Income and happiness across Europe: Do reference values matter?

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ABSTRACT

Using data from the European Social Survey (ESS), we examine the link between income and subjective well-being. We find that, for the whole sample of nineteen European countries, although income is positively correlated with both happiness and life satisfaction, reference income exerts a negative effect on individual well-being. Thus our results lend support to both the absolute and relative income hypotheses. Performing separate analyses for some Eastern European countries, we also find some evidence of a 'tunnel effect', in that reference income has a positive impact on subjective well-being. Our findings support the view that in environments with stable income and employment, reference income serves as a basis for social comparisons, whereas in relatively volatile environments, it is used as a source of information for forming expectations about future status.

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1. Introduction

Whether income can buy happiness remains one of the most vexed and fundamental issues in economics and the social sciences in general. Whilst philosophers and psychologists have debated on what happiness is and how to pursue it for thousands of years, in modern economic theory economists have focused on approximate measures of happiness and its relationship with measurable socio-economic and demographic variables. Although neoclassical economic theory portrays utility or wellbeing as synonymous to consumption or absolute income, the notion of relative utility could be traced back to the works of Adam Smith, Karl Marx, Veblen, and Duesenberry, and it is, once again, receiving considerable attention in the recent economic literature.

Some early empirical evidence that real income growth does not necessarily imply higher reported happiness levels is provided in the seminal work of Easterlin (1974). This finding has received further support from numerous subsequent studies (see, for example, Heady, 1991; Diener, et. al., 1993; Frey and Stutzer, 2000; Easterlin, 2001; van Praag and Ferrer-i-Carbonell, 2004). By and large, such studies confirm that despite the growth in real incomes in industrialized countries, happiness levels remained "flat" - this is known as the Easterlin Paradox (Easterlin, 1995). However, a number of recent studies conclude that income can, after all, buy happiness, especially in Eastern European countries (e.g., Frijters et al., 2004).

Such findings, which appear at first sight to contradict each other, are consistent with a number of theories for the determination of utility or

happiness (see also the discussion in Rojas, 2007). The *absolute income hypothesis* states that the level of utility varies positively with the level of income up to a threshold level of income beyond which utility remains largely invariant to any further increase in income. This characteristic of utility reflects the assumption that once a person's basic material needs are satisfied, the person's sense of happiness is predominantly determined by other aspects of life rather than further improvement in material wellbeing. Despite this assumption, the relation between income and wellbeing has been one of the most discussed and debated in the literature on the subjective wellbeing since the early 1970s (for an overview see Frey and Stutzer, 2002; Senic 2004a). Many studies have shown that, treating utility as a monotonic function of wages would be a mis-specification. Wellbeing has been shown to depend on the discrepancy between pay and some norm, though studies differ on precisely how that norm is generated. This finding leads into the realm of relative income theory, which has a distinguished lineage within economics (Veblen, 1899; Duesenberry 1948). The *relative income hypothesis* states that relative, instead of or in addition to absolute income, is what determines utility. Indeed, social norms, social comparisons, and reference values influence individuals' subjective evaluation of their economic situation, weakening the relationship between income and happiness one could observe based only on absolute income. How individuals feel about their wellbeing depends on the distance between their individual income level from a reference value, the latter being taken to be determined by the general living standard enjoyed by people around them or the level of living standard that the individuals have become accustomed to

over time. When the economy grows, individual incomes and the reference values all grow so that the distance between the two remain relatively stable, so does individuals' perception of utility or happiness. However, in circumstances in which an individual's income diverges from the reference value, the person's utility is expected to be adversely affected by the divergence. Moreover, in the case of the reference value being established on the basis of the individual's past living standard, any adjustment in the reference value also reflects the individual's changing aspiration levels and/or adaptability to changing circumstances. If individuals are highly adaptable, again their perception of happiness will remain largely stable no matter how the level of income fluctuates. Schor (1991) reports that in the US the percentage of population that felt "very happy" culminated in 1957 and has decreased since then, despite continuous economics growth.

There is a growing body of empirical evidence to support the relative income hypothesis. As Clark and Oswald (1996) show, using regression analysis and controlling for standard individual and demographic characteristics, utility depends on income relative to some reference or comparison income, based on the predicted income of 'people like you'. Defining the reference group to include those with similar education, similar age and living in the same region, Ferrer-I-Carbonell (2005) finds that income of the reference group is as important as own income for individuals' happiness. McBride (2001) uses all those in the same age group, within 5 years younger or older than the individual concerned, while Easterlin (1995) implicitly assumes that individuals compare themselves with all the other citizens of the same country. In an earlier study, Van de

Stadt et al. (1985) define the reference group according to education level, age and employment status. Rizzo and Zeckhauser (2003) and Mas (2006) are notable examples of recent studies highlighting the importance of reference points as determinants of actual behavior.

An alternative explanation focuses on individuals' comparisons with their own income or economic situation in the past. As Easterlin (2001) argues, individuals adapt to their economic circumstances so that changes in income have only transitory effects on well-being. This is consistent with a large body of research in psychology providing evidence of adaptation, following Brickman and Campbell's (1971) 'hedonic treadmill' hypothesis. Although Van Praag (1971) and Van Praag and Kapteyn (1973) were the first economists to explore this hypothesis, or, as they called it, the "preference drift" phenomenon, the notion of adaptation was not embraced with the same enthusiasm in the economics literature. Nevertheless, there is an increasing consensus that understanding the process of adaptation and changing aspirations is important for our understanding of economic behaviour (see Kahneman and Krueger, 2006.[1] Recent evidence by Stutzer (2004) shows that higher income aspirations, influenced by both individuals' past income and the average income in their community, reduce utility. Interestingly, Easterlin (2005) also finds that aspirations about economic wealth and other pecuniary aspects of one's well-being tend to change with the level of actual circumstances, suggesting almost complete adaptation.[2]

[1] The influence of past values of income and consumption on current levels of consumption or utility has also been incorporated into the recent main-stream economic literature on habit formation in investor and consumer behaviour (e.g., Abel, 1990; Campbell and Cochrane, 1999; Fuhrer, 2000).

[2] In contrast, Easterlin (2005) finds that this is not the case with marriage, number of children and other non-pecuniary aspects of one's life.

Clark et al. (2006) provide a comprehensive and insightful review of the main issues in the debate about the relationship between income and happiness.

The study by Rojas (2007) is particularly notable, as it explains the weak relationship between income and happiness using the conceptual-referent theory of happiness (CRT). According to CRT, individuals have different notions about what a happy life is and, therefore, different evaluations of their subjective well-being. As Rojas argues, this heterogeneity in beliefs about a happy life extends to the relationship between income and happiness. A weak relationship between income and happiness may be explained partially by the fact that income might be less important for individuals with conceptual referents for happiness with an inner orientation, as opposed to an outer orientation.[3]

In this paper, we use data from the first two waves of the European Social Survey (ESS) to examine the link between income and subjective well-being, as measured by self-reported happiness and life satisfaction scores, across 19 European countries. While many studies assume happiness and life satisfaction to be synonymous, there is a considerable body of literature showing that measures of happiness and satisfaction are not strongly correlated (see Cummings, 1998).[4] In general, life satisfaction refers to cognitive states of consciousness, whereas happiness is emotional and mainly concerns intimate matters of life. Indeed recent evidence (e.g.,

[3] As Rojas (2007, p. 12) points out, individuals with an inner orientation tend to *accept things as they are (stoicism), acting properly in their relations with others and with themselves, living a tranquil life, not looking beyond what is attainable.*

[4] It is worth noting that, whilst most studies find that the correlation between happiness and life satisfaction is in the range of 50 to 60 percent (e.g. Diener et al., 1995), other studies report much lower values for some population sub-groups.

Gundelach and Kreiner, 2004) reinforces Michalos's (1991) view that while happiness and satisfaction form part of a subjective well-being construct, it is heuristically useful to measure and analyse them separately.

After controlling for standard personal and demographic characteristics, our emphasis is on assessing whether social comparisons and reference groups exert a significant influence on individuals' subjective well-being. Perhaps not surprisingly, we find that absolute income has a positive effect on both happiness and life satisfaction. Nevertheless, we also find that such a relationship weakens when we include an individual's reference income as an explanatory variable. Using two different operational definitions of reference income, we find that this has a negative impact on subjective well-being for the nineteen European countries as a whole. In other words, Europeans in general feel disadvantaged or a loss of utility when the general living standard of their comparison group has improved. In this respect, our results provide additional support to the idea of relative utility and the importance of reference groups in influencing subjective evaluation of well-being. Interestingly, performing separate analyses for some Eastern European countries, we find some evidence that reference group's income exerts a positive influence on individual happiness and life satisfaction, which lends support to Hirschman's (1973) 'tunnel effect' conjecture. The 'tunnel effect' conjecture refers to the phenomenon that in uncertain and adverse situations people often interpret any positive signals that they can observe around them to predict an improvement in their own situation to occur sooner or later. Hirschman (1973) used the example of several lanes of traffic being stuck in a tunnel to illustrate this point. When

the traffic in one lane starts to move, drivers in the others lanes take this signal as an indication of 'light at the end of the tunnel' – hence the 'tunnel effect'. Therefore, it seems that in the Eastern European countries reference income does not influence individuals' well-being through social comparisons, but rather through their informational content, which individuals use in order to form expectations about their future economic situation.[5] So any increase in the reference income is positively viewed by individuals as an indication of a better life to come for themselves.

The layout of the remainder of the paper is as follows. Section 2 describes the data and the empirical framework. Section 3 presents the empirical findings and discusses their policy implications. Section 4 offers some concluding remarks.

2. Data and empirical framework

Our empirical analysis is based on data for nineteen European countries from the first two waves (2003 and 2004) of the European Social Survey (ESS). The European Commission, the European Science Foundation and scientific funding bodies in each of the participating countries fund the ESS jointly. Data on the following 19 countries are analyzed: Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Ireland, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

[5] Senic (2004) is the first study to test formally the 'tunnel effect' hypothesis using large-scale data.

The ESS data contains information on happiness and life satisfaction, the dependent variables in our analysis, which allows us to test whether social comparisons and reference groups exert an important influence on individuals' subjective well-being. The question on life satisfaction is formulated as follows: "*All things considered, how satisfied are you with your life as a whole nowadays? Please answer using this card, where 0 means extremely dissatisfied and 10 means extremely satisfied.*" Similarly, the question on happiness is: "*Taking all things together, how happy would you say you are?*" with responses on a scale *0* to *10* with *0* Extremely Unhappy and *10* Extremely Happy. We use these two variables as dependent variables in our regressions.

Due to the ordinal nature of the happiness and life satisfaction variables, we estimate ordered probit models, assuming that a latent and continuous measure of the dependent variable, a proxy for utility, is given by:

$$S_i^* = \beta' z_i + e_i ,$$

(1)

where z_i is a vector of explanatory variables describing individual characteristics and the characteristics of the firm or occupation that the individual is associated with, β is a vector of parameters to be estimated and e_i is a random error term, normally distributed.

The observed and coded discrete dependent variable S_i is determined from the model as follows:

$$S_i = \begin{cases} 0 & if \ -\infty \le S_i^* \le \mu_1 \\ 1 & if \ \ \mu_1 < S_i^* \le \mu_2 \\ 2 & if \ \ \mu_2 < S_i^* \le \mu_3 \\ & \vdots \\ 10 & if \ \ \mu_{10} < S_i^* \le \infty \end{cases}$$

(1a)

where μ_i represents thresholds to be estimated (along with the parameter vector β). Positive signs for the estimated parameters β indicate higher levels of life satisfaction as the value of the associated variable increases.[6]

The ESS data also provides information on a rich set of standard demographic and labour market characteristics that we use as controls in our life satisfaction and happiness regressions. Such controls include personal characteristics, education, labour force status, establishment size, income and health. Information on past unemployment experience is also used to evaluate whether individuals' perceptions about their current economic situation is influenced by past income shocks, usually associated with unemployment. To measure reference income, our main variable of interest, we use two main proxies. First, following McBride (2001), we define the reference group to include all individuals who are in the age range of 5 years younger and 5 years older than the individual concerned (*Proxy 1*). Second, we define the reference group to contain all individuals with a similar education level, inside the same age bracket, and living in the same country, as suggested by Ferrer-i-Carbonnell (2005). Education is divided into five different categories according to the highest educational attainment: up to

[6] For a discussion of the ordered probit model see McKelvey and Zavoina (1975)

primary school, lower secondary, upper secondary, post secondary but not tertiary and tertiary and beyond. The age brackets are: younger than 25, 25–34, 35–44, 45–65, and 66 or older. We refer to this measure of reference income as *Proxy 2*.[7] The definitions and sample means of all variables used in our analysis are in Appendix 1. We limit our sample to full-time salaried employees, which yields 30,285 observations fairly equally split between 2002 and 2004. Appendix 2 shows the number of observations by country and by year.

Figure 1 shows the distribution of happiness and life satisfaction for the 19 European countries under consideration. Clearly there is a strong but not perfect correlation between happiness and life satisfaction. Both measures indicate a high level of happiness or satisfaction among the respondents from the 19 participating EU countries, with the mode well-being score of 8. The distribution of happiness is also clearly skewed towards the high end. Moreover, there is little variation in the expression of happiness over the two reporting periods.

However, once we examine the level of happiness across countries, then some variations start to emerge, as shown in Figure 2. Using either measure, Denmark achieved the highest score at over 8, whilst Greece, Hungary, Poland and Portugal recorded the lowest scores during the reporting periods. In general, Western European countries score higher than Eastern European ones. Such differences are apparent also in Appendix 3, reporting the mean scores of life satisfaction and happiness. Although the

[7] These measures of reference income are based on a "cell means" approach. An alternative approach is to use a regression approach as introduced by Clark and Oswald (1996). For a summary of the various methods to calculate reference income in the literature, see Clark et al. (2006).

comparability of responses across individuals in different countries might call for caution in interpreting these stylised facts, mounting evidence supports the use and reliability of subjective well-being variables in economic research (see Clark et al., 2006). As Clark (2005) asserts, a small body of research in economics and psychology finds evidence of causation between the cross-sectional distribution of subjective scores and subsequent labour market outcomes.

3. Empirical findings

A potential econometric complication that is common for cross-sectional regression analysis is the problem of multi-collinearity among the explanatory variables. In this case, however, it is not a cause for concern, as the matrix of sample correlation coefficients in Appendix 4 shows. Table 1 reports the results for life satisfaction regressions. Column (1) reports the regression results with reference income being excluded as an explanatory variable. As the estimated coefficients in column 1 show, the results are generally consistent with those of previous studies and hardly surprising. As the estimated coefficients reveal, men tend to report lower satisfaction than women, while life satisfaction exhibits a U-shaped relationship with age. This is a pattern, well documented in the literature, reflecting life-cycle aspects of individuals' social, family and economic circumstances (e.g. Alesina et al., 2004; Blanchflower and Oswald, 2004; Blanchflower and Oswald, 2006).[8] Being married has a positive effect on life satisfaction,

[8] For a review of the factors that affect subjective well-being over the life cycle see Easterlin (2006).

while the opposite is true for divorce, separation and widowhood. The results also reveal a negative effect of the presence of children on life satisfaction. As expected, good health has a significant positive effect. There is some weak evidence that higher education qualifications tend to exert a negative impact on life satisfaction, with the estimated coefficient of 'Post tertiary' education being negative and statistically significant. This result is similar to the findings in earlier studies such as Campbell et al. (1976) and Fernandez and Kulik (1981). A possible explanation could be that education raises aspirations not easily fulfilled. There is no clear pattern in the link between life satisfaction and firm size.

Past unemployment has a positive effect on life satisfaction, with such an effect being stronger for more recently experienced unemployment (in the last twelve months) as opposed to unemployment in the more distant past (in the last five years). It is possible that the well-being of the currently employed exceeds their reference or aspiration value, which may have been reduced by the recently experienced unemployment shock.[9] As countries with generous social welfare systems dominate our sample, the positive effect of unemployment on happiness may reflect also the influence of social welfare systems on individual well-being during the period of unemployment. For example, in countries with poor social protection, unemployment is expected to have a stronger negative impact on individual wellbeing, a conjecture supported by running separate regressions for sub-

[9] Clark *et al* (2001) find that unemployment experience in the past three years reduces life satisfaction of the currently employed (i.e. unemployment 'scars' psychologically). However, they also find some evidence of habituation - people may get used to unemployment. According to Lucas et al. (2004), adaptation to unemployment is slow and incomplete.

groups of countries with different levels of social protection. The effect of recent unemployment (in the past 12 months) on well-being is strongly positive and statistically significant for the Scandinavian countries, and weakly positive but statistically insignificant for the Western European countries. In contrast, such an effect is very weakly positive and statistically insignificant for the Southern European countries, and strongly negative and statistically significant for the Eastern European countries. Differences regarding the negative well-being effect of unemployment across European countries can be attributed also to differences in the extent to which unemployment across these countries has become a social norm.[10]

There is clear evidence to suggest that higher absolute income is associated with higher life satisfaction. It is noted that as we move from the lowest income group to the highest income group, the estimated coefficients increase almost monotonically and are all statistically significant. Larger coefficients in the ordered probit regressions mean that higher levels of wellbeing are more likely to be observed. Looking at Table 1, for example, for the lowest income group, the estimated probability for individuals to report an overall life satisfaction of 10 is F(-0.481) = 32%. As a comparison, for individuals in the highest income group this probability is F(0.221) = 59%. Therefore, it appears that, across Europe, "income buys happiness" and our empirical results do lend clear support to the absolute income

[10] This is a point that Clark (2005) makes convincingly with evidence that supports the view that the negative well-being effect of unemployment is less severe, when unemployment has become more socially acceptable. Our findings of a significantly negative effect of unemployment on happiness for Eastern European countries are very similar to the findings in Hayo and Seifert (2003).

hypothesis.[11] In columns (2) and (3), we re-examine this conjecture by controlling for relative income, and to assess the extent to which social comparison effects may weaken the link between income and happiness. As shown in column (2), reference income (*Proxy 1*) has a negative and significant effect, suggesting that comparison effects in life satisfaction are present. The same result emerges using an alternative proxy for relative income (*Proxy 2)* in column (3). Therefore, our results are also consistent with the relative income hypothesis.

In Table 2, we repeat the analysis using self-reported happiness scores as the dependent variable instead of life satisfaction. Results are generally similar to those for life satisfaction in Table 1, with only slight differences in the size of the estimated coefficients. It is worth noting, for example, that income coefficients in the happiness regression tend to be 'smaller' than those in the life satisfaction regressions. This is consistent with the view that happiness is "a broader" concept than life satisfaction, with perhaps the impact of economic factors on happiness being mitigated by the influence of factors affecting individuals' well-being in the life domain. In this respect, the larger coefficient of being married (a positive life event/state) in the happiness regression compared to that in the life satisfaction regression is not surprising. In the same spirit, the negative coefficient for the presence of children is smaller than that in Table 1. Interestingly, social comparison effects are stronger in the case of happiness than in the case of life satisfaction regressions. As reported in columns (2)

[11] Focusing on Eastern European countries, Hayo and Seifert (2003) find a strong link between life satisfaction and subjective economic well-being.

and (3), the estimated coefficients of reference income are significantly higher than those in Table 1.

When repeating the analysis, by limiting our sample to the Eastern European countries (see Table 3) any evidence of social comparison effects seems to disappear. This effect is more prominent in Table 4, where we re-estimate the happiness regression for the Eastern European countries. In this case, there is some evidence not only that social comparison effects disappear, but also that reference income exerts a positive and significant effect on happiness, suggesting the presence of a "tunnel effect" (see Senic, 2004). The rapid growth of income that certain segments of the population experienced during the period of economic transition increased the expectations of the remainder of the population for higher incomes in the future. In a sense, pockets of high income and prosperity in the economy offer an optimistic outlook for those who are yet to catch up. As Hayo and Seifert (2003) highlight, during the early 1990s, there was a general climate of optimism among Eastern Europeans that their economic situation would improve, or at least not deteriorate, in the next five years. During these early years of reform, catching-up with the well-being levels of industrialised countries would dominate any relative income effects. Therefore, one should expect that such "tunnel effects" might be short-lived as those at the lower end of the income distribution realise that the gap between their economic position and that of the high earners widens without any prospects of ever catching up with them. If this conjecture is valid, then in the economies of transition in Eastern Europe we should expect 'tunnel effects' to be more prominent during the early years of economic reform and starting

to weaken as time passes by in a non-monotonic fashion. Given that our sample is based on data almost ten years after the ex-communist Eastern European countries embarked on a programme of economic reforms towards free market economies, evidence of 'tunnel effects' might not be as strong as 'tunnel effects' in the earlier years of economic transition.

4. Conclusions

In recent years, support for the notion that reference values are important in affecting individuals' behaviour has become widespread both in the psychology and the economics literature. Economists, in particular, tend to agree that decision makers evaluate the options available to them not on the basis of absolute values of wealth or welfare but on relative values instead, implying that utility is relative in nature. Van de Stadt *et. al.* (1985) provide some early evidence consistent with the relative utility hypothesis, while, more recently, Clark and Oswald (1996) show that utility depends on income relative to some reference or comparison income. In the same vein, Ferrer-i-Carbonell (2005) provides evidence that reference income is as important as personal income for individuals' happiness.

In this paper, we have re-examined the link between income and subjective well-being for a number of European countries, paying particular attention to whether relative income is indeed an important determinant of subjective well-being. Our results tend to support both the absolute and relative income hypotheses. Focusing on the latter, there is clear evidence that the income of a reference group exerts a negative effect on well-being,

even after controlling for absolute income and other personal and demographic characteristics. More intriguing, perhaps, is the fact that such social comparison effects tend to disappear when we limit our analysis to the Eastern European countries. In the case of Eastern Europe, reference income has a positive effect on happiness, consistently with the presence of a 'tunnel effect'. To the extent that the 'pursuit of happiness' enters the political agenda, our results highlight the existence of a clear wedge between Western and Easter European countries that can have important implications for the design of welfare reforms and income redistribution policies. If, as our results seem to imply, an increasing income gap between the rich and poor reduces well-being due to social comparisons, alleviating income inequality moves higher up in the policy agenda. In contrast, if higher inequality raises the expectations of the poor that they are to enjoy higher incomes in the future (i.e. 'tunnel effect'), then increased income inequality during rapid growth at the early stages of reforms becomes socially and politically more acceptable.

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Table 1: Life satisfaction regressions (Ordered probit)

	(1)		*(2)*		*(3)*	
	Coeff.	***|t-ratio|***	**Coeff.**	***|t-ratio|***	**Coeff.**	***|t-ratio|***
Male	-0.123	*10.16*	-0.124	*10.18*	-0.123	*10.17*
Age	-0.042	*13.08*	-0.028	*3.62*	-0.034	*8.07*
Age^2	0.050	*14.86*	0.033	*3.76*	0.041	*9.09*
Married	0.212	*11.37*	0.213	*11.43*	0.212	*11.39*
Separated	-0.288	*5.95*	-0.287	*5.91*	-0.287	*5.93*
Divorced	-0.067	*2.61*	-0.065	*2.53*	-0.066	*2.54*
Widowed	-0.066	*1.98*	-0.066	*1.98*	-0.067	*2.01*
Children	-0.027	*1.87*	-0.026	*1.80*	-0.027	*1.87*
Good Health	0.358	*46.19*	0.358	*46.16*	0.358	*46.18*
EDUCATION						
Low Secondary	-0.005	*0.20*	-0.004	*0.18*	0.051	*1.63*
High Secondary	-0.028	*1.22*	-0.029	*1.24*	0.077	*1.71*
Post Secondary	-0.011	*0.35*	-0.011	*0.35*	0.132	*2.17*
Tertiary	-0.022	*0.86*	-0.023	*0.89*	0.163	*2.24*
Post Tertiary	-0.058	*1.78*	-0.059	*1.80*	0.128	*1.69*
UNEMPLOYMENT						
In the last 12 months	0.023	*3.40*	0.023	*3.40*	0.023	*3.38*
In the last 5 years	0.009	*1.38*	0.009	*1.37*	0.010	*1.41*
FIRM SIZE						
25-99	0.023	*1.52*	0.023	*1.52*	0.023	*1.52*
100-499	-0.002	*0.11*	-0.002	*0.14*	-0.002	*0.14*
500++	0.004	*0.20*	0.003	*0.17*	0.003	*0.16*
INCOME[weekly]						
< 40 Euros	-0.481	*7.68*	-0.483	*7.70*	-0.481	*7.68*
Euros 40-70	-0.328	*8.20*	-0.328	*8.20*	-0.328	*8.21*
Euros70-120	-0.226	*6.96*	-0.226	*6.95*	-0.226	*6.95*
Euros 120-230	-0.150	*5.74*	-0.151	*5.75*	-0.150	*5.73*
Euros 230-350	-0.063	*2.61*	-0.062	*2.59*	-0.062	*2.60*
Euros 460-580	0.042	*1.76*	0.043	*1.80*	0.043	*1.80*
Euros 580-690	0.118	*4.80*	0.119	*4.84*	0.119	*4.84*
Euros 690-1150	0.153	*6.69*	0.154	*6.76*	0.155	*6.78*
Euros 1150-1730	0.209	*7.18*	0.212	*7.27*	0.213	*7.30*
Euros 1730-2310	0.187	*4.19*	0.190	*4.23*	0.191	*4.27*
> 2310 Euros	0.221	*3.77*	0.223	*3.81*	0.225	*3.85*
REFERENCE INCOME						
Proxy 1			-0.077	*1.96*		
Proxy 2					-0.067	*2.72*
Year dummy 2004	-0.018	*1.47*	-0.015	*1.18*	-0.018	*1.42*
Country Dummies	*Yes*		*Yes*		*Yes*	
Log-likelihood	*-56788.39*		*-56786.88*		*-56786.08*	
Number of observations	*30285*		*30285*		*30285*	

Notes:

Table 2: Happiness regressions (Ordered probit)

	(1)		*(2)*		*(3)*	
	Coeff.	***|t-ratio|***	**Coeff.**	***|t-ratio|***	**Coeff.**	***|t-ratio|***
Male	-0.122	*10.06*	-0.123	*10.08*	-0.122	*10.06*
Age	-0.040	*12.48*	-0.022	*2.79*	-0.028	*6.65*
Age^2	0.043	*12.85*	0.021	*2.40*	0.030	*6.61*
Married	0.322	*17.25*	0.324	*17.33*	0.323	*17.28*
Separated	-0.249	*5.11*	-0.246	*5.07*	-0.247	*5.08*
Divorced	-0.055	*2.11*	-0.052	*2.01*	-0.052	*2.01*
Widowed	-0.185	*5.56*	-0.185	*5.56*	-0.186	*5.62*
Children	-0.017	*1.18*	-0.016	*1.08*	-0.017	*1.18*
Good Health	0.348	*44.73*	0.347	*44.70*	0.348	*44.72*
EDUCATION						
Low Secondary	0.024	*1.00*	0.025	*1.03*	0.111	*3.50*
High Secondary	-0.037	*1.61*	-0.038	*1.63*	0.125	*2.77*
Post Secondary	-0.070	*2.29*	-0.070	*2.28*	0.151	*2.47*
Tertiary	-0.053	*2.06*	-0.054	*2.10*	0.234	*3.20*
Post Tertiary	-0.092	*2.81*	-0.093	*2.83*	0.196	*2.58*
UNEMPLOYMENT						
In the last 12 months	0.018	*2.69*	0.018	*2.69*	0.018	*2.66*
In the last 5 years	0.006	*0.84*	0.006	*0.84*	0.006	*0.89*
FIRM SIZE						
25-99	0.014	*0.92*	0.014	*0.92*	0.014	*0.91*
100-499	-0.005	*0.29*	-0.005	*0.32*	-0.005	*0.32*
500++	0.002	*0.13*	0.002	*0.09*	0.001	*0.07*
INCOME[weekly]						
< 40 Euros	-0.310	*4.95*	-0.312	*4.98*	-0.310	*4.95*
Euros 40-70	-0.269	*6.71*	-0.269	*6.71*	-0.270	*6.73*
Euros70-120	-0.189	*5.79*	-0.188	*5.78*	-0.188	*5.79*
Euros 120-230	-0.116	*4.41*	-0.116	*4.43*	-0.116	*4.40*
Euros 230-350	-0.050	*2.08*	-0.050	*2.06*	-0.050	*2.07*
Euros 460-580	0.039	*1.62*	0.041	*1.68*	0.041	*1.69*
Euros 580-690	0.093	*3.79*	0.094	*3.84*	0.095	*3.84*
Euros 690-1150	0.086	*3.77*	0.089	*3.87*	0.090	*3.92*
Euros 1150-1730	0.165	*5.68*	0.169	*5.79*	0.171	*5.87*
Euros 1730-2310	0.102	*2.27*	0.105	*2.33*	0.108	*2.40*
> 2310 Euros	0.114	*1.95*	0.118	*2.01*	0.122	*2 .08*
REFERENCE INCOME						
Proxy 1			-0.103	*2.61*		
Proxy 2					-0.103	*4.20*
Year dummy 2004	-0.013	*1.05*	-0.008	*0.67*	-0.012	*0.98*
Country Dummies	*Yes*		*Yes*		*Yes*	
Log-likelihood	*-53516.82*		*-53513.88*		*-53509.81*	
Number of observations	*30285*		*30285*		*30285*	

Notes:

Table 3: Life satisfaction regressions: Eastern Europe (Ordered probit)

	(1)		*(2)*		*(3)*	
	Coeff.	***|t-ratio|***	**Coeff.**	***|t-ratio|***	**Coeff.**	***|t-ratio|***
INCOME[weekly]						
< 40 Euros	-0.705	*7.18*	-0.708	*7.21*	-0.704	*7.17*
Euros 40-70	-0.458	*6.26*	-0.459	*6.27*	-0.458	*6.26*
Euros70-120	-0.279	*4.23*	-0.279	*4.22*	-0.279	*4.23*
Euros 120-230	-0.172	*2.76*	-0.172	*2.76*	-0.172	*2.76*
Euros 230-350	-0.037	*0.55*	-0.036	*0.54*	-0.037	*0.55*
Euros 460-580	-0.023	*0.25*	-0.023	*0.25*	-0.023	*0.25*
Euros 580-690	0.064	*0.52*	0.066	*0.53*	0.064	*0.51*
Euros 690-1150	-0.009	*0.07*	-0.011	*0.09*	-0.009	*0.07*
Euros 1150-1730	-0.384	*1.64*	-0.393	*1.68*	-0.384	*1.64*
Euros 1730-2310	0.421	*1.23*	0.429	*1.25*	0.421	*1.23*
> 2310 Euros	-0.342	*0.58*	-0.332	*0.56*	-0.342	*0.58*
REFERENCE INCOME						
Proxy 1			0.096	*0.99*		
Proxy 2					0.008	*0.87*
Log-likelihood	*-10214.02*		*-10213.53*		*-10214.02*	
Number of observations	*4913*		*4913*		*4913*	

Notes: Other regressors as in Table 1.

Table 4: Happiness regressions: Eastern Europe (Ordered probit)

	(1)		*(2)*		*(3)*	
	Coeff.	***|t-ratio|***	**Coeff.**	***|t-ratio|***	**Coeff.**	***|t-ratio|***
INCOME[weekly]						
< 40 Euros	-0.349	*3.57*	-0.349	*3.57*	-0.353	*3.61*
Euros 40-70	-0.235	*3.21*	-0.235	*3.21*	-0.236	*3.22*
Euros70-120	-0.155	*2.34*	-0.155	*2.34*	-0.155	*2.34*
Euros 120-230	-0.090	*1.44*	-0.090	*1.44*	-0.089	*1.42*
Euros 230-350	0.002	*0.03*	0.002	*0.03*	0.002	*0.03*
Euros 460-580	0.157	*1.69*	0.157	*1.69*	0.158	*1.71*
Euros 580-690	0.088	*0.71*	0.088	*0.71*	0.092	*0.74*
Euros 690-1150	0.080	*0.61*	0.080	*0.62*	0.079	*0.61*
Euros 1150-1730	-0.144	*0.61*	-0.144	*0.61*	-0.146	*0.62*
Euros 1730-2310	0.411	*1.20*	0.410	*1.19*	0.412	*1.20*
> 2310 Euros	-0.248	*0.42*	-0.248	*0.42*	-0.235	*0.40*
REFERENCE INCOME						
Proxy 1			0.065	*1.65*		
Proxy 2					0.073	*1.63*
Log-likelihood	*-9623.48*		*-9622.48*		*-9622.84*	
Number of observations	*4913*		*4913*		*4913*	

Notes: Other regressors as in Table 1.

APPENDIX 1: Variables definitions and sample means

	Definition	Mean	
		2002	2004
Male	Dummy Variable: 1=Male; 0 otherwise.	0.499	0.493
Age	Age in years.	45.853	48.238
Married	Dummy Variable: 1=Married; 0 otherwise.	0.616	0.611
Separated	Dummy Variable: 1=Separated; 0 otherwise	0.016	0.016
Divorced	Dummy Variable: 1=Divorced; 0 otherwise.	0.087	0.090
Widowed	Dummy Variable: 1=Widowed; 0 otherwise.	0.051	0.051
Never Married	Dummy Variable: 1=Never Married; 0 otherwise.	0.227	0.229
Children	Dummy Variable: 1=Children in household; 0 otherwise.	0.466	0.457
Good Health	Subjective General Health, Ordinal Variable: 1=Very Bad, 2=Bad, 3=Fair, 4=Good, 5=Very Good	3.874	3.888
EDUCATION			
Primary	Dummy Variable: 1=Primary; 0 otherwise.	0.116	0.132
Low Secondary	Dummy Variable: 1=Low Secondary; 0 otherwise.	0.204	0.177
High Secondary	Dummy Variable: 1=High Secondary; 0 otherwise.	0.377	0.392
Post Secondary	Dummy Variable: 1=Post Secondary; 0 otherwise.	0.086	0.062
Tertiary	Dummy Variable: 1=Tertiary; 0 otherwise.	0.160	0.193
Post Tertiary	Dummy Variable: 1=Post Tertiary; 0 otherwise.	0.061	0.056
UNEMPLOYMENT			
In the last 12 months	Number of periods of unemployment within last 12 months.	4.615	4.606
In the last 5 years	Number of periods of unemployment within last 5 years.	4.734	4.615
FIRM SIZE			
Less than 25	Dummy Variable: 1= Less than 25 employees; 0 otherwise	0.198	0.210
25-99	Dummy Variable: 1= Between 25-99 employees; 0 otherwise.	0.245	0.253
100-499	Dummy Variable: 1= Between 100-499 employees; 0 otherwise.	0.198	0.188
500++	Dummy Variable: 1= More than 500 employees; 0 otherwise.	0.158	0.136
INCOME [weekly] (Household's Total Net Income, All Sources)			
< 40 Euros	Dummy Variable: 1=Less than 40 Euros; 0 otherwise.	0.015	0.005
Euros 40-70	Dummy Variable: 1=Between 40-70 Euros; 0 otherwise.	0.040	0.026
Euros70-120	Dummy Variable: 1=Between 70-120 Euros; 0 otherwise.	0.064	0.054
Euros 120-230	Dummy Variable: 1=Between 120-230 Euros; 0 otherwise.	0.107	0.106
Euros 230-350	Dummy Variable: 1=Between 230-350 Euros; 0 otherwise.	0.125	0.113
Euros 350-460	Dummy Variable: 1=Between 350-460 Euros; 0 otherwise.	0.125	0.124
Euros 460-580	Dummy Variable: 1=Between 460-580 Euros; 0 otherwise.	0.121	0.113
Euros 580-690	Dummy Variable: 1=Between 580-690 Euros; 0 otherwise.	0.111	0.122
Euros 690-1150	Dummy Variable: 1=Between 690-1150 Euros; 0 otherwise.	0.184	0.208
Euros 1150-1730	Dummy Variable: 1=Between 1150-1730 Euros; 0 otherwise.	0.072	0.086
Euros 1730-2310	Dummy Variable: 1=Between 1730-2310 Euros; 0 otherwise.	0.020	0.024
> 2310 Euros	Dummy Variable: 1=More than 2310 Euros; 0 otherwise.	0.010	0.013
REFERENCE INCOME			
Proxy 1	All individuals who are in the age range of 5 years younger and 5 years older than the individual concerned, (by year by country)	6.347	6.368
Proxy 2	All individuals with a similar education level, inside the same age bracket, and living in the same country (by year)	6.428	6.464

Appendix 2. ESS 2002-2004: Number of Employees in European Countries

COUNTRIES	2002	2004	Total
Austria	865	714	1579
Belgium	821	841	1662
Switzerland	1061	1084	2145
Czech Republic	424	970	1394
Germany	1529	1305	2834
Denmark	881	783	1664
Spain	341	414	755
Finland	1047	1082	2129
Britain	634	519	1153
Hellas	535	383	918
Hungary	437	359	796
EIRE	748	616	1364
Luxemburg	546	608	1154
Netherlands	1335	968	2303
Norway	1333	1067	2400
Poland	818	636	1454
Portugal	515	537	1052
Sweden	1144	1116	2260
Slovenia	685	584	1269
Total	**16577**	**13708**	**30285**

APPENDIX **3. Average Life Satisfaction and Happiness**

	LIFE SATISFACTION			HAPPINESS		
COUNTRIES	**2002**	**2004**		**2002**	**2004**	
Austria	7.570	7.323	***	7.608	7.437	*
Belgium	7.471	7.374	***	7.782	7.704	**
Switzerland	7.956	7.977		7.986	8.036	
Czech Republic	6.296	6.318	**	6.710	6.782	*
Germany	6.780	6.699	**	7.144	7.091	*
Denmark	8.482	8.504		8.359	8.344	
Spain	6.904	7.165	**	7.268	7.332	*
Finland	7.891	7.980	*	8.035	8.059	*
Britain	7.012	7.001	*	7.517	7.483	
Hellas	6.219	6.346	*	6.390	6.702	***
Hungary	5.519	5.539	*	6.244	6.319	***
Ireland	7.459	7.687	**	7.893	7.936	***
Luxembourg	7.751	7.666	*	7.878	7.698	**
Netherlands	7.616	7.434	*	7.791	7.649	*
Norway	7.783	7.665	*	7.897	7.900	
Poland	5.754	6.122	***	6.383	6.658	**
Portugal	5.653	5.408	**	6.773	6.439	**
Sweden	7.786	7.860	**	7.873	7.854	*
Slovenia	6.494	6.911	**	6.900	7.215	**

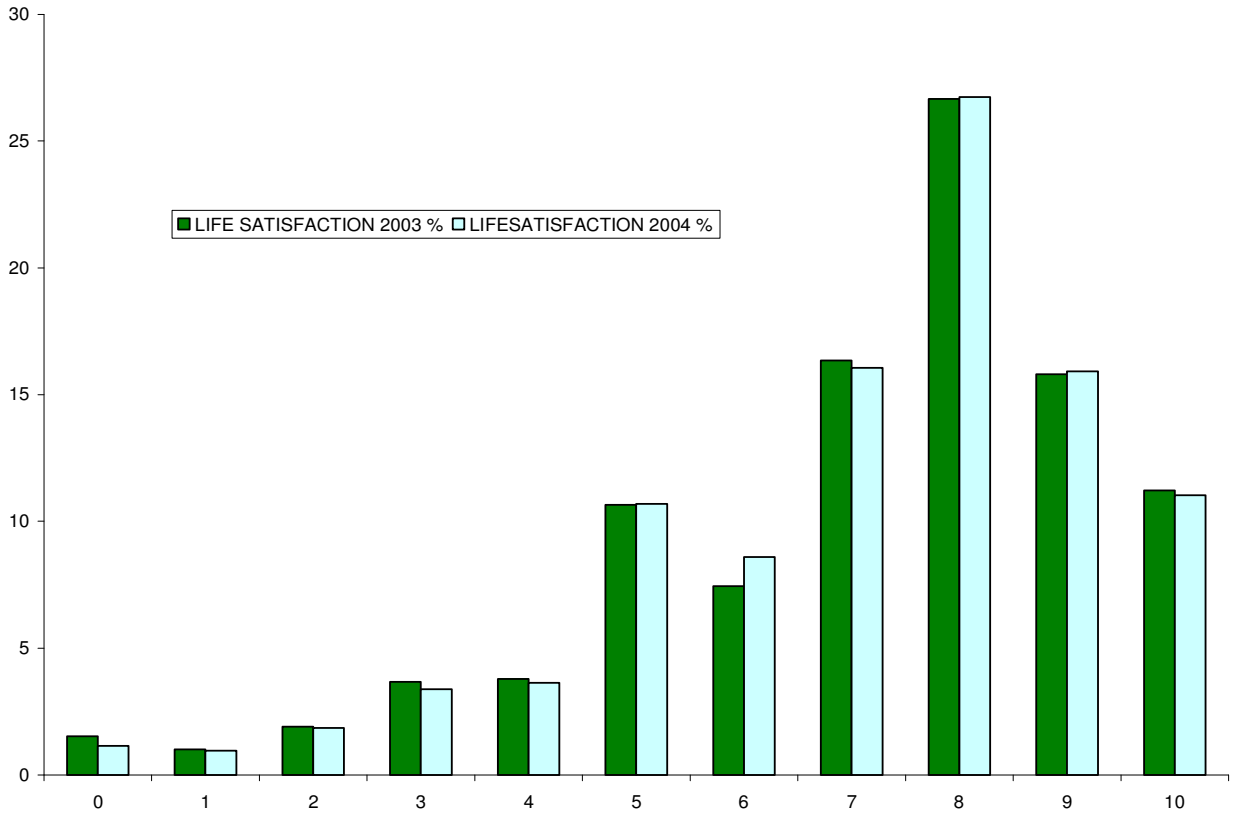
* : significant different by year at the 10% level; ** : significant different by year at the 5% level; *** : significant different by year at the 01% level

APPENDIX **4. Pairwise Correlations**

	Low Secondary	High Secondary	Post Secondary	Tertiary	Post Tertiary	Unemployed: In the last 12 months	Unemployed: In the last 5 years	Euros < 40 Euros	Euros 40-70	Euros 70-120	Euros 120-230	Euros 230-350	Euros 350-460	Euros 460-580	Euros 580-690	Euros 690-1150	Euros 1150-1730	Euros 1730-2310	Euros > 2310 Euros	Proxy 1	Proxy 2
Low Secondary	1.0000																				
High Secondary	-0.3854*	1.0000																			
Post Secondary	-0.1397*	-0.2263*	1.0000																		
Tertiary	-0.2251*	-0.3646*	-0.1322*	1.0000																	
Post Tertiary	-0.1228*	-0.1990*	-0.0721*	-0.1162*	1.0000																
Unemployed: In the last 12 months	-0.0424*	-0.0116*	0.0217*	0.0343*	0.0303*	1.0000															
Unemployed: In the last 5 years	-0.0470*	-0.0045	0.0141*	0.0403*	0.0287*	0.9297*	1.0000														
< 40 Euros	0.0281*	-0.0396*	-0.0204*	-0.0316*	-0.0183*	-0.0302*	-0.0328*	1.0000													
Euros 40-70	0.0613*	-0.0285*	-0.0330*	-0.0640*	-0.0310*	-0.0274*	-0.0330*	-0.0196*	1.0000												
Euros70-120	0.0609*	0.0013	-0.0310*	-0.0857*	-0.0344*	-0.0208*	-0.0277*	-0.0265*	-0.0474*	1.0000											
Euros 120-230	0.0270*	0.0011	-0.0119*	-0.0856*	-0.0380*	-0.0454*	-0.0480*	-0.0363*	-0.0649*	-0.0876*	1.0000										
Euros 230-350	0.0541*	0.0012	-0.0060	-0.0700*	-0.0358*	-0.0435*	-0.0428*	-0.0388*	-0.0694*	-0.0936*	-0.1281*	1.0000									
Euros 350-460	0.0299*	0.0103	-0.0088	-0.0418*	-0.0149*	-0.0222*	-0.0171*	-0.0396*	-0.0708*	-0.0955*	-0.1306*	-0.1397*	1.0000								
Euros 460-580	0.0049	0.0247*	-0.0033	-0.0077	-0.0136*	-0.0013	0.0061	-0.0384*	-0.0686*	-0.0927*	-0.1267*	-0.1355*	-0.1382*	1.0000							
Euros 580-690	-0.0099	0.0071	0.0172*	0.0305*	-0.0064	0.0090	0.0144*	-0.0381*	-0.0681*	-0.0919*	-0.1257*	-0.1345*	-0.1372*	-0.1331*	1.0000						
Euros 690-1150	-0.0799*	0.0166*	0.0237*	0.1136*	0.0444*	0.0530*	0.0502*	-0.0516*	-0.0924*	-0.1247*	-0.1705*	-0.1824*	-0.1860*	-0.1804*	-0.1790*	1.0000					
Euros 1150-1730	-0.0779*	-0.0223*	0.0300*	0.1179*	0.0592*	0.0577*	0.0555*	-0.0306*	-0.0547*	-0.0739*	-0.1010*	-0.1081*	-0.1102*	-0.1069*	-0.1061*	-0.1439*	1.0000				
Euros 1730-2310	-0.0457*	-0.0203*	0.0185*	0.0545*	0.0707*	0.0395*	0.0370*	-0.0158*	-0.0283*	-0.0382*	-0.0522*	-0.0558*	-0.0570*	-0.0552*	-0.0548*	-0.0743*	-0.0441*	1.0000			
> 2310 Euros	-0.0309*	-0.0280*	-0.0059	0.0571*	0.0602*	0.0341*	0.0324*	-0.0115*	-0.0205*	-0.0277*	-0.0378*	-0.0405*	-0.0413*	-0.0401*	-0.0397*	-0.0539*	-0.0319*	-0.0165*	1.0000		
Proxy 1	-0.0373*	0.0399*	0.0509*	0.0756*	0.0628*	-0.1196*	-0.1118*	-0.0358*	-0.0834*	-0.0639*	-0.0841*	-0.0693*	-0.0519*	0.0138*	0.0413*	0.1220*	0.0903*	0.0384*	0.0335*	1.0000	
Proxy 2	-0.3777*	-0.0041	0.1738*	0.5856*	0.3278*	0.0208*	0.0273*	-0.0878*	-0.1350*	-0.1311*	-0.1395*	-0.1065*	-0.0595*	0.0042	0.0493*	0.1906*	0.1708*	0.1002*	0.0802*	0.4526*	1.0000

Figure 1.

The distribution of happiness and life satisfaction scores



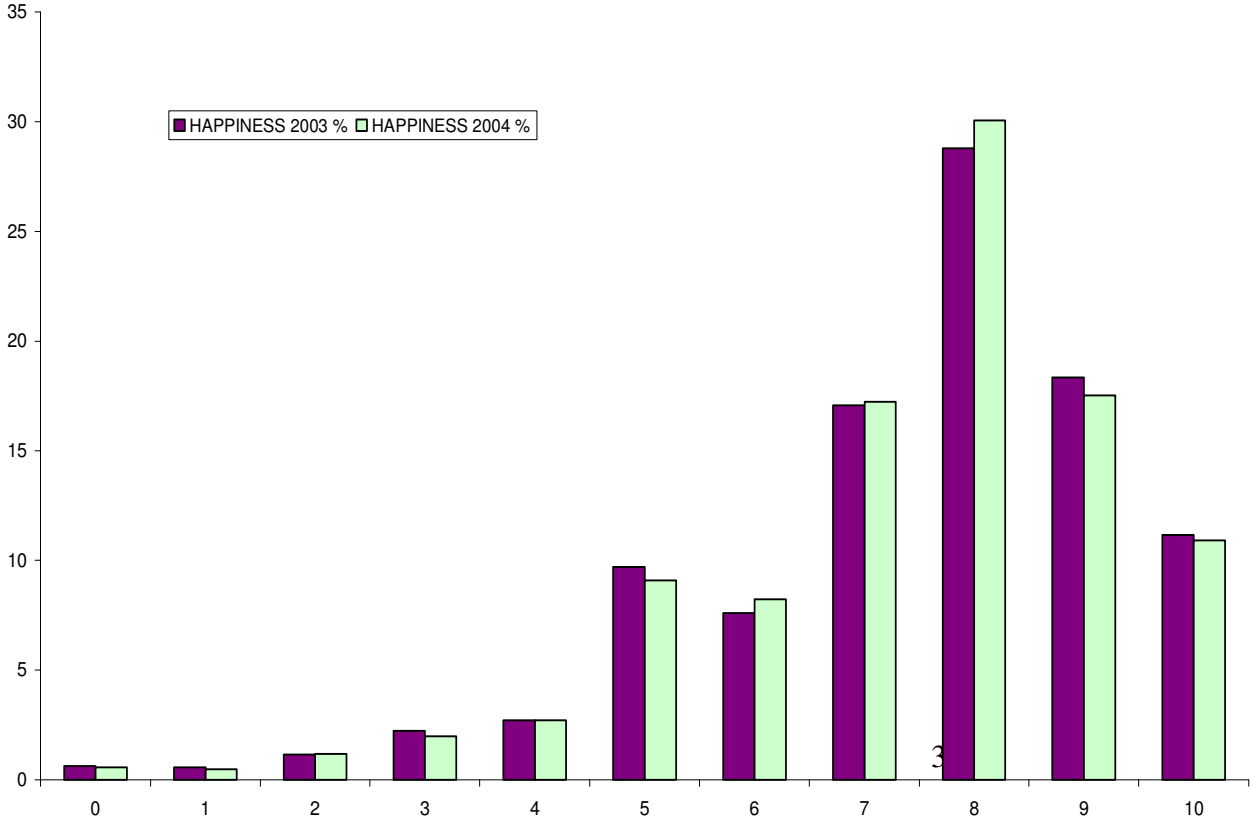


Figure 2.

Subjective well-being across Europe