Economic Growth Evens-Out Happiness: Evidence from Six Surveys

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Andrew E. Clark[†] (Paris School of Economics - CNRS)

Sarah Flèche[§] (Paris School of Economics)

Claudia Senik[‡] (Paris School of Economics and University Paris-Sorbonne)

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Abstract

In spite of the great U-turn that saw income inequality rise in Western countries in the 1980s, happiness inequality has dropped in countries that have experienced income growth (but not in those that did not). Modern growth has reduced the share of both the "very unhappy" and the "perfectly happy". The extension of public amenities has certainly contributed to this greater happiness homogeneity. This new stylized fact comes as an addition to the Easterlin paradox, offering a somewhat brighter perspective for developing countries.

Keywords: Happiness, inequality, economic growth, development, Easterlin paradox.

JEL codes: D31, D6, I3, O15

† PSE, 48 Boulevard Jourdan, 75014 Paris, France. Tel.: +33-1-43-13-63-29. E-mail: Andrew.Clark@ens.fr.
‡ PSE, 48 Boulevard Jourdan, 75014 Paris, France. Tel.: +33-1-43-13-63-47. E-mail: sarah.fleche@ens.fr.
§ PSE, 48 Boulevard Jourdan, 75014 Paris, France. Tel.: +33-1-43-13-63-12. E-mail: senik@pse.ens.fr.

I. Introduction

"*Will raising the incomes of all increase the happiness of all*?" Richard Easterlin asked somewhat ironically in 1995 (Easterlin, 1995), as he had shown some 20 years earlier that average self-declared happiness generally does not increase over the long run, even during episodes of sustained growth (Easterlin, 1974). This latter finding has more recently been called into question, and it has been suggested that in some countries there is a positive time-series correlation between per capita GDP and average levels of subjective well-being (a well-known contribution to this extent is Stevenson and Wolfers, 2008*a*). At the same time as this ongoing debate about the relationship between average happiness and GDP growth, a striking new stylised fact has recently emerged regarding the distribution of measures of happiness or "happiness inequality". As documented in Clark *et al*. (2013), there is strong evidence across a wide variety of datasets that GDP growth is associated with systematically lower levels of happiness inequality (as measured by the coefficient of variation). It is this finding that we wish to address here.

We provide systematic evidence that economic growth does even out the distribution of subjective well-being. It does so mostly despite the associated rise in income inequality, does not seem to be the result of any statistical artefact, is found in almost all domains of satisfaction, but is not found in placebo tests on other subjective variables.

In none of our analyses is there any relationship between GDP growth and average happiness. Outside of a utilitarian world, however, we may be more Rawlsian and give a certain weight to the avoidance of misery: here higher GDP does seem to chalk up points. The value we attach to GDP growth will then depend on the social welfare function that we have in mind.

The remainder of the paper is organised as follows. Section 2 shows that higher income is associated with a tighter distribution of subjective well-being across countries, within countries,

across individuals, and within individuals. Section 3 then presents a regression analysis emphasising the key roles of income inequality and public goods in determining happiness inequality. Section 4 considers the measurement of dispersion and discusses some placebo tests. Last, Section 5 concludes.

2. Income Growth and Happiness Inequality

There is a great deal of work using country-level data to show a relationship, or the lack of one, between GDP growth and average levels of satisfaction or happiness over time. However, until very recently little attention was paid to the inequality in subjective well-being as economies grew. A flat happiness profile over time can be associated with a stable distribution of happiness, rising inequality, or lower inequality.

Two papers, Stevenson and Wolfers (2008*b*) and Dutta and Foster (2013), have underlined a general fall in the inequality of happiness in a single country (the United States) over the last decade. Veenhoven (2005) found falling happiness inequality in EU countries (surveyed in the EuroBarometer) over the years 1973-2001, in spite of rising income inequality. He also notes a tighter distribution of happiness in "modern nations" rather than more traditional countries.

Clark *et al*. (2013) then looked at this issue systematically, using a wide variety of different datasets and a long time period (1970-2010). The crux of their argument is that countries with growing GDP per capita also have falling happiness inequality. The data used there come from the *World Values Survey* (WVS), the German socio-economic panel (SOEP), the *British Household Panel Survey* (BHPS), the American *General Social Survey* (GSS) and the *Household, Income and Labour Dynamics in Australia* survey (HILDA). Happiness inequality was picked up by the coefficient of variation (the standard deviation of happiness divided by the sample happiness mean).

It is difficult to know what is the correct measure of the distribution of subjective well-being. One worry is that higher happiness levels will mechanically lead to lower dispersion in the coefficient of variation. If higher income produces greater happiness, then the income-coefficient of variation correlation will be mechanically negative. We here avoid the possibility of any artificial relationship by using the simple standard deviation of happiness. As we will show, this makes no difference to the main result that economic growth evens out the distribution of happiness.

2.1 WVS Country Cross-Section

Our first piece of evidence is country cross-section, from the last available wave of the WVS (in the 2000s). Figure 1 shows the results. The left-hand panel reveals that the standard deviation of happiness is lower in richer countries. This relationship is significant at the one per cent level, as shown by the regression at the foot of the figure. The right-hand side panel shows the equivalent relationship using the coefficient of variation. The slope may look flatter, but of course the dependent variable is not on the same scale.

2.2 WVS Country Panel

The next piece of evidence comes from changes over time within countries. We first consider WVS countries which are observed at least twice, at least five years apart, and which experienced strictly positive GDP growth in all of the intervening years between the two consecutive observations. What happened to happiness inequality in these growth periods?

Figure 2A answers this question using data from a selection of Western countries. Although there is some sample variability here, happiness inequality falls over time as countries grow richer. The average panel relationship in these countries is given by the grey line. Again, it makes little difference whether we consider the standard deviation or the coefficient of variation.

While suggestive, neither Figure 1 nor Figure 2A arguably provides evidence of a clean causal relationship. In the cross-section analysis, there could be some innate country characteristic that both makes a country rich and reduces the spread of its happiness distribution; in Figure 2A there has perhaps been a generic move towards reduced happiness inequality across all countries, which has nothing to do with GDP growth *per se*.

One obvious rejoinder to the latter is to take countries which did not experience such periods of GDP growth, and show that the relationship is different for them. This is what we do in Figure 2B. Countries with at least one period of negative or zero growth over the five-plus year period between observations show no evidence of falling happiness inequality: the average panel relationship here is actually weakly positive. At the extreme, we can also consider countries which experienced only falls in income between two WVS observations (although there are only few of these). Figure 2C reveals a substantial rise in happiness inequality in these countries. Hence, there is then no evidence of a general trend towards a tighter distribution of subjective well-being over time in the WVS: this tightening is only found for countries which have systematically become richer.

It is worth noting that this finding is not particular to the WVS. We can reproduce Figures 2A and 2B (but not 2C, as there only very few observations) using 40 years of data from the Eurobarometer: these results are depicted in Appendix Figures 1A and 1B.

2.3 BHPS, SOEP, HILDA and GSS: Country Panels

One drawback of the WVS is its small time-series dimension.[1] We therefore now turn to single-country datasets which contain many more waves of data. We use four popular long-running single-country datasets covering the United Kingdom (BHPS), Germany (SOEP), Australia (HILDA), and

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[1] The WVS started in 1990 and has been repeated every five years. The sixth wave is currently in the field.

the United States (GSS). The way in which happiness and GDP co-move over time is summarized in Figure 3.

Figure 3 has four panels, one for each country. Each of these includes two graphs. The first shows average happiness and GDP per capita over time, as in the work on the Easterlin paradox; the second plots out the time series on the standard deviation of happiness and GDP per capita. We fit a quadratic trend when appropriate to the standard deviation of happiness (on the right-hand of each panel). All of the numbers in Figure 3 come from regressions in which we control for the changing demographic and social composition in each country over time (we condition on age, age-squared, sex, marital status, education, employment status and individual fixed effects).

There are two striking findings in Figure 3. The first is that, on the left-hand side, the rising trend in GDP per capita is certainly not matched by an analogous movement in average happiness. As found in a number of empirical contributions, GDP growth in these four countries does not go hand-in-hand with higher average happiness. But there does seem to be a systematic negative relationship between GDP and happiness inequality, as drawn on the right-hand side of Figure 3. In the UK and Australia, the best fit of falling inequality is a linear trend; in Germany and the US the relationship is quadratic. In the US happiness inequality notably started to rise again in the 2000s, after falling from 1970 to 1990. We will below suggest that this is at least partly driven by income inequality.[2]

2.4 BHPS, SOEP, HILDA and GSS: Individual Cross-sections

At the individual level, within each country, happiness dispersion is also smaller amongst the rich than amongst the less well-off (Figure 4): the richer seem to be more insulated against various kinds of shocks. Higher income allows consumption to be protected from movements in income.[3] And it

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[2] Again, we can produce analogous single-country graphs using Eurobarometer data: these appear in Appendix Figure 2.

[3] Which is why consumption varies less over time than does income: see Krueger and Perri (2006).

is in general likely that higher income allows the hedonic impact of various life shocks (job loss, divorce, etc.) to be smoothed.

2.5 BHPS, SOEP and HILDA: Individual Panels

Finally, we can also look at the same correlation within-individual, using the three panel datasets (we thus drop the GSS here). Within-individual volatility of happiness over time is lower for those in higher income deciles. Figure 5 shows that the standard deviation of happiness over time is lower for richer than for poorer individuals in the panel.

2.6 A Statistical Artefact?

All of the results so far suggest that higher income comes with less happiness inequality. We may worry that this is a statistical artifact. If higher incomes make people happier, and happiness is measured using a bounded scale, then inequality will fall as more people become right-censored on the top rung of the happiness ladder. At the extreme, as everyone reports the top subjective well-being score, inequality will be zero.

A first response to this worry is that there is actually little evidence from Figure 3 that higher income over time does go with higher happiness. We can nonetheless further check how the subjective well-being distribution changes using histograms of happiness at the beginning and end of the periods under consideration.

Figure 6 shows the results. We compare the happiness histograms for the first and last three years of each survey. Far from becoming more heavily populated, the top category is becoming increasingly deserted in all countries. Lower happiness inequality actually seems to come from a mean-preserving contraction, as the percentage reporting the lowest happiness levels is also falling. As a consequence, the middle happiness categories are increasingly popular.

A further formal test, if required, of the role of censoring comes from dropping the two end points in the panel datasets.[4] (Appendix Figure 5). The test here is to look at happiness answers in year *t+1* of those who reported happiness scores of between 2 and 6 in the BHPS data (say) at year *t*. All of these individuals can report both higher or lower happiness. Again, there is no trend in average happiness but lower happiness inequality (Figure 5 in the Appendix).

2.7 Well-being domains

Is there something strange about the specific distribution of overall satisfaction scores? Figures 7A to 7D suggest mostly not. Satisfaction with health, income and job all exhibit falling inequality in the UK, Germany and Australia. As was the case for life satisfaction, the US is an outlier. Job satisfaction inequality is (slightly) falling, but not that for health and income. We suspect that income inequality may play a crucial role here: this is the topic of the next section.

3. Regression Analysis: Income Inequality and Public Goods

The results above come from analyses without any controls other than basic demographics. Can we now identify variables that help to explain the trend in happiness inequality over time? We here consider the role of income inequality and public goods. Recent years have seen rising incomes accompanied by rising income inequality[5] (which we would suppose to increase happiness inequality): this is illustrated in Figure 8 for our four single-country datasets.

At the same time, we may also reasonably expect income growth in general to produce public goods (like education, health, public infrastructure and social protection). Modern growth also comes with non-material public goods, such as lower violence and crime, greater freedom of choice in private

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[4] We cannot do this in the GSS, of course, as there are only three possible happiness scores.
[5] See Atkinson *et al*. (2011).

life, political freedom, transparency and pluralism, better governance, and so on (Inglehart, 1997, and Inglehart *et al*., 2008). These public goods are by definition available to everyone (although of course their marginal benefit may differ across individuals). We then suspect that their provision will reduce happiness inequality.

The role of income inequality and public goods in determining the standard deviation of life satisfaction is explored in Table 1. The data here is the WVS and these are OLS regressions.[6] The "public-good"-type variables come from the World Bank Governance dataset: we consider Social expenditures, Life expectancy, the Control of Corruption, Civil Liberties and Political Rights.

Column 1 confirms, as expected from Figure 1, that happiness inequality falls with the log of GDP per capita.[7] Column 2 then adds income inequality, as measured by the Mean Log Deviation in Income, and our measure of social expenditures. These attract significant positive and negative coefficients respectively. Their addition only mildly affects the estimated coefficient on log GDP per capita. Last, column 3 controls for the whole set of "public-good" variables. The estimated coefficients on Social expenditures, Life expectancy, the Control of Corruption and Political Rights are all negative and significant at the 1% level, confirming that public-good provision reduces happiness inequality. The coefficient on Civil Liberties is insignificant. The inclusion of these variables reduces the coefficient on log GDP per capita somewhat, while that on income inequality remains positive and significant.

Another way of seeing this result is to carry out the graphical analysis in Figure 2A separately for low- and high-income inequality countries (where the cut-off is given by the average Gini coefficient of 0.32 in our sample): this is what we do in Figures 9A and 9B. The benefits of higher

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[6] We find the same results in ordered probit analysis.
[7] The errors are clustered at the country-year level here (which is the aggregation level of GDP per capita), to avoid under-estimating the standard errors: see Moulton (1990).

income in terms of reducing happiness inequality are far more noticeable in low income-inequality countries.

Income growth would therefore seem to reduce happiness inequality partly because it allows for the greater provision of public goods. However, if this growth is accompanied by too large a rise in income inequality, then it is entirely possible that happiness inequality will actually rise as a result: this is arguably what we have observed in the US data above.

4. The Index of Ordinal Variation and Placebo Tests

All of our analysis above uses the standard deviation in respondents' self-declared satisfaction as our key dispersion measure. Such a measure assumes that happiness is continuous and cardinal, with equal distances between the steps. Although such an assumption is common in the field, we have no way of knowing whether it is actually true. To be on the safe side, we show that the movement over time in the standard deviation of happiness is virtually the same as that of the Index of Ordinal Variation (Berry and Mielke, 1992), a measure of variation specifically designed for ordinal measures: see Appendix Figure 3.

Last, it might be suspected that there is something inherent about self-reported variables, particularly in a panel-data context, that produces more homogenous values over time. We here run a placebo test by looking at the changing standard deviation over time in other variables available in our four single-country datasets. For the BHPS, SOEP and GSS, we use self-reported interest in politics, which is measured on a one-to-four ordinal scale; in HILDA we consider the self-reported number of hours per week spent volunteering.

The results appear in Appendix Figure 4. There is little evidence of any particular trend in the dispersion of these measures over time, and certainly no evidence of a downward trend. The

shrinking dispersion of subjective well-being over time in our datasets appears to be specific to this question, rather than a general feature of self-reports.

5. Conclusions

In spite of the great U-turn that saw income inequality rise in Western countries in the 1980s, happiness inequality has dropped in countries that have experienced income growth (but not in those that did not). Modern growth has reduced the share of both the "very unhappy" and the "perfectly happy". The extension of public amenities may have contributed to this greater happiness homogeneity by reducing the precarity faced by the worst-off groups of the population. At the same time, it may also have enlarged the world of possibilities of the top elites, raising their aspirations and reducing their satisfaction. As in much of this literature, we find no evidence that economic growth has increased mean levels of subjective well-being. But we certainly believe that it has reduced happiness inequality. This new "augmented" Easterlin paradox therefore offers a somewhat brighter perspective for developing countries.

Data Appendix

This paper uses the five currently-available waves of the *World Values Survey* (WVS, 1981-2008), covering 105 countries. These include high-income, low-income and transition countries, as well as data from the ISSP and the 2002 *Latinobarómetro*. We also analyze individual-country surveys, such as the *British Household Panel Survey* (BHPS, 1996-2008), the German *Socio-Economic Panel* (SOEP, 1984-2009), the American *General Social Survey* (GSS, 1972-2010) and the *Household, Income and Labour Dynamics in Australia* survey (HILDA, 2001-2009).

The Happiness and Life Satisfaction questions were administered in the same format across all these surveys but with different response scales: 1-3 in the GSS, 1-10 in the WVS, 0-10 in the SOEP and the Australian HILDA, 1-7 in the BHPS. The wording of the Life satisfaction question in the WVS was "*All things considered, how satisfied are you with your life as a whole these days?: 1 (dissatisfied)....10(very satisfied)*". In the SOEP, it was "*How satisfied are you with your life, all things considered?*": 0 (*totally unsatisfied*) … 10 (*totally satisfied*). The BHPS survey asked "*How dissatisfied or satisfied are you with your life overall?*": 1 (*not satisfied at all*) … 7 (*completely satisfied*)". The wording of the Happiness question in the GSS was "*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?*". We do not need to harmonize these scales, as we consider the evolution of the variance of happiness over time within countries. The surveys cover representative samples of the population in participating countries, with an average sample size of ten to fifteen thousand respondents in each wave. As is common, we select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year.

We use the American *General Social Survey* because it is the only long-run survey containing a happiness or life satisfaction question in the United States. However, this data is not really suited to

our purpose, as only three responses are possible (very happy, pretty happy, and not too happy), making the calculation of the variance problematic. However, as the evidence initially used to suggest the Easterlin paradox partly relied on American data, and because we would like to include data from the United States, we do report the results based on this data, although they may need to be considered with some caution.

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Figure 1. Happiness Inequality and GDP per Capita. WVS Cross-Section, Last Available Year (2000s)

S.D. of Life Satisfaction   *S.D. of Life Satisfaction / Mean*

SD(Satisfaction) = -0.142**ln(GDP) + 3.31; R-squared=0.4020   SD(Satisfaction)/mean = -0.049**ln(GDP) + 0.74; R-squared=0.4959
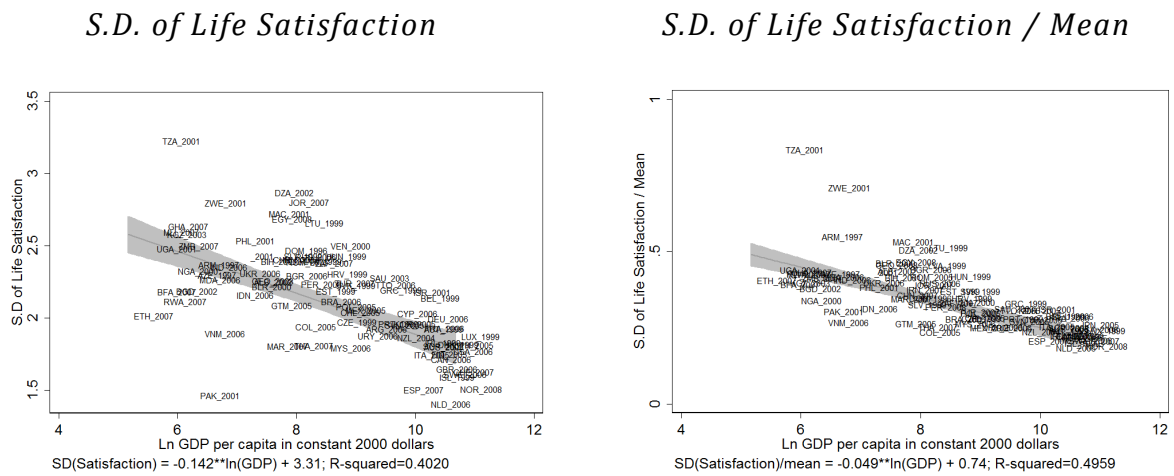
Note: We use the last available year for each country in the World Values Survey. Happiness inequality is measured as the standard deviation in self-declared life satisfaction per country per year.

Figure 2A. Happiness Inequality within Growing Countries. WVS Panel. Selected Western Countries
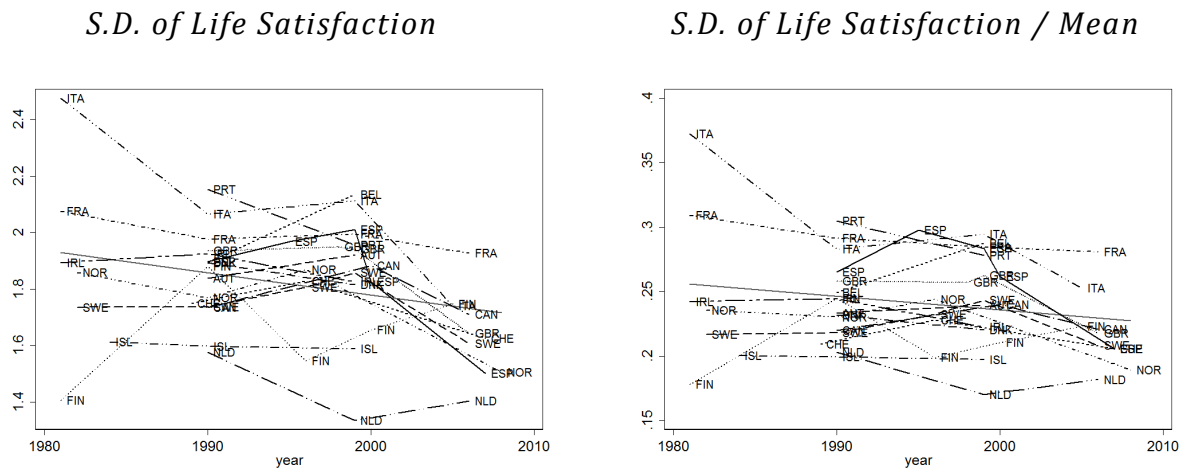
S.D. of Life Satisfaction   *S.D. of Life Satisfaction / Mean*

Note: The lines show the movements in life-satisfaction inequality for countries with periods of strictly positive growth, over periods of at least 5 years.

Figure 2B. Happiness Inequality within Countries with some Periods of Negative or Zero Growth. WVS Panel.

S.D. of Life Satisfaction   *S.D. of Life Satisfaction / Mean*
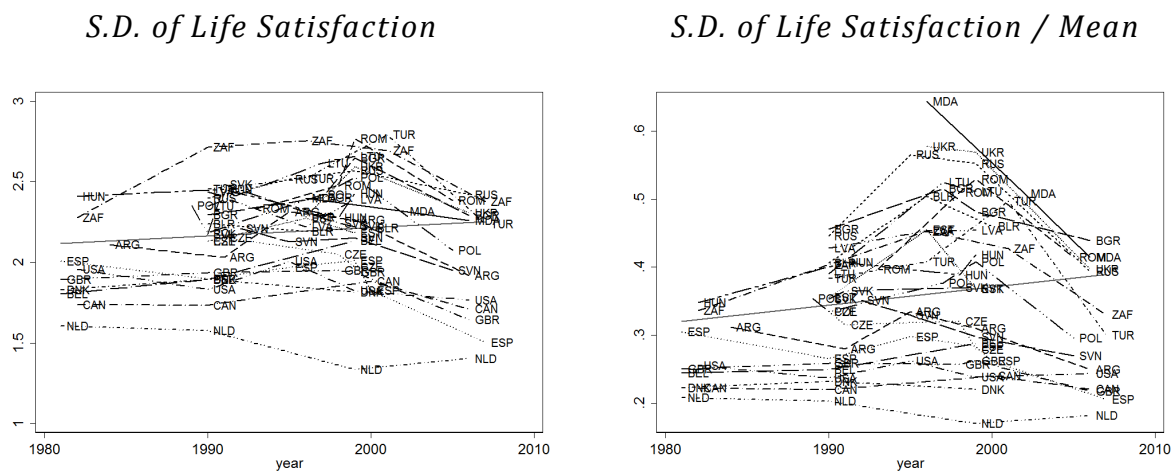
Note: The lines show the movements in life-satisfaction inequality for countries with some periods of zero or negative growth, over periods of at least 5 years.

Figure 2C. Happiness Inequality within Countries with Falling GDP. WVS Panel.
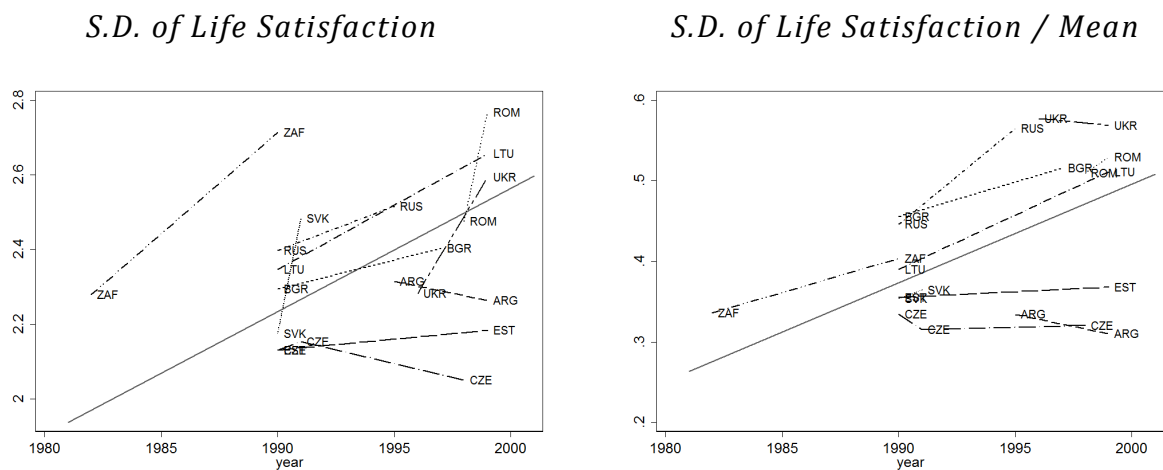
S.D. of Life Satisfaction   *S.D. of Life Satisfaction / Mean*

Note: The lines show the movements in life-satisfaction inequality for countries with periods of negative growth, over periods of at least 5 years.

Figure 3. Trends in GDP per Capita, Average Happiness and Happiness Inequality. Single-Country Panels.

Great Britain (BHPS)
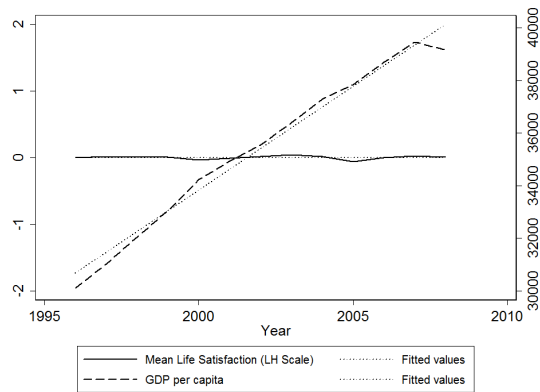
Mean of Life Satisfaction (residuals)   *S.D. of Life Satisfaction(residuals)*
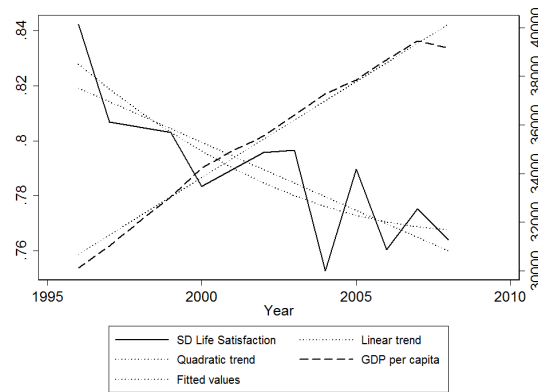
West Germany (SOEP)
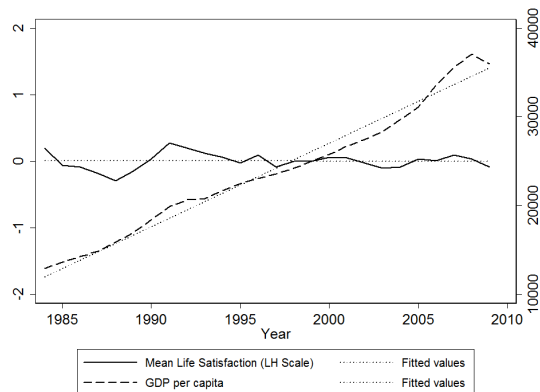
Mean of Life Satisfaction (residuals)   *S.D. of Life Satisfaction(residuals)*
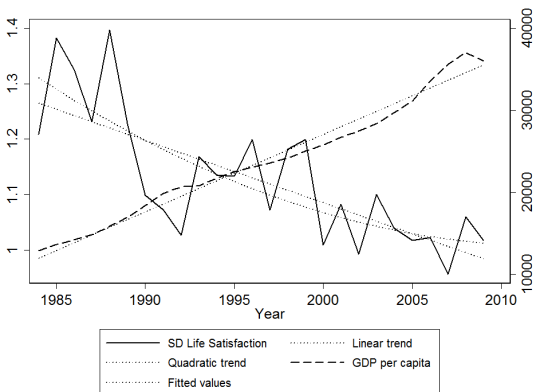
Australia (HILDA)
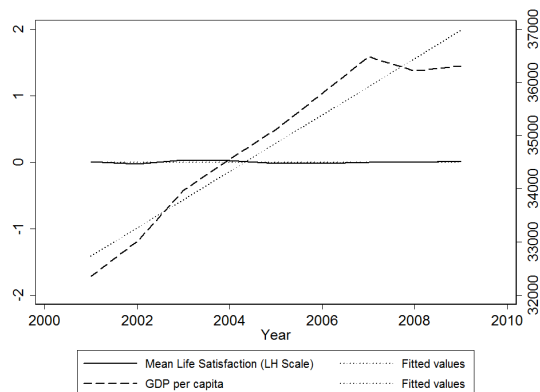
Mean of Life Satisfaction (residuals)   *S.D. of Life Satisfaction (residuals)*
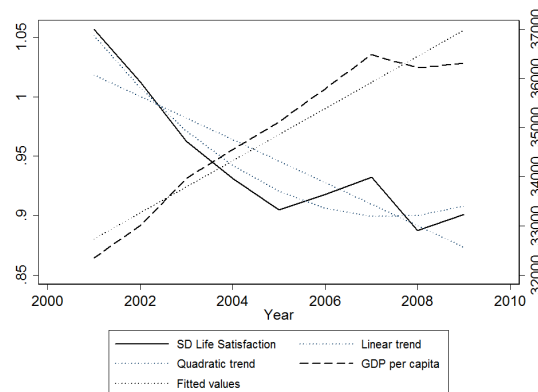
United States (GSS)

Mean of Happiness (residuals)
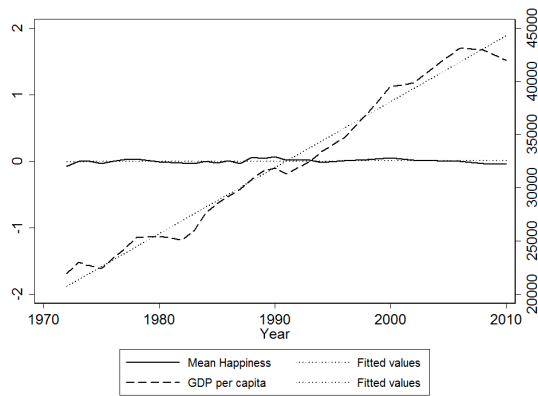
S.D. of Happiness (residuals)
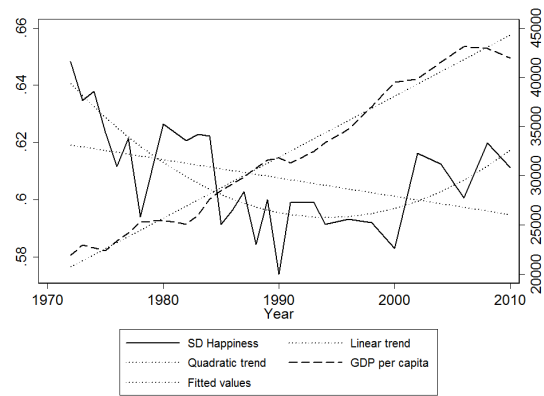
Notes: Happiness and Life Satisfaction questions are administered consistently over time within countries for all of these surveys, although the surveys use different response scales: 1-3 in the GSS, 0-10 in the SOEP and HILDA, and 1-7 in the BHPS. As is comm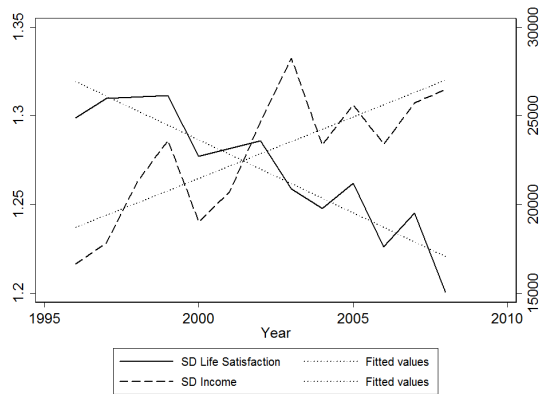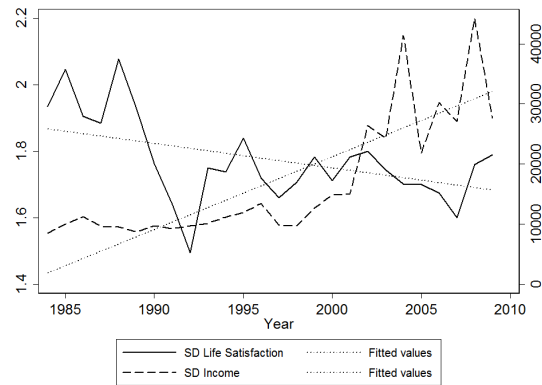on, we select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year. GDP per capita figures are taken from Heston, Summers and Aten - the Penn World Tables. The values plotted are the average and SD residuals by year from a regression of life satisfaction on gender, age, age squared, marital status, employment status, education and individual fixed effects.

Figure 4. Income as a Buffer Stock: The S.D. of Happiness is Lower in Higher Income Deciles

Great Britain (BHPS)
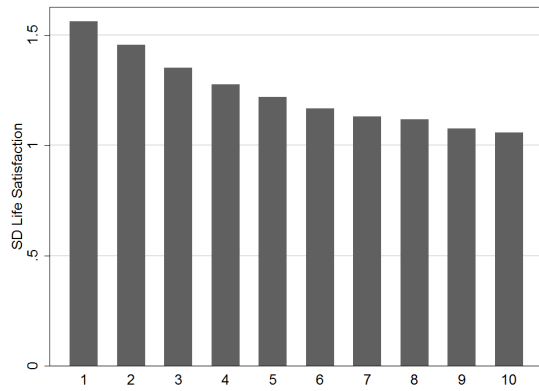
West Germany (SOEP)
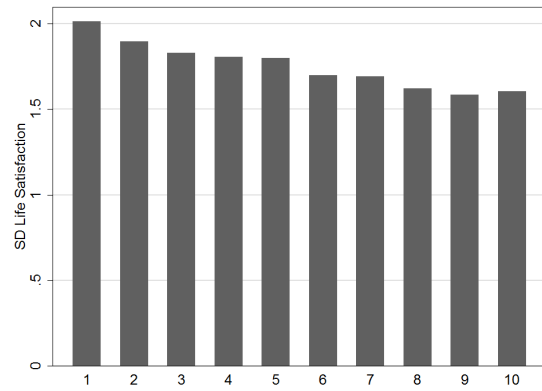
Australia (HILDA)
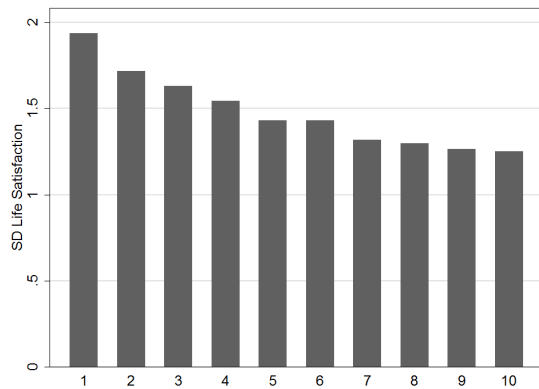
United States (GSS)
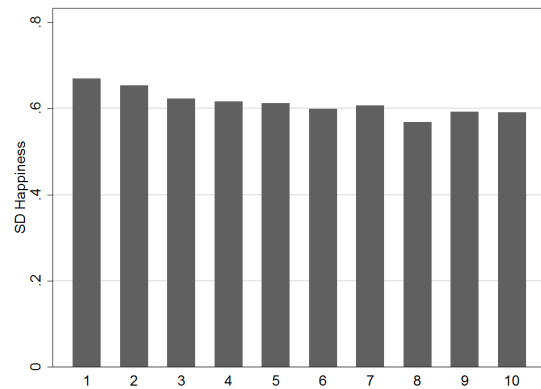
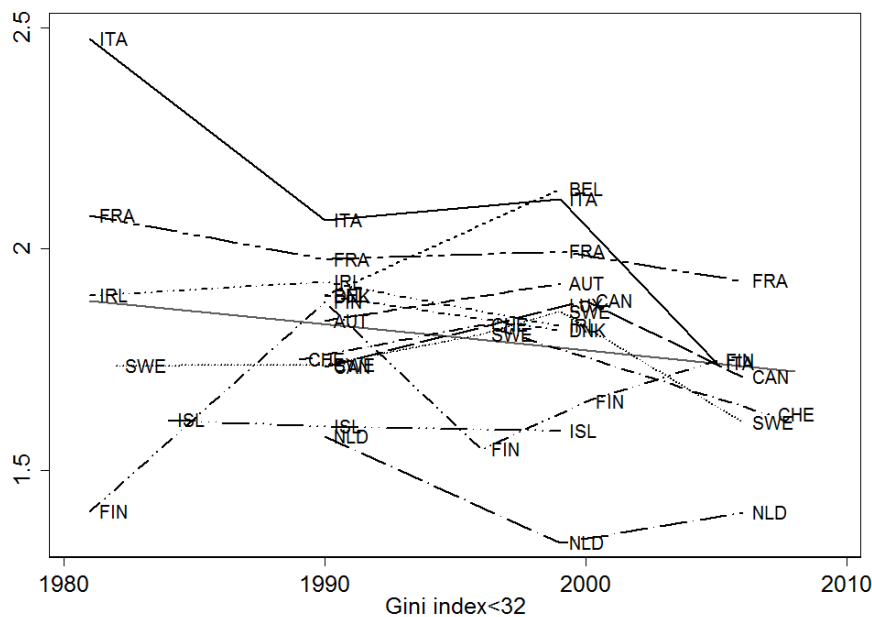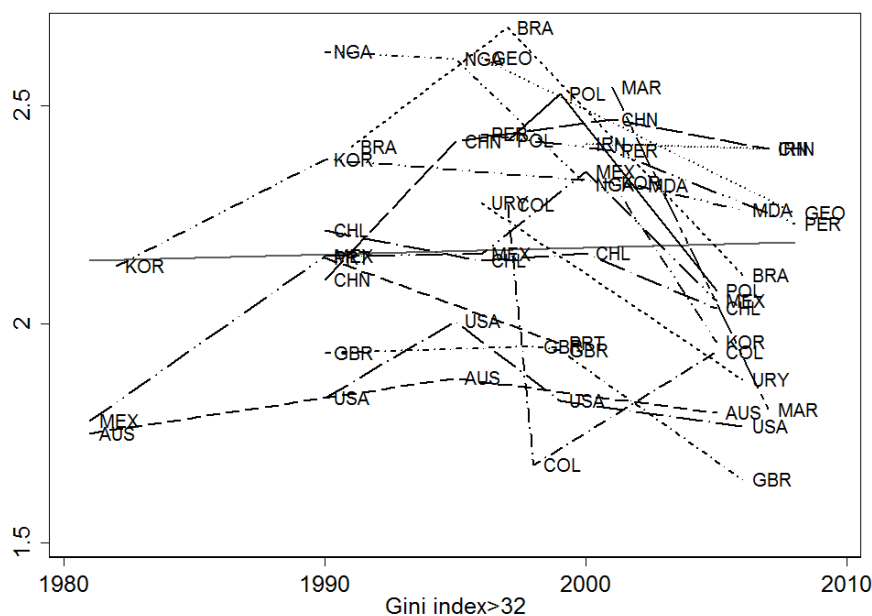Notes: "SD Life Satisfaction" are calculated by income decile. We select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year.

Figure 5. Income as a Buffer Stock: The S.D. of Happiness over time is lower for individuals in higher income deciles

Great Britain (BHPS)
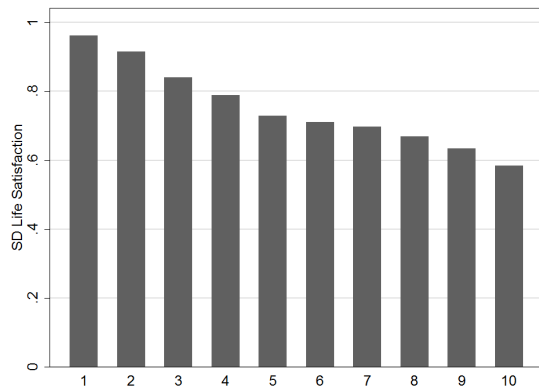
West Germany (SOEP)
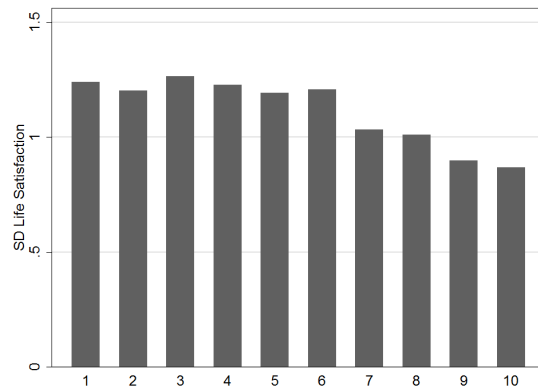
Australia (HILDA)
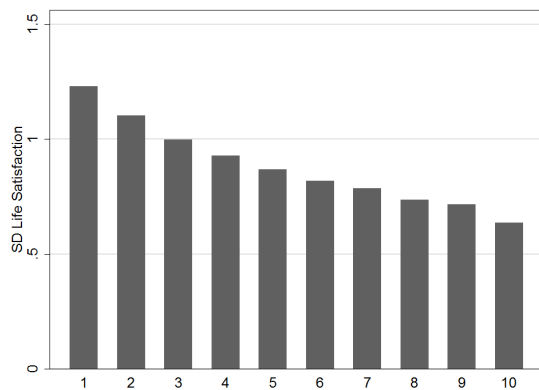
Notes: "SD Life Satisfaction" are calculated by individual, over time and then averaged by income decile. We select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year. "Income decile" is defined as the average income decile by individual over the period.

Figure 6. The Vanishing of Happiness Extremes

Great Britain (BHPS)
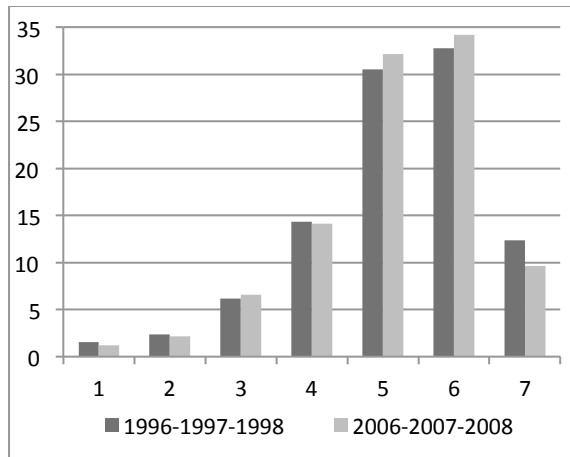
West Germany (SOEP)
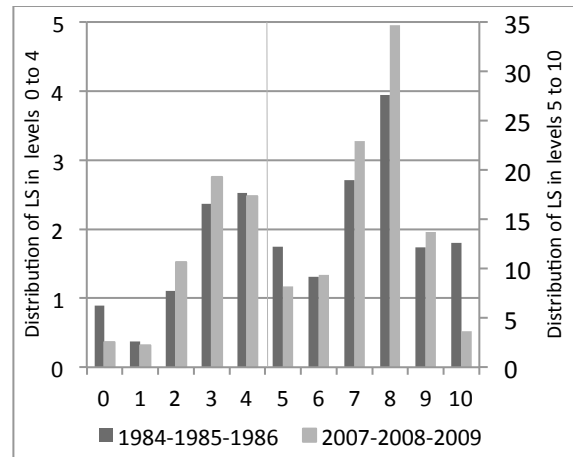
Australia (HILDA)
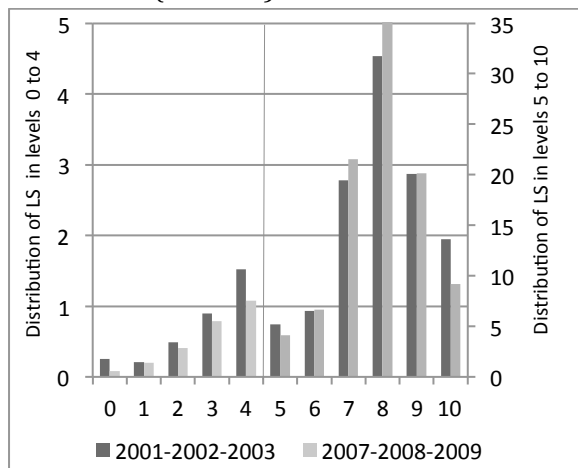
United States (GSS)
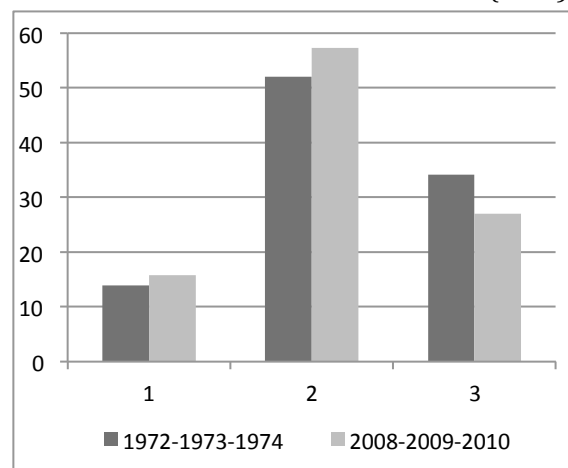
Notes: As above, we select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year. Dark bars show the distribution of life satisfaction in the survey the first three years it was available, and grey bars that in the last three years (in %).

Figure 7. Trends in Satisfaction Inequality by Domain

Great Britain (BHPS)

Health (1-7)   *Income (1-7)*   *Job (1-7)*
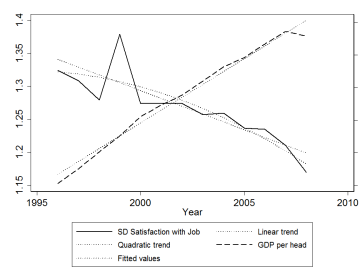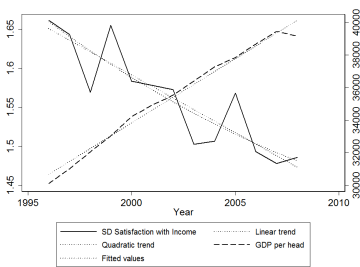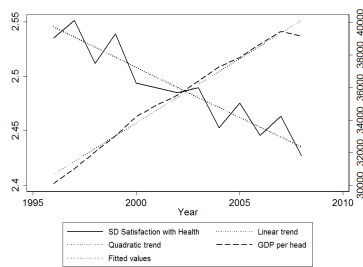
West Germany (SOEP)

Health (0-10)   *Income (0-10)*   *Job (0-10)*
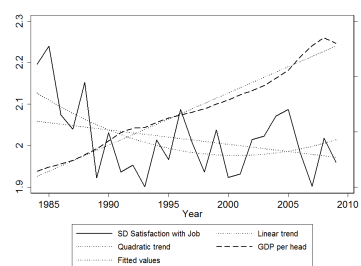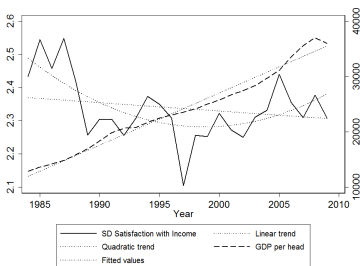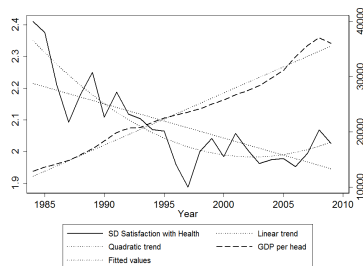
Australia (HILDA)

Health (0-10)   *Income (0-10)*   *Job (0-10)*
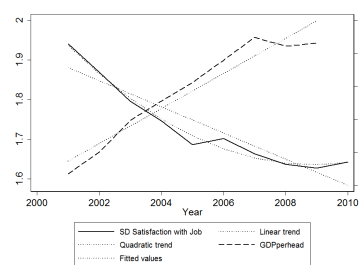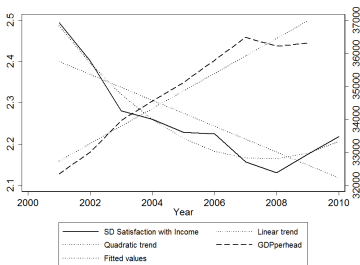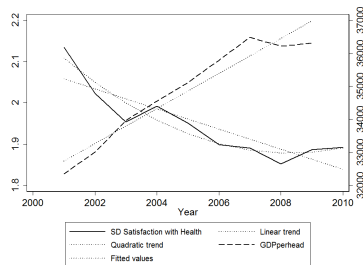
United States (GSS)

Health (1-7)   *Income (1-3)*   *Job (1-4)*
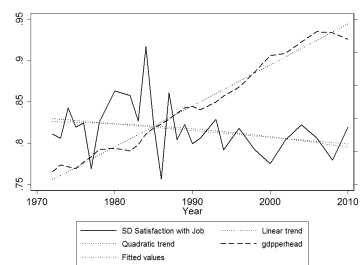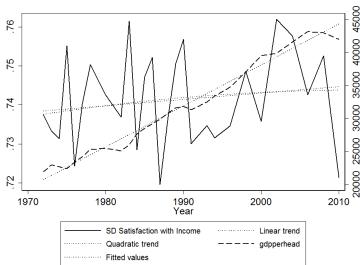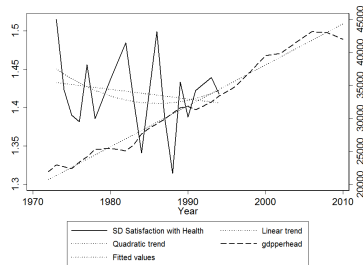
Notes: We select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year. GDP per capita figures are taken from Heston, Summers and Aten - the Penn World Tables.

Figure 8. Happiness Inequality and Income Inequality

Great Britain (BHPS)

West Germany (SOEP)

Australia (HILDA)
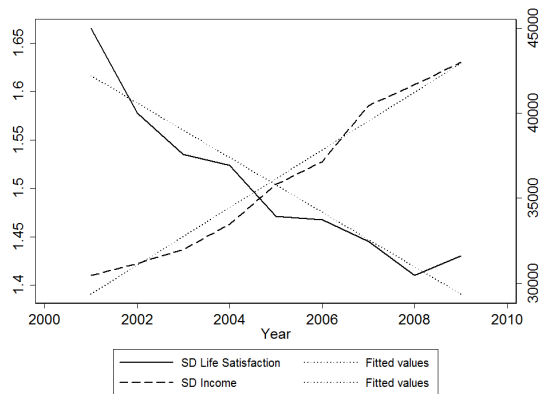
United States (GSS)

Notes: We select people aged between 18 and 65 years old; we also drop observations corresponding to a declared income of below 500$ per year.

Figure 9A. Happiness Inequality Over Time in Growing Countries with a <u>Low Level of Income Inequality</u> (WVS)

Figure 9B. Happiness Inequality Over Time in Growing Countries with a <u>High Level of Income Inequality</u> (WVS).

Table 1. OLS Estimates of the Determinants of SD Life Satisfaction: WVS

	(1)	(2)	(3)
Ln GDP Per capita	-0.659***	-0.718***	-0.531***
	(0.170)	(0.1237)	(0.184)
Mean Log Deviation in Income		1.476**	2.780***
		(0.830)	(0.961)
Social expenditures		-0.023**	-0.048***
		(0.012)	(0.013)
Life expectancy			-0.060***
			(0.024)
Control of Corruption			-0.148***
			(0.069)
Civil Liberties			-0.008
			(0.076)
Political Rights			-0.152***
			(0.040)
Observations	73507	73507	73507
R-squared	0.9176	0.9322	0.9565

Notes: The other controls include country fixed effects, age category dummies, sex, number of children, education, labour-force status, and marital status. The errors are clustered at the country-year level. GDP per capita is taken from Heston, Summers and Aten - the Penn World Tables. Social expenditures, Life Expectancy, Control of Corruption, Civil Liberties and Political Rights are from the World databank. http://info.worldbank.org/governance/wgi/index.asp.

Appendix

Appendix Figure 1A. Happiness Inequality within Growing Countries. Eurobarometer Panel. Selected Western countries

S.D of life satisfaction
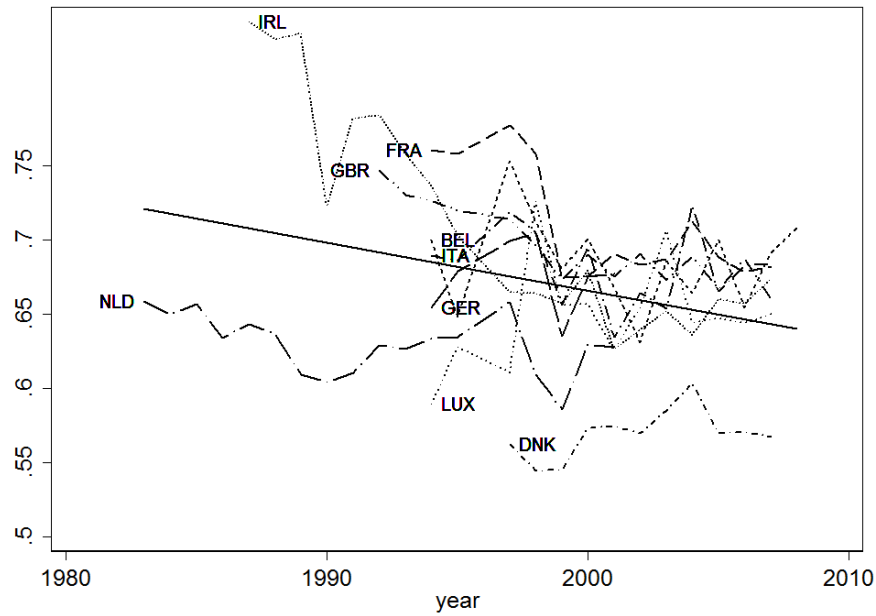
Appendix Figure 1B. Happiness Inequality within Countries with some Periods of Negative or Zero Growth. Eurobarometer Panel.

S.D of life satisfaction
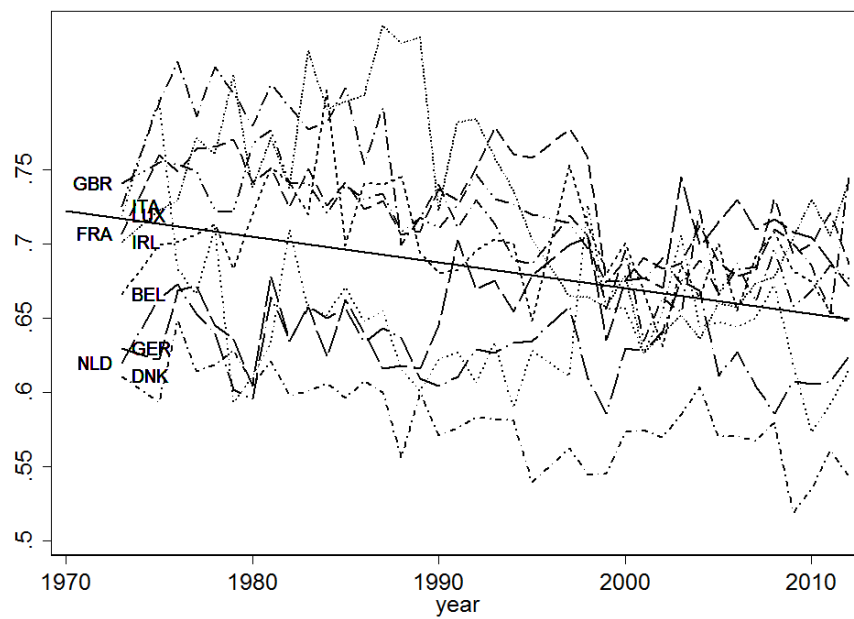
Appendix Figure 2. Single-Country Trends in Income Growth and Happiness Inequality, Eurobarometer.
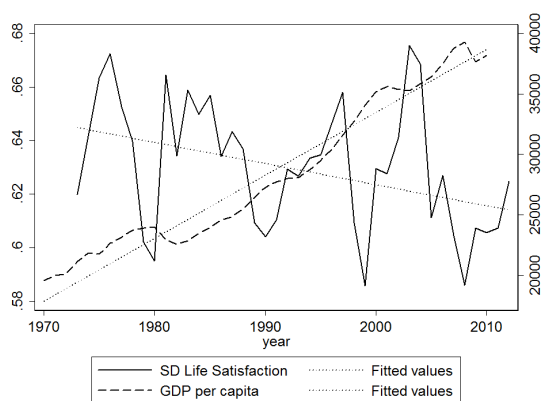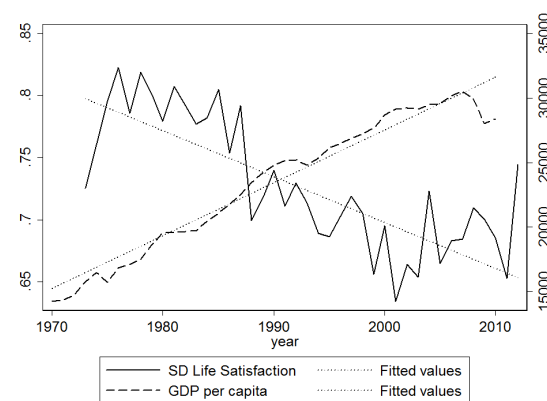
Great Britain
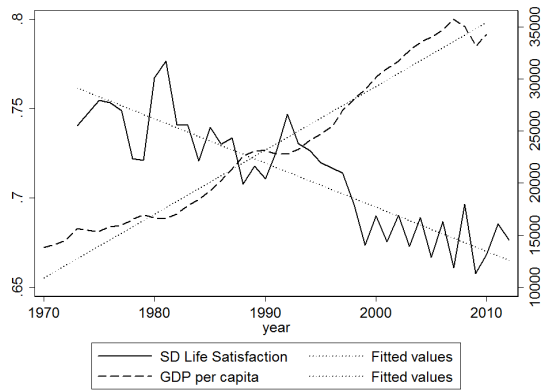
West Germany
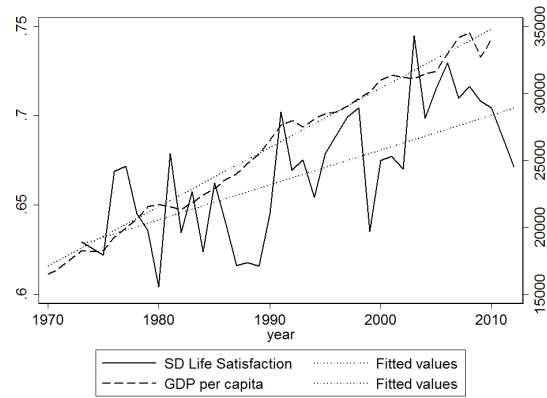
France
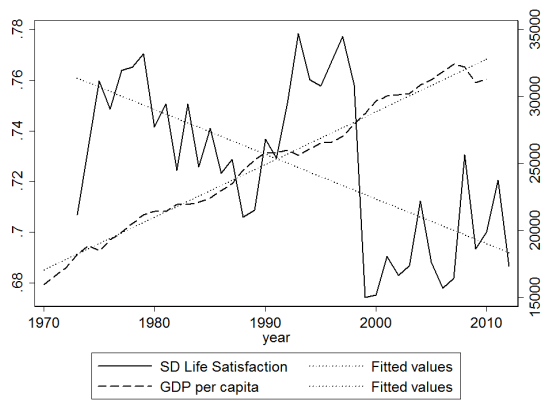
Denmark
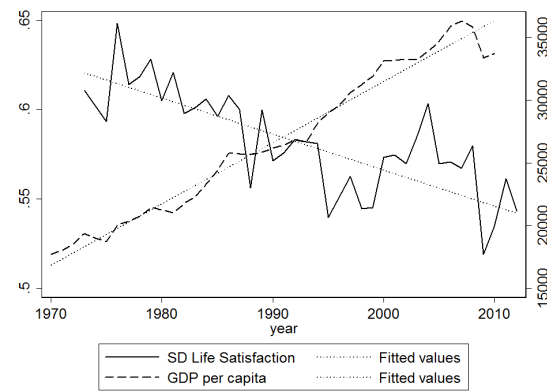
Netherlands

Italy

Note: SD of Life Satisfaction without controls.

Belgium
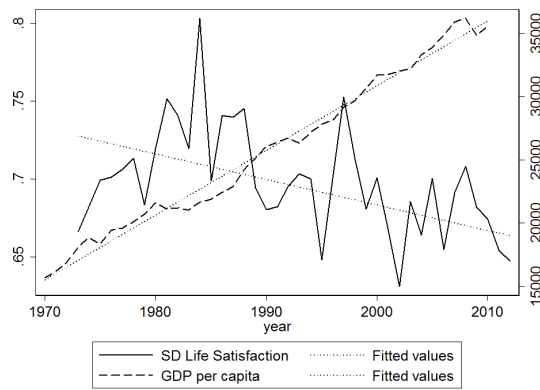
Ireland
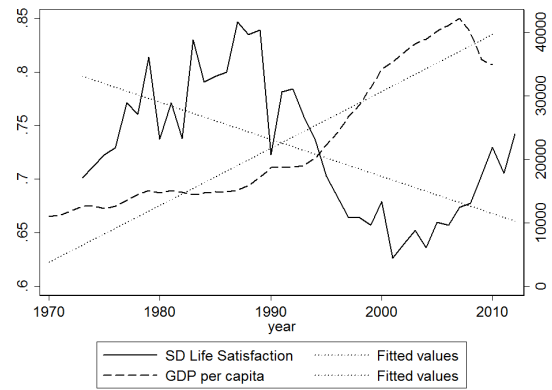
Luxembourg
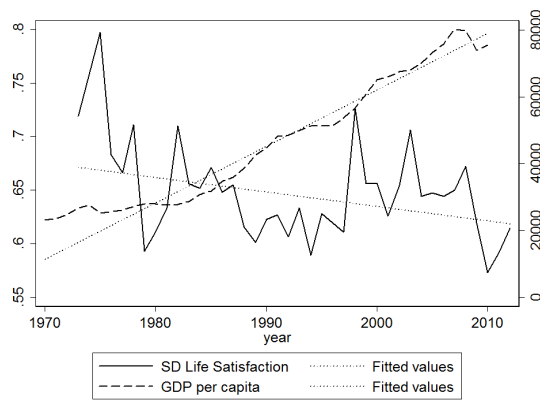
Note: SD of Life Satisfaction without controls.

Appendix Figure 3. The Evolution of the Index of Ordinal Variation and the SD of Happiness over Time
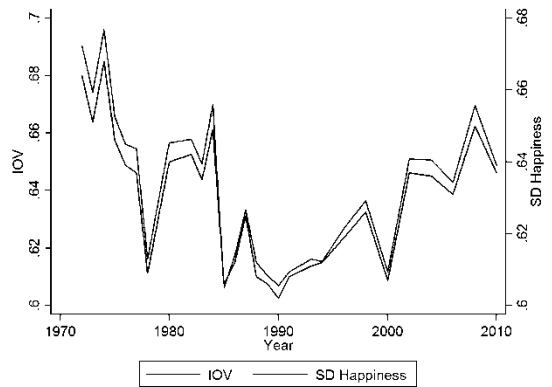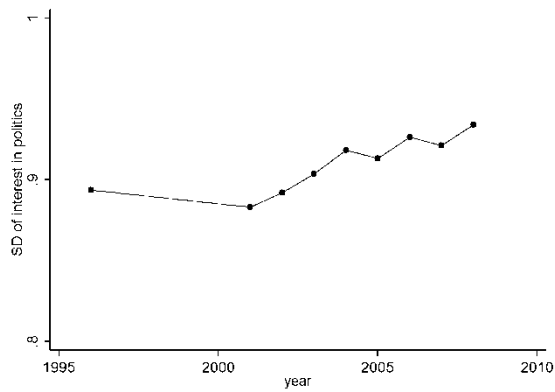
Great Britain (BHPS)
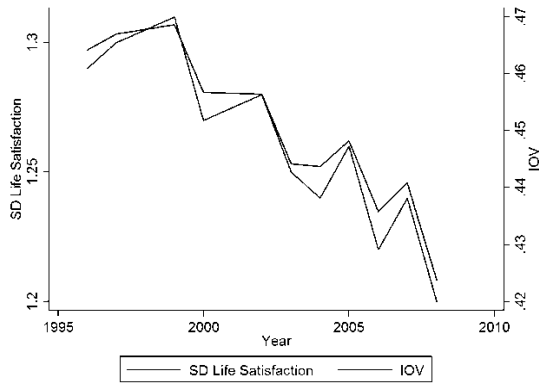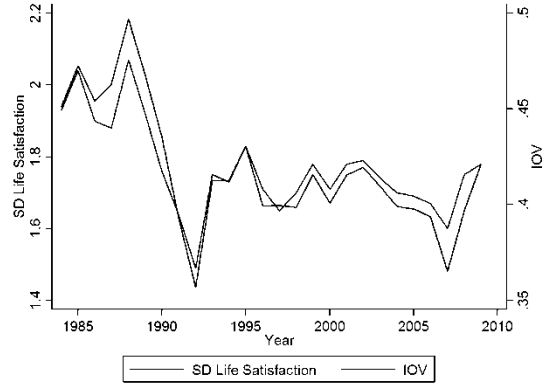
West Germany (SOEP)
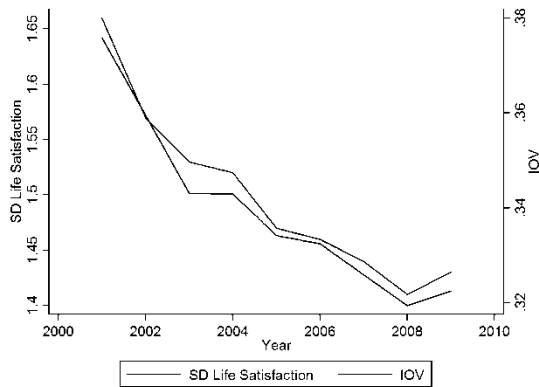
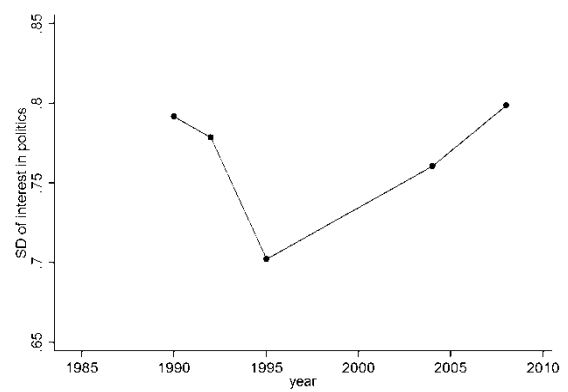*Australia (HILDA)*

United States (GSS)

Appendix Figure 4. Placebo Variables

Interest in Politics (1-4)

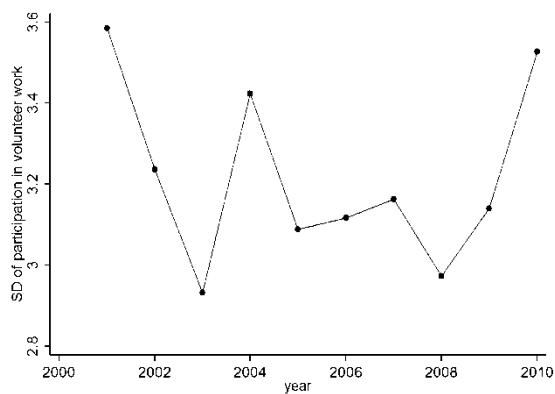*Great Britain (BHPS)*   *West Germany (SOEP)*

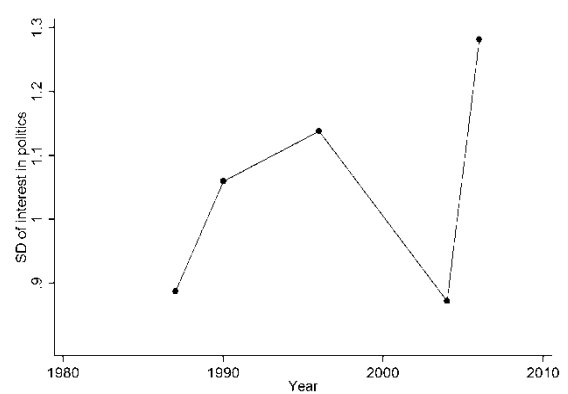## Participation in volunteer work (hours per week)
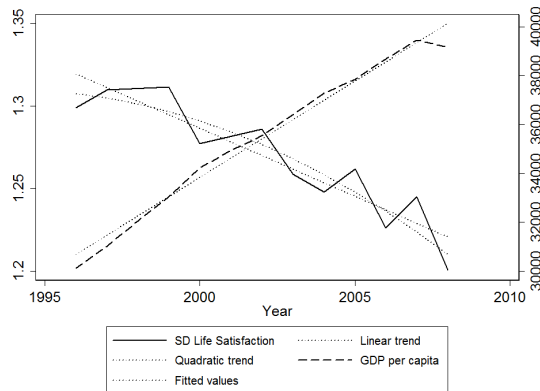
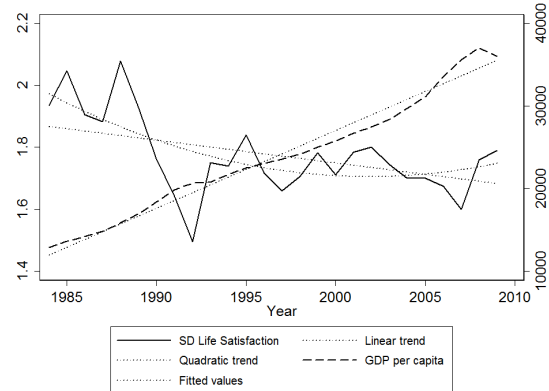*Australia (HILDA)*   *United States(GSS)*

<u>Notes</u>: Interest in politics ranges from 1 to 4, where 1 means "very interested" and 4 "not at all interested". Participation in volunteer work is defined as the number of hours per week.

Appendix. Figure 5. SD of Life Satisfaction, without People Reporting the Highest and Lowest Levels of Happiness
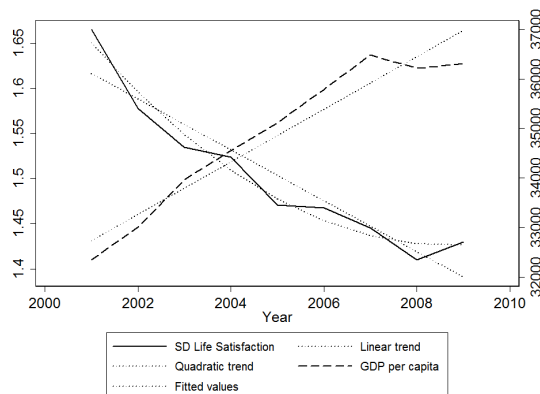
Great Britain (BHPS)   *West Germany (SOEP)*

Australia (HILDA)

<u>Notes</u>: We drop observations when people who reported being in the top or bottom life satisfaction categories one year earlier.