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**Does Relative Income Matter?  
Are the Critics Right?<sup>1</sup>**

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## **Abstract**

Do other peoples' incomes reduce the happiness which people in advanced countries experience from any given income? And does this help to explain why in the U.S., Germany and some other advanced countries, happiness has been constant for many decades? The answer to both questions is 'Yes'. We provide 4 main pieces of evidence. 1) In the U.S. General Survey (repeated samples since 1972) comparator income has a negative effect on happiness equal in magnitude to the positive effect of own income. 2) In the West German Socio-Economic Panel since 1984 the same is true but with life-satisfaction as the dependant variable. We also use the Panel to compare the effect of income comparisons and of adaptation as factors explaining the stable level of life-satisfaction: income comparisons emerge as much the more important. 3) When in our U.S. analysis we introduce "perceived" relative income as a potential explanatory variable, its effect is as large as the effect of actual relative income – further supporting the view that comparisons matter. 4) Finally, for a panel of European countries since 1973 we estimate the effect of average income upon average life-satisfaction, splitting income into two components: trend and cycle. The effect of trend income is small and ill-defined. Our conclusions relate to time series and to advanced countries only. They differ from those drawn in recent studies by Deaton and Stevenson/Wolfers, but those studies are largely cross-sectional and mostly include non-advanced as well as advanced countries.

Keywords: [Easterlin Paradox](#), [happiness](#), [relative income](#), [growth](#)

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In the USA happiness has been roughly constant since the early 1950s, despite massive income growth. The same is true in Europe's leading economy, (West) Germany, since their records began in the 1970s. At the same time evidence has accumulated that people in advanced countries care a lot about their income relative to other people. This has led to the following hypothesis **about advanced countries**:

- (i) Higher individual income produces a substantial increase in individual happiness, other things equal.
- (ii) Higher average income in a country produces much less increase in average happiness, and
- (iii) Individuals care greatly about their income relative to others (which makes (i) and (ii) consistent with each other).

One could well call this the Easterlin hypothesis,<sup>2</sup> but we shall not do so in order to emphasise that we are only concerned with the advanced countries of North America and Western Europe. What people in these countries want to know is: How far is general income growth (beyond income levels already achieved) likely to increase average happiness? This is a question about **time series** relationships. Even with time series evidence it is not easy to isolate the causal effects of income growth. But with cross-sectional evidence it is even more difficult to do so, since income differences across countries are so highly correlated with differences in institutions and cultures.<sup>3</sup> If we use time-series data it is much easier to control for these other influences on happiness. So this paper is about the **time series in advanced countries**.

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<sup>2</sup> Easterlin (1974).

<sup>3</sup> For the effects of institutional and cultural factors on the average happiness in different countries see for example Helliwell (2003, 2008 and this volume), Inglehart and Klingeman (2000) and Inglehart et al (2008).

Fortunately, there is enough evidence about these countries for us to make well-founded statements about the income-happiness relationship there, without bringing in evidence about poorer countries where the relationship may be very different. Despite this, the hypothesis with which we began has been sharply criticised in two interesting and influential papers by Deaton (2007) and Stevenson/Wolfers (2008), in which the main weight of evidence comes from countries poorer than those in North America and Western Europe and in which much of the evidence is cross-sectional. The conclusion of these studies is summed up by Stevenson/Wolfers as follows: “our evidence is consistent with the view that only absolute income matters to happiness. Indeed, whereas previous analyses of the link between income and happiness suggested a *prima facie* case for relative income playing a dominant role, our updated analysis finds no such case.”<sup>4</sup>

The purpose of this paper is to present the evidence (mainly time-series) that relative income matters in advanced countries, and finally to ask whether the additional evidence presented by Deaton and Stevenson/Wolfers is sufficient to outweigh the other evidence.

In what follows we therefore present our own analysis of the USA, West Germany and other West European countries. We also review other evidence in favour of the relative income hypothesis. Finally we turn to Deaton and Stevenson/Wolfers, and we conclude that their evidence is too weak to overthrow the weight of other evidence.

Throughout the paper we standardise the measures of happiness/life-satisfaction, so that they run from 0 to 10 (with intermediate replies equally spaced in between). This is the procedure we adopted in our previous cross-sectional study of the effects of individual income on individual happiness within countries. From a wide range of population surveys we found very similar coefficients, with a unit rise in log income raising happiness by 0.6 units on average.<sup>5</sup> This is the standard against which we can compare country-level time-series effects. For advanced countries they are very much lower, as we shall see.

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<sup>4</sup> Stevenson and Wolfers (2008), p.29.

<sup>5</sup> Layard et al (2008). We found coefficients like 0.61 for the World Values Survey and 0.60 for the European Social Survey. Similar results are reported below for the U.S. General Social Survey and the German Socio-Economic Panel.

# 1. USA

We begin with the USA. The USA is not of course just “one data point” in a large number of countries.<sup>6</sup> It includes 50 states, many of them larger than separate countries. It is a large proportion of the advanced world, and people in other countries look to it as important evidence about their own futures. In social science, U.S. evidence alone is regularly treated as sufficient for developing major propositions.

## **Aggregate data 1950-now**

Happiness in the USA has not risen since 1950, despite massive income growth. From 1950-1973 (a period not covered by Stevenson/Wolfers) income growth was especially rapid (Figure1). Yet happiness failed to rise over that period, and has not risen since.<sup>7</sup>

The happiness data are shown in Figure 2. From 1950 to 1970 we have nine observations from the American Institute of Public Opinion (Gallup) which asked the question:

“In general, how happy would you say you are – very happy, fairly happy, or not too happy?”

From 1963 to 1976 we have 7 observations from NORC which asked the question:

“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?”

And from 1972 to 2006 we have 26 observations from the General Social Survey which asked the same question as NORC.<sup>8</sup> As throughout this paper, we score the data by treating the highest answer as 10, the lowest as 0 and the others as equally spaced in between. The figure shows the average score in each year. For all three surveys there is a downward time trend.

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<sup>6</sup> Stevenson and Wolfers (2008), p.24

<sup>7</sup> Smith (1979) surveys in detail the data up to 1977 and concludes that “with the effects of variant wordings, seasons and contexts taken into consideration, it appears that happiness rose from the late forties to the late fifties, then fell until the early seventies.”

<sup>8</sup> The average sample size each year was 1,900 for AIPO; 1,400 for NORC; and 1,950 for the GSS.

When considering the period since 1973, Stevenson/Wolfers quite rightly draw attention to the growing inequality in that period (see Figure3) which means that the average of log income grows more slowly than the log of average income. But this is not sufficient to explain why average happiness is declining. To examine this, the obvious strategy is to look at the richest two quintiles of income where income rose substantially: even they experienced no rise in happiness (see Table 1 and Figure 4). Moreover, in the earlier period (1950-1970), inequality was falling and yet happiness failed to rise.

From this analysis one concludes that growing national income is not a sufficient condition for happiness to grow. One cannot say that growing income had no positive effect on happiness – it might have been outweighed by other negatives<sup>9</sup>. But, in reflecting on why growing income had so little effect, it is reasonable to ask if one reason was the importance of relative income.

### Individual data 1972 – now

To investigate this hypothesis we can use the individual data from the General Social Survey over the years since 1972.<sup>10</sup> For each individual we have one observation which tells us inter alia

- H happiness (very happy=10, pretty happy=5, not too happy=0)
- Y household real income per adult<sup>11</sup>
- $\bar{Y}$  average Y in same household type in same year
- R relative income as perceived by the individual<sup>12</sup> (well above average = 10, above average = 7.5, average = 5, below average = 2.5, well below average = 0)
- X age, age<sup>2</sup>, sex, marital status, employment status

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<sup>9</sup> See for example Layard (2005, pp 34-35) which guesses that higher income brought some benefits which were outweighed by deteriorating human relationships. See also Bartolini et al (2008) who trace how declining social capital reduced happiness.

<sup>10</sup> This is an updated version of Layard (2005) Annex 4.1 (1). The data are corrected in the ways described by Stevenson/Wolfers, though these corrections do not substantially affect the results.

<sup>11</sup> We ignore children (since they are a choice variable) and treat 1 adult as 1 unit, 2 adults as 1.6 units, and 3 adults as 2.1 units. We exclude households with over 3 people. Income is gross income.

<sup>12</sup> The question is: "Compared with other American families in general, would you say your family income is far below average, below average, average, above average, or far above average?"

To clarify the analysis, we confine it to whites aged 30-55; and, to reduce the effects of measurement error, we omit observations where reported income is in the top and bottom 5% of the range.<sup>13</sup> Controls (X) are always included.

We then use these data to explain individual happiness (see Table 2). First we include only the log of income (plus controls). It attracts a coefficient of 0.58. As we have said, this is the typical size of coefficient that emerges in the average country from a cross-sectional regression of happiness or life-satisfaction upon log income (when happiness/life satisfaction is scaled to the range 0-10).

This is a big effect. But what happens if we now introduce comparator income, measured by the average income in the same year in the same type of household. Log comparator income has an effect of  $-0.69$ . In other words relative income has an effect of 0.69 on life satisfaction, and the estimated effect of absolute income is negative. Even if a time trend is introduced into the equation, the effect of absolute income is barely above zero.<sup>14</sup>

Regression results can of course be a fluke, and we know little about exactly how people estimate comparator income. But fortunately the GSS asks respondents another key question - about how they **perceive** their position in the income distribution (well above average, above average, average, below average, or well below average). This adds enormously to the plausibility of the analysis because it directly measures cognition. When this variable (R) is introduced (column (3)), it proves highly significant. This is important evidence in favour of the view that individual happiness really does depend on relative

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<sup>13</sup> In the GSS, income is reported in bands, to each of which we assign values by the method used by Stevenson/Wolfers. To determine the 10% of outliers we regress income on the normal explanatory variables and select the outliers on the basis of the residuals. However, including them produces similar but less well-defined results. In our later analysis of Germany we have precise income data and include all respondents. Excluding the 10% of outliers in Germany produces similar but less well-defined results.

<sup>14</sup> The coefficients on  $\log Y$  and  $\log \bar{Y}$  are 0.58 (0.05) and  $-0.57$  (0.59). In this regression the time trend is completely insignificant at  $-0.001$  (0.007).

income as people experience it. And at the same time as it is introduced, the estimated effect of absolute income becomes even more negative.<sup>15</sup>

### **Financial satisfaction**

This gives us a coherent understanding of the overall US time series (even though we do not have time series for individuals).<sup>16</sup> This understanding is enhanced when we look at specifically economic sources of life-satisfaction. In the GSS, respondents are asked ‘Would you say you are pretty well satisfied with your present financial situation, more or less satisfied, or not satisfied at all?’

If people cared only about absolute income, they would have become more satisfied with their financial position as they became richer. But in fact the level of financial satisfaction has fallen somewhat (see Figure 5). Regression analysis shows that one reason for this is again the powerful influence of perceived relative income. As Table 3 shows, own income has a strong influence on financial satisfaction. But when comparator income  $\bar{Y}$  is introduced in Column (2), it becomes clear that comparator income is a major part of the story. If we go further and introduce perceived relative income (R), the position becomes even more clear. In this analysis the beta-coefficient on R is as large as that on absolute income. This is remarkable when one considers how crude the 5-point measure of perceived relative income is, compared with the measurement of absolute income.

We can end the U.S. story with a famous Gallup finding. For many years Gallup asked their respondents ‘What is the smallest amount of money a family of four needs to get along in this community?’ As Figure 6 shows, the answers moved clearly in line with average real incomes in the community. This supports the idea that people have a mental concept of an income norm, which rises with general levels of living.

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<sup>15</sup> If, to allow for dynamics, we introduce dummy variables to allow for whether income grew, was constant, or fell, then the coefficient on absolute income becomes -0.17 while that on relative income is unaffected.

<sup>16</sup> See footnote 13.



## 2. WEST GERMANY

We can turn now to the leading European economy, which also has the advantage of a longitudinal panel beginning in 1984 and providing our study with 81,000 person-year observations.<sup>17</sup> Figure 7 shows average life satisfaction among those aged 30-55 in the panel, together with average life satisfaction for all adults in Eurobarometer. As can be seen, there has been no rise in average life satisfaction in either survey. Meantime real income rose sharply (Figure 8).

To estimate the determinants of life satisfaction at the individual level, we first proceed exactly as we did with the GSS, ignoring the panel features of the data. The comparator income is taken as that in the same age/sex/education group.<sup>18</sup> The results are in Table 4. In columns (1) and (2) we repeat the analyses in the first two columns of the U.S. table, with remarkably similar results. The effect of absolute log income taken on its own is once again around 0.5, but it becomes negative when relative income is introduced. Even if a time trend is introduced, the effect of relative income remains twice as large as that of absolute income.<sup>19</sup>

But these estimates are vulnerable to other possible unmeasured characteristics of individuals which are correlated with income and with life satisfaction. We can deal with this problem by exploiting the panel features of the data and including both an individual fixed effect and state/year dummies to explain each observation. The results are shown in columns (3) and (4) of Table 4. When log income is included on its own, it attracts a reduced coefficient of 0.33 – lower than the original cross-sectional estimate but still quite high. However, when comparator income is introduced, relative income has a coefficient of 0.29 while the effect of absolute income falls to 0.04 (0.33 minus 0.29). This seems to provide a good explanation of why average happiness has not risen in response to rises in absolute income.

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<sup>17</sup> The life satisfaction question was: “In conclusion we would like to ask you about your satisfaction with your life in general. Please answer according to the following scale: 0 means completely dissatisfied and 10 means completely satisfied. How satisfied are you with your life, all things considered?”

<sup>18</sup> A more detailed comparator group is possible than in the GSS due to larger sample size.

<sup>19</sup> The coefficients on  $\log Y$  and  $\log \bar{Y}$  are 0.54 (.01) and -0.35 (.08). In this regression the trend has a coefficient of -0.009 (0.001).

## **Adaptation versus social comparisons**

However there is another possible explanation – adaptation. Psychologists in particular tend to favour this explanation. We can use the German panel data to examine the size of the effects of adaptation and social comparison. This is done in columns (5) and (6) of the table. Column (5) ignores the possible effects of social comparisons. It shows that, if we include lagged income over the previous three years, the three lagged income terms have a total effect of -0.07, implying that the long-run effect of own income is about four fifths of the short-term effect.<sup>20</sup>

This provides a small contribution to explaining why happiness has not risen as income has risen. But when we also introduce comparator income (in column (6)) we get a complete explanation. The negative effect of comparator income is equal in size to the positive effect of own income. Adaptation provides a small additional contribution, but that is all.

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<sup>20</sup> In a similar analysis of the German data di Tella et al (2007) uses four lags, even though the fourth lag is insignificant. When we do this on our sample the total effect of the four lagged terms is -0.09.

### 3. OTHER EVIDENCE ON THE IMPORTANCE OF RELATIVE INCOME IN ADVANCED COUNTRIES

Thus for the two largest economies of North America and Western Europe there is strong support for the importance of relative income. Such findings are not of course new.<sup>21</sup> In studying the USA, Luttmer (2005) used a different survey, the National Survey of Families and Households, to estimate a happiness equation for U.S. couples. The explanatory variables were household income and the average earnings in the local area (localities averaging around 100,000 population). The equation when estimated in cross-section was

$$H = 0.12 \log Y - 0.24 \log \bar{Y} + \text{controls}$$

(.02)                      (.07)

Like our Table 2 results for the USA, this shows the key importance of relative income.<sup>22</sup> Luttmer also showed that a unit increase in  $\log \bar{Y}$  raised hours of work by around 2 hours a week – consistent with the view that higher  $\bar{Y}$  reduces utility.

In Canada a similar cross-sectional micro study included as the comparator the average income in the same census tract. It found that relative income was the only significant income variable affecting life-satisfaction.<sup>23</sup> Likewise in Germany there have been at least two studies of the GSOEP similar to ours, with similar findings of relative income effects.<sup>24</sup>

#### Required income

However, again one would like to be sure that these findings were not statistical flukes, but corresponded to some inner psychological process. The GSOEP is very helpful here because it asks people about what income they consider sufficient. The question is “Whether you feel an income is good, or not so good, depends on your present life

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<sup>21</sup> For a survey see Clark et al (2008).

<sup>22</sup> Happiness was measured from 1-7. In fixed-effects panel estimation on 2 data points for each respondent

$$H_i = .05 \log Y_i - .37 \log \bar{Y}$$

(.05)                      (.16)

<sup>23</sup> Helliwell and Haifang Huang (2008).

<sup>24</sup> Ferrer-i-Carbonell (2005), Vendrik and Woltjer (2007)

circumstances and expectations. In your case, what net household income is just sufficient income?” Let us call this the individual’s required income. Using fixed effects, Frey and Stutzer (2003) showed that life satisfaction depended on the ratio of income to required income, with no independent role for absolute income. A similar result was obtained for Switzerland, using cross-sectional data (Stutzer, 2004).

This raises the question of what causes these income requirements. This is a well-established field going back to the work of Van Praag, who pioneered the study of what individuals consider to be a sufficient income.<sup>25</sup> In Figure 5 we showed Gallup estimates of required income which followed quite closely the course of absolute income. But Kapteyn and his colleagues were the first to show econometrically that required income (thus defined) is powerfully affected by generally prevailing levels of income.<sup>26</sup> Their work used a Dutch panel survey of households. Stutzer (2004) found similar effects from the Swiss Poverty Study – with required income responding to average income with an elasticity of one half.

We can then combine this Swiss evidence with the happiness equation quoted earlier, in order to obtain the reduced form effect of average income upon individual happiness. By doing this, we can see once more that relative income is having a powerful impact on happiness.

### **Hypothetical questions**

A final type of evidence comes from asking people hypothetical questions. Solnick and Hemenway (1998) asked a group of Harvard graduate students to choose between living in two imaginary worlds in which prices were the same:

- A** You get \$50k a year, while others get \$25k.
  
- B** You get \$100k and others get \$200k.

A majority of respondents preferred the first type of world.<sup>27</sup> This only makes sense if relative income is more important to them than absolute income.

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<sup>25</sup> See for example Van Praag and Frijters (1999)

<sup>26</sup> De Stadt et al (1985)

<sup>27</sup> By contrast, in a similar question about leisure, respondents preferred more absolute leisure even if it was less relative to others’ leisure. This is highly relevant to tax policy, see Layard (2006).

## 4. THE CRITICS

Given all this evidence, it is not surprising that there has been widespread support for the hypothesis of this paper. But the two recent studies by Deaton and Stevenson/Wolfers are thought by some to have disproved the hypothesis. How far should they make one change one's mind?

Deaton's analysis is fascinating but purely cross-sectional. It covers 132 countries from the poorest to the richest, and finds a strong relationship between average life satisfaction and log average incomes, with a coefficient of 0.84 which is at least as high as the within-country effect of log income at the individual level.<sup>28</sup> However if the analysis is confined to advanced countries (with income per head above \$20 thousand), the estimated coefficient is 0.38 and the coefficient is much smaller than its standard error (0.78). As Deaton says, this 'is consistent both with a true slope of zero and a slope that is the same or higher than the low-income countries.' One might think that was as much as could be said, but Deaton argues that "the latter is the natural conclusion. These results support a finding that the relationship between the log of income and life satisfaction offers a reasonable fit for all countries, whether high-income or low-income, and if there is any evidence for deviation, it is small and probably in the direction of the slope being higher among the high-income countries."

It is difficult to see how this could be the natural conclusion unless one had a strong prior that all countries work the same way, whether rich or poor, and that any evidence from outside the study should be disregarded, such as that just quoted showing the difference (in advanced countries) between effects across individuals and across country aggregates. However the weakest feature of the Deaton evidence from a policy point of view is its cross-sectional nature. Institutional factors correlated with income play a major role in

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<sup>28</sup> The life-satisfaction question was as follows: "Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?"

these cross-sectional country differences.<sup>29</sup> So we get little evidence from the cross-section about causality, which is what the public debate requires.

By contrast the exhaustive study by Stevenson/Wolfers covers time-series as well as cross-section data, again for countries from the poorest to the richest. They conclude that “the relationship between subjective well-being and income within a country (that is, contrasting the happiness of rich and poor members of a society) is similar to that seen across countries (contrasting rich and poor countries), which in turn is similar to the time series relationship (comparing the happiness of a country as it gets richer or poorer).”

This finding, if true, implies that relative income has no effect on happiness. But does this finding apply to the advanced countries taken on their own? Most of the analyses in Stevenson/Wolfers are for all countries from the poorest to the richest.<sup>30</sup> But they do give separate time-series analyses for the U.S., Japan and Europe.

(i) They describe the U.S. as “a data point supporting the Easterlin Paradox”, but argue that “it should be regarded as an interesting exception warranting further scrutiny”. In order to help explain experience since 1972 they invoke increased inequality, and, once they have done this, they conclude that “the U.S. experience could be roughly consistent with the accumulated evidence of a robust happiness-income link.” As we have seen, this explanation of the period after 1972 does not work, and it works even worse in the period 1950-1972 when economic growth was strongest and inequality fell.

(ii) For Japan their data show a strong positive impact of income on happiness until income reached around \$20,000 a head, at which point the impact became negative.<sup>31</sup>

(iii) But, for Europe, they have an important point. The Eurobarometer data beginning in 1972 shows rising happiness in a number of West European countries, though falling in a few others. In their statistical analysis of the average effect of income in Europe they include the countries of the former Warsaw Pact, where it is clear that other factors besides income are changing rapidly. To understand what is happening we should confine ourselves to countries that were never Communist. And to understand the impact of income

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<sup>29</sup> See footnote 3.

<sup>30</sup> At one point (p.11) they test whether the cross-section inter-country effect is flatter for countries above \$15,000 per head and conclude that it is not. But this cut-off includes many countries which are far from the experience of advanced countries, and a more appropriate cut-off for the public debate is \$20,000, as used by Layard (2005) and Deaton (2007).

<sup>31</sup> Their Fig. 18.

we should distinguish between the cyclical and long-run changes in income. This we do in the next section.<sup>32</sup>

## 5. WESTERN EUROPE

Our analysis relates to 1973-2007 and covers 16 countries. Figures 9 and 10 show the basic data from Eurobarometer.<sup>33</sup> The dependent variable is average life satisfaction in each country and year.<sup>34</sup> Average income in each year we split into two components - a cyclical component ( $Y_C$ ) and a trend component ( $Y_T$ ), using the Hodrik/Prescott filter. We also include unemployment and inflation, which are well-documented factors affecting the time-series behaviour of life satisfaction.<sup>35</sup> There is a fixed effect for each country. The main effect we are interested in is that of trend income, which tells us the long-run effect of higher living standards.

The results are shown in Table 5. The coefficient on the cyclical component of income is very large. But the coefficient on trend income is only 0.20 –well below the within-country effect of over 0.50. And it is extremely ill-defined with a standard error of 0.17, reflecting the different effects of income in different countries. (Unemployment and inflation have the usual effects, with a percentage point of unemployment being far more harmful than a percentage point of inflation).

These findings confirm that, even in the typical country in Western Europe, the long-run effect of higher average income at country level is quite small – and much less than the effect on individual happiness when one person's income rises while everyone else's stays the same.

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<sup>32</sup> We are grateful to Stevenson/Wolfers for providing us with their Eurobarometer data file.

<sup>33</sup> Typical sample sizes vary between one and two thousand per year.

<sup>34</sup> The question is 'On the whole are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?'

<sup>35</sup> Di Tella et al ( 2001 )

## 6. CONCLUSIONS

Our main conclusions are these.

1. In the U.S. happiness has not risen since the 1950s, despite large increases in income at all points in the income distribution. Nor has life satisfaction risen in Western Germany since records began, though it has in some other Western European countries.
2. In micro-data for the U.S. and West Germany a rise in individual log income (all else constant) raises individual happiness/life satisfaction substantially. In our metric (scaled 0-10) the effect is of the order of 0.5 for a one unit rise in log income, in both the U.S. and Germany.
3. We can split this effect into an effect of relative income and an effect of absolute income. In these data the whole effect is of relative income. This remains true if we include individual fixed effects. When adaptation is allowed for it provides little additional explanation for why happiness has been so stable in Germany while income has risen.
4. The importance of income comparisons is confirmed by including psychological perceptions as explanatory variables. If ‘perceived relative income’ is included, it has powerful effects. Similarly if ‘required income’ is included, life satisfaction depends simply on income relative to ‘required income’ (which in turn depends on the average prevailing level of living).
5. If we turn to the time series for 20 West European countries, we can estimate the effect of a long-run change in the average income of the whole population. This is much less than the effect when one individual becomes richer (all else constant). For the average West European country the country-level time series effect is around 0.2, which compares with the figure of 0.5-0.6 for individuals – again consistent with an important role for relative income.<sup>36</sup>
6. The findings of this paper are consistent with a substantial body of earlier research on the USA, Germany, Switzerland and the Netherlands. They are also consistent with psychological research where individuals are asked to choose between one world in which

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<sup>36</sup> The cross-sectional estimates of the effect of higher incomes already allow substantively for the role of adaptation.



they are relatively rich and absolutely poor, and another where they are relatively poor and absolutely rich. They are also consistent with honest introspection by most of us – who can say that they are completely unaffected by what others get?

7. Yet two recent papers dispute the role of relative income in affecting life-satisfaction/happiness. These papers cover the whole range of countries from poor to rich, while our argument is about rich countries only. For rich countries these recent papers provide no reason to question the importance of relative income as an influence on life-satisfaction.

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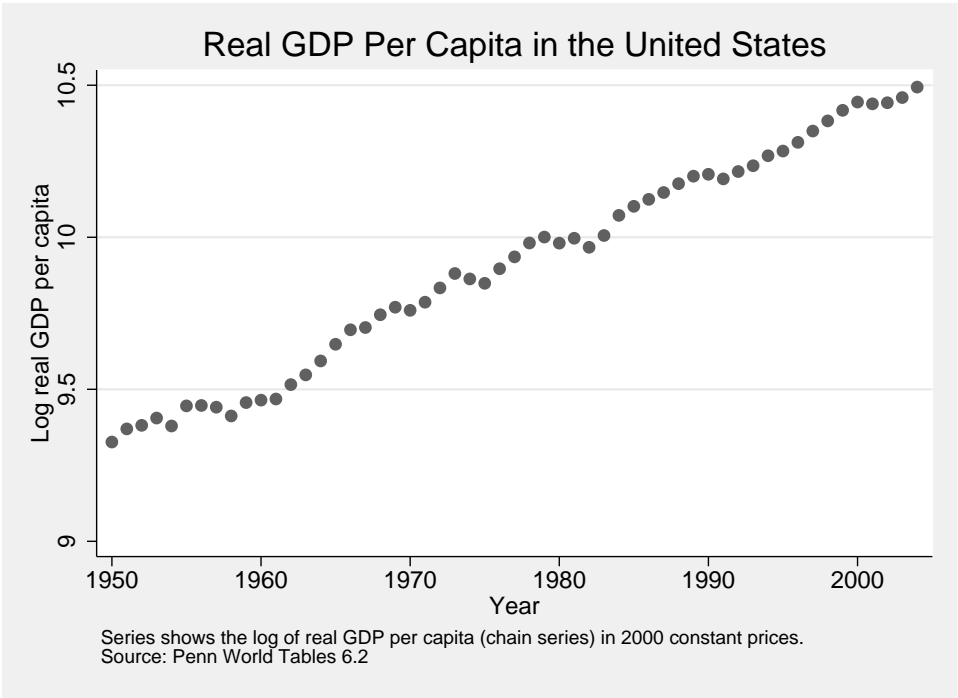


Figure 1: US GDP per capita over time.

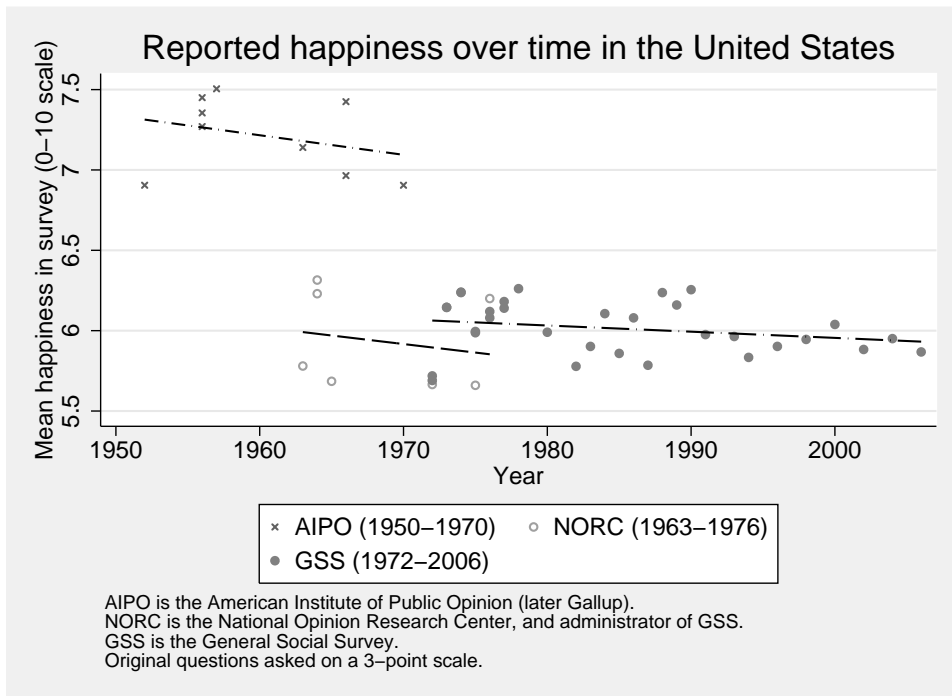


Figure 2: Reported happiness in the United States: 1950-2006. The surveys shown were chosen to cover the entire period with no gaps. Other surveys with a long time series, such as Gallup Ladder of Life person to person interviews and Gallup Ladder of Life telephone interviews show a comparable trend.



Figure 3: US Gini coefficient over time.



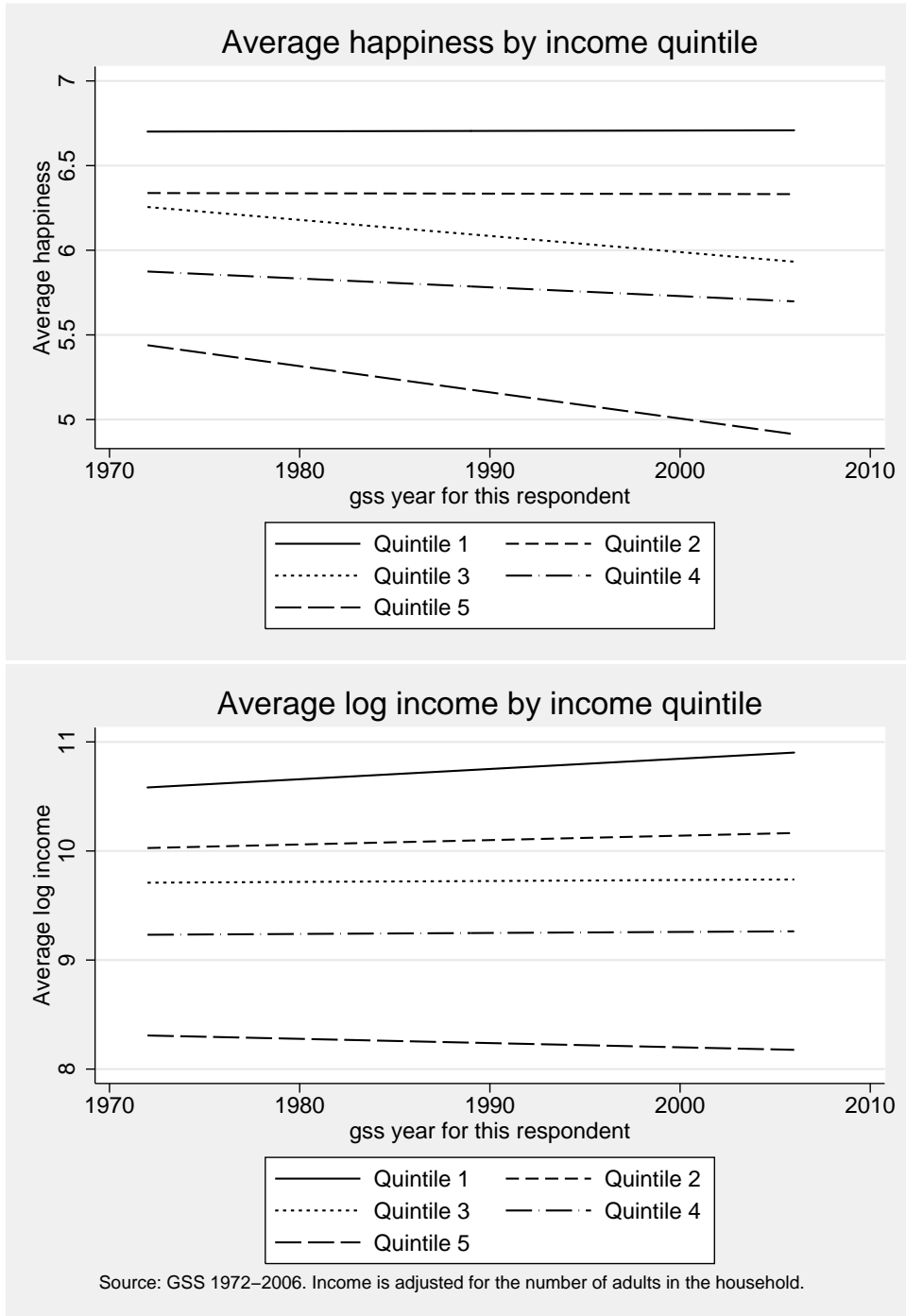


Figure 4: Average happiness and average log real income in the United States by income quintile (from high to low). Source: General Social Survey, 1972-2006. Income is adjusted for the number of adults in the household.

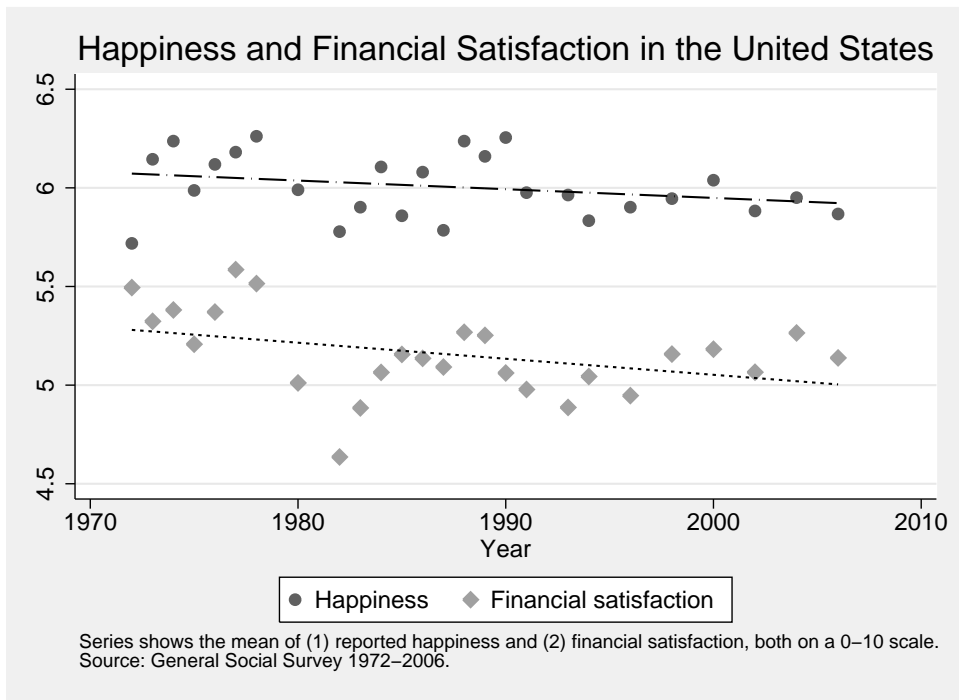


Figure 5: Happiness and Financial satisfaction in the United States.



Figure 6: Actual and required real income per head in the United States (1952=100).

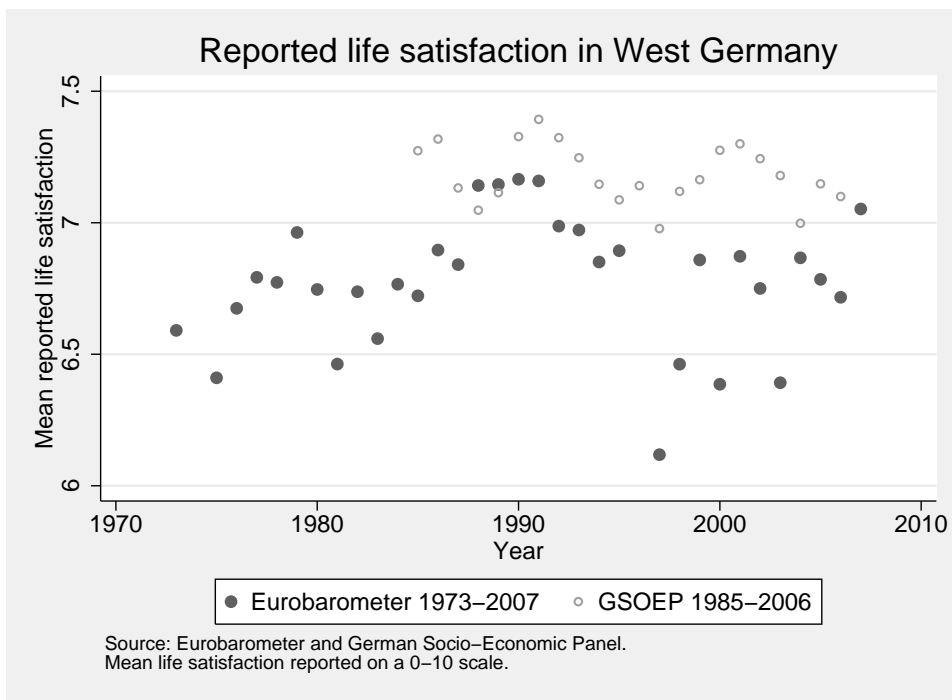


Figure 7: Average life satisfaction in West Germany.

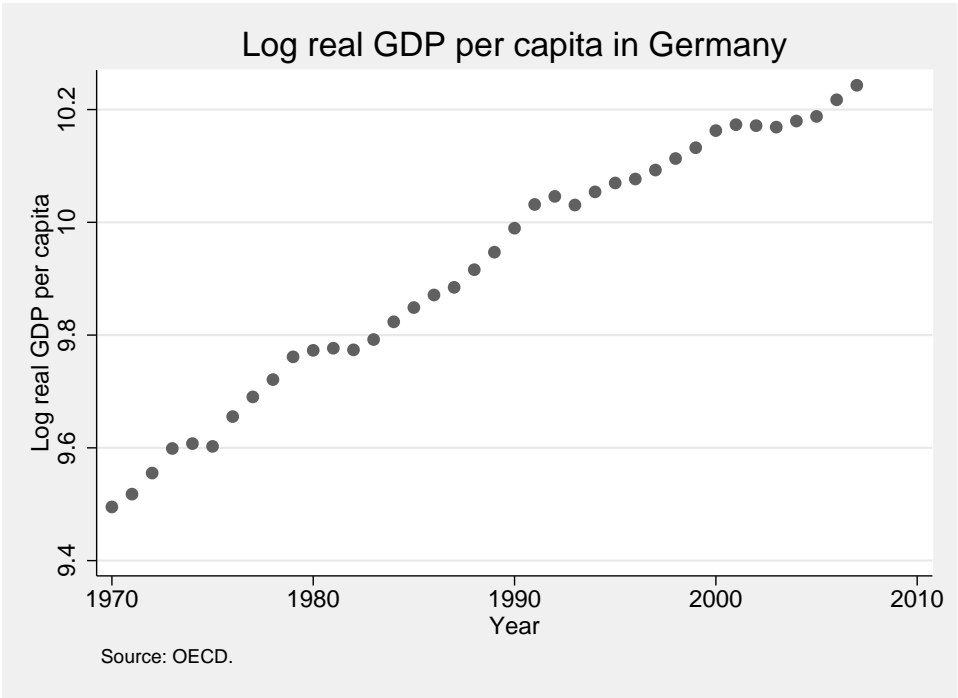


Figure 8: Log real GDP per capita in Germany.

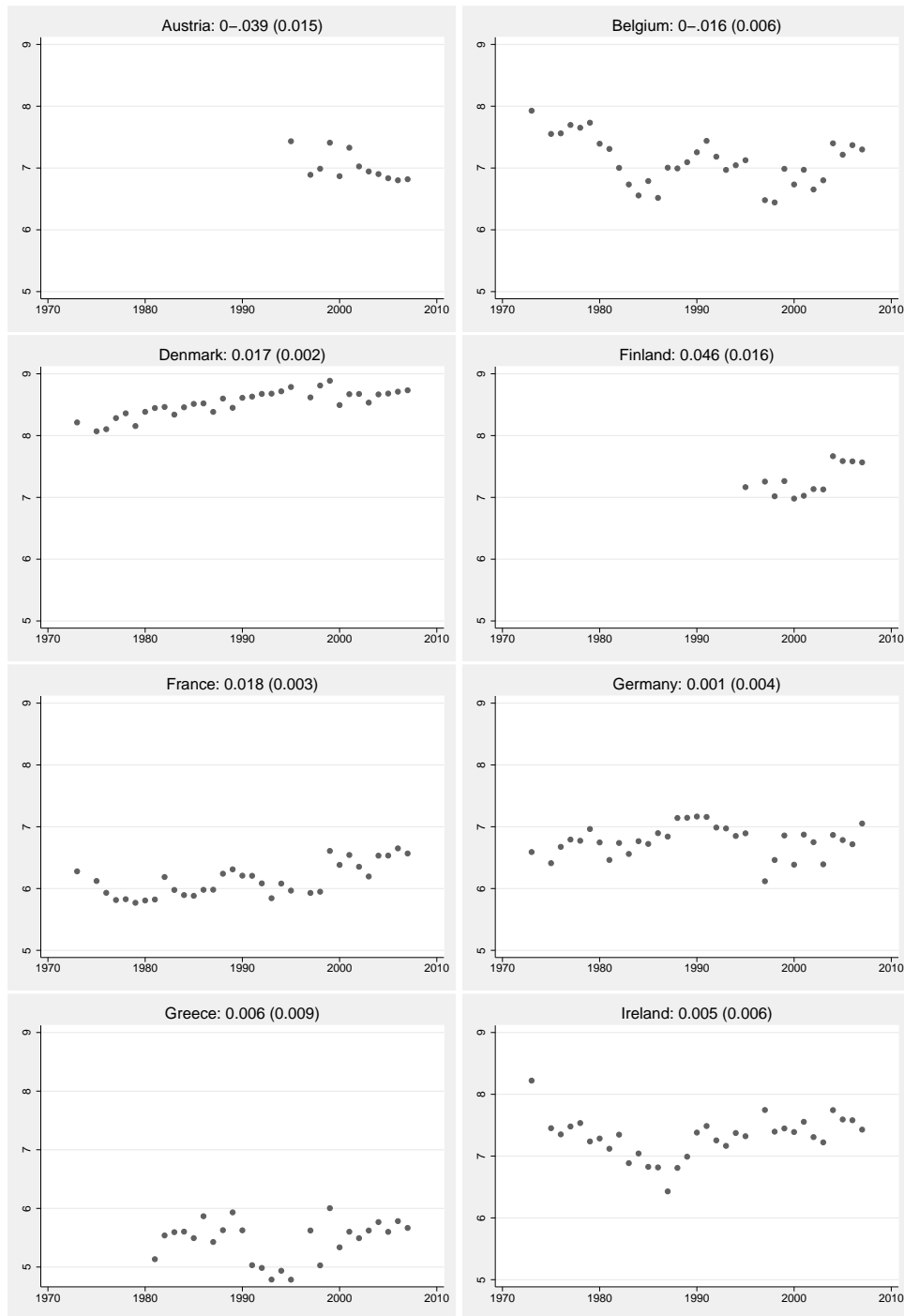


Figure 9: Happiness over time in Western Europe. Title include country name and regression slope (standard error in parentheses). Source: Eurobarometer 1973-2007.

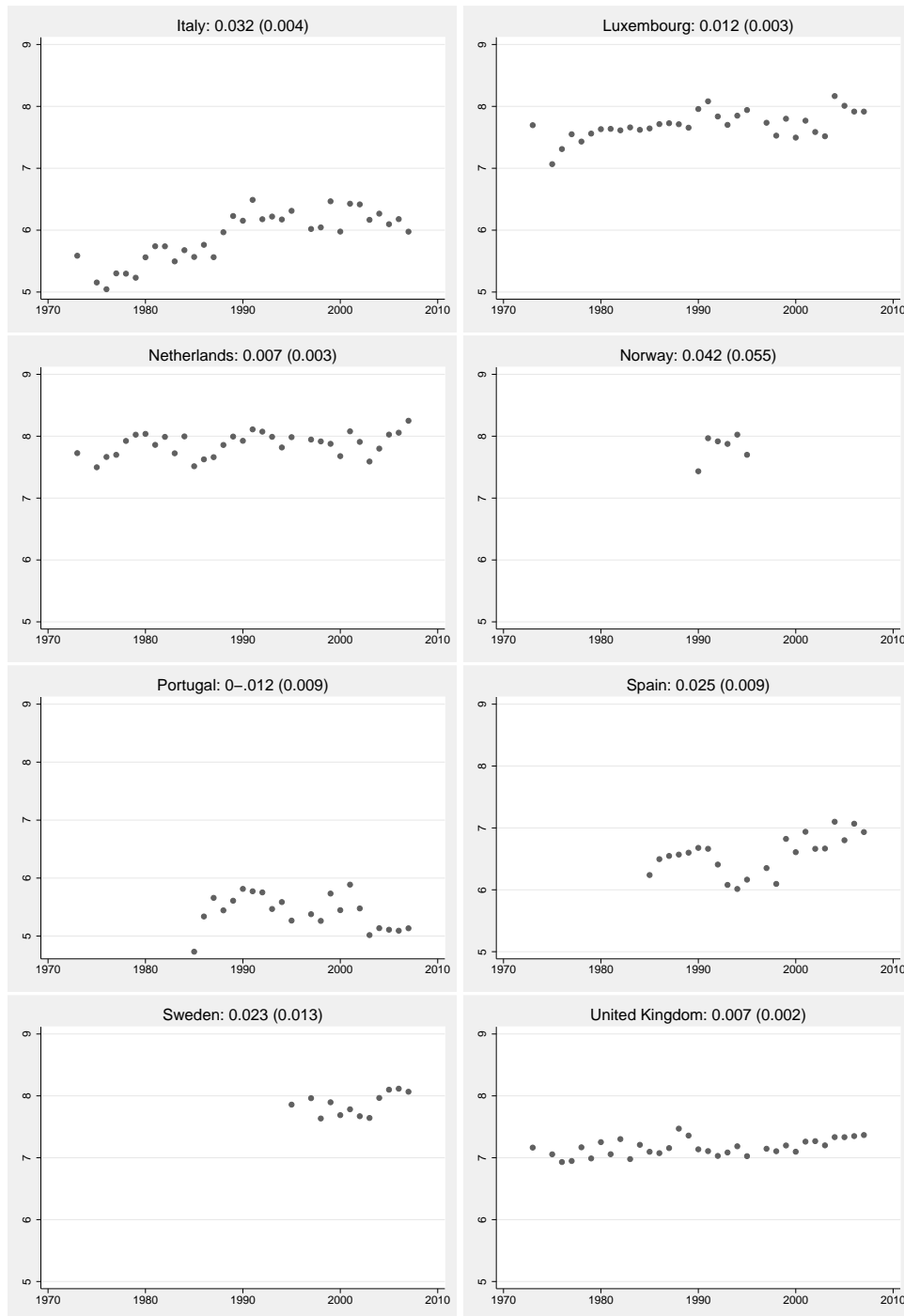


Figure 10: Happiness over time in Western Europe. Title include country name and regression slope (standard error in parentheses). Source: Eurobarometer 1973-2007.

Quintile	Avg. happiness trend	Log real income trend
1	-.0003 (.0035)	.014 (.0004)
2	-.001 (.0034)	.0079 (.0002)
3	-.01 (.0033)	.0059 (.0001)
4	-.0069 (.0035)	.0057 (.0002)
5	-.0165 (.0037)	-.0012 (.0007)
Combined	-.0059 (.0016)	.0082 (.0004)

Table 1: **Time trend of happiness and of log real income in the United States, by income quintile (from high to low). Source: General Social Survey, 1973-2006.** Trends reported are the coefficient on the year in a regression of average reported happiness (log income) against year with no other controls. Income is adjusted for the number of adults in the household. Standard errors are in parentheses. Sample size: 40,012.



	(1)	(2)	(3)
$\log Y$	0.565 (0.055)	0.578 (0.055)	0.330 (0.062)
$\log \bar{Y}$		-0.690 (0.243)	-0.486 (0.244)
$R$			0.150 (0.016)
$Rsq$	0.075	0.075	0.082

Table 2: **Regressions for explaining individual happiness in the United States using the General Social Survey (N=14,836).** The dependent variable is reported happiness scaled to a 0-10 range. Years: 1972-2006.  $Y$  is real income per adult,  $\bar{Y}$  average real income per adult in the year in observations matched for household type,  $R$  is financial situation relative to others (see text) scaled to the 0-10 range. Robust standard errors in parentheses. Regressions restricted to whites aged 30-55. Observations with extreme incomes were removed (see text for details). Controls include sex, quadratic in age and education, and marital and work status dummies. In column (3) the beta coefficients are 0.06 on  $Y$ , 0.10 on  $R$ , and -0.02 on  $\bar{Y}$ .

	(1)	(2)	(3)
$\log Y$	2.17 (0.062)	2.20 (0.062)	1.403 (0.071)
$\log \bar{Y}$		-1.552 (0.279)	-0.965 (0.271)
$R$			0.480 (0.019)
$Rsq$	0.157	0.159	0.207

**Table 3: Regressions for explaining individual financial satisfaction in the United States using the General Social Survey (N=14,756).** The dependent variable is reported financial satisfaction scaled to a 0-10 range. Years: 1972-2006.  $Y$  is real income per adult,  $\bar{Y}$  average real income per adult in the year in observations matched for household type,  $R$  is financial situation relative to others (see text) scaled to the 0-10 range. Robust standard errors in parentheses. Regressions restricted to whites aged 30-55. Observations with extreme incomes were removed (see text for details). Controls include sex, quadratic in age and education, and marital and work status dummies. In column (3) the beta coefficients are 0.23 on  $Y$ , 0.26 on  $R$ , and -0.03 on  $\bar{Y}$ .

	No fixed effects		Fixed effects			
	(1)	(2)	(3)	(4)	(5)	(6)
$\log Y$	0.501 (0.014)	0.527 (0.015)	0.326 (0.022)	0.329 (0.022)	0.321 (0.029)	0.324 (0.029)
$\log \bar{Y}$		-0.648 (0.072)		-0.291 (0.134)		-0.331 (0.169)
$\log Y_{t-1}$					-0.012 (0.028)	-0.011 (0.028)
$\log Y_{t-2}$					0.005 (0.028)	0.006 (0.028)
$\log Y_{t-3}$					-0.059 (0.027)	-0.057 (0.027)
$Rsq$	0.077	0.078	0.572	0.572	0.594	0.594

Table 4: **Regressions for explaining individual life satisfaction in West Germany using the German Socio-Economic Panel (N=90279 for the first 4 regressions, 56240 for the last two)**. The dependent variable is reported life satisfaction on a 0-10 scale.  $Y$  is real net household income,  $\bar{Y}$  is average real household income in year in observations matched for sex, age ( $\pm 5$  years), and education (3 groups). Robust standard errors in parentheses. Regressions restricted to non-immigrant West Germans aged 30-55. Controls for regular regressions include sex, quadratic in age and education, marital and work status, and state dummies. Controls for panel regressions include person fixed effects, a quadratic in age and education, marital and work status, and state/year combination dummies.

Regressor	(1)	(2)
$T$	0.002 (0.004)	Year Dummies
$\log Y_T$	0.201 (0.174)	0.180 (0.167)
$\log Y_C$	3.625 (1.014)	1.855 (1.406)
$u$	-0.023 (0.006)	-0.033 (0.007)
$\pi$	-0.006 (0.002)	-0.010 (0.004)
$Rsq$	0.930	0.943

Table 5: **Panel fixed effects regressions for explaining annual country-level mean life satisfaction in West Europe.** The dependent variable is mean life satisfaction.  $T$  is time trend,  $Y_T$  is trend GDP per head,  $Y_C$  is cyclical GDP per head,  $u$  is the unemployment rate and  $\pi$  is the inflation rate. Country fixed effects included. Source: Eurobarometer: 1973-2007. Mean life satisfaction calculated using the Eurobarometer sampling weights. GDP trend and cyclical components computed using Hodrick-Prescott filter with a parameter of 9.5 (a parameter of 6.25 produces similar results).

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