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

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

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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.

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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:

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

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:

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

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.

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

	Index Crisis 2008 (Difference 07-08)				Index Crisis 2009 (Difference 07-09)			
Country	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

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