Identifying Trends in Well-Being over Time: A Comparison of Results from International Panel Data and Repeated Cross-Sections

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VERY PRELIMINARY, PLEASE DON’t CITE

October 2011

Abstract

This paper analyzes trends in different subjective well-being measures for three different European countries: Germany, Britain and Switzerland. It first illustrates how to interpret the estimated regression coefficients, and argues that a very simple regression model might yield the most meaningful results. For West Germany, Britain and Switzerland, panel data indicate that well-being is slightly decreasing over the examined time period. A remarkable exception is East Germany, which has known an overall increase in life satisfaction over the examined period and has considerably caught up with West Germany. Women are more likely to report depressive symptoms and East German women gain more from reunification than East German men. When looking at trends in repeated cross-sections from the
World Values Survey, well-being seems to increase rather than to decrease over time for these three countries. This discrepancy suggests that respondents recalibrate their rating scale in subsequent survey rounds, an issue psychologists are sometimes concerned about. Repeated cross-sections are pseudo panel data might hence be preferred above genuine panel data to study trends in subjective data.

1 Introduction

During the last decades, many studies in economics have paid increasing attention to ‘stated utility’ as opposed to ‘revealed preferences’. While the latter are inferred from economic agents’ actions, the former are derived from very simple survey questions which often go as follows:

On a scale from 0 (very unsatisfied) to 10 (very satisfied), how satisfied are you with your life, all things together?

There is increasing evidence underpinning the internal validity of such data (Krueger and Schkade, 2008; Sgroi et al., 2010) as well as the external validity (Oswald and Wu, 2010). Many relationships between happiness data and socioeconomic variables, whether or not to be interpreted as causal, have been examined. Happiness has shown to be strongly correlated with relational goods and social capital (Bartolini et al., 2007; Becchetti et al., 2008; Powdthavee, 2008), with major life events such as unemployment, bereavement and disability (Clark et al., 2007; Oswald and Powdthavee, 2008a,b), with social status or rank (Blanchflower et al., 2009; Luttmer, 2005; Ravallion and Lokshin, 2010; Senik, 2004, 2008) and with expectations (de Grip et al., forthcoming; Senik, 2008).

The amount of research documenting trends in subjective well-being over time is rather limited, however. Trends in happiness levels, at the national level or at the level of subgroups, can be caused by changes in factors described above, which are, however,
not always perfectly observable. This implies that it will be very hard to measure
trends in happiness over time merely by using observable socioeconomic variables, and
hence looking simply at patterns over time might be very informative and useful as a
starting point. Blanchflower and Oswald (2004), find that happiness runs flat over time
in Britain, that it is increasing for blacks in America but decreasing for white American
women. In a recent paper, Stevenson and Wolfers (2009), using repeated cross-sections,
document how in the United States, over the last 3 decades, women’s happiness has
decreased both in absolute terms as well as relative to men and that nowadays men
are even happier than women while it was the reverse 3 decades ago. They look at a
general measure of life satisfaction, as well as at satisfaction with various aspects of life
(domain satisfactions). Their analysis almost exclusively deals, however, with American
data, although they do a robustness check on a general life satisfaction measure with
Eurobarometer data. Easterlin (1974, 1995, 2001) finds that national happiness did not
rise over time, in contrast with a spectacular growth in national income. This finding
has lead to the well-known “Easterlin paradox’, which states that an increase in income
for all does not influence average happiness.\footnote{This analysis, however, has recently been challenged by Deaton (2008), Stevenson and Wolfers
(2008) and Sacks et al. (2010), who argue that the absence of correlation between national income and happiness might be artificial.}

The study of well-being (or any other variable) over time makes the researcher face
with identification problems that need to be addressed. In some regression specifica-
tions, especially in fixed effects regressions, coefficients on time dummies are not always
measuring what the researcher aims for and hence might be interpreted incorrectly. The
identification problem at hand concerns disentangling time, cohort, and age effects. In-
deed, all three latter variables might have an effect on well-being. The baseline level of
happiness might well vary across birth cohorts. Also, well-being is likely to fluctuate over
the life cycle. Especially this last variable, i.e. people’s age, has received a huge amount
of attention in the recent subjective well-being literature. Many studies have noted a
U-shaped curve of well-being over the life cycle, decreasing from the early 20s until the
mid-40s, and rising again until the late 60s (See e.g. Blanchflower and Oswald, 2008 for cross-country evidence) often followed by another decline at higher ages (Deaton, 2010; Fisher, 2009; Gwozdz and Sousa-Poza, 2010). Nevertheless, very recently, a debate has been going on about the true shape of the curve, and more specifically about the correct regression specification. Food for this debate has been a concave pattern found in some American datasets, when no controls are included: the curve is then rising until the mid-40s and flattens out afterwards (Easterlin, 2006; Yang, 2008). One of the key points of this discussion is whether or not socioeconomic controls should be included in the regression (Easterlin, 2006; Blanchflower and Oswald, 2008, 2009; Glenn, 2009). Another point of discussion is again the disentanglement of time, age and cohort effects: since the three variables are collinear, it is not possible to identify the three effects simultaneously without making assumptions (De Ree and Alessie, forthcoming; Van Landeghem, forthcoming).

The contribution of this paper is threefold. First, it tries to focus on trends of well-being in Europe for three countries using panel data: Germany, the United Kingdom, and Switzerland. The paper will analyze the trend of well-being over time for the whole population, and men and women separately. Moreover, it will repeat the exercise for different well-being measures, as do Stevenson and Wolfers (2009) for the United States. Second, the paper tries to be explicit about the identification assumptions and the interpretation of the estimates, and argues for a very simple regression specification. Third, results from panel data will be compared with results from repeated cross-sections, in order to evaluate whether people recalibrate their rating scales after having filled out the questionnaire multiple times.

The remainder of the paper is as follows. Section 2 discusses the empirical strategy. Section 3 describes the data that will be used throughout the analysis. Section 4 presents and discusses the econometric results, and Section 5 concludes.

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2In more recent American data, one finds an approximate U-shape also in the raw data (Oswald and Wu, forthcoming; Stone et al., 2010).
The empirical strategy

As noted in the introduction, subjective well-being can vary across time, but baseline happiness may also differ across birth cohorts, and well-being might as well fluctuate with age (or evolve over the life cycle). Since time, year-of-birth, and age are perfectly collinear, they cannot be included simultaneously in a regression framework without any functional assumptions.

Let’s assume that there are $L$ years-of-birth (indexed with dummies $c_1$ to $c_L$, and $K$ calendar years for which data are available (indexed with dummies $t_1$ to $t_K$). If $n_l$ denotes the birth year of the cohort $c_l$, and $p_k$ the calendar year associated with period $t_k$, then an individual’s age $age_j$ can be computed as follows:

$$age_j = \left( \sum_{k=1}^{K} (p_k \ast t_k) \right) - \left( \sum_{l=1}^{L} (n_l \ast c_l) \right)$$  \hspace{0.5cm} (1)

When including the three vectors of age dummies $a_j$, time dummies $t_k$, and birth cohort dummies $c_l$ in a regression framework as independent variables together with a vector of 1’s (the constant), there will not be just 3 distinct linear dependencies across the vectors (as is always the case with exhaustive and mutually exclusive sets of dummy variables), but there will be a fourth dependency, namely each element of the $a$-vector can be written as:

$$n_j \ast a_j = \left( \sum_{k=1}^{K} (p_k \ast t_k) \right) - \left( \sum_{l=1}^{L} (n_l \ast c_l) \right)$$  \hspace{0.5cm} (2)

leaving out a dummy from one of each set, as is the standard practice to overcome trivial dependencies with dummy variables, will thus not be enough. One might opt for leaving out a second dummy from one of the sets. However, this implies that one needs to assume that two time effects, age effects, or cohort effects are equal. In case this
normalization assumption is incorrect, the estimated curves will be a rotated version of the actual curves. Not including a constant, and leaving out one dummy from each set leads to the same problem. Indeed, leaving out a constant and taking individuals of age category \( a_j \) and time period \( t_k \) as baseline implies that the baseline cohort is \( c_{j-k+K} \). The sum of the three effects associated with the omitted dummies need to be assumed to be equal to the constant, and the individuals in the baseline category thus need to be, on average, in their steady-state. Differencing the data in an attempt to get rid of the constant and the cohort effects leaves us with the same problem. Two sets of differenced dummies require us to leave out a differenced time or age dummy, meaning that we again have to assume that 2 consecutive age effects or time effects are equal to each other.\(^3\)

One may proceed by regressing the dependent variable only on a set of time dummies and a constant, which yields the following regression specification:

\[
WB_k = \alpha + \sum_{k=2}^{K} \beta_k t_k
\]  

(3)

Assuming that the age distribution in all time periods is the same\(^4\), the estimate \( \beta_k \) then equals

\[
E[WB_k] - \sum_{\tilde{k}=1}^{K} E[WB_{\tilde{k}}] = T_k + \sum_{l=1}^{L} (W_{lk}C_l)
\]

(4)

where \( \tilde{k} = 1, 2, \ldots k-1, k+1, \ldots, K \), \( T_k \) and \( C_l \) denote the actual time and cohort effect respectively, \( W_{lk} \) denotes a weight for the cohort effect \( C_l \) in period \( k \), and \( \sum_{l=1}^{L} w_{lk} = 1 \) for any \( k = 1 \ldots K \). Indeed, these weights will differ across periods as cohorts can age in and out of the panel as there are a finite number of age groups in the data. The oldest

\(^3\)A small calculation example showing how the curves rotate when making the wrong assumptions in the case of a first-difference regression is provided in Van Landeghem (forthcoming), Appendix 1.

\(^4\)In reality, this assumption will not hold completely because of population aging and panel aging. During the regression analysis, weights will be used in order to make sure that each age group has the same weight in each time period.
cohort will therefore only be observed in the first time period, while the youngest cohort will only be observed in the latest period.

Hence, in the specification shown in Equation 3, the changes in the coefficients on time dummies reflect changes in well-being due to changes in time-varying factors, plus changes in population composition (older cohorts age out, while younger cohorts age in). One should note that controlling for cohort effects would not lead us to estimates which have a more natural interpretation, on the contrary even. Indeed, when conditioning on the birth cohort, the $\beta_k$-coefficient would then equal:

$$E[W_B k | c_1, c_2 \ldots c_L] - \sum_{k=1}^{K} E[W_B k | c_1, c_2, \ldots c_L]$$

In words, by introducing cohort dummies, one is comparing individuals from the same birth cohort across time periods. Comparing individuals from the same birth cohort across time periods implies comparing individuals with different ages. In case there exists a trend of well-being in age (such as the often found U-shaped pattern), it will be picked up by the $\beta_k$-coefficients. The interpretation of the $\beta_k$-coefficients is then far less straightforward.

3 Data

Among the 3 panel datasets analyzed, the German Socio-Economic Panel is probably the dataset which allows the most extensive analysis and which is most being used in happiness research. The German Socio-Economic Panel (GSOEP) is provided by DIW Berlin, and is repeated with yearly intervals, running from 1984 for West Germany and 1990 for East Germany (see Wagner et al., 2007). For the period from 1984 to 2007, one observes more than 375000 person-year observations in total for more than 47000
individuals, 9800 in East Germany and 37500 in West Germany. These observations can be categorized in 7 different samples:

- Sample A (started in 1984) represents the West-German population, while sample C (started in 1990) represents the East German population.
- Samples E and F (started in 1998 and 2000 respectively) are refreshment samples in order to reduce the effects of panel aging and attrition.
- Samples B and D (started in 1984 and 1994 respectively) are immigrant subsamples, and sample G (started in 2002) comprises high-income households. The latter 3 samples are excluded from the analysis in order to avoid that kinks in well-being trends are caused by the oversampling of one of these categories.

The GSOEP contains questions measuring satisfaction in various domains. Unfortunately, however, many of these questions are not asked during all rounds. Two important questions on subjective well-being have been in the survey from 1984 onwards and have since then reappeared in every survey round.

On a scale from 0 (completely dissatisfied) to 10 (completely satisfied): How satisfied are you with your life, all things considered?

On a scale from 0 (totally unsatisfied) to 10 (totally satisfied): How satisfied are you with your household income?5

Across all rounds, the average life satisfaction score in West Germany equals 7.15 with standard error of 1.82. In east Germany, life satisfaction is, on average, somewhat lower than in West Germany, with an average score of 6.41 and standard error of 1.80.

The financial satisfaction measure has the same rating scale, but individuals, on average, give their financial satisfaction a slightly lower rating than their general life satisfaction.

5 Data for job satisfaction is available for all rounds as well, but as one might assume that the composition of the subgroup being at work has changed as well over time, these data are a bit harder to analyze in a meaningful way.
satisfaction. In West Germany, the average score for financial satisfaction equals 6.51 with a standard error of 2.26, while in East Germany, financial satisfaction has an overall average of 5.48 with a standard error of 2.31. In West Germany, 7.15% of individuals give the highest satisfaction score, compared to 1.98% for East Germany. 8.25% of individuals give the highest financial satisfaction score in West Germany, compared to only 2.77% in East Germany.

The British Household Panel Survey (BHPS) is made available through the ESRC Data Archive and originally collected by the ESRC Research Centre on Micro-social Change at the University of Essex. The BHPS started in 1991. In 1999, two additional samples were included in order to oversample households in Wales and Scotland. In 2001, a Northern Ireland sample was started so that the survey covered the UK area rather than just Great Britain. From 1997 to 2001, additional households were interviewed for the purpose of the European Community Household Panel, and those households who agreed that their information was passed on to the University of Essex constitute another subsample in the BHPS, the ECHP subsample.\(^6\)

Unfortunately, however, not all rounds contain all the information that should ideally be used throughout the analysis. A general life satisfaction question is only included from the year 1996 onwards, and has been skipped in 2001, which means that we have subjective well-being data for the period 1996-2000 and 2002-2008. The ‘satisfaction with life’ data for waves 6-10 and 12-18 are based on the following survey question:

Please tick the number which you feel best describes how dissatisfied or satisfied you are with your life overall? 1 (not satisfied at all) to 7 (completely satisfied)

Across these 12 waves and all surveyed individuals, respondents give an average life satisfaction score of 5.22 on a scale of 7, with a standard deviation of 1.29. In 1.48% of

\(^6\)The latter 4 samples are, however, not included in the analysis again to avoid artificial results.
the responses, an individual indicates being completely dissatisfied, while in 14.49% of cases, respondents are completely satisfied.

All 18 rounds, however, include data from a general health questionnaire, which are designed to identify depression. More in particular, these questions go as follows:

Here are some questions regarding the way you have been feeling over the last few weeks. For each question please tick the box next to the answer that best describes the way you have felt.

Have you recently . . .

1. been able to concentrate on whatever you’re doing? ++
2. lost much sleep over worry? –
3. felt that you were playing a useful part in things? ++
4. felt capable of making decisions about things? ++
5. felt constantly under strain? –
6. felt you couldn’t overcome your difficulties? –
7. been able to enjoy your normal day-to-day activities? ++
8. been able to face up to problems? ++
9. been feeling unhappy or depressed? –
10. been losing confidence in yourself? –
11. been thinking of yourself as a worthless person? –
12. been feeling reasonably happy, all things considered? ++

For the items followed by ‘++’ the response scale is as follows:

1. More so than usual
2. About the same as usual
3. Less so than usual
4. Much less than usual

And for the items followed by ‘−’:

1. Not at all
2. Not more than usual
3. Rather more than usual
4. Much more than usual

In order to construct an aggregate measure, a dummy is created for each item taking 1 when the score on the item equals 3 or 4. By summing up the dummies within a person-year observation, one gets a 0-12 depression scale. Subsequently, the score is reversed, so that 12 = no depressive symptoms, and 0 = severely depressed. This measure (known as GHQ score) will be used as an alternative dependent variable during the regression analysis instead of the life satisfaction measure.

Across all rounds and individuals, the average GHQ score equals 9.30, with a standard deviation of 3.20. 2.26% of respondents have the lowest GHQ score of 0, while 31.85% of respondents have the highest GHQ score of 12. Hence, there are considerably more individuals with the highest GHQ score than with the highest life satisfaction score, which illustrates the upper truncation of the former measure. The GHQ measure is appropriate to identify different degrees of depression, but it cannot help us to distinguish the satisfied individuals from the extremely satisfied individuals.

The BHPS also contains a financial satisfaction question in waves 6-10 and 12-18, which goes as follows:

Please tick the number which you feel best describes how dissatisfied or satisfied you are with … your household income. 1 (not satisfied at all) to 7 (completely satisfied)
On average, BHPS respondents give a score of 4.56 on this question, with a standard error of 1.60. As in the GSOEP, BHPS respondents rate their financial satisfaction a bit lower than their general life satisfaction. 5.44% of individuals give the lowest possible rating, while 10.87% give the highest possible rating.

The Swiss Household Panel (SHP) is a panel repeated with yearly intervals which started in 1999 and which is run by the FORS, the Swiss Centre of Expertise in the Social Sciences. Currently, there are 11 rounds available (up to 2009), with more than 95000 person-year observations and 18300 individuals.

A general life satisfaction question is asked from the year 2000 onwards and goes as follows:

In general, how satisfied are you with your life if 0 means ‘not at all satisfied’ and 10 means ‘completely satisfied’?

The average score across all person-year observations equals 8.01 (with a standard error of 1.48). 16.5% of individuals consider themselves as completely satisfied.

Finally, in order to compare results from panel data with results from repeated cross-sections, the paper draws upon data from the World Values Survey. The World Values Survey is a survey conducted worldwide and aims to facilitate the investigation of sociocultural and political changes across regions and over time. The World Values Survey now counts 5 waves spanning the periods 1981-1984, 1989-1993, 1994-1999, 1999-2004, and 2005-2008 respectively. Currently, a 6th wave is carried out.

The World Values Survey does not follow the same people over time. Nevertheless, many countries have been included in the survey in multiple rounds, which offers us repeated cross-sectional data for these countries. In particular, the 3 countries studied in this paper have been surveyed at least twice, which means that a comparison between panel data and repeated cross-sectional data is possible. There are data for Germany for the years 1997 and 2006, for Britain for the years 1998 and 2006, and for Switzerland
for the years 1989, 1996, and 2007. For each country, around 1100 to 2000 individuals are surveyed in one round.

The happiness variable in the World Values Survey is measured with the following question:

Taking all things together, would you say you are:

- Very happy
- Quite happy
- Not very happy
- Not at all happy

In this paper, scores 1 and 4, and 2 and 3 are swapped so that 1 denotes not at all happy and 4 denotes very happy, which makes the results easier to compare with results from the panel data. For the different waves and the 3 countries together, respondents report an average life satisfaction score of 3.11 (standard deviation 0.67). 31.2% of individuals report the highest happiness score. This is a significantly larger percentage than in the other data sets, but this might have to do with the more restricted scale which allows respondents less differentiation. Only 1.6% of individuals report the lowest happiness score.

4 Results

4.1 Results from Panel Data

This subsection examines the estimates from the very parsimonious and straightforward regression as of the form displayed in Equation (3), which means a pooled OLS regression containing only a constant and time dummies. The curve describing the pattern of well-being over time is thus driven by time-varying variables, as well as by changes in birth
cohort patterns. Indeed, younger cohorts age into the data, while older cohorts age out of the data. The latter regression is run for the 3 concerned panel datasets on the whole sample, for men and women separately, and for the different well-being indicators as described in Section 3.

4.1.1 Trends in the German Socioeconomic Panel

Figure 1 shows us trends of life satisfaction for the entire West German sample, as well as for men and women separately.

During the first 5 years of the panel, we see an overall slight decline in well-being from 7.4 to 7.1. In the next 2 years, following reunification, we see an upsurge in well-being, after which there is an almost steady decline until 1997, where well-being reaches a dip of 7. During the next 3 years (which was a period of economic recovery), well-being increased again up to a score of 7.3 in 2000. From 2001 to 2007, the pattern is a bit more irregular but overall downward sloping (with a dip in 2004).

The German Panel seems to suggest, for West-Germany, that well-being over time is cyclical, and overall very slightly downward sloping. It seems that, over these 24 years, well-being of men and women have known a very similar pattern. Moreover, women and men report, on average, the same level of life satisfaction both at the beginning and at the end of the period analyzed.

Figure 2 shows us similar regressions, but now with financial satisfaction as the explanatory variable. Financial satisfaction scores are lower than life satisfaction scores. Instead of a decrease in the beginning of the 1980s, we observe a slight increase of financial satisfaction until 1991. During the 1990s (especially during the early 90s), there is a decline in financial satisfaction. The curve goes up again in the years 2000 and 2001, when the economy was booming. During the last five years in the sample, financial satisfaction steadily declines from a score of 6.8 to 6.4. Financial satisfaction
is thus lower in the last round than in the first round, but the decline is less pronounced than that of life satisfaction. Again, financial satisfaction for men and women follow a similar path. Nevertheless, the average decline in financial satisfaction for women is steeper. While at the beginning of the time span, women’s financial satisfaction is significantly higher than that of men, their average responses are almost equal at the end of the time span.

Figure 3 shows us trends of life satisfaction for East Germany from 1991 onwards. Life satisfaction in East Germany is considerably lower than in West Germany. This gap narrows near the end of the sample but is still very pronounced, even 17 years after reunification. The overall patterns for East Germany is increasing. This discrepancy with West German data might be interpreted as evidence of a reduction of relative deprivation (in many ways) compared to neighbouring countries. Moreover, while male and female life satisfaction are on average the same at the beginning of the time span, women are considerably happier at the end of the life span compared to men.

Trends for financial satisfaction in East Germany are shown in Figure 4. Financial satisfaction scores are again lower than life satisfaction scores. In contrast with financial satisfaction in West Germany, the curves are overall increasing. Cyclical patterns are more or less the same, with a rapid increase around the millennium and a dip in 2004. In East Germany, as well, men are on average slightly less satisfied than women when it comes to household income.

Figure 5 illustrates the claim in Section 2 that differencing away the cohort effect still requires us to make a nontrivial normalization assumption. The two curves in Figure 5 are based on regressions with different normalizations. The regression underlying the first curve assumes that the age effects of age 18 and age 19 are equal to each other. For the second curve is assumed that the age effect of ages 57 and 58 are equal to each other.
It is clear that the 2 different normalizations lead to completely different results. According to the first specification, there is a steady and huge drop in life satisfaction over time. Life satisfaction in 1985 is almost 4 points higher than life satisfaction in 2007. According to the second specification, the drop in life satisfaction is much smaller, around 0.9 points over a 23-year period.

4.1.2 Trends in the British Household Panel Survey

Let us now turn to trends in GHQ scores, life satisfaction and financial satisfaction in the BHPS data.

Figure 6 shows us trends in GHQ scores for the whole sample and men and women separately from 1991 to 2008 onwards. A GHQ score of 0 means ‘seriously depressed’ and 12 means ‘no depressive symptoms’. It is remarkable that GHQ scores for women are considerably lower than GHQ scores for men, a finding which is not just limited to Britain (see the appendix for evidence on Belgium). This reminds us of the fact that a depression index is conceptually different from a life satisfaction score. The GHQ scores show a slightly downward sloping and cyclical pattern, with peaks in 1999 and a dip in the first years of the millennium. This dip comes 1 year earlier than in Germany, but this might be due to the fact that in Germany, interviews are conducted at the beginning in the year while in Britain they are conducted more towards the end of the year. In 2008 there is a huge jump in GHQ scores, both for men and for women, of more than 1 point. It is hard to understand this spectacular rise in GHQ scores in a time when the financial crisis hit off. Of course, there is also still a slight possibility that the latest round of the data suffers from some data errors.

Figure 7 shows us trends in life satisfaction from 1996 onwards. Women and men report more or less the same life satisfaction scores. It is also interesting to note that

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\(^{7}\)For the missing year 2001, the average of scores in 2000 and 2002 are used.
life satisfaction peaks in 1998, which is one year earlier than the GHQ score. There is also a peak in life satisfaction in 2008.

Figure 8 shows us trends of financial satisfaction in Britain, again only from 1996 onwards. As is the case for the GSOEP, financial satisfaction scores are considerably lower than life satisfaction scores. In 2008, there is again a jump, but less pronounced than with the other measures. Male and female average financial satisfaction scores are very close to each other.

4.1.3 Trends in the Swiss Household Panel

Swiss life satisfaction trends are shown in Figure 9 for the whole population, and men and women for the years 2000-2009.

The life satisfaction measure in the SHP has a 0-10 range, as does the life satisfaction measure in the GSOEP. This means that we can quite easily compare the level of the scores. It is then interesting to see that Swiss respondents rate their satisfaction with life on average much higher than Germans. In West Germany, average life satisfaction over time ranges from 6.7 to 7.4, while in Switzerland the average scores range from 7.9 to 8.2. In line with the other datasets, the Swiss data show some cyclicality in well-being over time, and on average, there seems to be a slight decrease over time. The time span is rather short, so difficult to observe convergence or divergence in male and female happiness. Nevertheless, if anything, the Swiss data seem to be in line with work from Stevenson and Wolfers (2009) for the U.S.: female happiness is slightly higher than male happiness in the beginning of the period, but is equal to male happiness at the end of the time span.
4.2 Results from repeated cross-sections

The previous subsection showed that well-being measures are, in general, slightly downward sloping over time, even when weights are used to correct for panel aging. The data from the World Values Survey allow us to verify whether similar long-term trends can be replicated with repeated cross-sectional data, i.e. similar questions are asked in each round but different samples of people are interviewed.

For Germany, comparison of means between outcomes for 1997 and 2006 reveals no downward trend. If anything, average well-being is even slightly higher in the latter year than in the former (2.966 versus 2.973). As for Britain, average well-being goes up significantly according to the World Values Survey between 1998 and 2006. In 1998, Britain’s report, on average, a well-being score of 3.21, which increases to 3.42 in 2006. This increase is statistically significant at any significance level.

Finally, as for Switzerland, average well-being scores equal 3.29 in 1989, 3.34 in 1996 and 3.35 in 2007. The increase between 1989 and 1996 is statistically significant at the 7% significance level, the increase over the period 1996 to 2007 is nor economically significant, nor statistically significantly different from 0. The increase between 1989 and 2007, however, is statistically significant at the 4% significance level, and seems to be of a substantial magnitude as well (0.05) given the limited scale of the variable and the relatively short time span.

In conclusion, the comparisons between results from the World Values Survey on the one hand, and results from the GSOEP, the BHPS, and the SHP on the other hand, reveal quite striking discrepancies between panel data and repeated cross-sections. While overall results from panel data suggest a downward sloping pattern of well-being over time, repeated cross-sections indicate a slightly upward-sloping trend. A plausible hypothesis for this discrepancy might be that people adjust their rating scale when being
repeatedly interviewed, a phenomenon psychologists are sometimes concerned about (see e.g. Lindell and Drexler, 1979).

5 Conclusion

This paper has focussed on trends in life satisfaction, financial satisfaction, and depression using three European panel datasets (the German Socio-Economic Panel, the British Household Panel Survey, and the Swiss Household Panel) and repeated cross-sections from the World Values Survey. The paper first tries to address the confusion of the interpretation of coefficients on time dummies in a regression by discussing the different assumptions one is (often unconsciously) making when estimating an equation. The paper documents very basic regressions, as they are likely to yield more useful results than more complicated specifications.

The patterns of the different satisfaction measures show some cyclicality in the different panel datasets, and in most cases scores are slightly lower in the last round of data than in the first round of data. Financial satisfaction is rated significantly lower than life satisfaction, a finding which is consistent across the two datasets which contain this measure (the BHPS and the GSOEP). Patterns in life satisfaction and financial satisfaction are not very different for men than for women (likely because of the relatively short time span of the data), but the BHPS data show that women are more likely to report depressive symptoms than men. Moreover, West German women’s scores of financial satisfaction negatively converge to West German men’s scores, and East German women gain more in terms of life satisfaction from reunification than East German men.

When comparing panel data results from these 3 countries with repeated cross-sectional results from the World Values Survey, one observes some discrepancies. While panel data show for different countries (apart from East Germany) and different measures an overall downward trend, repeated cross-sections for these countries rather indicate
an increase in well-being over time. This discrepancy might imply that respondents slightly adjust their rating scale in subsequent interviews. Repeated cross-sections and pseudo panel data might therefore be favoured above genuine panel data when studying well-being over time or over the life cycle.
References


Figure 1: Trends of Life Satisfaction over Time: West Germany
Figure 2: Trends of Financial Satisfaction over Time: West Germany
Figure 3: Trends of Life Satisfaction over Time: East Germany
Figure 4: Trends of Financial Satisfaction over Time: East Germany
Figure 5: Trends of Life Satisfaction over Time: Illustrating Biases in Fixed Effects Using German Data
Figure 6: Trends of GHQ Scores over Time: Britain
Figure 7: Trends of Life Satisfaction Scores over Time: Britain
Figure 8: Trends of Financial Satisfaction Scores over Time: Britain
Figure 9: Trends of Life Satisfaction Scores over Time: Switzerland
Appendix: Depression in the Panel Study on Belgian Households

The PSBH is a discontinued dataset which contains 11 rounds, running from 1992 to 2002. This nationally representative dataset has been used much less for international research purposes than the other datasets discussed throughout the paper. The dataset is not very user friendly, questions (or the set of alternative answers) change more frequently over time than in other datasets, and one can identify quite some inconsistencies or bugs, which make the dataset somewhat less attractive. Yet it contains a considerable amount of potentially valuable information for research.

The PSBH data do not contain a ‘life satisfaction question’, but there are a set of questions on ones mental health of which most are reoccurring in every round. This allows us to construct a variation of the GHQ score as done with BHPS data. More in particular, in all the rounds, the following question was asked:

During the last 3 months, did you feel the following emotions or did you experience the following impressions? 1 = never; 2 = rarely; 3 = now and then; 4 = often; 5 = very often

and this for the following aspects:

1. Feeling depressed
2. Reduced appetite/losing weight
3. Having sleeping problems
4. Not being well-rested, feeling tired, without energy
5. Not being able to sit still
6. Feeling guilty/underestimating oneself
7. Not being able to concentrate
8. Easily start crying

9. Being pessimistic

10. Having melancholic thoughts, thinking about unpleasant things


In order to construct an index, the scores on the 11 items are recoded into dummy variables which take 1 when the answer given by the respondent equals 3 or higher. Next, the dummies on the different items are summed up for each wave at the individual level. This leaves us with a depression measure ranging from 0 to 11. Finally, this score is reversed so that 0 (the lowest score) means ‘very depressed’ and 11, the highest score, means ‘no depressive symptoms’. Again, the drawback of such a measure might be that it suffers from upper-truncation. We are able to identify depressed people, but not people who are very satisfied.

The GHQ measure has an average, across all individuals and all round, of 7.29, and a standard error of 2.95. 16% of the individuals report the highest score of 11, which is not very much more than what one usually observes for general life satisfaction questions. The upper truncation problem thus seems to be minor.

It is striking, however, that in line with the results from the BHPS, women have on average a much lower GHQ score than men, being 6.68 and 7.95 respectively.