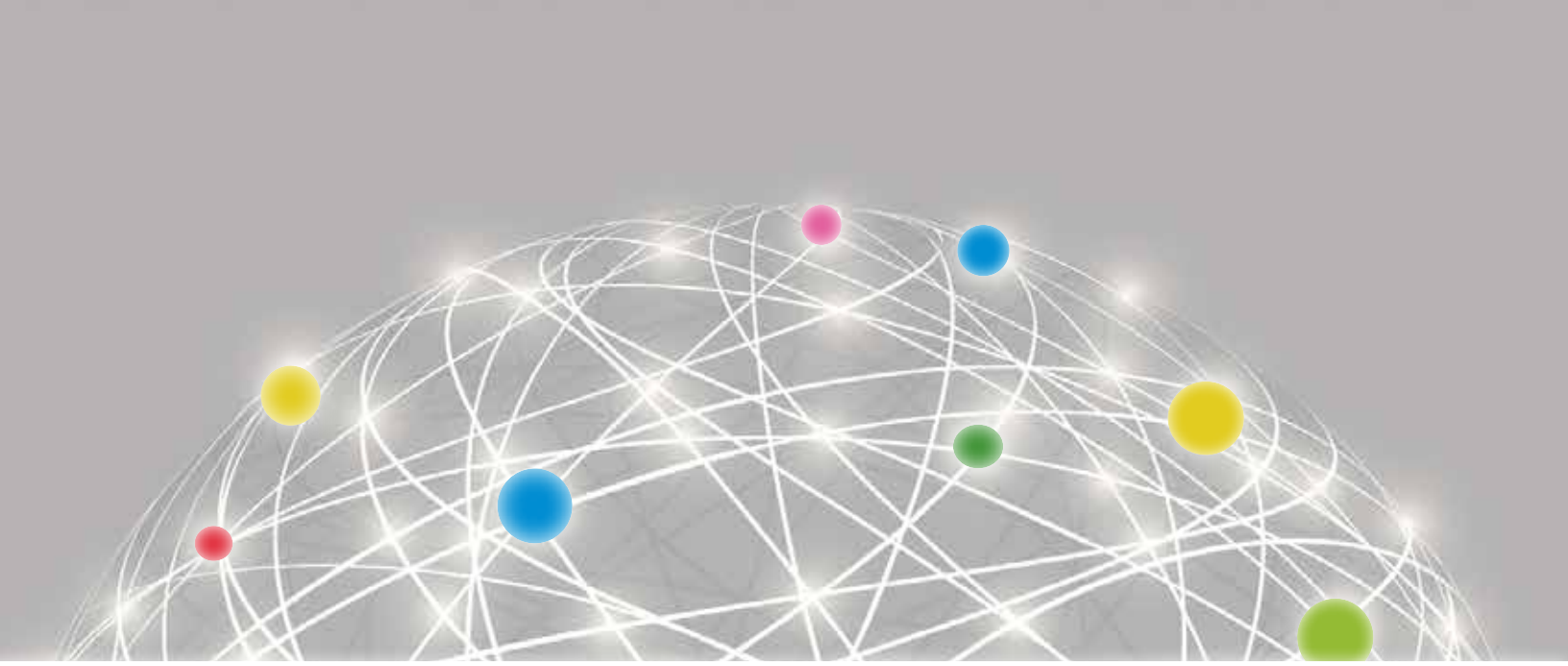

Chapter 2

THE DISTRIBUTION OF WORLD HAPPINESS

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Introduction

It is now almost four years since the publication of the first *World Happiness Report* (WHR) in 2012. Its central purpose was to survey the scientific underpinnings of measuring and understanding subjective well-being. Its main content is as relevant today as it was then, and remains available for those now coming to the topic for the first time. The subsequent *World Happiness Report 2013* and *World Happiness Report 2015*, issued at roughly 18 month intervals, updated and extended this background. To make this *World Happiness Report 2016 Update* accessible to those who are coming fresh to the *World Happiness Report* series, we repeat enough of the core analysis in this chapter, and its several on-line appendices, to explain the meaning of the evidence we are reporting.

Chapter 2 in *World Happiness Report 2015*, the Geography of World Happiness, started with a global map, and continued with our attempts to explain the levels and changes in average national life evaluations among countries around the world. This year we shall still consider the geographic distribution of life evaluations among countries, while extending our analysis to consider in more detail the inequality of happiness – how life evaluations are distributed among individuals within countries and geographic regions.

In studying more deeply the distribution of happiness within national and regional populations, we are extending the approach adopted in Chapter 2 of the first *World Happiness Report*, in which Figure 2.1 showed the global distribution of life evaluations among the 11 response categories, with the worst possible life as a 0 and the best possible life as a 10 (the Cantril ladder question). The various parts of Figure 2.2 then made the same allocation of responses for respondents in nine global regions, weighting the responses from different countries according to each country's population. In those figures we combined all the data then available, for the survey years 2005 through 2011, in order to achieve representative samples in each answer category. In this chapter we repeat that analysis using data from the subsequent four years, 2012-2015. This will give us sufficiently large samples to compare what we found for 2005-2011 with what we now see in the data for 2012-2015.

Our main analysis of the distribution of happiness among and within nations continues to be based on individual life evaluations, roughly 1,000 per year in each of more than 150 countries, as measured by answers to the Cantril ladder question: "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?" We will, as usual, present the average life evaluation scores for each country, in this report based on averages from the surveys conducted in 2013, 2014 and 2015.

This will be followed, as in earlier editions, by our latest attempts to show how six key variables contribute to explaining the full sample of national annual average scores over the whole period 2005-2015. These variables include GDP per capita, social support, healthy life expectancy, social freedom, generosity and absence of corruption. We shall also show how measures of experienced well-being, especially positive emotions, can add to life circumstances in the support for higher life evaluations.

We shall then turn to consider the distribution of life evaluations among individuals in each country, using data from all 2012-2015 surveys, with the countries ranked according to the equality of life evaluations among their survey respondents, as measured by the standard deviation from the mean. We shall then show how these national measures of the equality of life evaluations have changed from 2005-2011 to 2012-2015.

Our reason for paying more attention to the distribution of life evaluations is quite simple. If it is appropriate to use life evaluations as an umbrella measure of the quality of life, to supplement and consolidate the benefits available from income, health, family and friends, and the broader institutional and social context, then it is equally important to broaden the measurement of inequalities beyond those for income and wealth. Whether people are more concerned with equality of opportunities or equality of outcomes, the data and analysis should embrace the availability of and access to sustainable and livable cities and communities as much as to income and wealth. We will make the case that the distribution of life evaluations provides an over-arching measure of inequality in just the same way as the average life evaluations provide an umbrella measure of well-being.

The structure of the chapter is as follows. We shall start with a review of how and why we use life evaluations as our central measure of subjective well-being within and among nations. We shall then present data for average levels of life evaluations within and among countries and global regions. This will include our latest efforts to explain the differences in national average evaluations, across countries and over the years. After that we present the latest data on changes between 2005-2007 and 2013-2015 in average national life evaluations.

We shall then turn to consider inequality and well-being. We first provide a country ranking of the inequality of life evaluations based on data from 2012-2015, followed by a country ranking based on the size of the changes in inequality that have taken place between 2005-2011 and 2012-2015. We then attempt to assess the possible consequences for average levels of well-being, and for what might be done to address well-being inequalities. We conclude with a summary of our latest evidence and its implications.

Measuring and Understanding Happiness

Chapter 2 of the first *World Happiness Report* explained the strides that had been made during the preceding 30 years, mainly within psychology, in the development and validation of a variety of measures of subjective well-being. Progress since then has moved faster, as the number of scientific papers on the topic has continued to grow rapidly,[1] and as the measurement of subjective well-being has been taken up by more national and international statistical agencies, guided by technical advice from experts in the field.

By the time of the first report there was already a clear distinction to be made among three main classes of subjective measures: life evaluations, positive emotional experiences (positive affect) and negative emotional experiences (negative affect); see *Technical Box 1*. The Organization for Economic Co-operation and Development (OECD) subsequently released *Guidelines on Measuring Subjective Well-being*,[2] which included both short and longer recommended modules of subjective well-being questions.[3] The centerpiece of the OECD short module was a life evaluation question, asking respondents to assess their satisfaction with their current lives on a 0 to 10 scale. This was to be accompanied by two or three affect questions and a question about the extent to which the respondents felt they had a purpose or meaning in their lives. The latter question, which we treat as an important support for subjective well-being, rather than a direct measure of it, is of a type[4] that has come to be called "eudaimonic," in honor of Aristotle, who believed that having such a purpose would be central to any reflective individual's assessment of the quality of his or her own life.

Chapter 2 of *World Happiness Report 2015* reviewed evidence from many countries and several different surveys about the types of information available from different measures of subjective well-being.[8] What were the main messages? First, all three of the commonly used

Technical Box 1: Measuring Subjective Well-being

The OECD (2013) *Guidelines on Measuring Subjective Well-being*, quotes in its introduction the following definition and recommendation from the earlier Commission on the Measurement of Economic and Social Progress:

"Subjective well-being encompasses three different aspects: cognitive evaluations of one's life, positive emotions (joy, pride), and negative ones (pain, anger, worry). While these aspects of subjective well-being have different determinants, in all cases these determinants go well beyond people's income and material conditions... All these aspects of subjective well-being should be measured separately to derive a more comprehensive measure of people's quality of life and to allow a better understanding of its determinants (including people's objective conditions). National statistical agencies should incorporate questions on subjective well-being in their standard surveys to capture people's life evaluations, hedonic experiences and life priorities."[5]

The OECD Guidelines go on to recommend a core module of questions to be used by national statistical agencies in their household surveys:

"There are two elements to the core measures module.

The first is a primary measure of life evaluation. This represents the absolute minimum required to measure subjective well-being, and it is recommended that all national statistical agencies include this measure in one of their annual household surveys.

The second element consists of a short series of affect questions and an experimental eudaimonic question (a question about life meaning or purpose). The inclusion of these measures complements the primary evaluative measure both because they capture different aspects of subjective well-being (with a different set of drivers) and because the difference in the nature of the measures means that they are affected in different ways by cultural and other sources of measurement error. While it is highly desirable that these questions are collected along with the primary measure as part of the core, these questions should be considered a lower priority than the primary measure."[6]

Almost all OECD countries[7] now contain a life evaluation question, usually about life satisfaction, on a 0 to 10 rating scale, in one or more of their surveys. However, it will be many years before the accumulated efforts of national statistical offices will produce as large a number of comparable country surveys as is now available through the Gallup World Poll (GWP), which has been surveying an increasing number of countries since 2005, and now includes almost all of the world's population. The GWP contains one life evaluation as well as a range of positive and negative experiential questions, including several measures of positive and negative affect, mainly asked with respect to the previous day. In this chapter, we make primary use of the life evaluations, since they are, as we show in Table 2.1, more international in their variation and are more readily explained by life circumstances.

life evaluations (specifically Cantril ladder, satisfaction with life, and happiness with life in general) tell almost identical stories about the nature and relative importance of the various factors influencing subjective well-being. For example, for several years it was thought (and is still sometimes reported in the literature) that respondents' answers to the Cantril ladder question, with its use of a ladder as a framing device, were more dependent on their incomes than were answers to questions about satisfaction with life. The evidence for this came from comparing modeling using the Cantril ladder in the Gallup World Poll (GWP) with modeling

based on life satisfaction answers in the World Values Survey (WVS). But this conclusion, based on comparing two different surveys, unfortunately combines survey and method differences with the effects of question wording. When it subsequently became possible to ask both questions[9] of the same respondents on the same scales, as was the case in the Gallup World Poll in 2007, it was shown that the estimated income effects and almost all other structural influences were identical, and a more powerful explanation was obtained by using an average of the two answers.[10]

It was also believed at one time that when questions included the word "happiness" they elicited answers that were less dependent on income than were answers to life satisfaction questions or the Cantril ladder. Evidence for that view was based on comparing World Values Survey happiness and life satisfaction answers,[11] and by comparing the Cantril ladder with happiness yesterday (and other emotions yesterday). Both types of comparison showed the effects of income on the happiness answers to be less significant than on satisfaction with life or the Cantril ladder. Both conclusions were based on the use of non-comparable data. The first comparison, using WVS data, involved different scales and a question about happiness that might have combined emotional and evaluative components. The second strand of literature, based on GWP data, compared happiness yesterday, which is an experiential/emotional response, with the Cantril ladder, which is equally clearly an evaluative measure. In that context, the finding that income has more purchase on life evaluations than on emotions seems to have general applicability, and stands as an established result.[12]

But what if happiness is used as part of a life evaluation? That is, if respondents are asked how happy, rather than how satisfied, they are with their life as a whole? Would the use of "happiness" rather than "satisfaction" affect the influence of income and other factors on the answers? For this important question, no definitive answer was available until the European Social Survey (ESS) asked the same respondents "satisfaction with life" and "happy with life" questions, wisely using the same 0 to 10 response scales. The answers showed that income and other key variables all have the same effects on the "happy with life" answers as on the "satisfied with life" answers, so much so that once again more powerful explanations come from averaging the two answers.

Another previously common view was that changes in life evaluations at the individual level were largely transitory, returning to their baseline as people rapidly adapt to their circumstances. This view has been rejected by four independent lines of evidence. First, average life evaluations differ significantly and systematically among countries, and these differences are substantially explained by life circumstances. This implies that rapid and complete adaptation to different life circumstances does not take place. Second, there is evidence of long-standing trends in the life evaluations of sub-populations within the same country, further demonstrating that life evaluations can be changed within policy-relevant time scales.[13] Third, even though individual-level partial adaptation to major life events is a normal human response, there is very strong evidence of continuing influence on well-being from major disabilities and unemployment, among other life events.[14] The case of marriage is still under debate. Some recent results using panel data from the UK have suggested that people return to baseline levels of life satisfaction several years after marriage, a result that has been argued to support the more general applicability of set points.[15] However, subsequent research using the same data has shown that marriage does indeed have long-lasting well-being benefits, especially in protecting the married from as large a decline in the middle-age years that in many countries represent a low-point in life evaluations.[16] Fourth, and especially relevant in the global context, are studies of migration showing migrants to have

average levels and distributions of life evaluations that resemble those of other residents of their new countries more than of comparable residents in the countries from which they have emigrated.[17] This confirms that life evaluations do depend on life circumstances, and are not destined to return to baseline levels as required by the set point hypothesis.

Why Use Life Evaluations for International Comparisons of the Quality of Life?

In each of the three previous *World Happiness Reports* we presented different ranges of data covering most of the experiences and life evaluations that were available for a large number of countries. We were grateful for the breadth of available information, and used it to deepen our understanding of the ways in which experiential and evaluative reports are connected. Our conclusion is that while experiential and evaluative measures differ from each other in ways that help to understand and validate both, life evaluations provide the most informative measures for international comparisons because they capture the overall quality of life as a whole.

For example, experiential reports about happiness yesterday are well explained by events of the day being asked about, while life evaluations more closely reflect the circumstances of life as a whole. Most Americans sampled daily in the Gallup-Healthways Well-Being Index Survey feel happier on weekends, to an extent that depends on the social context on and off the job. The weekend effect disappears for those employed in a high trust workplace, who regard their superior more as a partner than a boss, and maintain their social life during weekdays.[18]

By contrast, life evaluations by the same respondents in that same survey show no weekend effects.[19] This means that when they are answering the evaluative question about life as a whole, people see through the day-to-day and hour-to-hour fluctuations, so that the answers they give on weekdays and weekends do not differ.

On the other hand, although life evaluations do not vary by the day of week, they are much more responsive than emotional reports to differences in life circumstances. This is true whether the comparison is among national averages[20] or among individuals.[21]

Furthermore, life evaluations vary more between countries than do emotions. Thus almost one-quarter of the global variation in life evaluations is among countries, compared to three-quarters among individuals in the same country. This one-quarter share for life evaluations is far more than for either positive affect (7 percent) or negative affect (4 percent). This difference is partly due to the role of income, which plays a stronger role in life evaluations than in emotions, and is also very unequally spread among countries. For example, more than 40 percent of the global variation among household incomes is among nations rather than among individuals within nations.[22]

These twin facts – that life evaluations vary much more than do emotions across countries, and that these life evaluations are much more fully explained by life circumstances than are emotional reports– provide for us a sufficient reason for using life evaluations as our central measure for making international comparisons.[23] But there is more. To give a central role to life evaluations does not mean we need to either ignore or downplay the important information provided by experiential measures. On the contrary, we see every reason to keep experiential measures of well-being, as well as measures of life purpose, as important elements in our attempts to measure and understand subjective well-being. This is easy to achieve, at least in principle, because our evidence continues to suggest that experienced well-being and a sense of life purpose are both important influences on

life evaluations, above and beyond the critical role of life circumstances. We shall provide direct evidence of this, and especially of the importance of positive emotions, in Table 2.1. Furthermore, in Chapter 3 of *World Happiness Report 2015* we gave experiential reports a central role in our analysis of variations of subjective well-being across genders, age groups, and global regions.

We would also like to be able to compare inequality measures for life evaluations with those for emotions, but unfortunately that is not currently possible, since the Gallup World Poll emotion questions all offer only yes and no responses. Thus nothing can be said about their distribution beyond the national average shares of yes and no answers. For life evaluations, however, there are 11 response categories, so we are able to contrast distribution shapes for each country and region, and see how these evolve as time passes. We start by looking at the population-weighted global and regional distributions of life evaluations, based on how respondents rate their lives[24].

In the rest of this report, Cantril ladder is the only measure of life evaluations to be used, and "happiness" and "subjective well-being" are used exchangeably. All the analysis on the levels or changes of subjective well-being refers only to life evaluations, specifically the Cantril ladder.

The Distribution of Happiness around the World

The various panels of Figure 2.1 contain bar charts showing for the world as a whole, and for each of 10 global regions, the distribution of the 2012-2015 answers to the Cantril ladder question asking respondents to value their lives today on a 0 to 10 scale, with the worst possible life as a 0 and the best possible life as a 10.

In Table 2.1 we present our latest modeling of national average life evaluations and measures of positive and negative affect (emotion) by country and year. For ease of comparison, the Table has the same basic structure as Table 2.1 in the *World Happiness Report 2015*. The major difference comes from the inclusion of data for late 2014 and 2015, which increases by 144 (or about 15 percent) the number of country-year observations.[25] The resulting changes to the estimated equation are very slight.[26] There are four equations in Table 2.1. The first equation provides the basis for constructing the sub-bars shown in Figure 2.2.

The equation explains national average life evaluations in terms of six key variables: GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity and freedom from corruption.[27] Taken together, these six variables explain almost three-quarters of the variation in national annual average ladder scores among countries, using data from the years 2005 to 2015. The model's predictive power is little changed if the year fixed effects in the model are removed, falling from 74.1% to 73.6% in terms of the adjusted r-squared.

Figure 2.1: Population-Weighted Distributions of Happiness, 2012-2015 (Part 1)

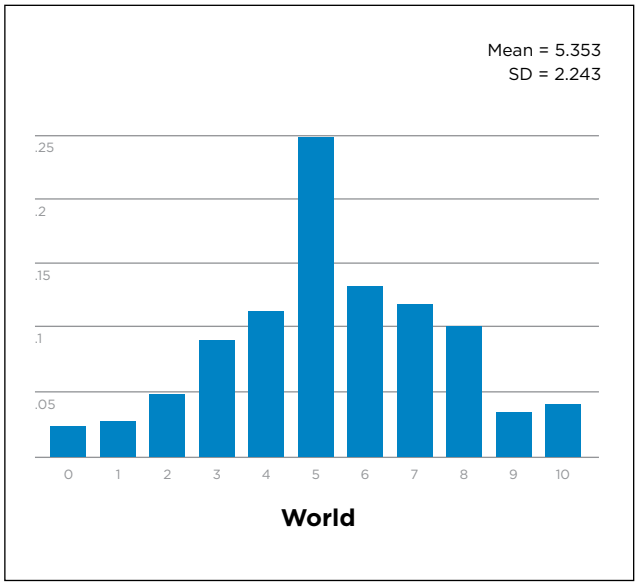


Figure 2.1: Population-Weighted Distributions of Happiness, 2012-2015 (Part 2)

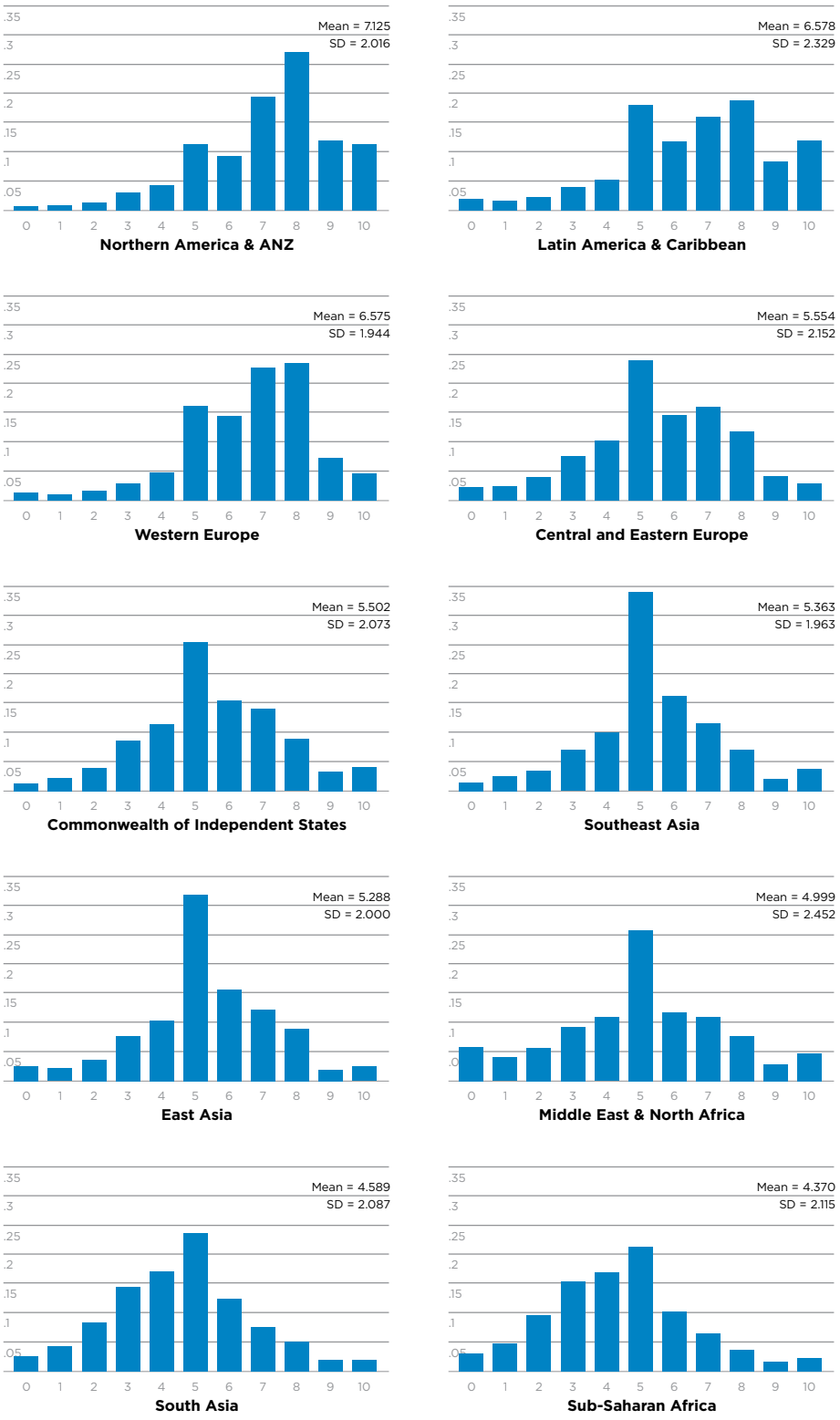


Table 2.1: Regressions to Explain Average Happiness across Countries (Pooled OLS)

	Dependent Variable			
Independent Variable	Cantril Ladder	Positive Affect	Negative Affect	Cantril Ladder
Log GDP per capita	0.338 (0.059)***	-0.002 (0.009)	0.011 (0.008)	0.341 (0.058)***
Social support	2.334 (0.429)***	0.253 (0.052)***	-0.238 (0.046)***	1.768 (0.417)***
Healthy life expectancy at birth	0.029 (0.008)***	0.0002 (0.001)	0.002 (0.001)*	0.028 (0.008)***
Freedom to make life choices	1.056 (0.319)***	0.328 (0.039)***	-0.089 (0.045)**	0.315 (0.316)
Generosity	0.820 (0.276)***	0.171 (0.032)***	-0.011 (0.030)	0.429 (0.277)
Perceptions of corruption	-0.579 (0.282)**	0.033 (0.030)	0.092 (0.025)***	-0.657 (0.271)**
Positive affect				2.297 (0.443)***
Negative affect				0.050 (0.506)
Year fixed effects	**Included**	**Included**	**Included**	**Included**
Number of countries	156	156	156	156
Number of observations	1,118	1,115	1,117	1,114
Adjusted R-squared	0.741	0.497	0.226	0.765

Notes: This is a pooled OLS regression for a tattered panel explaining annual national average Cantril ladder responses from all available surveys from 2005 to 2015. See Technical Box 2 for detailed information about each of the predictors. Coefficients are reported with robust standard errors clustered by country in parentheses. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

The second and third columns of Table 2.1 use the same six variables to estimate equations for national averages of positive and negative affect, where both are based on averages for answers about yesterday's emotional experiences. In general, the emotional measures, and especially negative emotions, are much less fully explained by the six variables than are life evaluations. But the differences vary a lot from one circumstance to another. Per-capita income and healthy life expectancy have significant effects on life evaluations, but not, in these national average data, on either positive or negative affect. The situation changes when we consider social variables.

Bearing in mind that positive and negative affect are measured on a 0 to 1 scale, while life evaluations are on a 0 to 10 scale, social support can be seen to have a similar proportionate effect on positive and negative emotions as on life evaluations. Freedom and generosity have even larger influences on positive affect than on the ladder. Negative affect is significantly reduced by social support, freedom, and absence of corruption.

In the fourth column we re-estimate the life evaluation equation from column 1, adding both positive and negative affect to partially imple-

Technical Box 2: Detailed information about each of the predictors in Table 2.1

1. GDP per capita is in terms of Purchasing Power Parity (PPP) adjusted to constant 2011 international dollars, taken from the World Development Indicators (WDI) released by the World Bank in December 2015. See the appendix for more details. GDP data for 2015 are not yet available, so we extend the GDP time series from 2014 to 2015 using country-specific forecasts of real GDP growth from the OECD Economic Outlook No. 98 (Edition 2015/2) and World Bank's Global Economic Prospects (December 2014 release), after adjustment for population growth. The equation uses the natural log of GDP per capita, since that form fits the data significantly better than does GDP per capita.

2. The time series of healthy life expectancy at birth are constructed based on data from the World Health Organization (WHO) and the World Development Indicators (WDI). WHO publishes the data on healthy life expectancy for the year 2012. The time series of life expectancies, with no adjustment for health, are available in WDI. We adopt the following strategy to construct the time series of healthy life expectancy at birth: first we generate the ratios of healthy life expectancy to life expectancy in 2012 for countries with both data. We then apply the country-specific ratios to other years to generate the healthy life expectancy data. See the appendix for more details.

3. Social support (or having someone to count on in times of trouble) is the national average of the binary responses (either 0 or 1) to the Gallup World Poll (GWP) question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?"

4. Freedom to make life choices is the national average of binary responses to the GWP question "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?"

5. Generosity is the residual of regressing the national average of GWP responses to the question "Have you donated money to a charity in the past month?" on GDP per capita.

6. Perceptions of corruption are the average of binary answers to two GWP questions: "Is corruption widespread throughout the government or not" and "Is corruption widespread within businesses or not?" Where data for government corruption are missing, the perception of business corruption is used as the overall corruption-perception measure.

7. Positive affect is defined as the average of previous-day affect measures for happiness, laughter and enjoyment for GWP waves 3-7 (years 2008 to 2012, and some in 2013). It is defined as the average of laughter and enjoyment for other waves where the happiness question was not asked.

8. Negative affect is defined as the average of previous-day affect measures for worry, sadness and anger for all waves. See the appendix for more details.

ment the Aristotelian presumption that sustained positive emotions are important supports for a good life.[28] The most striking feature is the extent to which the results buttress a finding in psychology, that the existence of positive emotions matters much more than the absence of negative ones. Positive affect has a large and highly significant impact in the final equation of Table 2.1, while negative affect has none.

As for the coefficients on the other variables in the final equation, the changes are material only on those variables – especially freedom and generosity – that have the largest impacts on positive affect. Thus we can infer first that positive emotions play a strong role in support of life evaluations, and second that most of the impact of freedom and generosity on life evaluations is mediated by their influence on positive emotions. That is, freedom and generosity have a large impact on positive affect, which in turn has an impact on life evaluations. The Gallup World Poll does not have a widely available measure of life purpose to test whether it too would play a strong role in support of high life evaluations. However, data from the large samples of UK data now available does suggest that life purpose plays a strongly supportive role, independent of the roles of life circumstances and positive emotions.

Ranking of Happiness by Country

Figure 2.2 (below) shows the average ladder score (the average answer to the Cantril ladder question, asking people to evaluate the quality of their current lives on a scale of 0 to 10) for each country, averaged over the years 2013-2015. Not every country has surveys in every year; the total sample sizes are reported in the statistical appendix, and are reflected in Figure 2.2 by the horizontal lines showing the 95 percent confidence regions. The confidence regions are tighter for countries with larger samples. To increase the number of countries ranked, we also include four countries that had no 2013-2015 surveys, but did have a survey in 2012. This brings the number of countries shown in Figure 2.2 to 157.

The length of each overall bar represents the average score, which is also shown in numerals. The rankings in Figure 2.2 depend only on the average Cantril ladder scores reported by the respondents.

Each of these bars is divided into seven segments, showing our research efforts to find possible sources for the ladder levels. The first six sub-bars show how much each of the six key variables is calculated to contribute to that country's ladder score, relative to that in a hypothetical country called Dystopia, so named because it has values equal to the world's lowest national averages for 2013-2015 for each of the six key variables used in Table 2.1. We use Dystopia as a benchmark against which to compare each other country's performance in terms of each of the six factors. This choice of benchmark permits every real country to have a non-negative contribution from each of the six factors. We calculate, based on estimates in Table 2.1, a 2013–2015 ladder score in Dystopia to have been 2.33 on the 10-point scale. The final sub-bar is the sum of two components: the calculated average 2013-2015 life evaluation in Dystopia (=2.33) and each country's own prediction error, which measures the extent to which life evaluations are higher or lower than predicted by our equation in the first column of Table 2.1. The residuals are as likely to be negative as positive.[29]

Returning to the six sub-bars showing the contribution of each factor to each country's average life evaluation, it might help to show in more detail how this is done. Taking the example of healthy life expectancy, the sub-bar for this factor in the case of India is equal to the amount by which healthy life expectancy in India exceeds the world's lowest value, multiplied by the Table 2.1 coefficient for the influ-

ence of healthy life expectancy on life evaluations. The width of these different sub-bars then shows, country-by-country, how much each of the six variables is estimated to contribute to explaining the international ladder differences. These calculations are illustrative rather than conclusive, for several reasons. First, the selection of candidate variables was restricted by what is available for all these countries. Traditional variables like GDP per capita and healthy life expectancy are widely available. But measures of the quality of the social context, which have been shown in experiments and national surveys to have strong links to life evaluations, have not been sufficiently surveyed in the Gallup or other global polls, or otherwise measured in statistics available for all countries. Even with this limited choice, we find that four variables covering different aspects of the social and institutional context – having someone to count on, generosity, freedom to make life choices and absence of corruption – are together responsible for 50 percent of the average differences between each country's predicted ladder score and that in Dystopia in the 2013-2015 period. As shown in Table 13 of the Statistical Appendix, the average country has a 2013-2015 ladder score that is 3.05 points above the Dystopia ladder score of 2.33. Of the 3.05 points, the largest single part (31 percent) comes from GDP per capita, followed by social support (26 percent) and healthy life expectancy (18 percent), and then by freedom (12 percent), generosity (8 percent) and corruption (5 percent).[30]

Our limited choice means that the variables we use may be taking credit properly due to other better variables, or to un-measurable other factors. There are also likely to be vicious or virtuous circles, with two-way linkages among the variables. For example, there is much evidence that those who have happier lives are likely to live longer, to be most trusting, more cooperative, and generally better able to meet life's demands.[31] This will feed back to influence health, GDP, generosity, corruption, and the sense of freedom. Finally, some of the variables are derived from the same respondents as the life evaluations, and hence possibly determined by common factors. This risk is less using national averages, because individual differences in personality and many life circumstances tend to average out at the national level.

The seventh and final segment is the sum of two components. The first is a fixed baseline number representing our calculation of the ladder score for Dystopia (=2.33). The second component is the average 2013-2015 residual for each country. The sum of these two components comprises the right-hand sub-bar for each country; it varies from one country to the next because some countries have life evaluations above their predicted values, and others lower. The residual simply represents that part of the national average ladder score that is not explained by our model; with the residual included, the sum of all the sub-bars adds up to the actual average life evaluations on which the rankings are based.

What do the latest data show for the 2013-2015 country rankings? Two main facts carry over from the previous editions of the *World Happiness Report*. First, there is a lot of year-to-year consistency in the way people rate their lives in different countries. Thus there remains a four-point gap between the 10 top-ranked and the 10 bottom-ranked countries. The top 10 countries in Figure 2.2 are the same countries that were top-ranked in *World Happiness Report 2015*, although there has been some swapping of places, as is to be expected among countries so closely grouped in average scores. Denmark, for example, was ranked first in *World Happiness Report 2013*, third in *World Happiness Report 2015*, and now first again in *World Happiness Report 2016 Update*. In Figure 2.2, the average ladder score differs only by 0.24 points between the top country and the 10th country. The 10 countries with the lowest average life evaluations are largely the same countries as in the 2015 ranking (identical in the case of the bottom 6). Compared to the top 10 countries in the current

Figure 2.2: Ranking of Happiness 2013-2015 (Part 1)

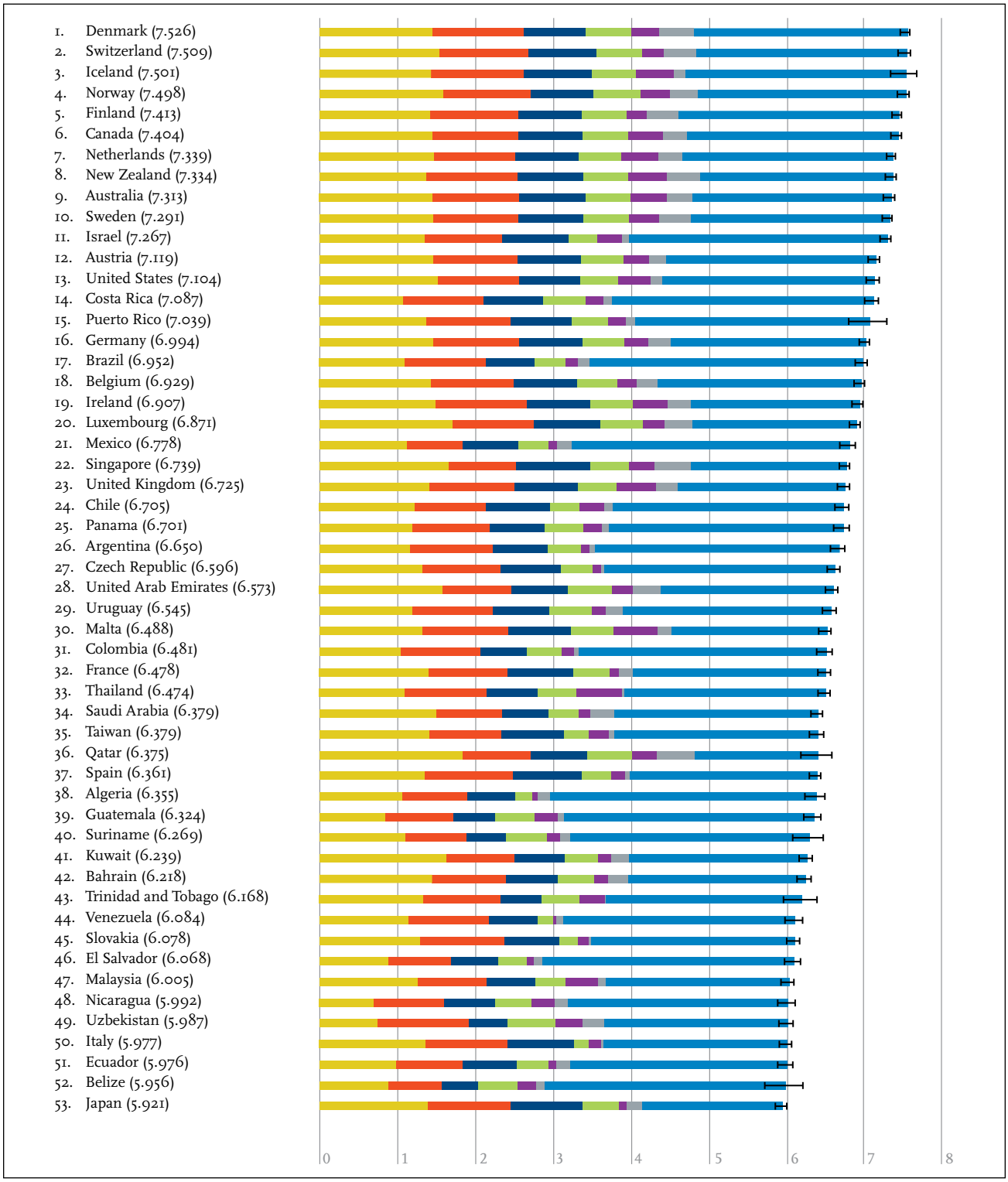


Figure 2.2: Ranking of Happiness 2013-2015 (Part 2)

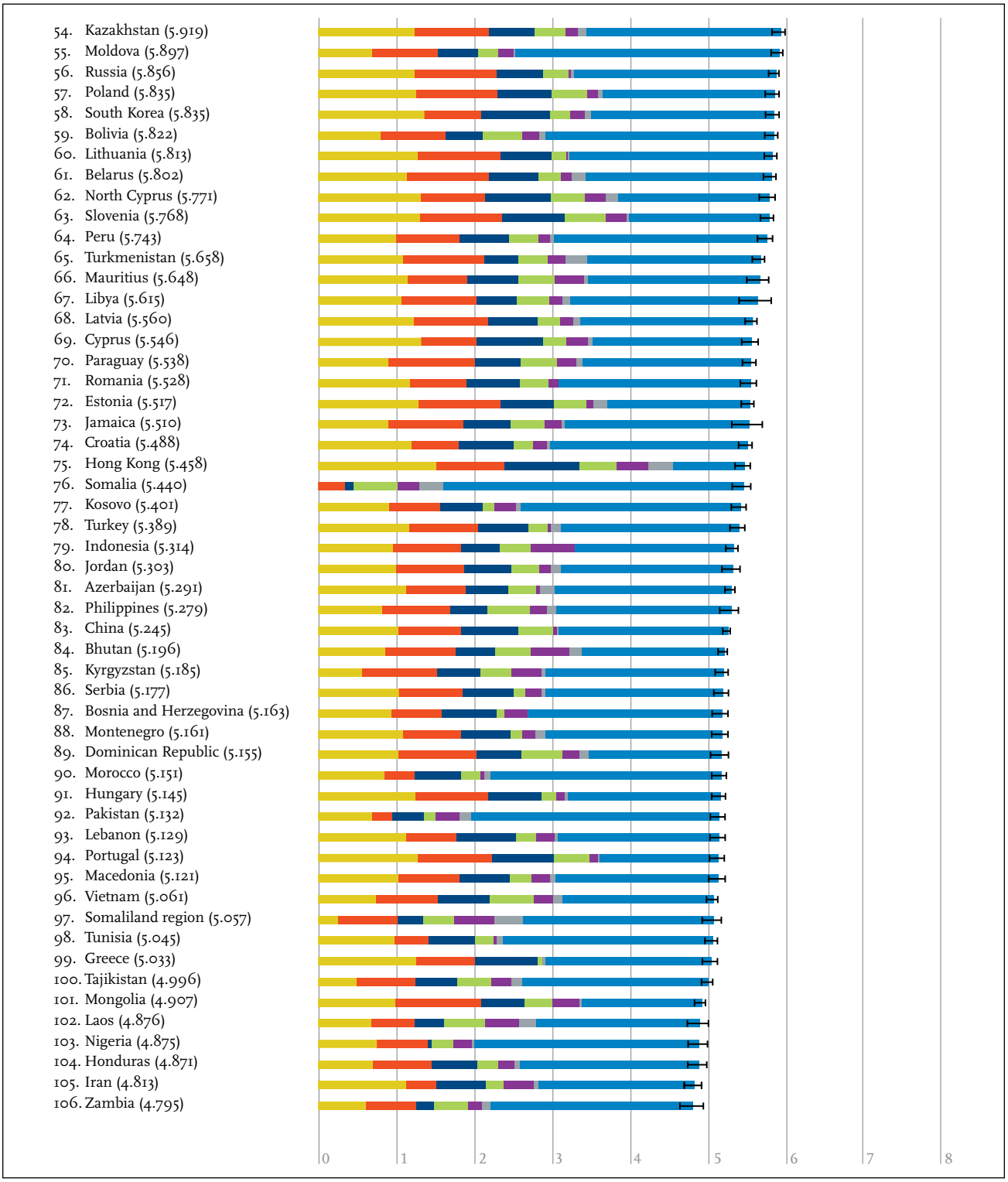
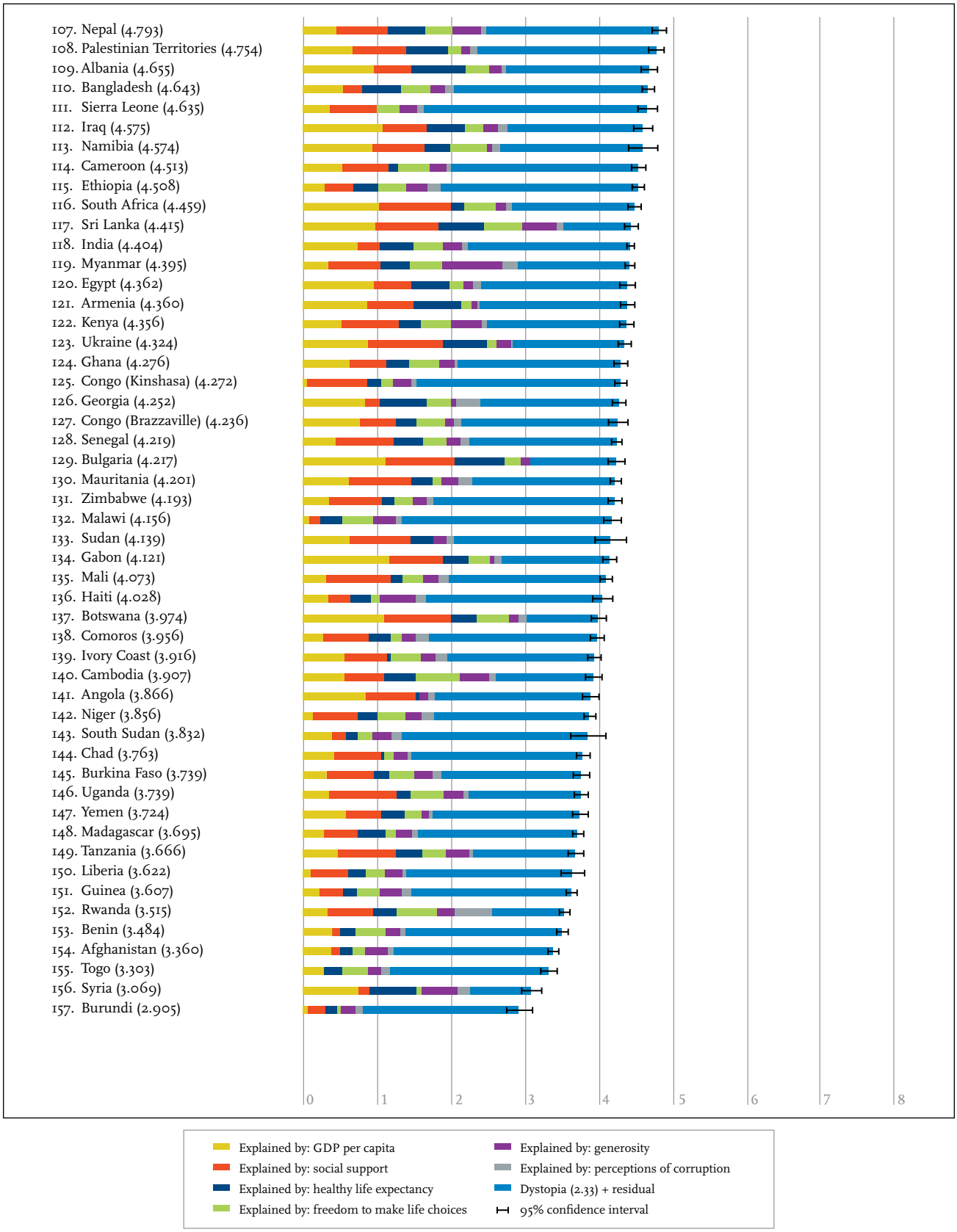


Figure 2.2: Ranking of Happiness 2013-2015 (Part 3)



Technical Box 3: Changes in Gallup World Poll research methods

As part of Gallup's effort to continue to improve its research methods and global coverage, there have been changes to the World Poll's methods over time that may have an impact on the happiness data.

In 2013, Gallup changed from face-to-face interviewing to telephone surveying (both cell phone and landline) in Malaysia, the United Arab Emirates, Saudi Arabia, Qatar, Kuwait, Bahrain, and Iraq. In addition, Gallup added interviews in English as a language of interview in addition to Arabic in the United Arab Emirates, Saudi Arabia, Qatar, Kuwait and Bahrain in an effort to reach the large, non-Arab expatriate population. Due to the three-year rolling average, this is the first report to no longer include face-to-face data from those countries. In addition, Gallup switched from face-to-face interviewing to telephone interviewing in Turkey in 2014. Caution should be used when comparing these data across time periods.

The United Arab Emirates was especially affected by the changes in survey methods, in part because of its newly sampled non-Emirati population. This has caused its ranking to drop for technical reasons unrelated to life in the UAE. Where the expatriate population is very large, it comes to dominate the overall averages based on the total resident population. The UAE provides a good example case, as it has the largest population share of expatriates among the Gallup countries, and has sample sizes large enough to make a meaningful comparison. Splitting the UAE sample into two groups would give a 2013-2015 Emirati ladder average of 7.06 (ranking 15th in Figure 2.2), and a non-Emirati average 6.48 (ranking 31st), very close to the overall average of 6.57 (ranking 28th.)

ranking, there is a much bigger range of scores covered by the bottom 10 countries. Within this group, average scores differ by as much as 0.8 points, or 24 percent of the average national score in the group. Second, despite this general consistency and stability, many countries have had, as we shall show later in more detail, substantial changes in average scores, and hence in country rankings, between 2005-2007 and 2013-2015.

When looking at the average ladder scores, it is important to note also the horizontal whisker lines at the right hand end of the main bar for each country. These lines denote the 95 percent confidence regions for the estimates, and countries with overlapping errors bars have scores that do not significantly differ from each other. Thus it can be seen that the four top-ranked countries (Denmark, Switzerland, Iceland, and Norway) have overlapping confidence regions, and all have national average ladder scores of 7.5 or slightly above. The next five countries (Finland, Canada, Netherlands, New Zealand and Australia) all have overlapping confidence regions and average ladder scores between 7.3 and 7.4, while the next two (Sweden and Israel) have almost identical averages just below 7.3.

The 10 countries with the lowest ladder scores 2013-2015 all have averages below 3.7. They span a range more than twice as large as do the 10 top countries, with the two lowest countries having averages of 3.1 or lower. Eight of the 10 are in sub-Saharan Africa, while the remaining two are war-torn countries in other regions (Syria in the Middle East and Afghanistan in South Asia).

Average life evaluations in the top 10 countries are more than twice as high as in the bottom 10, 7.4 compared to 3.4. If we use the first equation of Table 2.1 to look for possible reasons for these

very different life evaluations, it suggests that of the 4 point difference, 3 points can be traced to differences in the six key factors: 1.13 points from the GDP per capita gap, 0.8 due to differences in social support, 0.5 to differences in healthy life expectancy, 0.3 to differences in freedom, 0.2 to differences in corruption, and 0.13 to differences in generosity. Income differences are more than one-third of the total explanation because, of the six factors, income is the most unequally distributed among countries. GDP per capita is 25 times higher in the top 10 than in the bottom 10 countries.[32]

Overall, the model explains quite well the life evaluation differences within as well as between regions and for the world as a whole.[33] However, on average the countries of Latin America have average life evaluations that are higher (by about 0.6 on the 10 point scale) than predicted by the model. This difference has been found in earlier work, and variously been considered to represent systematic personality differences, some unique features of family and social life in Latin countries, or some other cultural differences.[34] In partial contrast, the countries of East Asia have average life evaluations below those predicted by the model, a finding that has been thought to reflect, at least in part, cultural differences in response style. It is also possible that both differences are in substantial measure due to the existence of important excluded features of life that are more prevalent in those countries than elsewhere.[35] It is reassuring that our findings about the relative importance of the six factors are generally unaffected by whether or not we make explicit allowance for these regional differences.[36]

Changes in the Levels of Happiness

In this section we consider how life evaluations have changed. For life evaluations, we consider the changes from 2005-2007, before the onset of the global recession, to 2013-2015, the most recent three-year period for which data from the Gallup World Poll are available. We present first the changes in average life evaluations.

In Figure 2.3 we show the changes in happiness levels for all 126 countries having sufficient numbers of observations for both 2005-2007 and 2013-2015.[37]

Of the 126 countries with data for 2005-2007 and 2013-2015, 55 had significant increases, ranging from 0.13 to 1.29 points on the 0 to 10 scale, while 45 showed significant decreases, ranging from -0.12 to -1.29 points, with the remaining 26 countries showing no significant change. Among the 20 top gainers, all of which showed average ladder scores increasing by 0.50 or more, eight are in the Commonwealth of Independent States and Eastern Europe, seven in Latin America, two in sub-Saharan Africa, Thailand and China in Asia, and Macedonia in Western Europe. Among the 20 largest losers, all of which showed ladder reductions of 0.44 or more, five were in the Middle East and North Africa, five were in sub-Saharan Africa, four were in Western Europe, three in Latin America and the Caribbean, two in Asia and one in the Commonwealth of Independent States.

These gains and losses are very large, especially for the 10 most affected gainers and losers. For each of the 10 top gainers, the average life evaluation gains exceeded those that would be expected from a doubling of per capita incomes. For each of the 10 countries with the biggest drops in average life evaluations, the losses were more than would be expected from a halving of GDP per capita. Thus the changes are far more than would be expected from income losses or gains flowing from macroeconomic changes, even in the wake of an economic crisis as large as that following 2007.

On the gaining side of the ledger, the inclusion of four Latin American countries among the top 10 gainers is emblematic of broader Latin American experience. The analysis in Figure

Figure 2.3: Changes in Happiness from 2005-2007 to 2013-2015 (Part 1)

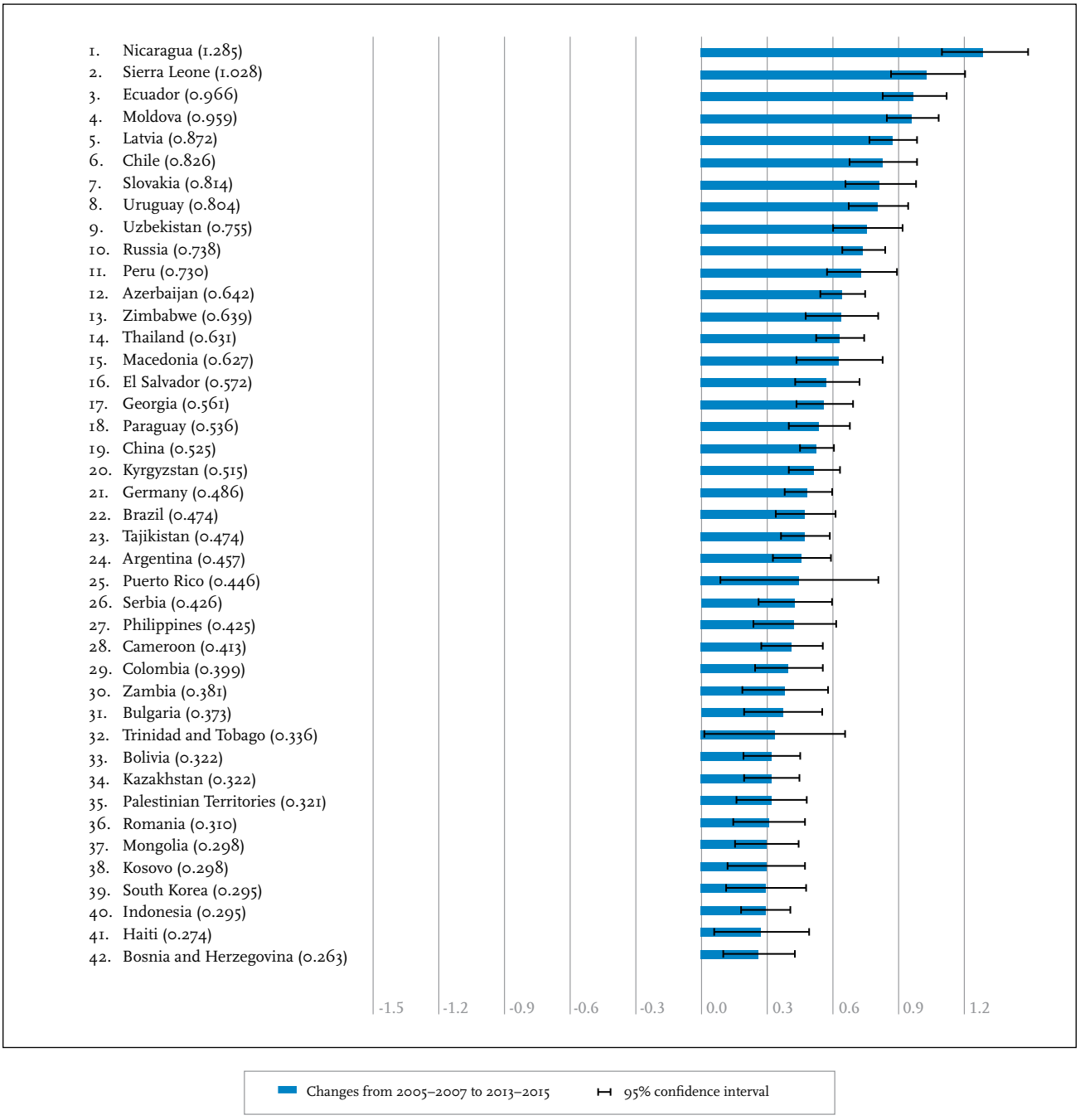


Figure 2.3: Changes in Happiness from 2005-2007 to 2013-2015 (Part 2)

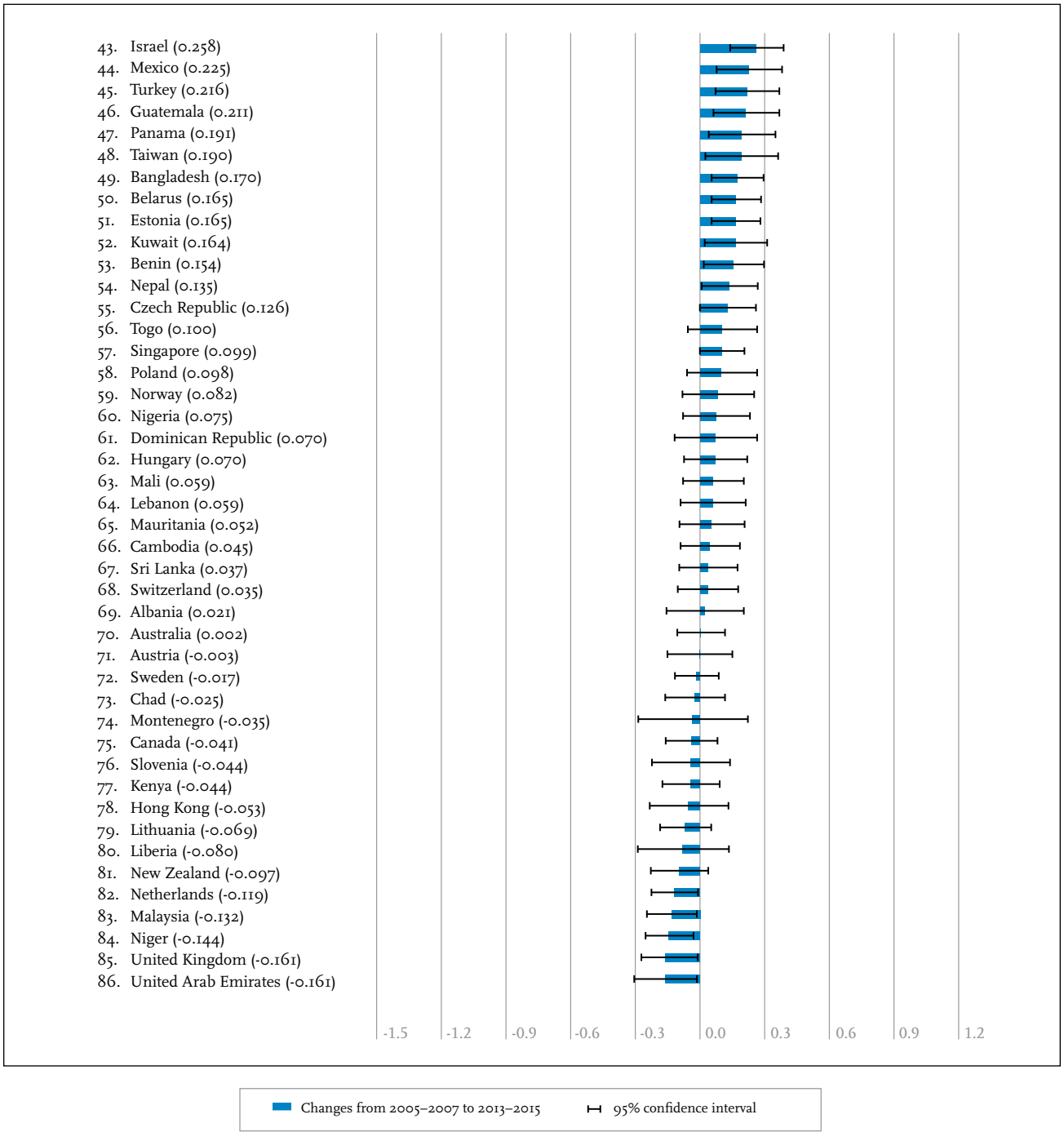
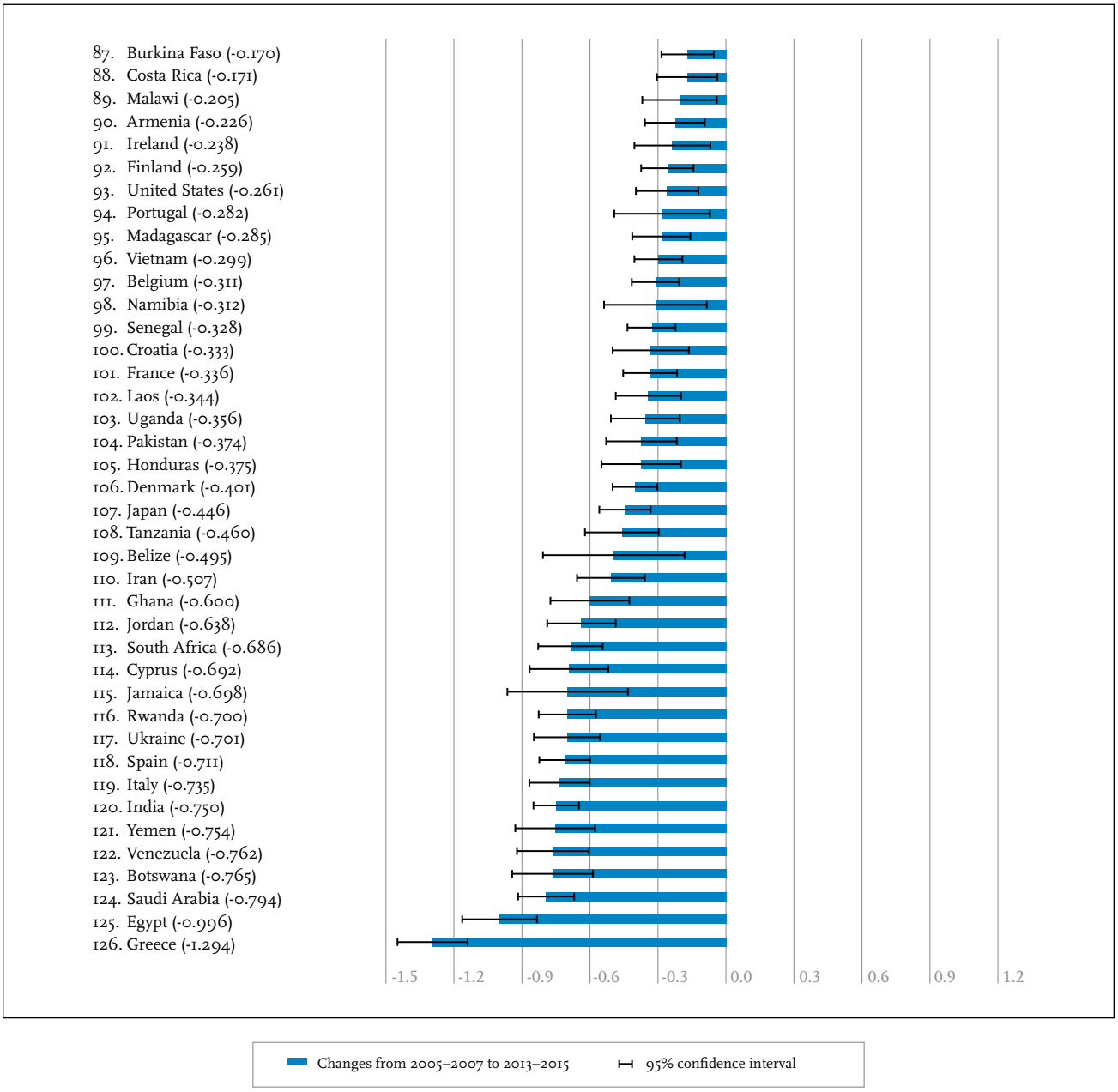


Figure 2.3: Changes in Happiness from 2005-2007 to 2013-2015 (Part 3)



3.10 of Chapter 3 of *World Happiness Report 2015* showed that Latin Americans in all age groups reported substantial and continuing increases in life evaluations between 2007 and 2013. Five transition countries are also among the top 10 gainers, matching the rising average life evaluations for the transition countries taken as a group. The appearance of sub-Saharan African countries among the biggest gainers and the biggest losers reflects the variety and volatility of experiences among the 25 sub-Saharan countries for which changes are shown in Figure 2.3.

The 10 countries with the largest declines in average life evaluations typically suffered some combination of economic, political and social stresses. Three of the countries (Greece, Italy and Spain) were among the four hard-hit eurozone countries whose post-crisis experience was analyzed in detail in *World Happiness Report 2013*. A series of recent annual declines has now pushed Ukraine into the group of 10 largest happiness declines, joining India, Venezuela, Saudi Arabia, two North African countries, Egypt and Yemen, and Botswana.

Looking at the list as a whole, and not just at the largest gainers and losers, what were the circumstances and policies that enabled some countries to navigate the recession, in terms of happiness, better than others? The argument was made in *World Happiness Report 2013* and *World Happiness Report* 2015 that the strength of the underlying social fabric, as represented by levels of trust and institutional quality, affects a society's resilience in response to economic and social crises. We gave Greece, which remains the biggest happiness loser in Figure 2.3 (improved from *World Happiness Report 2015*, but still almost 1.3 points down from 2005-2007 to 2013-2015), special attention, because the well-being losses were so much greater than could be explained directly by economic outcomes. The report provided evidence of an interaction between social capital and economic or other crises, with the crisis providing a test of the quality of the underlying social fabric.[38] If the fabric is sufficiently strong, then the crisis may even lead to higher subjective well-being, in part by giving people a chance to work together towards good purpose, and to realize and appreciate the strength of their mutual social support; and in part because the crisis will be better handled and the underlying social capital improved in use.

For this argument to be convincing requires examples on both sides of the ledger. It is one thing to show cases where the happiness losses were very big and where the erosion of the social fabric appeared to be a part of the story. But what examples are there on the other side? With respect to the post-2007 economic crisis, the best examples of happiness maintenance in the face of large external shocks are Ireland and especially Iceland. Both suffered decimation of their banking systems as extreme as anywhere, and yet have suffered incommensurately small happiness losses. In the Icelandic case, the post-shock recovery in life evaluations has been great enough to put Iceland third in the global rankings for 2013-2015. That there is a continuing high degree of social support in both countries is indicated by the fact that of all the countries surveyed by the Gallup World Poll, the percentage of people who report that they have someone to count on in times of crisis is exceptionally high in Iceland and Ireland.[39]

If the social context is important for happiness-supporting resilience under crisis, it is likely to be equally applicable for non-economic crises. There is now research showing that levels of trust and social capital in the Fukushima region of Japan were sufficient that the Great East Japan Earthquake of 2011 actually led to increased trust and happiness in the region.[40] The happiness effects of crisis response may also be mediated through generosity triggered by a large natural disaster, with the additional generosity adding to happiness.[41]

What can be learned by using the six-variable explanation of Table 2.1 to explain happiness

changes between 2005-2007 and 2013-2015 in countries and global regions? We have performed this exercise on a population-weighted basis to compare actual and predicted regional changes in happiness, and find that the equation provides a significant part of the story, while leaving lots of remaining puzzles. As shown in Table 31 of the Statistical Appendix, the model does best in explaining the average increase of 0.4 points in the Commonwealth of Independent States, and the average decreases of 0.23 points in Western Europe and North America & ANZ countries. For the Commonwealth of Independent States, the gains arise from improvements in all six variables. For Western Europe, meanwhile, expected gains from improvements in healthy life expectancy and corruption combined with no GDP growth and declines in the other three variables to explain more than half of the actual change of 0.23 points. The largest regional drop (-0.6 points) was in South Asia, in which India has by far the largest population share, and is unexplained by the model, which shows an expected gain based on improvements in five of the six variables, offset by a drop in social support.

The same framework can be used to try to explain the changes for the two groups of 10 countries, the biggest gainers and the biggest losers. For the group of 10 countries with the largest gains, on average they had increases in all six variables, to give an expected gain of 0.29 points, compared to the actual average increase of 0.9 points.[42] For the group of 10 countries with the largest drops, GDP per capita was on average flat, expected gains in healthy life expectancy (which are driven by long term trends not responsive to current life circumstances) were offset by worsening in each of the four social variables, with the biggest predicted drops coming from lower social support and losses in perceived freedom to make life choices. Of the average loss equal to 0.8 points, 0.17 was predicted by the partially offsetting effects from changes in the six variables.

The *World Happiness Report 2015* also considered evidence that good governance has enabled countries to sustain or improve happiness during the economic crisis. Results presented there suggested not just that people are more satisfied with their lives in countries with better governance, but also that actual changes in governance quality since 2005 have led to significant changes in the quality of life.[43] For this report we have updated that analysis using an extended version of the model that includes country fixed effects, and hence tries to explain the changes going on from year to year in each country. Our new results, as shown in Table 11 of the Statistical Appendix, show GDP per capita and changes in governmental quality to have both contributed significantly to changes in life evaluations over the 2005 to 2015 period.

Inequality and Happiness

The basic argument in this section is that inequality is best measured by looking at the distribution of life evaluations across those with very low, medium and high evaluations. If it is true, as we have argued before, that subjective well-being provides a broader and more inclusive measure of the quality of life than does income, then so should the inequality of subjective well-being provide a more inclusive and meaningful measure of the distribution of well-being among individuals within a society.

However, although there has been increasing and welcome attention in recent years to questions of distribution and inequality, that attention has been almost entirely focused on the nature and consequences of economic equality, especially the distribution of income and wealth. The United Nations,[44] the World Bank,[45] and the OECD[46] have produced reports recently on the risks of rising economic inequality, and several prominent researchers have published recent books.[47] All have concentrated on the sources and consequences of economic inequality, principally relating to the distribution of

income and wealth. There have also been studies of inequality of health care and outcomes[48], access to education, and equality of opportunity[49] more generally.

Much has and can be learned from these studies of inequality in different aspects of life. But would it not be helpful to have a measure of distribution that has some capacity to bring the different facets of inequality together, and to assess their joint consequences? Just as we have argued that subjective well-being provides a broader and more appropriate measure of human progress, so does the distribution of happiness provide a parallel and better measure of the consequences of any inequalities in the distribution of key variables, e.g. incomes, health, education, freedom and justice, that underpin the levels and distribution of human happiness.

In the middle of the 20th Century, Simon Kuznets surveyed data from economic history over the preceding decades to expose a pattern whereby economic inequality would increase in the early stages of industrialization, principally driven by the transfer of some workers from lower-paid rural to higher paid urban industrial jobs.[50] He hypothesized that when this transfer was largely accomplished, attention would turn, as it did in many industrial countries in the middle decades of the 20th century, to the design of social safety nets, and more widely available health care and education, intended to spread the benefits of economic growth more evenly among the population. Thus the so-called Kuznets curve, with economic inequality at first growing and then declining as economic growth proceeds. Among the industrial countries of the OECD, that pattern was largely in evidence for the first three-quarters of the 20th Century. But then, for reasons that are varied and still much debated,[51] the inequality of incomes and wealth has grown significantly in most of these same countries. The OECD estimates that during the period from the mid-1980s to 2013, income inequality grew significantly in 17 of 22 countries studied, with only one country showing a significant decrease.[52]

For the majority of the world's population living outside the OECD countries, economic growth and industrialization has happened much later. This might suggest, if the Kuznets analysis were still to hold, that income inequality would have kept growing for longer before turning around. This appears to have been the case, with the United Nations reporting that for most countries in the world income inequality rose from 1980 to 2000 and then fell between then and 2010.[53] World Bank data for subsequent changes in within-nation income inequality are still rather patchy, and show a mixed picture from which it is too early to construct a meaningful average.[54]

What are the consequences of inequality for subjective well-being? There are arguments both ethical and empirical suggesting that humans are or at least ought to be happier to live where there is more equality of opportunities and generally of outcomes as well. Beyond such direct links between inequality and subjective well-being, income inequalities have been argued to be responsible for damage to other key supports for well-being, including social trust, safety, good governance, and both the average quality of and equal access to health and education, - important, in turn, as supports for future generations to have more equal opportunities. Others have paid more direct attention to inequalities in the distribution of various non-income supports to well-being, without arguing that these inequalities were driven by income inequality.

If we are right to argue that broadening the policy focus from GDP to happiness should also entail broader measures of inequality, and if it is true that people are happier living in more equal societies, then we should expect to find that well-being inequality is a better predictor of average well-being levels than is the inequality of income. Comparative evidence on the relative information content of different measures of inequality is relatively scarce. For international comparison of the prevalence of poverty, an important channel though which inequality

affects well-being, it has been argued that people's own subjective assessments of the quality of their lives, including access to food and other essential supports, should supplement and may even be preferable to the construction of poverty estimates based on the comparison of money incomes.[55]

Thus the broader availability and possibly more relevant measurement of well-being inequalities should help them to perform better as factors explaining life evaluations. There is, however, only a short span of historical data available for such comparisons. One recent study, based on data from the World Values Survey and panel data from several industrial countries, reported evidence of a 'great moderation' in the inequality of well-being, with downward trends evident in most countries.[56] That was argued to represent a favorable outcome, on the assumption that most people would prefer more equality. The data we shall present later on recent trends in well-being inequality suggest a less sanguine view. Countries with significantly greater inequality of life evaluations in the 2012-2015 period, compared to the 2005-2011 base period, are five times more numerous than countries with downward trends.

A companion research paper[57] compares income inequality (as measured by the Gini coefficient) with well-being inequality (measured by the standard deviation of the distribution of life evaluations), as predictors of life evaluations, making use of three international surveys and one large domestic US survey. In each case well-being inequality is estimated to have a stronger negative impact of life evaluations than does the inequality of income. To buttress this evidence, which is subject to the possibilities of measurement bias arising from the limited number of response categories, two ancillary tests were run. First, it was confirmed that the estimated effects of well-being inequality are greater for those individuals who said they wish to see inequalities reduced.[58] A second test made use of the established indirect linkage running from inequality to reduced social trust, with subsequent implications for well-being. If well-being inequality is a better umbrella measure of inequality than income inequality, then it might also be expected to be a better predictor of social trust. This is an especially appropriate test since the inequality of income has been a long-established explanation for international differences in social trust,[59] and several forms of trust have been found to provide strong support for subjective well-being.[60] In all three international surveys, trust was better predicted by a country's inequality of life evaluations than by its inequality of incomes.[61] These auxiliary tests provide assurance that there are likely to be real effects running, both directly and indirectly, from well-being inequality to the level of well-being.

We have also tested the inequality of life evaluations and the inequality of income in the context of the equation of Table 2.1, and find a significant negative effect running from the inequality of well-being to average life evaluations.[62] The effects from income inequality are mixed, depending on which measure is used.[63] The strongest equations come from using the inequality of life evaluations along with the inequality of incomes varying each year based on the income data provided by the respondents to the Gallup World Poll. Both inequality measures are associated with lower average life evaluations.[64]

Having presented evidence that the inequality of well-being deserves more attention, we turn now to consider first the levels and then changes in the standard deviation of life evaluations.[65] For the levels, Figure 2.4 shows population-weighted regional estimates, and Figure 2.5 the national estimates for each country's standard deviations of ladder answers based on all available surveys from 2012-2015. In part because we combine data from four years, to increase the sample size, we are able to identify significant inter-country differences.[66] The standard deviations are negatively correlated with the average

ladder estimates,[67] and we have already shown that they contribute significantly in explaining average happiness, above and beyond what is captured by the six main variables in Table 2.1. There is a positive correlation between income inequality and well-being inequality in our data, but we would naturally expect well-being inequality to be explained also by the inequalities in the distribution of all the other supports for better lives and it would be nice to be able to see if well-being inequality could itself be explained. Unfortunately most of the other supports for well-being are not yet measured in a way that can show the inequality of their distribution among members of a society.[68]

Figure 2.4 shows that two regions – the Middle East & North Africa, and Latin America & Caribbean – have significantly more inequality of life assessments within their regions than is true for the world population as a whole. All of the other regions have significantly less inequality, with the three most equal regions, in order, being Western Europe, Southeast Asia, and East Asia. The fact that well-being inequality is greater for the world as a whole than in most global regions is another reflection of the fact that regions, like the countries within them, tend to have life circumstances that are more similar within the country or region than they are to conditions elsewhere in the world.

Figure 2.5 shows that the country rankings for equality of well-being are, like the regional rankings, quite different from those of average life evaluations. Bhutan, which ranks of the middle of the global distribution of average life evaluations, has the top ranking for equality. From an inequality average below 1.5 in Bhutan, Comoros and the Netherlands, the standard deviations rise up to values above 3.0 in the three most unequal countries, South Sudan, Sierra Leone and Liberia. The least unequal countries, as measured the standard deviation of life evaluations, contain a mix of countries from various parts of the happiness rankings shown in Figure 2.2. Of the 20 most equal countries, seven also appear in the top 20 countries in terms of average happiness. Of the 20 least equal, none except for Puerto Rico are among the top twenty in happiness, and most are in the bottom half of the world distribution, except for a few countries in Latin America and the Caribbean, where life evaluations and inequality are both higher than average.

Figure 2.4: Ranking of Standard Deviation of Happiness 2012-2015, by Region

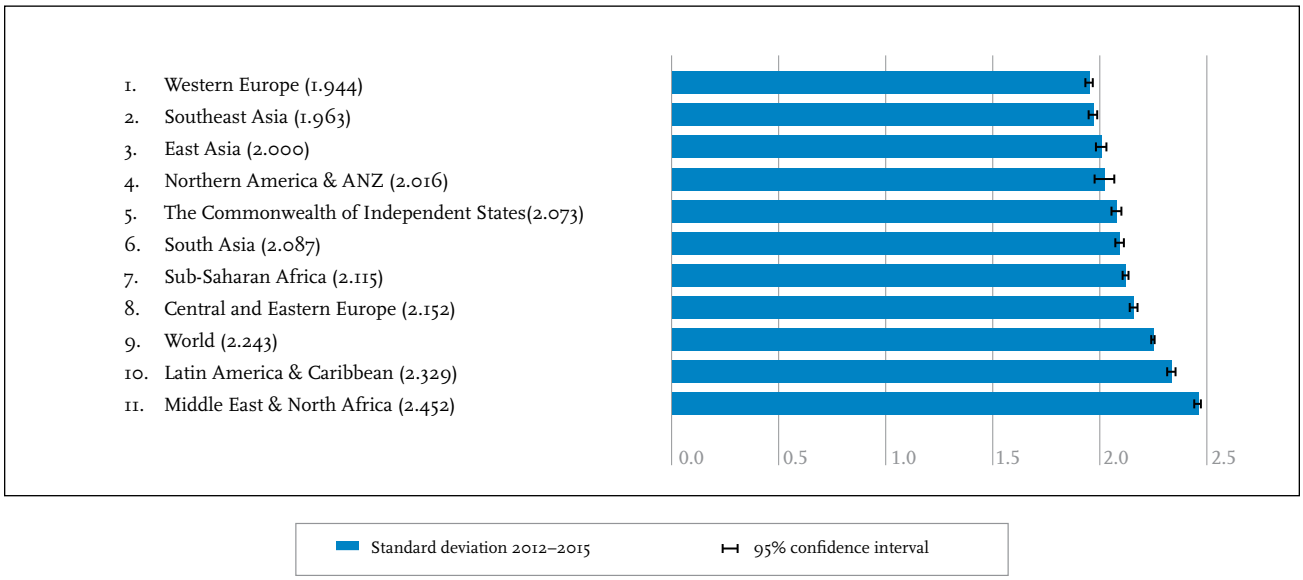


Figure 2.5: Ranking of Standard Deviation of Happiness by Country 2012-2015 (Part 1)

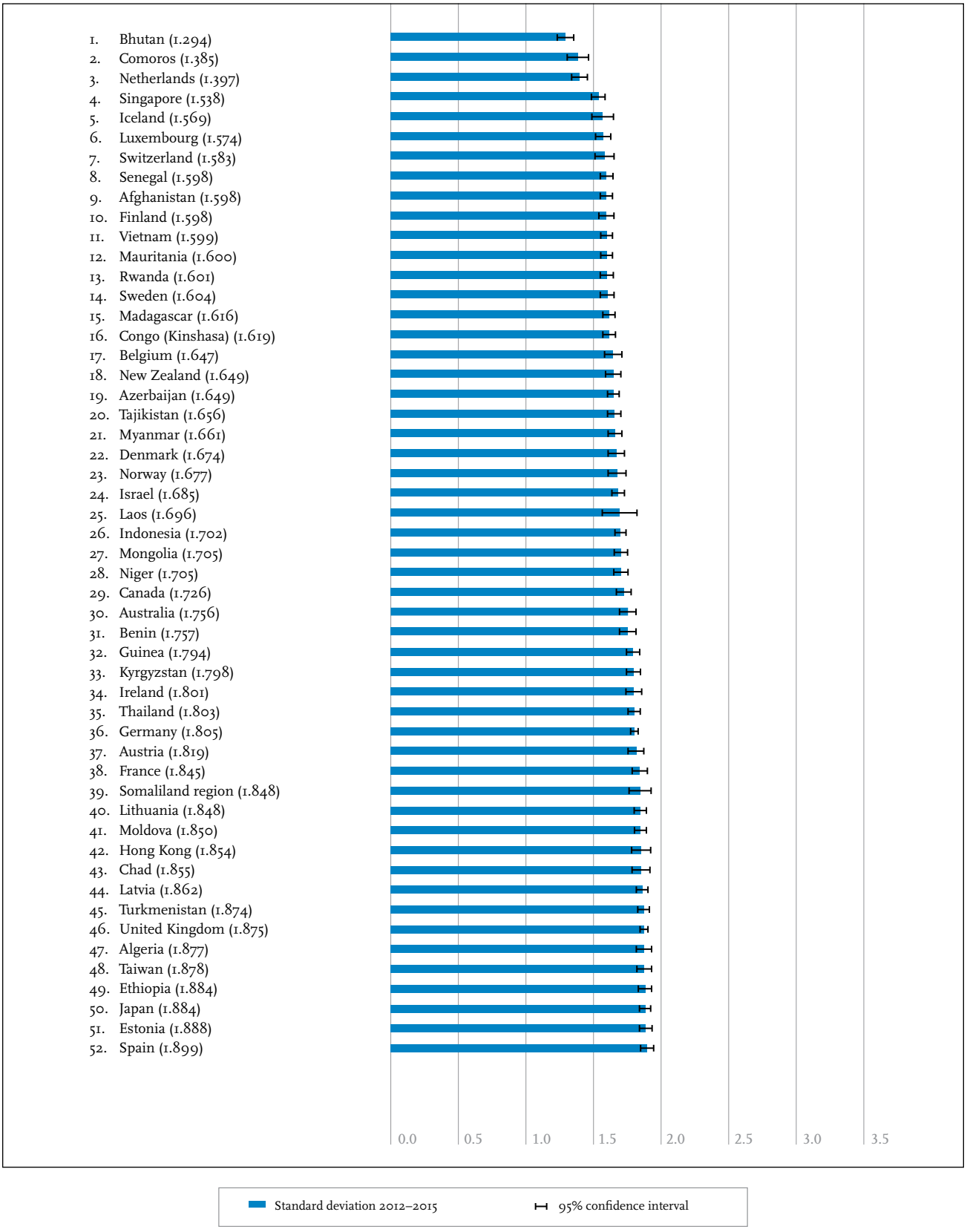


Figure 2.5: Ranking of Standard Deviation of Happiness by Country 2012-2015 (Part 2)

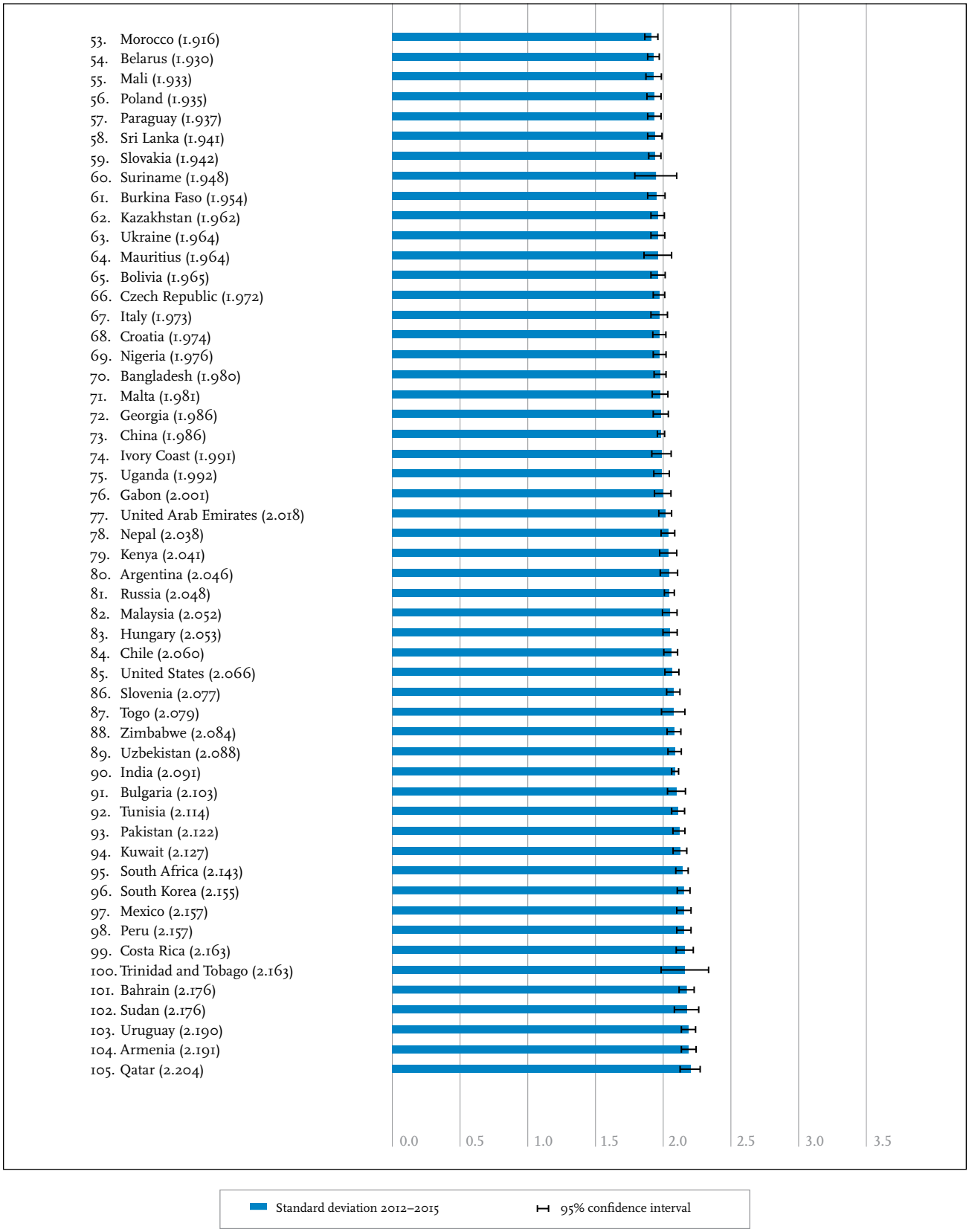
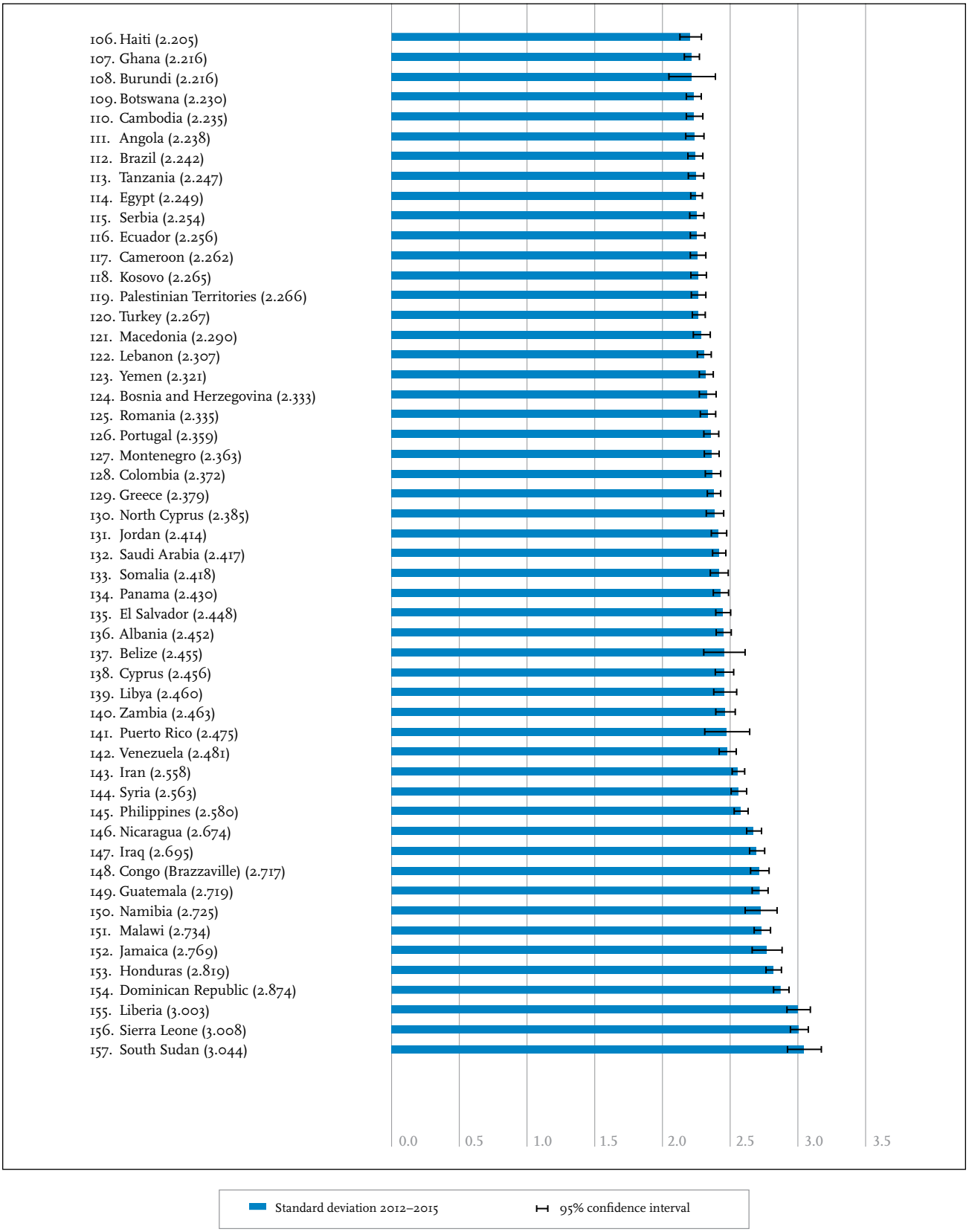


Figure 2.5: Ranking of Standard Deviation of Happiness by Country 2012-2015 (Part 3)



To measure changes in the distribution of happiness, we compare the standard deviation of life evaluations using all of the Gallup World Poll data from 2005 to 2011 (the period covered by our assessment of the inequality of subjective well-being in the first *World Happiness Report*) to the average for the four subsequent survey years, 2012 to 2015.[69] This is done for the world as a whole and 10 global regions in Figure 2.6, and for individual countries in Figure 2.7. In both figures we order the regions and countries by the size of the change in inequality from 2005-2011 to 2012-2015, starting at the top with the regions and countries where inequality has fallen the most or increased the least.

For the world as a whole, our population-weighted estimates show inequality of well-being growing significantly from 2005-2011 to 2012-2015, by an amount equaling about 5 percent of the estimated 2005-2011 standard deviation. The Latin American and Caribbean region shows an insignificantly small reduction in inequality, and Central and Eastern Europe an insignificantly small increase. All of the other regions show significant increases in well-being inequality. The two regions with the sharpest increases in inequality are the Middle East and North Africa and sub-Saharan Africa. The biggest relative increase in well-being inequality was in sub-Saharan Africa, where it grew by 15 percent of its 2005-2011 level. The corresponding increase was 13 percent in the Middle East & North Africa.

Looking at the national-level inequality-change data for the 149 countries with sufficient data to make the calculations, about a tenth had significant reductions in happiness inequality, while more than half had significant increases. The remaining one-third of countries showed no significant change. It is perhaps noteworthy that Iceland, the country showing the second largest reduction in inequality, was a country that was facing a deep banking crisis in 2008, but had managed to accept the consequences and rebuild average happiness by 2012-2013, when the second round of surveys was taken.[70] Iceland was noted earlier to have a very high fraction of the population having someone they could count on in times of trouble; the build-up and aftermath of the banking crisis put the Icelandic social fabric to a serious test. The subsequent recovery of average happiness suggests that the test was passed. It is perhaps significant that the happiness

Figure 2.6: Changes in Population-Weighted Standard Deviation of Happiness from 2005-2011 to 2012-2015, for the World and 10 Regions

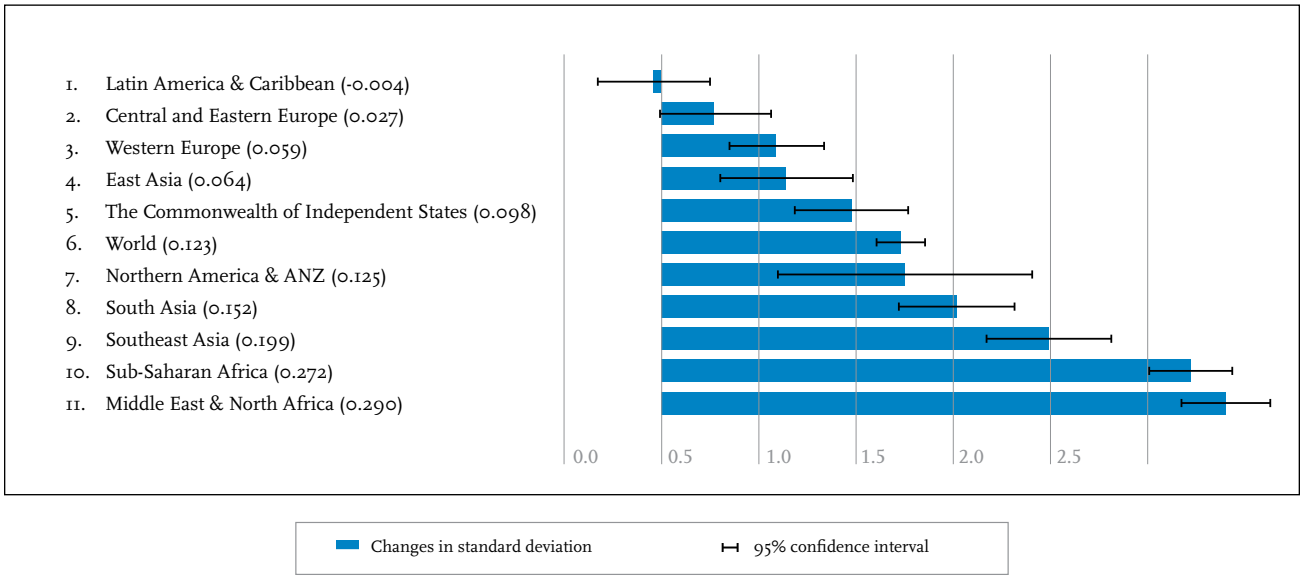


Figure 2.7: Changes in Standard Deviation of Happiness from 2005-2011 to 2012-2015 (Part 1)

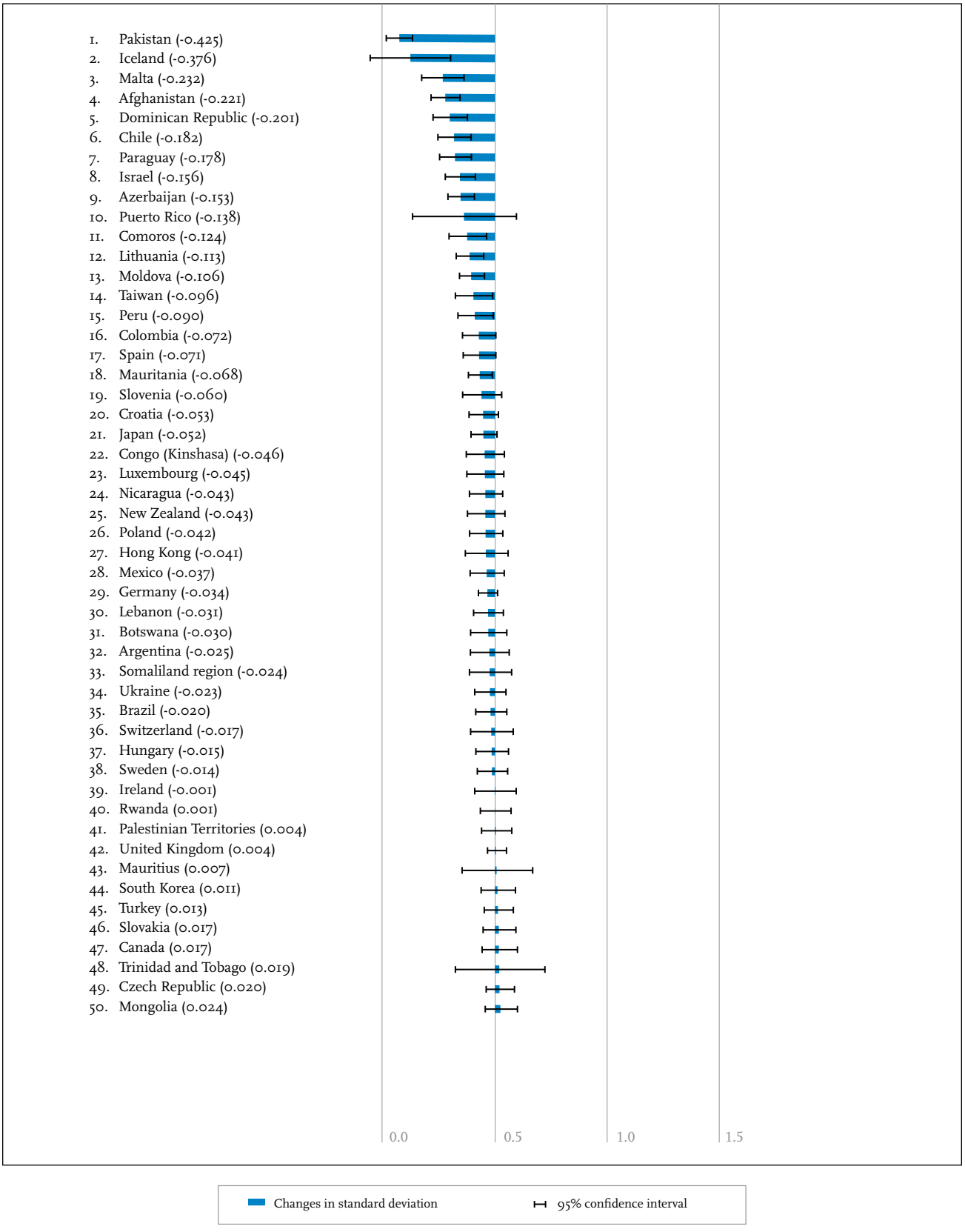


Figure 2.7: Changes in Standard Deviation of Happiness from 2005-2011 to 2012-2015 (Part 2)

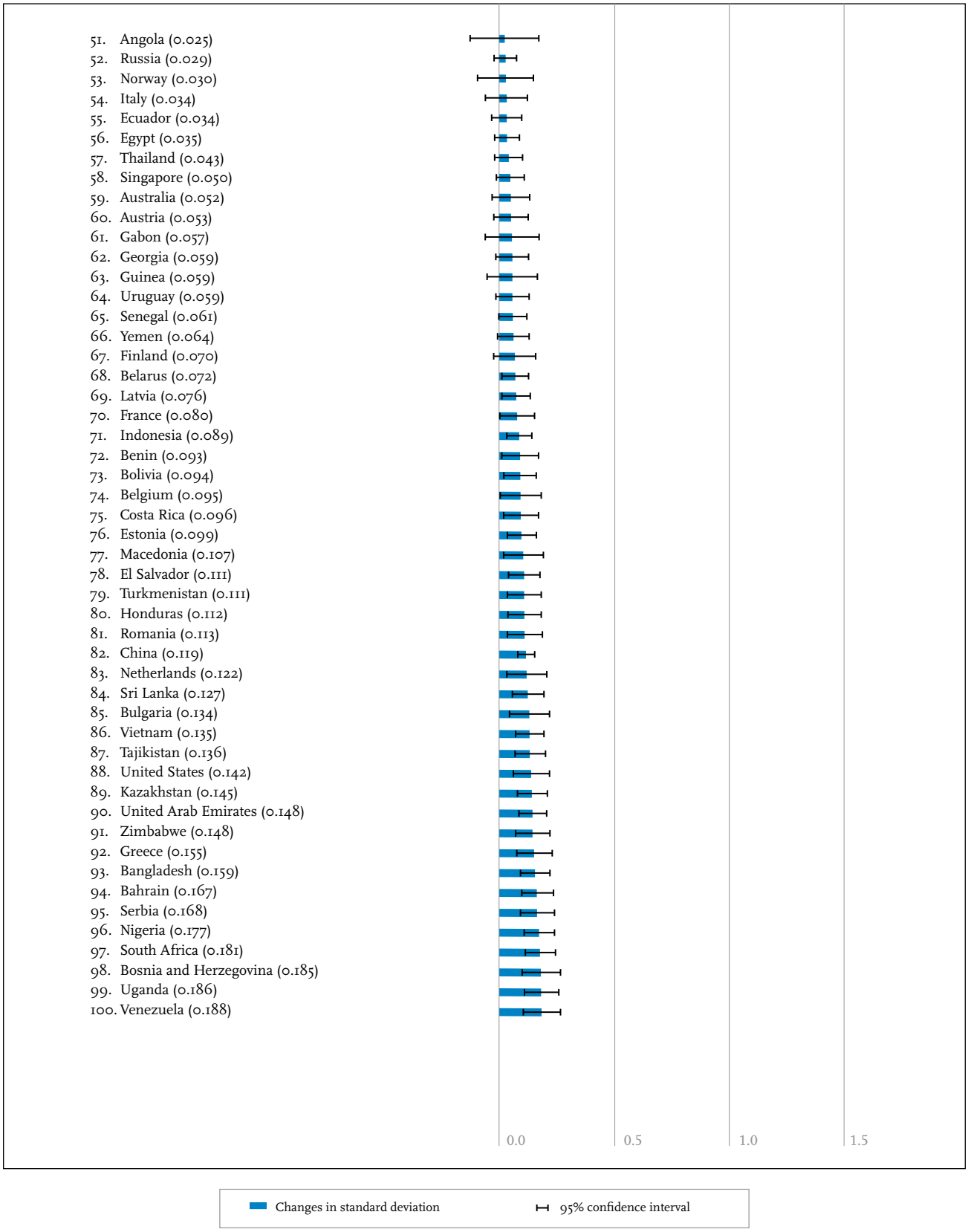
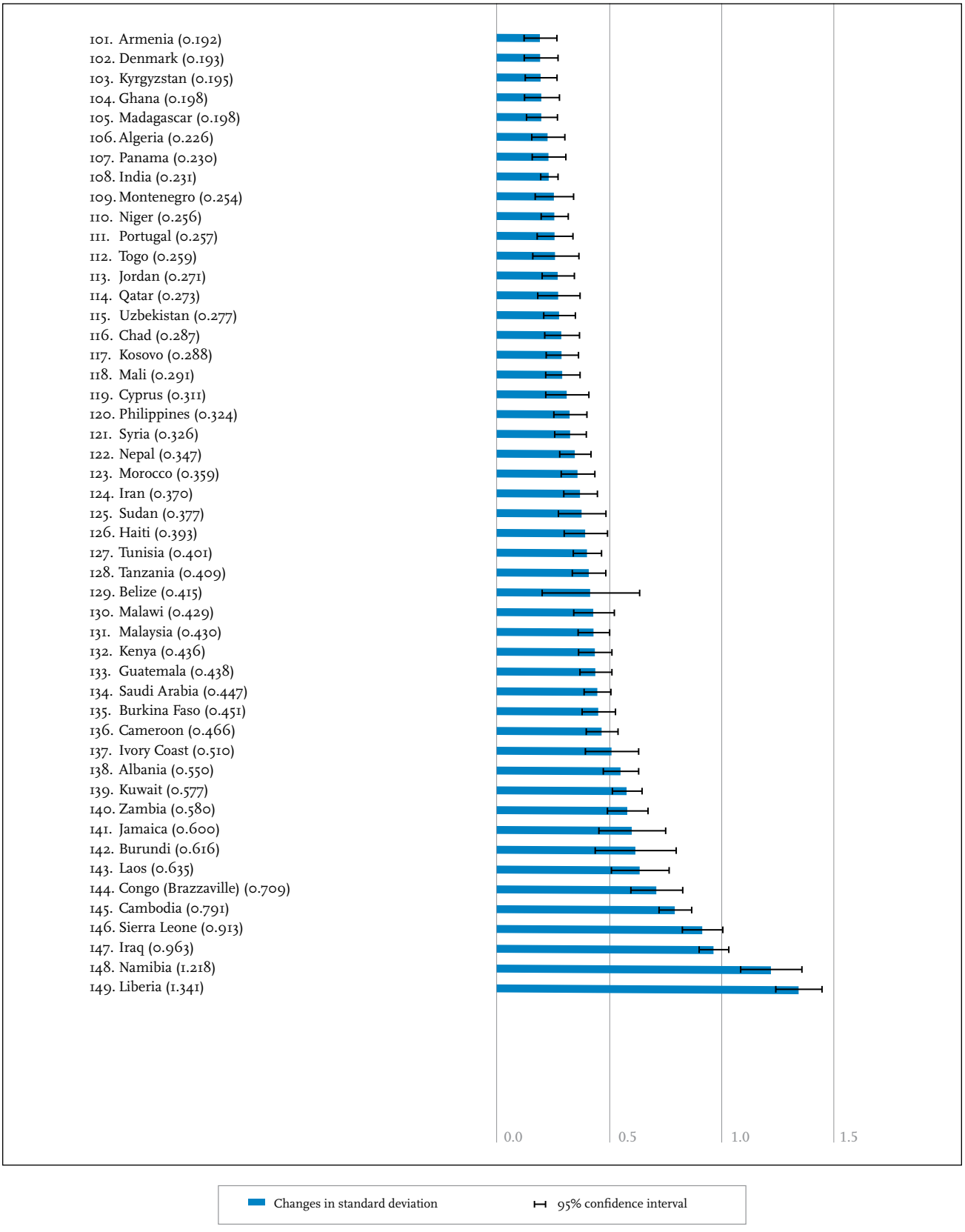


Figure 2.7: Changes in Standard Deviation of Happiness from 2005-2011 to 2012-2015 (Part 3)



inequality created in part by the banking boom and bust was erased in the subsequent recovery of well-being, suggesting a high degree of social resilience in Iceland.

The 10 countries with the largest increases in well-being inequality have all been undergoing significant political, social and economic difficulties. To what extent these inequality increases can be explained by changes in the underlying inequalities of income, social supports, health, generosity, corruption, freedom cannot be estimated on the basis of data currently available. This is because many of the key variables are not yet measured using scales with sufficient numbers of categories to permit measures of their inequality to be computed. Thus there remains much to be learned. It is perhaps enough, at this stage, to have made the case for taking well-being inequality seriously, and to have provided evidence on its levels and trends in nations, regions, and the world.

Summary and Conclusions

In presenting and explaining the national-level data in this chapter, we make primary use of people's own reports of the quality of their lives, as measured on a scale with 10 representing the best possible life and 0 the worst. We average their reports for the years 2013 to 2015, providing a typical national sample size of 3,000. We then rank these data for 157 countries, as shown in Figure 2.2. The 10 top countries are once again all small or medium-sized western industrial countries, of which seven are in Western Europe. Beyond the first ten, the geography immediately becomes more varied, with the second 10 including countries from four of the 10 global regions.

In the top 10 countries, life evaluations average 7.4 on the 0 to 10 scale, while for the bottom 10 the average is less than half that, at 3.4. The lowest countries are typically marked by low values on all of the six variables used here to explain international differences – GDP per capita, healthy life expectancy, social support, freedom, generosity and absence of corruption – and often subject in addition to violence and disease. Of the 4-point gap between the 10 top and 10 bottom countries, more than three-quarters is accounted for by differences in the six variables, with GDP per capita, social support and healthy life expectancy the largest contributors.

When we turn to consider life evaluation changes for 126 countries between 2005-2007 and 2013-2015, we see lots of evidence of movement, including 55 significant gainers and 45 significant losers. Gainers especially outnumber losers in Latin America, the Commonwealth of Independent States and Central and Eastern Europe. Losers outnumber gainers in Western Europe and to a lesser extent in sub-Saharan Africa, Middle East and North Africa. Changes in the six key variables explain a significant proportion of these changes, although the magnitude and natures of the crises facing nations since 2005 have been such as to move some countries into poorly charted waters. We continue to see evidence that major crises have the potential to alter life evaluations in quite different ways according to the quality of the social and institutional infrastructure. In particular, as shown in *World Happiness Report 2013* and *World Happiness Report 2015*, there is evidence that a crisis imposed on a weak institutional structure can actually further damage the quality of the supporting social fabric if the crisis triggers blame and strife rather than co-operation and repair. On the other hand, economic crises and natural disasters can, if the underlying institutions are of sufficient quality, lead to improvements rather than damage to the social fabric.[71] These improvements not only ensure better responses to the crisis, but also have substantial additional happiness returns, since people place real value to feeling that they belong to a caring and effective community.

With respect to the inequality of well-being, as measured by the standard deviation of life

evaluations within each country, we find that it varies among countries quite differently from average happiness, and from the inequality of income. We have argued that just as subjective well-being provides a broader and more inclusive measure of the quality of life than does income, then so should the inequality of subjective well-being provide a more inclusive and meaningful measure of the distribution of well-being among individuals within a society. We then measured changes since the 2005-2011 averages reported in the first *World Happiness Report*. We find, in contrast to some earlier evidence of global convergence in happiness equality, that from the first to the second half of our data there has been increased inequality of happiness within most countries, almost all regions, and for the world as a whole. Only one-tenth of countries showed a significant reduction in happiness inequality, while more than half showed a significant increase. The world as a whole and 8 of 10 global regions showed significant increases in well-being inequality from 2005-2011 to 2012-2015. We also found evidence that greater inequality of well-being contributes to lower average well-being.

Discussions about the inequality of income and wealth, and what to do about them, typically include reference to the transfer of resources from richer to poorer to achieve greater equality. Increasing the equality of happiness does not in general require transfer, since building happiness for some does not require reduction in the happiness of others. Indeed, one of the side benefits of broadening the focus of policy attention from income and wealth to subjective well-being is that there are many more options for improving average happiness, and increasing equality by improving the lot of those at the bottom, without others being worse off.

Targeting the non-material sources of well-being, which is encouraged by considering a broader measure of well-being, opens possibilities for increasing happiness while simultaneously reducing stress on scarce material resources. Much more research is needed to fully understand the interplay of factors that determine the inequality of well-being, but there is every hope that simply changing the focus from income inequality to well-being inequality will speed the arrival of a time when the distribution of well-being can be improved, for the benefit of current and future generations in all countries.

1 Diener, Lucas, & Oishi (2016) estimate the number of new scientific articles on subjective well-being to have grown by about two orders of magnitude in the past 25 years, from about 130 per year in 1980 to almost 15,000 in 2014.

2 See OECD (2013).

3 As foreshadowed by an OECD case study in the first WHR, and more fully explained in the OECD Chapter in WHR 2013. See Durand & Smith (2013).

4 See Ryff & Singer (2008). The first use of a question about life meaning or purpose in a large-scale international survey was in the Gallup World Poll waves of 2006 and 2007. It was also introduced in the third round of the European Social Survey (Huppert et al. 2009). It has since become one of the four key well-being questions asked by the UK Office for National Statistics (Hicks, Tinkler, & Allin, 2013).

5 Stiglitz, Sen, & Fitoussi (2009, p. 216).

6 OECD (2013, p. 164).

7 The latest OECD list of reporting countries is available as an online annex to this report. See http://worldhappiness.report/wp-content/uploads/sites/2/2015/04/Updated-slide-use-and-implementation.pptx

8 See Helliwell, Layard, & Sachs (2015, Chapter 2, p.14-16). That chapter of *World Happiness Report 2015* also explained, on pp. 18-20, why we prefer direct measures of subjective well-being to various indexes of well-being.

9 The Gallup Organization kindly agreed to include the life satisfaction question in 2007 to enable this scientific issue to be addressed. Unfortunately, it has not yet been possible, because of limited space, to establish satisfaction with life as a core question in the continuing surveys.

10 See Table 10.1 of Helliwell, Barrington-Leigh, Harris, & Huang (2010, p. 298).

11 See Table 1.2 of Diener, Helliwell, & Kahneman (2010), which shows at the national level GDP per capita correlates more closely with WVS life satisfaction answers than with happiness answers. See also Figure 17.2 of Helliwell & Putnam (2005, p. 446), which compares partial income responses within individual-level equations for WVS life satisfaction and happiness answers. One difficulty with these comparisons, both of which do show bigger income effects for life satisfaction than for happiness, lies in the different response scales. This provides one reason for differing results. The second, and likely more important, reason is that the WVS happiness question lies somewhere in the middle ground between an emotional and an evaluative query. Table 1.3 of Diener et al. (2010) shows a higher correlation between income and the ladder than between income and life satisfaction using Gallup World Poll data, but this is shown, by Table 10.1 of Helliwell et al. (2010), to be because of using non-matched sets of respondents.

12 See, for an example using individual-level data, Kahneman & Deaton (2010), and for national-average data Table 2.1 of Helliwell, Huang, & Wang (2015, p. 22) or Table 2.1 of this chapter.

13 Barrington-Leigh (2013) documents a significant upward trend in life satisfaction in Québec, compared to the rest of Canada, of a size accumulating over 25 years to an amount equivalent to more than a trebling of mean household income.

14 See Lucas (2007) and Yap, Anusic, & Lucas (2012).

15 See Lucas et al. (2003) and Clark & Georgellis (2013).

16 See Yap et al. (2012) and Grover & Helliwell (2014).

17 See International Organization for Migration (2013, chapter 3) and Frank, Hou, & Schellenberg (2015).

18 See Stone, Schneider, & Harter (2012) and Helliwell & Wang (2015). The presence of day-of-week effects for mood reports is also shown in Ryan, Bernstein, & Brown (2010).

19 See Stone et al. (2012), Helliwell & Wang (2014) and Bonikowska, Helliwell, Hou, & Schellenberg (2013).

20 Table 2.1 of this chapter shows that a set of six variables descriptive of life circumstances explains 74 percent of the variations over time and across countries of national average life evaluations, compared to 50 percent for a measure of positive emotions and 21 percent for negative emotions.

21 Using a global sample of roughly 650,000 individual responses, a set of individual-level measures of the same six life circumstances (using a question about health problems to replace healthy life expectancy) explains 19.5 percent of the variations in life evaluations, compared to 7.4 percent for positive affect, and 4.6 percent for negative affect.

22 As shown in Table 2.1 of the first *World Happiness Report*. See Helliwell, Layard, & Sachs (2012, p. 16).

23 For these comparisons to be meaningful, it should be the case that life evaluations relate to life circumstances in roughly the same ways in diverse cultures. This important issue was discussed some length in *World Happiness Report 2015*. The burden of the evidence presented was that the data are internationally comparable in structure despite some identified cultural differences, especially in the case of Latin America. Subsequent research by Exton, Smith, & Vandendriessche (2015) confirms this conclusion.

24 Gallup weights sum up to the number of respondents from each country. To produce weights adjusted for population size in each country for the period of 2012-2015, we first adjust the Gallup weights so that each country has the same weight (one-country-one-vote) in the period. Next we multiply total population aged 15+ in each country in 2013 by the one-country-one-vote weight.

We also produce the population weights for the period of 2005-2011, following the same process, but using total population in 2008 for this period. Total population aged 15+ is equal to the proportion of population aged 15+ (=one minus the proportion of population aged 0-14) multiplied by the total population. To simplify the analysis, we use population in 2008 for the period of 2005-11 and population in 2013 for the period of 2012-2015 for all the countries/regions. Data are mainly taken from WDI (2015). Specifically, the total population and the proportion of population aged 0-14 are taken from the series "Population ages 0-14 (percent of total)" and "Population, total" respectively from WDI (2015). There are a few regions which do not have data in WDI (2015), such as Nagorno-Karabakh, Northern Cyprus, Somaliland, and Taiwan. In this case, other sources of data are used if available. The population in Taiwan is 23,037, 031 in 2008 and 23, 373, 517 in 2013, and the aged 15+ is 19,131,828 in 2008 and 20,026,916 in 2013 respectively (Statistical Yearbook of the Republic Of China 2014). The total population in 2013 in Northern Cyprus is 301,988 according to *Economic and Social Indicators 2014* published by State Planning Organization of Northern Cyprus in December 2015 (p. 3). The ratio of population 0-14 is not available in 2013, so we use the one in 2011, 18.4 percent, calculated based on the data in 2011 Population Census, reported in *Statistical Yearbook 2011* by State Planning Organization of Northern Cyprus in April 2015 (p. 13). There are no reliable data on population and age structure in Nagorno-Karabakh and Somaliland region, therefore these two regions are not included in the calculation of world or regional distributions.

25 The statistical appendix contains alternative forms without year effects (Appendix Table 9), and a repeat version of the Table 2.1 equation showing the estimated year effects (Appendix Table 8). These results confirm, as we would hope, that inclusion of the year effects makes no significant difference to any of the coefficients.

26 As shown by the comparative analysis in Table 7 of the Statistical Appendix.

27 The definitions of the variables are shown in the notes to Table 2.1, with additional detail in the online data appendix.

28 This influence may be direct, as many have found, e.g. De Neve, Diener, Tay, & Xuereb (2013). It may also embody the idea, as made explicit in Fredrickson's broaden-and-build theory (Fredrickson, 2001), that good moods help to induce the sorts of positive connections that eventually provide the basis for better life circumstances.

29 We put the contributions of the six factors as the first elements in the overall country bars because this makes it easier to see that the length of the overall bar depends only on the average answers given to the life evaluation question. In *World Happiness Report 2013* we adopted a different ordering, putting the combined Dystopia+residual elements on the left of each bar to make it easier to compare the sizes of residuals across countries. To make that comparison equally possible in *World Happiness Report 2015* and *World Happiness Report 2016 Update*, we include the alternative form of the figure in the on-line statistical appendix (Appendix Figures 1-3) .

30 These calculations are shown in detail in Table 13 of the on-line Statistical Appendix.

31 The prevalence of these feedbacks was documented in Chapter 4 of *World Happiness Report 2013,* De Neve et al. (2013).

32 The data and calculations are shown in detail in Table 14 of the Statistical Appendix. Annual per capita incomes average $44,000 in the top 10 countries, compared to $1,600 in the bottom 10, measured in international dollars at purchasing power parity. For comparison, 94 percent of respondents have someone to count on in the top 10 countries, compared to 60 percent in the bottom 10. Healthy life expectancy is 71.6 years in the top 10, compared to 53 years in the bottom 10. 93 percent of the top 10 respondents think they have sufficient freedom to make key life choices, compared to 63 percent in the bottom 10. Average perceptions of corruption are 36 percent in the top 10, compared to 74 percent in the bottom 10.

33 Actual and predicted national and regional average 2013-2015 life evaluations are plotted in Figure 4 of the on-line Statistical Appendix. The 45 degree line in each part of the Figure shows a situation where the actual and predicted values are equal. A predominance of country dots below the 45 degree line shows a region where actual values are below those predicted by the model, and vice versa.

34 Mariano Rojas has correctly noted, in partial exception to our earlier conclusion about the structural equivalence of the Cantril ladder and satisfaction with life, that if our figure could be drawn using satisfaction with life rather than the ladder it would show an even larger Latin American premium (based on data from 2007, the only year when the GWP asked both questions of the same respondents). It is also true that looking across all countries, satisfaction with life is on average higher than the Cantril ladder scores, by an amount that is higher at higher levels of life evaluations.

35 For example, see Chen, Lee, & Stevenson (1995).

36 One slight exception is that the negative effect of corruption is estimated to be slightly, larger, although not significantly so, if we include a separate regional effect variable for Latin America. This is because corruption is worse than average in Latin America, and the inclusion of a special Latin American variable thereby permits the corruption coefficient to take a higher value. We also find that the separate regional variable for Latin America also sharply and significantly increases the estimated negative well-being impact of the standard deviation of life evaluations.

37 There are thus, as shown in Table 15 of the Statistical Appendix, 31 countries that are in the 2013-2015 ladder rankings of Figure 2.2 but without changes shown in Figure 2.3. These countries for which changes are missing include some of the 10 lowest ranking countries in Figure 2.2. Several of these countries might well have been shown among the 10 major losers had their earlier data been available.

38 See Helliwell, Huang, & Wang (2014).

39 In the 2013-15 GWP surveys, Iceland and Ireland are ranked first and fifth, respectively, in terms of social support, with over 95 percent of respondents having someone to count on, compared to an international average of 80 percent.

40 See Yamamura, Tsutsui, Yamane, Yamane, & Powdthavee (2015) and Uchida, Takahashi, & Kawahara (2014).

41 See Ren & Ye (2016) for an assessment of the happiness effects of the increased generosity following the 2008 Wenchuan earthquake.

42 As shown in Tables 19-20 of the Statistical Appendix, these results are based on treating each country equally when assembling the averages.

43 Those results were drawn from Helliwell, Huang, Grover, & Wang (2014).

44 See United Nations (2013).

45 The World Bank (2014) has emphasized the measurement and eradication of extreme poverty.

46 See Keeley (2015) for a survey of recent OECD data and research on inequality.

47 See Atkinson (2015), Atkinson & Bourguignon (2014), Deaton (2013), Piketty (2014), Stiglitz (2013, 2015), and Wilkinson and Pickett (2009). For an earlier review from a sociological perspective, see Neckerman & Torche (2007).

48 See, e.g. Marmot, Ryff, Bumpass, Shipley, & Marks (1997).

49 See Roemer & Trannoy (2013) for a theoretical survey, and Putnam (2015) for data documenting declining equality of opportunity in the United States. For a survey of research on intergenerational mobility, see Corak (2013).

50 See Kuznets (1955).

51 For a review of the arguments and evidence, see Keeley (2015).

52 See OECD (2015), p. 34.

53 See United Nations (2013, Figure 2.1). If the national Gini coefficients are weighted by national population, the global measure has been declining continuously, mainly through the impact of China. Still using population weights, but excluding China, the global average peaked in 2010 (just as did the unweighted average) and fell more rapidly than the unweighted average to a level that was nonetheless slightly higher in 2010 than it was in 1980.

54 See the World Bank data portal http://data.worldbank.org/indicator/SI.POV.GINI?order=wbapi_data_value_2010+wbapi_data_value+wbapi_data_value-last&sort=asc&page=1.

55 This is because it is almost impossible to compare price levels when there is very little overlap in the products consumed to sustain standards of living in different countries. See Deaton (2010).

56 See Clark, Flèche, & Senik (2014).

57 See Goff, Helliwell, & Mayraz (2016).

58 This proposition was first advanced and tested by Alesina, Di Tella, & MacCulloch (2004) to explain why income inequality was estimated by them to have a greater impact on subjective well-being in Europe than in the United States.

59 See Rothstein & Uslaner (2005).

60 See Helliwell & Wang (2011).

61 See Goff et al. (2016), Table 6.

62 The negative effect of well-being inequality becomes significant only when regional dummy variables are also included, as also found by Goff et al. (2016). That paper includes income and regional dummy variables for all regions, but none of the other variables used in Table 2.1. We find that the only necessary regional variable is for Latin America, which has inexplicably high life evaluations (i.e. most countries have actual ladder values above those predicted by the equation of Table 2.1) and also unusually high inequality of subjective well-being. The coefficient on well-being inequality rises if the variables for freedom and social support are removed, showing that these are in part the likely routes via which well-being inequality reduces well-being. If the Latin American countries are compared with each other, people are nonetheless happier in those countries with more equal distributions of well-being, consistent with earlier findings by Graham & Felton (2006).

63 We test two different measures of income inequality in our Table 2.1 equation. The first is from the World Bank, the same source used by Goff et al. (2016), and it shows for us, as it generally did for them, no significant negative effect, whether or not the inequality of well-being is also included in the equation. The second measure, as described in the Statistical Appendix, is based on Gini coefficients constructed from the incomes reported by individual respondents to the Gallup World Poll. That variable attracts a significant negative coefficient whether or not subjective well-being inequality is included, and it is stronger than the subjective well-being inequality when the two measures are both included, as shown in Table 10 of the Statistical Appendix.

64 See Table 10 of the Statistical Appendix.

65 We use the standard deviation as our preferred measure of well-being inequality, following Kalmijn & Veenhoven (2005) and Goff et al (2016). See also Delhey & Kohler (2011) and Veenhoven (2012). Since we are anxious to avoid mechanical negative correlation between average well-being and our measure of inequality, the standard deviation is a more conservative choice than the coefficient of variation, which is the standard deviation divided by the mean, and the Gini, which mimics the coefficient of variation very closely.

66 The 95 percent confidence intervals for standard deviations and changes in standard deviations are all estimated by bootstrapping methods (1,000 times).

67 The cross-sectional correlation between the average ladder for 2013-2015 and the standard deviations of within-country ladder scores is -0.25.

68 If the Gallup World Poll questions relating to corruption, freedom and social support had been asked on a 0 to 10 scale, rather than as either 0 or 1, we might have been able to see if the inequality of life evaluations was based on some combination of the inequalities of the main supporting variables.

69 Figure 2.4 in the first *World Happiness Report* shows the 2005-2011 values for the standard deviations of the ladder data in each country. Table 2.8 in *World Happiness Report 2013* shows changes in the income Ginis by global region.

70 Note also the wide standard error bars for the Icelandic changes, reflecting the relative infrequency and sometimes half-size of the survey samples there. Even with these smaller samples, the change shown in Figure 2.7 for Iceland is significantly positive.

71 See Dussaillant & Guzmán (2014). In the wake of the 2010 earthquake in Chile, there was looting in some places and not in others, depending on initial trust levels. Trust subsequently grew in those areas where helping prevailed instead of looting.

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