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Outcome, Process & Power in Direct Democracy

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OUTCOME, PROCESS & POWER IN DIRECT DEMOCRACY

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Abstract

Based on survey data for Switzerland, new empirical findings on direct democracy are presented. In the first part, we show that, on average, public employees receive lower financial compensation under more direct democratic institutions. However, top bureaucrats are more constrained in direct democracies and have to be compensated by higher wages for that loss of power.

In the second part, we demonstrate that reported subjective well-being of the population is much higher in jurisdictions with stronger direct democratic rights. This is not only the case because people value political outcomes higher but they derive utility from the political process itself.

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Process Utility

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I. Forms of Democracy

Public Choice has mainly been concerned with representative democracy. Most textbooks neglect the institutions of (semi-) direct democracy, i.e. popular referenda and initiatives, or mention them only in passing (e.g. Mueller 1989). Pure direct democracy in the classical Athenian sense (i.e. without parliament) disappeared beyond the communal level (but it still exists in some American and in many Swiss communes). In so far as Public Choice has dealt with direct democracy, the literature focussed mainly on two aspects: On the theoretical side, the possibility or impossibility of consistently aggregating individual preferences to a social welfare function or social decision has received considerable attention (Arrow 1951, Black 1958, Sen 1970, and the subsequent Social Choice literature). On the empirical side, the median voter model has been applied to two competing parties under perfect political competition (Downs 1957), as well as to decisions between different issues (e.g. Barlow 1970).

Today's semi-direct democracies, such as Switzerland or some American States (most prominently California), are a mixture of direct participation of the citizens via initiatives and referenda and the representative features of a parliament and executive. Much of the literature deals with legal and historical aspects, and is therefore mostly descriptive (see e.g. Möckli 1994 or Suksi 1993). However, some of the authors (e.g. Dryzek 1987) emphasize the major role of discussions in reaching decisions. Interestingly enough, the main modern proponent of discursive philosophy, Habermas (1985; 1992), fails to link it up to direct democracy but rather sees the German

Bundestag as the closest approximation to the "ideal speech situation". One of the most important features of direct democracy, however, is that, in principle, *everyone* may participate in the decision-making process; in contrast to a representative system, it is not formally reserved for the members of parliament or therewith for the "classe politique" (Bohnet and Frey 1994). Another important feature is that the discourse takes place before as well as after the vote, i.e. when the outcome has to be interpreted (Frey 1994). In contrast to Habermas' "ideal speech situation", which in some ways resembles an academic seminar, the discussion induced by a referendum is focussed on a particular issue, limited in time and has political consequences. It is not "cheap talk" in the game theoretic sense (and therefore theoretically irrelevant to the outcome) but systematically influences the decisions¹.

The literature on direct democracy has led to two important insights:

- (1) Firstly, direct participation leads to political outcomes more favorable to the citizens than when no such participation rights exist. The politicians are subject to an additional, strongly binding external constraint on their behavior. Power is given to people outside the political establishment, who are difficult or impossible to manipulate.
- (2) Secondly, the direct participation possibilities provide utility in themselves, i.e. the process (and not only the outcome) matters. This aspect of politics has been emphasized by, among others, Sen (1997) and Elster (1998), as well as Tyler (1990; 1997) in social psychology, who has demonstrated its empirical relevance in a large number of experiments.

The goal of this paper is to extend the empirical (econometric) knowledge on direct democracy, and to provide new evidence on the above two propositions:

- (1) With respect to *outcomes*, we discuss two important aspects of direct democracy:
 - (i) The *compensation* received by public employees. Direct democratic rights of the citizens act as a (further) restriction on politicians. This leads to (*ceteris paribus*) lower wages of public employees in direct democracies. However, highly ranked public employees are (*ceteris paribus*) paid higher salaries in more directly democratic compared to less directly democratic

¹ The theoretical aspects are discussed in Johnson (1993). It has been well established empirically that irrelevant preplay discussion systematically affects the outcomes of Prisoner's Dilemma Games (see in particular Dawes, McTavish and Shaklee, 1977 and Ostrom, Walker and Gardner, 1992). These results have been generalized to further game situations such as Dictator and Ultimatum Games (Frey and Bohnet 1995).

systems. We interpret the result in terms of "power": Since superiors in the public sector are able to wield less power in more directly democratic systems, they have to be compensated for this loss of power.

(ii) Reported *satisfaction with life*. All other things being equal, people enjoy higher self-reported satisfaction with life in more directly democratic systems.

(2) Referring to *process*, we show that direct democracy provides utility over and above outcome utility.

Section II offers a short survey of existing empirical results on direct democracy. Section III shows the effects on the compensation of public employees, and discusses the resulting interpretation in terms of power. The following section demonstrates the effect of direct participation rights on both the outcome and process utility in terms of reported satisfaction with life. Section V offers concluding remarks.

II. Existing Empirical Literature

The extent of participation rights in the various countries has been extensively documented (see e.g. Butler and Ranney 1994). While they exist in many countries, its regular use is concentrated in just two countries: in the United States on the sub-federal level (especially in the states of California and Oregon as well as in New England communes), and in Switzerland on all three levels of government (nation, canton, commune). Direct democracy is gaining ground, most importantly in Italy where, since 1990, no fewer than 31 referenda have been undertaken², and in Germany where the voters in several Laender (particularly in Bavaria) have successfully demanded direct participation rights. While the European Union does not know any direct democratic elements (it may even be argued that it is lacking many other democratic features, *vide* the much lamented "democracy deficit"), most countries organized a referendum before their entry (which, in the case of Norway, led to the decision not to enter).

² But their outcomes have not been respected by the political class. For instance, parliament ignored a demand by 90% of those who voted in a referendum in 1993 that political parties should no longer receive public funds.

The results or consequences of having direct democratic rights are difficult to measure empirically. In order to do so, a frame of reference is needed. A comprehensive comparison across countries is impossible because there is essentially only one country, Switzerland, where all major decisions are taken by the voters via initiatives and compulsory or optional referenda (see e.g. Klöti et al. 1999, Haller 1997 or Steinberg 1996). Hence, scholars have turned to analyses comparing the situation within the United States and Switzerland, where the extent of direct democratic rights differs between states and cantons (and sometimes between municipalities and communes). No systematic account needs to be given for this line of research because Kirchgaessner, Feld and Savioz (1999) have extensively surveyed it in their recent book. To give the flavor it suffices to mention some of the most important insights. In the case of the United States, econometric studies reveal that the more directly democratic states (*ceteris paribus*) have lower total public expenditure, but tend to spend more on education³.

For Switzerland, econometric analyses suggest that (*ceteris paribus*) the more extended direct democratic rights are in a canton, the lower are the tax burden and public deficits, the less citizens evade taxes, and the higher are per capita incomes⁴. In all these studies, jurisdictions within a common institutional framework are compared, and influences independent of direct democratic institutions are carefully controlled for. As a whole, econometric research leads to the conclusion that the preferences of the citizens are better observed in jurisdictions with more direct participation rights. Direct democracy thus matters with respect to outcomes.

III. Direct Democracy and the Compensation of Public Employees

1. Theory and Hypotheses

In order to empirically test whether direct democracy reduces the power of politicians and public employees, we focus on wage functions. The basic idea is that institutional settings have a

³ See e.g. Matsusaka (1995) or Rueben (1999) for general government expenditure, or Santerre (1989; 1993) for public education expenditures.

⁴ See e.g. Schneider and Pommerehne (1983) and Feld and Kirchgässner (1999) for general government expenditures. The latter authors also study the effect on self-financing ratios, taxes, and debt. Pommerehne and Weck (1996) and Frey (1997) analyse the effect on tax evasion, and Feld and Savioz (1997) on per capita gross domestic product.

systematic effect on (public employees') wages. Besides institutional characteristics, econometric studies of wage functions have established that an employee's compensation is the higher, the better his or her level of education and the longer his or her work experience and tenure in a particular firm are. Being female depresses compensation, and other family characteristics (e.g. being married) also have systematic effects on wages. Public employees are subject to the same influences (see e.g. Schultz 1998).

Politicians and top bureaucrats tend to use some of their leeway to pay rents to public employees in order to "buy" their *electoral support* as well as their collaboration. But the political and bureaucratic decision-makers are constrained by *political institutions*. We propose that in more directly democratic jurisdictions, politicians' and top bureaucrats' leeway is smaller and that therefore the rents paid to public employees are (ceteris paribus) lower⁵. This leads to

Hypothesis D: More directly democratic institutions result ceteris paribus in *lower* compensation of public employees.

Following the principle of compensating wage differentials (see e.g. Thaler and Rosen, 1976; Brown, 1980, or for a literature survey Rosen, 1986), employees who derive higher than average utility from part of their work (or from their income) have to be compensated less. Certainly "power", in the form of being able to direct and give orders to inferiors, belongs to this category. All other things being equal, employees with a larger number of inferiors have to be paid less.

Hypothesis P: The more "power" (in the form of the number of inferiors) an employee has, the *lower* his or her compensation.

This hypothesis follows immediately from the economic idea of compensating variation. However, it is not trivial at all: in most other social sciences it is assumed as a matter of course that higher power goes with higher income (see e.g. the 'managerial power model' discussed in Finkelstein, 1992 or Lambert, Larcker and Weigelt, 1993). As argued for hypothesis *D*, the "power" of public servants is the smaller, the more extensive the citizens' participation rights. Combining this feature with hypothesis *P* yields

⁵ This is not only a theoretical possibility but is of imminent practical importance. Within the last couple of years citizens voted down a number of proposals to raise the compensation of public employees as well as politicians, both on the cantonal as well as federal level.

Hypothesis D&P: The more directly democratic a jurisdiction, the more constrained are public employees with a given number of inferiors, and the *higher* they are paid to compensate them for this (relative) loss in power.

2. *Econometric Tests*

The hypotheses developed were tested using data from the 1996 Swiss Labor Force Survey. It includes roughly 16'000 respondents, who were asked detailed questions on their wages, work experience, education and other variables concerning their work-life as well as demographic characteristics. Since our hypotheses deal with the compensation of employees in the public administration, people working in the private sector as well as people in education, the retired, the unemployed or the self-employed, are excluded from the sample. Moreover, people that refused to report their incomes were excluded as well. This, of course, might introduce a problem of selectivity. However, it is unlikely that the variables of interest are correlated with the probability of making or refusing an income statement.

Since our main focus is on the effects of institutional settings varying between cantons, we further restrict the sample and consider *cantonal* public employees only. People employed by the federal state are all paid according to the same wage scheme and therefore have to be omitted from the sample.

In order to capture the different institutional settings for the 26 Swiss cantons an index designed to reflect the extent of direct democratic participation possibilities is constructed. The most important direct democratic instruments in cantons are the popular initiative to change a canton's constitution or laws, a compulsory and optional popular referendum to prevent new laws or the changing of existing laws, and an optional financial referendum to prevent new state expenditure. Citizens' access to these instruments differs from canton to canton. Thus, for example, the number of signatures required launching an initiative or an optional referendum, or the time span within which the signatures have to be collected, vary. Furthermore, the referendum on public expenditures may be launched at different levels of additional outlays.

The index of *direct democratic rights* is defined over a six-point scale with 1 indicating the lowest and 6 the highest degree of participation possibilities for the citizens. The average index value for

the 26 Swiss Cantons is roughly 3.5 with a minimum of 1.75 (canton Geneva) and a maximum of 5.69 (canton Basel-Land). For a full account of how the index is constructed, see the Appendix.

The *Swiss Labor Force Survey* (SLFS) focuses on total compensation. Therefore, the survey also includes questions on bonuses or non-monetary compensation (like company cars or company apartments). SLFS attributes monetary values to all these items to get a detailed picture of total compensation. To make wages even more comparable, we moreover correct for differences in weekly working time, vacation and overtime. The resulting average wage per hour is 47.20 Swiss Francs (approximately 30 US\$), with a maximum of 772.20 and a minimum of 0.50 SFr. Since an hourly wage of 0.50 SFr. is not credible, all respondents who stated an hourly wage of less than 5.00 SFr. are excluded. Excluding these people does, however, not change the results⁶. The considered sample finally consists of 478 cantonal public employees.

SLFS also asks questions concerning the hierarchical position of a respondent. There are, however, a great variety of titles, which makes it very difficult to make them comparable. We therefore concentrate on the number of subordinates as a proxy for hierarchical position. People with more than five subordinates were considered superiors. According to this definition, roughly sixteen percent of the cantonal employees in our sample have a position as superior.

All the estimates are weighted using the cross sections weights provided by SLFS. The weights are necessary to induce representativeness, since the SLFS does not use a random, but rather a weighted sample.

The results of the weighted OLS regressions are reported in table 1. The dependent variable is the logarithm of wages of public employees in Swiss cantons. The coefficients can therefore be interpreted as the percentage changes in hourly wages for an individual with the respective characteristics, compared with the wage of the reference group (male Swiss with just compulsory education, working for the cantonal government).

Table 1

⁶ While the levels of significance change, none of the formerly significant coefficients fall below the 90 percent significance level.

The first three variables refer to the three hypotheses developed. In order to prevent a misspecification bias, several other explanatory variables (like education, tenure, experience or sex) are included in order to keep productivity constant. The adjusted R^2 s are extraordinarily high for cross section analyses based on individual data.

Two models are estimated, of which the first incorporates our hypotheses and therefore is labeled ‘Power Model’. We also estimate an alternative model called the ‘Standard Model’. While the controls are the same in both regressions, the ‘Standard Model’ does not include the interaction term between being superior and working under certain directly democratic institutions. In what follows, we will first discuss the results with respect to all public employees and then turn to the effects concerning superiors only:

- (1) *Effects concerning all public employees*: For both models, public employees on all hierarchical levels working for a more directly democratic canton earn *less* than bureaucrats in more representative cantons do. This is supportive of hypothesis *D*: Rents paid to public employees are lower where the leeway for politicians is smaller. The size of the effect is quite significant: Extending direct democratic rights by one point on the six point index scale induces cantons to pay, on average, five percent *lower* wages. This result is in line with previous results by e.g. Poterba and Rueben (1995) who show that restricting the governments’ possibilities to generate tax revenue lowers the compensation of public employees.
- (2) *Effects concerning superiors only*: For the power model, the marginal effect on wages of becoming a superior in a cantonal public administration is *negative*, as predicted by hypothesis *P*. The size of the effect is considerable: Becoming a superior *ceteris paribus* reduces wages by roughly 19 percent⁷. However, in order to calculate the size of the *net effect* of becoming a superior, one also has to take into consideration the interaction term. Formally speaking, the

⁷ It is interesting to note, that the negative effect stems almost exclusively from those with 50 or more inferiors: While the effect for superiors with up to five inferiors is positive (although not on any traditional level of significance) and there is almost no effect for those between five and 49 inferiors, public employees in very high positions are willing to give up a considerable amount of money to exert ‘power’. This result is supportive of the idea that only public employees in high positions have a discretionary leeway – or power.

partial derivative of the wage function with respect to the variable “superior” is $\frac{\partial w}{\partial \text{sup}} = -0.197 + 0.098 \cdot \text{Direct Democratic Rights}$. This means that the change in wage of becoming a superior is dependent on the extent of direct democratic rights prevailing in a particular canton. Superiors in cantons with extended participation rights are compensated by almost 10 percent *higher* wages for each one-point rise in the index of direct democratic rights. This result is consistent with hypothesis *D&P*: Top bureaucrats have less discretionary leeway in direct democracies and have to be compensated for that loss of power. The negative intercept of the partial derivative can therefore only be interpreted in conjunction with the positive effect of direct democracy. While both effects cancel out for less democratic cantons (with an index around 2), becoming a superior in a canton with extended direct democratic rights has a positive effect on wages.

Confronting the results presented above with the ‘Standard Model’ reveals that the inclusion of the interaction term in the ‘Power Model’ has a dramatic effect on the coefficient of the superior variable. In the ‘Standard Model’, becoming a superior goes together with a raise in wage of almost nine percent. For most readers, this probably corresponds to what they intuitively expect to happen. Moreover, this alternative result is consistent with the assumption of most social sciences (see e.g. Lambert, Larcker and Weigelt 1993 for business administration). However, we argue that this is due to an omitted variable bias, with the omitted variable being a superior’s power, which is not only dependent on his or her hierarchical position (as in the ‘Standard Model’) but also on the prevailing political institutions. Omitting the interaction term therefore yields incomplete information on the wage-effect of becoming a superior.

The intuition behind the change of the coefficient is that the standard model does not distinguish between hypotheses *P* and *D&P*: On the one hand, having more inferiors (and therewith being able to exert *more* power) is compensated through lower wages. On the other hand, however, working for a more directly democratic canton (and therewith being more constrained and able to exert *less* power) should have a positive effect on wages. The ‘Standard Model’ captures the *net effect* only, and its direction is theoretically unclear. As shown in column 2 of table 1, it is *positive* for the case of cantonal public employees in Switzerland. Only the inclusion of the interaction term in the ‘Power Model’ allows separating the two

effects: As explained above, the pure effect of moving up the hierarchical ladder has a negative, while its combination with institutional restrictions has a positive, impact on wages of superiors as predicted by hypotheses *P* and *D&P*.

In addition to the results just presented, in both estimations all regular economic hypotheses are confirmed: Education, sex, tenure, experience, etc. systematically influence wage rates in the expected directions.

3. Sensitivity Analysis

There are two alternative explanations often put forward against our interpretation of the empirical findings described above. These explanations emphasize the possibility of spurious regression due to missing aggregate variables, namely the income level in a canton and its population size.

(1) *Income level in cantons*: It is hypothesized that wealthier cantons pay, on average, higher wages. The inclusion of national income per capita in a canton as a explanatory variable can therefore be expected to add to the explanatory power of the regression. Moreover, as Feld and Savioz (1997) convincingly demonstrated, gross domestic product is higher in more directly democratic cantons. One could therefore argue that the estimated result for the interaction term reflects the fact that richer cantons pay higher wages (especially to superiors). As column (2) of table 2 reveals, this is not the case. While the inclusion of national income per capita (on the level of cantons) significantly adds to the explanatory power of the regression (mainly by reducing the constant term), it has almost no effect on the coefficients of the variables of interest.

Table 2

(2) *Size of population in cantons*: One additional argument put forward against our interpretation of the regression results is that the index of direct democratic rights is mainly a proxy for the population size of the respective canton. It is often claimed that only small entities can afford to grant extended direct democratic rights to its citizen. Following this argument, less direct democratic cantons would be large cantons. In addition, since the number of inhabitants of a canton is closely correlated with the size of its bureaucracy, the index of direct democratic

rights would simply measure differences in the size of the bureaucracy. Superiors might enjoy working for a larger bureaucracy because of the extended discretionary leeway or because they receive more fringe benefits or higher recognition and prestige. Column (3) of table 2 displays the results of the power model extended by the variable size of “population in canton”. The inclusion of the additional variable does neither add to the explanatory power of the regression nor does it have a significant effect on the size or the significance of the coefficients in question. The same holds if both additional variables are jointly included in the estimation model (column 4).

IV. Direct Democracy and Satisfaction with Life

1. Theory and Hypotheses

Citizens' direct participation rights produce various types of utility. As discussed in section II above, government activities, in particular public outlays, are better geared to citizens' preferences. In addition, there are positive effects on the economy, e.g. the rate of unemployment and inflation are lower, and income is higher, than it would be otherwise. These favorable *outcomes* should be reflected in higher satisfaction with life or happiness:

Hypothesis O: The better developed the institutions of direct democracy, the more satisfied people are with their life.

In addition to this outcome utility, participation rights are valued as such and produce *procedural utility*. As only citizens can participate, while non-nationals are excluded, this process utility accrues solely for citizens.

Hypothesis PR: Swiss citizens enjoy procedural utility from their participation rights while non-nationals do not.

2. Empirical Test

The empirical test is based on survey results of more than 6000 Swiss residents for the year 1992, collected by Leu, Burri and Priester (1997). The dependent variable called "satisfaction with life" is based on the answer to the following question: "How satisfied are you with your life as a whole these days?" Simultaneously, the respondents were shown a table with a ten point scale of which

only the two extreme values ("completely dissatisfied" and "completely satisfied") were verbalised.⁸ The survey found a high general level of life satisfaction in Switzerland with an average of 8.2 out of 10 points.

The same index as in the estimation models on the compensation of public employees is used to characterize the extent of direct democratic rights in the cantons. A full account can be found in the Appendix.

Table 3 shows the estimation results of a weighted ordered probit model⁹. The weighting variable that is applied allows generating representative results on the subject level for Switzerland¹⁰. An ordered probit model is used in order to exploit all the information contained in the originally scaled dependent variable.

The results can be interpreted as follows: A positive coefficient indicates that the probability of stating a level of satisfaction with life greater or equal to any given level increases. The marginal effect indicates the change in the share of persons belonging to a stated happiness level when the independent variable increases by one unit¹¹. In case of dummy variables, the marginal effect is evaluated with respect to the reference group.

For simplicity, only the marginal effects for the extreme value of very high subjective well-being (score ten) are shown in table 3.

Table 3

The estimation results are consistent with both hypotheses:

⁸ In economics, the pathbreaking contribution to happiness studies is due to Easterlin (1974); more recent contributions are e.g. Clark and Oswald (1994), Oswald (1997), Winkelmann and Winkelmann (1998), Di Tella, MacCulloch and Oswald (1999). In psychology, there is a much older tradition; see e.g. the early survey by Wilson (1967), Argyle (1987), Veenhoven (1993), and the recent survey by Diener, Suh, Lucas and Smith (1999). "Satisfaction with life" is used here interchangeably with the terms "happiness" and "reported subjective well-being".

⁹ Our empirical analysis is faced with a the difficulty of omitted region variables. In order to allow variation across regions, five variables for community size, and seven variables for the type of community are added (not explicitly shown in table 3).

¹⁰ Weights are proportional to the inverse of the probability of being sampled. In addition, the weights are adjusted to the demographic structure in 1992.

¹¹ Alternatively, the marginal effect indicates the change of the probability belonging to a stated happiness level when the independent variable increases by one unit.

- (1) People are happier in cantons with more extended direct democratic participation rights, *ceteris paribus*. The major variable in the analysis, the index for direct democracy has a highly significant positive effect on happiness. This result is consistent with hypothesis *O*. An increase in the index of direct democratic rights by one point raises the number of persons indicating the highest level of happiness by 3.2 percentage points.
- (2) Swiss citizens derive more subjective well-being from individual political participation rights than foreign residents. This result suggests that procedural utility can be gained from direct democracy and is consistent with hypothesis *PR*. The interaction effect between direct democratic rights and being a foreigner reveals that foreigners are worse off with respect to procedural utility. The interaction variable suggests that foreigners, when compared to Swiss citizens, are *ceteris paribus* less happy in cantons in which the institutions of direct democracy are well developed. This effect is statistically highly significant. The size of the procedural utility gained from being able to participate in the direct democratic process can also be assessed. The size of the positive marginal effect of direct democracy, which applies to all the residents of a canton, is 3.2 percentage points. Comparing this with the negative marginal effect of 2.3 percentage points for the interaction term, reveals that two thirds of the gain in well-being is due to the application of a favorable process in political decision-making. This suggests that procedural utility, in addition to outcome utility, is an important source of satisfaction related to direct democracy.

In addition, the estimate in table 3 shows that a number of demographic and economic factors taken into account in previous happiness studies (see e.g. Diener et al., 1999; Oswald, 1997; Veenhoven, 1997), exert a statistically significant and sizeable effect on satisfaction with life: Compared to young respondents, people older than 60 are happier. Women are slightly more satisfied with life than men. People with higher education report significantly higher subjective well-being. Compared to couples without children, people living in other family settings reach high satisfaction scores with a lower probability. The self-employed and housewives are significantly happier than the reference group of employed people. Unemployment reduces well-being dramatically; the probability of stating a satisfaction score of ten is 28% lower for unemployed than for employed persons. Higher income correlates with higher happiness in a statistically significant way. However, the differences in subjective well-being are rather small.

Consider, for example, the highest income group with a monthly equivalence income¹² above Sfr. 6,000. Compared to persons with low income, only a 9.3 percentage points larger share reports being ‘completely satisfied’.¹³

3. Sensitivity Analysis

By examining the robustness of the positive effect of direct democracy on satisfaction with life, we try to exclude the possibility of spurious regression. The sensitivity analysis refers to the same aggregate control variables as in section III, i.e. the national income per capita in a canton and the size of population.

(1) *Income level in cantons*: It might be argued, that in cantons where inhabitants are richer than the Swiss average the public provision of goods can be extended or qualitatively augmented. Thus, if there is a high correlation between the index of direct democratic rights and the income level in Swiss cantons the former variable would just capture different levels of wealth in Swiss cantons. However, the inclusion of national income per capita in the estimation equation does not change the results significantly (see table 4, column 2). The income variable itself is not significant either.

Table 4

(2) *Size of population in cantons*: If direct democracy would be a phenomenon restricted to small jurisdictions then direct democracy might just capture an effect of sense of community rather than the beneficial outcome and process due to political participation rights. To separate these two possible sources of individual well-being the variable ‘population in canton’ is included in the microeconomic happiness function. The results in table 4 (column 3) show that the positive effect of direct democracy does not change significantly in magnitude and that people in smaller cantons are somewhat happier. Direct democracy thus has a robust and sizeable

¹² Equivalence income is measured by household income after tax and social security contributions and after adjusting for household size. The applied equivalence scale is the square root of the number of household members (Atkinson et al. 1995). Five income groups are explicitly distinguished, ranging from SFr. 2000 to SFr. 6000 and more. The constant term includes the reference group which are people with an equivalence income lower than SFr. 2000.

effect on satisfaction with life over and above differences of cantons in regard to wealth and size of population (see column 4).

V Concluding Remarks

This paper is based on approaches unusual for Political Economy. This holds in at least three respects:

Firstly, self-reported and hence subjective well-being or satisfaction with life is employed as the 'ultimate' outcome variable. It takes a great step beyond previous analyses to capture the effects of direct democratic institutions. Government expenditure, which has been used in previous research, is an input rather than an output variable in the sense that it does not capture whether direct democratic rights raise, lower, or leave individual utility unaffected. Some individuals may prefer a lower and others a higher level of public expenditure. The same holds true, in principle, even for per capita income. While the vast majority of individuals probably value higher income positively, it cannot be excluded that some of them value it negatively because they either dislike a possible decrease of environmental quality or, more fundamentally, reject materialism.

Such arguments do not apply to life satisfaction or happiness: it clearly measures outcome (or output) in the sense that a higher level is preferable to a lower level. But the concept of "happiness" itself is open to criticism. It has long been assumed that it is impossible to measure "utility". Indeed, modern micro-economics is based on the notion that human behavior can be explained without such measurement. Recently, however, the issue has been reconsidered. Among others, Kahneman, Wakker and Sarin (1997) have strongly argued that additional information and knowledge can be gained by measuring utility. Similar concepts have long been used in psychology, and in particular the measurement of reported subjective well-being has a long history (see Diener 1984 and Wilson 1967).

Secondly, this paper makes an effort to empirically account for both outcome and process utility. While it has often been argued that democratic participation may have a value in itself, the existence of procedural utility has been empirically analyzed by experiments in a non-political

¹³ Part of the correlation observed between happiness and the factors mentioned can be explained by reverse causation. For happy people, it is easier to find a partner. They probably lose their job less often, and get

setting (see Tyler 1997). To our knowledge, this is the first attempt to econometrically estimate the size of procedural utility both absolutely, and compared to outcome utility, in the democratic realm. It has been made possible by using data on subjective well-being. Our approach is based on the idea that only Swiss citizens enjoy the procedural utility of political participation, while non-nationals do not. In contrast, both may enjoy the effects of 'better' government activity, i.e. outcome utility. It is not argued that the two groups derive equal utility, but that non-nationals derive relatively less utility from the process than from outcomes. One could argue that the difference in utility stems from governments favoring Swiss nationals and not from process utility. However, in a country like Switzerland (as well as in other countries bound by the rule of law), the extent of discrimination in favor of the citizens is restricted in various respects. International laws, such as basic human rights, prohibit or at least reduce the possibility to treat citizens better than non-nationals in government policies. The macro-economic consequences of government activity make it even more difficult to discriminate between the two groups. Moreover, there are good reasons to assume that strong outcome discrimination between citizens and non-nationals is not desired for altruistic and perhaps even more so for selfish reasons. The assumption underlying our empirical determination of process and outcome utility thus seems to be acceptable.

Thirdly, this paper uses the concept of "*power*" which for good reasons has not been used in Public Choice analysis to date¹⁴ (but which, of course, takes a central place in traditional political science). However, the concept is used in a very specific sense, namely as an instance of compensating wage differentials. Power is indisputably an element in the utility function of most persons. People are therefore prepared to pay for exerting power, i.e. are prepared to accept lower pay for work positions with power over other persons. The compensating wage differential approach is open to two types of criticism:

- (1) The correct value of the argument in the utility function in question – in our case power – is only revealed in an unconstrained competitive equilibrium, i.e. all adjustments must be assumed to have taken place;

jobs where they earn more money.

¹⁴ An exception is "a priori voting power", derived from game theory; see e.g. Felsenthal and Machover (1998).

(2) The value reflected by lower pay can be attributed to any argument in the utility function. There may be other benefits of occupying a position with a given number of inferiors. Most importantly, such a position may be accompanied by various benefits (such as the use of a car, or living in a low priced apartment, provided by the employer). While we try to control for such privileges as good as we can (by asking respondents specific questions on fringe benefits), some of them might not be included because they cannot be easily expressed in monetary terms. Similarly, such a position in the public service may provide high visibility, recognition and fame (see Frank 1984). The (cet. par.) higher compensation going with a particular position in more directly democratic jurisdictions (cantons) thus does not necessarily reflect less power over inferiors. Our approach nevertheless indicates that *all* these various arguments in the utility function of public employees are less well served under more directly democratic conditions - be it power, fringe-benefits, or recognition and fame.

Our analysis of direct democracy is presented with the understanding that the results are only provisional, and that there are many possibilities to improve them. In particular, our quantitative results are based on specific data for Switzerland. We hope that future work supporting or rejecting our results will be undertaken with other data, in particular for the United States.

With these reservations in mind, the following are the major results of our analysis: The more developed the institutions of direct democracy are,

- the more constrained politicians and top public bureaucrats are, which is reflected in a (ceteris paribus) lower compensation of public employees;
- the less power (in terms of having inferiors) public employees of high position have. This is reflected in (ceteris paribus) higher compensation of such public employees;
- the higher the reported satisfaction with life of the population; and
- the higher the utility derived from participation in the political process.

References

- Argyle, M. (1987). *The Psychology of Happiness*. London: Methuen.
- Arrow, K. J. (1951). *Social Choice and Individual Values*. New York: John Wiley & Sons.
- Atkinson, A. B. and L. Rainwater and T. Smeeding (1995). Income Distribution in OECD Countries. Evidence from Luxembourg Income Study. *Social Policy Studies* 18.
- Barlow, R. (1970). Efficiency Aspects of Local School Finance. *Journal of Political Economy* 78: 1028-1040.
- Black, D. (1958). *The Theory of Committees and Elections*. Cambridge: Cambridge University Press.
- Bohnet, I. and B. S. Frey (1994). Direct-Democratic Rules: The Role of Discussion. *Kyklos* 47 (3): 341-354.
- Brown, C. (1980). Equalizing Differences in the Labor Market. *Quarterly Journal of Economics* 94: 113-34.
- Butler, D. and A. Ranney (eds) (1994). *Referendums around the World. The Growing Use of Direct Democracy*. Washington, D.C.: AEI Press.
- Clark, A. E. and A. J. Oswald (1994). Unhappiness and Unemployment. *Economic Journal* 104 (424): 648-659.
- Dawes, R. M. and J. McTavish and H. Shaklee (1977). Behavior, Communication, and Assumptions about other People's Behavior in a Commons Dilemma Situation. *Journal of Personality and Social Psychology* 35: 1-11.
- Di Tella, R. and R. J. MacCulloch and A. J. Oswald (1999). The Macroeconomics of Happiness. ZEI Working Paper B99-03, Center for European Integration Studies, Bonn.
- Diener, E. (1984). Subjective Well-Being. *Psychological Bulletin* 95: 542-575.
- Diener, E. and E. M. Suh and R. E. Lucas and H. L. Smith (1999). Subjective Well-Being: Three Decades of Progress. *Psychological Bulletin*, forthcoming .
- Downs, A. (1957). *An Economic Theory of Democracy*. New York: Harper and Row.
- Dryzek, J. S. (1987). *Rational Ecology, Environment and Political Economy*. Oxford: Blackwell.

- Easterlin, R. A. (1974). Does Economic Growth improve the Human Lot? Some Empirical Evidence. In: Paul A. David and Melvin W. Reder (eds) *Nations and Households in Economic Growth: Essays in Honour of Moses Abramowitz*. New York and London: Academic Press.
- Elster, J. (1998). Emotions and Economic Theory. *Journal of Economic Literature* 36 (1): 47-74.
- Feld, L. and G. Kirchgässner (1999). Public Debt and Budgetary Procedures: Top down or Bottom Up? Some Evidence from Swiss Municipalities. In: James M. Poterba and Jürgen von Hagen (eds) *Fiscal Institutions and Fiscal Performance*. Chicago: Chicago University Press.
- Feld, L. P. and M. R. Savioz (1997). Direct Democracy Matters for Economic Performance: An Empirical Investigation. *Kyklos* 50 (4): 507-538.
- Felsenthal, D. S. and M. Machover (1998). *The Measurement of Voting Power*. Cheltenham, U.K. and Northampton, Mass.: Edward Elgar.
- Finkelstein, S. (1992). Power in Top Management Teams: Dimensions, Measurement and Validation. *Academy of Management Journal* 35: 505-538.
- Frank, R. H. (1984). Are Workers Paid their Marginal Product? *American Economic Review* 74 (4): 549-572.
- Frey, B. S. (1994). Direct Democracy: Politico-Economic Lessons from Swiss Experience. *American Economic Review* 84 (2): 338-348.
- Frey, B. S. (1997). A Constitution for Knaves Crowds Out Civic Virtues. *Economic Journal* 107 (443): 1043-1053.
- Frey, B. S. and I. Bohnet (1995). Institutions Affect Fairness: Experimental Investigations. *Journal of Institutional and Theoretical Economics* 151 (June): 286-303.
- Habermas, J. (1985). *Erläuterungen zur Diskursethik*. Frankfurt: Suhrkamp.
- Habermas, J. (1992). *Faktizität und Geltung: Beiträge zur Diskurstheorie des Rechts und des demokratischen Rechtsstaates*. Frankfurt: Suhrkamp.
- Haller, W. (1997). Direkte Demokratie in der Schweiz. In: Wolfgang Luthardt and Arno Waschkuhn (eds) *Politische Systeme und direkte Demokratie*. München und Wien: Oldenbourg.
- Johnson, J. (1993). Is Talk Really Cheap? Prompting Conversation between Critical Theory Rational Choice. *American Political Science Review* 87 (1): 74-86.

- Kahneman, D. and P. P. Wakker and R. Sarin (1997). Back to Bentham? Explorations of experienced utility. *Quarterly Journal of Economics* 112 (2): 375-405.
- Kirchgässner, G. and L. P. Feld and M. R. Savioz (1999). *Die direkte Demokratie: Modern, erfolgreich, entwicklungs- und exportfähig*. Basel: Helbing und Lichtenhahn/Vahlen/Beck.
- Klöti, U. and P. Knoepfel, H. Kriesi, W. Linder and J. Papadopoulos (1999). *Handbuch zum Politischen System der Schweiz*. Zürich: Neue Zürcher Zeitung.
- Lambert, R. A. and D. F. Larcher and K. Weigelt (1993). The Structure of Organizational Incentives. *Administrative Science Quarterly* 38: 438-461.
- Leu, R. E. and S. Burri and T. Priester (1997). *Lebensqualität und Armut in der Schweiz*. Bern: Haupt.
- Matsusaka, J. G. (1995). Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years. *Journal of Political Economy* 103 (2): 587-623.
- Möckli, S. (1994). *Direkte Demokratie. Ein Vergleich der Einrichtungen und Verfahren in der Schweiz und Kalifornien, unter Berücksichtigung von Frankreich, Italien, Dänemark, Irland, Oesterreich, Liechtenstein und Australien*. Bern: Haupt.
- Mueller, D. C. (1989). *Public Choice II*. Cambridge: Cambridge University Press.
- Ostrom, E. and J. Walker and R. Gardner (1992). Covenants with and without a Sword: Self-Governance is Possible. *American Political Science Review* 86: 404-417.
- Oswald, A. J. (1997). Happiness and Economic Performance. *Economic Journal* 107 (445): 1815-1831.
- Poterba, J.M. and K. S. Rueben (1995). The Effect of Property-Tax Limits on Wages and Employment in the Local Public Sector. *American Economic Review* 85 (2): 384 - 389.
- Pommerehne, W. W. and H. Weck-Hannemann (1996). Tax Rates, Tax Administration and Income Tax Evasion in Switzerland. *Public Choice* 88 (1-2): 161-170.
- Rosen, S. (1986). The Theory of Equalizing Differences. In: Orley Ashenfelter and Richard Layard (eds) *Handbook of Labor Economics*. Amsterdam: North-Holland: 641-92.

- Rueben, K. (1999). Tax Limitations and Government Growth: The Effect of State Tax and Expenditure Limits on State and Local Government. *Journal of Political Economy*, forthcoming.
- Santerre, R. E. (1989). Representative versus Direct Democracy: Are There Any Expenditure Differences? *Public Choice* 60 (2): 145-154.
- Santerre, R. E. (1993). Representative versus Direct Democracy: The Role of Public Bureaucrats. *Public Choice* 76 (3): 189-198.
- Schneider, F. and W. W. Pommerehne (1983). Macroeconomia della crescita in disequilibrio e settore pubblico in espansione: il peso delle differenze istituzionali. *Rivista Internazionale di Scienze Economiche e Commerciali* 33 (4-5): 306-320.
- Schultz, P. T. (ed.) (1998). *Economic Demography*. Cheltenham, U.K. and Northampton, Mass.: Edward Elgar.
- Sen, A. K. (1970). *Collective Choice and Social Welfare*. republished, Amsterdam: North Holland, 1979, San Francisco: Holden-Day.
- Sen, A. K. (1997). Maximization and the Act of Choice. *Econometrica* 65 (4): 745-779.
- Steinberg, J. (1996). *Why Switzerland (2nd edn)*. Cambridge: Cambridge University Press.
- Stutzer, A. (1999). Demokratieindizes für die Kantone der Schweiz. IEW Working Paper 23, Institute for Empirical Research in Economics, University of Zurich.
- Suksi, M. (1993). *Bringing in the People. A Comparison of Constitutional Forms and Practices of the Referendum*. Dordrecht: Kluwer.
- Swiss Federal Statistical Office (ed.) (various years). *Statistisches Jahrbuch der Schweiz*. Zürich: Neue Zürcher Zeitung.
- Thaler, R. H. and S. Rosen (1976). The Value of Saving a Life: Evidence from the Market. In: Nestor E. Terleckyj (ed.) *Household Production and Consumption*. Cambridge, Mass.: National Bureau of Economic Research.
- Trechsel, A. and U. Serdült (1999). *Kaleidoskop Volksrechte: Die Institutionen der direkten Demokratie in den schweizerischen Kantonen 1970-1996*. Basel, Genf, München: Helbling & Lichtenhahn.

- Tyler, T. R. (1990). *Why People Obey the Law*. Hew Haven: Yale.
- Tyler, T. R. (1997). Procedural Fairness and Compliance with the Law. *Swiss Journal of Economics and Statistics* 133 (2-2): 219-240.
- Veenhoven, R. (1993). *Happiness in Nations: Subjective Appreciation of Life in 56 Nations 1946-1992*. Rotterdam: Erasmus University Press.
- Veenhoven, R. (1997). Progres dans la comprehension du bonheur. *Revue Quebecoise de Psychologie* 18: 29-74.
- Wilson, W. (1967). Correlates of Avowed Happiness. *Psychological Bulletin* 67 (4): 294-306.
- Winkelmann, L. and R. Winkelmann (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica* 65 (257): 1-15.

Appendix

Construction of the index for direct-democratic rights in Swiss cantons

Direct democracy is defined in terms of individual political participation possibilities. In Switzerland, institutions for the direct political participation of citizens exist on the level of the federal state as well as on the level of cantons. However, the direct-democratic rights on the level of cantons are very heterogeneous. Therefore, the index constructed is designed to measure the different barriers for citizens entering the political process, apart from elections. Data for the year 1992 is used. The index is based on data collected in Trechsel and Serdült (1999) (for details see Stutzer 1999).

The four main legal instruments to directly influence the political process in Swiss cantons are

- (3) the initiative to change a canton's constitution,
- (4) the initiative to change a canton's laws,
- (5) the compulsory or optional referendum to prevent new or the changing of law and
- (6) the compulsory or optional referendum to prevent new state expenditure.

Barriers are in terms of

- the number of signatures necessary to launch an instrument (absolute and relative to the number of citizens with the right to vote),
- the legally allowed time span to collect the signatures and
- the level of new expenditure per head allowing a financial referendum.

Each of these restrictions is evaluated on a six point scale: "one" indicates a high barrier, "six" a low one (compulsory referenda are treated like referenda with the lowest possible barrier).

The resulting non-weighted ratings represent the measure used for direct-democratic rights in Swiss cantons. They are presented in figure A below.

Figure A

Table 1: Compensation of Public Employees in Switzerland

Dependent variable is log(wage) of cantonal public employees

Variable	Power model		Standard model	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	3.460**	50.74	3.438**	50.25
Direct democratic rights	-0.055*	-3.33	-0.049**	-2.96
Superior	-0.197**	-3.58	0.088**	3.01
Superior \times direct democratic rights	0.098**	5.09		
Tenure	0.009**	3.22	0.009**	3.21
Tenure squared	-0.1E-3**	-3.23	-0.1E-3**	-3.13
Experience	0.027**	5.95	0.027**	6.03
Experience squared	-0.5E-3**	-3.94	-0.0005**	-4.00
Basic education	0.325*	2.28	0.316*	2.22
Apprenticeship	0.001	0.04	-0.113	-0.08
High school	0.122**	3.44	0.123**	3.45
Technical university	0.222**	6.75	0.212**	6.53
University degree	0.427**	14.83	0.444**	15.26
Female	-0.093**	-4.22	-0.091**	-4.15
Married	0.148**	6.55	0.147**	6.54
Temporary resident	-0.185**	-6.19	-0.198**	-6.66
Green card	-0.202**	-5.81	-0.202**	-5.88
Number of included observations	478		478	
Unweighted adjusted R ²	0.319		0.311	

Notes: Presented above are results from ordinary least square estimations. *Superior* means that the respective respondent has at least five people working for her. Significance levels: * $0.01 < p < 0.05$, ** $p < 0.01$.

Data source: Swiss Labor Force Survey 1996.

Table 2: Robustness of the Effect of Direct Democracy
on the Compensation of Public Employees

Dependent variable is log(wage) of public employees in Swiss cantons

Variable	Power model	Power model augmented by		
	(1)	National income per capita (2)	Population in canton (3)	National income and population (4)
Constant	-3.460** (50.74)	0.190 (0.19)	3.607** (19.19)	0.137 (0.143)
Direct democratic rights	-0.055** (-3.32)	-0.054** (-3.58)	-0.064** (-3.89)	-0.083** (-4.61)
Superior	-0.197** (-3.58)	-0.164** (-2.71)	-0.184** (-3.47)	-0.118* (-2.05)
Superior × direct democratic rights	0.098** (5.09)	0.090** (4.14)	0.093** (4.74)	0.072** (3.39)
National income per capita (log)		0.309** (3.34)		0.358** (3.98)
Population in canton (log)			-0.013 (-0.73)	-0.041** (-2.41)
Control variables for individual characteristics	yes	yes	yes	yes
Number of included Observations	478	478	478	478
Unweighted Adjusted R ²	0.31	0.34	0.31	0.34

Notes: See table 1. T-statistics in parentheses. Significance levels: * 0.01 < p < 0.05, ** p < 0.01.

Data source: Swiss Labor Force Survey 1996 and Swiss Federal Statistical Office (1998).

Table 3: Direct Democracy and Satisfaction with Life in Switzerland in 1992

Dependent variable is satisfaction with life

Variable	Coefficient	T-Statistic	Marginal effect (score 10)
Constant	1.820**	26.220	0.615
<i>(1) Demographic variables</i>			
Age 30 – 39	-0.095**	-3.782	-0.032
Age 40 – 49	-0.044	-1.662	-0.015
Age 50 – 59	-0.110**	-4.336	-0.037
Age 60 – 69	0.191**	3.289	0.064
Age 70 – 79	0.292**	4.359	0.099
Age 80 and older	0.281**	3.078	0.095
Female	0.046*	2.374	0.015
Foreigner	-0.025	-0.453	-0.009
Middle education	0.095**	4.965	0.032
High education	0.100**	3.602	0.034
Single woman	-0.215**	-7.054	-0.073
Single man	-0.137**	-4.024	-0.046
Couple with children	-0.048 ^(*)	-2.161	-0.016
Single parent	-0.286**	-4.616	-0.097
Other private household	-0.141**	-4.397	-0.048
Collective household	-0.334**	-3.943	-0.113
Self-employed	0.081**	3.355	0.028
Housewife	0.136**	5.607	0.046
Other employment status	-0.107**	-3.285	-0.036
<i>(2) Economic variables</i>			
Unemployed	-0.823**	-18.461	-0.278
Equiv. income SFr. 2000 – 3000	0.079 ^(*)	1.921	0.027
Equiv. income SFr. 3000 – 4000	0.183**	4.511	0.062
Equiv. income SFr. 4000 – 5000	0.309**	7.487	0.105
Equiv. income SFr. 5000 – 6000	0.373**	8.380	0.126
Equiv. income SFr. 6000 and more	0.276**	6.364	0.093
<i>(3) Institutional variables</i>			
Direct democratic rights	0.096**	10.727	0.032
Direct democratic rights x foreigner	-0.069**	4.971	-0.023
Number of observations	6134		
Log likelihood function	-10216.79		

Notes: Weighted ordered probit estimation. Dependent variable satisfaction with life is on an eight point scale (scores of 1, 2 and 3 were aggregated). Reference groups are 'people younger than 30', 'men', 'Swiss', 'people with low education', 'couples', 'employed people' and 'people with an equivalence income lower than SFr. 2000'. Additional control variables (not shown): size of community (5 variables) and type of community (7 variables). Significance levels: ^(*) 0.05 < p < 0.10, * 0.01 < p < 0.05, ** p < 0.01.

Data sources: Leu, Burri and Priester (1997) and Stutzer (1999).

Table 4: Robustness of the Effect of Direct Democracy on Satisfaction with Life

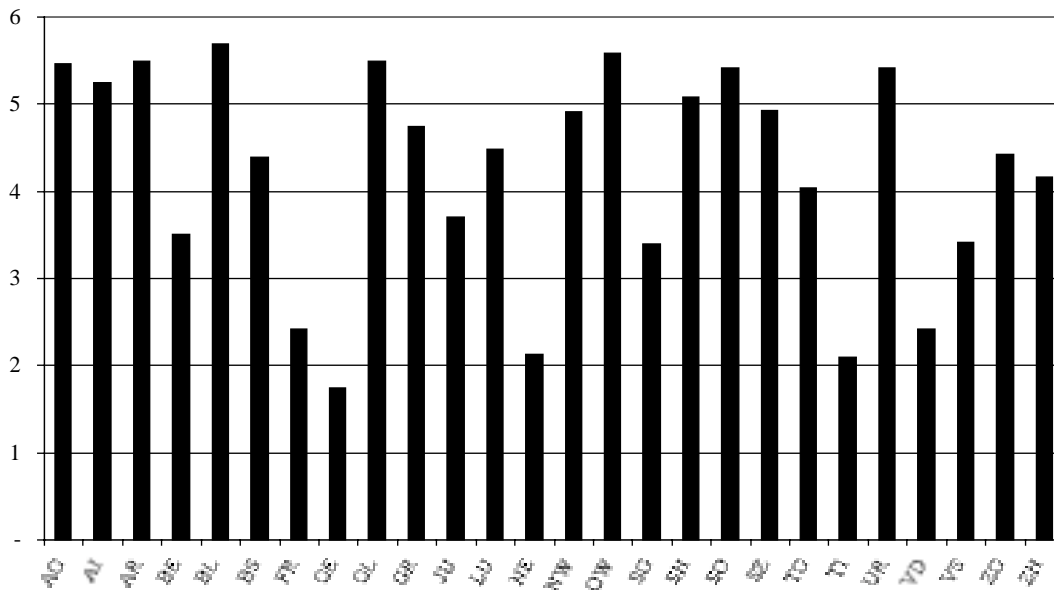
Dependent variable is satisfaction with life

Variable	Base equation	Base equation augmented by		
	(1)	National income per capita (2)	Population in canton (in 100,000) (3)	National income and population (4)
Direct democratic rights	0.096** (10.727)	0.098** (10.841)	0.094** (10.455)	0.095** (10.444)
Direct democratic rights x foreigner	-0.069** (-4.971)	0.069** (-4.990)	-0.064** (-4.630)	-0.065** (-4.664)
National income per capita in canton (in Sfr. 1000)		-0.002 (-1.666)		-0.001 (-0.932)
Population in canton (in 100,000)			-0.006* (-2.652)	-0.005* (-2.271)
Control variables for individual characteristics	yes	yes	yes	yes
Number of observations	6134	6134	6134	6134
Log likelihood function	-10216.79	-10216.33	-10215.65	-10215.51

Notes: See table 1. T-statistics in parentheses. Significance levels: * $0.01 < p < 0.05$, ** $p < 0.01$.

Data sources: Leu, Burri and Priester (1997), Stutzer (1999) and Swiss Federal Statistical Office (various years).

Table A: Index for direct-democratic rights in Swiss cantons in 1992



Note: The figure shows the degree of direct democratic participation possibilities in the 26 Swiss cantons, namely Aargau (AG), Appenzell I.-Rh. (AI), Appenzell A.-Rh. (AR), Bern (BE), Basel-Landschaft (BL), Basel-Stadt (BS), Fribourg (FR), Geneva (GE), Glarus (GL), Jura (JU), Lucerne (LU), Neuchâtel (NE), Nidwalden (NW), Obwalden (OW), St. Gallen (SG), Schaffhausen (SH), Solothurn (SO), Schwyz (SZ), Thurgau (TG), Ticino (TI), Uri (UR), Vaud (VD), Valais (VS), Zug (ZG) and Zurich (ZH).

Source: Stutzer (1999) based on Trechsel and Serdült (1999)