Working Paper No. 22

Maximising Happiness?

Bruno S. Frey and Alois Stutzer

October 1999

MAXIMISING HAPPINESS?

Bruno S. Frey and Alois Stutzer[*]

(University of Zurich)

Summary: The measurement of individual happiness challenges the notion that revealed preferences only reliably and empirically reflect individual utility. Reported subjective well-being is a broader concept than traditional decision utility; it also includes concepts like experience and procedural utility. Micro- and macroeconometric happiness functions offer new insights on determinants of life satisfaction. However, one should not leap to the conclusion that happiness should be maximised, as was suggested for social welfare function maximisation. In contrast, happiness research strengthens the validity of an institutional approach, such as reflected in the theory of democratic economic policy. (93 words)

Recently, great progress has been achieved in economics: happiness has been seriously measured, and many of its determinants have been identified. This constitutes a sharp break from the notion, much cherished by economists, that revealed preferences only reliably reflect individual utility, and that it is the only way to make serious measurements. In happiness studies, instead of inferring utility from data on income and prices, people are directly asked about their subjective well-being.

This paper wants to draw attention to this important development and discusses its consequences for the theory of economic policy. Three propositions are put forward:

(1) The measurement of happiness constitutes a great advance for economics;

(2) It is a mistake to leap to the conclusion that happiness should be maximized (in the sense of social welfare function maximisation);

(3) Happiness research strengthens the validity of an institutional approach (in the sense of a democratic economic policy).

Section I briefly discusses the concepts of utility and happiness basic to the argument. The following section provides econometric estimates of happiness functions. Section III argues that maximising such a happiness function is erroneous for several reasons. The next section demonstrates empirically that the institutional approach suggested by the theory of democratic economic policy is fruitful. The final section V summarises the results and shows that the study of happiness (i) helps to better grasp the role of institutions in economy and society; and (ii) is an area well-suited for the integration of economics and psychology.

I. Utility and Happiness

Economic analysis builds on individual utility which is inferred from choices. Happiness is a different concept of utility. This section provides a short overview[1] of the several types of utility (subsection A); happiness is more fully discussed in subsection B. In subsection C, the relationship between the behaviouristic utility concept and the measure of happiness is briefly discussed.

A. Types of utility

Standard economic theory (and decision science) uses an „objectivist" position[2] based on observable choices made by individuals. Individual utility only depends on tangible factors (goods and services), is inferred from revealed behavior (or preferences), and is in turn used to explain the choices made. This „modern" view is influenced by the positivistic movement. It rejects subjectivist experience (e.g. captured by surveys) as being „unscientific", because it

---

[1] An extensive discussion with many references is given in Lane (1991: 423-590). See also Benedikt (1996: 557-579).

[2] See Kahneman and Varey (1991), Kahneman, Wakker and Sarin (1997) for the term "objectivist" (and "subjectivist").

is not objectively observable. It is assumed that the choices made provide *all* the information required to infer the utility of outcomes. Moreover, the axiomatic revealed preference approach is not only applied to derive individual utility, but also to measure social welfare. To do so, social welfare comparison is based on consumption behaviour of households.[3] Econometrically, this is realised e.g. by using parametric translog indirect utility functions (Jorgenson, Lau and Stoker 1980).

This positivistic view is dominant in economics. Sen (1986: 18) observes that „the popularity of this view in economics may be due to a mixture of an obsessive concern with observability and a peculiar belief that choice (...) is the only human aspect that can be observed". Its dominance is also reflected in the contents of microeconomic textbooks. However, not all contemporary economists subscribe to this view. Numerous scholars challenge standard decision, individual utility and welfare theory from different angles. Five reservations are mentioned here due to their importance for the following discussion on the use of subjective measures of happiness. Arrow's impossibility theorem is separately discussed in section III.

i) There are numerous examples for non-objectivist theoretical analyses in economics. They incorporate emotions (e.g. Elster 1998), such as regret (e.g. Bell 1982), self-signaling (self-esteem), goal completion, mastery, and meaning (Loewenstein 1999) or status (e.g. Frank 1985), as well as even broader considerations beyond the normal use of utility (e.g. Sen's 1982 „entitlements").

ii) Standard theory assumes independent utilities, although interdependent utilities fit particular observed behaviour much better (e.g. Clark and Oswald 1998). More important, interdependent utilities question traditional welfare propositions (e.g. Boskin and Sheshinski 1978, Holländer 1999).

iii) By emphasising the value of outcomes rather than observed decisions, Kahneman, Wakker and Sarin (1997) distinguish various types of utility. They base their concept on the notion that outcomes are normally extended over time and that they are valued at different points in time. Predicted utility "refers to beliefs about the experienced utility of outcomes"; remembered utility "is inferred from a subject's retrospective reports of the total pleasure or displeasure associated with past outcomes", and instant utility measures "hedonic and affective experience, which can be derived from immediate reports of current subjective experience or from physiological indices" (pp. 376f). The differences between these evoke a number of positive questions that have not yet been answered in a satisfactory way, e.g., "How is the remembered utility of extended outcomes determined?" (p. 378). The hedonistic concept by Kahneman et al. being based on axiomatic rules to aggregate subjective experiences, normative issues need also be considered. This approach is related to an old tradition. The initiators of the modern analysis of decision-making (Bernoulli and Bentham) understood utility as satisfaction, referring to the hedonic quality in terms of pleasure and pain. In analogy to Kahneman et al., this early idea may be called 'experience utility', and the „modern" idea discussed above 'decision utility' (p. 375).

---

[3] This welfare indicator is suggested as an improvement compared to consumer's surplus. In their empirical work, especially in the large number of cost-benefit analyses, economists have relied heavily on consumer's surplus to measure the welfare effects of changes in incomes and prices. Yet, „it is now widely accepted that consumer's surplus should not be used as a welfare measure" (Slesnick 1998: 2108).

iv) The previous remarks reveal that the position of psychologists has differed markedly from the economic one. They value subjective experience as an important source of information about individual utility. Psychologists are less convinced that choices are always rational (see the vast literature on anomalies in decision-making, e.g. Thaler 1992), and therefore doubt that utility can meaningfully be derived from observed choices. Moreover, they go beyond tangible carriers of utility and emphasise the importance of emotions, such as fear and hope, disappointment, guilt and pride.

v) Psychologists have also transcended the consequentialism (of which utilitarianism is a special case, see Hammond 1991) and have considered procedural utility. The independent influence of procedural fairness on individual utility has been well established in laboratory and field experiments (Tyler 1990, 1997).

To conclude, individual and social welfare indicators that stick to decision utility are unable to integrate the broader aspects of experience and procedural utility.[4] The exclusive reliance on an objectivist approach by standard economic theory is thus open to doubt, both theoretically and empirically. There is room for the subjectivist approach of happiness, to which we turn now.

B. Happiness

„For most people, happiness is the main, if not the only, ultimate objective of life" (Ng 1996: 1). Happiness can be understood to mean a „lasting, complete and justified satisfaction with life as a whole" (Tatarkiewicz 1976: 16). Happiness, or as it is often called, subjective well-being, is measured by representative surveys. There is a vast literature on the measures and correlates of subjective well-being. A possible single-item measure is the individual question „how satisfied are you with your life taken as a whole?". The answer is given on a scale from three points up to eleven points. These surveys were initiated by social psychologists, who have much experience in carefully administrating this research technique.

For a long time, Easterlin (1974) has been the only economist to seriously consider happiness. A discussion in the *Economic Journal,* with contributions by Oswald (1997), Frank (1997) and Ng (1997), has recently sparked interest.[5]

In psychology, there is a much older and broader tradition. A first review of the state of the art was written by Wilson (1967) almost 35 years ago. Monographs on happiness have been published e.g. by Argyle (1987), Myers

---

[4] In fact, such subjectivist notions of happiness are even today often disregarded, without providing a reason; as done e.g. by Slesnick (1998: 2109) in his long survey on "Empirical Approaches to the Measurement of Welfare".

[5] Recently published works are e.g. Clark and Oswald (1994), Easterlin (1995), Frey and Stutzer (1999a), Gerlach and Stephan (1996), Kenny (1999), and Winkelmann and Winkelmann (1998). Yet unpublished papers are e.g. Di Tella, MacCulloch and Oswald (1999), Frey and Stutzer (1999b), Konow and Earley (1999), Namazie and Sanfey (2000) and Ravallion and Lokshin (1999).

(1993) and the sociologist Veenhoven (1993), and a recent survey has been prepared by Diener, Suh, Lucas and Smith (1999). Lane (1991, part IV) gives an overview of both the psychological and the economic literature.[6]

The surveys on happiness have a high scientific standard. The measures happiness have high consistency, reliability and validity. Happy people are e.g. more often smiling during social interactions (Fernández-Dols and Ruiz-Belda, 1995), are rated as happy by friends and family members (Sandvik, Diener and Seidlitz, 1993), as well as by spouses (Costa and McCrae, 1988). Furthermore, the measures of subjective well-being have a high degree of stability over time (Headey and Wearing, 1989). Happiness measures have also been shown to be reflected in behaviour, e.g. „people who call themselves happy ... are more likely to initiate social contacts with friends; more likely to respond to requests for help; ... less likely to be absent from work; less likely to be involved in disputes at work ...” (Frank 1997: 1833). But there is, of course, room for methodological concerns (e.g. Diener et al. 1999: 277-8). Economists should, however, not be too critical, in view of the deficiencies of what they measure and use as a matter of course. National income is a case in point. Its shortcomings are obvious and need not be discussed here. But the same applies to more innocuous concepts such as real income (e.g. Kapteyn 1994). Moreover, as will be demonstrated in this paper, the main use of happiness measures is not to compare levels, but rather to seek to identify the *determinants* of happiness.

C. Relationship between individual utility and happiness

Directly measurable subjective happiness, and derived „objective" decision utility (as commonly used in economics), enter economic research from different sides. Their mutual aim is to investigate individual and social welfare. However, happiness is a much broader concept than decision utility; it includes experience as well as procedural utility. It may be argued that happiness is the *fundamental* goal of people, because to be happy is a goal in itself (Ng 1999: 209). That is not the case for other things we may want, such as job security, status, freedom, and especially money (income). We do not want them for themselves, but rather to give us the possibility of making ourselves happier.

II. Micro- and Macroeconometric Happiness Functions

Happiness functions seek to establish an econometric relationship between the happiness measure and the determinants of happiness. The data on happiness are gathered e.g. in the Euro-Barometer Survey, which asks the question: „On the whole, are you satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?" This yields a four-scale index of happiness. The U.S. General Social Survey asks the question: „Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy?" This yields a three scale index of happiness.

---

[6] Country specific contributions are Glatzer and Zapf (1984), Glatzer (1992) and Noelle-Neumann (1996) for Germany and Leu, Burri and Priester (1997: chapter III.7) for Switzerland.

Existing econometric estimates analyse happiness mainly with regard to four sets of micro and macro factors:

a) Individual variables, such as employment status, income, education and demographic factors;

b) Macroeconomic variables, such as unemployment rate, inflation rate, gross domestic product per capita and unemployment benefits.

Table 1 shows such microeconometric happiness functions for a pooled cross-section time series estimate for Germany, 1975-1991 (taken from Di Tella et al. 1999), and for Switzerland, 1992. The latter estimate is based on survey results of more than 6,000 inhabitants in Switzerland collected by Leu, Burri and Priester (1997). (The variables are described in Appendix I. Summary statistics for Switzerland are presented in Appendix III.)[7]

The estimates for Germany and Switzerland reveal qualitatively very similar effects on happiness (but, in the case of Switzerland, somewhat more determinants are statistically significant). The effect on happiness of *individual unemployment* is strongly negative in a highly statistically significant way ($p < 0.01$). For Switzerland, Table 1 also reports the marginal effect for the highest score of happiness. With unemployment, the marginal effect is – 0.284. This indicates that the probability of an unemployed person reporting the highest level of happiness is (cet. par.) 28.4 percentage points smaller than for an employed person. Or, equivalently, the share of unemployed persons reporting to be „completely satisfied" is 28.4 percentage points smaller than

---

[7] The significance levels that are indicated for the results for Switzerland take into account stratification in sampling. Therefore, $p<0.01$ for $|t|>2.88$, $0.01<p<0.05$ for $2.17<|t|<2.88$ and $0.05<p<0.10$ for $1.81<|t|<2.17$.

Table 1 – Determinants of Satisfaction with Life in Germany and Switzerland

	Germany 1975-1991 Di Tella et al. (1999)		Switzerland 1992		
	Coefficient	Standard error	Coefficient	Standard error	Marginal effect
a) Employment status					
employed	Reference group		Reference group		
unemployed	-0.421**	0.036	-0.834**	0.041	-0.284
self employed	0.023	0.029	0.105**	0.023	0.036
at home	0.024	0.022	0.177**	0.023	0.060
school	0.027	0.033	0.047	0.102	0.016
retired	0.079**	0.027	-0.118**	0.039	-0.040
other			0.186**	0.054	0.064
b) Income					
first quartile	Reference group		Reference group		
second quartile	0.186**	0.020	0.056(*)	0.028	0.019
third quartile	0.319**	0.021	0.151**	0.027	0.052
fourth quartile	0.452**	0.022	0.263**	0.027	0.090
c) Education					
low	Reference group		Reference group		
middle	0.001	0.018	0.176**	0.017	0.060
high	0.110**	0.023	0.136**	0.025	0.046
d) Demographic factors					
female	Reference group		Reference group		
male	-0.029	0.016	-0.027	0.016	-0.009
age	-0.008**	0.003	-0.010*	0.004	-0.004
age squared	1.20e-4**	2.87e-5	1.76e-4**	4.27e-5	0.1e-3
marital status: single	Reference group		Reference group		
married	0.154**	0.023	0.107**	0.021	0.037
divorced	-0.330**	0.037	-0.178**	0.033	-0.061
separated	-0.408**	0.076	-0.612*	0.257	-0.208
widowed	-0.078*	0.033	-0.077	0.052	-0.026
no. of young children: one	-0.014	0.021			
two	-0.027	0.028			
three	-0.046	0.049			
Threshold parameters: one	-1.944**	0.071	0.302**	0.026	
two	-0.850**	0.069	0.724**	0.027	
three	1.086**	0.070	1.060**	0.027	
four			1.529**	0.027	
five			2.286**	0.027	
six			2.767**	0.027	
Observations	28151		6126		
Log likelihood function	-25881.1		-10321.77		

Notes: Ordered probit estimation (weighted for Switzerland). Dependent variable: level of satisfaction on a four point scale for Germany and on an eight point scale (scores of 1, 2 and 3 were aggregated) for Switzerland, respectively. The regression for Germany includes region dummies and year dummies from 1975 to 1991. The regression for Switzerland includes a constant term. Significance levels: (*) $0.05 < p < 0.10$, * $0.01 < p < 0.05$, ** $p < 0.01$.
Source for Germany: Di Tella, MacCulloch and Oswald (1999).
Data source for Switzerland: Leu, Burri and Priester (1997).

for employed persons, cet. par. As can also be seen from Table 1, to be self-employed and work at home significantly raises happiness in Switzerland (cet. par.). But while people in Germany report a higher well-being when retired, the opposite holds for Switzerland (a result worth further inquiry).

The second set of factors report the highly significant positive effect on happiness of *income* as measured by quartiles: higher income thus seems to improve the human lot, but it does so only a little, as revealed by the marginal effects for Switzerland.[8] The third set of factors refers to education. Persons with higher education report higher happiness than those with low education (this effect has also been found in other studies, see e.g. Oswald 1997: 1823 or Diener et al. 1999: 293).

Demographic factors (the fourth set of influences) have statistically significant effects on happiness. Age has a U-formed impact: the young are happier than persons around 30 years of age, and thereafter happiness rises with age. Married persons are happier than singles, and divorced persons are unhappier than singles. These results are supported by other studies on the effect of demographic variables on happiness (e.g. Oswald 1997: 1823, and the survey by Diener et al. 1999: 289-293).

Table 2 presents two macroeconometric happiness functions for a panel of eleven European countries, 1972-1991 (again from Di Tella et al. 1999). The results indicate that higher *unemployment and inflation rates* decrease satisfaction with life, while higher unemployment benefits and income per capita increase subjective well-being. However, per capita income has only a significant effect on happiness if the two macroeconomic bads are included in the estimation model as an aggregate misery index composed of a non-weighted addition of the inflation and the unemployment rate.

Robustness analyses of micro- as well as macroeconometric happiness functions reveal that most signs of the coefficients remain stable when the specification of the estimation equation is varied. Happiness functions are thus able to well capture important determinants of reported subjective well-being.

Table 2 – Macroeconomic Conditions and Satisfaction with Life in 11 European Countries

	(1)			(2)	
	Coefficient	Standard error		Coefficient	Standard error
Unemployment rate (U)	-1.629**	0.531			
Inflation rate (π)	-1.116**	0.344			
GDP per capita	3.9e-5	3.1e-5	5	5.4e-5*	2.7e-5
Unemployment benefits	0.590**	0.155		0.615**	0.151
Misery index (U + π)				-1.194**	0.323

---

[8] This result confirms Easterlin's (1974) well-known finding that higher income within a country raises happiness. Careful surveys of the large number of studies dealing with the relationship between happiness and income conclude that higher income does raise happiness but not to a large extent (see the survey by Diener and Oishi 1999 and Diener et al. 1999: 287-289).

Observations	150	150
Adjusted R^2	0.16	0.16

Notes: Panel estimation with control for country and time fixed effects, and corrected for heteroscedasticity using White's method. Dependent variable is the mean residual life satisfaction for each year and each country. The residuals are generated in a first step with OLS regressions on individual characteristics for each country (for characteristics see table 1). Explanatory variables are three year moving averages. Unemployment benefits are the OECD index of replacement rates (unemployment benefit entitlements divided by the corresponding wage). Significance levels: * $0.01 < p < 0.05$, ** $p < 0.01$.
Source: Di Tella, MacCulloch and Oswald (1999).

III. Should Happiness be Maximised?

An obvious temptation is to consider happiness functions as a reasonably good (the best existing) approximation to a *social welfare function,* and to maximize them. The optimal values of the determinants thus derived are – according to this view – the goals which economic policy should achieve. It seems that, at long last, the (so far empirically empty) social welfare maximum of the quantitative theory of economic policy (Tinbergen 1956, Theil 1968) has been filled with life.

This is exactly how the influential paper by Di Tella, MacCulloch and Oswald (1999) proceeds. They open their paper with the following statement: „Modern macroeconomics textbooks rest upon the assumption of a social welfare function defined on inflation, π, and unemployment, U. To our knowledge, no formal evidence for such a function W (π, U), has ever been presented in literature. . . . Although an optimal policy rule cannot be chosen unless the parameters of the presumed W (π, U) function are known, that has not prevented the growth of a large amount of theoretical literature in macroeconomics" (p. 2; without footnotes).

Such an endeavour overlooks some fundamental problems of the social welfare maximisation approach (Frey 1983: 182-194). Only *one* shortcoming, empirical emptiness, has been overcome (provided one is prepared to accept happiness functions as a reasonable approximation of a social welfare function). Two other problems remain, namely the problem of preference aggregation and the missing incentives:

(1) Impossibility theorem

Since Arrow (1951), it is known that under a number of „reasonable" conditions, no social welfare function exists that generally ranks outcomes consistently, except a dictatorship. This impossibility result spawned a huge amount of literature (called Social Choice), analyzing its robustness to modifications of the assumptions. Theorem after theorem demonstrated that almost all changes in the axiomatic structure left the dictatorial result unchanged (see e.g. Sen 1995, Slesnick 1998). It must be concluded that „there is no way we can use empirical observations on their own to produce an ethically satisfactory cardinalization, let alone an ethically satisfactory social welfare ordering" (Hammond 1991: 220-21).

This verdict applies to happiness functions if they are used as quasi social welfare functions.

(2) Missing incentives

Deriving optimal policies by maximizing a social welfare function only makes sense if the government has an incentive to put the optimal policies into reality. This is only the case if a „benevolent dictator" government is assumed (Brennan and Buchanan 1985). From introspection as well as from empirical analyses in Political Economy (see e.g. the collection of papers on Political Business Cycles in Frey 1997b), we know that governments are *not* benevolent and do not follow the wishes of the population, even in well-functioning democracies, not to mention authoritarian and dictatorial governments. Hence, to maximize social welfare corresponds to a 'technocratic-elitist' procedure neglecting the crucial incentive aspect.

This criticism applies fully to the endeavor to derive optimal policies by maximizing happiness.

There is a solution at hand which overcomes the problems posed by the impossibility theorem and by the government's missing incentives. *Constitutional Political Economy* (e.g. Buchanan 1991, Frey 1983, Mueller 1996) redirects attention to the level of the social consensus where, behind the veil of ignorance, the basic rules governing a society – the fundamental institutions – are chosen or emerge. At the same time, the approach shifts from a (vain) effort to directly determine social outcomes to shaping the *politico-economic process* by setting the institutions. The following section empirically demonstrates that the fundamental social institutions do indeed systematically influence happiness.

IV. Happiness and Institutions

The fundamental social institutions shape the incentives of the policy makers. Once these basic institutions are in place, and the incentives therefore set, little can be done to influence the current politico-economic process. Economic policy therefore must help to establish those fundamental institutions, which lead to the best possible fulfilment of individual preferences. Research in positive constitutional economics helps to identify which institutions serve this goal, and whether they do in fact systematically affect happiness.

According to the modern theory of institutions, we hypothesize that two basic institutions importantly affect happiness: direct democracy and federalism.

A. Direct democracy

Over the last few years, extensive econometric research has demonstrated the beneficial effects of direct democratic institutions on political outcomes. (Semi-) direct democracy allows the citizens to decide on substantial political issues via popular initiatives and referenda (see e.g. Budge 1996). While practically all countries have used referenda at one time or another (e.g. to vote on entry to the European Union), by far the greatest number of referenda have been undertaken in the United States (on the state and local level) and in Switzerland (on the national, cantonal and communal level) (Butler and Ranney 1994).

The results of the research on direct democracy are the subject of various surveys (e.g. Kirchgässner et al. 1999). For the United States, government expenditures and government revenues are lower with institutions of direct democracy (Matsusaka 1995). In contrast, educational public expenditures are higher when a referendum is possible (Santerre 1993). For Switzerland, the econometric evidence is even more compelling, one reason being that the institutions of direct democracy are better developed than in the U.S., and their effect on political outcomes can be better identified. Public expenditures in 131 Swiss cities are lower by 14%, but the median tax rate is higher[9] by 14% in cities with well developed institutions of referenda (Feld and Kirchgässner 1999). Due to a 5% higher share of self-financing, the per capita debt is no less than 45% lower. In addition, public expenditures exhibit significantly lower growth in cities with well established direct democracy (Schneider and Pommerehne 1983). Tax evasion is significantly lower in cantons with a higher degree of direct participation rights for voters (Frey 1997a). Finally, gross domestic product per capita is 5.4% higher in cantons with better established direct democratic institutions than in more representative ones (Feld and Savioz 1997). All these results are based on estimates which carefully control influences unrelated to direct democracy, and establish a causal effect from that institution on political outcomes and their consequences in terms of behavior (tax evasion) or economic activity (income). We now test the proposition whether democratic institutions systematically affect *happiness*.

The test proceeds by extending the happiness function for Switzerland presented above by a variable representing the influence of direct democracy. Table 3 shows the estimated coefficients, standard errors and marginal effects for *all* the determinants taken into account in Table 1. The coefficients, and in particular the marginal effects of employment status, income, education and demographic factors, correspond to those in Table 1.

In addition, the effect of „direct democratic rights" is revealed. Direct democratic rights is an index capturing the varying extent of direct participation possibilities in the 26 cantons of Switzerland, ranging from 1 („low extent of direct democratic rights") to 6 („high extent of direct democratic rights") (for the index construction see appendix II). Table 3 reports a statistically highly significant ($p<0.01$) positive influence of direct democratic rights on happiness. The marginal effect on the highest happiness level (score 10) is 0.033: An increase in the index of direct participation rights by one point (say from 4 to 5) raises the probability of belonging to that highest happiness class by 3.3 percentage points. This means that individuals in canton Solothurn (with an index score of 5.42) respond with an approximately 12 percentage points higher probability that they are „completely satisfied", than residents in canton Geneva (with an index score of 1.75).

Table 3 – Satisfaction with Life in Switzerland: Effect of Direct Democracy

	Coefficient	Standard error	Marginal effect (score 10)
a) Employment status			

[9] 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 when they can control directly the political outcome. In the above case, the second effect dominates.

employed		Reference group	
unemployed	-0.831**	0.041	-0.282
self employed	0.109**	0.023	0.037
at home	0.171**	0.023	0.058
school	0.022	0.104	0.007
retired	-0.116**	0.039	-0.039
other	0.180**	0.054	0.061
b) Income			
first quartile		Reference group	
second quartile	0.052(*)	0.028	0.018
third quartile	0.142**	0.027	0.048
fourth quartile	0.239**	0.027	0.081
c) Education			
low		Reference group	
middle	0.150**	0.017	0.051
high	0.121**	0.025	0.041
d) Demographic factors			
female		Reference group	
male	-0.024	0.017	-0.008
age	-0.011**	0.004	-0.004
age squared	1.82e-4**	4.25e-5	0.1e-3
marital status: single		Reference group	
married	0.105**	0.021	0.036
divorced	-0.172**	0.032	-0.058
separated	-0.623*	0.265	-0.212
widowed	-0.078	0.051	-0.027
e) Institutional factor			
direct democratic rights	0.096**	0.007	0.033
Observations	6126		
Log likelihood function	-10292.51		

Notes: Weighted ordered probit estimation. Dependent variable level of satisfaction is on an eight point scale (scores of 1, 2 and 3 were aggregated). Significance levels: (*) $0.05 < p < 0.10$, * $0.01 < p < 0.05$, ** $p < 0.01$.
Data source: Leu, Burri and Priester (1997) and Stutzer (1999).

B. Federalism

Federalism is a second fundamental institution relevant for subjective well-being. „... those who value a federal system typically do so for some mix of three reasons: it encourages an *efficient* allocation of national resources; it fosters *political participation* and a sense of the democratic community; and it helps to protect basic *liberties and freedoms*" (Inman and Rubinfeld 1997: 44). The first reason given is emphasized by Oates (1994: 130), who states that „[t]he tailoring of outputs to local circumstances will, in general, produce higher levels of well-being than a centralized decision to provide some uniform level of output across all jurisdictions ...".[10]

---

[10] The set of arguments in favor of federalism is combined and extended in a new federal concept based on functional, overlapping and competing jurisdictions (FOCJ) (Frey and Eichenberger 1999).

Here, we take up the traditional argument of fiscal federalism mentioned above and directly test the proposition that the extent of decentralization affects happiness. The differences in the degree of federalism in the 26 Swiss cantons is captured by an index of local autonomy. The index is based on survey results by Ladner (1994). Chief local administrators in 1856 Swiss municipalities were asked to report how they perceive their local autonomy on a ten point scale, with one indicating „no autonomy at all", and ten „very high" communal autonomy. Average scores for each canton were calculated from the answers. (The index is shown in Appendix II.)

Estimate (1) in Table 4 shows the statistically positive effect (p<0.01) on happiness by the extent of local autonomy in the cantons. The coefficient is slightly larger than the one for direct democracy in Table 3.

In order to keep the table as simple as possible, only the estimated coefficient (and statistical significance) for this particular institutional variable is reproduced, although the ordered probit estimation includes *all* the variables shown in Table 1 (as in Table 3, the signs of the coefficients are unchanged, and their size is little affected).

Table 4 also exhibits estimates demonstrating that the influence of the two fundamental institutional variables – direct democracy and federalism – is fairly robust. Equation (2) indicates that direct democracy remains an important determinant of happiness, even when local autonomy is simultaneously taken into account: the coefficient remains similar to the one in Table 2 and is equally statistically significant (p<0.01). The effect of decentralization as measured by local autonomy in the cantons has a lower statistical significance (0.05<p<0.10) than in equation (1), the reason being some extent of correlation (r = 0.444**). Direct democracy and federalism in Switzerland seem to be complements rather than economic substitutes. Local autonomy is thus one of the several "transmission mechanisms" of direct democracy's beneficial effects.

Table 4 –Satisfaction with Life in Switzerland: Effect of Federalism

	(1)	(2)	(3)	(4)	(5)
Individual factors a)-d)	yes	yes	yes	Yes	yes
Institutional factors					
Direct democratic rights		0.087**		0.081**	0.065**
		(0.008)		(0.011)	(0.012)
Local autonomy in canton	0.102**	0.026(*)			0.050**
	(0.011)	(0.014)			(0.015)
Additional structural factors					
National income per capita in canton (in 1'000)			-0.003**	-0.004**	-0.005**
			(0.001)	(0.001)	(0.001)
Population in canton (in 100'000)			-0.015**	-0.008**	-0.009**
			(0.002)	(0.002)	(0.002)
Urbanisation			0.086**	-0.095**	-0.090**
			(0.018)	(0.019)	(0.019)
French speaking canton			-0.278**	-0.127**	-0.128**
			(0.019)	(0.029)	(0.029)
Italian speaking canton			0.045	0.233**	0.225**
			(0.045)	(0.052)	(0.052)
Observations	6126	6126	6126	6126	6126
Log likelihood function	-10309.73	-10291.94	-10273.70	-10264.44	-10262.53

C. Sensitivity analysis

Various alternative explanations have been put forward for the empirical findings reached. These explanations focus on the possibility of spurious regression due to missing structural variables, in our case the income level, the population size, the degree of urbanisation and the major language spoken in a canton. If there is substantial correlation between the set of control variables and the institutional factors, one of the following counter hypotheses could be valid: i) in cantons where inhabitants are richer than the Swiss average, the public provision of goods can be quantitatively or qualitatively augmented and thus raises subjective well-being, ii) people living in smaller cantons are happier, iii) people living in an urban area suffer from disamenities of urbanisation and experience lower satisfaction with life (assuming that direct democracy is a phenomenon restricted to rural areas) and iv) differences in language or culture explain differences in happiness levels across cantons.

Equations (3), (4) and (5) of Table 4 include the five additional control variables in the regression model. The results are as follows: the aggregate income variable is negatively correlated with subjective well-being. Though statistically significant, the coefficient itself is small. People living in cantons with fewer inhabitants, or in a rural area, are in fact more satisfied with life. These results are only to a small degree sensitive to the inclusion of institutional factors. In contrast, the partial correlation between major language in a canton and satisfaction with life depends on whether institutional factors are included. Living in a French-speaking canton is negatively correlated with happiness. The effect, however, is smaller, if institutional differences are considered. In the case of the Italian-speaking canton Ticino, existing direct democratic rights are low, and thus low happiness scores are to be expected. However, this is not the case, judging from the positive coefficients in equations (4) and (5).

Most importantly, the significant positive effect on life satisfaction of the indices for direct democracy and federalism remain, when controlling for alternative explanatory variables. The coefficients are somewhat smaller in equation (5) than in (2) and (4). Direct democracy and federalism thus have a *robust* and *sizeable* effect on satisfaction with life over and above differences of cantons, with regard to wealth, population size, urbanisation and language.

V. Concluding Remarks

Happiness research adds a new element to economics. It stands in stark contrast to the „objectivist" way economists have measured welfare via revealed preference. Happiness is a „subjectivist" measure of individual welfare, and it is much broader than the way individual utility is normally defined. It seeks to capture a fundamental and stable goal of people, the „satisfaction with life taken as a whole". While happiness is not derived from actual behaviour, it is systematically and closely connected with generally accepted manifestations of well-being.

This paper identifies important determinants of happiness via econometrically estimated micro and macro functions with data for Germany, Switzerland and a set of eleven European countries. Among individual determinants,

unemployment, income, education and marital status stand out, while among the macroeconomic determinants it is the rate of unemployment and inflation that stand out.

Following the tradition of social welfare maximization, some scholars have been tempted to try to maximize the estimated happiness functions. Such an endeavor overlooks the fundamental problems of welfare aggregation and, even more importantly, the missing incentives of governments to pursue a happiness maximization policy. Rather, scholars should follow the institutional approach taken by the theory of democratic economic policy. The paper empirically demonstrates for the case of Switzerland that the institutions of direct democracy and federalism are two such institutions systematically affecting individual well-being. This novel research field thus underlines the importance of process rather than outcome-oriented economic policy.

The empirical analysis is consistent with the three propositions advanced at the beginning of the paper: (1) happiness research constitutes a significant advance in economic research; (2) happiness functions should not be maximized; and (3) institutions in the form of type of democracy and extent of political decentralisation crucially affect individual well-being.

Happiness research moreover represents a case of a productive cross-fertilization of two otherwise isolated fields, economics and psychology.

References

Argyle, Michael (1987). *The Psychology of Happiness*. London: Methuen.

Arrow, Kenneth J. (1951). *Social Choice and Individual Values*. New York: John Wiley & Sons.

Benedikt, Michael (1996). Complexity, Value, and the Psychological Postulates of Economics. *Critical Review* 10(4): 551-594.

Bell, David E. (1982). Regret in Decision Making Under Uncertainty. *Operations Research* 30: 961-981.

Boskin, Michael/Evtan Sheshinski (1978). Optimal redistributive taxation when individual welfare depends on relative income. *Quarterly Journal of Economics* 92 (4): 589-601.

Brennan, Geoffrey/James M. Buchanan (1985). *The Reason of Rules. Constitutional Political Economy*. Cambridge: Cambridge University Press.

Buchanan, James M. (1991). *Constitutional Economics*. Oxford: Basil Blackwell.

Budge, Ian (1996). *New Challenge of Direct Democracy*. Cambridge: Polity Press.

Butler, David/Austin Ranney (eds) (1994). *Referendums Around the World. The Growing Use of Direct Democracy*. Washington, D.C.: AEI Press.

Clark, Andrew E./Andrew J. Oswald (1994). Unhappiness and Unemployment. *Economic Journal* 104 (424): 648-659.

Clark, Andrew E./Andrew J. Oswald (1998). Comparison-concave Utility and Following Behaviour in Social and Economic Settings. *Journal of Public Economics* 70 (1): 133-155.

Costa, Paul T./Robert R. McCrae (1988). Personality in Adulthood: A Six-Year Longitudinal Study of Self-Reports and Spouse Ratings on the NEO Personality Inventory. *Journal of Personality and Social Psychology* 54 (5): 853-863.

Di Tella, Rafael/Robert J. MacCulloch/Andrew J. Oswald (1999). The Macroeconomics of Happiness. ZEI Working Paper B99-03, Center for European Integration Studies, Bonn.

Diener, Ed/Shigehiro Oishi (1999). Money and Happiness: Income and Subjective Well-Being Across Nations. In: Ed Diener and Eunkook M. Suh (eds) *Subjective Well-Being Across Cultures*. Cambrigde, MA: MIT Press.

Diener, Ed/Eunkook M. Suh/Richard E. Lucas/Heidi L. Smith (1999). Subjective Well-Being: Three Decades of Progress. *Psychological Bulletin* 125 (2): 276-303.

Easterlin, Richard 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: 89-125.

Easterlin, Richard A. (1995). Will Raising the Incomes of All Increase the Happiness of All? *Journal of Economic Behaviour and Organization* 27 (1): 35-48.

Elster, Jon (1998). Emotions and Economic Theory. *Journal of Economic Literature* 36 (1): 47-74.

Feld, Lars/Gebhard Kirchgässner (1999). Public Debt and Budgetary Procedures: Top Down or Bottom Up? Some Evidence form Swiss Municipalities. In: James M. Poterba and Jürgen von Hagen (eds) *Fiscal Institutions and Fiscal Performance.* Chicago: Chicago University Press: 151-179.

Feld, Lars P./Marcel R. Savioz (1997). Direct Democracy Matters for Economic Performance: An Empirical Investigation. *Kyklos* 50 (4): 507-538.

Fernández-Dols, José-Miguel/María-Angeles Ruiz-Belda (1990). Are Smiles a Sign of Happiness? Gold Medal Winners at the Olympic Games. *Journal of Personality and Social Psychology* 69 (6): 1113-1119.

Frank, Robert H. (1985). *Choosing the Right Pond.* New York: Oxford University Press.

Frank, Robert H. (1997). The Frame of Reference as a Public Good. *Economic Journal* 107 (445): 1832-1847.

Frey, Bruno S. (1983). *Democratic Economic Policy*. Oxford: Blackwell.

Frey, Bruno S. (1997a). A Constitution for Knaves Crowds Out Civic Virtues. *Economic Journal* 107 (443): 1043-1053.

Frey, Bruno S. (ed.) (1997b). *Political Business Cycles*. Cheltenham, UK: Edward Elgar.

Frey, Bruno S./Reiner Eichenberger (1999). *The New Democratic Federalism for Europe. Functional Overlapping and Competing Jurisdictions*. Cheltenham: Edward Elgar.

Frey, Bruno S./Alois Stutzer (1999a). Measuring Preferences by Subjective Well-Being. *Journal of Institutional and Theoretical Economics* 155(4).

Frey, Bruno S./Alois Stutzer (1999b). Happiness, Economy and Institutions. Working Paper No. 15, Institute for Empirical Research in Economics, University of Zurich.

Gerlach, Knut/Gesine Stephan (1996). A Paper on Unhappiness and Unemployment in Germany. *Economics Letters* 52: 325-330.

Glatzer, Wolfgang (1992). Lebensqualität und subjektives Wohlbefinden. Ergebnisse sozialwissenschaftlicher Untersuchungen. In: Alfred Bellebaum (ed.) *Glück und Zufriedenheit.* Opladen: Westdeutscher Verlag: 49-85.

Glatzer, Wolfgang/Wolfgang Zapf (eds) (1984). *Lebensqualität in der Bundesrepublik. Objektive Lebensbedingungen und subjektives Wohlbefinden*. Frankfurt: Campus.

Hammond, Peter J. (1991). Interpersonal Comparisons of Utility: Why and How They Are and Should Be Made. In: Jon Elster and John E. Roemer (eds) *Interpersonal Comparisons of Well-Being.* Cambridge: Cambridge University Press: 200-254.

Headey, Bruce/Alexander Wearing (1989). Personality, Life Events, and Subjective Well-Being: Toward a Dynamic Equilibrium Model. *Journal of Personality and Social Psychology* 57: 731-739.

Holländer, Heinz (1999). On the Validity of Utility Statements: Standard Theory vs Duesenberry's. Mimeo. Department of Economics and Social Sciences, University of Dortmund.

Inman, Robert P./Daniel L. Rubinfeld (1997). Rethinking Federalism. *Journal of Economic Perspectives* 11(4): 43-64.

Jorgenson, Dale W./Lawrence J. Lau/Thomas M. Stoker (1980). Welfare Comparison under Exact Aggregation. *American Economic Review* 70 (2): 268-72.

Kahneman, Daniel/Carol Varey (1991). Notes on the Psychology of Utility. In: Jon Elster and John E. Roemer (eds) *Interpersonal Comparisons of Well-Being*. Cambridge: Cambridge University Press: 127-163.

Kahneman, Daniel/Peter P. Wakker/Rakesh Sarin (1997). Back to Bentham? Explorations of Experienced Utility. *Quarterly Journal of Economics* 112 (2): 375-405.

Kapteyn, Arie (1994). The Measurement of Household Cost Functions. Revealed Preference Versus Subjective Measures. *Journal of Population Economics* 7 (4): 333-350.

Kenny, Charles (1999). Does Growth Cause Happiness, or Does Happiness Cause Growth? *Kyklos* 52 (1): 3-26.

Kirchgässner, Gebhard/Lars Feld/Marcel R. Savioz (1999). *Die direkte Demokratie: Modern, erfolgreich, entwicklungs- und exportfähig*. Basel: Helbing und Lichtenhahn and Munich: Vahlen.

Konow, James/Joseph Earley (1999). The Hedonistic Paradox: Is Homo Economicus Happier?, Mimeo, Deptartment of Economics, Loyola Marymount University, Los Angeles.

Ladner, Andreas (1994). Finanzkompetenzen der Gemeinden - ein Überblick über die Praxis. In: Franz Eng, Alexander Glatthard and Beat H. Koenig (eds) *Finanzföderalismus*. Bern: Emissionszentrale der Schweizer Gemeinden: 64-85.

Lane, Robert E. (1991). *The Market Experience*. Cambridge: Cambridge University Press.

Leu, Robert E./Stefan Burri/Tom Priester (1997). *Lebensqualität und Armut in der Schweiz*. Bern: Haupt.

Loewenstein, George (1999). Because It Is There: The Challenge of Mountainerring ... for Utility Theory. *Kyklos* 52 (3): 315-343.

Matsusaka, John G. (1995). Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years. *Journal of Political Economy* 103 (2): 587-623.

Mueller, Dennis C. (1996). *Constitutional Democracy*. New York: Oxford University Press.

Myers, David G. (1993). *The Pursuit of Happiness: Who Is Happy and Why?* New York: Avon.

Namazie, Ceema/Peter Sanfey (2000). Happiness and Transition: the Case of Kyrgyzstan. *Review of Development Economics*, forthcoming.

Ng, Yew-Kwang (1996). Happiness Surveys: Some Comparability Issues and an Exploratory Survey Based on Just Perceivable Increments. *Social Indicators Research* 38: 1-27.

Ng, Yew-Kwang (1997). A Case for Happiness, Cardinalism, and Interpersonal Comparability. *Economic Journal* 107 (445): 1848-1858.

Ng, Yew-Kwang (1999). Utility, Informed Preference, or Happiness: Following Harsanyi's Argument to Its Logical Conclusion. *Social Choice and Welfare* 16: 197-216.

Noelle-Neumann, Elisabeth (1996). Stationen der Glücksforschung. In: Alfred Bellebaum and Ludwig Muth (eds) *Leseglück Eine Vergessene Erfahrung?* Opladen: Westdeutscher Verlag: 15-41.

Oates, Wallace (1994). Federalism and Government Finance. In: John M. Quigley and Eugene Smolensky (eds) *Modern Public Finance*. Cambridge: Harvard University Press.

Oswald, Andrew J. (1997). Happiness and Economic Performance. *Economic Journal* 107 (445): 1815-1831.

Ravallion, Martin/Michael Lokshin (1999). Identifying Welfare Effects from Subjective Questions. Mimeo. World Bank, Washington DC.

Sandvik, Ed/Ed Diener/Larry Seidlitz (1993). Subjective Well-Being: The Convergence and Stability of Self-Report and Non-Self-Report Measures. *Journal of Personality* 61 (3): 317-342.

Santerre, Rexford E. (1993). Representative versus Direct Democracy: The Role of Public Bureaucrats. *Public Choice* 76 (3): 189-198.

Schneider, Friedrich/Werner 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.

Sen, Amartya K. (1982). *Choice, Welfare and Measurement*. Oxford: Basil Blackwell.

Sen, Amartya K. (1986). The Standard of Living. In: S. McMurrin (ed.) *Tanner Lectures on Human Values.* Vol. VII. Cambridge, England: Cambridge University Press.

Sen, Amartya K. (1995). Rationality and Social Choice. *American Economic Review* 85: 1-24.

Slesnick, Daniel T. (1998). Empirical Approaches to the Measurement of Welfare. *Journal of Economic Literature* 36: 2108-2165.

Stutzer, Alois (1999). Demokratieindizes für die Kantone der Schweiz. Working Paper No. 23, Institute for Empirical Research in Economics, University of Zurich.

Swiss, Federal Statistical Office (ed.) (various years). *Statistisches Jahrbuch der Schweiz*. Zürich: Neue Zürcher Zeitung.

Tatarkiewicz, Wladislaw (1976). *Analysis of Happiness*. The Hague: Nijhoff.

Thaler, Richard H. (1992). *The Winner's Curse. Paradoxes and Annomalies of Economic Life*. New York: Free Press.

Theil, Henry (1968). *Optimal Rules for Government and Industry*. Amsterdam: North Holland.

Tinbergen, Jan (1956). *Economic Policy: Principles and Design*. Amsterdam: North Holland.

Trechsel, Alexander/Uwe Serdült (1999). *Kaleidoskop Volksrechte: Die Institutionen der direkten Demokratie in den schweizerischen Kantonen 1970-1996*. Basel, Genf, München: Helbling & Lichtenhahn.

Tyler, Tom R. (1990). *Why People Obey the Law*. Hew Haven: Yale.

Tyler, Tom R. (1997). Procedural Fairness and Compliance with the Law. *Swiss Journal of Economics and Statistics* 133 (2-2): 219-240.

Veenhoven, Ruut (1993). *Happiness in Nations: Subjective Appreciation of Life in 56 Nations 1946-1992*. Rotterdam: Erasmus University Press.

Wilson, Warner (1967). Correlates of Avowed Happiness. *Psychological Bulletin* 67 (4): 294-306.

Winkelmann, Liliana/Rainer Winkelmann (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica* 65 (257): 1-15.

Appendix I

Definition of variables
a) Sample for Germany

Satisfaction with life: Discrete variable (four values) from Euro-Barometer Survey Series (1975-1991). Question: „On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with your life you lead?". Response categories: „Very satisfied", „fairly satisfied", „not very satisfied" and „not at all satisfied". (Not included in data set: „don't know" and „no answer" categories.)

Employment status: Dummies for unemployed or self-employed people, housekeepers, people at school, retired people and others. Reference group employed people.

Income: Dummies for second, third and fourth income quartile. Reference group lowest income quartile.

Education: Dummies for education to age 15-18 years (middle) and education to age 19 years or over (high). Reference group low education.

Demographic factors: Dummies for male, married, divorced, separated and widowed people and people with one, two or three 8-15 year old children living at home. The reference groups are female, single and people with no children. Age in years. Age in years squared.

b) Sample for Switzerland

Satisfaction with life: Discrete variable (ten values) from Leu, Burri and Priester (1997). 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. For the estimation model the scores of 1, 2 and 3 were aggregated.

Employment status: Dummies for unemployed or self-employed people, housekeepers, people at school, retired people and others. Reference group employed people.

Income: Dummies for second, third and fourth income quartile. Reference group lowest income quartile. The income measure is calculated as an equivalence income. Total household income after taxes and social security expenditure is divided through the equivalence scale of the Swiss conference for public assistance (SKOS).

Education: Dummies for middle and high education. Reference group low education.

Demographic factors: Dummies for male, married, divorced, separated and widowed people and foreigners. Reference groups female, single and Swiss. Age in years.

National income p.c.: Nominal national income per capita in a canton in 1992 (Swiss Federal Statistical Office 1997).

Population: Average number of residents in a canton in 1992 (Swiss Federal Statistical Office 1993).

Urbanisation: Dummy for people living in an urban area. Reference group people living in a rural area.

Appendix II

Index for direct democratic rights in Swiss cantons
Direct democracy is here 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, an index is constructed to measure the different barriers for citizens entering the political process, apart from elections in the year 1992. 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
a) the initiative to change the canton's constitution,
b) the initiative to change the canton's law,
c) the compulsory and optional referendum to prevent new or changing law and
d) the compulsory and optional referendum to prevent new state expenditure.

Barriers are in terms of
a) the necessary signatures to launch an instrument (absolute and relative to the number of citizens with the right to vote),
b) the legally allowed time span to collect the signatures and
c) the level of new expenditure per head allowing a financial referendum.
(Compulsory referenda are treated like referenda with the lowest possible barrier.)

Each of these restrictions is evaluated on a six point scale: „one" indicates a high barrier, „six" a low one. From the resulting ratings, a non-weighted average is calculated, which represents the measure of direct democratic rights in Swiss cantons. The results are presented in table A.1.

Table A.1 – Index for direct democratic rights in Swiss cantons in 1992

Canton	Index	Canton	Index	Canton	Index
Aargau	5.46	Graubünden	4.75	Schwyz	4.93
Appenzell i. Rh.	5.25	Jura	3.71	Thurgau	4.04
Appenzell a. Rh.	5.50	Luzern	4.48	Ticino	2.10
Bern	3.50	Neuchâtel	2.13	Uri	5.42
Basel Land	5.69	Nidwalden	4.92	Vaud	2.42
Basel Stadt	4.40	Obwalden	5.58	Valais	3.42
Fribourg	2.42	Sankt Gallen	3.40	Zug	4.42
Genève	1.75	Schaffhausen	5.08	Zürich	4.17
Glarus	5.50	Solothurn	5.42		

Index for local autonomy in Swiss cantons

The index for local autonomy is based on survey results by Ladner (1994). Chief local administrators in 1856 Swiss municipalities reported how they perceive their local autonomy on a ten point scale, with one indicating „no autonomy at all", and ten „very high" communal autonomy. Average scores for each canton are presented in table A.2.

Table A.2 – Index for local autonomy in Swiss cantons in 1994

Canton	Index	Canton	Index	Canton	Index
Aargau	4.9	Graubünden	5.8	Schwyz	4.6
Appenzell i. Rh.	5.0	Jura	4.0	Thurgau	5.9
Appenzell a. Rh.	5.8	Luzern	4.1	Ticino	4.3
Bern	4.6	Neuchâtel	3.7	Uri	5.4
Basel Land	4.3	Nidwalden	5.5	Vaud	4.7
Basel Stadt	5.5	Obwalden	6.0	Valais	5.5
Fribourg	4.2	Sankt Gallen	4.9	Zug	6.0
Genève	3.2	Schaffhausen	6.1	Zürich	5.4
Glarus	5.6	Solothurn	4.9		

Appendix III

Table A.3 – Summary Statistics – Satisfaction with Life in Switzerland

	Satisfaction with life	Mean/Share	Minimum	Maximum	Standard deviation
Satisfaction with life	8.219	8.219	1	10	1.717
a) Employment status					
employed	8.209	0.383		Dummy	0.486
unemployed	6.562	0.021		Dummy	0.144
self employed	8.306	0.109		Dummy	0.312
at home	8.384	0.142		Dummy	0.349
school	8.199	0.024		Dummy	0.153
retired	8.230	0.298		Dummy	0.458
other	8.368	0.022		Dummy	0.147
b) Income					
first quartile	7.994	0.249		Dummy	0.433
second quartile	8.172	0.249		Dummy	0.432
third quartile	8.245	0.251		Dummy	0.434
fourth quartile	8.464	0.251		Dummy	0.434
c) Education					
low	7.975	0.309		Dummy	0.462
middle	8.309	0.554		Dummy	0.497
high	8.407	0.137		Dummy	0.344
d) Demographic factors					
female	8.219	0.503		Dummy	0.500
male	8.219	0.497		Dummy	0.500
age		50.051	20	102	19.362
age squared		2.880e+3	400	10.404e+3	2.038e+3
marital status: single	8.076	0.230		Dummy	0.421
married	8.356	0.598		Dummy	0.490
divorced	7.600	0.061		Dummy	0.240
separated	6.500	0.004		Dummy	0.060
widowed	8.178	0.108		Dummy	0.310
Direct democratic rights		3.832	1.75	5.69	1.080
Local autonomy		4.791	3.2	6.1	0.645
National income p.c. (in 1'000)		42.686	31.77	73.98	7.411
Population (in 100'000)		5.513	0.14	11.75	3.724
Living in a rural area	8.295	0.348		Dummy	0.476
Living in a urban area	8.179	0.652		Dummy	0.476
German speaking cantons	8.305	0.757		Dummy	0.429
French speaking cantons	7.887	0.197		Dummy	0.398
Italian speaking canton	8.237	0.046		Dummy	0.210

Notes: The number of observations is 6126. All the descriptive statistics are not weighted.
Data sources: Ladner (1994), Leu, Burri and Priester (1997), Stutzer (1999) and Swiss Federal Statistical Office (various years).