importance attached to economic conditions by the electorate. All the economic variables have a much larger effect and greater statistical significance in the second period. In the case of all referenda [eqs. (7) and (10)], the impact of price increases rises from -2.10 to -4.56, i.e. more than double; that of real wage rate increases, from 1.14 to 3.51, i.e. more than triples; and that of net vacancies, increases from 0.48 to 0.68. It should also be noted that the same applies to the variables relating to the time trend, but not for the influence of the number of referenda per weekend.

To summarize: the referendum function developed is well able to explain (in a statistical sense) voting outcomes in Switzerland, and particularly in the period since the mid-1960s and for narrowly defined economic issues. The main macroeconomic variables have a strong and significant effect on the share of “yes” votes cast, with inflation having a negative and the growth of real income and net vacancies a positive effect. Price increases have quantitatively the largest effect on the electorate’s support for the established political system as represented by the Bundesrat. Eq. (6) in table 13.2 suggests, for example, that a 1 percent increase in the rate of inflation, $ceteris$ paribus, decreases the share of “yes” votes in narrowly economic referenda by 4.65 percentage points, while a 1 percent increase in real wage rates increases it by 3.29 percentage points and an increase in net vacancies of 1,000 increases it by 0.61 percentage points.

The dominant importance attached by Swiss voters to price stability suggests a reformulation of the referendum function. Some of the referenda issues are specifically concerned with laying the legal foundations of anti-inflation policy. Voters concerned about price stability may be expected to welcome such propositions. It may therefore be hypothesized that the higher inflation, the higher the share of the “yes” vote for such issues. The expected reaction is therefore just the opposite of what is hypothesized for the other issues. Owing to the small number of observations concerning anti-inflation referenda (there are only nine cases falling in this category), it is not possible to directly test the proposition. There are, however, two indirect ways to take account of the direct voting behavior concerning anti-inflation issues. The first is to test the referendum function excluding the anti-inflation issues. The second — and somewhat problematic — approach is to interpret a “yes” vote on an anti-inflation issue in the same way as a “no” vote on an ordinary issue. Accordingly, a “no” vote on anti-inflation is counted as, and added to, the “yes” vote
Table 13.4
Referendum function for Switzerland (quarterly). Test of the influence of anti-inflation issues, 1951–76.

<table>
<thead>
<tr>
<th>Eq.</th>
<th>Referenda concerned</th>
<th>Constant</th>
<th>Economic variables</th>
<th>Number of referenda per day</th>
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<td>Price increase (%)</td>
<td>Rate of increase in real wage rate (%)</td>
<td>Labor market tightness (vacancies-job seekers) (thousand)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( \alpha_0 )</td>
<td>( \alpha_1 )</td>
<td>( \alpha_2 )</td>
<td>( \alpha_3 )</td>
</tr>
<tr>
<td>(13)</td>
<td>All</td>
<td>31.84</td>
<td>-3.51&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.58&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.63&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.41&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(14)</td>
<td>Economic (wide)</td>
<td>39.51</td>
<td>-3.60&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.64&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.64&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.43&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(15)</td>
<td>Economic (narrow)</td>
<td>46.32</td>
<td>-3.92&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.01&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.67&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.44&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(16)</td>
<td>All</td>
<td>33.55</td>
<td>-3.40&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.47&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.62&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.41&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(17)</td>
<td>Economic (wide)</td>
<td>37.43</td>
<td>-3.46&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.64&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.63&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.42&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(18)</td>
<td>Economic (narrow)</td>
<td>43.57</td>
<td>-3.70&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.71&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.64&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.43&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Anti-inflation issues excluded

"No"-votes on anti-inflation issues counted as "yes"

For notes see table 13.2.
on ordinary issues because when the rate of inflation increases, both are expected to decrease. The estimates are given in table 13.4.

A comparison with table 13.2 shows that the results are in both cases changed little. The $R^2$ remains high and the various parameters referring to the influence of economic and noneconomic variables in general remain statistically significant. The size of the influence of inflation falls somewhat, being closer to $-3.5$ compared to about $-4$ in table 13.2; and the same is true for the effect of real wages (about $-2.5$ compared to $-3$ in table 13.2). The influence of labor market tightness rises somewhat. It may be concluded that the problem referred to above does not change the results obtained in table 13.2.

4. The government’s policy function

4.1. Estimation equation

The policy function describes the government’s economic activity, in particular public expenditures ($EXP$). As stated above, the present model is restricted to the federal level in Switzerland. The dependent variable is federal nominal expenditure for goods, services, and transfers first taken in the aggregate and then broken down into the following categories:

- general administration,
- administration, justice, police,
- defense,
- education, research, development,
- health,
- social welfare, and
- roads.

All these expenditure items, except the first, include transfers for the same purposes to lower level federal units, in particular to cantons.

There are three types of explanatory variables:

(a) Political determinants, reflected by the support deficit or surplus. A support deficit, $DEF$, is defined as occurring when the share of “yes” votes fails to reach a specified limit given by $YES^*$. It is assumed that the Bundesrat feels that its level of support is too low if a referendum is accepted by less than 50 percent of the voters participating. This condition is indicated by a dummy variable $D$ with the value 1 when the government faces a deficit in support and 0 otherwise. It is also expected that the size of the deficit has an impact upon expenditure. Thus

$$DEF = (YES^* - YES) \cdot D,$$

with $YES \leq YES^*$, $D = 1$, and $YES^*$ is 50 percent (of the citizens participating in the vote).
A support surplus, \( SUR \), is accordingly defined by
\[
SUR = (YES - YES^*) \cdot (1 - D),
\]
with \( YES > YES^* \) and \( D = 0 \).
Both \( DEF \) and \( SUR \) are assumed to affect expenditure with a lag of one year.
(b) The budget constraint is indicated by the level of tax receipts, with a lag of one year (\( TAX_{t-1} \)).
(c) The administrative and legal constraints are taken into account by including the previous year's expenditure level among the determinants of nominal expenditures (\( EXP_{t-1} \)).
The estimation equation for the policy function thus reads:
\[
EXP_t = \beta_0 + \beta_1 \cdot SUR_{t-1} + \beta_2 \cdot DEF_{t-1} + \beta_3 \cdot TAX_{t-1} + \beta_4 \cdot EXP_{t-1} + \epsilon_t.
\]
The government is expected to increase expenditures when it enjoys support surplus (\( \beta_1 > 0 \), as \( SUR = (YES - YES^*) \cdot D > 0 \)), and to decrease expenditures when it suffers a support deficit (\( \beta_2 < 0 \), as \( DEF = (YES^* - YES) \cdot (1 - D) > 0 \)), for the reasons given above. \( \beta_3 \) and \( \beta_4 \) are, of course, \textit{a priori} expected to have a positive sign.

4.2. Estimation results
Table 3.5 presents the estimates of the policy function shown above for yearly data\(^{11}\) covering the period 1951–74. Both the overall expenditure — eq. (19) — and components of it [eqs. (20)–(26)] perform well. 89–99 percent of the variance is explained and the \( t \)-test indicates an absence of serial correlation. The basic hypotheses are clearly confirmed. In a state of support surplus (\( D = 1 \)), the Bundesrat, \textit{ceteris paribus}, tends to increase expenditures (\( \beta_1 > 0 \)). In a state of support deficit, i.e. when the political constraint on behavior is binding (\( D = 0 \)), the Bundesrat, \textit{ceteris paribus}, tends to follow a restrictive policy and to reduce expenditures (\( \beta_2 < 0 \)). The coefficients \( \beta_1 \) and \( \beta_2 \) are in most cases statistically highly significant, in half the cases at the 99 percent level of confidence.
The budget constraint also has a clear effect on expenditure: \textit{ceteris paribus}, the higher the tax receipts, the higher the subsequent expenditures (\( \beta_3 > 0 \)). Not surprisingly, the previous year's level of outlays has a strong influence on the policy of the current year (\( \beta_4 > 0 \)).
It should be noted that the parameters and test statistics may be biased upwards because of the lagged endogenous variable being included.

\(^{11}\) Public expenditure data are only available for yearly intervals in Switzerland.
Table 13.5
Policy function for Switzerland, federal government, 1951–74 (yearly data).
Explanation of total public expenditure, and of its components.

<table>
<thead>
<tr>
<th>Eq.</th>
<th>Level of policy instrument $EXP_t$</th>
<th>Constant $\beta_0$</th>
<th>Support surplus $SUR_{t-1}$ $\beta_1$</th>
<th>Constraints</th>
<th>Test statistics $R^2$</th>
<th>$h$</th>
<th>d.f.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Political $\beta_2$</td>
<td>Economic $\beta_3$</td>
<td>Adminstr./legal $\beta_4$</td>
<td></td>
</tr>
<tr>
<td>(19)</td>
<td>Total gross expenditure</td>
<td>$-4122.51$</td>
<td>0.043$^b$ (2.14)</td>
<td>-0.081$^a$ (-2.84)</td>
<td>0.164$^a$ (3.43)</td>
<td>1.036$^a$ (17.41)</td>
<td>0.99</td>
</tr>
<tr>
<td>(20)</td>
<td>General administration</td>
<td>$-4528.12$</td>
<td>0.061$^b$ (2.32)</td>
<td>-0.182$^a$ (-3.80)</td>
<td>0.206$^a$ (3.07)</td>
<td>1.064$^a$ (22.46)</td>
<td>0.99</td>
</tr>
<tr>
<td>(21)</td>
<td>Administration, justice, police</td>
<td>$-4667.07$</td>
<td>0.072$^b$ (2.13)</td>
<td>-0.061 (1.94)</td>
<td>0.105$^a$ (3.37)</td>
<td>0.964$^a$ (9.47)</td>
<td>0.89</td>
</tr>
<tr>
<td>(22)</td>
<td>Defense</td>
<td>$-1780.87$</td>
<td>0.084$^b$ (2.12)</td>
<td>-0.042 (1.80)</td>
<td>0.06$^b$ (2.49)</td>
<td>1.019$^a$ (10.67)</td>
<td>0.97</td>
</tr>
<tr>
<td>(23)</td>
<td>Education, research, and development</td>
<td>$-5547.64$</td>
<td>0.041$^a$ (2.84)</td>
<td>-0.096$^a$ (-3.09)</td>
<td>0.124$^a$ (3.14)</td>
<td>1.083$^a$ (32.46)</td>
<td>0.99</td>
</tr>
<tr>
<td>(24)</td>
<td>Health</td>
<td>$856.39$</td>
<td>0.056$^b$ (2.36)</td>
<td>-0.099$^a$ (-2.81)</td>
<td>0.094$^a$ (2.94)</td>
<td>0.942$^a$ (8.46)</td>
<td>0.99</td>
</tr>
<tr>
<td>(25)</td>
<td>Social welfare</td>
<td>$-1459.38$</td>
<td>0.035 (1.99)</td>
<td>-0.082$^a$ (-2.84)</td>
<td>0.224$^a$ (14.59)</td>
<td>0.979$^a$ (9.49)</td>
<td>0.99</td>
</tr>
<tr>
<td>(26)</td>
<td>Roads</td>
<td>$6227.16$</td>
<td>0.052$^a$ (3.74)</td>
<td>-0.106$^a$ (-3.12)</td>
<td>0.206$^a$ (4.11)</td>
<td>1.055$^a$ (17.46)</td>
<td>0.99</td>
</tr>
</tbody>
</table>

For notes see table 13.2.
Table 13.6
Policy function for Switzerland, federal government, 1951—74 (yearly data).
Explanation of the absolute change in the total public expenditure and its components.

<table>
<thead>
<tr>
<th>Eq.</th>
<th>Absolute change in the level of the policy instruments $\Delta EXP_t$</th>
<th>Constant</th>
<th>Support surplus $SUR_{t-1}$</th>
<th>Constraints</th>
<th>Test statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta_0$</td>
<td>$\beta_1$</td>
<td>$\beta_2$</td>
<td>$\beta_3$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>(27)</td>
<td>Total gross expenditure</td>
<td>2086.79</td>
<td>0.094&lt;sup&gt;b&lt;/sup&gt;</td>
<td>(-2.64)</td>
<td>0.178&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(28)</td>
<td>General administration</td>
<td>1618.49</td>
<td>0.028&lt;sup&gt;b&lt;/sup&gt;</td>
<td>(-3.94)</td>
<td>0.131&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(29)</td>
<td>Administration, justice, police</td>
<td>3400.67</td>
<td>0.082&lt;sup&gt;b&lt;/sup&gt;</td>
<td>(-1.80)</td>
<td>0.094&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(30)</td>
<td>Defense</td>
<td>5810.44</td>
<td>0.102&lt;sup&gt;b&lt;/sup&gt;</td>
<td>(-1.62)</td>
<td>0.084&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(31)</td>
<td>Education, research, and development</td>
<td>3788.45</td>
<td>0.094&lt;sup&gt;a&lt;/sup&gt;</td>
<td>(-3.31)</td>
<td>0.146&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(32)</td>
<td>Health</td>
<td>329.43</td>
<td>0.064&lt;sup&gt;a&lt;/sup&gt;</td>
<td>(-2.76)</td>
<td>0.064&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(33)</td>
<td>Social welfare</td>
<td>3112.17</td>
<td>0.048&lt;sup&gt;a&lt;/sup&gt;</td>
<td>(-2.99)</td>
<td>0.164&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(34)</td>
<td>Roads</td>
<td>4471.38</td>
<td>0.082&lt;sup&gt;a&lt;/sup&gt;</td>
<td>(-2.80)</td>
<td>0.174&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

For notes see table 13.2.
among the explanatory variables. In order to test whether this possibility is of any significance for the empirical results, and to exclude a strong time trend in the expenditure and tax variables, the estimates have been repeated without lagged endogenous variables to explain the change (i.e. the first differences) in expenditures between one year and the next. The results are presented in table 13.6. These estimates again perform quite well and statistically explain between 59 and 78 percent of the variance in the change in expenditure. All the coefficients have the same sign and are equally or even more highly significant than those in table 13.5, suggesting that the policy equation captures the underlying structure well.

5. Concluding remarks

This paper is a first attempt to develop and empirically test a politico-economic model for a direct democracy. The two functions describing the macro interdependence between the economy and the polity perform satisfactorily.

The referendum function suggests that an increase in the rate of inflation strongly decreases the share of “yes” votes cast in referenda, indicating a loss of support for the federal government. The growth of real income has a somewhat smaller effect on referenda outcomes, while the state of the labor market (net vacancies) is of minor importance. We therefore conclude that the Swiss government undertakes a restrictive policy in order to combat inflation when it considers the level of the electorate’s support for it to be too low.

The policy function suggests that public expenditures (in the aggregate as well as the specific components) are indeed used to influence popular support for the government. Expenditures are reduced in the case of a support deficit; they are increased (always relative to the general trend) in the case of a support surplus in order to minimize conflict with the public bureaucracy and other interest groups who are pressing for special benefits. The government is, however, restrained by budgetary considerations. Both the referendum and policy functions are able to explain a high share of the variance, and the explanatory variables mentioned have in general a statistically significant effect on the dependent variables.

The model deals only with a part of macro politico-economic interdependence. Some important actors (such as the central bank and interest groups) and relationships (such as those between federal units) are missing. The framework of the analysis, however, allows in principle such aspects to be included. The satisfactory results reached with this simple model suggest that the framework of the politico-economic models used
is flexible enough to be applied to countries with strong elements of direct democracy.

References