# Measuring Preferences by Subjective Well-Being

by

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The measurement of preferences is an ongoing challenge for economists. New insights can be won by relying on reported subjective well-being in addition to observed behaviour. Empirical estimates of well-being functions, based on a sample of 5500 Swiss residents, find that unemployed persons are much unhappier than employed ones. Differences in life satisfaction between income classes are quite small and improvements in financial situation hardly raise happiness. Moreover, well-being functions are valuable in revealing the utility derived from constitutional conditions. Our econometric estimates suggest that more extended citizens' participation possibilities in the democratic process tend to raise subjective well-being. (JEL: D 60, I 31)

## *1. Introduction*

Individual preferences are not directly observable and can only be measured indirectly by the *traces* they leave. There are many such traces, and hence many different approaches to measuring individual preferences exist. These traces can be closer to or more distant from the individuals concerned. The further away they are, the more care must be taken to control for the influence of the intervening economic and political processes. However, it is certainly not true that reported preferences yield better information, because it is quite possible that they are systematically biased due to various strategic incentives. For that reason, the prevailing view in economics has always been that the best way to identify and empirically measure preferences is to look at behaviour, i.e. the revealed preference approach.

This view has been challenged. Sen [1972, 257 f.] has argued: "Much of the empirical work on preference patterns seems to be based on the conviction that behaviour is the only source of information on a person's preferences. ... The idea ... is extremely limiting for empirical work and is not easy to justify in

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terms of the methodological requirements of our discipline." This advice has been heeded. For specific issues, especially with respect to the environment, the contingent valuation method based on survey questions has gained great prominence (HANEMANN [1994]; PORTNEY [1994]). Where economic variables are concerned, three major approaches exist – individual welfare functions, election and popularity functions and reaction functions – that use econometric methods to empirically capture the influence of unemployment, income and inflation.

Recently, yet another approach has been devised, based on survey data on *subjective well-being, satisfaction with life,* or *happiness.*[1] We want to show in this paper that it constitutes a useful method of capturing individual preferences with respect to macroeconomic, as well as microeconomic variables, and we demonstrate that the results are compatible with other approaches. We present empirical estimates for Switzerland, based on a sample of 5500 persons interviewed in 1992. We find that unemployed persons are much unhappier than employed ones. This effect holds *ceteris paribus*; it can be attributed to psychological distress. Differences in life satisfaction between income classes are quite small, and improvements in financial situation hardly raise happiness. Demographic characteristics are connected with systematic happiness patterns. Thus, for example, women are happier than men, illness strongly reduces subjective well-being, and happiness rises with age (all these influences are partial, controlling for a large number of other influences).

Moreover, we argue that well-being functions are also valuable for revealing the utility derived from constitutional conditions. Thus, the well-being function approach allows an important step forward to capture the effects of different institutional settings that were neglected in the other approaches mentioned above. Our econometric estimates suggest that extended citizens' participation possibilities in the democratic process tend to raise reported subjective well-being.

Section 2 gives a short survey of the various approaches to empirically measuring individuals' preferences with respect to economic variables. The concept of reported subjective well-being is discussed for a sample of Swiss residents. Section 3 presents the respective data and derives the estimation equation. The results are discussed in the following sections: The micro- and macroeconomic variables in section 4, the constitutional variables in 5, and the demographic factors in 6. The final section offers concluding remarks.

[1] For simplicity, the rather clumsy term "reported subjective well-being" will be interchangeably used with the more simple and vivid term "happiness". For a discussion of the cognitive and affective elements of subjective well-being, see LUCAS, DIENER AND SUH [1996].

## 2. Preferences on Economic Variables

The various possibilities of measuring individual preferences have been dealt with in an extensive literature (for books see, e.g., FREEMAN [1993] and POMMEREHNE [1987]). This paper is concerned with measuring the impact of *personal and general economic* conditions on individual utilities. There is a wide variety of approaches here, ranging from a more informal analysis of political and governmental programmes (see KIRSCHEN, BENARD AND BESTERS [1964]) to econometric estimates. The latter are of particular interest because they take a large amount of data into account and are able to yield statistically more reliable results. Three approaches are particularly prominent.[2]

### 2.1 Individual Welfare Functions

A cardinal relationship between income and welfare is established by asking individuals to add income intervals to a number of verbally described income levels.[3] Answering this "income evaluation question" they should take into account their own situation with respect to family and job. The up to nine verbal descriptions ranging from "excellent" to "very bad" are grouped along an interval scale between 0 and 1. The bounded scale reflects the fact that the individual welfare function measures relative welfare as perceived by the individual alone. Every individual evaluates their income by comparing it with a worst position and a position of complete satiation. Thus, the translation of the verbal qualifications results in a sequence of points $(y_i, U(y_i))$ for each respondent, where $y_i$ is the income level and $U(y_i)$ is the number in the [0,1]-interval. It can be shown (VAN PRAAG [1968]) that the individual evaluations of income $U(y)$ correspond closely to a log normal distribution function

$$U(y) = \int_0^y \frac{1}{\sigma\sqrt{2\pi}} \cdot \frac{1}{t} \exp\left[-\frac{1}{2}\left(\frac{\ln(t)-\mu}{\sigma}\right)^2\right] dt$$
$$\equiv L(y;\mu,\sigma) \equiv N(\ln(y);\mu,\sigma)$$

with $L(y;\mu,\sigma)$ the lognormal distribution function with parameters $\mu$ and $\sigma$ and $N(\ln(y);\mu,\sigma)$ the normal distribution function with average $\mu$ and variance $\sigma^2$. For each individual, the parameters can be econometrically estimated. The psychological interpretation of $\mu$ and $\sigma$ is as follows: $\text{Exp}(\mu)$ is

[2] The purpose of the following discussion is to give the reader a feeling for, and provide some empirical results of, related approaches. For more extensive presentations, the reader is referred to the literature cited.

[3] For example, "Please try to indicate what you consider to be an appropriate amount for each of the following cases. Under my/our conditions, I would call a net household income per [month] of: about ___ very bad ... about ___ very good. Please enter an answer on each line ..." (VAN PRAAG [1993, 367]).

the median value of the lognormal distribution, i.e. fixes that income level corresponding to an evaluation of 0.5. For a high "want parameter" $\mu$, and therefore $\exp(\mu)$, an individual on average requires a higher income to reach a welfare evaluation of 0.5. $\sigma$ reflects the "welfare sensitivity"; it determines the slope of the individual welfare function around the median value $\exp(\mu)$. An individual with a high $\sigma$ evaluates a broad range of incomes differently from zero and one and, thus, does not react sensitively to *ex ante* income changes.

Individual welfare functions have been estimated for several countries, with good results, particularly for the Netherlands and Belgium (see, e.g., VAN HERWAARDEN, KAPTEYN AND VAN PRAAG [1977]).[4] A particularly interesting aspect is the connection established between the "want parameter" $\mu$ and income $y$, $\mu = \alpha_0 + \alpha_1 \ln(y)$, which measures the "preference drift" due to a change in income. A positive coefficient for income ($\alpha_1 > 0$) suggests that the *ex post* evaluation of a higher income is smaller than its *ex ante* evaluation. In other words, rich people evaluate a higher income as e.g. "sufficient" than do poor people. Empirical estimates for the Netherlands and Belgium yield a positive value for $\alpha_1$. Its magnitude of between 0.55 and 0.65 suggests that more than half of an *ex ante* expected welfare increase of higher income evaporates when higher income is reached. Only between 35 and 45% of an increase in income results in long-term welfare increase. If measurement errors as well as reference group effects in addition are taken into account, up to 80% of an expected initial welfare increase of additional income disappears with an actual rise in income (KAPTEYN, VAN PRAAG AND VAN HERWAARDEN [1976]).

### *2.2 Election and Popularity Functions*

The evaluation of economic conditions by the voters and their reaction in the voting booth or in regular political surveys was first econometrically studied by GOODHART AND BHANSALI [1970] and KRAMER [1971], and has led to an immense literature (it is surveyed, e.g., by PALDAM [1981], SCHNEIDER AND FREY [1988] and NANNESTAD AND PALDAM [1994]). While these reactions can be attributed to various models of individual behaviour, the "responsibility hypothesis" has fared the best in empirical analyses. Voters are taken to express a general dissatisfaction with the existing state of the economy and to make the government responsible for it.[5] Citizens thus tend to vote in a sociotropic way, i.e. based on their perception of the state of the macroeconomy rather than on their own economic experiences, and they tend to vote retrospectively (see, e.g., KINDER AND KIEWIET [1979] and FIORINA

[4] VAN PRAAG [1993] offers a survey of the research that is based on the individual welfare function approach.

[5] There are other ways to react to bad economic conditions, ranging from strikes and demonstrations to uprisings, *coups d'état* and revolutions. Among the contributions employing econometric methods, see, e.g., HIBBS' [1976] analysis of strike activities in 10 industrial countries, or the study of revolutions from OPP, VOSS AND GERN [1995].

[1981]). Election and popularity functions have been estimated for a great number of countries and periods. While the size of the effect of the various macroeconomic variables differs, of course, it is nevertheless possible to indicate broad magnitudes (see NANNESTAD AND PALDAM [1994], who consider more than 200 studies). The influence of a change in the rate of unemployment and in the rate of inflation, on the share of votes cast for, and the popularity attributed to government, is of similar size. A one percentage point increase in the rate of unemployment lowers the vote or popularity share of the government by between 0.4 and 0.8 percentage points. The same holds for a one percentage point increase in the rate of inflation.

In contrast, a change in the growth rate of per capita real income often has no statistically significant effect on vote and popularity shares, though the coefficient is regularly positive. Some studies have found statistically significant positive effects, but the coefficient tends to be smaller than for a respective change in unemployment and inflation. Thus, for example, HIBBS [1981] estimates a coefficient of 0.02 for France 1969–1978, KIRCHGÄSSNER [1985] of 0.4 for Germany 1971–1982, FREY AND SCHNEIDER [1978a] and [1978b] of 0.8 for the United Kingdom and of 0.5 for the United States 1953–1976, and PALDAM AND SCHNEIDER [1980] of 0.2 for Denmark. Other studies, however, do not identify any systematic effect of income growth on government votes or popularity.

### *2.3 Reaction Functions*

This approach reverses the quantitative theory of economic policy (TINBERGEN [1955] and THEIL [1964]). Instead of deriving the optimal use of policy instruments by maximising the social welfare function, it is assumed that the actual use of policy instruments reflects the maximisation of social welfare, and hence the weights of the various elements. If the policy makers do not maximise social welfare, this approach at least allows for the determination of the weights they attribute to various macroeconomic goals. The more the policy makers depend on the evaluations of the voters, the more closely the empirically derived weights reflect individual preferences. Reaction functions are to be looked at as revealed preference functions of the citizens, provided the policy makers know the structure of the economy, i.e. do not commit any systematic mistakes when using the instruments at their disposal.

Reaction functions have been econometrically estimated for a large number of countries and periods (for evaluative surveys see, e.g., WOOD [1967] and MAKIN [1976]). Most of the studies have been devoted to the behaviour of central banks[6] to determine the implied weights of macroeconomic

[6] If the preference weights derived are to be interpreted as reflecting the utility of the citizens or social welfare, it has to be assumed that central bankers pursue the citizens' or the population's interests for intrinsic reasons, as most central banks are shielded from direct political influence.

variables (see, e.g., DEWALD AND JOHNSON [1963], HAVRILESKY [1967] and FROYEN [1974] for the Federal Reserve; FISHER [1968] for the Bank of England or REUBER [1964] for the Bank of Canada). The studies yield quite different results according to the country and period studied, but also because central bank behaviour depends on political influences. FROYEN [1974] demonstrates, for example, that the weights attributed to the various goals depend on the administration in power. Under the Eisenhower administration (1953–1961), only the rate of unemployment and the level of economic activity influenced Federal Reserve behaviour, while under the Kennedy administration (1961–1969), the rate of inflation also exerted a significant influence. Under Nixon (1969–1972), the Federal Reserve systematically responded to the rate of unemployment, the level of economic activity, and the balance of payments.

Some studies have estimated reaction functions for governments. FRIEDLAENDER [1973] for instance, deduces for the United States that the administration of Eisenhower, Kennedy and Johnson emphasised price stability and a favourable balance of payment more strongly than full employment. PISSARIDES [1972] estimated a reaction function for the British government and the period 1955–1968. E.g., he concluded that the government dislikes an increase of unemployment by one percentage point as much as an increase in the price level of 0.26 percentage points.

## *3. Estimating Microeconometric Well-Being Functions*

Reported subjective well-being is an important concept for the measurement of individual preferences. However, until now it has hardly been considered in economic research. In contrast to the above mentioned approaches based on the behaviour of political actors, the well-being function stresses the subjective evaluation of one's life and relies on the reported respective result. This section presents results for Switzerland. This enables us to also take constitutional conditions into account in the form of direct democratic participation possibilities. We hypothesise that they lead to an outcome of the political process closer to voters' preferences, which is reflected in higher reported happiness.

### *3.1 Data and Estimation Equation*

Our empirical work is based on survey results of more than 5500 residents of Switzerland for the year 1992, collected by LEU, BURRI AND PRIESTER [1997]. The dependent variable called "happiness" is based on answers 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 10 point scale, of which only the two extreme values ("completely dissatisfied" and "completely satisfied") were verbalised. The survey found a high general life satisfaction in Switzerland, with an average of 8.2 out of 10 points. No fewer than 29% of the

interviewees reported a satisfaction level of 10 ("completely satisfied"), 17% 9, and 27% 8. The lower end of the happiness-scale, "completely dissatisfied" (score 1), score 2 and score 3, were indicated only by 0.4%, 0.5%, and 0.9%, respectively. As these categories of great unhappiness are thinly populated, they are aggregated, leaving us with eight happiness categories.

The major explanatory variables which we focus on in this paper are individual unemployment, income level of the household, change of financial situation and the institutional possibilities for individual political participation.

The direct democratic participation rights vary between the 26 Swiss cantons. As at the national level, strong direct democratic instruments exist besides representative democratic parliaments and governments. The most important direct democratic instruments in cantons are the initiative to change the canton's constitution or laws, compulsory and optional referenda to prevent new laws or changes in existing laws, and new state expenditure. Citizens' access to these instruments differ from canton to canton. Thus, for example, the number of signatures required to launch an initiative or an optional referendum, or the time span within which the signatures must be collected, varies. The referendum on public expenditures may be launched at different levels of additional outlays. In 1992, five cantons had citizens' meetings to discuss and to vote on legislative and financial issues. This traditional form of direct democratic participation (up until now, only two have maintained it) functions differently, and is therefore considered separately from semi-direct democracy. For the remaining 21 cantons, we constructed an index designed to reflect the extent of direct democratic participation possibilities (in the sense of low barriers to set an instrument into operation, e.g. a low number of signatures).[7] This index is defined over a six point scale with 1 indicating the lowest and 6 the highest, degree of participation rights for the citizens.

The estimation equations regress the indices of individual happiness on three sets of determinants. *Firstly*, standard determinants, i.e. *demographic variables*, are considered. They describe the personal attributes of the respondents and comprise age, gender, citizenship, extent of formal education, health, family setting (single woman or man; couple with children; single parent; other), type of household and individual employment status (self-employed; housewife or houseman; other). Reference groups are people younger than 30, men, Swiss, people with low education, people in good health, couples and employed. The average satisfaction level of these reference groups is reflected in the constant term.

*Secondly*, *economic variables* are included, which reflect three influences: *(i)* unemployment (the reference group are employed persons); *(ii)* equivalence income. Self-declared household income is adjusted for household size.

[7] It is based on data collected by TRECHSEL AND SERDÜLT [1999]. Details are given in STUTZER [1999].

The applied equivalence scale is the square root of the number of household members (ATKINSON, RAINWATER AND SMEEDING [1995]). Explicit distinctions are drawn between five income groups, ranging from Sfr. 2000 to Sfr. 6000 and more. The constant term includes the reference group "people with an equivalence income lower than Sfr. 2000" and *(iii)* change of financial situation. Respondents compare their present financial situation with that of the previous year. They state whether they are financially "much better" off, "somewhat better" off, "equally well" off, "somewhat worse" off or "much worse" off. The reference group are people in an unchanged financial situation.

*Thirdly, constitutional conditions*, focusing on the main institutional differences between cantons, are added. They are reflected in a composite index for direct democratic rights and citizens' meeting (existing or not).

### *3.2 Estimation results*

Life satisfaction is measured on an ordinal scale. Therefore, an ordered probit model is the appropriate econometric technique (GREENE [1997]). The weighting variable used allows representative results for Switzerland. Table 1 shows the coefficients for the determinants of reported subjective well-being. With regard to the income variables, two different specifications of the equation are estimated. Equation (1) considers two sets of variables for income level and financial change, and equation (2) analyses financial changes for different income levels. The estimates are satisfactory, judging from the various test indicators. The results will be interpreted in the following sections.

## *4. Economic Determinants*

In order to clarify the effect of unemployment and income on satisfaction with life, table 2 additionally presents the marginal effects for the two lowest and the two highest levels of satisfaction.

### *4.1 Unemployment*

Unemployed persons indicate a statistically highly significant lower level of subjective well-being than those employed.[8] It should be remembered that this coefficient captures the state of being unemployed, and not the resulting

[8] The coefficients should be interpreted as follows: A rise in the independent variable by one unit changes the probability of persons stating that they are completely satisfied. The signs of the coefficients indicate the direction of this change. For dummy variables (e.g. "unemployed"), the signs of the coefficients show the direction of the change in comparison to the respective reference group (e.g. "employed"). The size of the coefficients can be interpreted relative to the other coefficients. According to this interpretation, being unemployed has an effect on satisfaction with life about three times larger than falling in the top income category, c.p.

*Table 1: Part 1*

Satisfaction With Life in Switzerland in 1992 (Weighted Ordered Probit Estimate)

| | (1) | | (2) | |
|---|---|---|---|---|
| | Coefficient | Z-value | Coefficient | Z-value |
| Constant | 2.301** | 46.610 | 2.133** | 45.085 |
| *(1) Demographic variables* | | | | |
| Age 30–39 | −0.035 | −1.386 | −0.025 | −0.986 |
| Age 40–49 | 0.041 | 1.516 | 0.061* | 2.276 |
| Age 50–59 | 0.051(*) | 1.940 | 0.055(*) | 2.090 |
| Age 60–69 | 0.291** | 4.535 | 0.316** | 4.872 |
| Age 70–79 | 0.391** | 4.754 | 0.438** | 5.314 |
| Age 80 and older | 0.339** | 3.231 | 0.411** | 3.921 |
| Female | 0.046* | 2.302 | 0.046* | 2.320 |
| Foreigner | −0.254** | −12.718 | −0.260** | −13.126 |
| Middle education | 0.005 | 0.241 | −0.003 | −0.139 |
| High education | −0.038 | −1.290 | −0.050 | −1.691 |
| Poor health | −0.652** | −31.827 | −0.664** | −31.947 |
| Single woman | −0.254** | −8.080 | −0.249** | −7.901 |
| Single man | −0.212** | −5.908 | −0.218** | −6.042 |
| Couple with children | −0.102** | −4.407 | −0.091** | −3.933 |
| Single parent | −0.345** | −5.911 | −0.355** | −5.982 |
| Other private household | −0.134** | −3.811 | −0.126** | −3.593 |
| Collective household | −0.449** | −4.524 | −0.465** | −4.206 |
| Self-employed | 0.099** | 3.876 | 0.079** | 3.193 |
| Housewife | 0.151** | 5.850 | 0.147** | 5.672 |
| Other employment status | −0.018 | −0.476 | −0.018 | −0.483 |

*Notes:* See table 1: part 2.

income loss. The loss of income is controlled by the variable "much worse financial situation". Not having a job imposes non-pecuniary stress and unhappiness. The size of the drop in happiness due to unemployment is substantial. Figure 1 gives a graphical illustration.

If the persons looking for a job are compared with the reference group of employed people, a one percentage point higher share reports to be deeply unhappy (score 1, 2 or 3). Interestingly enough, the effect on the upper range of happiness is huge: 17 percentage points fewer persons indicate being extremely satisfied; or in terms of probability, an unemployed person reaches a satisfaction level of 10, with a 17 percentage point lower probability than an employed person. The marginal effect for a score of nine has to be interpreted as a net effect. Category nine gets a share of 17 percentage points of less happy unemployed from the top category and loses a share of 20 percentage points to the lower level, resulting in a net effect of minus 3 percentage points (always in comparison to the reference group). As mentioned above, these effects do not include unhappiness caused by the loss of income. The combination of both effects (unemployment and loss of income) reduce well-being even more greatly. The marginal effect of being unemployed, without

*Table 1: Part 2*

Satisfaction With Life in Switzerland in 1992 (Weighted Ordered Probit Estimate)

| | (1) | | (2) | |
|---|---|---|---|---|
| | Coefficient | Z-value | Coefficient | Z-value |
| *(2) Economic variables* | | | | |
| Unemployed | −0.506** | −10.191 | −0.635** | −14.049 |
| Equivalence income | | | | |
| Sfr. 2000–3000 | 0.034 | 1.185 | 0.134** | 3.915 |
| Sfr. 3000–4000 | 0.085* | 2.731 | 0.211** | 6.216 |
| Sfr. 4000–5000 | 0.148** | 4.669 | 0.235** | 6.604 |
| Sfr. 5000–6000 | 0.076(*) | 2.126 | 0.239** | 6.182 |
| Sfr. 6000 and more | 0.177** | 4.990 | 0.272** | 6.990 |
| Change of financial situation | | | | |
| Much better | 0.053 | 1.345 | | |
| Somewhat better | 0.029 | 1.028 | | |
| Somewhat worse | −0.284** | −13.698 | | |
| Much worse | −0.700** | −22.547 | | |
| Income x better financial situation | | | | |
| Sfr. 2000–3000 | | | 0.119* | 2.224 |
| Sfr. 3000–4000 | | | 0.006 | 0.107 |
| Sfr. 4000–5000 | | | 0.229** | 4.616 |
| Sfr. 5000–6000 | | | −0.087 | −1.205 |
| Sfr. 6000 and more | | | 0.040 | 0.791 |
| Income x worse financial situation | | | | |
| Sfr. 2000–3000 | | | −0.340** | −9.997 |
| Sfr. 3000–4000 | | | −0.338** | −8.040 |
| Sfr. 4000–5000 | | | −0.333** | −7.453 |
| Sfr. 5000–6000 | | | −0.384** | −6.655 |
| Sfr. 6000 and more | | | −0.128(*) | −2.134 |
| *(3) Institutional variables* | | | | |
| Direct democratic rights | 0.072** | 9.892 | 0.074** | 10.076 |
| Citizens' meeting | 0.642** | 10.076 | 0.670** | 10.573 |
| See table 1: Part 1 | | | | |
| Observations | 5506 | | 5506 | |
| Log likelihood function | −8950.841 | | −8983.239 | |
| $Chi^2(32)$ / $Chi^2(38)$ | 1019.460 | | 954.665 | |
| Likelihood ratio index | 0.050 | | 0.047 | |

*Notes:* Dependent variable: Level of satisfaction 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", "healthy people", "couples", "employed", "people with an equivalence income lower than Sfr. 2000" and "people in unchanged financial situation".
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].

controlling for income level and income change, is minus 26 percentage points for a satisfaction score of 10. Compared with the 17 percentage points from above, it follows that two thirds of the reduction in subjective well-being is caused by non-pecuniary costs.

*Table 2*

Marginal Effects of Economic Variables on Satisfaction With Life in Switzerland in 1992

| | (1) | | | | (2) | | | |
|---|---|---|---|---|---|---|---|---|
| | Marginal effect for score | | | | | | | |
| | 1 to 3 | 4 | 9 | 10 | 1 to 3 | 4 | 9 | 10 |
| Unemployed | 0.011 | 0.012 | −0.034 | −0.167 | 0.015 | 0.015 | −0.042 | −0.210 |
| Equivalence income | | | | | | | | |
| Sfr. 2000–3000 | −0.001 | −0.001 | 0.002 | 0.011 | −0.003 | −0.003 | 0.009 | 0.044 |
| Sfr. 3000–4000 | −0.002 | −0.002 | 0.006 | 0.028 | −0.005 | −0.005 | 0.014 | 0.070 |
| Sfr. 4000–5000 | −0.003 | −0.004 | 0.010 | 0.049 | −0.006 | −0.006 | 0.016 | 0.078 |
| Sfr. 5000–6000 | −0.002 | −0.002 | 0.005 | 0.025 | −0.006 | −0.006 | 0.016 | 0.079 |
| Sfr. 6000 and more | −0.004 | −0.004 | 0.012 | 0.058 | −0.007 | −0.007 | 0.018 | 0.090 |
| Change of financial situation | | | | | | | | |
| Much better | −0.001 | −0.001 | 0.004 | 0.017 | | | | |
| Somewhat better | −0.001 | −0.001 | 0.002 | 0.010 | | | | |
| Somewhat worse | 0.006 | 0.007 | −0.019 | −0.094 | | | | |
| Much worse | 0.016 | 0.017 | −0.047 | −0.231 | | | | |
| Income x better financial situation | | | | | | | | |
| Sfr. 2000–3000 | | | | | −0.003 | −0.003 | 0.008 | 0.039 |
| Sfr. 3000–4000 | | | | | 0.000 | 0.000 | 0.000 | 0.002 |
| Sfr. 4000–5000 | | | | | −0.006 | −0.006 | 0.015 | 0.076 |
| Sfr. 5000–6000 | | | | | 0.002 | 0.002 | −0.006 | −0.029 |
| Sfr. 6000 and more | | | | | −0.001 | −0.001 | 0.003 | 0.013 |
| Income x worse financial situation | | | | | | | | |
| Sfr. 2000–3000 | | | | | 0.008 | 0.008 | −0.023 | −0.112 |
| Sfr. 3000–4000 | | | | | 0.008 | 0.008 | −0.023 | −0.112 |
| Sfr. 4000–5000 | | | | | 0.008 | 0.008 | −0.022 | −0.110 |
| Sfr. 5000–6000 | | | | | 0.009 | 0.009 | −0.026 | −0.127 |
| Sfr. 6000 and more | | | | | 0.003 | 0.003 | -0.009 | −0.042 |

*Notes:* See table 1.

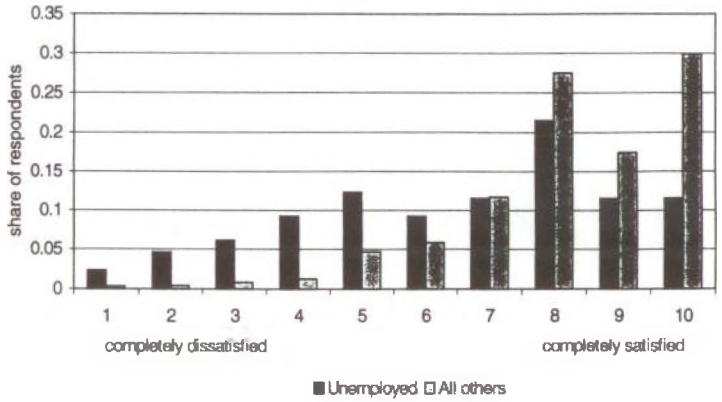
### *4.2 Income*

Tables 1 and 2 report the coefficients and marginal effects of two different income variables on happiness. It distinguishes between income levels and changes in financial situation. This allows us to investigate the effects of *(i)* being in a particular income group (rather than being in the lowest group, with an equivalence income of less than Sfr. 2000 per month) as well as *(ii)* experiencing income shifts (rather than being in a constant financial situation).

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 income above Sfr. 6000. Compared to persons with low income, only a 5.8 percentage points larger share reports being "completely satisfied". This effect may even be spurious: Personal characteristics such as optimism and extraversion may raise happiness as well as income possibilities. Another influence not controlled for is job satisfaction. High-wage jobs often offer more autonomy

*Figure 1*

Satisfaction With Life of Unemployed Persons in Comparison to all Others in Switzerland in 1992.




and require skills which are associated with life satisfaction (ARGYLE 1996). The small correlation between income level and subjective well-being can be shown not to be due to the multivariate analysis: Simple cross-tabulation shows that the satisfaction level of the three percent poorest in the sample (mean satisfaction 7.8) is only 0.8 index points lower than the respective level for the top income class (mean satisfaction 8.6). However, the much larger distribution of satisfaction scores for lower income recipients is remarkable. The standard deviation varies between 2.2 and 1.3 from the bottom to the top income category (detailed statistics are provided in the appendix in table A.1). In other words, wealth partially protects people from low satisfaction scores.

There is a measurable but weak relationship between income levels and life satisfaction, but what about the effect of income changes? Equation 1 entails four variables, which capture the effect of financial ups and downs. Astonishingly, people who state that they are financially somewhat or much better off than in the previous year do not on average report significantly higher subjective well-being. This statistical fact is also visible in the results for a cross-tabulation (see table A.2 in the appendix). The reference group with an unchanged financial situation reports an average satisfaction score of 8.4, as do people who improved their financial lot somewhat. Those who are much better off reach an average score of 8.5. This result is especially striking because changes and not levels are considered, and correlation between subjective income evaluation (versus objective income measures) and subjective well-being tend to be stronger (MYERS AND DIENER [1995]). However, according to equation 2, a better financial situation does slightly improve the lot of low and middle income recipients. For people with an

income between Sfr. 4000 and 5000, a positive financial change raises the share of respondents stating that they are completely satisfied with life by 7.6 percentage points.

The estimated minimal effect of financial improvements on happiness does not appear at all for income losses. People who state that their financial situation worsened within the last year feel much less satisfied than people reporting a constant income level. The probability of a happiness score of 10 is 9.4 percentage points lower for respondents in a somewhat worse financial situation. The respective figure for a much worse financial situation is minus 23.1 percentage points. A loss of income reduces subjective well-being almost independently of the resulting income level (see equation 2). For the top income class only (roughly 10 percent of the sample), the decrease is smaller. Overall, subjectively perceived income changes have very asymmetric effects on happiness. Gains hardly matter, whereas losses are very detrimental for one's satisfaction with life. These findings are consistent with the concept of loss-aversion advanced by KAHNEMAN AND TVERSKY [1979].

### *4.3 Sensitivity Analysis*

The analysis presented above is based on self-reported income data and not on income data from tax statistics, which are also available in the data set. We chose the former because they are chronologically better synchronized with other information collected in the interviews, e.g. changes in the financial situation of the respondents.[9] To check the robustness of the results, equations 1 and 2 were also estimated with official income measures (household income after tax and social security expenditure adjusted to family size by the Atkinson equivalence scale).[10] The results are very similar (the descriptive statistics are given in table A.1 in the appendix). The only noteworthy difference concerns the interaction variables "income level × better financial situation". In contrast to the results presented here, income improvements have a positive effect on happiness for the income class Sfr. 4000 – 5000 and for the top income class (Sfr. 6000 and more). However, a better financial situation is negatively correlated with subjective well-being for the income category in between (Sfr. 5000 – 6000).

### *4.4 Comparison With Other Studies*

Various studies have presented well-being functions for other countries and periods. They indicate a considerable degree of similarity concerning the major results. Thus, for Britain in 1991, OSWALD [1997] found that the

[9] Due to the inclusion of self-reported income data, the disposal sample size is reduced to 5506. The total sample accounts for 6301 interviews. 204 individual data sets include missing values for demographic variables or the dependent variable, and 591 people could not or did not want to answer the question on their household income.

[10] The results are available from the authors on request.

unemployed have a much lower level of well-being than the employed. He states succinctly: "Unemployed people are very unhappy" (p. 1822). As to the magnitude of the impact, "an enormous amount of extra income would be required to compensate for having no work" (p. 1821).[11] Other studies (e.g. DI TELLA, MACCULLOCH AND OSWALD [1999] or WINKELMANN AND WINKELMANN [1998]) have found corresponding results for the United States and European countries. However, they control only for income *level*, and thus do not capture the financial shock accompanying a job loss. Information on financial changes is necessary to distinguish between pecuniary and non-pecuniary costs of unemployment.

The somewhat mixed evidence we find concerning the effect of income on well-being also corresponds to the results of other studies. EASTERLIN [1974] was probably the first economist to empirically analyse the relationship between income and reported happiness, based on data for the United States. He identified three significant empirical patterns: *(1)* Self-reported satisfaction levels across individuals are positively associated with income; *(2)* The average reported subjective level of well-being within a given country is nearly constant over time and *(3)* Average reported well-being is at best weakly associated with the per capita incomes across countries.

It is difficult to identify a consistent pattern of results in the large number of studies undertaken since Easterlin's pathbreaking paper. But it seems that his conclusions need to be qualified.[12] For the United States, OSWALD [1997], for example, finds that, with rising per capita incomes, subjective well-being has been increasing – but that this increase is only *very slight*. Since the beginning of the 1970s, reported subjective levels of well-being in nine European countries have also increased only slightly (OSWALD [1997, 1820]). For Japan for the period 1958 – 1987, in which per capita incomes grew more than fivefold, subjective well-being remained almost completely stable (VEENHOVEN [1993]). The same result has been demonstrated by DIENER AND SUH [1997] for the United States, Japan and France since World War II.

With respect to Easterlin's first conclusion, the empirical evidence available suggests that the relation between subjective well-being and income level in cross-sectional within-nation data, while positive, is again small (see, e.g., INGLEHART [1990], using data for 12 nations collected by the Euro-Barometer). MULLIS [1992, 132] concludes in his survey that the "most striking feature of the findings ... is the low level of variance predicted by measures of (objective) economic well-being." INGLEHART AND RABIER [1986] compare these results with the effect of changes in financial situation. They find that financial improvements are more important for subjective well-being than overall income level. This result is not confirmed here for

[11] For a broader discussion of "unhappiness and unemployment" see CLARK AND OSWALD [1994].

[12] See FRANK [1997], and the extensive surveys by DIENER AND OISHI [1999] and VEENHOVEN [1993].

Switzerland. In a new study for West Germany, SCHYNS [1999] finds only a small effect for positive income changes.

One aspect of Easterlin's result has stood the test of time, namely his theoretical insistence that income is not evaluated in isolation, but that social comparisons with reference groups are crucial (for similar arguments see SCITOVSKY [1976], HIRSCH [1976], and very forcefully FRANK [1985] and [1997]). This well explains why economic growth buys little, if any happiness. But it also serves to explain why higher income is not in any simple way associated with higher subjective well-being within a country, contrary to the empirical pattern suggested by Easterlin.

The diffuse association between income and subjective well-being between income groups accords well with our own estimates for Switzerland presented above, with those derived by the individual welfare function, and with those obtained by election and popularity functions.

### *4.5 Inflation*

Due to the use of cross-section data, the influence of inflation on happiness could not be tested here. DI TELLA, MACCULLOCH AND OSWALD [1999] estimate macro-econometric well-being functions employing happiness panel data for the United States (1972–1990) and 12 European countries (1975–1991). After controlling for individual differences (such as personal income, age, etc.), they calculate average satisfaction for each country and each year. They find that "... inflation is an important determinant of well-being" (p. 13). They are able to establish the following subjective trade-off (p. 13): A one percentage point rise in the inflation rate must be compensated for by about $ 150 in additional per capita income (in 1985 dollars).

In comparison, a one percentage point rise in the unemployment rate must be compensated for by about $ 165 (in 1985 dollars) in additional per capita income (p. 13).[13] The cost of a one percentage point increase in inflation or in unemployment is thus quite similar. This corresponds to the results in the literature on election and vote functions discussed in section 2.2 (NANNESTAD AND PALDAM [1994, 216]). This coincidence is not a matter of course, because these estimates of the cost of inflation deviate strongly from the traditional partial equilibrium approach based on the area which lies under the money demand function (DI TELLA, MACCULLOCH AND OSWALD [1999, 13]). On the basis of this approach, LUCAS [1981] and FISHER [1981] estimate the cost of a one percentage point higher inflation to amount to only 0.05 and 0.03 percent of national income ($ 4.8 to $ 8 for a per capita income of approximately $ 16,000 in 1981 (in 1985 dollars)).

[13] Here, compensation for a higher unemployment rate is taken into account. This result must be distinguished from that for individual unemployment discussed above.

### *5. Constitutional Determinants*

Table 3 presents in addition to table 1 the marginal effects for the influence of constitutional factors on subjective well-being.

*Table 3*
Marginal Effects of Institutional Variables on Satisfaction With Life in Switzerland in 1992

| | (1) | | | | (2) | | | |
|---|---|---|---|---|---|---|---|---|
| | Marginal effect for score | | | | Marginal effect for score | | | |
| | 1 to 3 | 4 | 9 | 10 | 1 to 3 | 4 | 9 | 10 |
| Direct democratic rights | − 0.002 | − 0.002 | 0.005 | 0.024 | − 0.002 | − 0.002 | 0.005 | 0.024 |
| Citizens' meeting | − 0.014 | − 0.015 | 0.043 | 0.211 | − 0.016 | − 0.016 | 0.045 | 0.221 |

*Notes:* See table 1.

#### *5.1 Direct Democracy*

The index for direct democracy, as well as for the citizens' assembly, have a highly significant positive effect on happiness. An increase in the index of direct democracy by one point raises the share of persons indicating "very high" happiness by 2.4 percentage points. The respective figure for the citizens' assembly is 21.1 percentage points. These results are consistent with our hypothesis that the institutions of direct democracy raise the reported subjective well-being.

#### *5.2 Sensitivity Analysis*

The empirical analysis for the constitutional variables entails two potential pitfalls, namely omitted regional variables and correlation of the democracy index with linguistic groups.[14] In order to test for omitted regional variables, we performed an estimation in which five variables for community size and seven variables for the type of community are added (this also includes the control for rural as opposed to urban areas). In the extended equation 1, the estimated coefficient for direct democratic rights is 0.071; i.e. there is no significant difference to the estimates presented in table 1.

Membership of different language communities, and its relation to happiness, has been the subject of several investigations (e.g. VEENHOVEN [1993, 53] and INGLEHART [1990]). At best, partial support for a correlation between language and satisfaction is found. Interestingly, the case of Switzerland is used to illustrate the futility of explaining differences in

[14] We are aware that causality may in principle work in reverse. However, institutional conditions in Swiss cantons are quite stable and, therefore, causality runs unambiguously from direct democratic rights to satisfaction with life. The Spearman rank order correlation of the index for direct democratic rights between 1970 and 1996 is 0.803.

happiness by linguistic differences. "The Swiss have three different national languages, which coincide with three of the languages used in other nations in these surveys. ... In fact, the German-speaking Swiss, the French-speaking Swiss, and the Italian-speaking Swiss all express higher levels of satisfaction than do the German, French and Italians ..." (INGLEHART [1990, 28]). Due to the correlation between the democracy index and linguistic groups (the French-speaking cantons are less directly democratic), a further test is conducted. In addition to the regional variables, a dummy variable for French-speaking cantons, and one for the Italian-speaking canton, is included in estimation equation 1. Living in a French-speaking canton results in a significantly negative effect on subjective well-being, while residing in canton Ticino results in a positive effect. The coefficient for the constitutional variable direct democratic rights is slightly lower, but still highly significant ($p < 0.01$), i.e. 0.065 in comparison to 0.072 in equation 1.

### *5.3 Comparison With Other Research*

A large number of econometric studies have convincingly shown that the institutions of direct democracy lead to outcomes beneficial to the voters. Most of these studies refer to the United States and Switzerland. There is no need to give a full account of these results here because they are the subject of various surveys (e.g. FELD AND SAVIOZ [1998] or KIRCHGÄSSNER, FELD AND SAVIOZ [1999]). For the United States, the recent studies by MATSUSAKA [1995] and RUEBEN [1999] establish, e.g., that government expenditures and government revenues are lower with institutions of direct democracy. MCEACHERN [1978] shows that the per capita debt is substantially lower, with a referendum requiring a qualified majority. In contrast, educational public expenditures are higher when a referendum is possible (SANTERRE [1989], [1993]). For Switzerland, the econometric evidence is even more compelling, one reason being that the institutions of direct democracy are even more developed than in the U.S., and their effect on political outcomes can be better identified. SCHNEIDER AND POMMEREHNE [1983] find that public expenditures exhibit significantly lower growth in cities with well established direct democracy. FELD AND KIRCHGÄSSNER [1999] show that, for 131 Swiss cities, public expenditures are lower by 14%, but the median tax rate higher[15] by 14% in cities with well developed institutions of direct referendum. Due to a five percentage points higher share of self-financing, per capita debt is no less than 45% lower. Other studies (POMMEREHNE AND WECK-HANNEMANN [1996] and FREY [1997]) conclude that tax evasion is significantly lower in cantons with a higher degree of direct participation rights for voters. Finally,

[15] There are two countervailing effects. Voters prefer lower taxes in order to have a higher disposable income. At the same time, they are prepared to tolerate higher taxes because they believe that they are more wisely and more efficiently spent. In the above case, the second effect dominates.

Feld and Savioz [1997] establish that gross domestic product per capita is 5.4% higher in cantons with more established direct-democratic institutions than in more representative ones. All these results are based on estimates which carefully control for influences unrelated to direct democracy, and establish a causal effect from that institution on political outcomes and their consequences in terms of behaviour (tax evasion) or economic activity (income).

### *6. Demographic Determinants*

In the estimation equation in table 1, a number of demographic variables are included. They serve mainly as control variables. However, they offer interesting information to compare the magnitude of the influence of different factors on subjective well-being (see table 4).

*Table 4*
Marginal Effects of Demographic Variables on Satisfaction With Life in Switzerland in 1992

| | (1) | | | | (2) | | | |
|---|---|---|---|---|---|---|---|---|
| | Marginal effect for score | | | | Marginal effect for score | | | |
| | 1 to 3 | 4 | 9 | 10 | 1 to 3 | 4 | 9 | 10 |
| Age 30–39 | 0.001 | 0.001 | −0.002 | −0.011 | 0.001 | 0.001 | −0.002 | −0.008 |
| Age 40–49 | −0.001 | −0.001 | 0.003 | 0.013 | −0.002 | −0.002 | 0.004 | 0.020 |
| Age 50–59 | −0.001 | −0.001 | 0.004 | 0.017 | −0.001 | −0.001 | 0.004 | 0.018 |
| Age 60–69 | −0.007 | −0.007 | 0.020 | 0.096 | −0.008 | −0.008 | 0.021 | 0.104 |
| Age 70–79 | −0.009 | −0.009 | 0.026 | 0.129 | −0.011 | −0.011 | 0.029 | 0.145 |
| Age 80 and older | −0.008 | −0.008 | 0.023 | 0.112 | −0.010 | −0.010 | 0.028 | 0.136 |
| Female | −0.001 | −0.001 | 0.003 | 0.015 | −0.001 | −0.001 | 0.003 | 0.015 |
| Foreigner | 0.006 | 0.006 | −0.017 | −0.084 | 0.006 | 0.006 | −0.017 | −0.086 |
| Middle education | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | −0.001 |
| High education | 0.001 | 0.001 | −0.003 | −0.012 | 0.001 | 0.001 | −0.003 | −0.016 |
| Poor health | 0.015 | 0.016 | −0.044 | −0.215 | 0.016 | 0.016 | −0.044 | −0.219 |
| Single woman | 0.006 | 0.006 | −0.017 | −0.084 | 0.006 | 0.006 | −0.017 | −0.082 |
| Single man | 0.005 | 0.005 | −0.014 | −0.070 | 0.005 | 0.005 | −0.015 | −0.072 |
| Couple with children | 0.002 | 0.003 | −0.007 | −0.034 | 0.002 | 0.002 | −0.006 | −0.030 |
| Single parent | 0.008 | 0.008 | −0.023 | −0.114 | 0.009 | 0.009 | −0.024 | −0.117 |
| Other private household | 0.003 | 0.003 | −0.009 | −0.044 | 0.003 | 0.003 | −0.008 | −0.042 |
| Collective household | 0.010 | 0.011 | −0.030 | −0.148 | 0.011 | 0.011 | −0.031 | −0.153 |
| Self-employed | −0.002 | −0.002 | 0.007 | 0.033 | −0.002 | −0.002 | 0.005 | 0.026 |
| Housewife | −0.003 | −0.004 | 0.010 | 0.050 | −0.004 | −0.004 | 0.010 | 0.049 |
| Other employment status | 0.000 | 0.000 | −0.001 | −0.006 | 0.000 | 0.000 | −0.001 | −0.006 |

*Notes:* See table 1.

Compared to the respective reference groups, people older than 60 are happier. Women are more satisfied with life than men, while persons affected by illness have a much lower level of subjective well-being. Furthermore, foreigners are subject to a significantly lower probability of reaching high happiness scores compared to the Swiss. Couples without children are happier

than persons living in other family settings. Finally, self-employed persons and housewives report higher subjective well-being than the employed. Interestingly, no single demographic variable reduces happiness as much as unemployment does. Bad health lowers the probability of stating being "completely satisfied" by 21.5 percentage points, being single by not more than 8.4 percentage points, compared to 26.4 percentage points for unemployment (total effect, including income loss).

These results are quite similar to those reached by other researchers on happiness for other countries and periods (see the extensive survey by DIENER et al. [1999] and OSWALD [1997], for the United States and the United Kingdom, and DI TELLA, MCCULLOCH AND OSWALD [1999] for the countries of the European Union).

## *7. Concluding Remarks*

The purpose of this paper is to herald an approach for estimating the determinants of individual well-being, and to present respective estimates for Switzerland based on a large survey. As has been made clear, estimating a microeconometric "well-being function" is far from being the first or only approach with that purpose in mind. It is nevertheless interesting to note that the otherwise most careful surveys, by e.g. DIENER AND OISHI [1999], VEENHOVEN [1993], or DIENER et al. [1999], do not seem to be aware of these alternative approaches (at least judging from the lack of references to them). This may be due to the fact that the authors are psychologists and sociologists. But the same applies to the contributions by the economists cited in this paper.

Estimating functions of reported subjective well-being is most closely related to the work on individual welfare functions. The latter focuses on capturing the relationship to income. It imposes a structure on individual welfare (the lognormal distribution), which allows us to estimate various parameters beyond the direct effect of income levels on individual satisfaction. The election and popularity functions are less closely related; they are based on presumed responses to the expected future behaviour of government (which, as we have seen, is predominantly undertaken by evaluating the government's past behaviour). The reaction functions look at a still more distant phenomenon, namely the behaviour of political decision-makers (central bank and government, respectively), which is taken to reflect the preferences of the citizenry and presupposes that the policy makers know the economic structure that translates the use of policy instruments into outcomes relevant for individuals.

As has become clear, each of the approaches has its strengths and weaknesses, with none being generally superior to any other. Rather, the type of question asked dictates which approach is best to be used. For example, if

one wants to inquire what weights the central bank attributes to the various macro economic variables, it is adequate to consider reaction functions for that particular policy maker. However, these preferences are not necessarily those of the population as a whole. For that purpose, the more direct approaches relying on surveys of individuals relating to general feelings of well-being – as in the individual welfare and the happiness function approaches – are appropriate. Moreover, well-being functions allow the effect of different institutional settings on life satisfaction to be captured, as has been shown here. The institutional aspects are largely neglected in the reaction function approach. If the objective is to know the likely future behaviour of a democratic government, it is useful to consider popularity and election functions as they focus on the government's reelection constraints. Moreover, it is always enlightening to try to capture individual preferences from different points of view. We have been able to show that the results, using the various approaches, are certainly not inconsistent with each other, and that the estimate of reported subjective well-being functions constitutes a worthwhile addition to existing approaches.

## *Appendix*

*Table A.1*
Income and Satisfaction With Life

| Equivalence income | Self-reported income data | | | Income data from tax statistics | | |
|---|---|---|---|---|---|---|
| | Mean satisfaction | Standard deviation | Share of respondents | Mean satisfaction | Standard deviation | Share of respondents |
| Up to Sfr. 1000 | 7.774 | 2.179 | 2.8% | 7.667 | 2.130 | 3.3% |
| Sfr. 1000 – 2000 | 7.902 | 1.971 | 21.4% | 7.818 | 1.999 | 13.2% |
| Sfr. 2000 – 3000 | 8.156 | 1.749 | 30.5% | 8.100 | 1.818 | 25.3% |
| Sfr. 3000 – 4000 | 8.284 | 1.586 | 15.5% | 8.213 | 1.666 | 20.8% |
| Sfr. 4000 – 5000 | 8.409 | 1.515 | 11.5% | 8.447 | 1.491 | 15.5% |
| Sfr. 5000 – 6000 | 8.437 | 1.460 | 7.5% | 8.530 | 1.494 | 9.2% |
| Sfr. 6000 and more | 8.630 | 1.272 | 10.8% | 8.494 | 1.439 | 12.6% |
| Total | 8.212 | 1.714 | 100.0% | 8.215 | 1.722 | 100.0% |

*Note:* Income measure from interviews: Answer to the question "would you report the income range of your household per month according to the presented list?". Income measure from tax statistics: Household income after tax and social security expenditure. Household income is adjusted to household size by the square root of the number of household members (equivalence scale applied by ATKINSON et al. [1995]). The calculated averages are non-weighted. The number of observations is 5564 and 6178, respectively.
*Data source:* LEU, BURRI AND PRIESTER [1997].

*Table A.2*

Change in Financial Situation and Satisfaction With Life

| Financial situation today in comparison to last year | Mean satisfaction | Standard deviation | Share of Respondents |
|---|---|---|---|
| Much better | 8.507 | 1.539 | 3.3% |
| Somewhat better | 8.376 | 1.599 | 12.4% |
| Unchanged | 8.422 | 1.587 | 60.2% |
| Somewhat worse | 7.775 | 1.801 | 18.9% |
| Much worse | 6.922 | 2.291 | 5.2% |
| Total | 8.218 | 1.718 | 100.0% |

*Note:* Question: If you compare your situation today with the one last year, would you say that you are financially "much better", "somewhat better", "equally", "somewhat worse" or "much worse" off? The calculated averages are non-weighted. The number of observations is 6148.
*Data source:* Leu, Burri and Priester [1997].

## *References*


Argyle, M. [1996], "Subjective Well-Being", pp. 18–45 in: A. Offer (ed.), *In Pursuit of the Quality of Life*, Oxford University Press: New York.

Atkinson, A. B., L. Rainwater and T. Smeeding [1995], "Income Distribution in OECD Countries: Evidence from Luxembourg Income Study", *Social Policy Studies*, 18, OECD: Paris.

Clark, A. E. and A. J. Oswald [1994], "Unhappiness and Unemployment", *Economic Journal*, 104 (424), 648–659.

Dewald, W. G. and H. G. Johnson [1963], "Analysis of the Objectives of Monetary Policy", pp. 171–189 in: D. Carson (ed.), *Banking and Monetary Studies*, Irwin: Homewood.

Diener, E. and S. Oishi [1999], "Money and Happiness: Income and Subjective Well-Being Across Nations", in: E. Diener and E. M. Suh (eds.), *Subjective Well-Being Across Cultures*, MIT Press: Cambridge, MA, forthcoming.

–– and E. M. Suh [1997], "Measuring Quality of Life: Economic, Social, and Subjective Indicators", *Social Indicators Research*, 40, 189–216.

––, –– R. E. Lucas and H. L. Smith [1999], "Subjective Well-Being: Three Decades of Progress", *Psychological Bulletin*, 125(2), 276–303.

Di Tella, R., R. J. MacCulloch and A. J. Oswald [1999], "The Macroeconomics of Happiness", ZEI Working Paper B99-03, Center for European Integration Studies, Bonn.

Easterlin, R. A. [1974], "Does Economic Growth Improve the Human Lot? Some Empirical Evidence", pp. 89–125 in: P. A. David and M. W. Reder (eds.), *Nations and Households in Economic Growth: Essays in Honor of Moses Abramowitz*, Academic Press: New York.

Feld, L. P. and G. Kirchgässner [1999], "Public Debt and Budgetary Procedures: Top Down or Bottom Up. Some Evidence from Swiss Municipalities", pp. 151–179 in: J. M. Poterba and J. von Hagen (eds.), *Fiscal Institutions and Fiscal Performance*, Chicago University Press: Chicago.

–– and M. R. Savioz [1997], "Direct Democracy Matters for Economic Performance: An Empirical Investigation", *Kyklos*, 50(4), 507–538.

–– and –– [1998], "Vox Populi, Vox Bovi? Ökonomische Auswirkungen direkter Demokratie", pp. 29–80 in: G. Grözinger and S. Panther (eds.), *Konstitutionelle Politische Ökonomie. Sind unsere gesellschaftlichen Regelsysteme in Form und guter Verfassung?* Metropolis: Marburg.

FIORINA, M. P. [1981], *Retrospective Voting in American National Elections*, Yale University Press: New Haven.

FISHER, D. [1968], "The Objectives of British Monetary Policy 1951–1964", *Journal of Finance*, 23 (5), 821–831.

FISHER, S. [1981], "Towards an Understanding of the Costs of Inflation: II", *Carnegie-Rochester Conference Series on Public Choice*, 15, 5–41.

FRANK, R. H. [1985], *Choosing the Right Pond*, MIT Press: Cambridge, MA.

–– [1997], "The Frame of Reference as a Public Good", *Economic Journal*, 107 (445), 1832–1847.

FREEMAN, A. M. [1993], *The Measurement of Environment and Resource Values: Theory and Method*, Resources for the Future: Washington, D.C.

FREY, B. S. [1997], "A Constitution for Knaves Crowds Out Civic Virtues", *Economic Journal*, 107 (443), 1043–1053.

–– AND F. SCHNEIDER [1978a], "An Empirical Study of Politico-Economic Interaction in the United States", *Review of Economics and Statistics*, 60 (2), 174–183.

––and–– [1978b], "A Political-Economic Model of the United Kingdom", *Economic Journal*, 88 (350), 243–253.

FRIEDLAENDER, A. F. [1973], "Macro-Policy Goals in the Postwar Period: A Study in Revealed Preference", *Quarterly Journal of Economics*, 87 (1), 25–43.

FROYEN, R. T. [1974], "A Test of the Endogeneity of Monetary Policy", *Journal of Econometrics*, 2 (2), 175–188.

GOODHART, C. A. E. AND R. J. BHANSALI [1970], "Political Economy", *Political Studies*, 18 (1), 43–106.

GREENE, W. H. [1997], *Econometric Analysis*, 3rd ed., Prentice Hall: Upper Saddle River, NJ.

HANEMANN, M. W. [1994], "Valuing the Environment Through Contingent Valuation", *Journal of Economic Perspectives*, 8 (4), 19–43.

HAVRILESKY, T. [1967], "A Test of Monetary Policy Action", *Journal of Political Economy*, 57, 299–304.

HIBBS, D. [1976], "Industrial Conflict in Advanced Industrial Societies", *American Political Science Review*, 70 (12), 1033–1058.

–– [1981], "Economics and Politics in France: Economic Performance and Mass Political Support for President Pompidou and Giscard D'Estaing", *European Journal of Political Research*, 9, 133–145.

HIRSCH, F. [1976], *The Social Limits to Growth*, Harvard University Press: Cambridge, MA.

INGLEHART, R. [1990], *Culture Shift in Advanced Industrial Society*, Princeton University Press: Princeton.

–– AND J.-R. RABIER [1986], "Aspirations Adapt to Situation – But Why Are the Belgians so Much Happier than the French? A Cross-Cultural Analysis of the Subjective Quality of Life", pp. 1–56 in: F. M. Andrews (ed.), *Research on the Quality of Life*, Institute for Social Research: Ann Arbor.

KAHNEMAN, D. AND A. TVERSKY [1979], "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, 47 (2), 263–291.

KAPTEYN, A., B. M. S. VAN PRAAG AND F. G. VAN HERWAARDEN [1976], "Individual Welfare Functions and Social Reference Spaces", *Economic Letters*, 1, 173–178.

KINDER, D. R. AND D. R. KIEWIET [1979], "Economic Discontent and Political Behavior: The Role of Personal Grievances and Collective Judgements in Congressional Voting", *American Journal of Political Science*, 23 (3), 495–527.

KIRCHGÄSSNER, G. [1985], "Rationality, Causality, and the Relation Between Economic Conditions and the Popularity of Parties. An Empirical Investigation for the Federal Republic of Germany, 1971–1982", *European Economic Review*, 28 (1–2), 243–268.

—, L. P. Feld and M. R. Savioz [1999], "Die direkte Demokratie: Modern, erfolgreich, entwicklungs- und exportfähig", Discussion paper, Dept. of Economics, University of St. Gallen.

Kirschen, E. S., J. Benard and H. Besters [1964], *Economic Policy in our Time*, Vol. I, General Policy: Amsterdam.

Kramer, G. H. [1971], "Short-Term Fluctuations in U.S. Voting Behvior, 1896–1964", *American Political Science Review*, 65, 131–143.

Leu, R. E., S. Burri and T. Priester [1997], *Lebensqualität und Armut in der Schweiz*, Haupt: Bern.

Lucas, R. E. Jr. [1981], "Discussion of Stanley Fischer, 'Towards an Understanding of the Costs of Inflation: II'", *Carnegie-Rochester Conference Series on Public Choice*, 15, 43–52.

Lucas, R. E., E. Diener and E. Suh [1996], "Discriminant Validity of Well-Being Measures", *Journal of Personality and Social Psychology*, 71 (3), 616–628.

Makin, J. H. [1976], "Constraints on Formulation of Models for Measuring Revealed Preferences of Policy Makers", *Kyklos*, 29 (4), 709–732.

Matsusaka, J. G. [1995], "Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years", *Journal of Political Economy*, 103 (2), 587–623.

McEachern, W. A. [1978], "Collective Decision Rules and Local Debt Choice: A Test of the Median Voter Hypothesis", *National Tax Journal*, 31 (2), 129–136.

Mullis, R. J. [1992], "Measures of Economic Well-Being as Predictors of Psychological Well-Being", *Social Indicators Research*, 26 (2), 119–135.

Myers, D. G. and E. Diener [1995], "Who is Happy?", *Psychological Science*, 6, 10–19.

Nannestad, P. and M. Paldam [1994], "The VP-Function: A Survey of the Literature on Vote and Popularity Functions After 25 Years", *Public Choice*, 79 (3–4), 213–245.

Opp, K.-D., P. Voss and C. Gern [1995], *The Origins of a Spontaneous Revolution: East Germany 1989*, Michigan University Press: Ann Arbor.

Oswald, A. J. [1997], "Happiness and Economic Performance", *Economic Journal*, 107 (445), 1815–1831.

Paldam, M. [1981], "A Preliminary Survey of the Theories and Findings on Vote and Popularity Functions", *European Journal of Political Research*, 9, 181–199.

— and F. Schneider [1980], "The Macro-Economic Aspects of Government and Opposition Popularity in Denmark, 1957–1978", *Nationalokonomisk Tidsskrift*, 118 (2), 149–170.

Pissarides, C. A. [1972], "A Model of British Macroeconomic Policy 1955–1969", *Manchester School of Economic and Social Studies*, 40, 245–259.

Pommerehne, W. W. [1987], *Präferenzen für öffentliche Güter. Ansätze zu ihrer Erfassung*, Mohr (Siebeck): Tübingen.

— and H. Weck-Hannemann [1996], "Tax Rates, Tax Administration and Income Tax Evasion in Switzerland", *Public Choice*, 88 (1–2), 161–170.

Portney, P. R. [1994], "The Contingent Valuation Debate: Why Economists Should Care", *Journal of Economic Perspectives*, 8 (4), 3–17.

Reuber, G. L. [1964], "The Objectives of Canadian Monetary Policy, 1949–1961: Empirical 'Trade-Offs' and the Reaction Function of the Authorities", *Journal of Political Economy*, 72 (2), 109–132.

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.

— [1993], "Representative Versus Direct Democracy: The Role of Public Bureaucrats", *Public Choice*, 76 (3), 189–198.

SCHNEIDER, F. AND B. S. FREY [1988], "Politico-Economic Models of Macroeconomic Policy: A Review of the Empirical Evidence", pp. 240–275 in: T. D. Willett (ed.), *The Political Economy of Money, Inflation and Unemployment*, Duke University Press: Durham and London.

– – 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.

SCHYNS, P. [1999], "The Relationship Between Changes in Income and Life-Satisfaction in West Germany and the Russian Federation: Relative, Absolute, or a Combination of Both?", in: E. Diener (ed.), *Advances in Quality of Life Theory and Research*, Kluwer: Dordrecht, forthcoming.

SCITOVSKY, T. [1976], *The Joyless Economy: An Inquiry Into Human Satisfaction and Dissatisfaction*, Oxford University Press: Oxford.

SEN, A. K. [1972], "Behavior and the Concept of Preference", *Economica*, 40 (159), 241–259.

STUTZER, A. [1999], "Demokratieindizes für die Kantone der Schweiz", Discussion paper, Institute for Empirical Economic Research, University of Zurich.

THEIL, H. [1964], *Optimal Decision Rules for Government and Industry*, North Holland: Amsterdam.

TINBERGEN, J. [1955], *On the Theory of Economic Policy*, North-Holland: Amsterdam.

TRECHSEL, A. AND U. SERDÜLT [1999], *Kaleidoskop Volksrechte: Die Institutionen der direkten Demokratie in den schweizerischen Kantonen 1970–1996*, Helbing & Lichtenhahn: Basel-Genf-München.

VAN HERWAARDEN, F., A. KAPTEYN AND B. M. S. VAN PRAAG [1977], "Twelve Thousand Individual Welfare Functions of Income", *European Economic Review*, 9 (3), 283–300.

VAN PRAAG, B. M. S. [1968], *Individual Welfare Functions and Consumer Behavior*, North Holland: Amsterdam.

– – [1993], "The Relativity of the Welfare Concept", pp. 362–416 in: M. Nussbaum and A. Sen (eds.), *The Quality of Life*, Clarendon: Oxford.

VEENHOVEN, R. [1993], *Happiness in Nations: Subjective Appreciation of Life in 56 Nations 1946–1992*, Erasmus University Press: Rotterdam.

WINKELMANN, L. AND R. WINKELMANN [1998], "Why Are the Unemployed So Unhappy? Evidence from Panel Data", *Economica*, 65 (257), 1–15.

WOOD, J. H. [1967], "A Model of Federal Reserve Behavior", pp. 135–166 in: G. Horwich (ed.), *Monetary Process and Policy*, Irwin: Homewood.

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