

Subjective well-being, relative status, and material aspirations in a poor society

Muna Shifa and Murray Leibbrandt

Abstract

Decades of social science studies have suggested that relative status and socially determined aspirations are fundamental psychological mechanisms in influencing an individual's behaviour and social well-being. Empirical studies, however, produced mixed results. In this paper, we examine the relationship between subjective well-being, relative status, and material aspiration gaps. We use panel data from rural Ethiopia, one of the poorest countries in the world. Our study shows that individuals who reported lower subjective well-being are those who 1) perceive their household as the poorest in the village, 2) are fairing much worse now than their living standards in the past, and 3) are poorer than their fathers at the same age. Negative effect of social comparison is also observed when we use objective relative position as an indicator. In addition, we find that material aspiration gaps regarding food, housing, and health expenditures have a significant and negative impact on an individual's subjective well-being. Recent researches suggest that aspirations are socially determined, and large aspiration gaps can lead to aspiration failures. Thus, our findings have important implications for poverty reduction in poor countries.

Keywords: Aspirations, happiness, positional concerns, subjective well-being, Interdependence of preferences, Reference group

1. Introduction

The notion that individuals care about their relative position in their social environment, and that such comparisons in turn may affect some of their attitudes and economic decisions have long been recognized in earlier economics literatures (e.g. see Duesenberry, 1949, Easterlin, 1974, Frank, 1985; Leibenstein, 1950; Scitovsky, 1976). For example, as Duesenberry's relative income theory posits, each person's consumption spending (and the associated utility) is not only affected by the current level of his or her income, but also by relative consumption of relevant others or past own consumption patterns. Supporting this hypothesis, many of the studies that used data from developed countries show that reference group income (or consumption) and individual utility are negatively related (See Clark, Frijters & Shields, 2008; Frey & Stutzer, 2002 for a survey). These findings highlight the importance of rising aspiration gaps and relative income rather than absolute income in explaining life satisfaction in the developed world (Easterlin, 2001; Easterlin et al., 2010).

In the context of developing countries, research on the impact of relative position on subjective well-being (SWB) is limited, and reported mixed results (positive, negative, and no effect). The mixed results can be explained by various factors. For one, the presence of informal risk-sharing institutions in rural communities and other positive spillovers from having rich neighbours can explain the positive effect of relative position in poor countries (Ravallion & Lokshin, 2010; Bookwalter & Dalenberg, 2010). The potential explanation for the lack of comparison effect among the poor is that concern for relative position is only important once the basic needs are satisfied (Akay & Martinsson, 2011). In contrast, those who found negative relationship highlight the importance of relative economic position of an individual in his/ her assessment of well-being in poor countries. Differences in reference group definition, choice of relative position indicator, model specification, and estimation methods used can also be a factor. Another factor could be differences in social norms. Thus, more research is needed to better understand how relative position affects individual well-being in developing countries.

In this paper, we examine the relationship between relative economic position, material aspiration gaps, and subjective well-being using data from rural Ethiopia, one of the poorest countries in the world.¹ The paper contributes to the existing work in a number of ways. First, we analyse the impacts of both material aspiration gaps and relative position on individuals'

¹In this study, we are considering only material aspirations. However, an individual's aspiration includes a range of other dimensions of life (see Easterlin, 2001; Ray, 2003).

assessment of his/her well-being. Studies that have taken both aspiration gaps and positional concerns into account together are very limited. For example, using data from Mexico, Castilla (2012) shows that income satisfaction of the poor are influenced more by their income aspiration gaps, while it is less affected by perceived income differences with respect to others. Other studies from more advanced countries also show that an individual's assessment of life satisfaction is affected by the extent to which his/her aspirations are fulfilled (Easterlin, 2001; Plagnol & Easterlin, 2008; Stutzer, 2004). People with lower relative position may also have higher aspirations. Thus, failure to control for an individual's aspirations may underestimate the negative effect of relative income.

Second, unlike many of the studies that use cross-sectional data, our study uses panel data. The panel data structure allows us to account for unobserved individual heterogeneity, such as personality traits in our empirical analysis. In addition, given that multiple reference groups may jointly affect individuals' assessment of their well-being (McBride, 2001), our data allows us to investigate comparisons to others in the relevant reference group, to oneself in the past, and to one's father's wealth at the same age. Lastly, it is suggested that self-assessed relative position measures are expected to reflect the emotional reaction of an individual's relative position better than objective measures (Ravallion & Lokshin, 2010). For this reason, we use both objective and subjective relative position indicators while controlling for possible subjective reporting biases in our empirical analysis.

The rest of paper is structured as follows. Section 2 discusses the related literature. Section 3 describes the data and empirical strategies used. The results are presented in section 4, and section 5 draws conclusions.

2. Related Literature

The role of social and psychological factors in modern consumer theory in economics has been influenced by Duesenberry's (1949) seminal work, *Income, Saving and the Theory of Consumer Behavior* (See Mason, 2000).² Duesenberry (1949) argues that because of individuals' desire to emulate others (or keep own previous peak consumption), each person's consumption spending (and the associated utility) is not only affected by current level of his or

² However, the notion that our preferences are socially determined goes back to the works of earlier economists such as Smith (1776), Marx (1849), and Veblen (1899) (as cited in Heffetz & Frank, 2008). The interdependency of individual preference functions was also modelled by others (see for e.g. Leibenstein, 1950, 1962, 1975, Pollak, 1976; Neumark & Postlewaite, 1993; Clark & Oswald, 1998; Fershtman, Murphy, & Weiss, 1996; Hopkins, & Kornienko, 2004; Bowles & Park, 2005; Abel, 1990, 2005).

her income, but also by relative consumption of others with whom the individual came into frequent contact or past own consumption patterns. In the case of social comparison effect, Duesenberry suggests that an individual's utility index (satisfaction) depends on the ratio of his/her own consumption to a weighted average of consumption of relevant others.

In a related literature, Frank (1985, 1999, 2005) and Solnick, and Hemenway (1998, 2005) argue that individuals derive utility from consummation of both positional (e.g. large houses, expensive cars) and non-positional goods (e.g. health, public education, leisure). Thus, they suggest that an individual's utility depends both on absolute and relative consumption. However, they argue that the effect of relative consumption is more important in the case of positional goods than non-positional goods. One important implication of models with interdependent preferences is that a concern to relative standing creates positional externalities (Duesenberry, 1949; Frank, 1985; 2005; Frank, Levine & Dijk, 2014). For instance, Frank (1985) and Frank et al.(2014) used the term "expenditure cascade" to describe a process whereby higher consumption expenditure by richer individuals prompts higher consumption expenditure by those who are below them resulting in relatively lower saving rates by the poor. In addition, the process creates feelings of relative deprivation among the poor once they realized that others are moving upward.³

Early empirical support for the relative income hypothesis came from Easterlin (1974) who observed that at any particular time, richer individuals (or countries) are likely to be happier than poorer ones and, overtime, societies do not necessary become happier as they become richer. He argues that aspirations for materials are affected by social comparisons and it increases with income. Thus, although increase in income may increase happiness initially, overtime increase in happiness will wear off as people adapt to the increased income level. Recent papers by Easterlin and others have continued to confirm this observation, and suggest that reference group income (or consumption) and individual utility are negatively related in advanced countries (See Clark, Frijters & Shields, 2008; Easterlin, 2013; Frey & Stutzer, 2002 for a survey).

When it comes to the developing world, existing studies provide mixed outcomes regarding the impact of relative economic position on social well-being. Some studies found no

³ It is also suggested that positional concerns lead to an equilibrium outcome where people consume too much of positional goods and too little non-positional goods (see Hopkins, & Kornienko, 2004; Bowles & Park, 2005). This in turn can lead to welfare loss by diverting resources from non-positional goods (Frank, 2005: p.138).

significant relationship between relative consumption and well-being (Akay & Martinsson, 2011; Akay, Martinsson, Medhin, 2012 both in Ethiopia), while others found a positive relationship (Ravallion & Lokshin, 2010 in Malawi; Kingdon & Knight, 2007; Bookwalter & Dalenberg, 2010 both in South Africa). Using data from transition economies in Russia, Senik (2004) also found a positive relationship between reference group income and individual well-being. In contrast, consistent with the relative income hypothesis, there are studies that found a negative impact of relative income on well-being (e.g. Asadullah & Chaudhury, 2012 in Bangladesh; Castilla, 2012 in Mexico; Knight, Lina, & Gunatilaka, 2009; Knight & Gunatilaka, 2012 both in China; Guillen-Royo in Peru; Fafchamps & Shilip, 2008 in Nepal; Carlsson, Gupta, & Johansson-Stenman, 2009 in India; Posel & Casale, 2011 in South Africa).

Different mechanisms are put forward to explain the lack of (or positive) positional concern in poor and transitional economies. For example, Senik (2004) ascribes her results to Hirschman and Rothschild's (1973) "tunnel effect" hypothesis. According to this theory, in the face of limited information (uncertainty) about future prospects, an individual may derive positive utility, at least in the short run, if he observes his reference group's income as a source of information for his future prospects.⁴ Conversely, Ravallion and Lokshin (2010) and Kingdon and Knight (2007) propose that, in poor communities, it is possible to observe positive impact of relative income because of the presence of kinship relations and informal networks that can provide informal insurance through risk-sharing arrangements, which leads to empathy and altruism. Others suggest that positive effect of relative effect is possible because having richer neighbourhoods improves access to public goods and other types of positive spillovers (Bookwalter & Dalenberg, 2010, p.353).

In addition, results also vary due to differences in reference group definition, choice of relative position indicator, model specification, and estimation methods used. For instance, using various reference groups (e.g age groups, relatives, friends, and colleagues), Akay, Anderson, Martinsson and Medhin (2014) show that positional concerns are important in Ethiopia only when they used the same age group as a reference group. Likewise, the study by Kingdon and Knight (2007) in South Africa found evidence of negative relative income effects within race

⁴ In the context of developed countries, the "tunnel effect" hypothesis is also used to explain results in Clark, Kristensen and Westergård-Nielsen's (2009) study. Using data from Denmark, they show that an individual's job satisfaction is higher when other workers in the same establishment are better-paid. Using panel data from the UK, however, Brown, Gray and Roberts's (2015) study show that positive effect of relative position is observed when spatial reference groups is used in place of individual characteristics such as age groups. They argue that the positive effect of relative income may well have been area wealth effects.

groups, while they found positive relative income effects within neighborhoods. In contrast, Bookwalter and Dalenberg's (2010) study in South Africa show that increase in relative expenditure has a positive effect on well-being only for non-whites (mainly the poor), while Posel and Casale (2011) show that perceived higher relative ranking has positive impact on life satisfaction for both whites and blacks in South Africa.

Furthermore, studies that used both objective and self-assessed relative position indicators found that self-assessed relative position indicators are more important than objective relative position measures in explaining individuals subjective well-being (e.g. Knight & Gunatilaka, 2012; Posel & Casale, 2011; Ravallion & Lokshin, 2010). Discussions of the impact of relative position on subjective well-being have focused on objective indicators of relative position (e.g. mean/median reference group consumption). In using objective indicators of relative position, we need to assume that individuals who are objectively deprived in a relative sense are also emotionally affected by that deprivation. However, Ravallion and Lokshin (2010: p.178) argue that "Differences in the objective economic welfare of one's neighbors can hardly be relevant—either positively or negatively—to one's own welfare unless those differences are known and perceived as relevant by the person in question."

Very few studies have directly examined the impact of material aspiration gaps on subjective well-being. Using macro-level data, Easterlin (2001) and Plagnol, and Easterlin (2008) show that subjective well-being depends on the gap between aspired living standard and the actual standard of living that one already has ("a shortfall"). Likewise, using micro-level data from Switzerland, Stutzer (2004: p. 97) found that coefficient estimate on income and aspirations levels are of similar absolute size but opposite sign, indicating that it is mainly the discrepancy between income and aspirations that matters for well-being. A similar study by Knight and Gunatilaka (2012), show that higher income aspiration is associated with lower-subjective well-being in China. Using data from Mexico, Castilla (2012) show that income satisfaction of the poor are influenced more by the inability to achieve income aspirations, while it is less affected by perceived income differences with respect to others. Our study contributes to this line of work by examining the relationship between relative economic position, material aspiration gaps, and subjective well-being using data from rural Ethiopia.

3. Data and Empirical strategies

3.1. Data description

We use data from the Ethiopia Rural Household survey (ERHS), which is a rich panel dataset.⁵ Collection of the panel data started in 1994; a self-weighting sampling technique was used to select 1477 households from 15 peasant associations located in four regions of the country: Amhara, Oromia, Tigray, and SNNP. Further rounds were conducted in 1995, 1997, 1999, 2004, and 2009. A detailed report on the ERHS methodology is provided by Dercon and Hoddinott (2011). We use data from the last two surveys, 2004 and 2009, because data on detailed self-assessed well-being indicators were collected only during these survey years. Household heads were asked to answer the self-assessed well-being questions in the survey. Table 1A and Table 2A provide frequency distributions and the exact wordings of the various SWB questions used in this study.

We use two questions in the survey to measure SWB: happiness and life evaluation indicators. The happiness question asked the respondent to rate his or her happiness level. This is measured on a 3-point scale; 1 indicates not happy, 3 very happy. The life evaluation question asked the respondent to rate his or her current life condition on a ladder scale in which 0 indicates “the worst possible life” and 10 indicates “the best possible life”. For the life evaluation indicator, we combine code 0 with code 1, and combine code 10 and code 9 with code 8 due to the very low number of observations for codes 0, 9, and 10. In addition to the two measures, we use a well-being indicator that asked respondents explicitly to evaluate economic well-being of a household in general. Answers to this question coded “poor” (code 1) to “rich” (code 5).

To measure social comparisons, we use the ratio of an individual’s own household consumption and the average reference group (villagers’) consumption as a measure of relative position objectively.⁶ Village is considered as a relevant reference group because, in rural settings, individuals mainly compare their living conditions with their neighbours or villagers (see Knight et al., 2009; Ravallion & Lokshin, 2010). Following Ravallion and Lokshin (2010) and others, we also use various self-reported relative position measures. In the survey,

⁵ The data set is available at: <http://www.ifpri.org/dataset/ethiopian-rural-household-surveys-erhs>.

⁶ According to Dercon and Hoddinott (2011; p. 17), the consumption data includes “all food consumption in the last week, scaled to a month (by 4.28), including purchased, from own stock and gifts. To this purchased meals were added. Non-food consumption items were restricted to direct consumables (matches, soap, linen, clothes) but exclude school and health expenditure, as well as taxes and extraordinary contributions.”

respondents were asked to compare their current living standard with the average standard in their village, with their own living standard one year ago, and with wealth of their father's at the same age.

Regarding material aspirations, we use answers from consumption adequacy questions regarding food, health, and housing expenditures as a proxy indicator of material aspiration gaps. These variables measure the gap between households' desired level of expenditure (aspirations) and actual expenditure for a household (attainments). Similar approach is used in the literature. For example, Stutzer (2004) used the difference between aspirations income and actual household income as a measure of aspiration gap. Easterlin (2001) and Plagnol and Easterlin (2008) used the difference between an individual's desired number of consumer goods and their achieved number of goods as a proxy indicator of aspiration gap (or "short fall" in consumption).

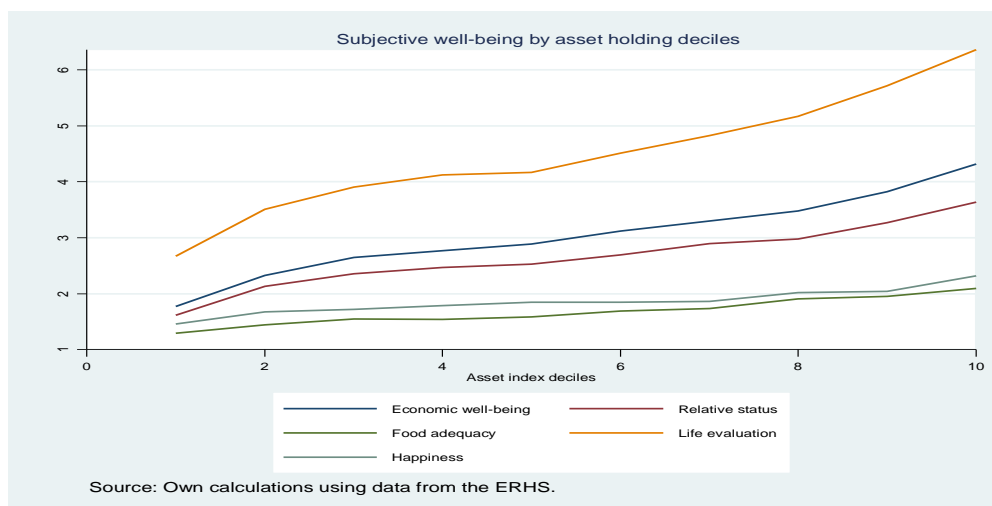


Figure 1: Distribution of responses to SWB and relative position indicators by asset holdings.

Figure 1 shows that the various SWB and relative position indicators used in this study positively associated with objective economic rankings such as asset index. We use multiple correspondence analyses to construct the asset index. Similar pattern is observed when we use consumption instead of asset index (not shown here). This result suggests that policies that affect household consumption and asset holdings would affect individuals welfare assessment. The figure also shows that when answering the SWB questions household heads mainly take into consideration household economic conditions.

3.2. Estimation Strategies

Here we assume that individuals derive utility (satisfaction) from not only their own levels of current consumption, but also from how much they consume relative to others and/or their own past consumption, and on the extent to which their material aspirations are fulfilled. The happiness, life evaluation, and economic well-being variables are used as a proxy measure of utility. Underlying each of these observed variables is the latent welfare status of the respondent, SWB_{it}^* . Following the literature (e.g. Stutzer, 2004; Knight & Gunatilaka, 2012), we define a linear relationship between the latent variable, SWB_{it}^* , and its determinants as follows:

$$SWB_{it}^* = \alpha_1 Y_{it}^r + \alpha_2 Y_{it}^{ag} + \alpha_3 Y_{it}^{rp} + X_{it}' \beta + \lambda_i + v_{it} \text{ -----[1]}$$

where i indicates the individual, t indicates the time, Y_{it}^r denotes social comparison, Y_{it}^{ag} is material aspiration gaps, Y_{it}^{rp} is current living standard compared to living standard one year earlier, X_{it}' indicates a vector of demographic and socio-economic variables that affect SWB, λ_i indicates time-persistent unobserved individual heterogeneity (e.g. personal traits or attitudes to life), v_{it} indicates random error term which is assumed to be distributed with zero means and constant variance, and $\alpha_1, \alpha_2, \alpha_3$, and β are parameters to be estimated. The control variables, X_{it}' , include respondent characteristics (age, gender, education), family compositions, household asset holdings (land and livestock), access to finance and social participation, health, village, and time dummies. Table 3A provides descriptive statistics for the control variables used in our regression analysis.

Given the ordered nature of the SWB variables, the vast majority of the literature in happiness studies have used ordered probit or ordered logit as estimation procedure. However, Ferrer-i- Carbonell and Frijters (2004) show that there is no difference in results when using linear estimation (assuming cardinality) methods such as OLS or ordered probit (or logit) estimation methods, but controlling for unobserved individual heterogeneity makes a difference in results.⁷ The advantage of linear model is that the parameters are interpretable as marginal effects. In our case, we use both OLS and panel ordered probit estimation technique to estimate

⁷ For a more detailed description and asymptotic properties of the various ordered probit estimators used in the literature, see Riedl and Geishecker (2012).

equation [1]. In addition, we estimate pooled ordered probit model to compare results. We specify a correlated random effects (CRE) procedure to model the unobserved time-invariant individual heterogeneity (Wooldridge, 2010). We assume that the time-invariant individual effect is a linear function of the exogenous variables in the model. Thus, we model the unobserved individual heterogeneity as:

$$\lambda_i = \tau_0 + \phi \bar{Z}_i + \xi_i \text{ -----}[2]$$

Here ξ_i is a new unobserved time-invariant individual heterogeneity, which is simply assumed as identically and independently distributed with mean zero and constant variance, \bar{Z}_i is average for time-varying exogenous variables in equation (1).⁸ The vector \bar{Z}_i includes family labour, household size composition, land size (own land), and respondents' age. We assume that these variables are exogenous in our model, at least in the short term. We expect that failure to fulfil material aspirations and lower current living standard compared to the past are negatively associated with SWB. The impact of lower own consumption relative to others (or perceived lower relative position), however, is ambiguous. We expect positive or no effect of relative position if altruism and risk sharing arrangements, which are common among rural communities, outweigh the envy effect of lower relative position. Otherwise, consistent with the relative income hypothesis, we expect a negative effect of lower relative position on individual's SWB.

4. Estimation results and discussions

In this section, we present the estimation results based on various model specifications. Since both the direction of the effect and significance of the variables are similar in our OLS and panel ordered probit model estimates, we use results from the OLS model in our discussions to facilitate interpretation of the coefficients. Table 1 and Table 2 present estimation results from the OLS estimates for happiness and life evaluation equations, respectively. Table 4A and Table 5A (in the appendix) present the corresponding estimates from the panel CRE ordered probit model. In addition, Table 6A in the appendix presents results from OLS model estimates using the economic well-being indicator. However, results obtained from using household economic well-being as a dependent variable are more or less the same with results obtained

⁸ Similar approach is used by Ferrer-i-Carbonell (2004; 2005) to model time-invariant individual heterogeneity in their estimation.

using the life evaluation variable, except coefficient estimates are larger in the life evaluation equation. Thus, our dissections focus on the life evaluation and happiness estimates. In all the Tables column 1 and column 4 are estimated using objective indicator of relative position (relative consumption), while in column 2 and 4 we use various individual's self-assessed relative position indicators instead of relative consumption expenditure. Column 3 and column 4 control for material aspiration gaps.

<Insert Table 1>

As expected, estimation results from both the OLS and the panel data models show that higher own household consumption is associated with higher individual SWB. The results suggest that higher own consumption increases SWB, which is consistent with similar studies in the literature (Ferrer-i-Carbonell, 2005). However, we find that the effect of own consumption significantly lower when we include self-assessed relative position indicator in our model. For example, the coefficient on own household consumption reduced from 0.75 (Table 2, column 1) to 0.22 (Table 2, column 2) for the life evaluation equation, while the corresponding figure for the happiness equation decreased from 0.13 to 0.04 (Table 1). It is also notable that the coefficient on own household consumption is larger in the life evaluation estimates compared to the happiness estimates. This result suggests that life evaluation questions strongly correlate with own consumption measures. Deaton and Stone (2013, p.592) report similar findings and argue that unlike happiness, life evaluation measures correlate more with income, education, and permanent income.

The estimated coefficient on relative consumption is not significant in the happiness equation (Table 1, column 1), while it is negative and significant in the life evaluation equation (Table 2, column 1). The negative coefficient on relative consumption suggests that the higher average consumption of others has positive effect on individual's life evaluation. However, the coefficient on relative consumption becomes positive and significant, once we control for aspiration gaps for both dependent variables (Table 1 and Table 2, column 4). These results suggest that, controlling for aspiration gaps and other factors, higher own consumption relative to the reference group consumption is associated with higher SWB. The results indicate the importance of controlling for material aspiration gaps while examining the relationship between relative position and SWB. Like the own consumption effect, the coefficient on relative consumption is larger in the case of the life evaluation model (0.22) compared to the happiness model (0.05).

We also find significant effect of relative position on both happiness and life evaluation equations when we use self-assessed relative position indicators (Table 1 and Table 2, column 2 and column 3). The estimated coefficient on one's own past comparison is negative and significant for those who reported their living standard as being much worse now than one year back (base category: the same), while SWB is higher for those who reported they are better currently compared to the past. Likewise, compared to the base category (the same in the village), individuals who consider their households as poorer in the village (poorer than average /the poorest in the village) are less likely to be happy and to report higher life satisfaction. On the other hand, individuals who consider their household as the richest in the village are more likely to report being happy and higher life satisfaction. These results indicate the absence of asymmetric structure of positional externalities and suggest that both upward and downward comparisons are important predictors of SWB.

However, evidence of asymmetry is found when we look at the size of the coefficient estimates on these variables. For example, in the life evaluation equation, the absolute value of the coefficient on the variable indicating an individual's perception of his/her household as the poorest in the village is 1.38, while it is 0.95 on the variable indicating the household perceived as the richest in the village. The corresponding figures for the happiness equation are 0.38 and 0.18, respectively (Table 1 and Table 2, column 3). In addition, evidence of asymmetry is observed when we look at the variable indicating perception of an individual's wealth relative to their father's wealth at the same age. The coefficient on this variable is negative and significant for those who reported being poorer (poorer/ a lot poorer) compared to their father at the same age (the base category: the same). It is not significant for those who reported being richer than their father. These results are consistent with the suggestion that individuals overvalue loss than gains and the extent of adaptation to rising living standards is greater than falling living standards (Duesenberry, 1949, Knight & Gunatilaka, 2012; Ferrer-i-Carbonell, 2005; Kahneman & Tversky, 1979).

Our results also show that falling behind others in a village has larger negative effect on assessing own well-being than falling behind oneself in the past or one's father's wealth at the same age. For example, the coefficient on the variable indicating an individual's perception of his/her household as the poorest in the village is 1.38, while it is 0.59 on the variables indicating the respondent perceives he/she is much worse now than last year, and it is 0.48 for those who perceived they are a lot poorer than their father (Table 2, column 3). These results may suggest

that external social comparisons are more important than internal comparisons. Furthermore, consistent with what is found by other similar studies (Knight & Gunatilaka, 2012; Posel & Casale, 2011; Ravallion & Lokshin, 2010), our results show that the estimated coefficients on self-assessed relative position indicators are larger than the objective relative position indicators. These findings suggest that self-assessed perception of relative position is more relevant in explaining subjective well-being than objective relative measures.

<Insert Table 2>

Regarding aspiration gaps, the estimated coefficient on the variable indicating material aspiration gaps regarding food expenditure is negative and significant for those who reported that food expenditure was less than adequate (base category: adequate). The coefficient ranges from -10 to -14 in the happiness equation (Table 1), while it ranges from -39 to -55 in the life evaluation equation (Table 2). Likewise, the estimated coefficient on the variable indicating housing expenditure (other than food) was less than adequate, ranges between -0.07 and -0.09 in the happiness equation, and ranges between -11 and -20 in the life evaluation (all significant). These results suggest that aspiration gaps regarding food and housing expenditures are negatively related with an individual's SWB, with the effect being stronger in the life evaluation equation than happiness. In addition, dissatisfaction with life is larger in the case of food expenditure gaps than housing expenditure gaps suggesting the hierarchy of needs.

Likewise, the coefficient on the variable indicating less than adequate health expenditure is negative in both cases; however, correlate more with happiness than life evaluation equation. The coefficient ranges between -15 and -17 in the happiness equation (and it is significant), while it ranges from -0.06 to -16 (and significant only in model 4) in the life evaluation equation. In contrast, the estimated coefficient on the variable indicating more than adequate health related expenditure is positive and significant in the life evaluation equation, while it is negative and marginally significant (only in model 3) in the happiness equation. These results may suggest that health expenditure (which is associated with presence of ill person in a house) is negatively related with emotional well-being (happiness) than life evaluation. Unlike the food and other housing expenditures, health expenditure is conditional on whether there is a need to spend on health (presence of ill person in a house). Thus, we allow for an interaction effect between the presence of ill person in a household and household health expenditure adequacy. The results remain more or less the same.

Robustness Checks

In this sub-section, we present a number of robustness checks to validate our results. The first concern in our analysis is that the subjective variables indicating aspiration gaps and relative positions could be endogenous in equation (1). Using subjective relative position indicators could lead to a biased estimate if there are subjective reporting biases. Such biases arise because respondent's feelings at the time of judgment (e.g. moods) may influence responses to life satisfaction and relative position questions. According to Schwartz and Strack (1991; p.36), moods at the time of reporting or any objective event "may influence evaluations of one's life-as-a-whole and evaluations of specific domains in opposite directions." To account for such endogeneity, we specify a reduced form equation for aspiration gaps (food adequacy only) and self-assessed relative position variables as follows:

$$Y_{it}^{ag*} = \gamma_1 Y_{it}^r + \gamma_2 Y_{it-1} + W_{it}'\theta + \zeta_{it} \text{-----} [2]$$

$$Y_{it}^{r*} = \phi_1 Y_{it-1} + Z_{it}'\pi + \eta_{it} \text{-----} [3]$$

Here, Y_{it-1} is past economic status, Z_{it}' and W_{it}' indicate other control variables, ζ_{it} and η_{it} are random error terms. We use the trivariate ordered probit model and simultaneously estimate the subjective well-being equation (1), the aspiration gaps equation (2), and the relative position equation (3). The three equations can be weakly identified based on non-linearity. However, it is suggested that proper identification requires exclusion restrictions (Roodman, 2011). As an identification strategy, we exclude variables indicating whether a household stores crops, number of months experienced food shortage, and whether an individual able to get 100 birr if needed from the happiness and life evaluation equations. We argue that these variables affect SWB mainly through their effect on food aspiration gap and relative status. Table 7A presents results from the trivariate ordered probit model estimates.

The estimated correlation coefficients between the subjective well-being, aspiration gap, and relative position equations are significant suggesting that the error terms are correlated. For the life evaluation equation, our results are not affected; except that coefficient estimates are now larger compared to the results from the CRE ordered probit model estimates. In the happiness equation, regarding comparisons with others, we find only being the poorest in the village is significantly related with happiness, while the coefficient on more food than adequate food expenditure becomes significant.

Regarding the determinants of food adequacy and relative position indicators (results not reported here), we find that perception of being relatively poor in a village and perception of being poor three years back are negatively associated with reporting adequate food expenditure, while those who reported that they were rich three years back and they are the richest in a village, and store cereals currently are more likely to report adequate food expenditure. Other variables such as family labour, family composition, and asset holdings are not related with the food adequacy response, while these variables are significant in the relative position model. More male labour and children in the house, having members with more education (higher education), and large land holding size are associated with reporting higher relative position. In addition, being a member in social networks, having radio, ability to get 100 Birr if needed are associated with reporting higher relative position. On the other hand, having family members working in wage employment, getting transfer payment, and being a female head are associated with lower relative position. These results are consistent with what we show earlier in Figure 1 that better economic conditions are associated with reporting higher SWB and relative position.

Lastly, some of the responses in our categorical variables have small cells. Only 4-8 percent of the respondents reported that they are richer than or the richest in the village, a lot richer than their father, expenditures regarding food, housing, and health is more than adequate. As a result, our model estimates may become unstable. We estimate all the tables after merging the small observations with other response for each of our categorical variables (results not reported here). Our findings remain the same.

5. Conclusions

In this paper, we examine whether an individual's relative position and material aspiration gaps are related with one's self-assessed well-being. Our results demonstrate that higher relative position measured as a ratio of own consumption and reference group consumption is positively related with higher subjective well-being. In addition, we find significant positional effects when we use various self-assessed relative position indicators. Individuals who reported lower subjective well-being are those who 1) perceive their household as the poorest in the village, 2) are fairing much worse now than their living standards in the past, and 3) are poorer than their fathers at the same age. These results suggest that multiple reference groups may jointly affect well-being. However, we find that falling behind others in a village has larger negative effect on assessing one's own well-being than falling behind oneself in the past or one's father's

wealth at the same age. This result is consistent with the hypothesis that individuals may attach different weights for different reference groups (Duesenberry, 1949; McBride, 2001).

In addition to relative position, our study shows that material aspiration gaps are important determinants of subjective well-being. Households who reported less than adequate expenditure for food, housing, and health are more likely to report lower subjective well-being. Furthermore, the estimated coefficient on the aspiration gaps variables show that coefficient estimates are relatively larger on the food expenditure gap variable followed by health expenditure. These results show significant aspiration gaps in basic needs. Recent researches suggest a link between aspiration gaps and poverty (Ray, 2003). Ray (2003) argues that very small or very large aspiration gaps discourage individuals from making welfare enhancing investments, because the distance to fill the gaps is too small or too large. In our case, inability to meet aspired level of basic needs such as food indicates large aspiration gaps, which in turn can lead to aspiration failures. In light of this, safety-net policies that will improve food-security and public health services will increase social well-being in poor countries.

References

- Abel, A. B. (2005). Optimal taxation when consumers have endogenous benchmark levels of consumption. *The Review of Economic Studies*, 72(1), 21-42.
- Akay, A., & Martinsson, P. (2011). Does relative income matter for the very poor? Evidence from rural Ethiopia. *Economics Letters*, 110(3), 213-215.
- Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development*, 40(2), 428-435.
- Akay, A., Andersson, L., Martinsson, P., & Medhin, H. (2014). Positional Concerns among the Poor: Does Reference Group Matter? Evidence from Survey Experiments. *Journal of African Economies*, 0(0), 1-27.
- Asadullah, M. N., & Chaudhury, N. (2012). Subjective well-being and relative poverty in rural Bangladesh. *Journal of Economic Psychology*, 33(5), 940-950.
- Brown, S., Gray, D., & Roberts, J. (2015). The relative income hypothesis: A comparison of methods. *Economics Letters*, 130, 47-50.
- Bookwalter, J. T., & Dalenberg, D. R. (2010). Relative to what or whom? The importance of norms and relative standing to well-being in South Africa. *World Development*, 38(3), 345-355.
- Bowles, S., & Park, Y. (2005). Emulation, Inequality, and Work Hours: Was Thorsten Veblen Right?*. *The Economic Journal*, 115(507), F397-F412.
- Clark, A. E., & Oswald, A. J. (1998). Comparison-concave utility and following behaviour in social and economic settings. *Journal of Public Economics*, 70(1), 133-155.
- Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic literature*, 46(1), 95-144.
- Clark, A. E., Kristensen, N., & Westergård-Nielsen, N. (2009). Job Satisfaction and Co-worker Wages: Status or Signal?*. *The Economic Journal*, 119(536), 430-447.
- Carlsson, F., Gupta, G., & Johansson-Stenman, O. (2008). Keeping up with the Vaishyas? Caste and relative standing in India. *Oxford Economic Papers*, 1-22.
- Castilla, C. (2012). Subjective well-being and reference-dependence: Insights from Mexico. *The Journal of Economic Inequality*, 10(2), 219-238.
- Deaton, A., & Stone, A. A. (2013). Two happiness puzzles. *The American economic review*, 103(3), 591.
- Dercon, S., & Hoddinott, J. (2011). The Ethiopian rural household surveys 1989 -2009: Introduction. Retrieved from International Household Survey website: http://catalog.ihnsn.org/index.php/catalog/5164/related_materials
- Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior*. Harvard University Press, Cambridge, MA.
- Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. *Nations and households in economic growth*, 89, 89-125.
- Easterlin, R.A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior and Organization*, 27 (1), 35– 47.

- Easterlin, R. A. (2001). Life cycle welfare: evidence and conjecture. *The Journal of Socio-Economics*, 30(1), 31-61.
- Easterlin, R. A., McVey, L. A., Switek, M., Sawangfa, O., & Zweig, J. S. (2010). The happiness–income paradox revisited. *Proceedings of the National Academy of Sciences*, 107(52), 22463-22468.
- Easterlin, R. A. (2013). Happiness, Growth, and Public Policy. *Economic Inquiry*, 51(1), 1-15.
- Fershtman, C., Murphy, K. M., & Weiss, Y. (1996). Social status, education, and growth. *Journal of Political Economy*, 104(1), 108-132.
- Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. *Journal of Public Economics*, 89(5), 997-1019.
- Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important is Methodology for the estimates of the determinants of Happiness?*. *The Economic Journal*, 114(497), 641-659.
- Frey, B. S., & Stutzer, A. (2002). What can economists learn from happiness research?. *Journal of Economic literature*, 40(2), 402-435.
- Fafchamps, M., & Shilpi, F. (2008). Subjective welfare, isolation, and relative consumption. *Journal of Development Economics*, 86(1), 43-60.
- Frank, R. H. (1985). The demand for unobservable and other nonpositional goods. *The American Economic Review*, 75(1), 101-116.
- Frank, R. H. (1999). *Luxury Fever: Money and Happiness in an Era of Excess*. Princeton: Princeton University Press.
- Frank, R. H. (2005). Positional externalities cause large and preventable welfare losses. *American Economic Review*, 95(2), 137-141.
- Frank, R.H., Levine, A.S., & Dijk, O. (2014). Expenditure Cascades. *Review of Behavioral Economics*, 1(1-2), 55-73.
- Guillen-Royo, M. (2011). Reference group consumption and the subjective wellbeing of the poor in Peru. *Journal of Economic Psychology*, 32(2), 259-272.
- Heffetz, O., & Frank, R. H. (2008). Preferences for status: Evidence and economic implications. In J. Benhabib, A. Bisin, & M. Jackson (Eds), *Handbook of Social Economics* (Vol.1, pp. 69- 91). Netherlands: North-Holland
- Hirschman, A. O., & Rothschild, M. (1973). The changing tolerance for income inequality in the course of economic development. *The Quarterly Journal of Economics*, 87(4), 544-566.
- Hopkins, E., & Kornienko, T. (2004). Running to keep in the same place: consumer choice as a game of status. *American Economic Review*, 1085-1107.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 47(2), 263-291.
- Kingdon, G. G., & Knight, J. (2007). Community, comparisons and subjective well-being in a divided society. *Journal of Economic Behavior & Organization*, 64(1), 69-90.
- Knight, J., & Gunatilaka, R. (2012). Income, aspirations and the hedonic treadmill in a poor society. *Journal of Economic Behavior & Organization*, 82(1), 67-81.

- Knight, J., Lina, S. O. N. G., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China Economic Review*, 20(4), 635-649.
- Leibenstein, H. (1950). Bandwagon, snob, and Veblen effects in the theory of consumers' demand. *The Quarterly Journal of Economics*, 64(2), 183-207.
- Leibenstein, H. (1962). Notes on welfare economics and the theory of democracy. *The Economic Journal*, 72(286), 299-319.
- Leibenstein, H. (1975). The economic theory of fertility decline. *The Quarterly Journal of Economics*, 89(1), 1-31.
- Mason, R. (2000). The social significance of consumption: James Duesenberry's contribution to consumer theory. *Journal of Economic Issues*, 34(3), 553-572.
- McBride, M. (2001). Relative-income effects on subjective well-being in the cross-section. *Journal of Economic Behavior & Organization*, 45(3), 251-278.
- Neumark, D., & Postlewaite, A. (1998). Relative income concerns and the rise in married women's employment. *Journal of public Economics*, 70(1), 157-183.
- Plagnol, A. C., & Easterlin, R. A. (2008). Aspirations, attainments, and satisfaction: Life cycle differences between American women and men. *Journal of Happiness Studies*, 9(4), 601-619.
- Pollak, R. A. (1976). Interdependent preferences. *The American Economic Review*, 309-320.
- Posel, D. R., & Casale, D. M. (2011). Relative standing and subjective well-being in South Africa: The role of perceptions, expectations and income mobility. *Social Indicators Research*, 104(2), 195-223.
- Ray, D. (2003). Aspirations, poverty and economic change. Retrieved from New York University website: <https://www.nyu.edu/econ/user/debraj/Papers/povasp01.pdf>
- Ravallion, M., & Lokshin, M. (2010). Who cares about relative deprivation?. *Journal of Economic Behavior & Organization*, 73(2), 171-185.
- Riedl, M., & Geishecker, I. (2012). Ordered response models and non-random personality traits: Monte Carlo simulations and a practical guide. CEGE Discussion Papers, 116. Retrieved from: <http://wwwuser.gwdg.de/~cege/Diskussionspapiere/DP116.pdf>
- Roodman, D. (2011). Fitting fully observed recursive mixed-process models with cmp. *The Stata Journal*, 11(2), 159-206.
- Schwarz, N. & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwartz (Eds.), *Subjective Well-Being: An Interdisciplinary Perspective* (pp. 27– 48). Oxford: Pergamon Press.
- Scitovsky, T. (1976). *The joyless economy: An inquiry into human satisfaction and consumer dissatisfaction*. Oxford: Oxford University Press.
- Senik, C. (2004). When information dominates comparison: Learning from Russian subjective panel data. *Journal of Public Economics*, 88(9), 2099-2123.
- Solnick, S. J., & Hemenway, D. (1998). Is more always better?: A survey on positional concerns. *Journal of Economic Behavior & Organization*, 37(3), 373-383.
- Solnick, S. J., & Hemenway, D. (2005). Are positional concerns stronger in some domains than in others?. *American Economic Review*, 95(2), 147-151.

Stutzer, A. (2004). The role of income aspirations in individual happiness. *Journal of Economic Behavior & Organization*, 54(1), 89-109.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. Cambridge: MIT Press.

Appendix

Table 1: OLS estimates for happiness equation

| | (1) | (2) | (3) | (4) |
|--|------------------|--------------------|--------------------|--------------------|
| Log consumption | 0.13** (0.05) | 0.04** (0.02) | | |
| Log consumption gap | -0.05 (0.06) | | | 0.05** (0.02) |
| The Poorest in the village | | -0.54*** (0.04) | -0.38*** (0.04) | |
| Poorer than average in the village | | -0.25*** (0.03) | -0.18*** (0.03) | |
| Richer than average villager | | 0.06 (0.05) | 0.03 (0.05) | |
| The Richest in the village | | 0.25*** (0.05) | 0.18*** (0.05) | |
| Less than adequate food expenditure | | | -0.10*** (0.03) | -0.14*** (0.03) |
| More than adequate food expenditure | | | 0.06 (0.06) | 0.06 (0.06) |
| Less than adequate housing expenditure | | | -0.07** (0.03) | -0.09*** (0.03) |
| More than adequate housing expenditure | | | 0.02 (0.05) | 0.03 (0.05) |
| Less than adequate health expenditure | | | -0.15*** (0.03) | -0.17*** (0.03) |
| More than adequate health expenditure | | | -0.09* (0.05) | -0.07 (0.05) |
| Much better now than last year | | | 0.19*** (0.06) | 0.22*** (0.06) |
| A little better now than last year | | | 0.11*** (0.03) | 0.13*** (0.04) |
| A little worse now than last year | | | 0.01 (0.03) | -0.01 (0.04) |
| Much worse now than last year | | | -0.12*** (0.04) | -0.21*** (0.04) |
| A lot richer than my father | | | 0.08 (0.07) | 0.08 (0.08) |
| Richer than my father | | | -0.02 (0.05) | -0.02 (0.05) |
| Poorer than my father | | | 0.01 (0.04) | -0.01 (0.04) |
| A lot poorer than my father | | | -0.08 (0.06) | -0.14** (0.06) |
| Observations | 2,385 | 2,385 | 2,338 | 2,338 |
| R-squared | 0.165 | 0.248 | 0.290 | 0.256 |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: OLS estimates for life evaluation equation

| | (1) | (2) | (3) | (4) |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Log consumption | 0.75*** (0.14) | 0.22*** (0.05) | | |
| Log consumption gap | -0.41*** (0.14) | | | 0.22*** (0.05) |
| The Poorest in the village | | -1.77*** (0.09) | -1.38*** (0.09) | |
| Poorer than average in the village | | -1.02*** (0.08) | -0.84*** (0.08) | |
| Richer than average villager | | 0.87*** (0.12) | 0.75*** (0.12) | |
| The Richest in the village | | 1.06*** (0.14) | 0.95*** (0.14) | |
| Less than adequate food exp. | | | -0.39*** (0.07) | -0.55*** (0.08) |
| More than adequate food exp. | | | 0.03 (0.13) | 0.08 (0.15) |
| Less than adequate housing exp. | | | -0.11* (0.06) | -0.20*** (0.07) |
| More than adequate housing exp. | | | -0.11 (0.12) | 0.01 (0.14) |
| Less than adequate health exp. | | | -0.06 (0.06) | -0.16** (0.07) |
| More than adequate health exp. | | | 0.37*** (0.12) | 0.47*** (0.12) |
| Much better now than last year | | | 0.12 (0.14) | 0.26* (0.15) |
| A little better now than last year | | | 0.08 (0.08) | 0.16* (0.09) |
| A little worse now than last year | | | -0.11 (0.08) | -0.19** (0.09) |
| Much worse now than last year | | | -0.59*** (0.10) | -0.92*** (0.10) |
| A lot richer than my father | | | 0.09 (0.15) | 0.13 (0.17) |
| Richer than my father | | | 0.02 (0.11) | 0.00 (0.12) |
| Poorer than my father | | | -0.26*** (0.10) | -0.38*** (0.11) |
| A lot poorer than my father | | | -0.48*** (0.14) | -0.74*** (0.15) |
| Observations | 2,385 | 2,385 | 2,338 | 2,338 |
| R-squared | 0.296 | 0.449 | 0.479 | 0.398 |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.

Table 1A: Distribution of individuals by subjective well-being

| | 2004 | 2009 |
|---|-------|-------|
| Happiness | | |
| <i>Taken all together, how would you say things are for you these days? Would you say you are:</i> | | |
| 1)Not too happy | 35.7 | 25.0 |
| 2)Pretty happy | 52.53 | 59.35 |
| 3) Very happy | 11.77 | 15.65 |
| Life evolution question | | |
| <i>Suppose we say that the top of a ladder represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time?</i> | | |
| 0 (the worst possible life) | 1.17 | 0.62 |
| 1 | 4.52 | 5.06 |
| 2 | 9.28 | 9.74 |
| 3 | 15.9 | 16.74 |
| 4 | 17.38 | 16.04 |
| 5 | 29.85 | 24.07 |
| 6 | 10.37 | 15.03 |
| 7 | 5.92 | 6.78 |
| 8 | 3.82 | 4.28 |
| 9 | 1.4 | 1.48 |
| 10 (the best possible life) | 0.39 | 0.16 |
| Household economic well-being | | |
| <i>Just thinking about your own household circumstances, would you describe your household as:</i> | | |
| 1)Poor | 20.42 | 13.16 |
| 2)Never had enough | 12.7 | 12.77 |
| 3)Can manage | 29.93 | 32.71 |
| 4)Comfortable | 30.4 | 33.8 |
| 5) Rich | 6.55 | 7.55 |

Source: Own calculations using data from ERHS. Note: For the purpose of our empirical analysis, the responses to the happiness and economic well-being questions were recoded into ascending order. Regarding the life evaluation question, we combine code 0 with code 1, and combine code 10 and code 9 with code 8.

Table 2A: Distribution of individuals by perceived relative status and material aspiration gaps

| | 2004 | 2009 |
|---|-------|-------|
| <i>Compared to other households in this village, would you describe your household as:*</i> | | |
| 1) Poorest | 21.75 | 16.51 |
| 2) Poorer than average | 18.08 | 17.45 |
| 3) About average | 47.00 | 54.28 |
| 4) Richer than average | 6.70 | 6.62 |
| 5) Richest | 6.47 | 5.14 |
| <i>How do you compare the overall economic situation of the household with one year ago?</i> | | |
| 1) Much better now | 8.00 | 4.70 |
| 2) A little better now | 29.06 | 32.46 |
| 3) Same | 25.49 | 15.50 |
| 4) A little worse now | 26.96 | 32.31 |
| 5) Much worse now | 10.49 | 15.03 |
| <i>How does your household's wealth compare with that of your father at about the same age?</i> | | |
| 1) A lot richer | 4.21 | 5.69 |
| 2) Richer | 16.91 | 21.96 |
| 3) About the same | 10.52 | 4.83 |
| 4) Poorer | 55.11 | 55.69 |
| 5) A lot poorer | 8.18 | 8.72 |
| <i>Concerning your family's food consumption over the past month, which of the following is true?</i> | | |
| 1) It was less than adequate for the family | 39.20 | 39.33 |
| 2) It was just adequate for the family | 54.17 | 54.28 |
| 3) It was more than adequate for the family | 5.85 | 6.23 |
| <i>Concerning your family's housing expenditure, which of the following is true?</i> | | |
| 1) It was less than adequate for the family | 40.22 | 33.80 |
| 2) It was just adequate for the family | 51.36 | 58.41 |
| 3) It was more than adequate for the family | 7.72 | 7.63 |
| <i>Concerning your family's health expenditure, which of the following is true?</i> | | |
| 1) It was less than adequate for the family | 41.70 | 33.10 |
| 2) It was just adequate for the family | 50.27 | 59.35 |
| 3) It was more than adequate for the family | 5.77 | 7.40 |

Source: Own calculations using data from ERHS. Note: * answers to this question were coded from 1 (the riches in the village) to 7 (the poorest in the village). We combined code 2 (amongst the riches in the village) with code 1, and code 6 (amongst the poorest in the village) with code 7. Then, responses were recoded into ascending order.

Table 3A: Descriptive statistics of variables used in the regression models.

| Variables | 2004 (n=1135) | | 2009(n=1255) | |
|---|---------------|-------|--------------|-------|
| | Mean | S.D. | Mean | S.D. |
| Male family labour (numbers) | 1.44 | 1.04 | 1.46 | 1.10 |
| Female family labour(numbers) | 1.51 | 0.93 | 1.55 | 0.93 |
| Family members aged <15 | 2.63 | 1.85 | 2.39 | 1.85 |
| Family members aged >65 | 0.27 | 0.52 | 0.34 | 0.56 |
| Head sex (1 , if female) | 28.11 | 0.45 | 31.31 | 0.46 |
| Head can read and write | 36.48 | 0.48 | 48.61 | 0.50 |
| Head age(years) | 50.50 | 14.80 | 52.72 | 15.05 |
| <i>Households with (%)</i> | | | | |
| Land size(< 0.5 ha) | 22.03 | 0.41 | 20.72 | 0.41 |
| Land size (>0.5 and <=1 ha) | 15.77 | 0.36 | 19.28 | 0.39 |
| Land size (>1 and <=3 ha) | 49.07 | 0.50 | 44.94 | 0.50 |
| Land size (>3 ha) | 13.13 | 0.34 | 15.06 | 0.36 |
| Livestock value (log) | 5.24 | 5.09 | 5.48 | 5.11 |
| Self-employed person in a house (1, if yes) | 34.71 | 0.48 | 39.04 | 0.49 |
| Wage employed person in a house (1, if yes) | 37.97 | 0.49 | 35.70 | 0.48 |
| Get transfer payment (1, if yes) | 38.41 | 0.49 | 54.74 | 0.50 |
| A member of <i>equb</i> (1, if yes) | 17.00 | 0.38 | 13.78 | 0.34 |
| Participate in labour sharing (1, if yes) | 44.14 | 0.50 | 39.04 | 0.49 |
| Own a radio (1, if yes) | 14.63 | 0.35 | 49.16 | 0.50 |
| Can get 100 birr if needed (1, if yes) | 76.21 | 0.43 | 73.15 | 0.44 |
| Store crop currently (1, if yes) | 66.78 | 0.47 | 78.80 | 0.41 |
| Ill person in the past 4 weeks (1, if yes) | 42.83 | 0.50 | 51.39 | 0.50 |

Source: Own calculations using ERHS data.

Table 4A: CRE panel ordered probit estimates for happiness equation

| | (1) | (2) | (3) | (4) |
|------------------------------------|-------------------|--------------------|--------------------|--------------------|
| Log consumption | 0.29*** (0.11) | 0.09** (0.04) | | |
| Log consumption gap | -0.13 (0.12) | | | 0.10** (0.04) |
| The Poorest in the village | | -1.19*** (0.09) | -0.90*** (0.10) | |
| Poorer than average in the village | | -0.50*** (0.07) | -0.38*** (0.08) | |
| Richer than average villager | | 0.11 (0.10) | 0.06 (0.10) | |
| The Richest in the village | | 0.50*** (0.10) | 0.38*** (0.11) | |
| Less than adequate food exp. | | | -0.23*** (0.07) | -0.30*** (0.07) |
| More than adequate food exp. | | | 0.13 (0.13) | 0.13 (0.13) |
| Less than adequate housing exp. | | | -0.16** (0.07) | -0.21*** (0.07) |
| More than adequate housing exp. | | | 0.04 (0.11) | 0.08 (0.11) |
| Less than adequate health exp. | | | -0.34*** (0.06) | -0.39*** (0.06) |
| More than adequate health exp. | | | -0.20* (0.11) | -0.15 (0.11) |
| Much better now than last year | | | 0.43*** (0.13) | 0.49*** (0.13) |
| A little better now than last year | | | 0.24*** (0.08) | 0.28*** (0.08) |
| A little worse now than last year | | | 0.02 (0.08) | -0.02 (0.08) |
| Much worse now than last year | | | -0.32*** (0.11) | -0.52*** (0.11) |
| A lot richer than my father | | | 0.17 (0.16) | 0.15 (0.17) |
| Richer than my father | | | -0.04 (0.10) | -0.04 (0.11) |
| Poorer than my father | | | 0.02 (0.10) | -0.02 (0.10) |
| A lot poorer than my father | | | -0.21 (0.14) | -0.35** (0.14) |
| Observations | 2,385 | 2,385 | 2,338 | 2,338 |
| Number of individuals | 1,299 | 1,299 | 1,292 | 1,292 |
| sigma2_u | 0.11** (0.05) | 0.03 (0.05) | 0.05 (0.05) | 0.10* (0.05) |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5A: CRE panel ordered probit estimates for life evaluation equation

| | (1) | (2) | (3) | (4) |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Log consumption | 0.56*** (0.10) | 0.18*** (0.04) | | |
| Log consumption gap | -0.31*** (0.10) | | | 0.17*** (0.04) |
| The Poorest in the village | | -1.43*** (0.08) | -1.15*** (0.08) | |
| Poorer than average in the village | | -0.78*** (0.06) | -0.66*** (0.07) | |
| Richer than average villager | | 0.67*** (0.10) | 0.58*** (0.10) | |
| The Richest in the village | | 0.83*** (0.12) | 0.75*** (0.12) | |
| Less than adequate food exp. | | | -0.32*** (0.06) | -0.42*** (0.06) |
| More than adequate food exp. | | | 0.02 (0.11) | 0.06 (0.12) |
| Less than adequate housing exp. | | | -0.08 (0.05) | -0.14*** (0.05) |
| More than adequate housing exp. | | | -0.09 (0.10) | 0.01 (0.10) |
| Less than adequate health exp. | | | -0.05 (0.05) | -0.12** (0.05) |
| More than adequate health exp. | | | 0.31*** (0.10) | 0.37*** (0.10) |
| Much better now than last year | | | 0.11 (0.11) | 0.20* (0.11) |
| A little better now than last year | | | 0.07 (0.07) | 0.13* (0.07) |
| A little worse now than last year | | | -0.09 (0.07) | -0.14** (0.06) |
| Much worse now than last year | | | -0.51*** (0.09) | -0.74*** (0.08) |
| A lot richer than my father | | | 0.08 (0.12) | 0.10 (0.13) |
| Richer than my father | | | 0.00 (0.09) | -0.01 (0.09) |
| Poorer than my father | | | -0.22*** (0.08) | -0.29*** (0.08) |
| A lot poorer than my father | | | -0.43*** (0.11) | -0.60*** (0.12) |
| Observations | 2,385 | 2,385 | 2,338 | 2,338 |
| Number of individuals | 1,299 | 1,299 | 1,292 | 1,292 |
| sigma2_u | 0.10** (0.04) | 0.03 (0.03) | 0.02 (0.03) | 0.05 (0.04) |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6A: OLS estimates for economic well-being equation

| | (1) | (2) | (3) | (4) |
|------------------------------------|-------------------|--------------------|--------------------|--------------------|
| Log consumption | 0.34*** (0.09) | 0.13*** (0.02) | | |
| Log consumption gap | -0.06 (0.09) | | | 0.19*** (0.03) |
| The Poorest in the village | | -1.67*** (0.05) | -1.48*** (0.06) | |
| Poorer than average in the village | | -0.78*** (0.05) | -0.67*** (0.05) | |
| Richer than average villager | | 0.63*** (0.06) | 0.55*** (0.06) | |
| The Richest in the village | | 0.95*** (0.06) | 0.87*** (0.06) | |
| Less than adequate food exp. | | | -0.30*** (0.04) | -0.46*** (0.05) |
| More than adequate food exp. | | | 0.05 (0.07) | 0.09 (0.09) |
| Less than adequate housing exp. | | | -0.09** (0.04) | -0.19*** (0.05) |
| More than adequate housing exp. | | | 0.13** (0.06) | 0.23*** (0.08) |
| Less than adequate health exp. | | | -0.06 (0.04) | -0.15*** (0.05) |
| More than adequate health exp. | | | 0.12** (0.06) | 0.21*** (0.08) |
| Much better now than last year | | | 0.03 (0.07) | 0.17* (0.09) |
| A little better now than last year | | | 0.05 (0.04) | 0.12** (0.05) |
| A little worse now than last year | | | -0.04 (0.05) | -0.11** (0.05) |
| Much worse now than last year | | | -0.20*** (0.06) | -0.56*** (0.07) |
| A lot richer than my father | | | -0.04 (0.08) | -0.03 (0.11) |
| Richer than my father | | | -0.08 (0.06) | -0.09 (0.07) |
| Poorer than my father | | | -0.18*** (0.05) | -0.28*** (0.06) |
| A lot poorer than my father | | | -0.19*** (0.07) | -0.46*** (0.09) |
| Observations | 2,385 | 2,385 | 2,338 | 2,338 |
| R-squared | 0.330 | 0.613 | 0.642 | 0.461 |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Cluster-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7A: trivariate ordered probit estimates.

| | Life evaluation | Happiness | Economic well-being |
|------------------------------------|--------------------|--------------------|------------------------|
| The Poorest in the village | -1.39*** (0.17) | -0.61** (0.25) | -1.57*** (0.18) |
| Poorer than average in the village | -0.75*** (0.11) | -0.20 (0.15) | -0.65*** (0.11) |
| Richer than average villager | 0.72*** (0.13) | -0.07 (0.15) | 0.75*** (0.14) |
| The Richest in the village | 0.95*** (0.19) | 0.09 (0.23) | 1.23*** (0.20) |
| Less than adequate food exp. | -1.03*** (0.11) | -0.93*** (0.20) | -1.43*** (0.08) |
| More than adequate food exp. | 0.87*** (0.15) | 0.93*** (0.23) | 1.30*** (0.11) |
| Less than adequate housing exp. | -0.05 (0.05) | -0.13** (0.06) | -0.10** (0.05) |
| More than adequate housing exp. | -0.08 (0.09) | 0.03 (0.10) | 0.17** (0.08) |
| Less than adequate health exp. | -0.04 (0.05) | -0.30*** (0.06) | -0.05 (0.05) |
| More than adequate health exp. | 0.28*** (0.08) | -0.18* (0.10) | 0.20** (0.09) |
| Much better now than last year | 0.09 (0.09) | 0.40*** (0.11) | 0.08 (0.09) |
| A little better now than last year | 0.06 (0.06) | 0.23*** (0.07) | 0.07 (0.06) |
| A little worse now than last year | -0.05 (0.06) | 0.04 (0.07) | -0.02 (0.06) |
| Much worse now than last year | -0.39*** (0.08) | -0.26*** (0.10) | -0.25*** (0.08) |
| A lot richer than my father | 0.05 (0.11) | 0.16 (0.14) | -0.05 (0.12) |
| Richer than my father | -0.02 (0.08) | -0.05 (0.10) | -0.13 (0.08) |
| Poorer than my father | -0.19*** (0.07) | 0.04 (0.09) | -0.23*** (0.07) |
| A lot poorer than my father | -0.37*** (0.10) | -0.17 (0.13) | -0.27*** (0.10) |
| Observations | 2,390 | 2,390 | 2,390 |
| Rho_12 | -0.42*** | -0.49*** | -0.78*** |
| Rho_13 | -0.29*** | 0.02 | -0.06 |
| Rho_23 | -0.35*** | -0.38*** | -0.33*** |

Source: Own calculations using data from ERHS. Note: All estimates control for respondent characteristics (age, gender, education), family compositions, household asset holdings, access to finance and labour markets, social participation, village, time dummies, and time averages of time-varying exogenous covariates. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1