

Welsch, Heinz; Kühling, Jan

Working Paper

How Has the Crisis of 2008-2009 Affected Subjective Well-Being?

Wirtschaftswissenschaftliche Diskussionspapiere, No. V-330-11

Provided in Cooperation with:

University of Oldenburg, Department of Economics

Suggested Citation: Welsch, Heinz; Kühling, Jan (2011) : How Has the Crisis of 2008-2009 Affected Subjective Well-Being?, Wirtschaftswissenschaftliche Diskussionspapiere, No. V-330-11, University of Oldenburg, Department of Economics, Oldenburg

This Version is available at:

<https://hdl.handle.net/10419/105018>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Wirtschaftswissenschaftliche Diskussionspapiere

How Has the Crisis of 2008-2009 Affected Subjective Well-Being?

Heinz Welsch and Jan Kühling

V – 330 – 11

Januar 2011

Institut für Volkswirtschaftslehre
Universität Oldenburg, D-26111 Oldenburg

How Has the Crisis of 2008-2009 Affected Subjective Well-Being?

Heinz Welsch

Jan Kühling

Department of Economics

University of Oldenburg

26111 Oldenburg, Germany

Abstract: Results of life satisfaction regressions for more than 91,000 individuals are used to investigate how the macroeconomic crisis of 2008-2009 has affected subjective well-being (SWB) in 30 OECD countries. In a number of countries, the effect of the crisis on a representative person's SWB is of a similar magnitude as the effects of the most important personal life events. Our findings highlight the importance of GDP fluctuations for SWB.

JEL classifications: E32; I31; E61

Keywords: macroeconomic crisis; growth; stability; subjective well-being

Acknowledgement: We are grateful to Jürgen Bitzer for useful comments and suggestions.

1. Introduction

This paper uses life satisfaction regressions for an assessment of how the macroeconomic crisis of 2008-2009 has affected subjective well-being (SWB) in 30 OECD countries.

The consequences of macroeconomic conditions for SWB were first studied by Di Tella et al. (2001). Their regression analyses for twelve member countries of the European Union (EU12), 1975-1992, produced statistically significant inverse relationships between the life satisfaction of the citizens and the inflation and unemployment rates prevailing in their countries.¹ Di Tella et al. (2003) included the change in per capita GDP in life satisfaction regressions alongside unemployment and inflation (EU12, 1975-1992) and found at least one of these three variables to be insignificant. For the period 1992-2002, Welsch (2011) found the life satisfaction of the citizens of EU12 to be negatively and significantly related to the unemployment and inflation rate and positively and significantly related to the annual GDP growth rate.

The present paper extends previous work by estimating the effects of unemployment, inflation and GDP growth on the life satisfaction of more than 91,000 individuals in a set of almost all OECD countries, 1990-2008. By applying the estimated coefficients to the macroeconomic crisis of 2008-2009, we find that in a number of countries the effect of the crisis on a representative person's SWB is of a similar magnitude as the effects of the most serious personal life events (a divorce, say). Our findings concerning the recent crisis highlight the importance of GDP fluctuations for SWB.

2. Empirical Approach and Data

Our life satisfaction regression is stated as follows:

$$LS_{kit} = \alpha_g g_{it} + \alpha_u u_{it} + \alpha_p p_{it} + \beta_r + \gamma_t + \delta c_{kit} + \varepsilon_{kit} \quad (1)$$

where LS_{kit} denotes life satisfaction of individual k in country i and year t . The variables g , u , and p are the rates of GDP growth, unemployment and inflation, respectively, and α_g , α_u and α_p the associated coefficients. The vector c_{kit} comprises a set of individual k 's socio-demographic characteristics (age, sex, civil status, employment status, income). Since c_{kit} includes a person's employment status, we are able to separate SWB effects of the general unemployment rate from those of the individual-level employment situation. β_r and γ_t are

¹ Self-rated life satisfaction (elicited in surveys) is a common measure of SWB. Since macroeconomic life satisfaction regressions control for the individual employment status, the cited evidence indicates that the general unemployment rate has effects on SWB beyond those of being personally unemployed.

region and time dummies, and ε_{kit} is an error term. The growth, unemployment, and inflation rates are measured in percent. An extended version of eq. (1) includes the level of per capita GDP as a control.

Data comes from two main sources. The rates of GDP growth, unemployment, and inflation (as well as per capita GDP) are taken from the OECD online database. Data on people's life satisfaction and their socio-demographic characteristics comes from the second to fifth waves of the World Values Surveys. Life satisfaction is the response to the following question: "All things considered, how satisfied are you with your life as a whole these days?" and is measured on a 10-point scale, where 1 = "dissatisfied" and 10 = "satisfied".

Our sample contains 91,195 valid observations in 30 member countries of OECD in the years 1990, 1995-2001 and 2005-2008.² Since the persons surveyed differ from year to year, our database is a pooled cross-section.

There has been some debate in the literature on whether life satisfaction should be treated as a cardinal phenomenon. If not, an ordered discrete choice model should be estimated rather than a linear regression model. Research that has applied both approaches has found little difference between the results of a linear regression and an ordered logit or probit (Ferrer-i- Carbonell and Frijters 2004). To facilitate interpretation, we use least squares as the primary method and an ordered probit as a robustness check. We report heteroskedasticity robust standard errors, corrected for clustering at the country-year level.

3. Estimation Results

Columns A–D in Table 1 present estimation results for several versions of eq. (1). Columns A and B report least squares estimates whereas columns C and D show results from using an ordered probit maximum likelihood estimator. Our discussion focuses on the macroeconomic variables.³

² Following OECD conventions, the countries are grouped in six regions: Canada, Mexico, USA (region OECD-America); Japan, Korea (region OECD-Asia); Australia, New Zealand (region OECD-Pacific); Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Switzerland, UK (region OECD-Western Europe); Czech Republic, Hungary, Poland, Slovak Republic, Turkey (region OECD Eastern Europe); Denmark, Finland, Iceland, Norway, Sweden (region OECD-Scandinavia). OECD countries Chile and Slovenia are excluded because data are incomplete.

³ With respect to the individual-level socio-demographic variables, all regressions yield the same qualitative results, and these results are consistent with common findings for developed countries (see Frey and Stutzer 2002 for a review): positive and significant coefficients on being female, being married or living together, and on income; negative and significant coefficients on being unemployed and on being divorced, separated or widowed; life satisfaction first decreasing then increasing in age (with turning point in the late 40s). In quantitative terms, large differences exist between being married and being divorced (about 0.62 on a 10-point scale) and between being (full-time) employed and being unemployed (0.85).

Table 1: Estimation Results

	A (OLS)	B (OLS)	C (Ordered Probit)	D (Ordered Probit)
Unemployment rate	-0.031*** (0.010)	-0.031*** (0.011)	-0.018*** (0.006)	-0.019*** (0.006)
Inflation rate	-0.013*** (0.003)	-0.013*** (0.003)	-0.006*** (0.001)	-0.006*** (0.002)
GDP growth rate	0.042*** (0.011)	0.042*** (0.011)	0.021*** (0.006)	0.021*** (0.006)
GDP per capita		-0.001 (0.005)		-0.003 (0.003)
Male	Reference	Reference	Reference	Reference
Female	0.083*** (0.026)	0.083*** (0.026)	0.045*** (0.013)	0.046*** (0.013)
Age	-0.061*** (0.004)	-0.061*** (0.004)	-0.033*** (0.002)	-0.032*** (0.002)
Age ²	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Single	Reference	Reference	Reference	Reference
Married	0.421*** (0.037)	0.421*** (0.037)	0.221*** (0.021)	0.222*** (0.021)
Living together	0.164*** (0.058)	0.164*** (0.057)	0.083*** (0.031)	0.084*** (0.031)
Divorced	-0.198*** (0.051)	-0.197*** (0.051)	-0.101*** (0.024)	-0.098*** (0.024)
Separated	-0.564*** (0.069)	-0.563*** (0.069)	-0.267*** (0.032)	-0.266*** (0.032)
Widowed	-0.153*** (0.046)	-0.153*** (0.046)	-0.083*** (0.023)	-0.083*** (0.023)
Children	0.003 (0.013)	0.003 (0.013)	0.007 (0.007)	0.006 (0.007)
Full time employed	Reference	Reference	Reference	Reference
Part time employed	-0.063 (0.045)	-0.063 (0.045)	-0.025 (0.022)	-0.024 (0.022)
Self employed	0.022 (0.049)	0.021 (0.051)	0.029 (0.024)	0.025 (0.025)
Retired	-0.044 (0.051)	-0.044 (0.051)	0.006 (0.027)	0.006 (0.027)
Housewife	0.131* (0.069)	0.130* (0.069)	0.093*** (0.034)	0.090*** (0.034)
Student	0.075* (0.045)	0.075* (0.044)	0.031 (0.024)	0.030 (0.024)
Other occupation	-0.270*** (0.077)	-0.271*** (0.077)	-0.103*** (0.040)	-0.104*** (0.040)
Unemployed	-0.848*** (0.075)	-0.848*** (0.075)	-0.381*** (0.035)	-0.381*** (0.035)
Income	0.110*** (0.009)	0.110*** (0.009)	0.053*** (0.004)	0.053*** (0.004)
Region dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Observations	91195	91195	91195	91195
R ² /Pseudo R ²	0.133	0.133	0.032	0.032

Dependent variable: life satisfaction (10-point scale). The rates of unemployment, inflation, and growth are measured in percent. GDP per capita is measured in thousand PPP-adjusted USD2000. Robust standard errors in parentheses are adjusted for clustering at the country-year level. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Regression A shows that life satisfaction is negatively and significantly related to the rates of unemployment and inflation and positively and significantly related to the rate of GDP growth. The coefficient on unemployment is larger (in absolute terms) than that on inflation. Adding per capita GDP (regression B) has little effect on the coefficients obtained in

regression A. Per capita GDP itself is found to be insignificant.⁴ In the ordered probit counterparts to regressions A and B (regressions C and D, respectively) the coefficients retain their sign and significance, and their *ratios* are similar (though, of course, their magnitudes differ). Per capita GDP is again insignificant.

With respect to economic significance, we refer to the least-squares estimates because they are more accessible to interpretation than are the coefficients from the ordered probit. As seen in columns A and B of Table 1, a 1-percentage point increase in the unemployment rate is associated with a drop in life satisfaction by about 0.03 on a 10-point scale. To illustrate, this is about 5 percent of the effect of being shifted from ‘married’ to ‘divorced’ status, or more than 3 percent of the effect of *personally* becoming unemployed (which are among the life events that affect SWB most strongly; cf. footnote 3). The effect of a 1-percentage point increase in the inflation rate is somewhat less than one half in comparison with the unemployment rate, whereas the effect of a 1-percentage point drop in the GDP growth rate is about one third larger.

4. The Crisis of 2008-2009

Having estimated the model, the consequences of the macroeconomic crisis for SWB will be measured by means of the following index:

$$I_{it} := \alpha_g g_{it} + \tilde{\alpha}_u u_{it} + \alpha_p p_{it}. \quad (2)$$

In this formulation, the coefficient $\tilde{\alpha}_u$ takes account of the circumstance that a change in the aggregate unemployment rate changes the number of unemployed persons, thus affecting life satisfaction in an indirect way. At a given participation rate s , an increase in the unemployment rate by 1 percentage point (or 0.01) shifts a fraction $0.01 \cdot s$ of the population into unemployed status. If becoming unemployed changes a person’s life satisfaction by δ_u , the total effect of a 1-percentage-point increase in the unemployment rate is thus $\tilde{\alpha}_u = \alpha_u + 0.01 \cdot s \cdot \delta_u$.

We use the results from regression A of Table 1 to compute the index presented in eq. (2). Table 2 shows the difference of the 2008 and 2009 index values from the values in 2007. The overall changes are decomposed into their growth, unemployment, and inflation components.

⁴ We experimented with including indicators of governance quality as additional macro-level controls and found them insignificant and having no appreciable effect on the coefficients of interest.

It is seen that in the countries most strongly affected (Iceland, Ireland), the drop in SWB is about 0.3 and 0.4 in 2008, and between 0.7 and 0.8 in 2009. In 2009, SWB effects in Finland, the Slovak Republic and in Spain are of a similar magnitude as in Ireland. To illustrate in terms of personal life events, these effects are of a similar size as the effect of getting divorced. Among the least affected countries in 2009 are Asia-Pacific countries Korea, Australia, and New Zealand. The U.S. and the U.K. take an intermediate position.

In all countries, there is a worsening of the SWB effect in 2009 compared to 2008. Whereas the overall effects in 2008 are largely driven by the drop in the growth rate, there is a considerable contribution by unemployment in 2009 (especially in Iceland, Ireland, Spain, and the U.S.). The inflation rate plays a minor role in general. In the case of Ireland (2009), however, there is even a considerable positive SWB effect from the *drop* in the inflation rate.

5. Conclusions

In the member countries of OECD there exists a macroeconomic welfare function over growth, employment and price stability which reflects the preferences of those countries' citizens. This finding provides empirical support for the usual view in macroeconomics that "a successful economy is an economy that combines high output growth, low unemployment and low inflation" (Blanchard et al. 2010, p. 27). With respect to the crisis of 2008-2009, we find that its effect on subjective well-being may be of the same magnitude as the effect of the most important personal life events. Our results show that GDP fluctuations are important determinants of subjective well-being.

References

- Blanchard, O., Armighini, A., Giavazzi, F. (2010), *Macroeconomics: A European Perspective*, Harlow: Pearson Education Limited.
- Di Tella, R., MacCulloch, R.J., Oswald, A.J. (2001), Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness, *American Economic Review* 91, 335-341.
- Di Tella, R., MacCulloch, R.J., Oswald, A.J. (2003), The Macroeconomics of Happiness, *Review of Economics and Statistics* 85, 809-827.
- Ferrer-i-Carbonell, A., Frijters, P. (2004), How Important is Methodology for the Estimates of the Determinants of Happiness?, *Economic Journal* 114, 641-659.
- Frey, B.S., Stutzer, A. (2002), What Can Economists Learn from Happiness Research, *Journal of Economic Literature* 40, 402-435.
- Welsch, H. (2011), The Magic Triangle of Macroeconomics: How Do European Countries Score?, *Oxford Economic Papers* 63, 71-93.

Table 2: Effects of the Crisis on Subjective Well-Being

Country	Index Crisis 2008 (Difference 07-08)				Index Crisis 2009 (Difference 07-09)			
	GDP-Growth	Unemp	Inflat	Index (Sum)	GDP-Growth	Unemp	Inflat	Index (Sum)
Australia	-0.11	0.01	-0.03	-0.13	-0.10	-0.04	0.01	-0.14
Austria	-0.07	0.02	-0.01	-0.06	-0.32	-0.01	0.02	-0.31
Belgium	-0.08	0.02	-0.03	-0.10	-0.24	-0.01	0.02	-0.23
Canada	-0.07	0.00	0.00	-0.08	-0.20	-0.08	0.02	-0.26
Czech Republic	-0.15	0.03	-0.04	-0.16	-0.43	-0.05	0.03	-0.46
Denmark	-0.11	0.02	-0.02	-0.12	-0.28	-0.08	0.01	-0.36
Finland	-0.19	0.02	-0.02	-0.19	-0.56	-0.05	0.03	-0.57
France	-0.09	0.02	-0.02	-0.09	-0.21	-0.04	0.02	-0.23
Germany	-0.07	0.04	0.00	-0.03	-0.31	0.04	0.02	-0.25
Greece	-0.13	0.02	-0.02	-0.12	-0.27	-0.04	0.02	-0.30
Hungary	0.00	-0.01	0.02	0.01	-0.31	-0.09	0.05	-0.36
Iceland	-0.21	-0.03	-0.10	-0.33	-0.52	-0.18	-0.09	-0.79
Ireland	-0.39	-0.05	0.01	-0.43	-0.55	-0.26	0.12	-0.69
Italy	-0.12	-0.03	-0.02	-0.17	-0.27	-0.07	0.01	-0.33
Japan	-0.15	0.00	-0.02	-0.17	-0.32	-0.04	0.02	-0.34
Korea	-0.12	0.00	-0.03	-0.14	-0.21	-0.01	0.00	-0.22
Luxembourg	-0.22	-0.04	-0.01	-0.27	-0.43	-0.04	0.03	-0.45
Mexico	-0.08	-0.01	-0.01	-0.11	-0.42	-0.07	-0.02	-0.50
Netherlands	-0.09	0.01	-0.01	-0.08	-0.33	-0.01	0.01	-0.33
New Zealand	-0.18	-0.02	-0.02	-0.22	-0.14	-0.09	0.00	-0.23
Norway	-0.08	0.00	-0.04	-0.13	-0.17	-0.03	-0.02	-0.22
Poland	-0.07	0.09	-0.02	0.00	-0.22	0.05	-0.02	-0.18
Portugal	-0.10	0.01	0.00	-0.09	-0.21	-0.05	0.04	-0.22
Slovak Republic	-0.20	0.06	-0.02	-0.16	-0.64	-0.03	0.01	-0.66
Spain	-0.11	-0.11	-0.02	-0.24	-0.31	-0.35	0.04	-0.62
Sweden	-0.16	-0.01	-0.02	-0.18	-0.35	-0.08	0.03	-0.41
Switzerland	-0.07	0.00	-0.02	-0.09	-0.23	-0.03	0.02	-0.24
Turkey	-0.17	-0.03	-0.02	-0.22	-0.39	-0.14	0.03	-0.50
United Kingdom	-0.12	-0.01	-0.02	-0.15	-0.32	-0.08	0.00	-0.40
United States	-0.08	-0.04	-0.01	-0.14	-0.19	-0.17	0.04	-0.32

Note: Results are based on eq. (2) and on estimation results in column A of Table 1

Bisher erschienen: *

- V-297-07 **Christoph Böhringer and Carsten Helm**, On the Fair Division of Greenhouse Gas Abatement Cost
- V-298-07 **Christoph Böhringer**, Efficiency Losses from Overlapping, Regulation of EU Carbon Emissions
- V-299-07 **Udo Ebert**, Living standard, social welfare and the redistribution of income in a heterogeneous population
- V-300-07 **Udo Ebert**, Recursively aggregable inequality measures: Extensions of Gini's mean difference and the Gini coefficient
- V-301-07 **Udo Ebert**, Does the definition of nonessentiality matter? A clarification
- V-302-07 **Udo Ebert**, Dominance criteria for welfare comparisons: Using equivalent income to describe differences in needs
- V-303-08 **Heinz Welsch, Jan Kühling**, Pro-Environmental Behavior and Rational Consumer Choice: Evidence from Surveys of Life Satisfaction
- V-304-08 **Christoph Böhringer and Knut Einar Rosendahl**, Strategic Partitioning of Emissions Allowances Under the EU Emission Trading Scheme
- V-305-08 **Niels Anger, Christoph Böhringer and Ulrich Oberndorfer**, Public Interest vs. Interest Groups: Allowance Allocation in the EU Emissions Trading Scheme
- V-306-08 **Niels Anger, Christoph Böhringer and Andreas Lange**, The Political Economy of Environmental Tax Differentiation: Theory and Empirical Evidence
- V-307-08 **Jan Kühling and Tobias Menz**, Population Aging and Air Pollution: The Case of Sulfur Dioxide
- V-308-08 **Tobias Menz, Heinz Welsch**, Population Aging and Environmental Preferences in OECD: The Case of Air Pollution
- V-309-08 **Tobias Menz, Heinz Welsch**, Life Cycle and Cohort Effects in the Valuation of Air Pollution: Evidence from Subjective Well-Being Data
- V-310-08 **Udo Ebert**, The relationship between individual and household welfare measures of WTP and WTA
- V-311-08 **Udo Ebert**, Weakly decomposable inequality measures
- V-312-08 **Udo Ebert**, Taking empirical studies seriously: The principle of concentration and the measurement of welfare and inequality
- V-313-09 **Heinz Welsch**, Implications of Happiness Research for Environmental Economics
- V-314-09 **Heinz Welsch, Jan Kühling**, Determinants of Pro-Environmental Consumption: The Role of Reference Groups and Routine Behavior
- V-315-09 **Christoph Böhringer and Knut Einar Rosendahl**, Green Serves the Dirtiest: On the Interaction between Black and Green Quotas
- V-316-09 **Christoph Böhringer, Andreas Lange, and Thomas P. Rutherford**, Beggar-thy-neighbour versus global environmental concerns: an investigation of alternative motives for environmental tax differentiation
- V-317-09 **Udo Ebert**, Household willingness to pay and income pooling: A comment
- V-318-09 **Udo Ebert**, Equity-regarding poverty measures: differences in needs and the role of equivalence scales
- V-319-09 **Udo Ebert and Heinz Welsch**, Optimal response functions in global pollution problems can be upward-sloping: Accounting for adaptation
- V-320-10 **Edwin van der Werf**, Unilateral climate policy, asymmetric backstop adoption, and carbon leakage in a two-region Hotelling model
- V-321-10 **Jürgen Bitzer, Ingo Geishecker, and Philipp J.H. Schröder**, Returns to Open Source Software Engagement: An Empirical Test of the Signaling Hypothesis
- V-322-10 **Heinz Welsch, Jan Kühling**, Is Pro-Environmental Consumption Utility-Maximizing? Evidence from Subjective Well-Being Data
- V-323-10 **Heinz Welsch und Jan Kühling**, Nutzenmaxima, Routinen und Referenzpersonen beim nachhaltigen Konsum
- V-324-10 **Udo Ebert**, Inequality reducing taxation reconsidered
- V-325-10 **Udo Ebert**, The decomposition of inequality reconsidered: Weakly decomposable measures
- V-326-10 **Christoph Böhringer and Knut Einar Rosendahl**, Greening Electricity More Than Necessary: On the Excess Cost of Overlapping Regulation in EU Climate Policy

- V-327-10 **Udo Ebert and Patrick Moyes**, Talents, Preferences and Inequality of Well-Being
- V-328-10 **Klaus Eisenack**, The inefficiency of private adaptation to pollution in the presence of endogeneous market structure
- V-329-10 **Heinz Welsch**, Stabilität, Wachstum und Well-Being: Wer sind die Champions der Makroökonomie?
- V-330-11 **Heinz Welsch and Jan Kühling**, How Has the Crisis of 2008-2009 Affected Subjective Well-Being?

* Die vollständige Liste der seit 1985 erschienenen Diskussionspapiere ist unter <http://www.vwl.uni-oldenburg.de/45163.html> zu finden