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Subjective wellbeing and income: Empirical patterns in the rural developing world

Short title: Subjective wellbeing and income among the poor

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Subjective wellbeing and income: Empirical patterns in the rural developing world

Abstract

A commonality in the economics of happiness literature is that absolute income matters more for the subjective wellbeing of people at low income levels. In this article, we use a large sample of people in rural areas of developing countries with relatively low income levels to test whether subjective wellbeing is an increasing function of absolute income in our sample, and to analyze the existence of adaptation and social comparison effects on subjective wellbeing. Our sample includes 6973 rural households in 23 countries throughout Asia, Africa, and Latin America. The average total income per adult equivalent in our sample was US\$1555, whereas levels of subjective wellbeing resembled levels found in previous research using cross-country data. We find that, despite low levels of absolute income, levels of subjective wellbeing of our respondents resemble levels found in previous research using cross-country data. We also find remarkable similarities in many of the determinants of subjective wellbeing previously tested. Our data show that absolute income covariates with subjective wellbeing, but -as for richer samples- the magnitude of the association is lower once we control for adaptation and social comparison. Finally, our results suggest that social comparison has a stronger effect than adaptation in explaining the subjective wellbeing of our sample. Our findings highlight the importance of adaptation and social comparison even at low levels of absolute income.

Key words: Basic needs; Happiness; Life satisfaction; Poverty and Environment
Network (PEN); Quality of Life

Subjective wellbeing and income: Empirical patterns in the rural developing world

Introduction

Findings from more than four decades of research have identified multiple correlates of happiness or subjective wellbeing, defined as ‘a person’s cognitive and affective evaluations of his or her life’ (Diener, Oishi, & Lucas, 2002, p. 63)¹. Researchers agree that both personal characteristics (age, family experience, income, or health) and external factors (work satisfaction, governance, values or religion) are related to subjective wellbeing (Helliwell et al. 2012; Easterlin 2003; Myers and Diener 1995; Myers 1993; Easterlin et al. 2010), but they continue to debate the causal links (Lyubomirsky et al. 2005; Clark et al. 2008). A key topic in this literature is the relation between income and happiness: to what extent can money buy happiness?

Research addressing the relation between subjective wellbeing and happiness has flourished especially after Richard A. Easterlin stated in his seminal article (Easterlin 1974, 1995) that, while at any particular time richer individuals are likely happier than poorer ones, over time societies may not become happier as they become richer. This so-called Easterlin paradox has generated a growing body of literature with conflicting evidence. Easterlin and co-authors (2010) continue to accumulate data that corroborate Easterlin’s original findings. Other researchers have proposed a modified version of Easterlin’s hypothesis, suggesting that while income and wellbeing are linked among people at low income levels, there is a threshold –or satiation point- beyond which further income is unrelated to wellbeing (Diener and Seligman 2004; Clark et al. 2008; Di Tella and MacCulloch 2008). Other authors argue that there is no paradox and people and countries do get happier with increasing income. While acknowledging that

¹ Subjective well-being is an umbrella term that includes the various types of evaluation of one's life (self-esteem, joy, fulfillment, etc.). We use the terms happiness, subjective wellbeing, and life satisfaction interchangeably in the text.

1 the relation can be less acute at higher levels of income, they argue that there is no
2 satiation point at which income does not matter more for happiness (Deaton 2008;
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4 Stevenson and Wolfers 2008).
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7 Attempts to explain any association between income and happiness have also
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9 sparked much research. Following Duesenberry (1949), several authors have stressed
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11 income comparisons – to oneself in the past (adaptation) and to others in their relevant
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13 reference group (social comparisons) - to explain how income and subjective wellbeing
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15 might be related. In other words, some authors argue that there is a process of
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17 adaptation: people may adapt to new circumstances, including new income levels. A
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19 change in income level might affect happiness in the short turn, but with time people
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21 tend to go back to their previous happiness levels (Suh et al. 1996; Easterlin 2003;
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23 Diener et al. 2006; Lucas et al. 2003) and more so when experiencing income rises than
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25 income falls (Burchardt 2005). For example, Inglehart and Rabier (1986) find that
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27 happiness is positively correlated with income increases over the past twelve months,
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29 yet unrelated to current income. Similarly, Di Tella and colleagues (2010) suggest that
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31 increasing income loses more than half of its happiness effect after four years,
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33 suggesting that income effects on happiness dissipate with time. A common explanation
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35 for adaptation effects is the so-called “hedonic treadmill”: unknowingly, people display
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37 escalating material aspirations as their income rises, thus capping over time happiness
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39 increments with rising incomes (Easterlin 2003; van den Bergh 2011).
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48 On the other hand, authors have also argued that there is a process of
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50 comparison: individuals want to “keep up with the Joneses,” so they compare their
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52 material positions to that of relevant peers. Hence, an increase in individual income
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54 would only lastingly raise individual wellbeing if the former exceeds that of group
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56 income (Diener et al. 1993; Clark et al. 2008). This could help explain why people may
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1 not seem to get generally happier, or at least not linearly, as their societies get richer.
2 Some findings indeed confirm that, controlling for own income, the income of the
3 reference group is negatively correlated with respondents' life satisfaction (Ferrer-i-
4 Carbonell 2005; Blanchflower and Oswald 2004). Furthermore, when societies growing
5 richer also become more unequal, individuals falling behind may experience relative
6 deprivation that unleashes negative emotions of envy, guilt, anger, or depression, hence
7 decreasing their subjective wellbeing (Subramanian et al. 2005; Wilkinson 1997). Yet,
8 counterexamples do exist where subjective wellbeing proves to rise with reference
9 group incomes due to a marked sense of community and altruism (Knight et al. 2006).
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21 A consensus in the economics of happiness literature is that absolute income
22 grows with diminishing returns (less-than-proportional increases) for subjective
23 wellbeing (Frey and Stutzer 2002; Stevenson and Wolfers 2008), which implies that
24 absolute income should matter more for the subjective wellbeing of people at low
25 income levels (Howell et al. 2006; Camfield et al. 2010; Diener and Biswas-Diener
26 2002; Easterlin 2003). Thus, it has been argued that rises in income help the poor to
27 meet their basic material needs, but as societies grow richer, rising aspirations and
28 relative income gaps are expected to become more important in determining subjective
29 wellbeing than absolute income (Diener and Seligman 2004).
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43 Appealing as it might be, this argument has not been fully confirmed by real
44 world data. A burgeoning amount of work addressing the determinants of subjective
45 wellbeing in developing countries has examined to what extent the subjective wellbeing
46 of the poor is negatively affected by positional concerns. This literature provides
47 divergent results. Thus, against the assumption that relative income should not matter
48 for the poor, several studies show that holding a low relative economic position
49 (measured through relative income and/or relative consumption) negatively affects the
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1 wellbeing of the poor (see for example Guillen-Royo 2011; Knight and Gunatilaka
2 2012; Fafchamps and Shipi 2008; Knight et al. 2009; Fafchamps and Kebede 2008;
3
4 Carlsson et al. 2009). Contrarily, low relative levels of income and consumption do not
5
6 appear to affect subjective wellbeing among low-income samples in rural Ethiopia
7
8 (Akay and Martinsson 2011) and Venezuela (Kuegler 2009). Ravallion and Lokshin
9
10 (2010) find that, in Malawi, subjective wellbeing falls with average neighborhood
11
12 income, but only among upper income households. Furthermore, in South Africa
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14 subjective wellbeing is found to increase with district average income (Kingdon and
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16 Knight 2006).

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These studies are important as they provide detailed information on the dynamics of relative income in several parts of the developing world. However, because each of the studies employs a different methodology and approach, it is difficult to generalize from them. Only two works compare data from two or more countries (Herrera et al. 2006; Graham and Pettinato 2002) again showing contrasting findings. Furthermore, none of the mentioned studies addressing the effects of income on happiness in developing countries provides a systematic analysis of the two mechanisms that seem to mediate this relation in non-rural societies: adaptation and social comparisons.

In this article, we aim to contribute to research on the determinants of subjective wellbeing in developing countries. After testing whether subjective wellbeing an increasing function of absolute income in our sample, we analyze the existence of adaptation and social comparison effects on subjective wellbeing. We test for absolute income, adaptation and social comparison with a single data set which includes a large sample of people in rural areas of developing countries with relatively low income levels. For social comparison we include both an objective and a subjective measure of

1 household's relative position. Our sample includes societies with a myriad of mores,
2 social norms, religious beliefs, and livelihoods likely affecting notions of the relative
3 importance of income and subjective wellbeing (Selin and Davey 2012; Diener et al.
4 2003; Myers 1993), assuring that our findings should be relatively robust.
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10 **Material and methods**

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12 A network of 35 researchers collected individual, household, and village data
13 under the common framework of the Poverty Environment Network (PEN), a project of
14 the Center for International Forestry Research (<http://www.cifor.cgiar.org/pen/>). Data
15 collection occurred during 2005-10 in 23 different countries. Each case study included
16 fieldwork covering between 9 and 12 months. Income data were collected through four
17 quarterly household surveys using a three month recall period. Researchers also
18 conducted a terminal survey which they used to collect measures of subjective
19 wellbeing, adaptation, and social comparison. A comprehensive guide to fieldwork and
20 research methods based on the PEN experience is published in Angelsen, Larsen, Lund,
21 Smith-Hall & Wunder (2011).
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40 ***Sampling***

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42 The PEN sites cover the major sub-continental areas of Africa, Asia and Latin
43 America. Within the selected regions, villages were chosen according to stratification
44 criteria along key gradients including market distance, vegetation types, land-tenure
45 regimes, and ethnicity. Villages in continuous geographical sub-areas were aggregated
46 into 'sites', comprising 50-350 households randomly selected from village censuses.
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48 Within a household, we interviewed the first household head (male or female) available.
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50 The sample originally included 8,301 households in the ex-ante survey, which by
51 attrition were reduced to 7,978 households in the ex-post survey (with the subjective
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1 wellbeing questions). For the multivariate analysis presented below, missing
2 observations in the explanatory variables reduce our sample to 6973 households within
3
4 52 sites (294 villages) in 23 countries from Asia, Africa, and Latin America.
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8 9 ***Dependent variable: Subjective Wellbeing***

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12 Despite the potential limitations of using a single measure (Ferrer-i-Carbonell &
13
14 Frijters, 2004) and to increase comparability with other studies, we followed the
15
16 standard approach used by psychologists and economists to measure subjective
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18 wellbeing as the *overall appreciation of one's life* (Diener et al. 1999; Easterlin et al.
19
20 2010). We used a survey question that has proved useful in similar cross-country
21
22 comparisons. Specifically, we asked: “*All things considered together, how satisfied are*
23
24 *you with your life over the past 12 months?*” Responses to this question were ranked on
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26 a five-point scale from 1 (very unsatisfied) to 5 (very satisfied). We framed the question
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28 on a 12-month-period to allow for comparison with the detailed socioeconomic
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30 information collected in our surveys.
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38 39 ***Explanatory variables***

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41 *Absolute income:* Cash and subsistence household income data were collected quarterly
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43 and aggregated to obtain a measure of annual income.² Subsistence income includes the
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45 value of self-consumed agricultural and forest products. To make comparisons across
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47 households, we scaled total household income by the adult equivalent units (AEU)³. For
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55 ² We kept households who missed one of the four quarters. For households participating in three out of
56 the four quarterly surveys, we calculated the income for the missing quarter as the average of the non-
57 missing quarters adjusted by a trend factor we defined as the ratio of village average for missing quarters
58 to village average for non-missing quarters.

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60 ³ We follow the formula used in World Bank analyses, which is a variant of the OECD scales (Atkinson,
61 Rainwater & Smeeding, 1995): children below 15 years and adults above 65 years get a weight of 0.5,
62 while all other household members (15-65 years) get a weight of 1.
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cross-country comparisons, we used purchasing power parity (PPP) exchange rates.

Thus, our absolute income figures express PPP adjusted US\$ per AEU.

Adaptation: Our measure of adaptation refers to the individual's own income in the recent past and was constructed by asking respondents to compare their household's economic situation to five years back (Knight et al. 2006). Respondents could rank their household's economic situation as "*worse-off*" (=0), "*the same*" (=1) or "*better-off*" (=2).

Social comparison: We used two different measures of social comparison. First, we measured the self-perceived household position in relation to other households in the village. We asked: "*Compared with other households in the village, how well-off is your household?*" Respondents chose whether they considered their household as "*worse-off*," "*average*" or "*better-off*." Second, we also use a more objective measure of social comparison: relative income. We calculated a household's relative income by centering absolute income at the site level.⁴ Thus, the variable reflects the income position of the household relative to the average site income. We used the site, rather than the country, as a comparison group because, in assessing their relative standing, people are more likely to compare themselves locally (Ferrer-i-Carbonell 2005).

Control variables

We selected control variables based on the literature on the determinants of subjective wellbeing (Helliwell et al. 2012; Easterlin 2003; Myers and Diener 1995; Myers 1993; Easterlin et al. 2010). We included both personal characteristics and

⁴ We subtracted the mean income at the site level from the household income, and divided the result by the standard error, so that the relative income has a (0,1) distribution.

1 external factors. The former were 1) sex (*female*), 2) *age* and *age squared*, 3) *household*
2 *size*, 4) marital status (differentiating between informants who were *married* –or in
3 marriage-like arrangements- (=1) at the moment of interview and informants who were
4 single, divorced, and widowed (=0)), and 5) *education* level. Our control variables for
5 external factors were 6) *illness* (whether or not a household member died or was
6 seriously ill during the past 12 months), 7) *work situation*, assessed by three dummy
7 variables *i) recently unemployed* (capturing whether someone in the household became
8 unemployed during the period of research), *ii) major loss* (capturing whether the
9 household suffered any major loss of crops or livestock), and *iii) business* (capturing
10 whether the household received any income from own business); 8) *Social capital and*
11 *support* was measured with four standard questions: *i) help* (“*Can you get help from*
12 *other people in the village if you are in need, for example, if you need extra money*
13 *because someone in your family is sick?*” coded as 1=yes, and 0=no or sometimes, but
14 not always; *ii) trust* (“*In general, do you trust people in the village?*” 1=yes; 0=no or I
15 trust some people but not others; *iii) bonding social capital* proxied by asking about
16 household participation in forest user groups; and *iv) bridging social capital* assessing
17 whether the household head belonged to the largest ethnic group in the village; and 9)
18 *income inequality* was measured by computing Gini indices of inequality in our
19 measured income’s distribution at each site, and entered as a percentage in regressions.
20 Our estimations also include a set of dummies for site.
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51 ***Data analysis***

52 We conducted descriptive and bivariate analyses with the pooled sample and the
53 continental subsamples. We tested the association between individual subjective
54 wellbeing and a) absolute income, b) adaptation, and c) social comparison using
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1 multivariate analysis to control for personal characteristics and external factors that
2 previous research suggests as affecting subjective wellbeing. Because subjective
3 wellbeing is a discrete ordered categorical variable, we used an Ordered Logit model.
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5 For the empirical analysis, we use the following expression:
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9 [1] $SWB_{ihv} = \alpha + \beta Y_{ihv} + \gamma A_{ihv} + \delta SC_{ihv} + \epsilon P_{ihv} + \zeta E_{ihv} + \eta C_v + \theta_{ihv}$
10

11
12 SWB captures self-reported wellbeing of a person, where i denotes the
13 responding subject, h the household, v the site. Y_{ihv} captures income, expressed as
14 absolute income. A_{ihv} captures adaptation and SC_{ihv} captures social comparisons (self-
15 perceived household position and relative income). P_{ihv} is a vector of control variables
16 for personal and household characteristics that, according to previous research, directly
17 affect wellbeing (e.g., age, marital status). E_{ihv} is a vector of control variables for
18 external factors that may affect SWB (i.e., work situation, income inequality). C_v
19 represents dummy variables for site, country, and continent. θ_{ihv} is a random error term
20 with standard properties.
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34 In our first estimation, we use the baseline empirical specification typically used
35 for studying the determinants of subjective wellbeing. This specification includes the
36 measure of absolute income and previously identified personal, household, and village
37 correlates of happiness. In subsequent estimations we add the variables that capture
38 adaptation and social comparison, while maintaining the rest of the terms in the
39 equation. The approach allows us not only to assess the effects of adaptation and social
40 comparison on subjective wellbeing, but also to observe the effects of absolute income
41 on subjective wellbeing after the effects of adaptation and social comparison have been
42 netted out. If absolute income matters more for the subjective wellbeing of people at
43 low income levels than for richer samples (Howell et al. 2006; Camfield et al. 2010;
44 Diener and Biswas-Diener 2002; Easterlin 2003), then we should find a very strong
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1 association between absolute income and subjective wellbeing in our sample.

2 Furthermore, this association would not be significantly altered by the inclusion of
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4 adaptation and social comparison measures, variables that would also have a weak
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6 association to subjective wellbeing.
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9 We tested for multicollinearity between our explanatory and control variables by
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11 calculating the variance inflation factor (VIF). We only found evidence of
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13 multicollinearity between age and age square and the village dummies, but in both cases
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15 collinearity is a property of the predictors, not of the model. The VIF of the rest of the
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17 variables included in our model is <1.7 , and the mean VIF for the variables included in
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19 the different models is <1.2 . We ran our models for the full sample, and for the three
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21 regional sub-samples.
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31 **Results**

32 *Descriptive and bivariate analyses*

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35 The average subjective wellbeing was slightly above the midpoint (3) of our
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37 measure of subjective wellbeing (mean=3.2; SD=1.03). On a range from 1 to 5, 49.0%
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39 of the informants reported a subjective wellbeing of 4 or 5. Six per cent of the
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41 informants reported to be very unsatisfied with their lives, while 5.0% reported to be
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43 very satisfied. The analysis by regions suggests some noteworthy patterns: while 86.1%
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45 of Latin American and 61.4% of Asian respondents were above the midpoint (>3), the
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47 share was lower in Africa (43.3%), where 8% reported to be very unsatisfied with their
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49 lives.
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56 The average total PPP income per AEU was US\$1555 (Table 1, Row [A]). Cash
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58 income accounted for US\$1044 and subsistence income for US\$ 516. Only 0.23% of
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1 households did not receive cash from any source. Important differences across regions
2 included that average absolute income in the Latin American cases was double and
3
4 triple that in Asia and Africa, respectively. Differences were statistically significant in a
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7 Kruskal-Wallis test ($p < 0.001$).
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TABLE 1

40.1% of respondents thought their household was better-off at the time of the
interview than five years prior, 34.9% thought it was about the same, and 25.0%
thought they were worse-off (Table 1, Row [B]). The share of households perceiving
that their situation had improved was larger in Latin America (60.8%) than in Asia
(40.7%) and Africa (35.0%). The average absolute income of people who considered
that the economic situation of their household was worse than five years ago was about
half the absolute income of people who considered their economic situation to be better
than five years ago.

About one third of the sample was above the mean absolute income (Table 1,
Row [D]). The share of households in the better-off category is lower when looking at
the perceived household's position in a village (Table 1, Row [C]) than when looking at
relative income (Table 1, Row [D]). Thus, only 18% of the respondents considered that
their households were better-off than other households in the same village (versus 34%
who were actually above the mean in terms of absolute income). Most people (63%)
reported their household as being in the category "average" income.

A common occurrence in all the comparisons is that the average absolute income
was higher for the self-reported better-off groups than for the middle and worse-off
groups. In both the global and the regional analyses, the difference in absolute income
between the better-off and the other groups was statistically significant in a one-way

1 ANOVA test ($p < 0.001$). This indicates some correspondence between absolute income
2 and our measures of adaptation and social comparison.
3

4 The descriptive statistics of other variables used in multivariate regression
5 analysis can be found in Table 2. The average respondent in our sample was a married
6 (88%) man (75%) of around 44 years of age belonging to the largest ethnic group in his
7 village of residency (77%) with a relatively low level of education (only 2% had higher
8 education) and living in a household with the equivalent of 4 adults. About one third of
9 the households (31%) had suffered a death or a major illness within the year prior to the
10 interview. Only 37% of respondents were certain they could obtain help if needed, and
11 about half of the sample (47%) generally trusted people in the village. 27% of the
12 households in the sample participated in forest users groups. The average Gini index of
13 site income inequality was of 0.38, the lowest being in Asia (0.33).
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TABLE 2

Multivariate analysis

We start by analyzing the correlates of subjective wellbeing without the income
comparison variables (Table 3, Model [a]). Our basic analysis shows that absolute
income, household size, being married, owning a business, the ability to get help, and
trust seem to have a positive effect on subjective wellbeing, while the presence of
illness in the household, major economic losses, and income inequality seem to have a
negative effect on subjective wellbeing. Our data do not show a relation between
subjective wellbeing and the sex of the respondents, their age, or their level of
education. We did not find a relation between being recently unemployed or between
bonding and bridging social capital and subjective wellbeing either.

We also found a positive and statistically significant association between
absolute income and subjective wellbeing. Since income is measured in log terms, the

1 coefficient should be read as elasticity. If a subject was to increase her absolute income
2 by one percent, the ordered log-odds of having a higher subjective wellbeing score
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4 would increase by 0.44 while the other variables in the model are held constant.
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8 INSERT TABLE 3 9

10 In our next model, we introduce our measure of adaptation (Table 3, model [b]).
11 We find a clear association between the perceived situation relative to past income and
12 subjective wellbeing. For subjects who perceived that their income was worse than 5
13 years ago, the odd-logs of reporting higher subjective wellbeing was 0.82 less than for
14 people who did not perceive any change in their income, and it was 0.57 more for
15 people who perceived that their income was higher than in the past ($p < 0.05$). In this
16 model, the relation between absolute income and subjective wellbeing remains positive
17 and statistically significant, although the magnitude of the coefficient decreases (as
18 compared to Model [a]).
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32 Social comparisons were analyzed via the alternative inclusion of two proxy
33 variables (Models [c] and [d]). The two variables that capture social comparisons bear a
34 statistically significant association with subjective wellbeing. For subjects who
35 perceived that their income was worse than the income of neighboring households, the
36 odd-logs of reporting higher subjective wellbeing was 1.2 less than for people who
37 consider their income to be around the local average. Contrarily, for subjects who
38 perceived that their income was better than the income of neighboring households, the
39 odd-logs of reporting higher subjective wellbeing was 0.85 more ($p < 0.05$). Similarly,
40 improving the income position of the household relative to the average site income also
41 increased the log-odds of a person reporting higher subjective wellbeing (Model [d]).
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57 As in the model including adaptation, in the two models that consider social
58 comparison, absolute income continues to bear a positive and statistically significant
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1 association with subjective wellbeing. However, the magnitude of the coefficient drops
2 from 0.436 in the benchmark model to 0.28 when including self-perceived household
3 position and to 0.26 when including relative income.
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7 Table 4 presents a regional analysis, which basically consisted of running the
8 same equations as in Table 3, but using only our regional sub-samples. Table 4 reports
9 only the coefficients of absolute income, adaptation, and social comparison variables,
10 although the model calculated includes the same controls as in Table 3. We highlight
11 two common trends and three regional differences. The first commonality is that in
12 most regressions, adaptation and social comparison variables seem to be associated to
13 subjective wellbeing in the expected direction. The second is that in all regressions, the
14 inclusion of adaptation and social comparison variables reduces the coefficient of the
15 association between absolute income and subjective wellbeing. The main regional
16 differences consists of the lack of statistically significant association between relative
17 income and subjective wellbeing for the African sample; the lack of statistically
18 significant association between absolute income and subjective wellbeing for the Asian
19 - sample once relative income is included in the equation; and the overall lack of
20 statistically significant association between absolute income and subjective wellbeing
21 for the Latin American sample.
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45 **Discussion**

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47 The overall agreement in the economics of happiness literature is that absolute
48 income matters more for the subjective wellbeing of people at low rather than at high
49 income levels. And this is so because rises in income help the poor meet their basic
50 material needs (Howell et al. 2006; Camfield et al. 2010; Diener and Biswas-Diener
51 2002; Easterlin 2003). From this assumption it is derived that income comparisons
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1 should become more important in determining subjective wellbeing as societies get
2 richer (Diener and Seligman 2004). Because the empirical work testing this assumption
3 shows conflicting results, here we have tried to assess the role of comparison income
4 (through adaptation and social comparison) in the subjective wellbeing of people with
5 low income levels.
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11 Despite differences in sample composition (i.e., our sample does not include
12 urban populations nor people in so-called developed countries), we find that overall
13 levels of subjective wellbeing in our sample resemble levels found in other global
14 samples. For example, aggregated data collected from 2005 through mid-2011 from
15 respondents in 150 countries answering the Gallup World Polls show that, on a scale
16 from 0-10, over two-thirds of the sample report levels of subjective wellbeing at the
17 midpoint of the scale or higher (Helliwell et al. 2012), whereas only about 4% of that
18 sample gives values in the two lower categories of the scale. This roughly resembles our
19 data, where 49.0% of the informants reported a subjective wellbeing of 4 or 5 and only
20 6% of the respondents reported to be very unsatisfied with their lives. The similarity is
21 noteworthy because the respondents to our survey had relatively low levels of absolute
22 income. Notably, the average absolute income in our sample is about US\$ 1500 (PPP
23 conversion) per AEU, well below the US\$ 8000 per capita threshold beyond which
24 further income is believed to have diminishing returns to wellbeing (Layard 2005; Frey
25 and Stutzer 2002).
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48 Findings from our work also support the long claimed finding that there are
49 multiple correlates of subjective wellbeing (Helliwell et al. 2012; Easterlin 2003; Myers
50 and Diener 1995; Myers 1993; Easterlin et al. 2010), and this is so also for people at
51 relative levels of low income. Thus, our results confirm the universally tested positive
52 role of marriage, self-employment (i.e., owning a business), help, and trust on
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1 subjective wellbeing, and the -also largely tested- negative effects of the presence of
2 illness in the household, major economic losses, and income inequality. Our findings
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4 also support the idea that there is not a clear, universal pattern of relation between the
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6 sex of the respondent, her level of education, and her subjective wellbeing (Helliwell et
7
8 al. 2012). Perhaps the most contrasting finding with previous literature is that we fail to
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10 find the well established U-shaped relation between age and subjective wellbeing.
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12 Previous work has found that through life satisfaction declines, reaches a minimum
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14 around middle-age (between 40 and 50) and then rises again (Helliwell 2003;
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16 Blanchflower and Oswald 2004). A potential explanation for our contrasting result
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18 relates to the idea that the effect of age in subjective wellbeing might be relative to the
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20 life expectancy of the person. As our sample includes people with lower –or at least
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22 very different- life expectancies, this might mask the relation between changes in the
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24 life cycle of a person and subjective wellbeing. But overall, our findings indicate that
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26 there are many factors that determine the wellbeing of people in developing countries.
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34 An important third finding of this work is that absolute income exerts a positive
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36 effect on subjective wellbeing, as expected (Frey and Stutzer 2002; Stevenson and
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38 Wolfers 2008). However, the magnitude of the association between absolute income
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40 and subjective wellbeing diminishes once we control for adaptation and social
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42 comparisons, although in most regressions both absolute income and social comparison
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44 variables maintain a positive and statistically significant effect when included
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46 simultaneously (see Blanchflower and Oswald (2004) for a similar result).
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51 Thus, our data suggest that adaptation and social comparison variables are
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53 associated to subjective wellbeing on their own, giving support to the growing body of
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55 research arguing that the subjective wellbeing of people in developing countries is
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57 negatively affected by positional concerns (i.e., Guillen-Royo 2011; Knight and
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1 Gunatilaka 2012; Fafchamps and Shipi 2008; Knight et al. 2009; Fafchamps and
2 Kebede 2008; Carlsson et al. 2009), as it is affected by absolute income. Furthermore,
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4 and contrary to what has been found in previous work in the developing world (e.g.
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6 (Akay and Martinsson 2011; Linssen et al. 2011; Asadullah and Chadhury 2012), the
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8 effects might be larger than the effects of absolute income.
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11 Between the two measures tested, social comparisons (whether self-perceived
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13 and measured) have stronger effects on subjective wellbeing than adaptation.
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15 Furthermore, the inclusion of social comparison variables has a stronger lowering effect
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17 on absolute income than the inclusion of adaptation. This result contrast with findings
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19 by Angeles (2010), whose results in the UK strongly supported the existence of
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21 adaptation effects, but only found weak evidence in favor of social comparison.
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26 Yet, why is it that the increasing prosperity of one part of the group might lead
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28 to decreases in the subjective wellbeing of others? The answer to that question might
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30 relate both to subjective and objective reasons. In other words, lower levels of wellbeing
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32 for the group whose income did not change might be due to well-known sociological
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34 factors related to the pervasive effects of income inequality. Research on income
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36 inequality suggests that the comparison with the better-off produces a sense of relative
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38 deprivation that might unleash negative emotions, such as envy, shame, guilty, anger,
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40 depression, hostility, cynicism, insecurity, social isolation, anxiety, and inadequacy
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45 (Marmot & Wilkinson 2001; Wilkinson 1997; Kawachi et al. 1997), all them
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47 contributing to worsen subjective wellbeing. But lower wellbeing might also have to do
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49 with objective changes in opportunities to avail of resources or services. For example, it
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51 is possible that the increase in income for some people in the group can drive up general
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53 prices, thus objectively worsening the situation of those who are left behind. Higher
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55 incomes might allow some people to invest in technology (i.e., chainsaw, rifle, tractors)
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1 that allows for a more efficient use of natural resources. If such resources are common
2 access (i.e., forest, game, common pasture), the raise in income in one part of the group
3 might result in decreased availability for those who are left behind. Whether subjective
4 or objective reasons pay a more important role in explaining the effects of social
5 comparison on subjective wellbeing is an interesting empirical question worth pursuing.
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11 We also found that adaptation matters for feelings of wellbeing, although –in our
12 sample- it matters less than social comparison. An interesting question derived from this
13 finding is whether there is asymmetry in adaptation; income increase is associated to an
14 increase in wellbeing, but is the feeling of decline in the sense of wellbeing of equal
15 intensity for a decrease in income by the above amount? However, as the testing of such
16 an idea, originally posed by Kahneman and Tversky (1979) and recently discussed by
17 DiTella et al. (2010), requires panel data in this study we are unable to answer this
18 question.
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31 One more aspect merits discussion. A main difference in our regional analysis
32 relates to the Latin American sample. Notice that, for this part of the sample, there is an
33 overall lack of statistically significant association between absolute income and
34 subjective wellbeing. Furthermore, only the self-perceived social position of the
35 household seems to play an important role in subjective wellbeing. Descriptive data
36 show that this region is not only the richest in the sample, but also different in the
37 distribution of households across the social comparison variables. Thus, respondents in
38 Latin America show a different pattern from Africa and Asia, with a higher percentage
39 of people reporting themselves in the “better-off” groups, and lower percentages in the
40 “worse-off” groups. The differences might be explained for a larger concern about
41 economic position in Latin American countries, which are among the most unequal in
42 the world.
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1 We are aware that our results may suffer from two main biases. First,
2 unobserved factors (such as personality) might partially explain the associations found
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4 between adaptation and social comparison and subjective wellbeing (DeNeve and
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6 Cooper 1998; Steel et al. 2008). Just as positive affect--the hallmark of wellbeing—is
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8 believed to be the cause of many of the desirable characteristics, resources, and
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10 successes correlated with happiness (Lyubomirsky et al. 2005), people who are more
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12 optimistic would also be expected to be more positive about the relative situation of
13
14 their household. Future research among low income populations should use panel data
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16 to control for the confounding effect of personality factors (which can be corrected via
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18 individual fixed effects if and when panel data are available) (Ferrer-i-Carbonell and
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20 Frijters 2004).
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26 Second, there is an extended discussion on whether happiness is context-
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28 dependent or not. Some authors argue that happiness is an affective experience linked to
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30 universal human needs, which suggest that the conditions of happiness are similar
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32 across the world (although with some cultural variation), even if different countries and
33
34 cultures give different meanings to the concept of happiness (Selin and Davey 2012; Eid
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36 and Diener 2001). Other authors, however, argue that contextual and cultural factors can
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38 affect whether emotions are considered valuable and appropriate across cultures, thus
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40 suggesting that some correlates of subjective wellbeing can be culture-specific (Diener
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42 and Oishi 2005; Diener et al. 2003). For instance, self-esteem has been found to be a
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44 much stronger predictor of life satisfaction of women in individualistic than in
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46 collectivistic societies (Diener and Diener 1995). This discussion obviously presents an
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48 important challenge in cross-cultural research on subjective wellbeing (including this
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Conclusion

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2 We conclude by highlighting some implications of our main finding. If
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4 subjective wellbeing depends partially on the gratification of basic physiological needs
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6 and partially on the gratification of social needs, there is no reason to believe that
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8 subjective wellbeing in rural areas of developing countries should not also depend on
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10 social comparisons. Our research findings suggest that -even at low levels of absolute
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12 income- adaptation and social comparison are important covariates of subjective
13
14 wellbeing. This apparent universality of these mechanisms in their relation with
15
16 subjective wellbeing has important implications for public policies aimed at poverty
17
18 alleviation. On the one hand, our findings show that absolute income is important in
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20 itself. Thus, public policies aimed at increasing absolute income in populations with low
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22 income levels are certainly relevant in improving human wellbeing. On the other hand,
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24 the relevance of social comparison for rural populations implies that there exists a
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26 negative externality to income-generating activities: gains in subjective wellbeing of
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28 those whose income increases are accompanied by decreases in subjective wellbeing of
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30 those in the comparison group (see Layard (2005)). Hence, public policies aimed at
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32 increasing absolute income should consider social comparison aspects, if they aim to
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34 also increase overall subjective wellbeing.
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Table 1: Absolute income^a and its distribution across adaptation and social comparison levels

| | | Global (n=6973) | Africa (n=3742) | Asia (n=2361) | Latin America (n=870) | | | | |
|-------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|--------------------|-------------------|--------------------------|-------------------|-----------------|-------------------|-----------------|
| [A] | | <i>Mean^b</i> | <i>Mean</i> | <i>Mean</i> | <i>Mean</i> | | | | |
| <i>Absolute income</i> | Cash | 1044 (1 948) | 631 (1526) | 1091 (1552) | 2 693 (3224) | | | | |
| | Subsistence | 516 (1542) | 437 (1954) | 493 (499) | 914 (1325) | | | | |
| | Total | 1555 (2730) | 1062 (2733) | 1580 (1704) | 3602 (3809) | | | | |
| [B] | | <i>Mean</i> | <i>% hh</i> | <i>Mean</i> | <i>% hh</i> | <i>Mean</i> | <i>% hh</i> | <i>Mean</i> | <i>% hh</i> |
| <i>Adaptation: Household's income compared to 5 years before</i> | Worse-off | 1057 (3250) | 25 | 926 (4289) | 31 | 1118*** (734) | 21 | 2288 (1635) | 11 |
| | Same | 1456 (2256) | 34 | 985 (2016) | 34 | 1475*** (1350) | 38 | 3362 (3594) | 28 |
| | Better-off | 2424*** (3382) | 40 | 1515*** (2700) | 35 | 2592*** (2953) | 41 | 4585*** (4516) | 61 |
| [C] | | | | | | | | | |
| <i>Social comparison: Self-perceived household position in relation to other households</i> | Worse-off | 1057*** (3247) | 19 | 926 (4287) | 20 | 1117*** (733) | 23 | 2289 (1635) | 6 |
| | Average | 1455*** (2255) | 63 | 986 (2014) | 64 | 1474*** (1350) | 60 | 3362 (3594) | 67 |
| | Better-off | 2421*** (3375) | 18 | 1516*** (2696) | 17 | 2588*** (2946) | 17 | 4569*** (4513) | 27 |
| [D] | | | | | | | | | |
| <i>Social comparison: Relative income</i> | Below the mean | 866*** (795) | 66 | 540*** (504) | 67 | 948*** (510) | 64 | 2063*** (1149) | 66 |
| | Above the mean | 2879 (4229) | 34 | 2118 (4512) | 33 | 2685 (2369) | 36 | 6652 (5168) | 34 |

***: Significant in a one-way ANOVA (or t-test comparison of means for [D]), p<0.001

^a All values are per adult equivalent in purchasing power parity adjusted USD.

^b Standard deviation in parenthesis.

Table 2: Definition and descriptive statistics of control variables used in the analysis

| | | Global (n=6973) | Africa (n=3742) | Asia (n=2361) | Latin America (n=870) |
|-------------------------------|------------------------------------------------------------------------------------------------|--------------------|--------------------|------------------|-----------------------------|
| Personal factors | | | | | |
| <i>Female</i> | Women answering the survey | 25% | 18% | 36% | 20% |
| <i>Age</i> | Age of the person, in years | 44.1 | 45.0 | 43.3 | 42.7 |
| <i>Household size</i> | Adult equivalents living in the household | 4.1 | 4.5 | 3.6 | 3.8 |
| <i>Married</i> | The informant was married at the moment of interview (versus widowed, divorced, never married) | 88% | 89% | 89% | 90% |
| <i>Education</i> | No schooling | 35% | 37% | 38% | 16% |
| | Primary school | 29% | 27% | 27% | 45% |
| | Secondary school | 34% | 32% | 34% | 37% |
| | Higher education | 2% | 3% | 1% | 2% |
| External factors | | | | | |
| <i>Illness</i> | Households where someone died or was seriously ill during the past 12 months | 31% | 36% | 24% | 32% |
| <i>Work situation</i> | Recently unemployed | 3% | 1% | 6% | 2% |
| | Major loss | 45% | 52% | 39% | 31% |
| | Own business | 38% | 59% | 25% | 24% |
| <i>Social capital</i> | <i>Help:</i> Households that can get help when in need | 37% | 33% | 40% | 47% |
| | <i>Trust:</i> Informants generally trusting village people | 47% | 43% | 53% | 47% |
| | <i>Bonding capital:</i> Households participating in forest user groups | 27% | 20% | 42% | 18% |
| | <i>Bridging capital:</i> Male household head belongs to village's largest ethnicity | 77% | 69% | 86% | 86% |
| <i>Site income inequality</i> | Gini index of site income inequality (n=52) ^a , in regressions entered as % | 0.38 | 0.40 | 0.33 | 0.40 |

^a n= 23 for Africa, n=20 for Asia, n=9 for Latin America

Table 3

Results from Ordered Logit regressions. Absolute income, adaptation, and social comparison versus subjective wellbeing (n=6973)

| | | [a] | [b] | [c] | [d] |
|-----------------------------------------------------------|-------------------------------------------|---------------------|---------------------|---------------------|---------------------|
| <i>Explanatory variables</i> | | | | | |
| | <i>Absolute income, in logs</i> | 0.443 (0.059)** | 0.348 (0.061)** | 0.281 (0.054)** | 0.258 (0.100)* |
| | <i>Adaptation</i> | | -0.826 (0.082)** | | |
| | <i>Worse than 5 years ago</i> | | | | |
| | <i>Better than 5 years ago</i> | | 0.569 (0.092)** | | |
| | <i>Social comparison:</i> | | | -1.214 (0.105)** | |
| | Self-perceived household position | | | | |
| | <i>Worse than other households</i> | | | | |
| | <i>Better than other households</i> | | | 0.855 (0.106)** | |
| | <i>Social comparison: Relative income</i> | | | | 0.177 (0.068)** |
| <i>Control variables: Personal characteristics</i> | | | | | |
| | <i>Female</i> | -0.026 (0.078) | -0.005 (0.078) | 0.008 (0.077) | -0.021 (0.077) |
| | <i>Age</i> | | | | |
| | Age | -0.008 (0.011) | -0.007 (0.010) | -0.012 (0.010) | -0.008 (0.10) |
| | Age squared | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.0001) |
| | <i>Household size</i> | 0.097 (0.018)** | 0.081 (0.018)** | 0.047 (0.018) | 0.100 (0.018)** |
| | <i>Married</i> | 0.167 (0.081)* | 0.136 (0.072) | 0.114 (0.078) | 0.181 (0.081)* |
| | <i>Education (no schooling omitted)</i> | | | | |
| | Primary school | 0.007 (0.074) | -0.021 (0.072) | -0.032 (0.077) | 0.004 (0.074) |
| | Secondary school | 0.084 (0.081) | 0.018 (0.078) | -0.059 (0.084) | 0.074 (0.080) |
| | High education | 0.066 (0.202) | -0.027 (0.183) | -0.144 (0.200) | 0.031 (0.207) |
| <i>Control variables: External factors</i> | | | | | |
| | <i>Illness</i> | -0.410 (0.087)** | -0.350 (0.082)** | -0.370 (0.086)** | -0.406 (0.087)** |
| | Recently unemployed | -0.179 (0.299) | -0.111 (0.299) | -0.074 (0.294) | -0.171 (0.300) |
| | <i>Work situation</i> | | | | |
| | Major loss | -0.252 (0.068)** | -0.189 (0.063)** | -0.252 (0.071)** | -0.251 (0.069)** |
| | Business | 0.150 (0.069)* | 0.120 (0.069) | 0.087 (0.064) | 0.151 (0.067)* |
| | <i>Social capital</i> | | | | |
| | Help | 0.208 | 0.127 | 0.091 | 0.206 |

| | | | | | |
|----|-------------------------------|-----------|-----------|-----------|-----------|
| 1 | | (0.099)* | (0.093) | (0.092) | (0.098)* |
| 2 | Trust | 0.450 | 0.428 | 0.448 | 0.457 |
| 3 | | (0.093)** | (0.090)** | (0.087)** | (0.095)** |
| 4 | Bonding | 0.057 | 0.085 | 0.056 | 0.057 |
| 5 | capital | (0.082) | (0.081) | (0.078) | (0.082) |
| 6 | Bridging | -0.066 | -0.027 | -0.094 | -0.063 |
| 7 | capital | (0.087) | (0.084) | (0.083) | (0.085) |
| 8 | <i>Site income inequality</i> | -31.363 | -31.287 | -26.908 | -24.013 |
| 9 | | (2.85)** | (2.597)** | (2.776)** | (4.087)** |
| 10 | <i>R2</i> | 0.10 | 0.12 | 0.13 | 0.10 |

Regressions include dummies for site. Standard errors are in parenthesis. *, ** significant at 0.05 and 0.01 levels. Variables are defined in Table 2.

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Table 4

Results from Ordered Logit regressions. Dependent variable: subjective wellbeing

| | [a] | [b] | [c] | [d] |
|------------------------------------------|--------------------|---------------------|---------------------|--------------------|
| <i>Africa</i> (n= 3736) | | | | |
| <i>Absolute income</i> , in logs | 0.419 (0.073)** | 0.354 (0.076)** | 0.287 (0.067)** | 0.308 (0.124)* |
| <i>Adaptation</i> | | -0.738 (0.095)** | | |
| <i>Worse than</i> <i>5 years ago</i> | | | | |
| <i>Better than</i> <i>5 years ago</i> | | 0.620 (0.114)** | | |
| <i>Social comparison:</i> | | | -1.321 (0.123)** | |
| Self-perceived household position | | | | |
| <i>Worse than other households</i> | | | | |
| <i>Better than other households</i> | | | 0.660 (0.108)** | |
| <i>Social comparison:</i> | | | | 0.115 (0.087) |
| Relative income | | | | |
| <i>Asia</i> (n=2361) | | | | |
| <i>Absolute income</i> , in logs | 0.636 (0.117)** | 0.478 (0.123)** | 0.389 (0.099)** | 0.231 (0.161) |
| <i>Adaptation</i> | | -0.982 (0.200)** | | |
| <i>Worse than</i> <i>5 years ago</i> | | | | |
| <i>Better than</i> <i>5 years ago</i> | | 0.595 (0.225)** | | |
| <i>Social comparison:</i> | | | -1.200 (0.218)** | |
| Self-perceived household position | | | | |
| <i>Worse than other households</i> | | | | |
| <i>Better than other households</i> | | | 1.482 (0.229)** | |
| <i>Social comparison:</i> | | | | 0.338 (0.094)** |
| Relative income | | | | |
| <i>Latin America</i> (n=870) | | | | |
| <i>Absolute income</i> , in logs | 0.040 (0.101) | -0.048 (0.079) | -0.064 (0.110) | 0.016 (0.231) |
| <i>Adaptation</i> | | -0.715 (0.384) | | |
| <i>Worse than</i> <i>5 years ago</i> | | | | |
| <i>Better than</i> <i>5 years ago</i> | | 0.448 (0.165)** | | |
| <i>Social comparison:</i> | | | -0.731 (0.405) | |
| Self-perceived household position | | | | |
| <i>Worse than other households</i> | | | | |
| <i>Better than other households</i> | | | 0.562 (0.222)* | |
| <i>Social comparison:</i> | | | | 0.022 (0.154) |
| Relative income | | | | |

Regressions include the same control variables (including personal characteristics, external factors, and dummies for site and country) as in Table 3, but those are not reported here. Standard errors are in parenthesis. *, ** significant at 0.05 and 0.01 levels.