

# WELL-BEING ACROSS OECD COUNTRIES: IS EUROPE DIFFERENT?

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## Abstract

The answer to this question is a resounding ‘no’. This paper considers a range of well-being indicators available for OECD countries in the mid 2000s, including subjective measures of life satisfaction as well as objective indicators of physical and mental health. It then analyses whether participation in the EU or in the euro area affects overall well-being, subject to a large set of possible control variables. The main results are two. First, participation in the EU and the euro area does not matter for well-being and this appears to be a robust result. Second, cross country differences in subjective well-being are largely explained by only three variables, notably the employment rate with a positive sign, and average temperature (which is negatively correlated with the quality of institutions) and a dummy variable identifying Post Communist countries with a negative sign. By contrast, income appears to be important for measures of objective well-being, though in a highly non-linear fashion.

**Keywords:** Life Satisfaction, OECD, EU, euro, happiness economics, well-being.

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*While the American Dream tires and languishes in the past, a new European Dream is being born. Today we see a new set of values emerging which are focused on sustainable development, quality of life and multilateralism. More cosmopolitan and less concerned with the brute exercise of power, the European Dream is better positioned to accommodate the many forces that are propelling us into a more interconnected and interdependent world.* From the back cover of J. Rifkin, *The European Dream* (2004); emphasis added.

*By measures too numerous to mention, Americans are much better off than most of their European cousins. (...) Instead of circumventing democratic choice, people like Rifkin need to recognize that individuals will act like individuals no matter how interdependent the society. As Adam Smith realized 229 years ago, society only works if its institutions are designed so that, as individuals act like individuals, they also work for the benefit of other people. The American dream works because people can get rich mainly if they do things that help others. The European dream won't work if it denies people such opportunities.* Rifkin's European Dream, posted on the blog <http://www.commonblog.org/archives/000225.php>.

## **1. Introduction**

As the quotes above show, it is difficult to remain nonchalant on the topic of Europe and the subject of European integration is often an emotionally charged one, with different people taking definite sides for or against Europe, to the point that “Euroscepticism” and “pro-Europeanism” have become entries in everyday dictionaries.<sup>2</sup> Survey evidence suggests that common views are both strong and split on Europe. According to the 2005 Eurobarometer survey, while the majority of European citizens express hope or trust in the European Union, there is a large minority of eurosceptics who feel distrust or rejection, and only about 20% declare to be indifferent towards it. Paraphrasing George W. Bush, it appears therefore that you either are with Europe, or against it.

With the euro approaching its tenth birthday, it is also time to take stock of the pros and cons of the common currency and there is already a copious literature on this matter. Among the economic benefits, the literature has emphasised the increase in policy credibility, lower real (short-term and long-term) interest rates, more stable and integrated financial markets and stronger economic performance. In the ten years after the creation of the euro compared with the previous ten years, the euro area has experienced lower inflation (in level and variability), lower unemployment, and

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<sup>2</sup> For example, according to *Wikipedia*, “Euroscepticism has become a general term for opposition to the process of European integration. It originated in the United Kingdom, and at first referred to those within the Labour Party and Conservative Party who were sceptical of their parties’ official support for UK membership of the then European Economic Community. Since then, the meaning has expanded, to cover most opposition to the European Union, to its policies, to the introduction of the euro, and to any future pan-European entity in the form of a superstate, a federation, or a confederation. The term entered other European languages as a loan word or calque, for instance *Europaskepsis* in German.”

higher job creation. As to the economic costs of the euro, it is often mentioned that the euro area cannot be characterised as an optimal currency area (OCA) as it fails some key requirements of OCA theory, in particular the flexibility of wages and prices and labour mobility; see, among others, Giavazzi and Torres (1993), Frankel and Rose (1997), Artis (2003), and in particular Feldstein (1997) for a pessimistic assessment of the common currency.<sup>3</sup> DA LIRA

Is Europe allowing people to run a better life, or rather preventing them from doing so? The main question addressed in this paper is whether being a member of the European Union and having adopted the euro are, *by themselves*, factors that contribute to citizens' *overall well-being*. By focusing on well-being rather than standard measures of economic performance such as the Gross Domestic Product (GDP) in assessing the merits and shortcoming of Europe, this paper moves towards the burgeoning literature on happiness economics; see, among others, Kahneman, Diener and Schwarz (1999), DiTella, MacCulloch and Oswald (2001), and Frey and Stutzer (2002) and Dolan et al. (2007) for recent surveys. This literature is mainly based on surveys of self-reported well-being, cross checked with objective measures of physical and mental health. It is motivated by the consideration that focussing narrowing on income and leisure, as traditional in economics, can miss important elements of welfare, and that agents' utility cannot be fully revealed by their choices (Kahneman et al., 1999). Importantly, measures of reported happiness and satisfaction are correlated with several objective indicators, among which a person's assessment of happiness by friends and family; a person's assessment of happiness by the spouse; the heart rate and blood pressure response to stress; the risk of getting coronary heart disease; and outcomes of brain imaging analyses. Moreover, there is evidence that the state of the mind determines the health of the body; for example, people with a higher status tend to live longer.<sup>4</sup> Interestingly, there is a certain interest also in policy-making circles in getting beyond narrow measures of economic performance and considering welfare from a broader perspective.<sup>5</sup>

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<sup>3</sup> See also Rose (2000), Baldwin (2006), Giannone and Reichlin (2006), and Lane (2006) on the costs and benefits of the euro.

<sup>4</sup> See Rablen and Oswald (2007).

<sup>5</sup> See for example the conference organised by the European Commission "Beyond GDP", whose proceedings are available at <http://www.beyond-gdp.eu/programme.html>; and the OECD's global project "Measuring the progress of societies"; see <http://www.oecd.org/dataoecd/56/37/36917656.htm>.

This paper builds on previous studies attempting at comparing Life Satisfaction across countries (see DiTella, MacCulloch and Oswald, 2003; Bjornskov, Dreher and Fischer, 2007a and 2007b). Specifically, I collect a relatively large number of well-being aggregate indicators for the 30 OECD countries, including reported Life Satisfaction and happiness as well as more “objective” measures of physical and mental health, for the mid 2000s. The objective of the analysis is to study whether the simple fact that a certain country is a Member of the European Union or adopts the European common currency exerts a statistically and economically significant impact on citizens’ well-being. In order to test this proposition properly, I need to control for a number of factors that have been shown in the literature to influence reported happiness and well-being. In order to do this, I also collect data for a number of characteristics, such as geographical position, population density, and historical and linguistic background that are arguably independent of whether a country is a member of the EU or of the euro area. A first set of results refer to what I dub “unconditional” regressions, namely including only the control variables that are *almost certainly* independent of Europe. In a second stage, I also condition the well-being indicators to a number of indicators that are potentially affected by the fact that a certain country participates in the EU or in the euro. The results for this second set of “conditional” regressions might indicate whether there is a *marginal* value added (or cost, depending on the sign) of being in Europe, on top of its possible economic consequences.

The main results of this paper are two. First, it is found that participation in the EU and the euro area does not matter, at least directly, for well-being, and this appears to be a robust result. Second, cross country differences in *subjective* well-being are largely explained by only three variables, notably the employment rate with a positive sign, and average temperature (which is negatively correlated with proxies for the quality of institutions) and a dummy variable identifying Post Communist countries with a negative sign. By contrast, income appears to be important for measures of *objective* well-being, though in a highly non-linear fashion.

The paper is organised as follows. I describe the methodology in Section 2. The data used in the study are described in Section 3. Section 4 presents the empirical evidence. Section 5 provides some discussion of the results. Section 6 concludes.

## 2. Econometric approach

The typical approach in the happiness economics literature is to estimate a relationship between of this type,

$$W_{it} = a + bX_{it} + e_{it}$$

where  $W$  is self-reported happiness or Life Satisfaction,  $X$  a vector of socio-demographic and economic characteristics, and  $e$  measures unobserved characteristics and measurement error. Variables are indexed by  $i$ , which refers to the individual, and  $t$ , which refers to time. Equations at individual level are often analysed via ordered logit or probit equations, because individual answers to surveys are almost always ordinal, rather than cardinal.<sup>6</sup> It is also notable that equations of this type normally lead to very low R squared, of the order of magnitude of a few percentage points, reflecting the overwhelming weight of the unexplained personal variation.

Since this paper takes a macroeconomic perspective, it aggregates across individuals in the same country, which leads to the elimination of a large variation of personal characteristics and, as we will see later, to a dramatic increase in the explained cross-sectional variation. The focus over countries, rather than individuals should also minimise the cross sectional dependence of the data, thereby increasing the explanatory power. On the negative side, the elimination of the individual variation leads to a dramatic reduction in sample size, leading to concerns about small sample bias (I have the full database only for the 30 OECD countries, and some indicators are even missing for a couple of them). This is exacerbated by the fact that observations refer only to one time period  $t$ , referring to the mid 2000s. This choice is dictated by the willingness to analyse a large number of alternative well-being indicators, among which the Life Satisfaction data for all OECD countries drawn from the World Values Survey, which are available only on a couple of dates. Moreover, it is doubtful that adding some time series dimension to the data would add much value added, since happiness and life satisfaction data *at country level* typically display very little variation *over time* (as opposed to cross section), a phenomenon which is at the root of the “Easterlin paradox”.<sup>7</sup> This is especially the case if one considers that adding some time series variation would severely constrain the number of variables that one would be able to collect for the cross section.

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<sup>6</sup> Ferrer-i-Carbonell and Frijters (2004) show that assuming ordinality or cardinality of happiness scores makes little difference.

<sup>7</sup> See Frey and Stutzer (2002).

From a methodological point of view, I deal with the small sample problem in the following way. I divide the  $X$  vector in two sub-vectors,  $X_{exog}$  and  $X_{endog}$ , the first containing the variables that are clearly exogenous to whether a country participates in the EU or the euro, as for example its geographical location, and the second the variables that are potentially influenced by participation in the European Union or the euro. I first run an “unconditional” regression including only a handful of the clearly exogenous variables as well as a dummy variable which takes value 1 if the country is in the EU or the euro, and 0 otherwise. The model selection criterion is not merely the statistical significance of the regressors, but also the Schwarz information criterion in order to penalise heavily for the loss of degrees of freedom and obtain parsimonious models. While this approach falls short of the Bayesian averaging method proposed by Sala-i-Martin, Doppelhofer and Miller (2004) in the context of the literature on cross country determinants of long run growth, it is conceptually similar to it.<sup>8</sup> In a second step of the analysis, I consider the variables in the second block,  $X_{endog}$ , that are *potentially* affected by whether a country is in the EU or the euro area, such as, say, the unemployment rate (“conditional” regressions). I start from the best unconditional regression and then add one variable at the time, and include only the variable or set of variables that improve the Schwarz information criterion. The *overall purpose* of the analysis is to evaluate the sign, size and statistical significance of the coefficients related to the EU or euro area, controlling for both exogenous and potentially endogenous control variables in a parsimonious model selected on the basis of a Bayesian criterion.

It should also be emphasised that, as compared with existing studies evaluating Life Satisfaction across countries, this paper only focuses on OECD, i.e. advanced countries. This is motivated by two considerations. First, data availability; the OECD has made a substantial statistical effort in order to provide data that are comparable across countries, and these are reported in several OECD publications. It is therefore natural to use the group of OECD countries as a first step in addressing the main question of this paper. Second, it is also interesting to compare well-being across advanced countries alone, since the drivers of life satisfaction, happiness and health are arguably very different as compared with developing countries (income, for

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<sup>8</sup> Indeed Sala-i-Martin, Doppelhofer and Miller state that “The weights given to individual regressions have a Bayesian justification similar to the Schwarz model selection criterion” (p. 813).

example, is likely to matter considerably less). It is also more natural to compare European or euro area countries with their peers, namely other advanced countries, than to developing countries that may have completely different characteristics and priorities.

### **3. Data**

I collect data for each OECD country that refer to the mid 2000s or to the closest period available. The OECD includes Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States. Out of these 30 countries, 12 are euro area members (only Slovenia is not OECD) and 19 are EU members (8 EU countries do not belong to the OECD, though most of them are relatively rich countries). Note that some measures of well-being are available for a sample period which precedes the entry of the New Member States into the EU in 2004; for this reason I consider both the EU with and without the New OECD Member States in the empirical analysis. Since this does not make any difference in the results, I will not report separately about the two definitions. Likewise, it does not make any difference in the results whether Greece is considered to be inside or outside the euro area (Greece joined the euro area in 2001). Many of the data are available from the OECD's website or from OECD publications, as will be specified in detail below. The database can be divided in three categories, namely (i) well-being measures, (ii) variables that are almost certainly independent of Europe, (iii) variables that could be influenced by Europe, though they not need to. The data refer to the mid 2000s or the closest available period.

**Well-being measures.** The baseline measure of well-being is average Life Satisfaction as reported in the fourth wave of the World Values Survey and cover individuals over the period 1999-2001 (with the only exception of Australia, where data are available only up to 1995). The Life Satisfaction scores are computed as the percentage of population answering in the top three categories to the question "How satisfied are you with your life these days?". As in Bjornskov, Dreher and Fischer (2007a), the aggregate measures for each country are sub-divided into men and women, into low, middle and high income and into leftwing and rightwing voters. The

latter distinction might be relevant in the light of common perception that leftwing voters may be more pro-European. Considering aggregate measures, a concern that might arise is that no account is taken of heterogeneity across individuals within a certain country. Arguably, it matters for a policy-maker if there are many unsatisfied and very satisfied people, i.e. inequality in life satisfaction within a country. To take this into account, I use the inequality-adjusted happiness data contained in the World Database of Happiness set up by Ruut Veenhoven.<sup>9</sup> This database also contains a measure of “happy life years”, that combines life expectancy and life satisfaction measures, and I also include this variable as a well-being measure.

In addition to subjective measures of wellbeing, I also consider more objective measures of mental and physical health, including (i) the number of suicides per 100,000 inhabitants, (ii) life expectancy at birth, (iii) fertility, (iv) obesity, (v) infant mortality, (vi) the age-standardized mortality rate for cardiovascular diseases (per 100, 000 inhabitants), (vii) age-adjusted average blood pressure (for men and women). All data are derived from OECD publications (specifically the *2007 OECD Factbook* and the *OECD Health Data 2007*) except for the mortality rate for cardiovascular diseases and average blood pressure, that are drawn from the World Health Organization website. Moreover, I also collect data for the United Nations’ Human Development Index (HDI), available in the UN website, which combines life expectancy, literacy, education, and standard of living (measured by real income per capita) for countries worldwide.<sup>10</sup> Finally, I also include the Economist’s measure of Quality of Life, itself a derivation of the Life Satisfaction scores in the World Values Survey, but based on objective indicators (whose weights are obtained from a cross country regression of average Life Satisfaction). **Table 1** includes all Life Satisfaction and happiness scores, while **Table 2** reports the objective well-being measures.

With a total of 12 different measures of well-being, it is useful to consider some summary measure as well as to evaluate how the variables are related among them. **Table 3** reports the correlation between our baseline measure of well-being, namely the Life Satisfaction score, and other 10 measures (the sample is pairwise matched for

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<sup>9</sup> See [http://worlddatabaseofhappiness.eur.nl/statnat/statnat\\_fp.htm](http://worlddatabaseofhappiness.eur.nl/statnat/statnat_fp.htm).

<sup>10</sup> OECD countries are mostly at the top of HDI rankings; since 1994, the top country is either Canada or Norway.



the indicators where not all countries are available).<sup>11</sup> Not surprisingly, the Economist Quality of Life index is highly correlated with Life Satisfaction, given that it is derived from the latter. Life expectancy, fertility, the HDI and the Veenhoven measures are expectedly positively correlated with Life Satisfaction, while suicides, infant mortality and mortality from cardiovascular diseases are negatively correlated with it, again as expected. Rather unexpectedly in the light of the results of Blanchflower and Oswald (2007), blood pressure in men is uncorrelated with Life Satisfaction, while the correlation has the right sign for women, but is rather weak. Closer inspection of the data reveals that this result is generalised and not due to a few outliers; it probably reflects the fact that the average measure of blood pressure is a poor measure of the medical condition of hypertension that is presumably correlated with health and well-being.

It is also interesting to combine all the subjective and objective measures of well-being in two common factors. Among the objective measures, a preliminary analysis shows that fertility is not very correlated with the common factor and is therefore dropped from the list of indicators (also in the light of its tenuous link with Life Satisfaction as identified in the literature; see Blanchflower and Oswald, 2004), and the same goes for blood pressure data for the reasons just explained. With the restricted list of six objective indicators (the Economist index, life expectancy, infant mortality, mortality from cardiovascular diseases, suicides, and HDI), one common factor explains about two thirds of the cross country variability, and the factor loadings are as expected (positive for the Economist index, life expectancy and HDI; negative for infant mortality, mortality from cardiovascular diseases, and suicides). I therefore label this common factor as ‘objective well-being’, or OWB. As regards the three subjective measures, the common factor explains as much as 96 per cent of the country variability. I therefore dub it as ‘subjective well-being’ or SWB. It is important to note that OWB and SWB are highly correlated, with the correlation coefficient as high as 0.70; and the correlation does not depend decisively on the presence of the Economist quality of life measure among the objective indicators, nor is largely due to an outlier, Turkey. **Figure 1** reports the scatter plot of the two measures, OWB and SWB. The positive correlation between the two measures is an

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<sup>11</sup> Note that after a preliminary analysis I excluded obesity after noting that (i) it has a very low correlation with other indicators; (ii) it has a very large outlier (the United States). On the economics of obesity in the US see Chou, Grossman and Saffer (2003) and Oswald and Powdthavee (2007).

important validation for both, in particular for the subjective measures; it increases the likelihood that these common factor really capture the latent variable “well-being”.

**Possible explanatory variables that are independent of the EU or the euro.**

Among these variables, I include population, population density, latitude and average temperature of the capital city (see Rehdanz and Maddison, 2005), the old age dependency ratio (see Blanchflower and Oswald, 2004; Easterlin, 2006), whether a country is Post Communist (see Blanchflower and Freeman, 1997) and if it is English-speaking. Data are drawn from the *2007 OECD Factbook* and, for latitude and average temperature, respectively from the *CIA World Factbook* and from the World Meteorological Organization Service. Arguably, none of these variables are significantly, if at all, affected by a country’s participation in the European Union or the euro. The data for this variable are reported in **Table 4**.

**Possible explanatory variables that could depend on the EU or the euro.**

Finally, I collect a number of variables which, broadly speaking, measure economic and social performance and policies. These variables could, though they certainly not need to, be affected by a country’s participation in the euro area or the EU. They include: real income per capita, the growth rate of real GDP between the mid-1990s and the mid-2000s, and income inequality (the Gini index of inequality as estimated by World Bank, 2005; see also Brandolini and Smeeding, 2007); labour market data (the employment rate in working age population, hours worked, and the unemployment rate) together with the OECD’s Employment Protection Legislation score; the World Bank Doing Business indicator; three measures of the quality of social capital and institutions (one, well known, is the measure of trust in the World Values Survey, based on the answer to the question “In general, do you think that most people can be trusted?”; the second is the prison population per 100,000 inhabitants; the third is the percentage share of citizens who vote in political elections);<sup>12</sup> a measure of the quality of the environment (Co2 emissions per capita); education (measured by the tertiary attainment for the 25-64 age bracket);<sup>13</sup> fiscal policy variables (social expenditure as a share of GDP and government consumption as a share of GDP); a measure of government effectiveness drawn from the World Bank governance indicators (see Kaufmann et al, 2007); and, finally, two measures of openness: trade openness (share

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<sup>12</sup> On the role of social capital for Life Satisfaction and happiness see Helliwell (2006).

<sup>13</sup> The existing evidence on the impact of education on Life Satisfaction and happiness is inconclusive; see Dolan et al. (2007).

of exports and imports over GDP) and the ranking of countries in the Globalization Index compiled by A.T. Kearney/FOREIGN POLICY, which tracks and assesses changes in four key components of global integration, incorporating measures such as trade and investment flows, movement of people across borders, volumes of international telephone traffic, Internet usage, and participation in international organizations (the data used refer to 2006). Apart from trust, the Globalization Index and the World Bank Doing Business and governance indicators, all data are drawn from OECD sources and refer to the mid-2000s or closest available.

Of particular interest are the variables that have been shown in Bjornskov, Dreher and Fischer (2007a) to be consistently important in explaining cross country differences in life satisfaction: trust, openness to trade, the Doing Business index<sup>14</sup> (a proxy for the quality of the business environment), and the share of government consumption on GDP (Bjornskov, Dreher and Fischer, 2007b). Note that I do not include the inflation rate among the explanatory variables, because there is really too little cross country variation among most OECD countries in the mid 2000s, although inflation is certainly a possible driver of well-being in the light of the results of Di Tella, MacCulloch, and Oswald (2001). Likewise, I do not include democracy and political freedom among the explanatory variables, again in the belief that there is too little variation among OECD countries (apart from a couple of possible outliers such as Turkey and Mexico).<sup>15</sup> Overall, **Table 5** reports (panels A and B) the data for this group of variables.

## 4. Results

### 4.1 Subjective measures of well-being (SWB)

I start describing the results for the SWB measure and its three components (Life Satisfaction, inequality-adjusted happiness and happy life years). I first run the unconditional regression by including the variables in the first group, i.e. those that are presumed to be unconnected to the EU or the euro. Out of these variables, only two are clearly statistically significant and enter into the equation with a negative sign: the dummy variable identifying post Communist countries and average temperature (see **Table 6**). The significance of the first variable, which has a large

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<sup>14</sup> Bjornskov, Dreher and Fischer use the investment price level to capture this concept.

<sup>15</sup> On the link between freedom and happiness see, e.g., Frey and Stutzer (2002), especially Figure 5 on page 423.

impact also in absolute terms, is not surprising in the light of the results of Bjornskov, Dreher and Fischer (2007a). The impact of the second variable is more puzzling, and is unlikely to indicate a preference for colder weather as such. Rehdanz and Maddison (2005) have found that temperature extremes, for both hot and cold weather, reduce self-reported levels of happiness. One reason for finding a negative impact of temperature could be that it is positive correlated with temperature extremes. More likely, however, the impact of average temperature reflects a correlation between average temperature and the quality of institutions. This is confirmed by regressing average temperature on trust and income, which shows statistically significant negative signs. The puzzle is not entirely solved, however, since including both trust and income in the equation does not entirely trump average temperature; there is evidently something more to it. It should also be noted that the effect of temperature is not due to one or few outliers; **Figure 2** reports the scatter plot of SWB and average temperature; the negative relationship appears to be a robust feature of the data. Population, population density, average latitude (though negatively correlated with average temperature) and old age dependency do not enter significantly in the equation and are therefore dropped.

The equation reported in Table 6 appears to be well specified; the R squared is 0.61, which implies that more than half of the cross country variability is explained by just two variables. I also run a RESET test to detect possible non-linearities in the equation, but the null of linearity cannot be rejected.

I repeat the estimation based on the specification in Table 6 on all three subjective measures of well-being as well as for all sub-components of the Life Satisfaction score (men, women, high, middle and low income, and rightwing and leftwing voters) but there is no appreciable difference in the estimated coefficients.

Finally, and most pertinent to the objectives of the present paper, I include the dummies for EU and euro area; these turn out to be insignificant by a large margin. This is, again, a generalised result that is common to all subjective measures of well-being; for example, there is no evidence that leftwing voters benefit from living in a EU or euro area country, nor that rightwing voters suffer from it (assuming that leftwing voters are more associated to the European emphasis on social cohesion). Hence, the first conclusion of this analysis is that whether a country participates in the EU or the euro area does not really matter for subjective well-being; as long as a

country is cold and is not Post Communist, being in Europe or having the euro seems to be quite unimportant.

I then turn to extend the model to include the variables in the second group, those that might conceivably be associated to whether a country is in the European Union or in the euro area. After including one variable at the time and checking whether the Schwarz information criterion is improved, in order to preserve a parsimonious specification, a handful of variables turn out to be potentially interesting, but by far the largest improvement is carried by the inclusion of the employment rate, which has a *positive* and strongly statistically significant sign. In particular, while the unemployment rate is statistically significant with a negative coefficient, when included alone<sup>16</sup>, it becomes insignificant when included together with the employment rate. I therefore move to a baseline specification including the dummy for Post Communist, average temperature and the employment rate; and again add all variables in the second group (obviously with the exception of the employment rate itself) and check the readings of the information criteria. The only statistically significant variable in this second round is trade openness, entering with a *positive* coefficient; however, since it leads to only a marginal improvement in the R squared (from 0.71 to 0.73) and to a worsening of the Schwarz information criterion, I exclude it from the baseline specification, that is reported in **Table 7**; note that also income per capita is insignificant, also when considering plausible non-linear specifications. The model passes the usual diagnostic tests and has a high R squared, indicating that over two thirds of the cross country variability of SWB can be explained by just three variables; a country with high SWB is therefore one with cold weather, not a Post Communist one and with a high employment rate (not surprisingly, the Scandinavian countries typically report high Life Satisfaction scores).

The positive relationship between the employment rate and SWB is noteworthy and is a very robust feature of the data, as indicated in **Figure 3**. It indicates that participation in the labour market significantly raises subjective well-being, over and above the effect of the unemployment rate. The impact is not only statistically, but also economically significant. It is also notable that the employment rate tends to dominate over the unemployment rate, which might reflect the fact that in several countries many unemployed people are hidden from the unemployment statistics.

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<sup>16</sup> This is unsurprising given the consistent finding from data for individuals that unemployment significantly reduces happiness; see, e.g., Oswald (1997).

When including also the Employment Protection Legislation (EPL) indicator, this is insignificant, and the interaction term between EPL and either the employment or the unemployment rate is likewise insignificant. I check whether the specification reported in Table 7 is consistent across all individual measures, and I find this to be the case. The employment rate, in particular, is highly statistically significant in all individual indicators; income and political orientation of the respondents do not appear to matter. Finally, I include the euro and EU dummies and again they are completely insignificant.

The list of variables that are insignificant to explain cross sectional variation in SWB across OECD countries is conspicuously large. Compared with Bjornskov, Dreher and Fischer (2007b), for example, I do not find government consumption to affect SWB at all, a discrepancy that can perhaps be explained by the fact that I consider only advanced countries, while they also cover developing countries. The absence of trust and other variables of institutional quality, such as government effectiveness, is very likely to be explained by the presence of average temperature, that is correlated with them (though it appears to have additional explanatory power). The absence of economic performance indicators, such as log income per capita and economic growth, is also noteworthy even if certainly not surprising given that the sample only includes countries that are already relatively rich. Education and the quality of the environment also do not matter, though the measure chosen for the latter (Co2 emissions) is likely to capture the degree of pollution only in a very imperfect way. Working hours also do not enter significantly in the equation, which is not surprising given existing results in the literature (Dolan et al., 2007). Income inequality (as measured by the Gini coefficient) also does not matter, both alone (also for low income and leftwing voters) and in combination with other variables, including whether a country is in the EU (based on the idea that Europeans might be more adverse to inequality on account of lower perceived social mobility). This is again not surprising in the light of the existing evidence on the impact of income inequality on well-being, which is mixed (see Dolan et al., 2007). Finally, the absence of social expenditure from the variables that matter for well-being is consistent with the evidence reported in Veenhoven (2000), but *prima facie* contradicts the idea that citizens benefit from more income redistribution (Layard, 2006).

## 4.2 Objective measures of well-being (OWB)

As for SWB, I start with the “unconditional” regression including only variables that are undoubtedly unrelated to participation in the EU or the euro area. The variables that enter in a statistically significant way are the same as those found for SWB: the dummy identifying Post Communist countries and average temperature, although the latter is now only significant at the 10 per cent confidence level, and the fit of the equation is notably worse than for SWB (the adjusted R squared is now .31; results are reported in **Table 8**). **Figure 4** reports the scatter plot of average temperature with OWB. Moreover, there is some sign of mis-specification in the equation as signalled by the RESET test. In any event, the dummy variables identifying participation in the EU or the euro area insignificant by a large margin, also in this case.

I then turn to the “conditional” regressions and, as for SWB, look for variables in the second group, that which could conceivably be affected by the EU and the euro, that can improve the specification, in particular the Schwarz information criterion. I find that, in the case of OWB, this is the case for income per capita; all other variables turn out to be insignificant<sup>17</sup>, as is now also average temperature. However, just including log income does not appear to lead to a sensible specification, as there is evidence for residual non-linearity. In fact, including the square value of log income dramatically improves the fit of the equation. The results, reported in **Table 9**, indicate that the relationship between OWB and log income per capita is strongly concave: it is steep for relatively low income levels and practically flat after a certain threshold. This is made clearer when looking at the scatter plot in **Figure 5**, which shows that the relationship turns practically flat after an income per capita level of about 30,000 US dollars. It is notable that this simple equation with just two variables, real income per capita and the dummy for Post Communist countries, is able to explain the bulk of the variability of OWB across OECD countries, with the R squared above 0.90.<sup>18</sup>

Of course, the significance of real income per capita in the equation for OWB is no surprise since two measures included in this factor, namely the Economist Quality of Life index and the UN HDI explicitly include this variable in the computation. It is therefore rather obvious to find income highly significant in the equation. It should be stressed, however, that income is also very significant for two objective measures of

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<sup>17</sup> Note that the employment rate is also significant for OWB, with a positive coefficient as for SWB, but becomes insignificant once income per capita is included in the equation.

<sup>18</sup> Note that I do not find any evidence of a link between OWB and income distribution nor government consumption.

health, namely life expectancy and mortality from cardiovascular diseases (see **Figures 6 and 7**). It is, indeed, mainly due to these variables that the influence of income on overall OWB has a strongly concave shape; the relationship between income and the Economist Quality of Life measure as well as the HDI is more linear, especially for the former. The only variable in the lot that does not appear to depend on income is the suicide rate, which is generally very difficult to explain on the basis of the variables included in this study.<sup>19</sup>

Finally, once a proper specification has been identified I include the usual dummy variable for the EU and the euro area; and also in this case, the relative coefficients are insignificant by a large margin. I repeat the estimation for all individual OWB measures and find that the dummies for the EU and the euro area are always insignificant.<sup>20</sup> Hence, the overall conclusion of this study is that participation to the EU or the euro area does not matter for subjective or objective well-being, irrespective of the set of controls used in the estimation, and this appears to be a pretty robust result. Hence, EU or euro area countries appear just to be “normal” OECD countries, that could have been selected at random, as far as well-being is concerned.

Note that the result for the euro is in contrast with the study by Wunder et al. (2006), who find a large negative impact of the euro on subjective well-being when using merged data from the British Household Panel Survey and the German Socio-Economic Panel. The methodology of this paper is, however, substantially different from theirs; it is therefore not easy to reconcile the discrepancies in the two studies.

## 5. Discussion

How plausible is the main result of this study, that the EU and the euro do not appear to have a significant impact on subjective or objective measures of well-being? One way to address this question is to find a nexus with the existing literature on the determinants of *individual* happiness and Life Satisfaction. So far, only a handful of variables have been shown to have a consistent impact on individual well-being (Dolan et al., 2007): income, but mostly in relation to some measure of reference income (Clark et al., 2007), marital or partnership status, age, some measure of trust

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<sup>19</sup> I find that the only variable to be significant for the suicide rate is Employment Protection Legislation, with a negative coefficient, but this result is very likely to be spurious.

<sup>20</sup> Note that not only are coefficients statistically insignificant, but they are also small in absolute size (i.e. they would be economically insignificant even if they were statistically significant.)



or social capital, and unemployment (the latter over and above the impact on income; see Frey and Stutzer, 2002). In cross country comparisons, the effect of income may cancel out, since income at the national level may be strongly linked to reference income (i.e. individuals in richer countries feel relatively poorer, for a given level of income); this effect may be particularly strong if we restrict ourselves to developed countries, as in the present study. I do not consider marital status in this paper, and find no impact of the age structure of the population (measured through the old age dependency ratio) on subjective well-being. Trust is statistically significant and has the correct sign, but is empirically dominated by average temperature, that is strongly negatively correlated with it across OECD countries. This leaves the effect of the final variable, unemployment. Here the results of the cross-country analysis in this paper are completely consistent with those on individual well-being: being employed is typically found to have a strong positive effect on well-being, to the point that Frey and Stutzer (2002) conclude that (page 427), “If low income is due to unemployment, the research suggests that providing people with higher incomes can only compensate for the pecuniary effect. In order to improve well-being, policy should rather be directed toward providing appropriate employment”. It is also notable that recent research has largely dispelled the concern that the positive impact of employment could be due to a reverse causation (selection effect); see, e.g., Lucas et al. (2004).

Therefore, the main policy recommendation arising from this paper is that policy-makers in our hypothetical OECD country should foster employment if they want to raise their citizens’ subjective well-being. Increasing per capita income has some positive effect on objective well-being, in particular on measures of physical health, but the marginal effect appears to vanish after a certain point. Government consumption, the welfare state, and government effectiveness (to the extent that it does not contribute to social capital and trust) are found to matter little.

It is interesting to note that EU legislation and policies have comparatively little impact on the key drivers of individual well-being identified in the literature. Arguably, they do not play a crucial role in marital relationships and social capital, and they also matter relatively little for employment policies, the competence for which is largely left to national policy-makers. In this respect, it is worth noting that the emphasis of the EU Lisbon Agenda on creating jobs and fostering employment appears to go in the right direction as far as the maximisation of well-being is

concerned, but the implementation is largely a responsibility of the Member States. Similar considerations are valid for the European common currency, the euro.

Some caveats have to be kept in mind in interpreting the results of this paper. The first is the risk of “data snooping”, since I regress measures of well-being on a relatively large number of variables, and it could be that I find statistical significance only by mere chance. One consideration however appears to downplay the seriousness of this concern, and this is the plausibility and reasonableness of the results, that are broadly in keeping with previous literature as just noted. The second caveat is the absence of *inflation* from the list of explanatory variables. As noted, the exclusion is motivated by the absence of interesting cross country variation in the mid 2000s, but previous studies have demonstrated that people do care about inflation, and this is a competence for which the European level of government is fully responsible. Finally, the limited number of observations may certainly be of some concern, although the estimated equations explain the bulk of the cross country variation by means of very few variables.

## **6. Conclusions**

This paper has aimed to take a scientific look at the question of whether Europe (including the EU and the euro) is good or bad for citizens’ well-being. Taking the OECD non-EU countries as a control group and conditioning to a number of controls, the paper has shown that participation in the EU or in the euro area does not appear to materially affect well-being. I also find that a small number of explanatory variables explain a large portion of the cross country variation in subjective and objective measures of well-being. For the subjective measures, the relevant variables are whether a country is Post Communist, the average temperature and the employment rate. For the objective measures, income plays a dominant role but in non-linear manner.

The main result of this paper is certainly not surprising: in the current institutional setting, the European level of government is quite removed from the variables that really matter for individual well-being, with the notable exception of inflation. The responsibility resides with the national policy-makers. On the one hand, this may be sobering for believers in the European Dream (which includes the author of this paper). On the other hand, these results should also deter national decision-makers

and opinion leaders from taking the EU or the euro as the “scapegoat” for home-grown political, economic and social problems.

## References

Alesina, A., R. DiTella and R. MacCulloch (2004): "Inequality and happiness: are Europeans and Americans different?", *Journal of Public Economics*, 88, pp. 2009-2042.

Artis, M. (2003): "Reflections on the optimal currency area (OCA) criterion in the light of EMU", *International Journal of Finance and Economics*, pp. 297-307.

Blanchflower, D. and A. Oswald (2004): "Well-being over time in Britain and the USA", *Journal of Public Economics*, 88, pp. 1359-1387.

Blanchflower, D. G. and A. J. Oswald (2007): "Hypertension and happiness across nations", *Journal of Health Economics*, forthcoming.

Blanchflower, D. and R. Freeman (1997): "The attitudinal legacy of Communist labor relations",

Bjornskov, C., Dreher, A. and J. A. V. Fischer (2007a): „Cross country determinants of life satisfaction: exploring different determinants across groups in society“, *Social Choice and Welfare*, 30, 1, pp. 119-173.

Bjornskov, C., Dreher, A. and J. A. V. Fischer (2007b): „The bigger the better? Evidence of the effect of government size on life satisfaction around the world“, *Public Choice*, 130, pp. 267-292.

Brandolini, A. and T. M. Smeeding (2007): "Inequality: international evidence", forthcoming, *New Palgrave Dictionary of Economics*.

Chou, S.-Y., Grossman, M. and H. Saffer (2003): "An economic analysis of adult obesity: results from the Behavioural Risk Factor Surveillance System", *Journal of Health Economics*, 23, 2, pp. 565-587.

CIA (2005): *The CIA World Factbook 2004*, Washington DC.

Clark, A. E. and A. Oswald (1996): "Satisfaction and comparison income", *Journal of Public Economics*, 61, pp. 359-381.

Clark, A. E., Frijters, P. and M. A. Shields (2007): "Relative income, happiness and utility: an explanation for the Easterlin paradox and other puzzles", IZA Discussion Paper No. 2840.

Di Tella, R., R. J. MacCulloch and A. J. Oswald (2001): "Preferences over inflation and unemployment: evidence from surveys of happiness", *American Economic Review*, 91, pp. 335-341.

Di Tella, R., R. J. MacCulloch and A. J. Oswald (2003) The macroeconomics of happiness, *Review of Economics and Statistics*, 85, pp. 809-825.

Dolan, P., Peasgood, T. and M. White (2007): “Do we really know what makes us happy? A review of the economic literature on the factors associated with well-being”, *Journal of Economic Psychology*, forthcoming.

Easterlin, R. A. (2005): “Feeding the illusion of growth and happiness: A reply to Hagerty and Veenhoven”, *Social Indicators Research*, 74, pp. 429-443.

Easterlin, R. A. (2006): “Life cycle happiness and its sources. Intersections of psychology, economics and demography”, *Journal of Economic Psychology*, 27, pp. 463-482.

Feldstein, M. (1997): “The political economy of the European Economic and Monetary Union: political sources of an economic liability”, *Journal of Economic Perspectives*, 11, 4, pp. 23-42.

Ferrer-i-Carbonell, A. and P. Frijters (2004): “How important is methodology for the estimates of the determinants of happiness?”, *The Economic Journal*, 114, pp. 641-659.

Frankel, J. and A. Rose (1997): “Is EMU more justifiable ex post than ex ante?”, *European Economic Review*, 41, pp. 753-760.

Frey, B. S. and A. Stutzer (2002): “What can economists learn from happiness research?”, *Journal of Economic Literature* 40, pp. 402-435.

Giannone, D. and L. Reichlin (2006): “Trends and cycles in the euro area: how much heterogeneity and should we worry about it?”, *ECB Working Paper n. 595*.

Giavazzi, F. and F. Torres eds. (1993): *Adjustment and growth in the European Monetary Union*, Cambridge: Cambridge University Press.

Helliwell, J. F. (2006): “Well-being, social capital and public policy: What’s new?”, *Economic Journal*, 116, pp. 34-45.

Kahneman, D., Diener, E. and N. Schwarz (1999): *Well-being: The foundations of hedonic psychology*, New York: Russel Sage.

Kaufmann, D., Kraay, A. and M. Mastruzzi (2007). "Governance Matters VI: Governance Indicators for 1996-2006". World Bank Policy Research, June 2007.

Lane, P. (2006): “The real effects of EMU”, *CEPR Discussion Paper n. 5536*.

Layard, R. (2006): “Happiness and public policy: a challenge to the profession”, *The Economic Journal*, 116, pp. 24-33.

Lucas, R. E., Clark, A. E., Georgellis, Y. and E. Diener (2004): “Unemployment alters the set point for life satisfaction”, *Psychological Science*, 16, pp. 945-950.

OECD (2007): *OECD Health data 2007 – Statistics and indicators for 30 countries*, Cd-ROM, Paris.

OECD (2007): *OECD Factbook 2007*, Paris.

Oswald, A. J. (1997): "Happiness and economic performance", *The Economic Journal*, 107, pp. 1815-1831.

Oswald, A. and D. G. Blanchflower (2007): "Is well-being U-shaped over the life cycle?", IZA Discussion Paper No. 3075.

Oswald, A. J. and N. Powdthavee (2007): "Obesity, unhappiness, and the challenge of affluence: theory and evidence", *Economic Journal*, forthcoming.

Ovaska, T. and R. Takashima (2006): "Economic policy and the level of self-perceived well-being: an international comparison", *Journal of Socio-Economics*, 35, pp. 308-325.

Rablen, M. S. and A. Oswald (2007): "Mortality and immortality", University of Warwick working paper.

Rehdanz, K. and Maddison, D. (2005): "Climate and Happiness", *Ecological Economics*, 52, pp. 111-125.

Rifkin, J. (2004): *The European Dream: How Europe's Vision of the Future is Quietly Eclipsing the American Dream*, New York: J. P. Tarcher.

Sala-i-Martin, X., Doppelhofer, G. and R. I. Miller (2004): "Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach", *American Economic Review*, 94, 4, pp. 813-835.

Veenhoven, R. (2000): "Well-being in the welfare state: level not higher, distribution not more equitable", *Journal of Comparative Policy Analysis: Research and Practice*, 2, pp. 91-125.

World Bank (2005): *World development report 2005. Equity and development*, New York and Oxford: Oxford University Press.

Wunder, C., Schwarze, J., Krug, G. and B. Herzog (2006): „Welfare effects of the euro cash changeover“, IZA Discussion Paper No. 2508.

**Table 1. Subjective well-being scores**

	<i>Life Sat.</i>	<i>Life Sat., low income</i>	<i>Life Sat., high income</i>	<i>Life Sat., men</i>	<i>Life Sat., women</i>	<i>Life Sat., leftwing voters</i>	<i>Life Sat., rightwing voters</i>	<i>Inequality- adjusted happiness</i>	<i>Happy life years</i>
Australia	60.8	55.6	68.0	57.7	63.5	59.7	64.6	71.0	60.7
Austria	69.1	60.1	75.3	70.0	67.6	68.5	67.1	72.0	61.0
Belgium	62.5	50.1	71.3	60.9	63.0	60.3	67.3	66.0	56.5
Canada	66.6	57.5	72.9	65.3	67.8	64.5	68.9	68.0	59.8
Czech Republic	47.4	38.3	56.5	47.6	46.9	41.0	53.8	57.0	47.9
Denmark	76.7	65.8	87.6	76.2	76.1	71.1	83.3	76.0	62.7
Finland	72.7	62.7	80.0	69.3	75.4	69.2	77.4	71.0	59.8
France	44.3	34.5	52.1	45.2	42.9	42.5	48.1	58.0	51.4
Germany	61.6	51.3	66.1	60.3	61.8	60.8	64.3	65.0	55.7
Greece	41.6	37.4	48.9	42.7	40.4	38.2	45.4	55.0	49.6
Hungary	26.3	16.3	40.1	25.3	26.9	25.3	29.8	48.0	40.0
Iceland	74.4	61.7	83.1	73.1	75.5	71.8	77.4	72.0	62.2
Ireland	69.7	61.6	73.4	70.2	68.6	70.7	71.7	69.0	58.3
Italy	49.2	44.8	57.0	50.7	47.1	48.6	50.2	62.0	54.2
Japan	36.5	31.5	42.4	31.6	38.4	30.5	41.4	55.0	50.4
Korea	31.2	23.0	40.2	30.1	30.9	29.4	32.0	53.0	43.8
Luxembourg	65.8	60.4	71.0	67.2	63.5	66.1	65.4	69.0	59.0
Mexico	71.7	65.0	71.9	71.6	68.6	69.5	72.8	67.0	55.3
Netherlands	69.5	60.1	78.9	69.1	69.7	69.8	70.4	70.0	58.7
New Zealand	63.6	56.2	68.0	63.5	61.3	56.6	69.2	64.0	55.8
Norway	63.9	NA	NA	64.7	62.5	58.8	69.7	69.0	59.3
Poland	38.8	29.1	50.4	37.7	39.1	37.2	38.7	50.0	43.1
Portugal	41.0	NA	NA	42.0	39.8	37.1	47.0	53.0	45.7
Slovak Republic	30.1	21.7	37.0	28.0	31.4	26.2	41.2	46.0	40.0
Spain	42.8	33.1	50.1	42.7	41.9	40.6	46.5	62.0	54.1
Sweden	63.0	55.1	71.8	64.2	61.4	59.4	68.2	70.0	60.8
Switzerland	75.1	64.6	84.4	75.1	74.5	71.2	80.8	75.0	63.9

Turkey	28.5	25.1	34.8	23.5	33.6	24.3	32.9	42.0	35.8
United Kingdom	57.1	50.0	62.5	57.8	55.2	57.0	61.2	64.0	55.2
United States	46.9	51.0	72.1	60.3	60.4	52.5	67.8	67.0	57.0

Source: World Values Survey for Life Satisfaction (1999-2001; 1995 for Australia), World Database of Happiness for inequality-adjusted happiness and happy life years. See text for further explanations.



**Table 2. Objective indicators of well-being.**

	<i>Suicides, 2005 (a)</i>	<i>Life expectancy, 2004</i>	<i>Fertility, 2000- 2005 (b)</i>	<i>Obesity, 1999- 2004 (c)</i>	<i>Infant mortality, 2002 (d)</i>	<i>Mortality from cardiovascular diseases, 2001 (a) (e)</i>	<i>Blood pressure, men, 2001 (e)</i>	<i>Blood pressure, women, 2001 (e)</i>	<i>UN Human Development Index, 2004</i>	<i>Economist Quality of Life index, 2005</i>
Australia	11.1	83	1.75	21.7	5	140	118.2	124.7	0.957	7.925
Austria	14.5	82.1	1.39	9.1	4.1	204	127.9	121.6	0.944	7.268
Belgium	18.4	81.7	1.66	12.7	4.4	162	127.2	118.9	0.945	7.095
Canada	10.6	82.4	1.51	14.3	5.4	141	125.9	118.4	0.95	7.599
Czech Republic	13	79	1.17	14.8	4.1	315	129.1	122.2	0.885	6.629
Denmark	11.3	79.9	1.75	9.5	4.4	182	121.6	114.1	0.943	7.796
Finland	18.4	82.3	1.72	12.8	3	201	130.3	123.2	0.947	7.618
France	15.1	83.8	1.87	9.5	4.1	118	127.2	122.5	0.942	7.084
Germany	10.3	81.4	1.32	12.9	4.2	211	134.4	130	0.932	7.048
Greece	2.9	81.4	1.25	21.9	5.1	258	129.8	123.2	0.921	7.163
Hungary	22.6	76.9	1.3	18.8	7.2	364	133.7	126.1	0.869	6.534
Iceland	8.7	82.7	1.97	12.4	2.3	164	124.9	117.9	0.96	7.911
Ireland	11.1	80.7	1.94	13	5	214	128.7	122.5	0.956	8.333
Italy	5.6	82.5	1.28	9	4.3	174	127.4	120.3	0.94	7.81
Japan	20.3	85.6	1.33	3.2	3	106	126	117.6	0.949	7.392
Korea	18.7	80.8	1.23	3.2	5.3	186	126.1	120.8	0.912	6.877
Luxembourg	12.5	81	1.73	18.4	5.1	177	125.1	120	0.945	8.015
Mexico	3.8	77.6	2.4	24.2	21.4	163	124.7	121.3	0.821	6.766
Netherlands	7.9	81.4	1.72	10.7	5	171	129.8	120.8	0.947	7.433
New Zealand	12	81.3	1.96	20.9	5.6	175	132.5	121.6	0.936	7.436
Norway	10.5	82.3	1.79	8.3	3.5	181	128.7	122.5	0.965	8.051

Poland	13.6	79.2	1.26	12.5	7.5	324	128.6	123.3	0.862	6.309
Portugal	NA	80.5	1.47	12.8	5	208	126.1	123.6	0.904	7.307
Slovak Republic	8.7	77.8	1.2	15.4	7.6	371	130.3	125.7	0.856	6.381
Spain	11.9	83.8	1.27	13.1	4.1	137	122.5	117	0.938	7.727
Sweden	6.7	82.7	1.64	9.7	3.3	176	130.8	125	0.951	7.937
Switzerland	11.4	83.7	1.41	7.7	5	142	125.4	114	0.947	8.068
Turkey	16.3	73.6	2.46	12	26.7	542	117.6	118.8	0.757	6.286
United Kingdom	6.3	80.7	1.66	23	5.2	182	130.9	125.3	0.94	6.917
United States	10.2	80.1	2.04	32.2	7	188	123.3	118.6	0.948	7.615

Source: OECD Factbook 2007, Economist, United Nations, World Health Organisation. See text for further explanations.

- (a) Per 100,000 inhabitants.
- (b) Number of children per woman.
- (c) Percentage of obese in the population.
- (d) Per 1,000 live births.
- (e) Age adjusted.

**Table 3: Quality of life indicators in OECD countries, correlations**

Indicator	Correlation
Economist Quality of Life index	0.65
Life expectancy	0.37
Suicide rate	-0.35
Fertility	0.35
Infant mortality	-0.24
Mortality from cardiovascular diseases	-0.55
Average blood pressure, men	0.00
Average blood pressure, women	-0.24
Human Development Index	0.53
Inequality-adjusted happiness	0.94
Happy life years	0.91

Note: Data for OECD countries. Some indicators are not available for a couple of countries; correlations shown are based on the pairwise matched samples.

**Table 4. Potential explanatory variables which are unrelated to the EU or the euro.**

	<i>Population, thousands, 2005</i>	<i>Density, per square km, 2005</i>	<i>Old age dependency ratio (for 65+), 2005</i>	<i>Average temperature in the capital city</i>	<i>Average latitude</i>
Australia	20340	3	13.1	13	14.3
Austria	8233	98	16.3	10.6	47.3
Belgium	10438	342	17.2	10.3	50.83
Canada	32299	3	13.1	6	60
Czech Republic	10221	130	14.1	8.1	49.75
Denmark	5416	126	15.1	8	56
Finland	5246	16	15.9	4.8	64
France	60873	111	16.4	10.8	46
Germany	82466	231	18.9	9.3	51
Greece	11099	84	18.3	17.4	39
Hungary	10087	108	15.7	10.7	47
Iceland	296	3	11.7	4.4	65
Ireland	4131	59	11.2	9.6	53
Italy	58135	193	19.6	15.5	42.83
Japan	127768	338	20	16.1	36
Korea	48138	483	9.1	12.5	37
Luxembourg	455	175	14.3	8.5	49.75
Mexico	105300	53	5.3	16.8	23
Netherlands	16320	400	14.2	9.7	52.5
New Zealand	4099	15	12.1	13.5	41
Norway	4623	14	14.7	6	62
Poland	38161	122	13.2	8.2	52
Portugal	10563	114	17.1	16.8	39.5
Slovak Republic	5387	110	11.7	10.1	48.66
Spain	43398	86	16.8	14	40
Sweden	9030	20	17.3	6.8	62
Switzerland	7438	180	15.9	8.8	47
Turkey	72064	92	5.9	14.4	39
United Kingdom	59989	245	16	11	54
United States	296410	32	12.4	14.5	38

Source: OECD Factbook 2007, CIA World Factbook 2005 and World Meteorological Organization.

**Table 5. Potential explanatory variables which might be related to the EU or the euro.**

(A)

	<i>Income per capita, 2005</i>	<i>Real GDP growth, 1996-2006</i>	<i>Unemployment, 2005</i>	<i>Employment, in % of the labour force, 2004</i>	<i>Work hours, 2005</i>	<i>Employment Protection Legislation, 2003</i>	<i>Trade openness, 2005</i>	<i>Globalization ranking, 2006</i>	<i>World Bank Doing Business, 2006</i>	<i>Prison population, 2004 (a)</i>	<i>Gini index of income inequality, 2000</i>
Australia	34240	3.4	5.1	69.5	1730	1.2	44.55	8	6	120	30.5
Austria	34393	2.2	5.2	66.5	1656	1.9	106.57	9	32	96.5	25.2
Belgium	32998	2.3	8.4	60.5	1534	2.2	172.77	NA	18	88	NA
Canada	34058	3.5	6.8	72.6	1737	0.8	70.1	6	4	107	30.1
Czech Republic	20606	2.8	8	64.2	2002	1.9	148.46	16	41	169	26
Denmark	34137	2.1	5	76	1551	1.4	100.94	5	8	70	22.5
Finland	30959	3.8	8.4	67.2	1714	2	83.85	13	13	66	26.1
France	30266	2.3	10	62.8	1546	3	55.14	23	44	91	27.3
Germany	30777	1.5	11.2	65.5	1437	2.2	84.69	18	19	96	27.7
Greece	29578	4.1	9.6	59.6	2053	2.8	45.62	32	80	82	34.5
Hungary	17483	4.4	7.3	56.8	1994	1.5	155.1	20	52	163	29.3
Iceland	36183	4.3	2.6	82.8	1794	NA	83.09	NA	12	39	NA
Ireland	38850	7.2	4.3	65.5	1638	1.1	147.84	4	11	85	30.4
Italy	28094	1.4	7.8	57.4	1801	1.9	56.5	27	70	97	34.7
Japan	30842	1.1	4.4	68.7	1775	1.8	30.95	28	10	58	31.4
Korea	22098	4.2	3.7	63.6	2354	2	85.35	29	27	121	NA
Luxembourg	70245	5.1	3.1	61.6	NA	NA	302.53	NA	NA	121	26.1
Mexico	10627	3.6	3.5	60.8	1909	3.1	65.14	42	73	177.5	48
Netherlands	35120	2.5	5.2	73.1	1367	2.1	139.04	7	24	123	25.1
New Zealand	25950	2.8	3.7	73.5	1809	1.5	59.94	11	1	168	33.7

Norway	47207	2.7	4.6	75.6	1360	2.6	75	14	5	65	26.1
Poland	13894	4.2	17.7	51.9	1994	1.7	81.53	33	54	210	36.7
Portugal	19889	2.2	7.7	67.8	1685	3.5	70.03	24	42	129	35.6
Slovak Republic	15983	4.1	16.2	57	1739	1.9	176.04	26	37	165	NA
Spain	27400	3.8	9.2	62	1769	3.1	58.2	25	30	138	32.9
Sweden	32111	3.1	7.8	73.5	1587	2.2	94.49	10	14	81	24.3
Switzerland	35650	1.8	4.3	77.4	1659	1.1	97.36	2	17	81	26.7
Turkey	7711	4	10.3	46.1	1672	3.7	64.09	NA	93	100	43.9
United Kingdom	32860	2.8	4.6	72.7	1804	0.7	60.44	12	9	138.7	32.6
United States	41789	3.2	5.1	71.2	1868	0.2	28.15	3	3	725	35.7

**(B)**

	<i>Percentage of population voting, 2005</i>	<i>Co2 emissions per capita, 2004</i>	<i>Education (tertiary attainment), 2004</i>	<i>social expenditure, % of GDP, 2003</i>	<i>Government consumption, % of GDP, 2006</i>	<i>Trust, 1999-2001</i>	<i>World Bank government effectiveness, 2006</i>
Australia	79.08634	18.4	30.8	17.9	18.2	43.84709	1.939487
Austria	75.67502	9.4	18.3	26.1	18.1	32.83444	1.623077
Belgium	88.53937	10.7	29.8	26.5	22.6	31.36002	1.644216
Canada	55.2897	17	44.6	17.3	19.3	46.9496	2.030468
Czech Republic	61.67425	11.5	12.3	21.1	22.3	27.52425	1.014627
Denmark	81.41166	8.8	32.4	27.6	25.5	60.07715	2.287138
Finland	71.49063	10.6	34	22.5	21.4	56.40086	2.084285
France	71.11587	6.2	23.9	28.7	23.6	23.27841	1.198941
Germany	71.74029	9.9	24.9	27.6	18.5	36.06664	1.524581
Greece	89	8.6	20.6	21.3	14	23.73225	0.615972

Hungary	58.29932	5.7	16.7	22.7	22.5	25.58391	0.710179
Iceland	91.5645	7.5	27.8	18.7	24.8	41.52027	2.129578
Ireland	62.10944	10.6	28.3	15.9	15.9	41.24344	1.525406
Italy	84.9	7.8	11.4	24.2	20.3	31.41035	0.380509
Japan	62.15257	9.5	37.4	17.7	18.1	42.89055	1.293429
Korea	87.34092	9.3	30.5	5.7	13.5	32.45833	1.051331
Luxembourg	56.06845	24.8	22.9	22.2	15.9	25.95103	1.733979
Mexico	60	3.7	16.4	6.8	11.9	25.1375	0.158474
Netherlands	75.75297	11.2	29.3	20.7	25.3	53.93576	1.864459
New Zealand	77.1	8.5	25.3	18	17.5	49.05336	1.94008
Norway	74.97376	8	31.8	25.1	19.3	63.86506	2.103165
Poland	53.03577	7.8	15.7	22.9	18.2	23.71813	0.490816
Portugal	68.86598	6	12.5	23.5	20.5	15.72446	0.951431
Slovak Republic	60.71825	7.1	12.4	17.3	19.2	21.89861	0.910226
Spain	81.07048	7.9	26.4	20.3	17.9	33.58263	1.050979
Sweden	77.12055	5.6	34.5	31.3	26.7	62.30155	2.001997
Switzerland	35.88043	6	28.2	20.5	11.7	42.08564	2.128435
Turkey	72.9044	3	9.1	NA	13.1	10.40705	0.232311
United Kingdom	69.4	8.8	29	20.1	22.2	36.86214	1.832093
United States	55.27283	19.6	39.1	16.2	16	42.06035	1.644768

Source: OECD Factbook 2007, AT Kearney, World Bank, Brandolini and Smeeding (2007).

(a) Per 100,000 inhabitants.

**Table 6: SWB across OECD countries**

Post Communist	-3.26*** (.61)
Average temperature	-.26*** (.06)
Adjusted R squared	0.58
Number of observations	30

Note: White heteroskedasticity-consistent standard errors and covariance. The model also includes a constant term. \*/\*\*/\*\* indicates statistical significance at the 10/5/1 per cent level.

**Table 7: SWB across OECD countries**

Post Communist	-2.22*** (.56)
Average temperature	-.17*** (.06)
Employment rate	0.09** (.04)
Adjusted R squared	0.67
Number of observations	30

Note: White heteroskedasticity-consistent standard errors and covariance. The model also includes a constant term. \*/\*\*/\*\* indicates statistical significance at the 10/5/1 per cent level.

**Table 8: OWB across OECD countries**

Post Communist	-3.20*** (.28)
Average temperature	-.19* (.10)
Adjusted R squared	0.31
Number of observations	29

Note: White heteroskedasticity-consistent standard errors and covariance. The model also includes a constant term. \*/\*\*/\*\* indicates statistical significance at the 10/5/1 per cent level.

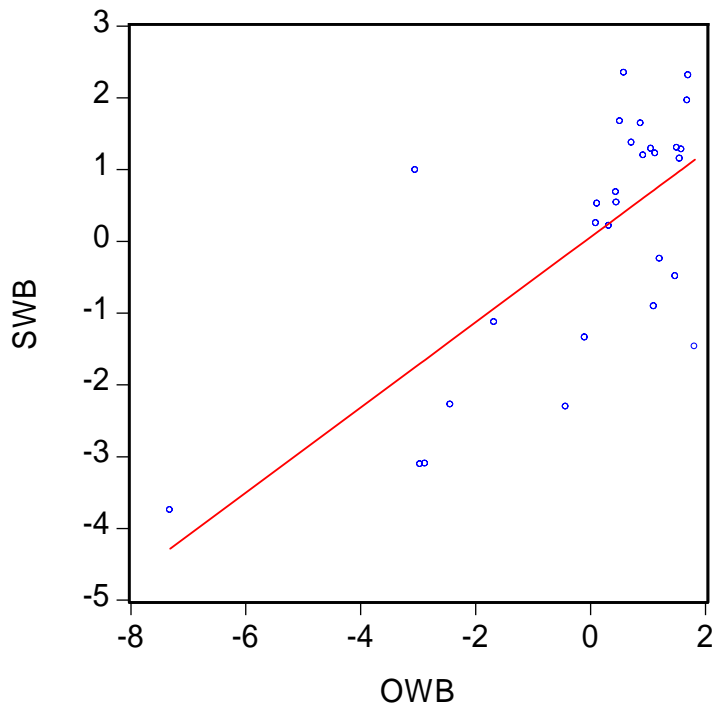
**Table 9: OWB across OECD countries**

Post Communist	-1.26*** (.42)
Log income	54.17*** (7.22)
Log income, squared	-2.53** (.35)
Adjusted R squared	0.90
Number of observations	29

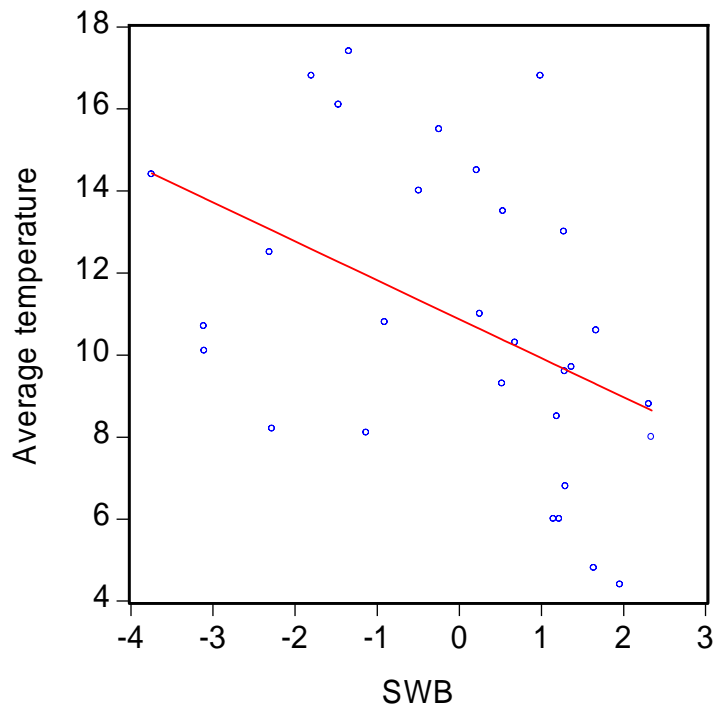
Note: White heteroskedasticity-consistent standard errors and covariance. The model also includes a constant term. \*/\*\*/\*\* indicates statistical significance at the 10/5/1 per cent level.



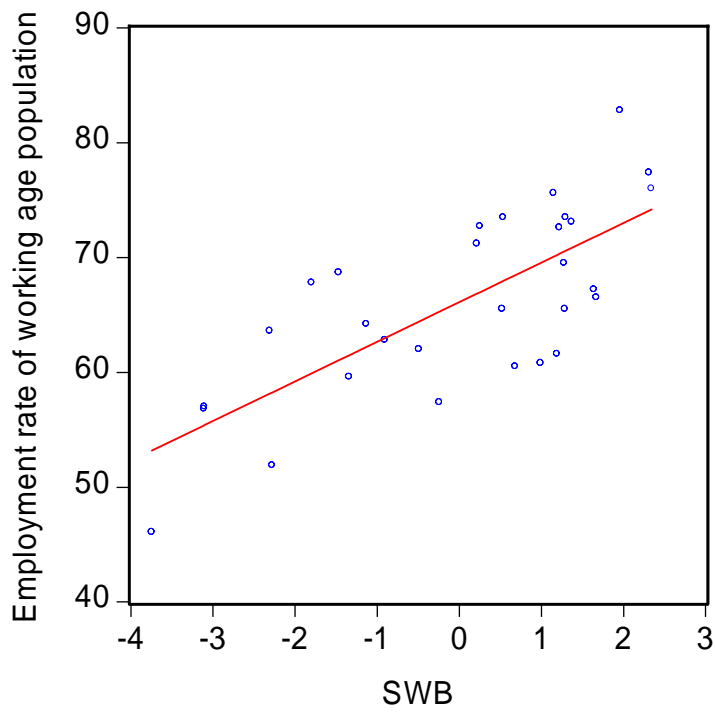
**Figure 1. OWB vs SWB across OECD countries**



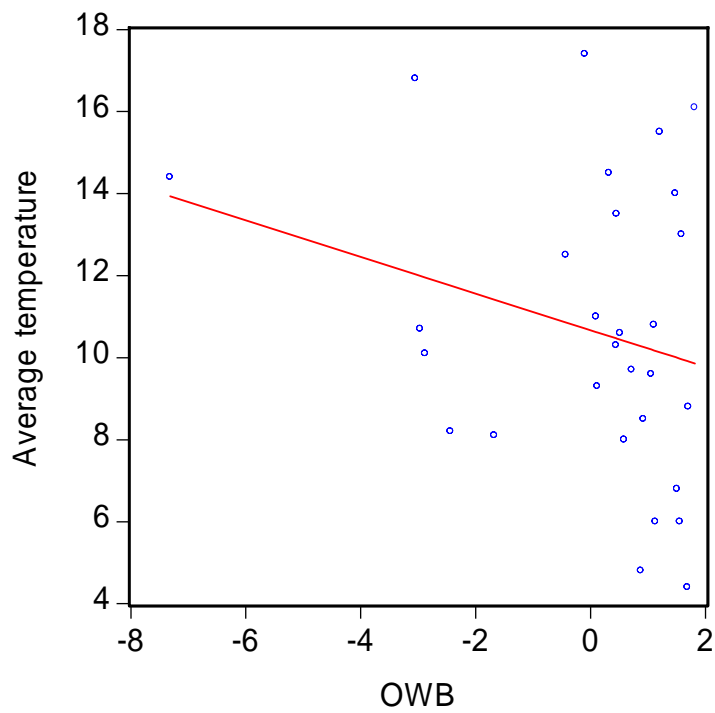
**Figure 2. Average temperature and SWB across OECD countries**



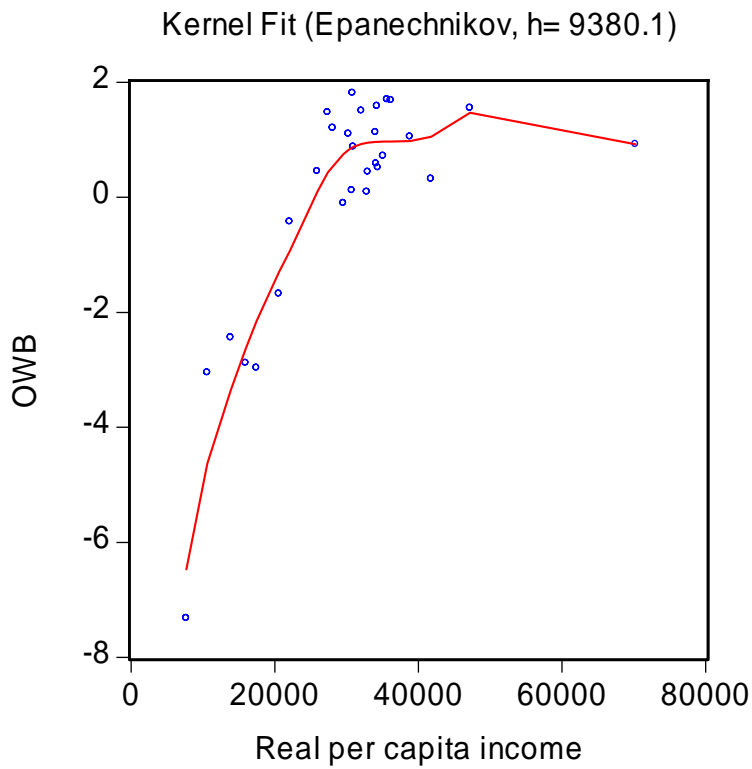
**Figure 3. SWB and the employment rate across OECD countries**



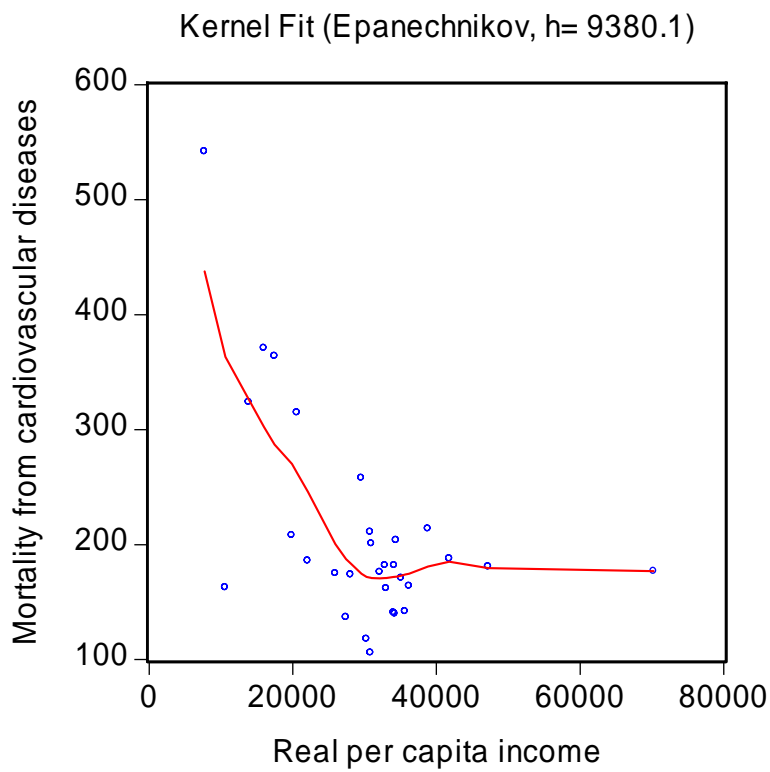
**Figure 4. OWB (Objective Well-Being) and average temperature across OECD countries**



**Figure 5. OWB and real per capita income across OECD countries**



**Figure 6. Per capita income and mortality from cardiovascular diseases across OECD countries**



**Figure 7. Per capita income and life expectancy at birth across OECD countries**

