

INTERNATIONAL DIFFERENCES IN THE DETERMINANTS OF LIFE SATISFACTION

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This paper uses measures of life satisfaction, drawn from the first wave of well-being data now being collected annually by the Gallup World Poll, to investigate differences across countries, cultures and regions, in the factors linked to differences in life satisfaction. We first examine two-level global and regional equations for life satisfaction covering 105 countries, paying special attention to several key variables: income, age, attainment of basic needs (as represented by presence of running water, and having sufficient food), having someone to count on, perceived corruption levels, and perceived sense of freedom. We then estimate and compare the coefficients of cross-sectional life satisfaction equations for each of the 105 countries. While many of the key variables affecting life satisfaction have quite comparable effects in almost all countries, we are nonetheless able to identify some interesting regional and other cross-country differences.

1. Introduction

A previous paper (Helliwell¹⁴) argued that direct measures of life satisfaction provide a useful way to assess the quality of development within and across communities and nations. A case was made that previous doubts about the usefulness of comparing measures of subjective well-being across cultures and over time are being resolved in favour of subjective measures^a.

^a First, earlier claims that each person has a psychological set-point for subjective well-being to which he or she invariably returns (Brickman and Campbell², Brickman et al³, Lucas et al¹⁹) have been replaced by research showing that adaptation to most changes in life circumstances is partial in nature (Lucas, Diener and Scollon⁶, Lucas¹⁸). Second, experimental evidence that retrospective assessments of well-being differ from Bentham-like (Kahneman, Wakker and Sarin¹⁷) integrals of momentary assessments (Kahneman¹⁵, Frederickson and Kahneman⁸, Kahneman and Riis¹⁶) was held not to threaten the usefulness of retrospective evaluations of satisfaction, especially as the latter, are what govern future decisions (Wirtz et al²⁸). Third, in response to suggestions that freedom and capabilities, which were held to be of fundamental value to well-being (Sen^{25, 26}), would be left out of account by measures of life satisfaction, it was shown that measures of life satisfaction appear to differ from assessments of positive and negative affect in just the ways that make life satisfaction an appropriate measure. Indeed, in this paper we show that a sense of personal freedom is highly significant as a support for higher measures of life satisfaction.

The earlier paper compared results from the Gallup World Poll and the World Values Survey, focusing on modeling differences among nations in average scores from different measures of the quality of life. That paper also estimated two-level regressions based on individual data, and argued that most of the cross-country variance in survey measures of life satisfaction can be explained by measurable differences in life circumstances in those countries, under the assumption that people all over the world have similar basic preferences, and answer life satisfaction questions in roughly comparable ways. In this paper we dig further into the data to see to what extent the assumption of common preferences is justified. More particularly, we shall concentrate on using Gallup World Poll data on the quality of life to estimate cross-sectional life satisfaction equations in each of 105 countries. We shall then see to what extent the results on a country-by-country basis are consistent with the use of two-level analysis in which coefficients are assumed to be the same for residents in all countries.

To set the stage for this analysis of the nature of and possible reasons for cross-country differences in the determinants of life satisfaction, we shall first present some results for global estimates of several different equations, and then regional estimates of the same equation that we shall then estimate separately for each country.

2. Two-Level Global and Regional Estimates Assuming Similar Preferences

Our key dependent variable comprises individual answers, from roughly 1,000 respondents in each of 105 countries^b, to a question asking respondents to evaluate their lives at present using a ladder with steps numbered from zero at the bottom to 10 at the top, with 0 representing the worst possible life and 10 the best possible life. This is the Cantril ladder form for measuring the quality of life. Comparisons in Helliwell¹⁴ between results from the Gallup data, using this question, and from the World values Survey asking respondents to assess satisfaction with their lives as a whole on a scale of 1 to 10 suggest that the different ways of asking the question and framing the scale make some difference to the results, perhaps contributing to the greater correlation between income and life satisfaction in the Gallup data. However, even with the slightly

^b The wave of Gallup World poll we use covers 129 countries/regions. Twenty of them however do not report household income. In addition we were not able to find per capita GDP for Myanmar. Three additional countries/regions are excluded from the sample because of other missing information.

different question forms, different sample selection and administration techniques, different survey years, and different structures and ordering of questions, the two bodies of data gave strikingly consistent views of the factors contributing to life satisfaction around the world. For 75 countries in both surveys, the simple cross-country correlation of average life satisfaction scores was 0.8, suggesting that there are consistent cross-country differences in life satisfaction that are stable through time and robust to alternative survey techniques. Analysis in the earlier paper also showed that the high cross-country correlation of life satisfaction scores was not just due to both being highly correlated with average per capita incomes, because the residual cross-country variance of life satisfaction beyond that explained by income was also significantly correlated between the surveys.

The basic observations are at the individual level, and we are interested in estimating the extent to which individual life satisfaction depends on circumstances and events at the individual, household, community and national levels. We have developed three inter-related ways of unravelling the data. The first, which we emphasize in this paper, is to use the individual-level data in equations that are separate for each country. A second is to measure and account for international differences in life satisfaction using national average data, and a third is to use multi-level analysis to explore individual-level and higher-level correlates simultaneously. The second and third approaches were the focus of a previous paper (Helliwell¹⁴), while in this paper we concentrate on the estimation and interpretation of separate equations for each country.

Before proceeding to the analysis of country-by-country coefficients, we shall first use the two-level model to estimate data pooled either globally or by geographic region.

The basic estimation form for the two-level analysis of the ordered life satisfaction responses is:

$$LS_{ij} = \alpha + \ln(y_{ij}) + \mu X_{ij} + Z_j + \epsilon_{ij} \quad (1)$$

where LS_{ij} is life satisfaction for respondent i in country j , measured on a scale of 0 to 10, y_{ij} is the level of household income of the respondent, the X_{ij} are other individual or household-level variables, and the Z_j are national-level variables, with the same value being used for all individual observations in country j . We use the log form for both household and national average income, to reflect standard economic assumptions and many empirical results suggesting that less affluent agents derive greater utility from extra income. In general, we employ national-level variables for which we also have household-level

observations, in which case the coefficients represent contextual effects, or, in other terms, the extent of positive or negative externalities^c. In all equations robust standard errors are estimated assuming errors to be clustered by country.

When we calculate compensating differentials for non-financial determinants of life satisfaction, we take into account the functional form of equation (1). Thus in our theoretically and empirically preferred case where income is in log form and X is in linear form, $\Delta \ln Y / \Delta X$ will be the log change in income that has for the average respondent the same life satisfaction effect as a change in the non-financial life characteristic X .

Table 1 shows life satisfaction equations using individual-level data from samples ranging from about 70,000 to 83,000 respondents in 105 countries, with the smaller sample sizes resulting from missing observations for some variables^d. Table 1 starts with the simplest equation in the first column, where life satisfaction is determined by gender, age (in quadratic form), marital status, and the logarithm of household income. We then sequentially add two measures of basic needs (running water and enough money for adequate food), a measure of social connectedness (having someone to count on), a measure of trust in institutions (each individual's assessments of corruption in business and government), and a measure of the individual's sense of freedom to choose. The exact wording of each question is shown in Table 5.

^c We do not include national level values for gender, the age variables, and marital status. Although there are some differences among countries and regions in population age structure and marital status, experiments adding the national averages to equation 1 do not reveal significant effects or materially alter the sizes of other coefficients.

^d The lack of response to the question of household income is responsible for most of the reduction in sample size.

Table 1: Determinants of well-being, global sample

Regression method: weighted survey linear regression with countries as PSU

	Demographics and income	Add Basic need	Add Count on help	Adjust for sample†	Add Corruption	Add Freedom
Male	-0.095 [0.023]**	-0.093 [0.023]**	-0.084 [0.022]**	-0.094 [0.025]**	-0.097 [0.025]**	-0.1 [0.025]**
Age	-0.041 [0.005]**	-0.038 [0.005]**	-0.035 [0.005]**	-0.038 [0.005]**	-0.037 [0.005]**	-0.036 [0.005]**
Age squared/100	0.037 [0.005]**	0.034 [0.005]**	0.031 [0.005]**	0.034 [0.005]**	0.034 [0.005]**	0.032 [0.005]**
Married or as if married	0.053 [0.047]	0.074 [0.047]	0.074 [0.047]	0.083 [0.048]	0.079 [0.048]	0.072 [0.048]
Separated, divorced or widowed	-0.221 [0.054]**	-0.19 [0.054]**	-0.18 [0.054]**	-0.157 [0.057]**	-0.156 [0.057]**	-0.156 [0.058]**
Log of household income††	0.564 [0.027]**	0.461 [0.027]**	0.441 [0.027]**	0.434 [0.026]**	0.432 [0.026]**	0.426 [0.026]**
Home has running water		0.252 [0.052]**	0.234 [0.052]**	0.203 [0.056]**	0.208 [0.056]**	0.195 [0.053]**
Not enough money for food in last 12 months		-0.67 [0.036]**	-0.618 [0.034]**	-0.606 [0.036]**	-0.601 [0.036]**	-0.579 [0.037]**
Has someone to count on			0.544 [0.036]**	0.55 [0.035]**	0.55 [0.035]**	0.524 [0.033]**
Perception of corruption					-0.233 [0.042]**	-0.194 [0.043]**
Freedom to choose						0.39 [0.037]**
Log of GDP per capita, PPP	-0.254 [0.089]**	-0.152 [0.091]	-0.135 [0.091]	-0.131 [0.089]	-0.13 [0.089]	-0.122 [0.089]
Average: Running water	0.642 [0.282]*	0.405 [0.297]	0.421 [0.296]	0.475 [0.296]	0.467 [0.296]	0.5 [0.298]

Average: Not enough money for food	-0.739 [0.367]*	-0.074 [0.358]	-0.137 [0.357]	-0.076 [0.342]	-0.082 [0.342]	-0.093 [0.342]
Average: Has someone to count on	1.884 [0.630]**	1.879 [0.626]**	1.332 [0.631]*	1.297 [0.615]*	1.295 [0.615]*	1.302 [0.619]*
Average: Perception of corruption	-0.974 [0.333]**	-0.983 [0.330]**	-0.982 [0.328]**	-1.051 [0.324]**	-0.819 [0.326]*	-0.862 [0.327]**
Average: Freedom to choose	1.676 [0.434]**	1.682 [0.433]**	1.686 [0.432]**	1.713 [0.434]**	1.713 [0.434]**	1.305 [0.442]**
Constant	4.79 [0.780]**	4.688 [0.779]**	4.598 [0.778]**	4.678 [0.773]**	4.676 [0.773]**	4.682 [0.775]**
Observations	83219	83219	83219	69801	69801	68210
R-squared	0.3	0.32	0.32	0.32	0.32	0.33
Number of nations	105	105	105	105	105	105

Standard errors in brackets, * significant at 5%, ** significant at 1%

†: A sizable portion of respondents have missing values in perception of corruption regarding business, or regarding government or both. The adjustment of sample size simply restraint the regressions on those who have valid response to both perception questions.

††: The individual household incomes in the Gallup data are divided by their country means to get relative incomes within each country. These figures are then converted into common level form by adding the resulted relative income to the average GDP per capita in 2003 measured at Purchasing Power Parity (from Penn World table 6.2)

†††: The following countries are in the Gallup data we use but not included in the regression due to missing information: Egypt; Iran; Morocco; Lebanon; Saudi Arabia; Jordan; Turkey; Pakistan; China (Peoples Republic); West Bank & Gaza (Palestine); Philippines; Laos; Myanmar(Burma); Belarus; Kyrgyzstan; Moldova; Ukraine; Croatia; Cuba; Iraq; Kuwait; Macedonia (Republic Of); United Arab Emirates;

Table 5: Exact wordings of key questions in Gallup World Poll

WP16: Life today; 0-10 point scale

Please imagine a ladder/mountain with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder/mountain represents the best possible life for you and the bottom of the ladder/mountain represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder/mountain do you feel you personally stand at the present time?

WP27: Count on help; yes/no binary response

If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?

WP134: Freedom to choose; yes/no binary response

In this country, are you satisfied or dissatisfied with your freedom to choose what you do with your life?

Corrupt: Perception of corruption; $\text{Corrupt} = (\text{WP145} + \text{WP146})/2$

WP145: Is corruption widespread within businesses located in this country, or not? yes/no

WP146: Is corruption widespread throughout the government in this country, or not? yes/no

WP40: Not enough money for food; yes/no binary response

Have there been times in the past twelve months when you did not have enough money to buy food that you or your family needed?

WP33: Running water; yes/no binary response

Does your home or the place you live have running water?

Age effects are estimated by a quadratic form in age; in all cases there is a general U-shape, with some variation among country groupings. Marital status is divided into three categories: married or equivalent, single, and a combination of divorced, separated and widowed, with single being treated as the base case in estimation.

The log of household income is a very strong correlate of individual life satisfaction in the Gallup equations, even when the equation adds, as in column 2, responses to other life-circumstance questions determined at least partly by income: running water and having enough money for food. As shown in Table 2 that divides the sample by regions, the income coefficient is if anything higher in the richer countries (as previously noted by Deaton⁴) and shows no obvious tendency to drop as individual income rises, beyond the non-linearity implied by the logarithmic form for income. As shown in Helliwell¹⁴ the correlation between income and life satisfaction is higher with the Gallup World Poll data

than with World Values Survey (WVS) data. It is possible that the Gallup life satisfaction question, taking the form of a Cantril ladder, invites respondents to think in relative terms more than when they are simply asked, as in the World Values Survey, to assess their life satisfaction on a scale running from 1 to 10. The current version of the Gallup survey is asking the question in both forms, to help answer this question. Attempts are also being made to expand the number of income categories, and thereby to give more income variation in the group of higher income earners. The WVS captures this already, by choosing income categories to match income deciles, and the next rounds of the Gallup survey should be able to provide at least this amount of income detail.

Table 2: Determinants of well-being, regressions by regions

Regression method: weighted survey linear regression with countries as PSU

	Western Europe, N. America, Australia & N.Z.	Eastern Europe & FSU	Latin America and Caribbean	Asia	Africa
Male	-0.215 [0.036]**	-0.053 [0.029]	-0.221 [0.061]**	-0.092 [0.079]	-0.012 [0.038]
Age	-0.039 [0.009]**	-0.058 [0.010]**	-0.061 [0.009]**	-0.042 [0.009]**	-0.001 [0.009]
Age squared/100	0.042 [0.009]**	0.047 [0.009]**	0.049 [0.009]**	0.044 [0.009]**	-0.001 [0.011]
Married or as if married	0.183 [0.049]**	0.106 [0.087]	0.139 [0.079]	0.138 [0.112]	-0.027 [0.065]
Separated, divorced or widowed	-0.165 [0.058]*	-0.012 [0.097]	-0.107 [0.130]	-0.096 [0.118]	-0.148 [0.100]
Log of household income††	0.555 [0.059]**	0.482 [0.053]**	0.47 [0.047]**	0.428 [0.041]**	0.29 [0.038]**
Home has running water	0.221 [0.311]	0.167 [0.077]*	0.294 [0.113]*	0.22 [0.119]	0.28 [0.089]**
Not enough money for food in last 12 months	-0.628 [0.107]**	-0.709 [0.062]**	-0.626 [0.082]**	-0.714 [0.041]**	-0.385 [0.057]**
Has someone to count on	0.886 [0.098]**	0.582 [0.063]**	0.616 [0.097]**	0.443 [0.080]**	0.428 [0.045]**

Perception of corruption	-0.267 [0.057]**	-0.301 [0.102]**	-0.149 [0.091]	-0.063 [0.085]	-0.094 [0.112]
Freedom to choose	0.525 [0.087]**	0.523 [0.058]**	0.372 [0.084]**	0.221 [0.069]**	0.289 [0.074]**
Log of GDP per capita, PPP	0.231 [0.449]	-0.429 [0.184]*	-0.287 [0.182]	0.16 [0.134]	-0.257 [0.110]*
Average: Running water	16.2 [13.879]	-0.641 [0.874]	1.999 [0.746]*	-0.41 [0.594]	0.463 [0.525]
Average: Not enough money for food	1.289 [0.894]	-2.052 [1.118]	-0.607 [1.455]	-0.887 [1.031]	-0.249 [0.645]
Average: Has someone to count on	3.346 [3.517]	-0.782 [1.878]	-0.416 [1.983]	-1.045 [1.898]	1.648 [0.569]**
Average: Perception of corruption	-1.004 [0.437]*	1.81 [1.035]	-0.058 [1.227]	0.678 [0.848]	-0.376 [0.768]
Average: Freedom to choose	0.811 [2.434]	1.81 [1.006]	3.058 [1.146]*	1.89 [1.602]	0.896 [0.643]
Constant	-12.713 [14.022]	5.213 [1.364]**	3.541 [2.176]	6.193 [1.334]**	2.737 [1.293]*
Observations	13388	12907	11870	11192	18304
R-squared	0.19	0.21	0.16	0.25	0.13
Number of nations	21	20	22	15	26

Standard errors in brackets, * significant at 5%; ** significant at 1%

††: The individual household incomes in the Gallup data are divided by their country means to get relative incomes within each country.

These figures are then converted into common level form by adding the resulted relative income to the average GDP per capita in 2003 measured at Purchasing Power Parity (from Penn World table 6.2)

As might be expected, the coefficient of log income drops when the basic needs are included. The drop of the income coefficients suggests some form of additional non-linearity of the income effect, with the coefficient on log income in the equation including basic needs reflecting the value of income for aspects of life beyond running water and the presence of enough money for food.

The idea that income should matter more for those whose basic needs have not been met can be tested alternatively by dividing the sample in two: the richer part including those with enough money for adequate food, and the poorer part, including all those who have sometime in the past year not had enough money for food. The results are shown in Table 3. Somewhat surprisingly, the coefficient on log income is slightly lower in the group whose basic food needs have sometimes not been met. To some extent this is probably due to the higher incidence of food poverty in Africa, where the estimated income coefficient is systematically below that in other regions. This in turn may be due to the greater prevalence of subsistence living in Africa, and the lesser relevance of money income. Money income may well be a less adequate measure of full income in Africa than in other regions.

Table 3: Global sample split according to whether basic needs for food have been met
Regression method: weighted survey linear regression with countries as PSU

	Basic needs met†	Basic needs not met†
Male	-0.133 [0.025]**	-0.042 [0.044]
Age	-0.044 [0.005]**	-0.021 [0.009]*
Age squared/100	0.04 [0.005]**	0.015 [0.009]
Married or as if married	0.164 [0.043]**	-0.081 [0.067]
Separated, divorced or widowed	-0.094 [0.049]	-0.214 [0.085]*
Log of household income	0.442 [0.028]**	0.391 [0.035]**
Home has running water	0.235 [0.067]**	0.162 [0.065]*
Has someone to count on	0.513 [0.045]**	0.551 [0.044]**
Perception of corruption	-0.229 [0.040]**	-0.094 [0.087]
Freedom to choose	0.37 [0.040]**	0.417 [0.048]**
Log of GDP per capita, PPP	-0.161 [0.093]	-0.179 [0.100]
Average: Running water	0.65 [0.306]*	0.425 [0.351]
Average: Not enough money for food	-0.082 [0.359]	-0.355 [0.462]

Average: Has someone to count on	1.466 [0.850]	1.197 [0.540]*
Average: Perception of corruption	-0.751 [0.295]*	-0.796 [0.582]
Average: Freedom to choose	1.652 [0.520]**	0.679 [0.521]
Constant	4.203 [0.892]**	4.143 [1.017]**
Observations	47618	20592
R-squared	0.29	0.17
Number of nations	105	105

Standard errors in brackets, * significant at 5%; ** significant at 1%

†: The two columns in the table are split-sample estimations according to respondents' answer to whether there have been times in the past twelve months when they did not have enough money to buy food that they or their family needed.

There are other interesting differences between the equations for the two groups of respondents divided according to food adequacy. First, there is a significant female life satisfaction advantage among those reporting adequate food, but this is absent for those reporting inadequate food. This suggests that women are more likely than men to bear the psychological brunt of the consequences of having inadequate food for the family. Second, for those with inadequate food, the life satisfaction benefit of marriage is less, and the negative consequences of separation, divorce or widowhood are greater, in each case relative to being unmarried. Part of the gains from marriage probably flow from having greater capacity to provide for basic needs.^e Third, those reporting lack of enough money for food are also much less likely to report having family or friends they can count on in times of trouble, to a much greater extent than can be explained by inter-country differences in this measure of social connectedness.^f This suggests the lack of social connection is associated with a lack of food adequacy regardless of what countries the respondents live in. One possible explanation of the correlation is that the absence of social networks strong enough to provide assistance in times of need is likely to lead to a greater chance of basic needs going unmet. Additional support for this possibility is

^e These patterns in coefficient differences persist within most regions when the sample is split by food adequacy. Therefore the difference in regional weightings in the global sample split by food adequacy are not responsible for the coefficient differences.

^f Thus the average values of having someone to count on are 0.89 for those with food adequacy and 0.74 for those without enough money for food. By comparison, the country averages of having someone to count on for the same two sub samples are 0.86 and 0.80, respectively. These data are from the summary statistics following the Table.

shown by the fact that the coefficients of having someone to count on and of the country averages of having someone to count on are both more significant in the smaller low-food-adequacy sample. Likewise, events such as warfare might occur that simultaneously destroy social capital and reduce access to basic needs.

Returning to the discussion of basic needs, the second and subsequent columns in Table 1 and all equations in Table 2 show strong life satisfaction effects from the two measures of basic needs. While both running water and lack of enough money for food attract roughly similar coefficients in the separate equations for respondents in different regions, the summary statistics following Table 2 show that the actual prevalence of these measures of poverty is far higher in Africa, and far lower in Western Europe, North America, Australia and New Zealand, grouped together as region 1. For example, running water is found in the homes of 99% of the region 1 respondents and 73% of Asian respondents, in contrast to only 19% of those in Africa. By comparison, lack of enough money for food was reported by 9% of the region 1 respondents, compared to 21% in Asia and 55% in Africa.

The next variable added, in the third and subsequent columns of Table 1, and all of the regional equations in Table 2, is a measure of positive social connections, as represented by whether the respondent has relatives or friends they can count on to help them whenever help is needed. In all parts of the world, most respondents report that they have family or friends they can count on, ranging from 75% in Africa to 81% in Asia and 91% in the countries of region 1. And in all regions this social support is tightly linked to life satisfaction, with a coefficient that exceeds that on log income in every region except Asia, where the two coefficients are roughly equal. This implies income-equivalent life satisfaction for social connections that are very high indeed. It would appear that respondents in Western Europe, North America, Australia and New Zealand are richer in social as well as economic terms than those living elsewhere, and attach even higher values to such social support. The coefficient on having someone to count on is 0.88 ($t = 9.1$), twice as high as in Asia and in Africa (approximately 0.44 in both regions, $t = 5.5, 9.5$ in Asia and Africa, respectively).

Some other variables indicative of personal or community-level social capital are available for only a subset of the Gallup respondents. But they all show the high values attached to mutually supportive social connections. For example, as shown in Helliwell¹⁴ those who think that their lost wallets would be returned by a neighbour or the police are more satisfied with their lives (by

0.15 and 0.22 points), as are those who express confidence in the police (0.22). Respondents appear to value not only the support they get from others, but their own support for others. For instance, those who in the last month had donated money or time to an organization, or aided a stranger needing help were systematically more satisfied with their lives, especially for donations (0.30) and helping a stranger (0.16), as shown by the second equation in Table 4a of Helliwell¹⁴.

The 4th column in Table 1 reduces the sample size to that for which observations are available for the variables added in columns 5 and 6. No significant coefficient changes result from using the smaller sample size, and the number of countries remains 105. Column 5 adds the average of each individual's binary assessments of whether corruption in their country is widespread in business and government.

For the global sample on average, an individual who thinks that corruption is widespread in business and government has life satisfaction that is lower by 0.23 points, about half the size of the coefficients on income and having family or friends to rely on. Table 2 shows that the estimated effects are largest for those living in the transition countries (Russia and Eastern Europe) and countries of region 1, and lower in Latin America, Asia and Africa. The perceived prevalence of corruption is highest in the transition countries (0.88) and lowest in region 1 (0.50). Regional averages for Asia, Latin America and Africa range from 0.77 to 0.80. There is a large variation among countries in the level of perceived corruption, both within and across regions, with Russia at .94, New Zealand at 0.22 and Singapore at 0.20.

Table 4 provides a more precise way of testing for inter-regional differences in coefficients. The equation is estimated using region 1 as the base case, and tests for coefficients in other regions that are different from those in region 1. The key significant differences, as was already suggested in Table 2, and will appear also in the Figures 1 - 6 are: income coefficients are lower in Africa; effects of social connection are lower in Asia and Africa and higher in region 1 than in any other region; the effects of corruption are less in Asia and Africa, especially Asia (and, as with social connections, are greater in region 1 than in any other region), and the effects of a sense of personal freedom are also lower in Asia and Africa, and highest in region 1. Thus for social connections, corruption and a sense of personal freedom, the effects are smallest in Africa and Asia and largest in region 1.

Table 4: Differences in determinants of well-being across regions
 Regression method: weighted survey linear regression with countries as PSU

	Global Sample
Male	-0.102 [0.024]**
Age	-0.036 [0.005]**
Age squared/100	0.032 [0.005]**
Married or as if married	0.101 [0.039]*
Separated, divorced or widowed	-0.123 [0.050]*
Log of household income	0.54 [0.063]**
Home has running water	0.25 [0.048]**
Not enough money for food in last 12 months	-0.614 [0.093]**
Has someone to count on	0.91 [0.103]**
Perception of corruption	-0.382 [0.096]**
Freedom to choose	0.586 [0.090]**
Average: Running water	0.159 [0.303]
Average: Not enough money for food	-0.452 [0.431]
Average: Has someone to count on	0.754 [0.573]
Average: Perception of corruption	-0.368 [0.312]
Average: Freedom to choose	0.813 [0.380]*
Interaction: Hshld income x Region 2†	-0.181 [0.078]*
Interaction: Hshld income x Region 3	-0.036 [0.079]
Interaction: Hshld income x Region 4	-0.148 [0.080]
Interaction: Hshld income x Region 5	-0.281 [0.073]**
Interaction: Enough food x Region 2	-0.149 [0.127]
Interaction: Enough food x Region 3	-0.067 [0.129]

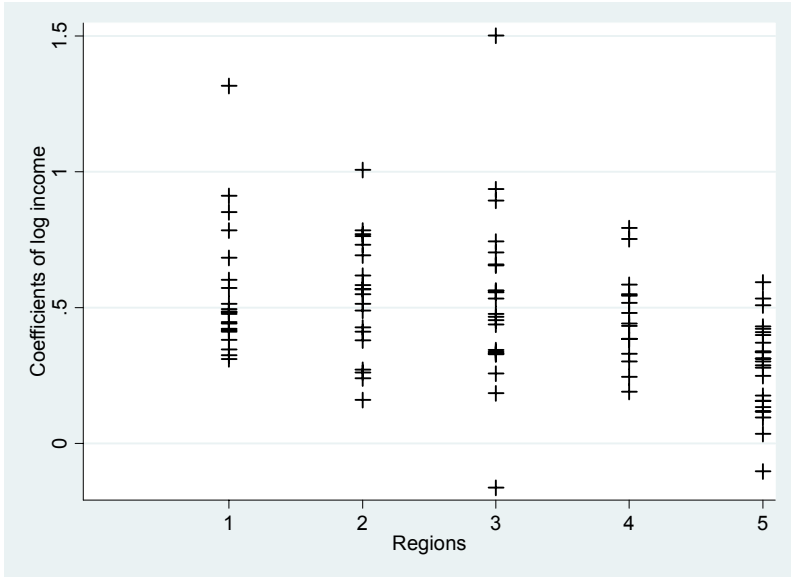
Interaction: Enough food x Region 4	-0.07 [0.107]
Interaction: Enough food x Region 5	0.217 [0.118]
Interaction: Someone to count on x Region 2	-0.306 [0.121]*
Interaction: Someone to count on x Region 3	-0.233 [0.150]
Interaction: Someone to count on x Region 4	-0.525 [0.121]**
Interaction: Someone to count on x Region 5	-0.464 [0.120]**
Interaction: Corrupt x Region 2	0.128 [0.142]
Interaction: Corrupt x Region 3	0.196 [0.158]
Interaction: Corrupt x Region 4	0.501 [0.153]**
Interaction: Corrupt x Region 5	0.289 [0.143]*
Interaction: Freedom to choose x Region 2	-0.112 [0.116]
Interaction: Freedom to choose x Region 3	-0.14 [0.134]
Interaction: Freedom to choose x Region 4	-0.357 [0.115]**
Interaction: Freedom to choose x Region 5	-0.296 [0.118]*
Region 2 (E. Europe & FSU) dummy	-0.362 [0.223]
Region 3 (L. America & Caribbean) dummy	0.387 [0.259]
Region 4 (Asia) dummy	-0.118 [0.271]
Region 5 (Africa) dummy	-0.471 [0.285]
Constant	5.516 [0.679]**
Observations	68210
R-squared	0.34
Number of nations	105

Standard errors in brackets, * significant at 5%; ** significant at 1%

†: Variables starting with "Interaction" are interactive terms with regional dummies. In this table, Western Europe, US, Canada, Australia & NZ are used as the comparator group.

Region dummies: 1: W. Europe, N. America, Australia & N.Z.; 2: E. Europe & FSU; 3: Latin America and Caribbean; 4: Asia; 5: Africa

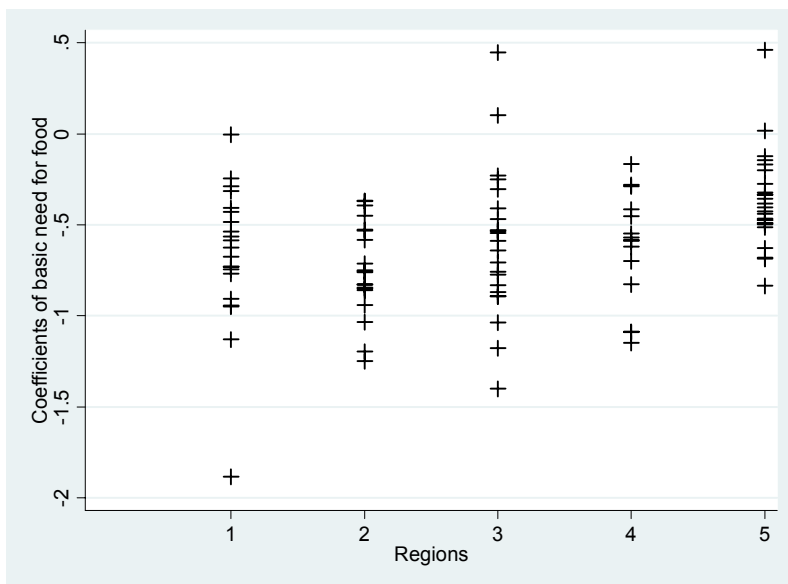
Figure 1: International difference in determinants of well-being: log of household income



Regions	Mean	Std. Dev.
1	0.56	0.24
2	0.54	0.22
3	0.53	0.32
4	0.46	0.17
5	0.28	0.16

- 1: Western Europe,
U.S. Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

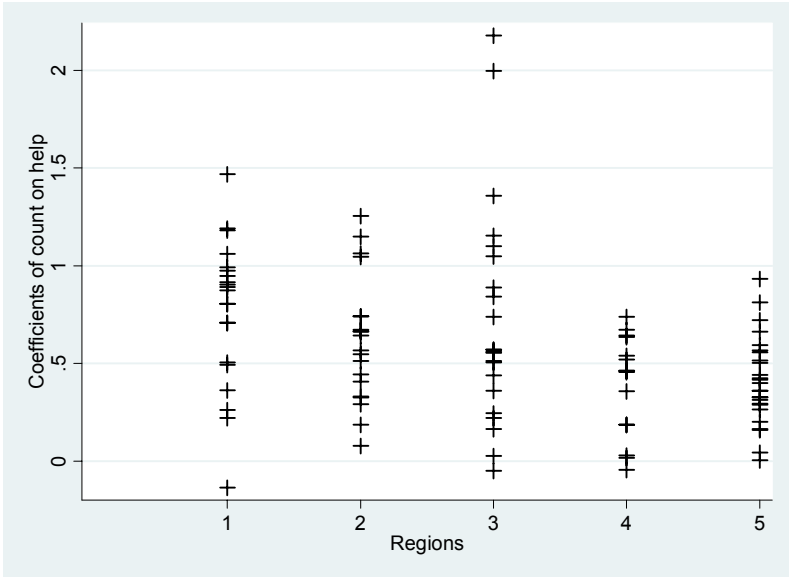
Figure 2: International difference in determinants of well-being: not enough money for food



Regions	Mean	Std. Dev.
1	-0.66	0.39
2	-0.74	0.26
3	-0.60	0.41
4	-0.62	0.30
5	-0.37	0.25

- 1: Western Europe,
U.S. Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

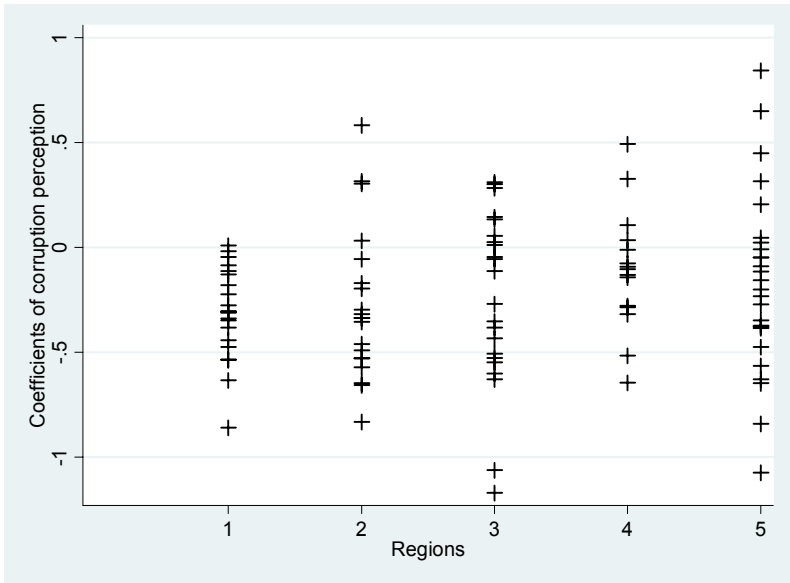
Figure 3: International difference in determinants of well-being: count on help



Regions	Mean	Std. Dev.
1	0.77	0.37
2	0.62	0.32
3	0.73	0.57
4	0.39	0.26
5	0.41	0.22

- 1: Western Europe, U.S.
Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

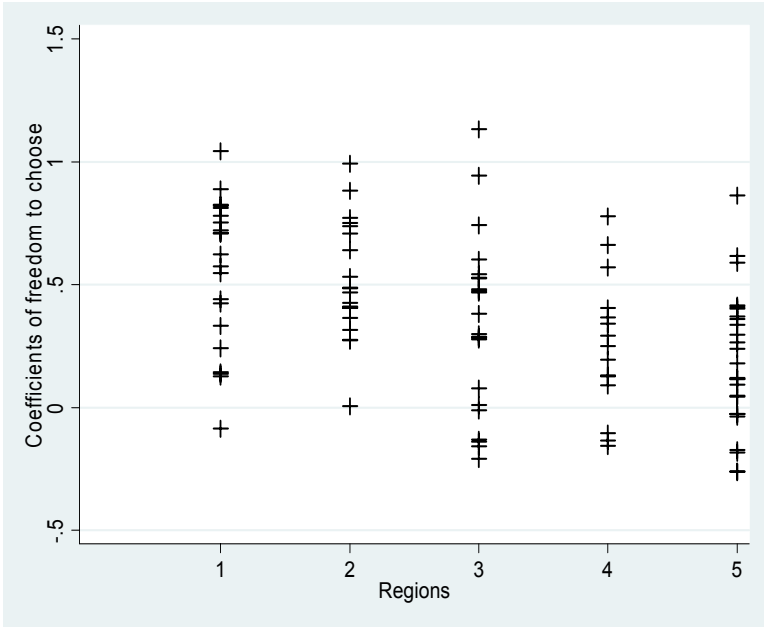
Figure 4: International difference in determinants of well-being: perception of corruption



Regions	Mean	Std. Dev.
1	-0.31	0.22
2	-0.28	0.36
3	-0.25	0.41
4	-0.11	0.29
5	-0.17	0.44

- 1: Western Europe, U.S.
Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

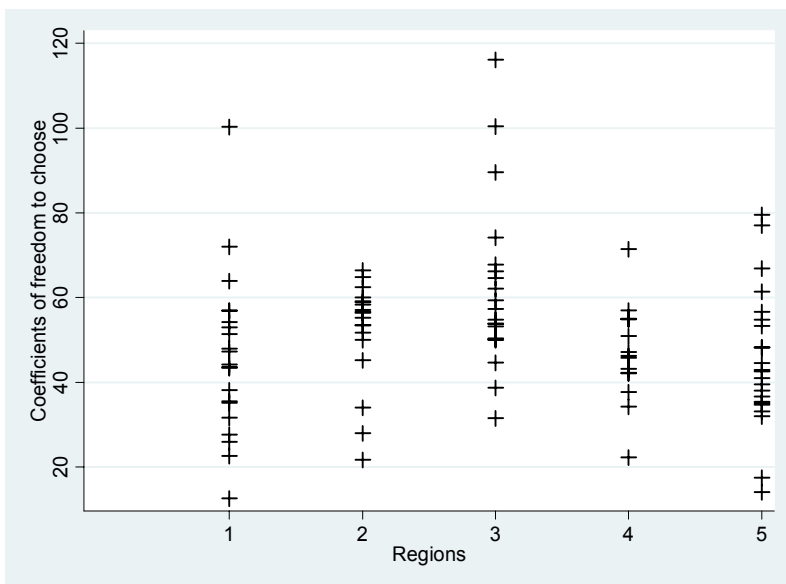
Figure 5: International difference in determinants of well-being: freedom to choose



Regions	Mean	Std. Dev.
1	0.55	0.30
2	0.52	0.24
3	0.34	0.36
4	0.25	0.28
5	0.19	0.28

- 1: Western Europe,
U.S. Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

Figure 6: International difference in determinants of well-being: turning point of the age-wellbeing curve†



Regions	Mean	Std. Dev.
1	45.95	19.02
2	52.29	12.11
3	61.95	20.34
4	47.02	11.42
5	44.93	16.20

- 1: Western Europe,
U.S. Canada, Australia & Nz
- 2: Eastern Europe & FSU
- 3: Latin America and Caribbean
- 4: Asia
- 5: Africa

†: Figure 6 and its summary statistics exclude countries that have turning points being negative or greater than 125. Six countries are excluded as the result.

To convert any of these effects into an income-equivalent value requires division by the estimated income coefficient. The smallest compensating differentials for non-financial aspects of life are obtained by using the income coefficient obtained if the other income-related variables (food and water) are removed from the equation. This gives an income coefficient of just over 0.5, slightly smaller than the coefficient on having someone to rely on, as estimated in that same equation. Thus having someone to rely on has a life satisfaction effect roughly ten times larger than a 5% change in income (i.e. $10 \times \sim 0.54/0.05$).

We turn now to consider contextual effects, as measured by the national averages of variables also included at the individual level. One of the more striking results in the Gallup data is the fact that average per capita income has little effect. Earlier research using more local data has tended to find significant relative income effects^g, and this was matched by the earlier WVS results. In Tables 1 and 2, household incomes are measured as log levels, converted into common units by the use of purchasing power parities used in the preparation of the Penn World Tables estimates of average GDP per capita^h. Thus if there are any significant relative income effects at the national level we would expect to find the contextual national GDP per capita entering with a negative sign. There is a significant negative effect in the most basic global equation in column 1 of Table 1, but this becomes smaller and insignificant in the more fully specified equations. This suggests that in the Gallup ladder data any relative income effects at the national level are being substantially offset by the effects of other excluded variables that support life satisfaction in the richer countriesⁱ. In particular, the national average should reflect all the tax-funded public good

^g See Luttmer²⁰ and Barrington-Leigh and Helliwell¹. See also Easterlin⁷.

^h More precisely, the individual household incomes in the Gallup data are divided by their country means to get relative incomes within each country. These figures are then converted into common level form by adding the resulting relative income to the average GDP per capita in 2003 measured at Purchasing Power Parity (from Penn World table 6.2). The contextual variable is the same Penn World Table series. Thus if there are significant relative income effects at the national level the contextual variable should attract a negative coefficient. Our equations also eliminate about 2000 observations where the reported family income is below 2% of the national average. Almost all of these observations report zero income. This adjustment raises and tightens the estimate of the coefficient on log income, as does the use of the Penn World Tables to convert national data to internationally comparable levels.

ⁱ Alternatively, since the biggest reduction in the coefficient on national income happens when the basic needs variables are added, the reduction in the relative income effect may be due to the large positive cross-country correlations between national income and the attainment of basic needs. It is one more reason for the issue to remain open.

consumption and income supports that are largely missing from measured variables.

The estimation of contextual effects at the national level is limited by small sample sizes and a large number of possible hypotheses. It is especially hard to estimate these effects separately by regional groupings, as the number of countries is only about 20, and inter-country variations within each region tend to be smaller than in the global sample. We are therefore not surprised that there are no significant patterns of contextual effects in the regional equations of Table 2. In Table 1, the contextual variables are included in every equation. In equations before the ones where the variable is entered at the individual level, the coefficients represent the combination of individual and contextual effects, and are therefore often significant. To see the properly measured contextual effects, at the global level, we must look at column 6 of Table 1, which includes both individual and contextual effects for all of the variables.

3. Country-by-Country Modelling of Life Satisfaction

The basic estimation form for analysis of individual life satisfaction within each county is:

$$LS_{ij} = \alpha_j + \beta_j \ln(y_{ij}) + \mu_j X_{ij} + \epsilon_{ij} \quad (2)$$

where LS_{ij} is individual life satisfaction measured on a scale of 0 to 10, y_{ij} is household income, and the X_{ij} are other individual-level variables. The estimates α_j , β_j , and μ_j are specific to country j . The entire explanatory power of equation (2) comes from explaining cross-sectional individual-level variance within a specific country, with differences between countries showing up as differences in constant terms and the estimated coefficients.

The national samples are fairly small, averaging 1000 in the first place, but rendered smaller by lack of data on key variables, especially household income. As further annual waves of the Gallup World Poll are undertaken, it should be able to identify more precisely any resulting cross-country or cross-cultural differences in the correlates of life satisfaction. Figures 7 - 12 shows histograms of the coefficients from all 105 country equations, while the various panels of Figures 1 - 6 divide the countries and coefficients by region. Table 6 displays the estimated coefficients and t-statistics for the 105 countries. The model in these estimations is identical to that in the last column of Table 1, except that all country-wide averages drop out due to lack of variations within a country.

Figure 7 - 12: Distribution of estimated coefficients of determinants of life today

Figure 7: Coefficients of log household income

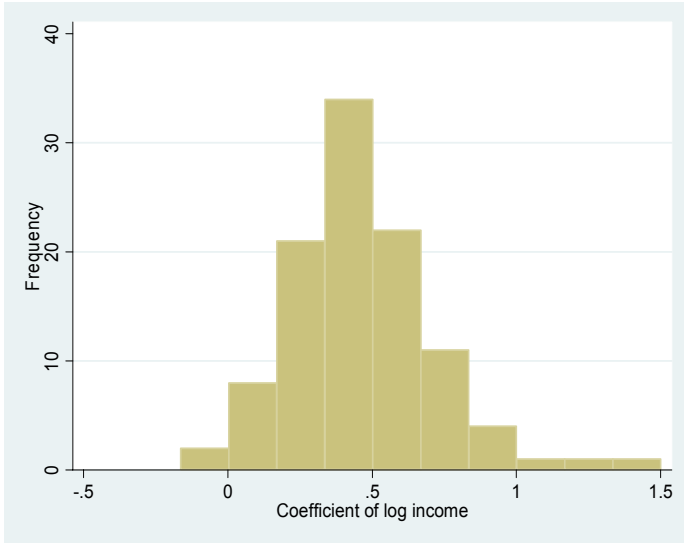


Figure 8: Coefficients of not enough money for food

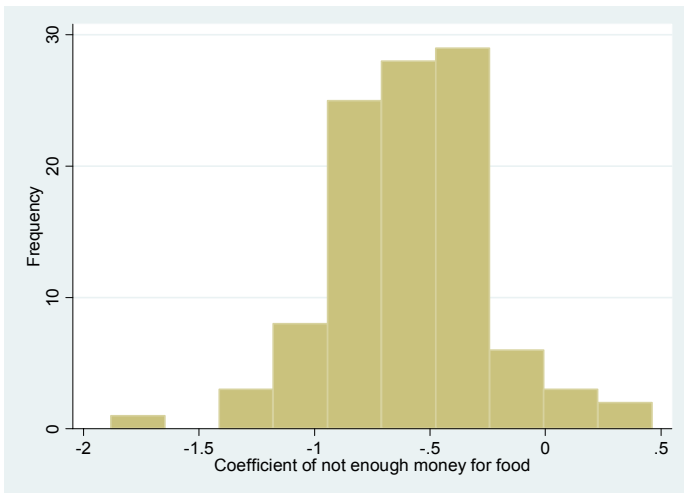


Figure 9: Coefficients of has someone to count on

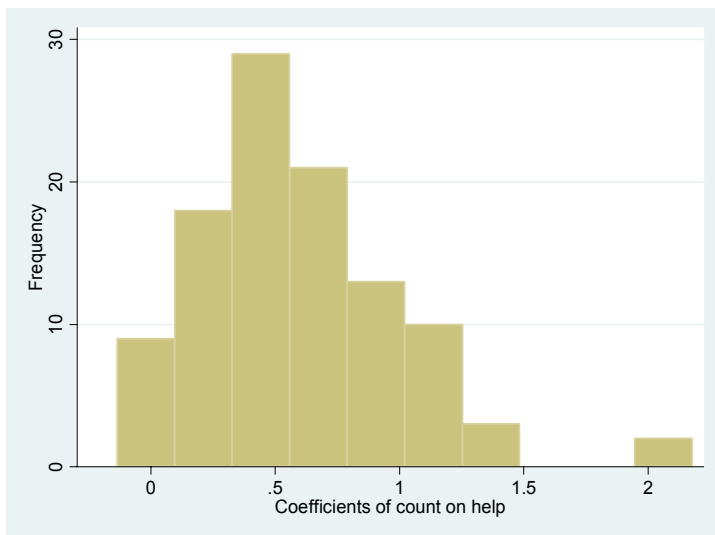


Figure 10: Coefficients of perception of corruption

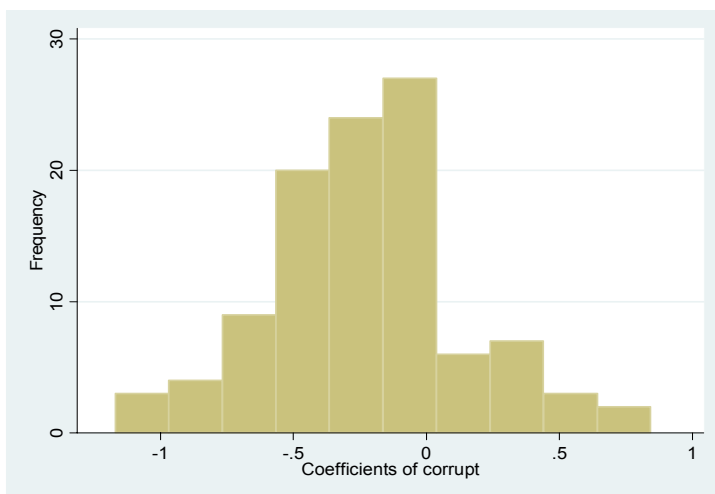


Figure 11: Coefficients of freedom to choose

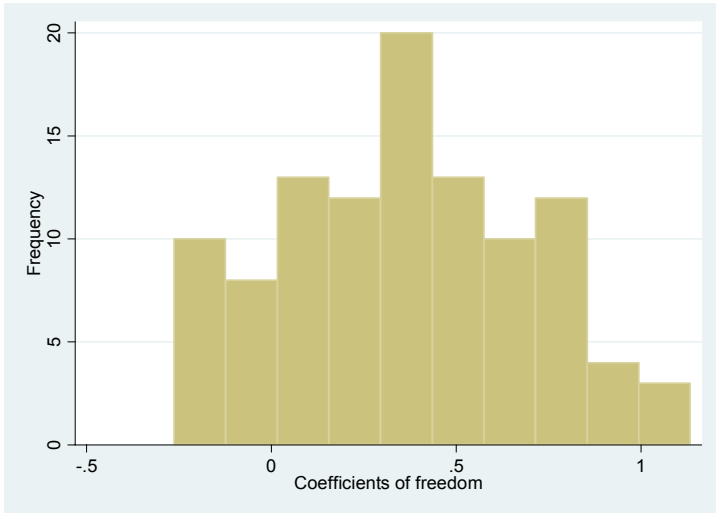


Figure 12: Estimated turning point of age†



Summary statistics

	Obs	Mean	Std. Dev.
Coefficients of log household income	105	0.47	0.25
Coefficients of not enough money for food	105	-0.59	0.35
Coefficients of has someone to count on	105	0.59	0.40
Coefficients of perception of corruption	105	-0.23	0.36
Coefficients of freedom to choose	105	0.37	0.33
Estimated turning point of age as proportion of 50†	99	50.39	17.31

†:Figure 12 and its summary statistics exclude countries that have turning points being negative or greater than 125. Six countries are excluded as the result.

Table 6: Estimated coefficients and t-statistics from country by country regressions of well-being

Country/Region	Log of hshld. income		Not enough money for food		Can count on help		Perception of corruption		Freedom to choose	
Region 1: W. Europe, N. America, Australia and New Zealand										
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Australia	0.32	4.23	-0.31	-1.51	0.99	3.43	-0.18	-1.44	0.82	3.91
Austria	0.78	4.99	-1.13	-2.76	0.95	2.84	-0.54	-2.95	-0.09	-0.28
Belgium	0.57	4.38	-0.74	-2.93	0.49	1.79	-0.28	-2.07	0.82	4.08
Canada	0.48	7.44	-0.95	-5.30	0.81	3.56	-0.30	-3.01	0.55	2.61
Cyprus	0.91	5.61	-1.88	-5.19	0.87	3.23	-0.44	-1.97	0.14	0.59
Denmark	0.31	2.69	-0.29	-1.56	0.26	0.77	-0.08	-0.59	0.13	0.44
Finland	0.35	3.98	-0.67	-2.85	1.19	4.62	-0.35	-2.12	0.24	0.75
France	0.60	4.96	-0.54	-2.66	0.71	2.56	-0.38	-2.39	0.42	2.01
Germany	0.85	8.82	-0.73	-3.49	0.89	2.92	0.01	0.06	0.71	4.73
Greece	1.32	9.53	0.00	-0.02	0.92	3.72	-0.63	-2.59	0.33	1.92
Ireland	0.48	4.11	-0.62	-1.26	-0.13	-0.24	-0.05	-0.24	0.72	1.95
Italy	0.49	3.47	-0.73	-2.27	1.06	3.57	-0.22	-0.61	0.44	2.33
Netherlands	0.42	4.78	-0.41	-2.15	0.51	2.49	-0.02	-0.18	0.58	3.61
New Zealand	0.41	4.60	-0.48	-2.06	0.36	1.24	-0.34	-2.12	0.75	2.64
Norway	0.38	3.03	-0.77	-3.33	1.18	4.03	-0.47	-3.56	0.89	3.14
Portugal	0.68	5.47	-0.91	-2.88	0.71	2.18	-0.86	-2.91	0.14	0.54
Spain	0.42	2.39	-0.24	-0.86	0.22	0.48	-0.31	-1.29	0.78	2.33
Sweden	0.44	3.26	-0.43	-1.62	1.47	4.45	-0.11	-0.77	0.81	2.43
Switzerland	0.51	4.47	-0.94	-3.64	0.97	3.19	-0.31	-2.09	0.71	3.23

United Kingdom	0.49	6.07	-0.58	-2.68	0.80	2.22	-0.13	-0.95	1.04	5.17
United States	0.45	5.07	-0.56	-3.19	0.90	2.71	-0.54	-3.86	0.62	2.90
Region 2: E. Europe and Former Soviet Union										
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Albania	0.73	6.69	-0.85	-4.64	0.55	2.71	-0.57	-2.16	0.40	2.76
Armenia	0.49	6.62	-0.45	-3.20	0.44	2.93	0.31	1.37	0.49	3.58
Azerbaijan	0.27	3.48	-0.76	-5.52	1.05	5.53	-0.17	-1.02	0.28	1.94
Bosnia Herzegovina	0.62	7.44	-1.19	-6.31	0.74	5.30	-0.32	-1.19	0.71	5.73
Czech republic	0.57	3.22	-0.37	-1.64	1.15	3.40	-0.49	-1.40	0.99	4.06
Estonia	0.55	3.98	-0.37	-1.81	0.67	2.39	0.03	0.16	0.41	2.16
Georgia	0.41	4.21	-1.25	-8.51	0.33	2.15	-0.53	-3.03	0.74	5.08
Hungary	0.77	3.97	-1.03	-4.49	0.74	2.20	-0.46	-1.22	0.01	0.03
Kazakhstan	0.16	1.78	-0.83	-4.99	0.67	3.11	-0.34	-1.38	0.27	1.68
Latvia	0.51	4.74	-0.53	-2.84	0.29	1.38	-0.06	-0.17	0.41	3.20
Lithuania	0.38	3.54	-0.94	-4.68	1.26	5.04	-0.30	-0.65	0.47	3.54
Montenegro	0.43	2.44	-0.39	-1.32	0.57	1.57	-0.53	-1.67	0.36	1.50
Poland	0.69	6.00	-0.75	-3.93	1.06	3.42	-0.83	-1.69	0.88	4.10
Romania	0.76	6.80	-0.75	-4.87	0.51	2.34	-0.19	-0.47	0.53	2.80
Russia	0.57	8.40	-0.58	-4.68	0.41	2.27	-0.35	-1.46	0.32	2.81
Serbia	0.78	9.04	-0.53	-3.30	0.66	4.11	-0.66	-3.39	0.77	6.71
Slovakia	1.01	7.39	-0.83	-3.79	0.08	0.27	0.58	1.34	0.64	4.56
Slovenia	0.58	5.08	-0.86	-3.44	0.64	2.33	-0.65	-3.46	0.49	1.78
Tajikistan	0.26	2.61	-0.71	-4.33	0.19	1.12	0.32	1.71	0.43	2.95
Uzbekistan	0.24	2.57	-0.84	-4.78	0.33	1.18	-0.34	-1.79	0.75	3.77

Region 3: Latin America and Caribbean										
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Argentina	0.48	4.19	-0.76	-4.17	0.51	1.81	-0.05	-0.19	0.60	3.72
Bolivia	0.53	7.08	-0.25	-1.79	0.03	0.15	0.29	1.35	0.08	0.47
Brazil	0.18	1.48	-1.18	-5.78	0.74	3.09	0.30	1.39	0.94	3.65
Chile	0.56	4.66	-0.54	-2.37	0.56	2.15	-0.11	-0.50	0.29	1.32
Columbia	0.70	3.01	-0.89	-4.11	0.51	1.44	0.06	0.18	-0.16	-0.66
Costa rica	0.34	2.53	-0.54	-2.82	0.57	1.56	-0.06	-0.25	-0.01	-0.05
Dominican Republic	0.33	2.44	-0.89	-3.17	0.56	1.08	-1.17	-3.15	0.01	0.02
Ecuador	0.47	5.20	-0.53	-3.35	0.22	0.86	0.03	0.08	0.53	3.51
El salvador	0.65	4.93	-0.47	-2.26	0.57	1.67	0.01	0.04	0.38	1.91
Guatemala	0.45	4.30	-0.30	-1.65	0.44	2.12	-0.53	-2.60	0.28	1.74
Haiti	-0.16	-0.72	0.45	1.99	-0.05	-0.20	-0.35	-0.87	-0.14	-0.64
Honduras	1.50	7.01	-0.59	-2.15	0.89	1.75	-0.38	-0.82	-0.21	-0.82
Jamaica	0.34	2.28	-1.40	-5.45	1.36	3.94	0.31	0.61	-0.13	-0.50
Mexico	0.33	2.32	-0.64	-2.83	0.84	2.22	0.15	0.49	0.48	1.78
Nicaragua	0.89	3.44	-0.83	-3.87	0.16	0.47	-0.63	-1.73	0.53	2.10
Panama	0.94	8.30	0.10	0.53	1.05	2.57	-0.60	-1.63	0.28	1.03
Paraguay	0.26	3.48	-0.87	-5.75	0.36	1.47	-0.43	-1.95	0.30	1.98
Peru	0.56	5.85	-0.23	-1.33	1.15	3.95	-0.27	-0.75	0.54	3.09
Puerto rico	0.44	2.75	-0.77	-2.44	0.25	0.52	0.14	0.25	0.74	2.33
Trinidad & Tobago	0.66	3.04	-0.41	-1.16	2.00	3.94	-1.06	-1.60	0.47	1.12
Uruguay	0.56	5.52	-1.04	-5.45	1.10	4.32	-0.51	-2.83	0.48	2.41
Venezuela	0.74	3.62	-0.71	-2.77	2.18	3.93	-0.55	-1.63	1.13	3.24

Region 4: Asia										
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Afghanistan	0.19	2.00	-0.17	-0.88	0.03	0.18	0.49	2.05	0.34	1.81
Bangladesh	0.75	7.83	-0.62	-4.70	0.19	1.56	-0.32	-2.11	0.09	0.82
Cambodia	0.52	8.01	-0.58	-4.80	0.36	2.73	-0.08	-0.44	0.78	3.73
China (Taiwan)	0.48	4.50	-0.59	-2.89	0.67	3.30	-0.52	-2.31	0.57	4.44
Hong Kong/Macau	0.58	6.67	-0.42	-1.61	0.46	2.23	-0.14	-0.84	0.25	1.08
India	0.33	5.78	-0.70	-5.46	0.64	5.47	0.03	0.21	0.29	2.14
Indonesia	0.44	5.40	-0.55	-4.49	0.02	0.12	-0.13	-0.52	0.19	1.70
Japan	0.30	2.20	-1.09	-3.86	0.64	1.82	-0.10	-0.44	0.66	2.71
Korea (South)	0.55	5.56	-0.83	-3.62	0.74	4.07	-0.28	-1.36	0.37	2.27
Malaysia	0.38	4.76	-1.15	-2.42	0.52	2.92	-0.28	-1.84	0.13	0.67
Nepal	0.25	3.16	-1.09	-6.09	0.54	3.37	-0.09	-0.43	0.40	3.45
Singapore	0.43	6.91	-0.29	-1.37	0.19	1.02	0.33	2.55	-0.10	-0.98
Sri Lanka	0.79	7.86	-0.57	-4.36	0.46	2.50	0.11	0.59	0.13	0.99
Thailand	0.54	9.51	-0.45	-3.08	0.46	3.32	-0.64	-3.60	-0.16	-1.21
Vietnam	0.38	4.48	-0.28	-1.73	-0.04	-0.24	-0.01	-0.08	-0.13	-0.68
Region 5: Africa										
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Angola	-0.10	-0.90	-0.34	-1.58	0.93	3.00	0.65	1.54	-0.18	-0.93
Benin	0.16	2.09	-0.49	-3.75	0.66	5.15	-0.63	-3.14	0.12	0.91
Botswana	0.59	7.65	-0.27	-1.54	0.50	2.04	-0.38	-1.81	0.40	1.99
Burkina Faso	0.13	1.48	-0.36	-2.50	0.16	0.99	0.32	1.68	0.18	1.33
Burundi	0.25	4.01	-0.50	-4.58	0.17	1.44	-0.09	-0.68	0.26	2.64

Cameroon	0.41	5.39	-0.68	-5.33	0.60	4.54	-0.23	-0.84	0.36	2.97
Chad	0.34	4.08	0.46	3.17	0.31	2.15	-0.27	-0.71	0.37	2.57
Ethiopia	0.29	3.37	-0.20	-1.01	0.01	0.03	-0.47	-2.04	0.62	3.95
Ghana	0.34	4.06	-0.44	-2.65	0.56	2.90	-0.01	-0.03	0.04	0.19
Kenya	0.40	5.65	-0.15	-1.14	0.27	1.31	-0.38	-1.78	0.12	1.00
Madagascar	0.31	4.90	-0.38	-4.10	0.29	2.97	-0.16	-1.52	0.30	3.19
Malawi	0.31	5.25	-0.32	-2.10	0.42	2.98	-0.35	-2.05	0.41	2.71
Mali	0.18	2.54	-0.12	-1.08	0.40	3.09	0.21	1.42	0.59	5.29
Mauritania	0.03	0.38	-0.47	-2.98	0.33	1.54	0.84	4.97	-0.04	-0.23
Mozambique	0.53	8.11	-0.47	-3.77	0.20	1.18	-0.56	-4.05	-0.03	-0.24
Niger	0.43	4.27	-0.40	-3.01	0.44	3.51	0.05	0.33	0.34	2.52
Nigeria	0.34	3.78	-0.43	-2.85	0.72	4.25	-0.84	-3.20	0.24	1.57
Rwanda	0.28	3.83	-0.83	-8.48	0.33	3.22	-0.05	-0.43	-0.26	-1.63
Senegal	0.37	4.49	-0.33	-2.10	0.36	2.60	-0.65	-4.21	0.09	0.59
Sierra leone	0.12	1.73	-0.17	-1.47	0.43	3.57	-0.37	-2.08	0.42	3.40
South africa	0.51	6.83	0.02	0.10	0.36	1.35	0.45	1.95	0.86	4.88
Tanzania	0.12	1.55	-0.51	-3.17	0.57	2.87	-1.07	-5.75	-0.17	-0.88
Togo	0.42	4.08	-0.47	-3.73	0.52	4.29	-0.05	-0.25	0.12	0.96
Uganda	0.30	4.89	-0.63	-4.48	0.29	1.72	-0.20	-0.98	-0.26	-1.72
Zambia	0.16	1.73	-0.69	-4.80	0.05	0.23	0.02	0.12	-0.03	-0.16
Zimbabwe	0.10	1.32	-0.49	-3.14	0.81	4.06	-0.11	-0.38	0.05	0.33

Note: The model in these estimations is identical to that in the last column of Table 1, except that all country-wide averages drop out due to lack of variations within a country.

Preliminary assessment of the cross-country distributions of coefficients seem consistent with the view that most of the variables found to be important at the individual level in the global sample are also significant in most of the individual countries. For example, food inadequacy, which has substantial variance within each country, has significant (as measured by an absolute t -value > 2) negative coefficients in 81 of the 105 individual country regressions, while the running water variable, which has much more of its variance between countries, has significant positive coefficients in only 26 of the 105 regressions. The social support variable has significant positive coefficients in 69 of the regressions, and the corruption variable in 35.

The quadratic pattern of age effects is almost universal, with 89 countries having coefficients that are negative on age and positive on age squared. The gender effect for males is negative in 78 of the 105 countries, although significantly so in only 23. The other demographic variables are also fairly weakly defined in the national samples, reflecting the small sample sizes and the variety of individual experiences.

The log of household income is positive in 103 of the 105 country regressions, and significantly so in 91 cases. This is so even though the equations contain two other income-dependent variables: adequacy of money for food, and running water in the home. For all variables the means of the country coefficients are very close to the values estimated in Table 1, as would be expected if the national samples were drawn from a global population with broadly similar responses to these variables. Figure 13 provides a graphic example of the cross-national consistency of parameters estimates by showing the individual coefficients for India, juxtaposed with those for Asia as a whole, and for the global sample.^j

Finally, it is necessary to address more directly the experimental (e.g. Heine and Norenzayen¹¹) and other evidence (e.g. Kahneman¹⁵, Diener and Suh⁵, Kahneman and Riis¹⁶) that cross-national comparisons of retrospective assessments of subjective well-being are rendered difficult or possibly uninformative by cultural differences in the ways in which questions are interpreted, scales are used, values are determined and answers are framed (Heine et al¹², Schmidt and Bullinger²⁷). What is meant by culture in this context? Matsumoto²¹ defines culture as “a dynamic system of rules – explicit and implicit – established by groups in order to ensure their survival, including

^j The global coefficients are from the final equation in Table 1, the Asia coefficients from Table 2, and the India coefficients from the single-country equation for India, drawn from the group of 105 for which the coefficients are shown in Figures 1 and 2.

attitudes, values, beliefs, norms, and behaviours ...communicated across generations, relatively stable but with the potential to change across time.” This bears striking similarities to the OECD²² definition of social capital (Putnam^{23, 24}, Halpern¹⁰) as “networks together with shared norms, values and understandings that facilitate co-operation within and among groups”. In international research into the well-being consequences of differences in the quality of social capital (Helliwell and Putnam¹³), it is presumed that key aspects of social norms (e.g. trust) can be meaningfully measured and compared across cultures and over time. The use of pooled international samples with constant coefficients implies also that the well-being consequences of different levels of trust, for example, are comparable across cultures.

Figure 13: Cross-national comparisons of determinants of well-being

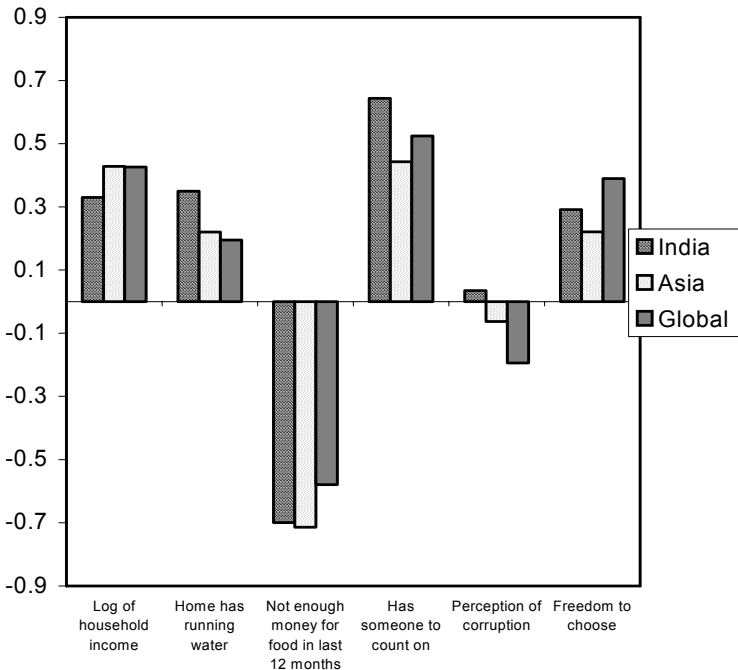
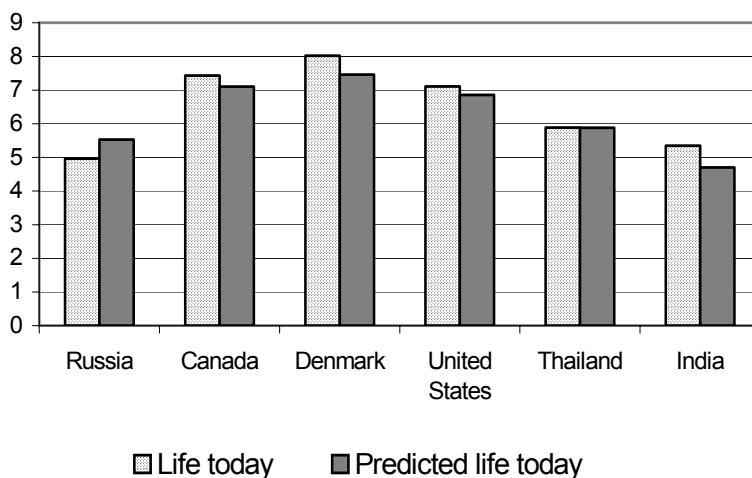


Figure 14: Well-being: measured and predicted



Coefficients	India	Asia	Global
Log of household income	0.33	0.428	0.426
Home has running water	0.35	0.22	0.195
Not enough money for food in last 12 months	-0.699	-0.714	-0.579
Has someone to count on	0.643	0.443	0.524
Perception of corruption	0.035	-0.063	-0.194
Freedom to choose	0.291	0.221	0.39
Standard errors			
Log of household income	0.057	0.041	0.026
Home has running water	0.106	0.119	0.053
Not enough money for food in last 12 months	0.128	0.041	0.037
Has someone to count on	0.118	0.08	0.033
Perception of corruption	0.166	0.085	0.043
Freedom to choose	0.136	0.069	0.037
t-statistics			
Log of household income	5.789474	10.43902	16.38462
Home has running water	3.301887	1.848739	3.679245
Not enough money for food in last 12 months	-5.46094	-17.4146	-15.6486
Has someone to count on	5.449153	5.5375	15.87879
Perception of corruption	0.210843	-0.74118	-4.51163
Freedom to choose	2.139706	3.202899	10.54054

Our research and results suggest that some of the key inter-cultural differences in norms and values emphasized in the literature are supported in the subjective well-being data of the Gallup World Poll. For example, the well-being costs of living in a society with high perceived levels of corruption in business and government appear to be slightly less in countries where corruption is a long established feature of the status quo. Similarly, the well-being value attached to a sense of personal freedom is slightly higher in societies classed as individualistic rather than collectivist. But while these differences qualitatively confirm some key experimental cross-cultural findings, what appears to us remarkable is that application of the same well-being equation to 105 different national societies shows the same factors coming into play in much the same way and to much the same degree. This is illustrated by Figure 14, which shows actual and predicted values of life satisfaction obtained by applying the same model, with coefficients restricted to be the same for all countries^k. Thus the international differences in predicted values are entirely due to differences in their underlying circumstances.

4. Conclusion

We have estimated the same life satisfaction equation for 105 countries. The results are strikingly consistent among countries, cultures and regions. Thus it would appear that the large international differences in life satisfaction are not due to differences in underlying preferences but to identifiable differences in life circumstances. Since these results are based on a single cross-section within each of the countries, with samples averaging less than 1,000, new rounds of survey evidence should enable more precise estimates within each country, testing of a broader range of underlying models, and first attempts to disentangle some of the complex dynamics that underlie the cross-sectional correlations reported here.

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^k The equation is that shown in the right-hand column of Table 1.

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