

## **Satisfaction with Life and Economic Well-Being: Evidence from Germany**

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### **Abstract**

The relationship between an individual's economic well-being and satisfaction with own life has been the focus of many studies both within and across countries, in one period of time and over time. As a proxy of economic well-being household income both adjusted and unadjusted for household needs has been generally used. The aim of the present paper is to propose a more comprehensive measure of well-being considering the role that wealth and permanent income play in *simultaneously* determining satisfaction with life. The results, based on representative microdata from the German Socio-Economic Panel Study (SOEP), suggest that both income and wealth increase satisfaction, that long-run income is more appropriate than short-term income and that satisfaction with life is particularly high for those who are at the top of both the income and wealth distributions.

*JEL-Classifications: I30, D60*

### **1. Introduction**

The relationship between an individual's economic well-being and satisfaction with own life has been the focus of many studies both within and across countries, during a single time period and over time. Household income, both adjusted and unadjusted for household needs, has been used as a proxy for the economic well-being of the household. Three main aspects of this relationship have been highlighted: 1) within each country at a given point in time, richer people are more satisfied with their lives; 2) within each country over time, an increase in average income does not increase substantially satisfaction with life; 3) across-countries, on average, individuals living in richer countries are more satisfied with their lives.<sup>1</sup> As far as point 1) is concerned "additional income does not raise happiness ad infinitum, and not for certain. (...) (T)he

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<sup>1</sup> For empirical evidence on these facts see, among others, for 1) Blanchflower / Oswald (2004), Di Tella / MacCulloch / Oswald (2001), Easterlin (1995); for 2) Blanchflower / Oswald (2004), Easterlin (1995); for 3) Frey / Stutzer (2002).

same proportional increase in income yields a lower increase in happiness at higher income levels.” (Frey/Stutzer, 2002, 409). Furthermore, income matters but other factors are also important in explaining differences in satisfaction with own life. “In particular, other economic (in particular unemployment) and noneconomic (in particular health but also personality) factors exert strong influences beyond the indirect consequences on income.” (Frey/Stutzer, 2002, 410).

But what about wealth? Does wealth exert an additional role in determining life satisfaction? Are the richer individuals mentioned above in point 1) income rich or wealth rich or both? For economists the distinction between income and wealth is clear and obvious, but for laymen this may not be the case. A rich individual may be more satisfied with his life but he could feel rich either because he earns a lot (he is income rich) or because he already has a lot of money (he is wealth rich). There is a good rationale for considering as an indicator of economic well-being both income and wealth also from an economist's point of view. Income, properly measured, is an indicator of the individual ability to consume commodities in a given time period. Wealth, on the other hand, plays a different role: it generates income, such as capital income and imputed rents; it confers economic security allowing the individual to be prepared for emergencies and to consume out of wealth in case of an illness and in any other bad situation caused by uninsurable risks; it enables individuals to take care of their offspring and of themselves when retired. Hence, we believe that a more comprehensive measure might shed a clearer light on the relationship between economic well-being and satisfaction with own life.

Three other papers, to the best of our knowledge, have addressed similar issues. Mullis (1990) includes household wealth in a measure of economic well-being based on the life cycle/permanent income hypothesis of Modigliani/Brumberg (1954) and Friedman (1957). In his interpretation of the latter, economic well-being depends not only on current income but also on wealth and future income of the individual. Current and future income are proxied by the individual's permanent income as derived from averaging incomes in the periods previous to the one under analysis. The resulting measure of economic well-being is the sum of permanent income and annuitized net worth divided by the poverty level income which is used for capturing relative economic demands of the household. Using the National Longitudinal Survey Mature Male cohort, Mullis (1990) showed that the proposed composite index outperformed the current income measure in explaining satisfaction with life. Headey/Wooden (2004) using data from the 2001 and 2002 waves of the Australian national panel found that in Australia, wealth is at least as important to well-being as income. Headey/Muffels/Wooden (2008) confirm the above findings using national panel surveys for Australia in 2002, Britain in 2000, Germany in 2002, Hungary in 1996 and the Netherlands in 1997.

The aim of the present paper is to build on this literature exploring the role that, in addition to current income, wealth and permanent income play in determining satisfaction with life. The German Socio-Economic Panel (SOEP) constitutes a unique source for this aim, because in 2002, the year for which wealth data is available, a special sample of high income, and presumably high wealth, households was added. Making full use of the panel data nature of SOEP, we analyze the effects of contemporaneous wealth (wealth in 2002) and permanent income (measured as mean income over the period 1992–2002) on life satisfaction in 2002, controlling for events that took place in 1992–2002 and contemporaneous variables in 2002. In addition, we analyze the effects of past wealth (wealth in 2002) and permanent income (measured as mean income over the period 2002–2006) on life satisfaction in 2006, controlling for events that took place in 2002–2006 and contemporaneous variables in 2006.

The wealth concept used in this paper is marketable wealth (or net worth), which is defined as the current value of all marketable or fungible assets less the current value of debts (see Section 2 for details).

In line with many empirical findings in the cross-disciplinary literature, our results suggest that life satisfaction is associated with marital/partner status and changes therein, as well as with having children and labour market history. However, our results also show these associations between such standard correlates and satisfaction to be fairly robust with respect to controlling for income *and* for wealth. We do find that life satisfaction increases with income and with wealth, that controlling for long-run as opposed to contemporaneous income is associated with larger differences in life satisfaction and that both income and wealth matter. Indeed, our evidence suggests that those who are at the higher end of both the distribution of income and the distribution of wealth are most satisfied with life.

The rest of the paper is organized as follows: The next section (Section 2) contains a description of the data sources. Results are contained in Section 3. Section 4 concludes.

## 2. Data Sources

The data used in this analysis comes from the German Socio-Economic Panel Study (SOEP; [www.diw.de/gsoep](http://www.diw.de/gsoep)) and covers the period 1992 (the year for which the first annual income measure is available for the East German sample) to 2006. We make use of two balanced panel populations made up by all adult respondents in East and West Germany providing valid information on income and subjective satisfaction over the periods 1992 to 2002 and 2002 to 2006, respectively. This restriction leaves us with 7,012 observations and 16,165 observations in each period. By applying appropriately defined weighting factors, we explicitly account for variation in the sampling design of the various SOEP subsamples described above as well as for selective attrition behaviour over time.

Satisfaction with life – our dependent variable – is measured on an 11-point scale, ranging from 0 (completely dissatisfied) to 10 (completely satisfied). Landua (1991) argues that there is evidence of panel effects concerning these satisfaction scales, i.e. respondents tend to use these scales differently after getting used to them (especially there is a tendency away from the extreme values such as 10). This will have to be considered when interpreting the changes in satisfaction over the first waves of a panel. Frick / Goebel / Schechtman / Wagner / Yitzhaki (2006) confirm this finding for more recent waves of SOEP data providing evidence for learning effects on behalf of the respondents with respect to satisfaction as well as income.<sup>2</sup>

The wealth measure applied in the following is per capita *net* household wealth. This information is currently only available in the 2002 survey year of SOEP, and considers owner-occupied property (net), other real estate (net), financial assets, private insurances, business assets, collectibles, and consumer debts. Although the wealth data in SOEP is collected at the individual level, we aggregate wealth holdings across household members and re-assign a per capita value to each adult household member. We chose to follow the rationale of “pooling and (equally) sharing” within private households for two reasons: (a) we must assume that individuals without own wealth also profit from wealth held by their spouse or other adult household members, as can be seen in the case of residing in owner-occupied housing, and (b) because we also have to follow this standard approach in the welfare economics literature with respect to income. Our income measure is annual post-government household income over the previous year, defined as the sum of income received across all household members from labor, capital, private sources, plus public transfers and pensions, minus direct taxes and social security contributions. In order to compare income over time, all income measures are deflated to 2000 prices, also accounting for purchasing power differences between East and West Germany. In line with the per-capita wealth measure described above, we use a per capita-adjusted post-government household income.<sup>3</sup> As usual in survey data, both our economic outcome measures, income and wealth, suffer from item-non-response – in those cases we make use of imputed values which are designed to control for eventual selectivity involved in the missing process.<sup>4</sup>

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<sup>2</sup> Due to these learning effects, we exclude wave 1 of the more recently started subsamples from our analyses.

<sup>3</sup> In an alternative specification we make use of a more standard equivalent income instead of a per capita measure. In order to control for differences in household size and the economies of scale, we apply the modified equivalence scale suggested by the OECD, which assigns a needs weight of one to the household head, 0.5 to any additional adult household member, and a weight of 0.3 to children up to 14 years of age. Regression results shown in the empirical section below are in principle robust with respect to the choice of using either equivalent or per capita incomes.

### 3. Results

Our focus is on how income *and* wealth affect life satisfaction. In order to bring out the importance of distinguishing between contemporaneous associations between income, wealth and life satisfaction on the one hand, and associations between long-run economic status and life satisfaction, on the other, we show regression results with economic status measured only over a period of several years.<sup>5</sup> In particular, we estimate regressions that relate life satisfaction in 2002 to *long-run* (“permanent”) income over the period 1992–2002 and wealth in 2002 (see Table 1) and life satisfaction in 2006 to *long-run* income averaged over the period 2002–2006 and *lagged* wealth in 2002 (see Table 2).<sup>6</sup> We control for gender, migration background, changes across time in marital/partner status, changes in health, having children, initial levels of education and labour market history as well as age. The full set of regression results along with a discussion of the coefficient estimates for the control variables can be found in the data appendix available from the authors on request. We focus our discussion here on the results for income and wealth across a range of different specifications.

We start by showing in Figure 1 the observed differences in life satisfaction across the *joint* distribution of long-term income and wealth, expressed relative to the overall average (so the average across all cells is one). The bars suggest that, holding wealth decile group constant, life satisfaction tends to increase with income (although not monotonically, as might be expected based on linear regression results). Similarly, holding income decile group constant, increases in wealth are associated with increases in life satisfaction. However, the joint distribution reveals some quite striking non-linearities. First, being in the (two) bottom decile groups of net worth in 2002 is associated with below average life satisfaction up to the 7<sup>th</sup> income decile. Second, and perhaps most strikingly, life satisfaction increases quite substantially once we move toward the higher end of *both* the income and the wealth distribution. Life satisfaction is very clearly the highest for those who enjoy both high long-run income and high wealth. This leads us to include in our regressions not only wealth and income but also their interaction.

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<sup>4</sup> For a detailed description of the imputation procedures correcting for missing data on income and wealth due to non-response and the respective impact of imputation on inequality and mobility measures see Frick/Grabka (2005) and Frick/Grabka/Sierminska (2007), respectively.

<sup>5</sup> An earlier version of this paper additionally reports associations between life satisfaction and contemporaneous income and wealth.

<sup>6</sup> Given that our dependent variable is based on an 11-point scale, we apply simple OLS regressions, thus assuming linearity. In an alternative specification we estimate ordered regression models which substantively show the same results as those presented here. All regression results are available from the authors upon request.

Table 1

**Determinants of LIFE SATISFACTION in 2002 (0–10 scale)**  
**using longitudinal information on income 1992–2002 and wealth 2002**  
**(beta coefficients from OLS Regressions)**

	(1) LSAT02	(2) LSAT02	(2a-West) LSAT02	(2b-East) LSAT02	(3) LSAT02
p.c. Perm. Income Quintile = lowest	<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	
p.c. Perm. Income Quintile = 2	0.068 (0.095)	0.043 (0.095)	−0.031 (0.119)	0.249* (0.125)	
p.c. Perm. Income Quintile = 3	0.424** (0.107)	0.359** (0.108)	0.274* (0.134)	0.600** (0.140)	
p.c. Perm. Income Quintile = 4	0.432** (0.121)	0.341** (0.123)	0.296* (0.147)	0.538** (0.169)	
p.c. Perm. Income Quintile = highest	0.633** (0.124)	0.464** (0.132)	0.404** (0.153)	0.849** (0.228)	
p.c. Wealth Quintile = lowest		<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	
p.c. Wealth Quintile = 2		0.372** (0.107)	0.408** (0.137)	0.376** (0.145)	
p.c. Wealth Quintile = 3		0.379** (0.106)	0.344** (0.133)	0.480** (0.139)	
p.c. Wealth Quintile = 4		0.433** (0.108)	0.376** (0.131)	0.631** (0.151)	
p.c. Wealth Quintile = highest		0.668** (0.122)	0.650** (0.143)	0.751** (0.200)	
Inc = 1 <sup>st</sup> & Wealth = 1 <sup>st</sup> (Ref.) = 11					<i>Ref.</i> —
income_wealth_quint9202 = 12					0.524** (0.162)
income_wealth_quint9202 = 13					0.307+ (0.163)
income_wealth_quint9202 = 14					0.448* (0.203)
income_wealth_quint9202 = 15					0.582 (0.412)
income_wealth_quint9202 = 21					0.045 (0.193)
income_wealth_quint9202 = 22					0.560** (0.170)
income_wealth_quint9202 = 23					0.530** (0.158)
income_wealth_quint9202 = 24					0.281 (0.181)

	(1) LSAT02	(2) LSAT02	(2a-West) LSAT02	(2b-East) LSAT02	(3) LSAT02
income_wealth_quint9202 = 25					0.697** (0.238)
income_wealth_quint9202 = 31					0.251 (0.228)
income_wealth_quint9202 = 32					0.764** (0.188)
income_wealth_quint9202 = 33					0.732** (0.194)
income_wealth_quint9202 = 34					0.901** (0.161)
income_wealth_quint9202 = 35					1.046** (0.237)
income_wealth_quint9202 = 41					0.287 (0.288)
income_wealth_quint9202 = 42					0.483* (0.218)
income_wealth_quint9202 = 43					0.997** (0.173)
income_wealth_quint9202 = 44					0.932** (0.233)
income_wealth_quint9202 = 45					0.861** (0.185)
income_wealth_quint9202 = 51					0.933** (0.327)
income_wealth_quint9202 = 52					0.584 (0.393)
income_wealth_quint9202 = 53					0.562* (0.257)
income_wealth_quint9202 = 54					0.876** (0.187)
income_wealth_quint9202 = 55					1.232** (0.176)
Observations	7012	7012	4780	2232	7012
R-squared	0.21	0.22	0.22	0.23	0.23

Robust standard errors in parentheses. + significant at 10%; \* significant at 5%; \*\* significant at 1%.

Source: Authors' estimations from SOEP 1992–2002 (balanced panel).

Note: The regressions control for gender, marital status, health status, children, education, age, job characteristics and location. Where relevant, we control for both the status at the outset of the period for permanent income measurement and changes during it.

Table 2

**Determinants of LIFE SATISFACTION in 2006 (0–10 scale)**  
**using longitudinal information on income 2002–2006 and wealth 2002**  
**(beta coefficients from OLS Regressions)**

	(1) LSAT06	(2) LSAT06	(2a-West) LSAT06	(2b-East) LSAT06	(3) LSAT06
p.c. Perm. Income Quintile = lowest	<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	
p.c. Perm. Income Quintile = 2	0.187* (0.076)	0.149+ (0.076)	0.157+ (0.093)	0.077 (0.115)	
p.c. Perm. Income Quintile = 3	0.376** (0.077)	0.315** (0.079)	0.344** (0.094)	0.180 (0.124)	
p.c. Perm. Income Quintile = 4	0.438** (0.079)	0.328** (0.081)	0.319** (0.095)	0.335* (0.137)	
p.c. Perm. Income Quintile = highest	0.594** (0.094)	0.424** (0.096)	0.394** (0.109)	0.736** (0.173)	
p.c. Wealth Quintile = lowest		<i>Ref.</i> —	<i>Ref.</i> —	<i>Ref.</i> —	
p.c. Wealth Quintile = 2		0.093 (0.077)	−0.034 (0.094)	0.495** (0.120)	
p.c. Wealth Quintile = 3		0.247** (0.089)	0.147 (0.107)	0.602** (0.123)	
p.c. Wealth Quintile = 4		0.423** (0.073)	0.353** (0.085)	0.633** (0.125)	
p.c. Wealth Quintile = highest		0.558** (0.077)	0.492** (0.087)	0.807** (0.158)	
Inc = 1 <sup>st</sup> & Wealth = 1 <sup>st</sup> ( <i>Ref.</i> ) = 11					<i>Ref.</i> —
income_wealth_quint0206 = 12					0.068 (0.153)
income_wealth_quint0206 = 13					0.070 (0.185)
income_wealth_quint0206 = 14					0.693** (0.165)
income_wealth_quint0206 = 15					0.495** (0.172)
income_wealth_quint0206 = 21					−0.007 (0.146)
income_wealth_quint0206 = 22					0.180 (0.124)
income_wealth_quint0206 = 23					0.482** (0.131)
income_wealth_quint0206 = 24					0.519** (0.120)

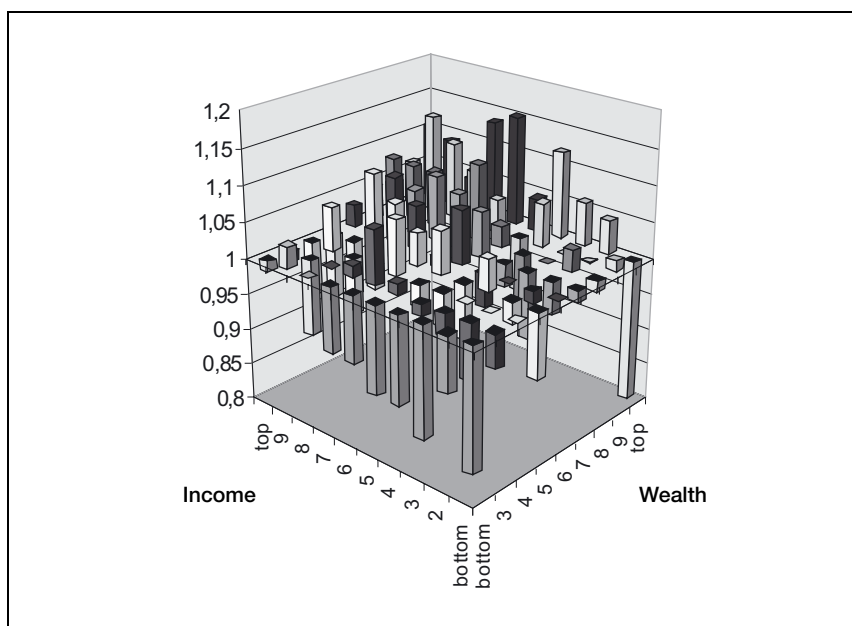


	(1) LSAT06	(2) LSAT06	(2a-West) LSAT06	(2b-East) LSAT06	(3) LSAT06
income_wealth_quint0206 = 25					1.068** (0.167)
income_wealth_quint0206 = 31					0.350* (0.164)
income_wealth_quint0206 = 32					0.310* (0.127)
income_wealth_quint0206 = 33					0.642** (0.124)
income_wealth_quint0206 = 34					0.783** (0.120)
income_wealth_quint0206 = 35					0.837** (0.131)
income_wealth_quint0206 = 41					0.423** (0.157)
income_wealth_quint0206 = 42					0.587** (0.152)
income_wealth_quint0206 = 43					0.694** (0.138)
income_wealth_quint0206 = 44					0.620** (0.123)
income_wealth_quint0206 = 45					0.784** (0.122)
income_wealth_quint0206 = 51					0.653** (0.179)
income_wealth_quint0206 = 52					0.695** (0.216)
income_wealth_quint0206 = 53					0.530* (0.249)
income_wealth_quint0206 = 54					0.868** (0.133)
income_wealth_quint0206 = 55					0.979** (0.120)
Observations	16165	16165	11870	4295	16165
R-squared	0.25	0.26	0.25	0.27	0.27

Robust standard errors in parentheses. + significant at 10%; \* significant at 5%; \*\* significant at 1%.

Source: Authors' estimations from SOEP 2002–2006 (balanced panel).

Note: The regressions control for gender, marital status, health status, children, education, age, job characteristics and location. Where relevant, we control for both the status at the outset of the period for permanent income measurement and changes during it.



Source: Authors' estimations from SOEP 1992–2002 (balanced panel; weighted). Light grey bars indicate that the sample is < 30 individuals.

Figure 1: Life satisfaction in 2002 (as a proportion of overall mean) by permanent income in 1992–2002 and wealth in 2002

We present regression results for life satisfaction in 2002 regressed on longitudinal income information for 1992–2002 and wealth for 2002 (see Table 1) and life satisfaction in 2006 regressed on longitudinal income 2002–2006 and wealth 2002. We allow the association between life satisfaction and the resource variables to be quite flexible. In particular, income and wealth are entered as a set of indicator variables for each quintile group.

We report two sets of regressions in each table. Column 1 regresses life satisfaction on a set of control variables and on quintile group of estimated permanent income.<sup>7</sup> The coefficient estimates suggest being higher up in the distribution of long-run income is associated with higher life satisfaction, but that the association is not monotonic. For instance, in 2002, being in the second long-term income quintile group is not associated with significantly greater

<sup>7</sup> The full regression results, including coefficient estimates on all control variables, are available from the authors on request. The controls include gender, marital status, health status, children, education, age, job characteristics and location. Where relevant, we control for both the status at the outset of the period for permanent income measurement and changes during it.

life satisfaction than being at the bottom. Being in the middle quintile group is, on the other hand, associated with a statistically significant 0.424 points higher life satisfaction than being at the bottom. Having income in the fourth quintile group does not increase life satisfaction relative to the third by a lot – the coefficient estimate is 0.432, indicating an advantage of only 0.008 to the third, but being in the top group is associated with a further 0.219 points higher life satisfaction. When we add quintile group of wealth (column 2), the income coefficients decline in absolute value, the third quintile group is now associated with greater life satisfaction than the fourth, and individuals at the top now enjoy a further 0.123 point advantage in life satisfaction.

The coefficient estimates on the indicators for net worth quintile group suggest that the life satisfaction of those in quintile group 2 is substantially larger than for those at the bottom – the difference is 0.372 points, but that further moving to the middle quintile group is not associated with a large increase. Those in the top wealth quintile have 0.668 points higher life satisfaction than those at the bottom. The decline in the coefficients on income quintile groups on adding wealth is thus largely picked by the wealth information, but clearly income is also associated with higher life satisfaction as well.

Before we examine if income and wealth interact to generate higher life satisfaction, we examine another question, namely if the regression results for the population in West and East Germany are different (columns 2a-West and 2b-East). Qualitatively, the results are not too dissimilar. The wealth gradient in life satisfaction is in fact almost remarkably similar – the only large difference is that in the east, the fourth quintile enjoys a substantial advantage in life satisfaction. However, the income gradient appears to be substantially steeper in the east. The coefficients on income quintile groups tend to be roughly twice as large in the east. If this is because money buys more in the east, or because the relative comparison in the east makes for a very large social distance in income, we can not tell. A formal statistical test of the difference in all the coefficient estimates for the east and west fails to reject the null hypothesis the parameter vectors are the same.

The final column in Table 1 shows regression results that control for the full set of interactions between income and wealth quintile group. While these do convey interesting information, essentially echoing the patterns in Figure 1, it is instructive to note that the change in the *R*-squared is 0.02 which is not statistically significant. I.e., the marginal effects of wealth and income are sufficient to capture the effects even if there is an empirical tendency for being at the higher end of both distributions to increase life satisfaction.

The regressions of life satisfaction in 2006 on income 2002–2006 and wealth in 2002 yield qualitatively similar results. The main exception is that the excess income gradient in the east relative to the west (columns 2a-West and 2b-East in Table 2) has now largely vanished, with the exception of the life

satisfaction enjoyed by the top quintile group, which is still substantially higher than in the west. In the West there is a decline in the wealth gradient up to the third quintile.

A few points should be added to this. First, the coefficient estimates on the other control variables are reasonably robust to whether or not, and how, income and wealth are controlled for. Second, measuring income in long-run or short-run terms matters. We have estimated, but do not report here, regressions using only contemporaneous income. The regression coefficients for single-year income quintile groups were, as one might expect because of transitory errors, substantially smaller than those on the long-run income groups.

#### 4. Conclusions

Based on data from the German Socio-Economic Panel (SOEP) over the period 1992 to 2006 the aim of this study is to investigate the relevance of income and wealth as determinants of life satisfaction. While our results widely coincide with the existing literature on the relevance on non-monetary correlates of life satisfaction (or happiness), the most relevant empirical findings of this study include the following: (a) long-run income is more important than short-run income in explaining differences in life satisfaction, thus pointing to the relevance of panel data to model determinants of life satisfaction rather than just correlates, (b) wealth has a self-contained impact on life satisfaction, (c) income and wealth also appear to be jointly important.

The last point is in light of our graphical illustration particularly important. Namely, while holding wealth (income) constant, increasing income (wealth) increases life satisfaction, the big gains in life satisfaction result from moving up in both distributions. This, in turn, suggests that well-being may be very heavily concentrated at the top of joint distribution of income and wealth.

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