The Macroeconomics of Happiness

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Abstract

This paper shows that macroeconomic movements have strong effects on the happiness of nations. First, we find that there are clear microeconomic patterns in the psychological well-being levels of a quarter of a million randomly sampled Europeans and Americans from the 1970's to the 1990's. Happiness equations are monotonically increasing in income, and have a similar structure in different countries. Second, movements in reported well-being are correlated with changes in macroeconomic variables such as Gross Domestic Product. This holds true after controlling for the personal characteristics of respondents, country fixed-effects, year dummies, and country-specific time trends. Third, the paper establishes that recessions create psychic losses that extend beyond the fall in GDP and rise in the number of people unemployed. These losses are large. Fourth, the welfare state appears to be a compensating force: higher unemployment benefits are associated with higher national well-being.

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I. Introduction

Newspapers regularly report changes in macroeconomic variables. It is also known that economic variables predict voters' actions and political outcomes (Frey and Schneider (1978)). These facts suggest that aggregate economic forces matter to people. Yet comparatively little is known empirically about how human well-being is influenced by macroeconomic fluctuations.[1] When asked to evaluate the cost of a business cycle downturn, most economists measure the small drop in Gross Domestic Product.

This paper adopts a different approach. It begins with international data on the reported well-being levels of hundreds of thousands of individuals. The paper's first finding is that there are strong microeconomic patterns in the data, and that these patterns are similar in each country. Happiness data behave in a predictable way. We then show that, after controlling for the characteristics of people and countries, macroeconomic forces have marked and statistically robust effects on reported well-being. Furthermore, pure psychic costs appear to be large. As well as the losses from a fall in GDP, and the direct costs of recession to those falling unemployed, a typical business cycle downturn of one year's length would have to be 'compensated' by giving each citizen – not just unemployed citizens – approximately $200 per year in mid-80s dollars.[2] This loss is over and above the GDP cost of a year of recession. It is an indirect or 'fear' effect that is omitted from economists' standard calculations of the cost of cyclical downturns.

In spite of a long tradition studying aggregate economic fluctuations, there is disagreement among economists about the seriousness of their effects. One view, associated with Keynes, argues that recessions are expensive disruptions to the economic organisation of society. Recessions involve considerable losses – under-utilisation of invested capacity, emotional costs to those who lose their jobs, and distributional unfairness. A different view is adopted by real-business-cycle theorists. They argue that Keynesians overestimate the costs of business cycles: for every downturn there is a period of boom, and, given that individuals are optimising, recessions are desirable adjustments to productivity shocks. This means that the costs of business cycles are

[1] It is known that suicide rose markedly in the Great Depression, but that was probably too extreme an episode to allow any easy judgement.

small – perhaps only 0.1 percent of total consumption in the US (Lucas (1987)).[3] Consequently, these economists have turned their attention to economic growth and away from fluctuations.

Our paper derives a measure of the costs of an economic downturn that can be used in such debates. In doing so, the paper employs data of a kind more commonly found in the psychology literature. Collected in standard economic and social surveys, the data provide self-reported measures of well-being, such as responses to questions about how happy and satisfied individual respondents are with their lives. We begin by showing that life-satisfaction regression equations – where individuals' subjective well-being levels are regressed on the personal characteristics of the respondents – have a broadly common structure across countries. A large set of personal characteristics has approximately the same influence on reported happiness, regardless of where well-being questions are being asked. This regularity suggests that happiness data contain potentially interesting information.

From the outset, the paper has to face two conceptual problems. The first is caused by the approximately untrended nature of reported happiness (as noted by Richard Easterlin (1974)). For the usual unit-root reasons, we cannot then regress happiness on trended variables such as Gross Domestic Product. The paper experiments with equations in which there are (i) year dummies, (ii) country-specific time trends, and (iii) change-in-GDP variables. The second conceptual problem is that variables such as GDP per capita, unemployment and inflation are not exogenous. These variables are influenced by politicians' choices; their choices are shaped by re-election probabilities; those probabilities in turn can depend on the feeling of contentment among a country's citizens. A further possible source of simultaneity is that happier people may work harder and thus produce more output. It is not straightforward to find believable macroeconomic instruments that can identify the well-being equation. Instead, the paper experiments with different forms of lag structures, to attempt to see if movements in macroeconomic forces lead, later on, to movements in well-being.

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[2] In 1985 US dollars, which is the middle of our sample.

[3] Even when market imperfections are introduced, the costs rise by only a factor of five, and they are significantly lower if borrowing is allowed: see Atkeson and Phelan (1994). A different

Traditionally, economists assume that it is sufficient to pay attention to decisions. This is because people's choices should reveal their preferences. More recently, however, it has been suggested that an alternative is to focus on *experienced* utility, a concept that emphasises the pleasures derived from consumption (e.g. Kahneman and Thaler (1991)). Kahneman, Wakker and Sarin (1997) provide an axiomatic defence of experienced utility with applications to economics. We make the assumption that survey measures of happiness are closer to experienced utility than to the decision utility of standard economic theory. Although a number of conceptual questions remain unanswered (for example, with respect to how people are affected by comparisons and reference points), it has been argued by some that self-reports of satisfaction may help deal with the challenges posed by the need to understand experienced utility (see Rabin (1998), for instance).

There has been comparatively little research by economists on reported well-being data. Richard Easterlin (1974) began what remains a small literature, and recently updated his work in Easterlin (1995). Other contributions include Ng (1996, 1997), Blanchflower, Oswald and Warr (1993), Frank (1985), Inglehart (1990), Fox and Kahneman (1992), Frey and Stutzer (2000), Konow and Earley (1999), Oswald (1997), Winkelmann and Winkelmann (1998), and Morawetz et al (1977). Di Tella, MacCulloch and Oswald (2001) study people's preferences between inflation and unemployment. Di Tella and MacCulloch (1999) use happiness data to examine the properties of partisan versus opportunistic voting models.

Section II describes the data. The paper's main data source is the Euro-Barometer Survey Series. Partly the creation of Ronald Inglehart at the University of Michigan, the surveys record happiness and life-satisfaction scores on approximately 300,000 people living in twelve European countries over the period 1975 to 1992. We also use the United States General Social Survey. It records similar kinds of information on approximately 30,000 individuals over the period 1972-94. Section III explains the empirical strategy.

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approach to measuring the costs of business cycles using asset prices is developed in Alvarez and Jermann (1999).

It is well-known that individuals' answers to well-being questions can be influenced by order and framing effects within a survey, and by the number of available answer categories (in our main data set, there are only four). Apart from the pragmatic defense that we are constrained by the data as collected, some of these problems can be reduced by averaging across large numbers of observations, and by the inclusion of country fixed-effects in the macroeconomic regressions.

Section IV studies the relationship between well-being data and variables such as national income per-capita. The survey questions do not ask people whether they like economic booms. Instead, respondents are asked how happy they feel with their lives, and their collective answers can be shown – unknown to the respondents themselves – to move systematically with their nation's GDP and other macroeconomic variables.[4]

We also study, in section V, what happens to reported happiness when governments try to reduce the impact of economic fluctuations. The focus here is on the welfare state, and especially on the impact upon well-being of an unemployment benefit system. We show that countries with more generous benefit systems are happier (or, more strictly speaking, say that they are happier). Some economists who study European unemployment have claimed a causal link between the region's relatively generous welfare provision and its unemployment problems. By making life too easy for the unemployed, the argument goes, the welfare states of Europe have taken away the incentive to work and so fostered voluntary joblessness. We test, and fail to find evidence for, this common supposition. Contrary to conventional wisdom, the gap in happiness between the employed and the unemployed has stayed the same since the 1970s. It has apparently not become easier, over the decades, to be out of work in Europe.

Section VI summarizes.

[4] Thus, our approach differs from that of Shiller (1996), Di Tella and MacCulloch (1996b), Boeri, Borsch-Supan and Tabellini and Luttmer (2001), who use survey data directly related to the issue being studied (inflation, unemployment benefits, welfare state reform and redistribution respectively).

II. Happiness Data and Microeconometric Patterns

A random sample of Europeans is interviewed each year and asked two questions, among others, that are of interest here. The first is *"Taking all things together, how would you say things are these days – would you say you're very happy, fairly happy, or not too happy these days?"* (small "Don't know" and "No answer" categories are not studied here). The surveys also report the answers of 271,224 individuals across 18 years to a "life satisfaction" question. This question is included in part because the word happy translates imprecisely across languages. It asks, *"On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?"* (The small "Don't know" and "No answer" categories are again not studied).

Raw well-being data are presented in Table 1. We focus principally on life satisfaction data because they are available for a longer period of time – from 1975 to 1992 instead of just 1975-86. Happiness and life satisfaction are correlated (the correlation coefficient is 0.56 for the period 1975-86). Blanchflower and Oswald (1999) have shown that where British data on both are available the microeconometric equations have almost identical forms. Our paper finds, in a later table, the same for Europe. The Appendix presents summary statistics, describes the data sets, gives equations individually for nations, and explains how our later macroeconomic variables are measured. Table 1a provides a cross-tabulation of life satisfaction for Europe.

The analysis also examines well-being data from the United States General Social Survey (1972-1994). There is a similar happiness question that reads *"Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy?"* (Small "Don't know" and "No answer" categories are not studied in this paper). This was asked in each of 23 years and covers 26,668 individuals. There was no life satisfaction question for the U.S. Table 1b summarizes the happiness responses for the United States. With only three response categories, this question may be less revealing than the life question satisfaction that offers four. An odd number of categories may allow less introspection since people can choose the middle category when unsure of their choice.

Taking at face value the numbers in the two halves of Table 1, well-being scores appear to be skewed towards the top of the possible answer distribution. In other words, individuals seem to answer optimistically. On average they say that they are relatively happy and satisfied. Whatever the appropriate interpretation of this pattern, it is clear that in both Europe and the United States the unemployed and divorced are much less content. These events are two of the largest negatives in life. Marriage and high income, by contrast, are associated with high well-being scores. These are two of the largest positives. Women give fractionally higher well-being answers than men.

To consider the case for happiness regression equations, are there good reasons why economists should use subjective well-being data in formal analysis?

One is a market-based argument: people who study mental health and happiness for a living (psychologists) use such data. There are thousands of papers that do so in psychology and other social-science journals. Unless economists believe they know more about human psychology than psychologists, there is a case for considering how such survey information can inform the discipline of economics. A second argument is that the data pass so-called validation exercises. For example, Pavot et al (1991) establishes experimentally that people who report themselves as happy tend to smile more. See also Myers (1993). Diener (1984) shows that people who say they are happy are independently rated by those around them as happy individuals. Konow and Earley (1999) describe other ways in which subjective well-being data have been validated. Self-reported measures of well-being are also correlated with physiological responses and electrical readings in the brain (for example, Sutton and Davidson (1997)). Another of the checks is that, as explained, different measures of self-reported well-being seem to exhibit high correlations with one another. Third, we regressed suicide rates on country-by-year average reported happiness, using the same panel of countries used later in the paper. We controlled for year dummies and country fixed-effects, and corrected for heteroscedasticity using White's method. Consistent with the hypothesis that well-being data contain useful information, the regression evidence revealed that higher levels of national reported well-being are associated with lower national suicide rates (statistically significant at the 6 per cent level). Last, we obtained an approximate measure of consistency by comparing the structure of happiness responses across countries.

A single individual's answers on a well-being questionnaire are unlikely to be reliable: there is no natural scaling to allow cross-person comparison of terms like 'happy' or 'satisfied'. However, in a well-being regression equation that uses large samples, this difficulty is less acute. In some settings, measurement error does little harm in a dependent variable (though well-being variables would be less easy to use as independent variables).

Tables 2, 3 and 4 present micro-econometric well-being equations for Europe and the U.S. Because of data limitations, Table 3 cannot be estimated over the full set of years.

The equations of Tables 2-4 include a dummy for the year when the survey was carried out (and, in the case of the Europe-wide data, for the country where the respondent lives). Two features stand out. One is that – comparing for example Table 3 with Table 4 – approximately the same personal characteristics are statistically associated with happiness in Europe and in the U.S. Another, on closer examination, is that the sizes of the effects do not vary dramatically between the two sides of the Atlantic. For example, the consequences of employment status, being a widow and of income appear to be similar in the U.S. and Europe. The effect of unemployment is always large: it is equivalent to dropping from the top to the bottom income quartile. Similar results obtain if we examine the individual nations within Europe (in the Appendix). The regression evidence here is consistent with the idea that unemployment is a major economic source of human distress (as in the psychiatric stress data of Clark and Oswald (1994)). More generally, independent of the country where the respondent lives, the same personal characteristics appear to be correlates with reported happiness. Having family income classified within a higher income quartile increases the likelihood that a respondent says he or she is satisfied with life. This effect is monotonic. To an economist, it is reminiscent of the utility function of standard economics. A strong life-cycle pattern in well-being also emerges. In every country in our sample, happiness is U-shaped in age.

III. Empirical Strategy

In order to estimate the costs of aggregate economic fluctuations, we start by evaluating the role of national income per capita (GDP) in affecting individuals' reported happiness. A fundamental issue is the potential role of reference groups, that is, the possibility that individuals care about their position relative to others in society and not just about the absolute level of income (see, for example, Easterlin (1974), Diener (1984), Frank (1985), Fox and Khaneman (1992), *inter alia*). Hence we estimate a regression that controls for, first, the income quartile to which the respondent's family belongs and, second, also the average income per-capita in the country. A key parameter of interest is the coefficient on GDP in a happiness regression equation of the form

$$HAPPY_{jit} = \alpha\ GDP_{it} + \Sigma\ Personal_{jit} + \varepsilon_i + \lambda_t + \mu_{jit} \qquad (1)$$

where $HAPPY_{jit}$ is the well-being level reported by individual *j*, in country *i* in year *t*, and GDP_{it} is gross domestic product per capita in that country (measured in constant 1985 dollars). $Personal_{jit}$ is a vector of personal characteristics of the respondents, which include income quartile, gender, marital status, education, whether employed or unemployed, age and number of children.[5] In some specifications, country-specific time trends are also added. Because many of the personal variables are potentially endogenous, a later section of the paper checks alternative econometric specifications in which only exogenous variables, such as age and gender, are used as microeconomic controls. The data set does not contain the person's income, only the quartile of the income distribution within which it lies.

We also include a country fixed-effect ε_i, and a year fixed-effect λ_t. The first captures unchanging cultural and institutional influences on reported happiness within nations, and the second any global shocks that are common to all countries in each year. The data are made up of a series of cross sections, so no individual person-specific effects can be included. The categorical nature of the data is dealt with by the use of an ordered

[5] An alternative two-step procedure that allows the coefficients on personal characteristics to vary across countries is explained in our working paper. Results are available upon request.

probit model. To obtain the correct standard errors, an adjustment is made for the fact that the level of aggregation of the left-hand variable, happiness, is different than the right-hand macroeconomic variables. See Moulton (1986) for a discussion of the necessary correction to the standard errors.

Easterlin (1974) points out that happiness data appear to be untrended over time. By contrast, nations grow richer over the years, so income per capita is trended. Hence, if happiness is a stationary variable, α in a simple regression equation is likely, for standard reasons, to be biased towards zero.[6] In that case, a potential solution is to focus on the growth rate of GDP or to study macroeconomic variables measured relative to trend.

We explore this issue. The paper includes time dummies for the panel of countries, studies different lengths of lag, and experiments with a simple distributed lag structure. We also include country-specific time trends (along with the year and country fixed-effects) and change-in-GDP variables. These issues are not simply technical ones. The economics of the problem suggests that we should allow for the presence of adaptation effects, whereby, other things equal, high levels of income in the past might fail to produce large effects on happiness because they lead to higher aspirations and altered comparisons. This is related to a particularly important question. Does higher GDP have permanent effects on a nation's well-being? Conventional economics assumes that it does. The inherited wisdom in this field, due to Richard Easterlin and others, is that it may not and that a concern for relative income is what could explain the untrended nature of happiness survey responses (see Easterlin (1974), Blanchflower and Oswald (1999), *inter alia*). Another possibility is that GDP does buy extra happiness, but that other factors have gradually been worsening in industrial societies through the decades, and these declines have offset the benefits from extra real income. If so, it might be possible to make compatible the idea that GDP buys happiness with the fact that well-being survey data do not trend upwards. A panel approach, with country and year dummies and country specific time trends, would then provide an appropriate testing ground. Furthermore, controlling for the income quartiles to which individuals belong to

in our regressions provides some reassurance that the results on aggregate income do not just reflect concerns for relative income (with the reference group based on the whole economy).

If income per capita can be shown to affect happiness, a regression designed to value other macroeconomic influences can be estimated. This has the following form

$$HAPPY_{jit} = \alpha\ GDP_{it} + \beta\ Unemp_{it} + \Theta\ Macro_{it} + \Sigma\ Personal_{jit} + \varepsilon_i + \lambda_t + \mu_{jit} \quad (2)$$

where $Unemp_{it}$ is the unemployment rate in country *i* in year *t*, and $Macro_{it}$ is a vector of other macroeconomic variables that may influence well-being. $Macro_{it}$ includes $Inflation_{it}$, the rate of change of consumer prices in country *i* and year *t*, and $Benefit_{it,}$ the generosity of the unemployment benefit system, which is here defined as the income replacement rate. To explore possible problems of simultaneity, in some equations we use only personal controls that are exogenous (such as gender and age) and study macroeconomic variables measured with a time lag.

In most regression equations, this paper's specifications include as a regressor a personal variable for whether the individual is unemployed. That enables us, because we are then controlling for the personal cost of joblessness, to test for any extra losses from recessions – including economy-wide indirect psychic losses of a kind normally ignored by economists. As the effect of the business cycle on personal unemployment is thus controlled for within the microeconomic regressors, a correction has to be done later, when the whole cost of a recession is being calculated, to add back into the calculation those personal costs. In other words, an increase in joblessness can affect well-being through at least two channels. One is the direct effect: some people become unhappy because they lose their jobs. The second is that, perhaps because of fear, a rise in the unemployment rate may reduce well-being even among those who are in work or looking after the home. To calculate the full losses from a recession, these two effects have to be added together.

[6] Easterlin (1974) made this observation looking at US data. This is not the norm, however, in our sample of 12 European countries. For more on the specific country trends, the reader is referred to our working paper.

The paper also examines the way that governments have tried to alleviate the costs of business-cycle downturns. It has often been argued that the European welfare state has allowed life to become too easy for the jobless -- and thus made recessions more lasting. The phenomenon of structural unemployment in Europe is routinely blamed on the continent's welfare system.[7] To test this hypothesis in a new way, we use well-being data. The paper restricts the sample to those individuals who are either employed or unemployed (thus excluding the retired, those keeping home and those attending school). A regression of the following form is then estimated:

$$HAPPY_{jit} = \delta\ Benefit_{it} + \Omega\, MacroB_{it} + \Sigma\, Personal_{jit} + \varepsilon_i + \lambda_t +$$
$$+ (\psi\, Benefit_{it} + \pi\, MacroB_{it} + \rho\, Personal_{jit} + \theta_i + \tau_t) * Dunem_{jit} + \mu_{jit}$$

where $Dunem_{jit}$ is a dummy taking the value 1 if respondent j is unemployed and zero otherwise. $Personal_{jit}$ is the same vector of personal characteristics defined above (which includes $Dunem_{jit}$) and $MacroB_{it}$ is a vector of macroeconomic variables (GDP per capita, inflation rate and unemployment rate). Our interest is the value of , which is the interaction effect of benefits on the happiness 'gap'. The gap is the difference in well-being between employed people and unemployed people.

The size of different variables' effects on well-being is of interest. An intuitive way to think of what the coefficients mean in an ordered probit is, unfortunately, not straightforward. However, the formula for a calculation is as follows. In our main regression equations there are three cut points: call them *a*, *b* and *c*. If a person's happiness score (measured in 'utils') is equal to *H*, then the chance that she will declare herself "very happy" (the top category) is: Prob("very happy") = F(*H*-*c*) where F(.) is the standard cumulative normal distribution.[8] If for example, $H = c$, then F(0) = 0.5 (or, in other words, a 50 percent chance). To interpret the coefficients, therefore, if a change in an explanatory variable leads to a ΔH change in one's happiness score, the change in the

[7] Di Tella and MacCulloch (1996a) presents some theory and evidence behind the determination of unemployment benefits.

[8] More formally, a person's "happiness score" is the predicted value of the underlying continuous variable from the ordered probit regression given their observed personal characteristics.

probability of calling oneself "very happy" will go up by: Δ Prob ("very happy") = F(H + ΔH - c) - F(H-c).

As background, Table 5a sets out the means and standard deviations for the macroeconomic variables and Table 5b contains correlation coefficients.

IV. Happiness Data, Macroeconomics and the Cost of a Recession

The first hypothesis to be tested is whether macroeconomic movements feed through into people's feelings of well-being. A second task is to calculate the size of any effects. In order to put a value on recessions and booms, the paper compares the marginal effect of income on happiness with the marginal effect of an unemployment upturn on happiness. In other words, it calculates the marginal rate of substitution between GDP and unemployment.

As is known, recessions mean losses in real output, and higher levels of joblessness. By exploiting well-being data, it is possible to test for additional costs. We find that there is evidence for what appear to be important psychic losses that are usually ignored in economic models.

The Effect of GDP on Happiness

Table 6 presents simple specifications for happiness equations in which macroeconomic influences are allowed to enter. It focuses on GDP, and, for transparency, examines a variety of lag lengths. Column 1 of Table 6 regresses reported well-being on the set of personal characteristics of the respondent and on the country's current level of GDP per capita. The GDP variable enters with a coefficient of 1.1 and a standard error of 0.34 (where GDP here has been scaled in the regressions by a factor of 10,000). The data cover a dozen nations from 1975 to 1992. To control for country and year effects, dummies for these are included. Since we are controlling in column 1 of Table 6 for the quartile to which the respondent's family income belongs, the coefficient on GDP reflects the effect of an absolute increase in national income on individual happiness while keeping constant the relative position of the respondent. There is evidence of a positive and well-determined effect of GDP per capita on individuals'

perceived well-being. An extra $1,000 in GDP per capita (in 1985 dollars) has systematic and non-negligible consequences.[9] It can be shown that it raises the proportion of people in the top happiness category ("very satisfied" with their lives) by approximately 3.6 percentage points, which takes this category from 27.3% to 30.9%.[10] It lowers the proportion in the bottom category ("not at all satisfied" with life) by 0.7 percentage points, from 4.8% to 4.1%.[11] In these data, contemporaneous happiness and GDP are strongly correlated.

To begin to understand dynamics, and to check robustness, Columns 2 and 3 of Table 6 give equivalent results when lagged levels of GDP are used. Going back one year makes little difference: the coefficient on lagged national income per capita in a well-being equation is only slightly reduced. Column 2 of Table 6 thus continues to find a well-determined GDP effect. Things weaken in column 3, which goes back to a two year lag of GDP; but the coefficient remains positive, with a t-statistic of approximately 1.7. Year dummies (not reported) enter significantly. They are trended down over the period, so some general force, common to these European nations, is acting to reduce people's feelings of happiness. Our paper will not attempt to uncover what it might be, but this remains a potentially important topic for future research.

It might be argued that, despite the inclusion of the year dummies, the mix of an I(0) happiness variable with an I(1) GDP regressor still provides an unpersuasive estimator for the effect of national income on well-being. There seem to be two potential solutions. The first is to shift focus entirely to the growth rate in income. As an intermediate step, that helps assess how restrictive this shift might be, we include in regression 4 of Table 6 a set of variables for GDP per capita current, lagged once and lagged twice. As might be expected, the GDP terms in column 4 of Table 6 are then

[9] Dollars of 2001 equal 1985 dollars multiplied by approximately 1.6. Hence we are considering a rise of $ 1,600 when expressed in 2001 values.

[10] This is calculated as follows: the average predicted happiness score, H, for the column 1 regression equals 1.16. A $1000 rise in GDP per capita increases the predicted happiness score by ΔH = 0.00011*1000 = 0.11. The top cut point, c = 1.84. Hence Δ Prob("very satisfied") = F(1.16+0.11-1.84) - F(1.16-1.84) = 0.284 - 0.248 = 0.036. Similar calculations can be done to find a confidence interval for this point estimate (where one standard error below and above the GDP coefficient equals 0.8 and 1.4, respectively). The interval is (0.025, 0.048).

[11] Since Δ Prob("Not at all satisfied") = F(-0.70-(1.16+0.11)) - F(-0.70-1.16) = 0.024-0.031 = 0.007, where the bottom cut-point, a = -0.70.

individually insignificantly different from zero. Nevertheless, solving out for the implied long run equation, the steady-state coefficient on GDP per capita is positive and similar in absolute value (equality cannot be rejected) to the coefficient on GDP per capita in columns 1 and 2 of Table 6. This point-estimate is inconsistent with the idea of complete adaptation – the idea that individuals entirely adjust to their income levels after a while and only derive happiness from increases in income – although the standard errors themselves in column 4 are large.

Regressions (4) and (5) turn attention to growth in national income, ΔGDP per capita and ΔGDP per capita (-1). These are defined, respectively, for one lag and two lags (where the former measures GDP minus GDP(-1) and the latter measures GDP(-1) minus GDP(-2)). The latter, ΔGDP per capita (-1), in column 6 of Table 6, is positive, well defined, and economically important in size. Hence there is evidence in our data that bursts of GDP produce temporarily higher happiness. Those sympathetic to the Easterlin hypothesis can find support in column 6 of Table 6.

Another check is to include country-specific time trends. We do this – repeating the earlier analysis of Table 6 to allow an exact comparison – in Table 7. Here the set of personal characteristics has been estimated in the same (one-step) way as in Table 6, with extremely similar coefficients, so those personal coefficients are not reported individually in the tables.

The results are again supportive of the idea that increases in national income are associated with higher reported happiness. Column 1 of Table 7 shows that the current level of GDP per capita enters with a similar coefficient to the specification without country-specific trends. However, in columns 2 and 3, lagged GDP levels are now weaker than before, with one sign reversing itself. In column 4 of Table 7, all three of the GDP terms are again entered together. In this case the steady-state coefficient is poorly determined and now numerically close to zero. By contrast, in columns 5 and 6, the change-in-GDP variables work even more strongly than in Table 6.

We draw the conclusion that there is evidence in these data for the existence of both level and change effects on nations' happiness. First, consistent with standard economic theory, it appears that well-being is robustly correlated, in a variety of settings, with the level of current GDP. As far as we know, this is the first empirical finding of its

kind. Second, reported well-being is also correlated with growth in GDP, and this result is consistent with adaptation theories in which the benefits of real income wear off over time. Finally, lagged levels of GDP are statistically significant in certain specifications.

To go decisively beyond these conclusions, and to try to say whether it is level effects or change effects that dominate the data, will probably require longer runs of data than available to us. Our conjecture is that there is strong adaptation, so that human beings get used to a rise in national income, but that not all of the benefits of riches dissipate over time. Hence GDP matters, even in the long run, but there are strong delta-GDP effects in the short run. Whether that conjecture will survive future research remains to be seen.

The Cost of Recessions

Having established that income is correlated with happiness, we turn to other macroeconomic variables to see if their inclusion removes the correlation between happiness and GDP. It does not. Table 8, for example, repeats the previous analysis, and incorporates also the rate of unemployment, the inflation rate, and an indicator of the generosity of the welfare state. Regression (1) in Table 8 demonstrates that the macro variables enter with what might be thought the expected signs. All are statistically significant at normal confidence levels.

How costly are recessions? It can be shown that there are large losses over and above a GDP decline and rise in personal unemployment.

To explore economic significance, we take as a yardstick a downturn that is equal to an increase in the unemployment rate of 1.5 percentage points. The number 1.5 was chosen by taking the average of the eleven full business cycles in the US since the Second World War, and dividing by two to get the average unemployment deviation. It is then possible to calculate, from the coefficients in column 1 of Table 8, the marginal rate of substitution between GDP per capita and unemployment. Pure psychic losses can then be estimated. The ratio of the two coefficients implies that, to keep their life-satisfaction constant, individuals in these economies would have to be given, on top of compensation for the direct GDP decline, extra compensation per year of approximately

200 dollars each (where this number is 0.015 times 1.91/0.00014).[12] This would have to be paid to the average citizen, not just to those losing their jobs. Such a calculation makes the implicit assumption that, over the relevant range, utility is linear, so that the margin is equal to the average. This seems justifiable for normal recessions, where national income changes by only a few per cent, but it might not for a major slump in which national income fell dramatically.

Regression (6) in Table 8 allows us to make these calculations using the growth rate in GDP per capita. The estimated coefficients indicate that the average person (employed or unemployed) would experience no change in well being if, in the event of a business downturn which increased the rate of unemployment by 1.5 percentage points, his/her income were to be increased by approximately 3%.[13]

Such calculations underestimate the full cost to society of a rise in joblessness. The reason for the underestimation is that these regressions hold constant the personal cost of being unemployed (as a microeconomic regressor). It can be calculated from regression (1) in Table 8 that an increase in the unemployment rate from 0 percent to 1.5 percent would have a 'utils' cost – for want of a better term – equal to approximately 0.029 (which is derived from 1.91 times 0.015). This is for the average citizen, whether employed or unemployed. On the other hand, a person who becomes unemployed experiences an actual loss (in utils) equal to 0.5. This number comes from the coefficient on being unemployed in regression (1) in Table 8 (which is unreported but is similar to those given in Table 6). The full social cost of an increase of 1.5 percentage points in the unemployment rate in well-being units is therefore the sum of two components: it is (0.5 times 0.015) + (1.91 times 0.015) = 0.0075 + 0.029 = 0.036.[14] Measured in dollars this is

[12] This number, of course, has a standard error attached. The number 0.015 comes from the assumption that a typical economic downturn adds 1.5 percentage points to unemployment. The number 1.91 is the coefficient on *Unemployment rate* in Table 8, column 1. The number 0.00014 comes from the coefficient of 1.4 on GDP in column 1 of Table 8, after re-scaling back by a factor of 10,000.

[13] Since 0.015*1.95/0.000118 = 248 dollars which represents 3.2 per cent of the average level of GDP per capita across the nations and years in the sample (= 248/7809).

[14] The following calculations may help clarify this. Call total welfare in society $W= (1-u) E + u V$, where u is the unemployment rate and E and V are the utility of being employed and unemployed respectively. The function, E, is defined over net income (because it includes taxes), inflation and unemployment and the function, V, is defined over benefits, unemployment and inflation. Then $dW/du= (1-u) dE/du + u dV/du - (E-U)$. The expressions, dE/du and dV/du, can be

equal to approximately $260 (where this number is 0.036/0.00014). For an individual who loses her job during the recession the actual loss is approximately $3,800 (where this number equals (0.5 + 0.029)/0.00014).

The regressions in Table 8 establish that high unemployment in the economy is unpleasant even for people who are employed. One possibility is that this is some form of fear-of-unemployment effect (see for instance Blanchflower (1991)). There may also be a – presumably fairly small – taxation effect, because if unemployment goes up the population at large have to pay more tax to fund the increased bill for unemployment benefits. The indirect effects, when added to the direct ones on those who actually lose their jobs, amount to a substantial well-being cost. This stands in contrast to the view that unemployment involves layoffs with short and relatively painless jobless spells. The ex-post effect on someone who actually loses his or her job is 20 times larger than the effect on those who still have a job. The indirect 'fear' losses are even larger, in aggregate, because they affect more people.

The large well-being cost of losing a job shows why a rise in a nation's unemployment might frighten workers. Becoming unemployed is much worse than is implied by the drop in income alone. The economist's standard method of judging the disutility from being laid off focuses on pecuniary losses. According to our calculations, that is a mistake, because it understates the full well-being costs, which, according to the data, appear to be predominantly non-pecuniary.

The coefficients in Table 8 also allow us to put a value on the cost of inflation by comparing the marginal effect of income on happiness with the marginal effect of an inflation upturn on happiness. In other words, we can also calculate the marginal rate of substitution between GDP and inflation. Using the ratio of the two coefficients on GDP per capita and the Inflation Rate in column 1 implies that, to keep their life-satisfaction constant, an individual would have to be given compensation of approximately 70 dollars for each 1 percentage point rise in inflation (where this number is 0.01 times 0.99/0.00014).

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thought of as a fear of unemployment effect for the employed and the unemployed respectively. The third term is the personal cost of falling unemployed. The first two terms sum to 1.91

Simultaneity and Other Tests

Happiness, personal characteristics and macroeconomic variables could be simultaneously determined. It is hard to think of a convincing instrument in such a setting. A full treatment of these issues will have to be left for future research and different data sets. Some reassurance in this respect can be obtained by running regressions where only truly exogenous personal characteristics are included, such as age and gender, and where all macroeconomic variables are entered with a lag. Table 9 checks the outcome. The substantive conclusions remain the same as in earlier tables.

Another interesting issue is how well-being in a country is affected by the amount of inequality. Assume utility functions are concave. Then it might be thought that inequality must automatically reduce the average level of happiness. We hope to tackle this issue properly in future work, but one test was done on these data. Provided that income inequality depends negatively on welfare generosity (and we would expect that government help for the poorest would reduce inequality), higher unemployment benefits in a society should raise the happiness of lower income people relative to higher income people. Given concavity, the poor dislike their relative position more than rich people like their own. As a test, therefore, we repeated all the regression specifications reported in the earlier Table 3 but also included interactions of our measure of benefit generosity with each of the income quartiles. As expected, the results show a significantly positive differential effect (at the 5 per cent level) of benefits on the happiness of the poor relative to the rich.

V. Happiness Evidence on the Role of the Welfare State.

Tables 8 and 9 find that the coefficient on *Benefits,* our indicator of the generosity of publicly provided unemployment insurance, is positively correlated with happiness levels and is well-defined statistically. Regression (1) in Table 8 implies that individuals who live in a country such as Ireland, where the replacement rate averaged 0.28 over the sample period, would be willing to pay 214 dollars (US 1985) to live in a country with a

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whereas the third term equals 0.50.

more generous welfare state such as France, where the replacement rate averaged 0.31.[15] In terms of Table 8's regression (6), which includes country-specific time trends and has a well-defined coefficient on ΔGDP per capita, people seem to be willing to forego growth rates of 2.5 per cent in order to see an improvement in the summary measure of the parameters of the unemployment benefit system from the Irish level to the French level. Such numbers should, however, probably be thought of as upper bounds on the correct estimates, because the regressions cannot adjust for the need in an improved welfare state for higher taxes.

Besides providing a way to assess the returns from a welfare state, the paper's approach can be used to shed light on the validity of one criticism of European-style welfare states. A number of economists have argued that generous welfare provision has made life "too easy" for the unemployed, leading to a poor labour market performance in a number of European countries. The average OECD-calculated benefit replacement rate across the sample of countries rose from 0.31 to 0.35 over the period of our data. The strictness with which benefit rules were enforced, moreover, is believed by some observers to have diminished.

We first approach this problem by partitioning the sample into employed and unemployed workers, and estimating a similar set of regressions to those presented in Table 8. Regressions (1) and (2) in Table 10 show that happiness and *Benefits* are positively correlated for both the unemployed and the employed sub-sample. Moreover, the two coefficients on the benefits variable, 1.25 and 1.44, are similar. Hence an increase in the generosity of unemployment benefits helps the well-being of the unemployed and employed by a similar amount (perhaps because the employed know they may in the future lose their jobs, and the jobless know they may find a job). More formally, regression (3) of Table 10, which estimates the difference in the corresponding coefficient estimate across the two sub-samples, is a test of the hypothesis that the welfare state made life too easy for the unemployed (at least relative to the employed). That hypothesis is not supported by the data. The reason is that the benefits variable enters the Gap equation – where the 'gap' can be thought of as the difference in well-being between those with jobs and those looking for a job – with a coefficient that is

[15] Since (0.31-0.28)*1.0/0.00014=214 dollars.

insignificantly different from zero. Table 11 re-does the equations to check for robustness to country-specific time trends.

Further evidence comes from direct examination of the data on the life satisfaction of employed and unemployed Europeans. Figures 1 and 2 plot the raw numbers. As Figure 1 shows, there is no marked rise over time in the happiness of the jobless compared to those in jobs. Both series run roughly together over the years. Figure 2, which is a plot of the gap itself, in fact reveals a slight widening of the difference in well-being levels (though it is not statistically significant) between the two groups. These life satisfaction data seem to paint a clear picture. It has not become easier and less unpleasant, over this period, to be out of work in Europe.

VI. Conclusions

This paper shows that macroeconomic movements have strong effects on the happiness of nations. It also suggests a new way to measure the costs of business-cycle downturns.

We use psychological well-being data on a quarter of a million people across twelve European countries and the United States. The data come in the form of answers to questions such as *"How happy are you?"* or *"How satisfied are you with life as a whole."* Ordered probit equations are estimated. Differences in people's use of language are viewed as a component of the error term. Using normal regression techniques, the paper starts by showing that happiness data have a stable structure. Micro-econometric well-being equations take the same general form in different countries. An estimated happiness equation is increasing in income – like the economist's traditional utility function.

Macroeconomics matters. People's happiness answers en masse are strongly correlated with movements in current and lagged Gross Domestic Product per capita. This is the main finding of the paper.

An important conceptual issue is whether improvements in national income lead to permanent or only temporary gains in national happiness. In other words, is it the level or change in GDP that influences well-being? After an examination of a range of specifications, we conclude that there is statistical support for both kinds of channel. The

persuasive evidence for a change-in-GDP effect upon a country's happiness is consistent with theories of adaptation. It seems likely, therefore, that some of the well-being gains from extra national income wear off over time. Our conjecture is that there are strong habituation effects, so that human beings get used to a rise in national income, but that not all of the benefits of riches dissipate over time. Future research, with longer runs of data, will have to revisit that conjecture.[16]

Losses from recessions are large. It is not just that GDP drops and that some citizens lose their jobs. On top of those costs to society, and after controlling for personal characteristics of the respondents, year dummies, and country fixed-effects, we estimate that individuals would need 200 extra dollars of annual income to compensate for a typical U.S.-size recession. In our sample, $200 is approximately 3 percent of per capita GDP. This loss is over and above the actual fall in income in a recession. One potential interpretation is that, in an economic downturn, people suffer a fear-of-unemployment effect.[17] For those actually becoming unemployed, moreover, we conclude that falling unemployed is as bad as losing approximately 3,800 dollars of income a year. Standard economics tends to ignore what appear to be important psychic costs of recessions.

The methods developed in the paper have other applications. Economists who analyze high European unemployment, for example, often claim that the problem lies with a growing generosity of the welfare state in these countries: benefits have made life too easy for the unemployed. Using well-being data, the paper tests this hypothesis. It does not find evidence to support it.

There are likely to be other ways in which the subject of macroeconomics can harness the kind of subjective well-being data studied here. We suspect that this paper has only scratched the surface of a large topic.

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[16] It means that some explanation will have to be found for the negative trend in year dummies in the happiness equations estimated here.

[17] Strictly speaking, our specifications imply that even unemployed people suffer a psychic or fear cost as the unemployment rate rises. One possible interpretation is that a higher unemployment rate makes a jobless person feel he or she is less likely to find work quickly.

Table 1a
Life Satisfaction in Europe: 1975 to 1992

Reported Life Satisfaction	All %	Unemployed %	Marital Status Married %	Divorced %
Very satisfied	27.29	16.19	28.90	19.18
Fairly satisfied	53.72	44.70	53.85	51.80
Not very satisfied	14.19	25.52	12.98	20.90
Not at all satisfied	4.80	13.59	4.27	8.11

Reported Life Satisfaction	Sex: Male %	Female %	Income Quartiles 1st (Lowest)	2nd	3rd	4th (Highest)
Very satisfied	26.81	27.75	22.80	24.98	28.07	33.07
Fairly satisfied	54.45	53.01	50.43	54.25	55.66	54.38
Not very satisfied	13.90	14.47	18.86	15.65	12.66	9.82
Not at all satisfied	4.84	4.77	7.92	5.11	3.61	2.73

Note: Based on 271,224 observations. All numbers are expressed as a percentage.

Table 1b
Happiness in the United States: 1972 to 1994

Reported Happiness	All %	Unemployed %	Marital Status Married %	Divorced %
Very happy	32.66	17.75	39.54	19.70
Pretty happy	55.79	52.66	52.51	61.75
Not too happy	11.55	29.59	7.95	18.55

Reported Happiness	Sex Male %	Female %	Income Quartiles 1st (Lowest)	2nd	3rd	4th (Highest)
Very happy	31.95	33.29	24.07	29.46	34.80	40.78
Pretty happy	56.33	55.31	56.04	58.02	56.22	53.14
Not too happy	11.72	11.39	19.88	12.52	8.98	6.08

Note: Based on 26,668 observations. All numbers are expressed as a percentage.

Table 2
Life Satisfaction Equation for Europe, Ordered Probit: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	Coefficient	Standard Error
Unemployed	-0.505	0.020
Self employed	0.060	0.012
Retired	0.068	0.014
Home	0.036	0.009
School	0.012	0.020
Male	-0.066	0.007
Age	-0.028	0.001
Age Squared	3.2e-4	1.3e-5
Income Quartile:		
Second	0.143	0.011
Third	0.259	0.013
Fourth (highest)	0.397	0.017
Education to age:		
15-18 years old	0.060	0.009
≥ 19 years old	0.134	0.013
Still Studying	0.159	0.022
Marital Status:		
Married	0.156	0.010
Divorced	-0.269	0.017
Separated	-0.328	0.025
Widowed	-0.145	0.013
Number of children:		
1	-0.032	0.008
2	-0.042	0.010
≥ 3	-0.094	0.016
Countries:		
Belgium	0.498	0.051
Netherlands	0.887	0.022
Germany	0.363	0.023
Italy	-0.110	0.034
Luxembourg	0.756	0.026
Denmark	1.206	0.032
Ireland	0.590	0.043
Britain	0.533	0.019
Greece	-0.187	0.043
Spain	0.205	0.020
Portugal	-0.234	0.037

Notes: Number of Observations 271,224. Log-likelihood=-276,101. $Chi^2(50)$=10,431. Cut1=-1.67, Cut2=-0.80, Cut3=0.87. The regression includes year dummies from 1975 to 1992. The base country is France. The exact question for the dependent variable is: *"On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?"*

Table 3
Happiness Equation for Europe, Ordered Probit: 1975 to 1986.

Dependent Variable: Reported Happiness	Coefficient	Standard Error
Unemployed	-0.390	0.023
Self employed	0.038	0.016
Retired	0.060	0.020
Home	0.060	0.015
School	-0.015	0.031
Male	-0.067	0.013
Age	-0.035	0.002
Age Squared	3.6e-4	1.9e-5
Income Quartile:		
Second	0.131	0.014
Third	0.259	0.017
Fourth (highest)	0.378	0.019
Education to age:		
15-18 years	0.025	0.012
≥ 19 years	0.076	0.019
Marital Status:		
Married	0.249	0.017
Divorced	-0.291	0.027
Separated	-0.398	0.040
Widowed	-0.197	0.021
Number of children:		
1	-0.033	0.012
2	-0.041	0.016
≥ 3	-0.111	0.027
Countries:		
Belgium	0.559	0.054
Netherlands	0.850	0.023
Germany	0.146	0.017
Italy	-0.366	0.048
Luxembourg	0.389	0.037
Denmark	0.656	0.052
Ireland	0.548	0.053
Britain	0.360	0.027
Greece	-0.467	0.058
Spain	0.132	0.028
Portugal	-0.179	0.040

Notes: Number of Observations=103,990. Log-likelihood=-92,127. $Chi^2(42)$=4,575. Cut1=-1.21, Cut2=-0.59. The regression includes year dummies from 1975 to 1992. The base country is France. The exact question for the dependent variable is: *"Taking all things together, how would you say you are these days - would you say you're very happy, fairly happy, or not too happy these days?"*

Table 4
Happiness Equation for the United States, Ordered Probit: 1972 to 1994.

Dependent Variable: Reported Happiness	Coefficient	Standard Error
Unemployed	-0.379	0.041
Self Employed	0.074	0.023
Retired	0.036	0.031
Home	0.005	0.023
School	0.176	0.055
Other	-0.227	0.067
Male	-0.125	0.016
Age	-0.021	0.003
Age Squared	2.8e-4	3.0e-5
Income Quartile:		
Second	0.161	0.022
Third	0.279	0.023
Fourth (highest)	0.398	0.025
Education:		
High School	0.091	0.019
Associate/ Junior College	0.123	0.040
Bachelor's	0.172	0.027
Graduate	0.188	0.035
Marital Status:		
Married	0.380	0.026
Divorced	-0.085	0.032
Separated	-0.241	0.046
Widowed	-0.191	0.037
Number of children:		
1	-0.112	0.025
2	-0.074	0.024
≥ 3	-0.119	0.024

Notes: Number of Observations 26,668. Log-likelihood= -23941.869. $Chi^2(50)$= 2269.64. Cut1=-1.217, Cut2=-0.528. The regression includes year dummies from 1972 to 1994. The exact question for the dependent variable is: "*Taken all together, how would you say things are these days Would you say you are very happy, pretty happy, or not too happy?"*.

Table 5a
Summary Statistics, 12 European Nations: 1975 to 1992.

	Obs	Mean	Std. Dev	Min	Max
Reported Life Satisfaction	271,224	2.035	0.778	0	3
GDP per capita (US$ 1985)	190	7,809	2,560	2,145	12,415
Δ GDP per capita	190	244	234	-968	902
Benefit replacement rate	190	0.302	0.167	0.003	0.631
Inflation rate	190	0.079	0.056	-0.007	0.245
Unemployment rate	190	0.086	0.037	0.006	0.211

Table 5b
Correlation Coefficients, 12 European Nations: 1975 to 1992.

	Reported Life Satisfaction	GDP per capita (US$ '85)	Δ GDP per capita	Benefit replacement rate	Inflation rate
Reported Life Satisfaction	1				
GDP per capita (US$ '85)	0.209	1			
Δ GDP per capita	0.056	0.278	1		
Benefit replacement rate	0.281	0.471	0.111	1	
Inflation rate	-0.161	-0.659	-0.379	-0.521	1
Unemployment rate	-0.023	-0.151	0.062	-0.016	-0.230

Table 6: Life Satisfaction and GDP, Ordered Probit Regressions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GDP per capita	**1.094 (0.335)**			1.220 (0.763)		
GDP per capita (-1)		**0.927 (0.357)**		0.575 (1.283)		
GDP per capita (-2)			0.640* (0.389)	-0.875 (0.870)		
Δ GDP per capita					0.953 (0.719)	
Δ GDP per capita (-1)						**1.761 (0.780)**
Personal Characteristics						
Unemployed	**-0.502 (0.020)**	**-0.503 (0.019)**	**-0.504 (0.019)**	**-0.502 (0.020)**	**-0.505 (0.020)**	**-0.504 (0.020)**
Self employed	**0.062 (0.011)**	**0.061 (0.011)**	**0.061 (0.012)**	**0.061 (0.012)**	**0.060 (0.012)**	**0.060 (0.012)**
Retired	**0.068 (0.014)**	**0.068 (0.014)**	**0.068 (0.014)**	**0.068 (0.014)**	**0.067 (0.014)**	**0.068 (0.014)**
Home	**0.036 (0.009)**	**0.036 (0.009)**	**0.036 (0.009)**	**0.036 (0.009)**	**0.036 (0.009)**	**0.036 (0.009)**
School	0.014 (0.020)	0.015 (0.020)	0.014 (0.020)	0.014 (0.020)	0.011 (0.020)	0.012 (0.020)
Male	**-0.067 (0.007)**	**-0.067 (0.007)**	**-0.066 (0.007)**	**-0.067 (0.007)**	**-0.066 (0.007)**	**-0.066 (0.007)**
Age	**-0.028 (0.001)**	**-0.028 (0.001)**	**-0.028 (0.001)**	**-0.028 (0.001)**	**-0.028 (0.001)**	**-0.028 (0.001)**
Age Squared	**3.1e-4 (1.3e-5)**	**3.1e-4 (1.3e-5)**	**3.2e-4 (1.3e-5)**	**3.1e-4 (1.3e-5)**	**3.2e-4 (1.3e-5)**	**3.1e-4 (1.3e-5)**
Income Quartile: Second	**0.144 (0.011)**	**0.144 (0.011)**	**0.144 (0.011)**	**0.144 (0.011)**	**0.143 (0.011)**	**0.143 (0.011)**
Third	**0.261 (0.013)**	**0.260 (0.013)**	**0.260 (0.013)**	**0.261 (0.013)**	**0.259 (0.013)**	**0.260 (0.014)**
Fourth (highest)	**0.398 (0.017)**	**0.398 (0.017)**	**0.398 (0.017)**	**0.397 (0.017)**	**0.397 (0.017)**	**0.397 (0.017)**
Education to age: 15-18 years old	**0.061 (0.009)**	**0.061 (0.009)**	**0.061 (0.009)**	**0.061 (0.009)**	**0.061 (0.009)**	**0.061 (0.009)**
≥ 19 years old	**0.134 (0.013)**	**0.134 (0.013)**	**0.133 (0.013)**	**0.135 (0.013)**	**0.135 (0.013)**	**0.136 (0.013)**
Marital Status: Married	**0.156 (0.010)**	**0.156 (0.010)**	**0.156 (0.010)**	**0.156 (0.010)**	**0.156 (0.010)**	**0.156 (0.010)**
Divorced	**-0.269 (0.017)**	**-0.269 (0.017)**	**-0.269 (0.017)**	**-0.269 (0.017)**	**-0.269 (0.017)**	**-0.269 (0.017)**
Separated	**-0.328 (0.025)**	**-0.328 (0.025)**	**-0.327 (0.025)**	**-0.329 (0.024)**	**-0.328 (0.025)**	**-0.329 (0.024)**
Widowed	**-0.144 (0.013)**	**-0.144 (0.013)**	**-0.144 (0.013)**	**-0.144 (0.013)**	**-0.145 (0.013)**	**-0.145 (0.013)**
Number of children: 1	**-0.032 (0.008)**	**-0.032 (0.008)**	**-0.032 (0.008)**	**-0.032 (0.008)**	**-0.032 (0.008)**	**-0.032 (0.008)**
2	**-0.043 (0.010)**	**-0.042 (0.010)**	**-0.042 (0.010)**	**-0.042 (0.010)**	**-0.043 (0.010)**	**-0.042 (0.010)**
≥ 3	**-0.095 (0.016)**	**-0.094 (0.016)**	**-0.094 (0.016)**	**-0.095 (0.016)**	**-0.094 (0.016)**	**-0.094 (0.016)**
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time Trends	No	No	No	No	No	No
Pseudo-R^2	0.08	0.08	0.08	0.08	0.08	0.08
Number of Observations	271,224	271,224	271,224	271,224	271,22	271,224

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level; * at 10 per cent level. [3] Cut points (standard errors) are -0.70 (0.30), 0.18 (0.31), 1.84 (0.31) for reg. (1); -0.86 (0.32), 0.01 (0.32), 1.68 (0.32) for reg. (2); -1.13 (0.34), -0.26 (0.34), 1.41 (0.34) for reg. (3); -0.84 (0.34), 0.04 (0.34), 1.70 (0.34) for reg. (4); -1.65 (0.07), -0.77 (0.07), 0.89 (0.07) for reg. (5); -1.63 (0.07), -0.76 (0.07), 0.91 (0.07) for reg. (6). [4] GDP is scaled by a factor of 10,000.

Table 7
Life Satisfaction and GDP, with Country-Specific Time Trends,
Ordered Probit Regressions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GDP per capita	**1.031 (0.455)**			1.133* (0.626)		
GDP per capita (-1)		0.301 (0.500)		0.654 (0.888)		
GDP per capita (-2)			-0.801 (0.492)	**-1.652 (0.716)**		
Δ GDP per capita					**1.390 (0.552)**	
Δ GDP per capita (-1)						**1.920 (0.620)**
Personal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time Trends	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.09	0.09	0.09	0.09	0.08	0.08
Number of Observations	271,224	271,224	271,224	271,224	271,224	271,224

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level; * at 10 per cent level. [3] Cut points (standard errors) are -1.37 (0.43), -0.49 (0.43), 1.18 (0.43) for reg. (1); -1.01 (0.42), -0.13 (0.42), 1.54 (0.42) for reg. (2); -0.51 (0.42), 0.37 (0.42), 2.04 (0.42) for reg. (3); -0.69 (0.40), 0.19 (0.40), 1.86 (0.41) for reg. (4); -0.96 (0.37), -0.08 (0.37), 1.59 (0.37) for reg. (5); -0.82 (0.30), 0.06 (0.30), 1.73 (0.30) for reg. (6). [4] GDP is scaled by a factor of 10,000.

Table 8
Life Satisfaction and Macroeconomic Variables, Ordered Probit Regressions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GDP per capita	**1.408 (0.361)**	1.305* (0.784)		**1.132 (0.552)**	1.020 (0.668)	
GDP per capita (-1)		0.576 (1.305)			0.628 (0.890)	
GDP per capita (-2)		-0.561 (0.842)			**-1.455 (0.698)**	
GDP per capita			0.775 (0.725)			**1.184 (0.583)**
Benefit replacement rate	**1.027 (0.219)**	**1.026 (0.223)**	**0.665 (0.213)**	**0.883 (0.363)**	**0.854 (0.359)**	**0.769 (0.372)**
Unemployment rate	**-1.909 (0.664)**	**-1.845 (0.675)**	**-2.703 (0.694)**	-1.291 (0.823)	**-1.481 (0.722)**	**-1.954 (0.673)**
Inflation rate	**-0.994 (0.464)**	**-0.963 (0.480)**	-0.780 (0.470)	-1.042* (0.585)	-0.804 (0.601)	-0.845 (0.600)
Personal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time	No	No	No	Yes	Yes	Yes
Pseudo-R^2	0.08	0.08	0.08	0.09	0.09	0.09
Number of Observations	271,224	271,224	271,224	271,224	271,224	271,224

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level. * at 10 per cent level. [3] Cut points (standard errors) are -0.31 (0.34), 0.57 (0.35), 2.24 (0.35) for reg. (1); -0.41 (0.37), 0.47 (0.38), 2.14 (0.38) for reg. (2); -1.67 (0.12), -0.80 (0.12), 0.87 (0.12) for reg. (3); -2.39 (0.62), -1.51 (0.62), 0.16 (0.62) for reg. (4); -1.40 (0.61), -0.52 (0.61), 1.15 (0.61) for reg. (5); -1.54 (0.46), -0.66 (0.46), 1.01 (0.46) for reg. (6). [4] GDP is scaled by a factor of 10,000.

Table 9
Life Satisfaction Regressions and Exogeneity, Ordered Probit Regresions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GDP per capita (-1)	**1.275** **(0.361)**	**2.315** **(0.826)**		0.521 (0.503)	**1.518** **(0.680)**	
GDP per capita (-2)		-2.025 (1.357)			-1.471 (0.957)	
GDP per capita (-3)		0.987 (0.805)			-0.421 (0.606)	
GDP per capita (-1)			**1.608** **(0.713)**			**1.771** **(0.549)**
Benefit replacement rate (-1)	**0.907** **(0.235)**	**0.911** **(0.235)**	**0.592** **(0.217)**	**1.238** **(0.375)**	**1.249** **(0.384)**	**1.254** **(0.389)**
Unemployment rate (-1)	**-1.659** **(0.726)**	**-1.765** **(0.688)**	**-2.426** **(0.709)**	-0.929 (0.746)	-1.314 (0.703)	-1.188* (0.637)
Inflation rate (-1)	**-0.718** **(0.313)**	**-0.712** **(0.333)**	-0.550* (0.322)	-0.633* (0.375)	-0.417 (0.372)	-0.464 (0.360)
Personal Characteristics						
Male	**-0.019** **(0.007)**	**-0.019** **(0.007)**	**-0.019** **(0.007)**	**-0.018** **(0.007)**	**-0.019** **(0.007)**	**-0.019** **(0.007)**
Age	**-0.014** **(0.001)**	**-0.014** **(0.001)**	**-0.014** **(0.001)**	**-0.014** **(0.001)**	**-0.014** **(0.001)**	**-0.014** **(0.001)**
Age Squared	**1.4e-4** **(1.2e-5)**	**1.4e-4** **(1.2e-5)**	**1.4e-4** **(1.2e-5)**	**1.4e-4** **(1.2e-5)**	**1.4e-4** **(1.1e-5)**	**1.4e-4** **(1.2e-5)**
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time Trends	No	No	No	Yes	Yes	Yes
Pseudo-R^2	0.06	0.06	0.06	0.06	0.07	0.07
Number of Observations	271,224	271,224	271,224	271,224	271,224	271,224

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level. * at 10 per cent level. [3] Cut points (standard errors) are -0.48 (0.36), 0.36 (0.36), 1.98 (0.37) for reg. (1); -0.48 (0.38), 0.36 (0.39), 1.99 (0.39) for reg. (2); -1.69 (0.10), -0.85 (0.10), 0.77 (0.10) for reg. (3); -2.41 (0.53), -1.56 (0.53), 0.06 (0.53) for reg. (4); -1.70 (0.55), -0.85 (0.55), 0.77 (0.55) for reg. (5); -2.19 (0.36), -1.34 (0.37), 0.28 (0.37) for reg. (6). [4] GDP is scaled by a factor of 10,000.

Table 10
Life Satisfaction of the Employed, Unemployed and the Well-being Gap, Ordered Probit Regressions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**Employed (1)**	**Unemployed (2)**	**The Gap (3)**	**Employed (4)**	**Unemployed (5)**	**The Gap (6)**
GDP per capita	**1.418**	1.053*	0.208			
	(0.439)	(0.614)	(0.714)			
Δ GDP per capita				1.028	0.991	0.084
				(0.853)	(1.110)	(1.249)
Benefit replacement rate	**1.248**	**1.438**	-0.385	**0.910**	**1.227**	-0.480
	(0.268)	**(0.408)**	(0.510)	**(0.247)**	**(0.395)**	(0.497)
Unemployment rate	**-1.660**	**-3.046**	1.788	**-2.486**	**-3.573**	1.573
	(0.747)	**(1.096)**	(1.256)	**(0.778)**	**(1.033)**	(1.177)
Inflation rate	**-1.388**	**-1.602**	0.422	**-1.117**	-1.551*	0.634
	(0.508)	**(0.809)**	(0.836)	**(0.506)**	(0.857)	(0.871)
Personal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time Trends	No	No	No	No	No	No
Pseudo-R^2	0.09	0.06	0.10	0.09	0.06	0.09
Number of Observations	136,570	12,493	149,063	136,570	12,493	149,063

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level. * at 10 per cent level. [3] Cut points (standard errors) are -0.27 (0.42), 0.63 (0.43), 2.38 (0.43) for reg. (1); -0.58 (0.65), 0.31 (0.65), 1.70 (0.65) for reg. (2); -0.33 (0.42), 0.56 (0.42), 2.28 (0.43) for reg. (3); -1.71 (0.13), -0.81 (0.13), 0.94 (0.13) for reg. (4); -1.58 (0.23), -0.69 (0.23), 0.70 (0.23) for reg. (5); -1.69 (0.13), -0.80 (0.13), 0.92 (0.13) for reg. (6). [4] GDP is scaled by a factor of 10,000. [5] The Gap equations are derived by combining the samples of employed and unemployed people, and then estimating a life satisfaction equation in which, as well as the usual microeconomic regressors, a set of interaction terms are included. These interact a dummy for being unemployed with each of the independent variables. The reported coefficients, in columns 3 and 6, are the coefficients on those interaction terms.

Table 11
Life Satisfaction Regressions by Employment Status, with Country-Specific Time Trends, Ordered Probit Regressions, Europe: 1975 to 1992.

Dependent Variable: Reported Life Satisfaction	**Employed (1)**	**Unemployed (2)**	**The Gap (3)**	**Employed (4)**	**Unemployed (5)**	**The Gap (6)**
GDP per capita	**1.394**	**2.473**	-0.133			
	(0.642)	**(0.911)**	(0.999)			
Δ GDP per capita				**1.463**	1.592	-0.294
				(0.708)	(1.061)	(1.213)
Benefit replacement rate	**1.068**	**1.403**	-0.477	**0.915**	**1.061**	-0.253
	(0.443)	**(0.536)**	(0.728)	**(0.442)**	**(0.539)**	(0.719)
Unemployment rate	-0.858	-2.233*	1.683	**-1.709**	**-4.093**	**2.880**
	(0.969)	(1.248)	(1.415)	**(0.785)**	**(1.058)**	**(1.210)**
Inflation rate	**-1.540**	-1.498*	0.162	**-1.295**	-1.096	-0.035
	(0.642)	(0.845)	(0.718)	**(0.658)**	(0.880)	(0.746)
Personal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Specific Time	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.09	0.06	0.10	0.09	0.06	0.10
Number of Observations	136,570	12,493	149,063	136,570	12,493	149,063

Notes: [1] Standard errors in parentheses. [2] Bold-face is significant at the 5 per cent level. * at 10 per cent level. [3] Cut points (standard errors) are –2.76 (0.69), -1.86 (0.69), -0.11 (0.69) for reg. (1); -3.53 (1.15), -2.63 (1.15), -1.24 (1.15) for reg. (2); -2.73 (0.68), -1.84 (0.68), -0.12 (0.68) for reg. (3); -1.70 (0.48), -0.80 (0.48), 0.95 (0.48) for reg. (4); -1.61 (1.06), -0.72 (1.07), 0.67 (1.07) for reg. (5); -1.68 (0.48), -0.79 (0.48), 0.93 (0.48) for reg. (6). [4] GDP is scaled by a factor of 10,000.

Appendix

Table A1: Life Satisfaction Equations in European Nations (Ordered Probits), 1975 to 1992.

Dependent Variable: Reported Life Satisfaction		**U.K.**	**France**	**Germany**	**Italy**
Unemployed		-0.591 (0.035)	-0.258 (0.028)	-0.421 (0.036)	-0.538 (0.033)
Self employed		0.034 (0.029)	0.122 (0.026)	0.023 (0.029)	0.065 (0.021)
Retired		0.113 (0.027)	0.351 (0.030)	0.079 (0.027)	0.057 (0.027)
Home		-3.5e-4 (0.022)	0.149 (0.022)	0.024 (0.022)	0.010 (0.022)
School		0.051 (0.046)	0.245 (0.034)	0.027 (0.033)	0.031 (0.031)
Male		-0.104 (0.017)	-0.060 (0.015)	-0.029 (0.016)	0.012 (0.016)
Age		-0.027 (0.003)	-0.026 (0.003)	-0.008 (0.003)	-0.032 (0.003)
Age squared		3.3e-4 (2.9e-5)	3.0e-4 (3.0e-5)	1.2e-4 (2.9e-5)	3.2e-4 (2.9e-5)
Income quartiles:	Second	0.225 (0.023)	0.213 (0.020)	0.186 (0.020)	0.184 (0.019)
	Third	0.368 (0.024)	0.371 (0.021)	0.319 (0.021)	0.297 (0.020)
	Fourth (highest)	0.561 (0.026)	0.580 (0.023)	0.452 (0.022)	0.392 (0.021)
Education to age:	15-18 years old	0.035 (0.021)	0.117 (0.018)	0.001 (0.018)	0.044 (0.019)
	≥ 19 years old	0.116 (0.028)	0.243 (0.021)	0.110 (0.023)	0.055 (0.020)
Marital status:	Married	0.153 (0.023)	0.043 (0.022)	0.154 (0.023)	0.210 (0.021)
	Divorced	-0.281 (0.042)	-0.179 (0.043)	-0.330 (0.037)	-0.235 (0.086)
	Separated	-0.347 (0.063)	-0.241 (0.069)	-0.408 (0.076)	-0.250 (0.065)
	Widowed	-0.114 (0.034)	-0.175 (0.036)	-0.078 (0.033)	-0.069 (0.033)
Number of children:	1	-0.101 (0.022)	-0.079 (0.019)	-0.014 (0.021)	-4.27e-4 (0.018)
	2	-0.128 (0.024)	-0.075 (0.023)	-0.027 (0.028)	-0.004 (0.025)
	≥ 3	-0.199 (0.037)	-0.169 (0.033)	-0.046 (0.049)	-0.071 (0.048)
Observations		25,565	28,841	28,151	29,263
cut 1		-1.853 (0.071)	-1.636 (0.069)	-1.944 (0.071)	-1.493 (0.066)
cut 2		-1.087 (0.070)	-0.715 (0.069)	-0.850 (0.069)	-0.511 (0.066)
cut 3		0.556 (0.070)	1.136 (0.069)	1.086 (0.070)	1.206 (0.066)
Log-likelihood		-25968	-29619	-25881	-31872

Note: The regressions include country dummies and year dummies from 1975 to 1992.

Table A1 (Cont'd): Life Satisfaction Equations in European Nations (Ordered Probits), 1975-92.

Dependent Variable: Reported Life Satisfaction		**Belgium**	**Netherlands**	**Denmark**	**Luxembourg**
Unemployed		-0.354 (0.030)	-0.532 (0.032)	-0.444 (0.035)	-0.915 (0.135)
Self employed		-4.1e-4 (0.028)	0.052 (0.033)	0.012 (0.030)	0.015 (0.052)
Retired		0.051 (0.030)	0.101 (0.032)	-0.084 (0.032)	7.84e5 (0.053)
Home		0.073 (0.024)	0.015 (0.023)	0.009 (0.034)	0.071 (0.044)
School		0.003 (0.037)	-0.011 (0.035)	0.039 (0.033)	0.034 (0.068)
Male		-0.045 (0.017)	-0.187 (0.019)	-0.133 (0.016)	-0.083 (0.034)
Age		-0.023 (0.003)	-0.041 (0.003)	-0.029 (0.003)	-0.028 (0.005)
Age squared		2.4e-4 (2.9e-5)	4.5e-4 (3.2e-5)	3.5e-4 (3.1e-5)	3.6e-4 (5.9e-5)
Income quartiles:	Second	0.131 (0.022)	0.124 (0.021)	0.097 (0.024)	0.236 (0.038)
	Third	0.262 (0.024)	0.281 (0.022)	0.260 (0.027)	0.395 (0.040)
	Fourth (highest)	0.370 (0.026)	0.459 (0.023)	0.433 (0.028)	0.452 (0.041)
Education to age:	15-18 years old	0.045 (0.019)	0.071 (0.020)	0.059 (0.021)	0.016 (0.039)
	≥ 19 years old	0.092 (0.023)	0.064 (0.023)	0.091 (0.023)	0.050 (0.047)
Marital status:	Married	0.085 (0.024)	0.169 (0.024)	0.147 (0.023)	0.161 (0.042)
	Divorced	-0.340 (0.047)	-0.404 (0.044)	-0.186 (0.040)	-0.190 (0.086)
	Separated	-0.286 (0.053)	-0.670 (0.113)	-0.249 (0.079)	-0.312 (0.125)
	Widowed	-0.233 (0.036)	-0.266 (0.039)	-0.120 (0.036)	-0.188 (0.066)
Number of children:	1	-0.043 (0.021)	-0.026 (0.022)	-0.042 (0.022)	0.040 (0.038)
	2	-0.020 (0.027)	-0.041 (0.023)	-0.034 (0.027)	-0.058 (0.051)
	≥ 3	0.004 (0.041)	-0.080 (0.038)	-0.123 (0.050)	0.036 (0.087)
Observations		25,304	28,118	26,738	8,051
cut 1		-2.350 (0.084)	-2.802 (0.080)	-2.686 (0.078)	-2.073 (0.135)
cut 2		-1.511 (0.083)	-1.972 (0.078)	-1.870 (0.074)	-1.227 (0.131)
cut 3		0.190 (0.082)	-0.199 (0.077)	-0.259 (0.073)	0.504 (0.131)
Log-likelihood		-25233	-24879	-22179	-7460

Note: The regressions include country dummies and year dummies from 1975 to 1992.

Table A1 (Cont'd): Life Satisfaction Equations in European Nations (Ordered Probits): 1975-92.

Dependent Variable: Reported Life Satisfaction		**Ireland**	**Spain**	**Portugal**	**Greece**
Unemployed		-0.607 (0.032)	-0.406 (0.047)	-0.502 (0.062)	-0.280 (0.049)
Self employed		0.094 (0.026)	0.081 (0.039)	0.128 (0.034)	0.027 (0.023)
Retired		0.089 (0.039)	0.153 (0.043)	0.007 (0.043)	0.092 (0.033)
Home		-0.045 (0.028)	0.082 (0.037)	-0.021 (0.035)	0.130 (0.027)
School		0.012 (0.050)	0.022 (0.049)	0.116 (0.051)	0.089 (0.039)
Male		-0.164 (0.023)	0.012 (0.028)	-0.040 (0.024)	-0.007 (0.020)
Age		-0.024 (0.003)	-0.037 (0.004)	-0.034 (0.004)	-0.026 (0.003)
Age squared		3.4e-4 (3.5e-5)	3.8e-4 (4.0e-5)	3.5e-4 (4.2e-4)	2.8e-4 (3.2e-5)
Income quartiles:	Second	0.129 (0.024)	0.132 (0.032)	0.126 (0.033)	0.197 (0.022)
	Third	0.248 (0.025)	0.244 (0.033)	0.213 (0.034)	0.318 (0.024)
	Fourth (highest)	0.485 (0.027)	0.355 (0.036)	0.414 (0.036)	0.490 (0.025)
Education to age:	15-18 years old	0.126 (0.020)	-0.024 (0.031)	0.055 (0.032)	0.105 (0.021)
	≥ 19 years old	0.204 (0.030)	0.021 (0.032)	-0.002 (0.032)	0.155 (0.024)
Marital status:	Married	0.114 (0.023)	0.114 (0.034)	-0.008 (0.034)	0.169 (0.027)
	Divorced	-0.072 (0.257)	-0.055 (0.150)	-0.246 (0.092)	-0.183 (0.073)
	Separated	-0.535 (0.079)	-0.075 (0.100)	-0.334 (0.116)	-0.374 (0.147)
	Widowed	-0.142 (0.038)	-0.157 (0.051)	-0.222 (0.052)	-0.126 (0.043)
Number of children:	1	-0.051 (0.025)	0.003 (0.030)	-0.037 (0.027)	-2.63e-4 (0.022)
	2	-0.070 (0.026)	-0.014 (0.036)	-0.052 (0.036)	-0.001 (0.026)
	≥ 3	-0.104 (0.025)	-0.053 (0.055)	-0.157 (0.059)	0.080 (0.053)
Observations		20,075	10,973	12,497	20,003
cut 1		-2.103 (0.080)	-2.012 (0.103)	-1.803 (0.096)	-1.108 (0.084)
cut 2		-1.423 (0.079)	-0.963 (0.102)	-0.819 (0.096)	-0.314 (0.084)
cut 3		0.102 (0.078)	0.479 (0.102)	1.316 (0.096)	1.004 (0.084)
Log-likelihood		-21029	-12324	-12082	-24879

Note: The regressions include country dummies and year dummies from 1975 to 1992.

Table A2: Means and Standard Deviations for European Life Satisfaction Regression, 1975 to 1992

Dependent Variable:		**Mean**	**Standard Deviation**
Reported Life Satisfaction		3.035	0.778
Independent Variables:			
Unemployed		0.046	0.210
Self Employed		0.098	0.298
Retired		0.167	0.373
Home		0.211	0.408
School		0.072	0.258
Male		0.471	0.499
Age		43.4	17.6
Age Squared		2192	1662
Income Quartiles:	Second	0.248	0.432
	Third	0.256	0.436
	Fourth (highest)	0.253	0.435
Education to age:	15-18 years old	0.390	0.488
	≥ 19 years old	0.203	0.402
Marital Status:	Married	0.630	0.483
	Divorced	0.026	0.159
	Separated	0.010	0.100
	Widowed	0.082	0.274
Number of children:	1	0.156	0.362
	2	0.099	0.299
	≥ 3	0.039	0.193

*** Based on 271,224 observations**

Table A3: Means and Standard Deviations for the U.S. Happiness Regression, 1972 to 1994.

Dependent Variable:		**Mean**	**Standard Deviation**
Reported Happiness		2.211	0.631
Independent Variables:			
Unemployed		0.032	0.175
Self Employed		0.112	0.316
Retired		0.119	0.323
Home		0.164	0.370
School		0.018	0.132
Other		0.011	0.106
Male		0.471	0.499
Age		44.7	16.9
Age Squared		2280	1674
Income Quartiles:	Second	0.240	0.427
	Third	0.266	0.442
	Fourth (highest)	0.266	0.442
Education:	High School	0.523	0.500
	Associate / Junior College	0.040	0.196
	Bachelor's	0.129	0.335
	Graduate	0.058	0.233
Marital Status:	Married	0.612	0.487
	Divorced	0.104	0.305
	Separated	0.033	0.178
	Widowed	0.090	0.286
Number of children:	1	0.158	0.365
	2	0.244	0.430
	≥ 3	0.329	0.470

*** Based on 26,668 observations**

Figure 1: Average Life Satisfaction of Employed and Unemployed Europeans* (based on a random sample of 271,224 individuals).

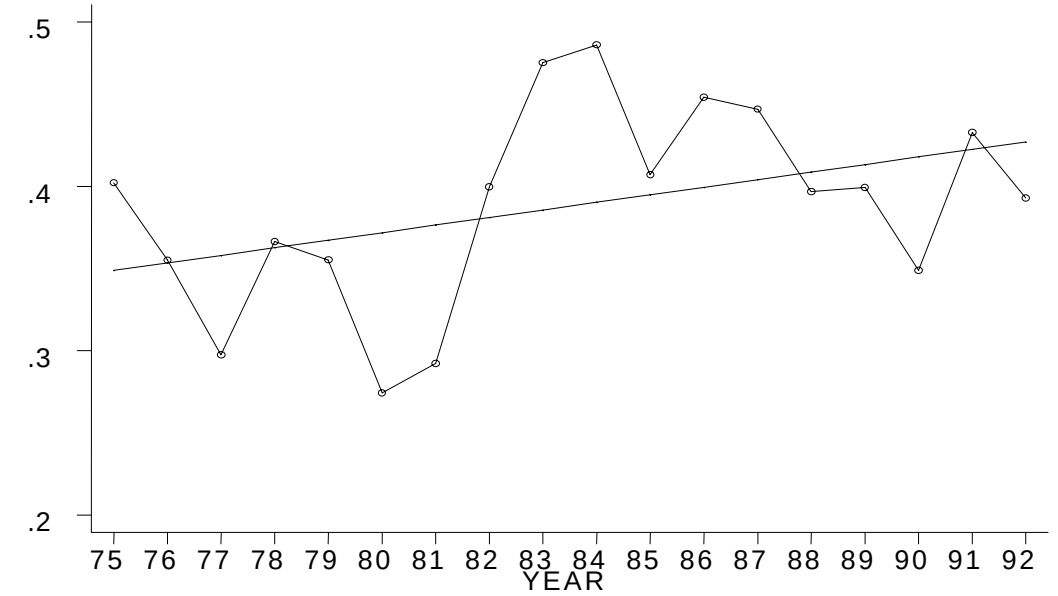

Figure 2: The Life Satisfaction Gap between Employed and Unemployed Europeans with Trend Line Added (based on a random sample of 271,224 individuals).

*The numbers are on a scale where the lowest level of satisfaction is 1 and the highest 4.

Appendix (Continued)

Data Sources

The United States General Social Survey (1972-1994)

The General Social Surveys have been conducted by the National Research Center at the University of Chicago since 1972. Interviews have been undertaken during February, March and April of 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1980, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1993 and 1994. There were no surveys in 1979, 1981 and 1992. There were a total of 32380 completed interviews (1613 in 1972, 1504 in 1973, 1484 in 1974, 1490 in 1975, 1499 in 1976, 1530 in 1977, 1532 in 1978, 1468 in 1980, 1506 in 1982, 354 in 1982 black oversample, 1599 in 1983, 1473 in 1984, 1534 in 1985, 1470 in 1986, 1466 in 1987, 353 in 1987 black oversample, 1481 in 1988, 1537 in 1989, 1372 in 1990, 1517 in 1991, 1606 in 1993 and 2992 in 1994).

The Euro-Barometer Survey Series (1975-1992)

The Euro-Barometer Surveys were conducted by various research firms operated within the European Community (E.C.) countries under the direction of the European Commission. Either a nationwide multi-stage probability sample or a nationwide stratified quota sample of persons aged 15 and over was selected in each of the E.C. countries. The cumulative data file used contains 36 attitudinal, 21 demographic and 10 analysis variables selected from the Euro-Barometers, 3-38. Data for Belgium, France, Germany, Ireland, Italy, Luxembourg, Netherlands and the United Kingdom were available for the full sample period (1975-1992) whereas data were only available from 1981 to 1992 for Greece and from 1985 to 1992 for both Spain and Portugal.

Data Definitions

REPORTED LIFE SATISFACTION: The answer to the Euro-Barometer Survey question that asks, *"On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?"* (The small "Don't know" and "No answer" categories are not studied here).

REPORTED HAPPINESS: The answer to the U.S. General Social Survey and Euro-Barometer questions that ask, *"Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy?"* (Small "Don't know" and "No answer" categories are not studied here).

BENEFIT REPLACEMENT RATE: The OECD index of (pre-tax) replacement rates (unemployment benefit entitlements divided by the corresponding wage. It attempts to captures the situation of a representative or average individual. Consequently, the unweighted mean of 18 numbers based on the following scenarios is determined (1) three unemployment durations (for persons with a long record of previous employment); the first year, the second and third years, and the fourth and fifth years of employment (2) three family and income situations: a single person, a married person with a dependent spouse, and a married person with a spouse in work; and (3) two different levels of previous earnings: average and two-thirds of average earnings (For further details see the OECD Jobs Study (1994)). Since this index was calculated only for odd-numbered years, for even-numbered years we made a linear interpolation.

UNEMPLOYMENT RATE: The standardised unemployment rate from the CEP OECD Data set.

INFLATION RATE: The inflation rate as measured by the rate of change in consumer prices, from CEP OECD Data Set.

GDP PER CAPITA: Real GDP per capita at the price levels and exchange rates of 1985 (in U.S. dollars) from OECD National Accounts (1997).

ΔGDP PER CAPITA: *GDP PER CAPITA* minus *GDP PER CAPITA (-1).*

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