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Life Satisfaction in Urban Ethiopia

*The Role of Relative Poverty and Unobserved
Heterogeneity*

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Life-Satisfaction in Urban Ethiopia: The Role of Relative Poverty and Unobserved Heterogeneity*

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Abstract

Unlike most studies of subjective well-being in developing countries, we use a fixed effects regression on three rounds of rich panel data to investigate the impact of relative standing on life satisfaction of respondents in urban Ethiopia. We find a consistently large negative impact of relative standing - both relative to others and to oneself over time - on subjective well-being. However, controlling for unobserved heterogeneity through a fixed effects model reduces the impact of the relative standing variables on subjective well-being by up to 24 percent and reduces the impact of economic status by about 40 percent. Our findings highlight the need to be cautious in interpreting parameter estimates from subjective well-being regressions based on cross-sectional data, as the impact of variables may not be disentangled from that of unobserved heterogeneity.

JEL Classification: O12, I30, I31.

Keywords: Life Satisfaction; Urban Ethiopia; Relative Standing; Fixed Effects.

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1 Introduction

Economic growth in industrialized countries over the past few decades did not result in improved subjective well-being (SWB) of citizens. This finding, known in the SWB literature as the “Easterlin Paradox”, is mainly a result of the fact that subjective well-being is a positive function of income but a negative function of relative income (Easterlin, 1974; 1995). In this paper, we study the impact of relative standing on SWB in a developing country framework using three rounds of rich panel data and account for individual fixed effects (unobserved heterogeneity). In a subjective well-being study, fixed effects are personality traits such as gloomy or cheery personality. Once personality traits - which explain about 45 percent of the variation in SWB in urban Ethiopia - are accounted for, we show that income and relative standing have much less impact on subjective well-being.

Recognition of the impact of relative standing on well-being in the discipline of economics dates back to the times of Adam Smith and Karl Marx. In his influential work the *Wealth of Nations*, Smith (1776) articulated the role of relative standing using the example of English women who desired better quality clothing than that worn by Scottish women, to signal that they were more prestigious members of the society. So did Marx (1847) in one of his classic works, *Wage Labor and Capital*, where he pointed out the role of relative position in society by arguing about the unacceptability of the presence of a small house next to a palace. Relatively recently, Easterlin (1974; 1995) undertook the most frequently referred economic analysis on the topic by pointing out that people do compare their income levels with others and that, when income increases, so do aspirations, resulting in little change in the level of reported subjective well-being in response to a change in income over time.

A large proportion of the economic studies on SWB in general and those focusing on the impact of relative standing in particular come from studies undertaken in industrialized countries. Following Easterlin’s hypothesis, various studies undertaken in these countries¹ indicate that there is a positive but diminishing impact of income on SWB, mainly due to the role of relative income, which negatively affects SWB. This phenomenon has been explained in the literature based on the standard “envy effects”, i.e., people feel negative when others in their reference group do better (Clark and Senik 2010). Parallel to these findings, a positive impact of relative income has been documented. People also feel well-off when others in their reference group do better than them. Higher earnings of colleagues working in the same company may imply positive prospects for one’s own future income (Clark et al. 2009a), which positively affects SWB. There is also evidence suggesting that respondents may report a higher level of SWB when their neighbors are richer, which may result in positive externalities in creating local social capital in the community (Clark et al. 2009b).

Consistent with the “envy effects” findings from industrialized countries, the relatively few studies undertaken in developing countries² also document the strong negative impact of relative

¹E.g., McBride (2001); Blanchflower and Oswald (2004); Luttmer (2005); Ferrer-i-Carbonell (2005); Graham and Felton (2006); Caporale et al., (2009); and Clark et al., (2009).

²E.g., Fafchamps and Shilpi (2009) in Nepal; Guillen-Royo (2011) in Peru; Carlsson, Gupta, and Johansson-Stenman (2009) in India; Knight, Song, and Gunatilaka (2009); and Knight and Gunatilaka (2010) in China; and

standing on SWB of respondents. A similar finding has been documented by Ravallion and Lokshin (2010), who find a negative impact on SWB only among the rich section of the community in Malawi. Kingdon and Knight (2007) and Bookwalter and Dalenberg (2009), on the other hand, find a positive impact of the income of close neighbors in South Africa. More recently, Alem and Colmer (2013) investigate the impact of climate variability on SWB of farmers in rural Ethiopia and also show that relative poverty is one important determinant of SWB in rural communities.

All of these studies conducted in developing countries (with the exception of Alem and Colmer (2013), who used two rounds of panel data) used cross-sectional data, which does not allow controlling for unobserved heterogeneity. Given the fact that most explanatory variables would likely be correlated with unobserved heterogeneity - which makes it difficult to disentangle their impact on SWB - it is important to use credible econometric techniques to address this issue. Ferrer-i-Carbonell & Frijters (2004) point out that controlling for unobserved heterogeneity can influence the findings regarding what does and does not determine SWB. However, doing so requires one to have panel data that tracks and collects information from respondents over time, which is difficult to find in developing countries. In addition, with panel data, it is possible to see trends of variables over time, which could give interesting insights.

The current paper builds on existing studies and investigates the impact of relative standing on SWB on households in urban Ethiopia using three rounds of rich panel data spanning a decade. The data set contains detailed information on comparisons of respondents with others, with oneself over time, and with anticipated changes in the future, which enables us to compare the differences in the magnitude of the impact of these variables on SWB. Ethiopia is one of the least-developed countries and has recently experienced rapid but inflationary economic growth (CIA, 2013) that has had clear welfare impacts on the urban population. In this context, analysis of the impact of relative standing on SWB, applying robust empirical models to panel data spanning a long period of time, provides an important opportunity to add to the growing stock of knowledge on relative position and SWB in developing countries.

Fixed effects regression results suggest that comparisons both with others and with oneself over time have significant negative impacts on life satisfaction in urban Ethiopia. Respondents who perceive themselves to be poorer than their comparison group, those who perceive a decline in their standard of living, and those anticipating negative achievement in the future report a consistently lower level of life satisfaction. However, controlling for time-invariant unobserved heterogeneity results in strikingly large changes in the magnitude of relative standing and other explanatory variables. When a fixed effects approach is used, the impact of the relative standing variables on subjective well-being declines by up to 24 percent and that of economic status by 40 percent, indicating that a large proportion of the variation in SWB is explained by unobservables. Regression results also show that comparison to others has the largest effect on SWB and that past achievements have a greater effect than anticipated achievements. We highlight the need to be cautious in interpreting parameter estimates from subjective well-being regressions based on cross-sectional data, as the impact of variables may not be disentangled from that of unobserved

Asadullah and Chaudhury, (2012), in Bangladesh.

heterogeneity.

The remainder of the paper is organized as follows. Section 2 presents the data and the empirical strategy. Section 3 presents descriptive statistics of relevant variables. Section 4 presents results from alternative panel data models for SWB regressions. Section 5 concludes the paper.

2 Data and Empirical Strategy

We use three rounds of panel data from the Ethiopian Urban Socioeconomic Survey (EUSS), collected in 2000, 2004, and 2009. EUSS is a rich data set containing several socioeconomic variables at the individual and household level. The first two waves of the data used in this paper were collected by the Department of Economics of Addis Ababa University in collaboration with the University of Gothenburg, and covered seven of the country’s major cities: the capital Addis Ababa, Awassa, Bahir Dar, Dessie, Dire Dawa, Jimma, and Mekelle.³ Representativeness of the major socioeconomic characteristics of the Ethiopian urban population was taken into consideration when selecting the cities initially. About 1,500 households were distributed over the cities, in proportion to the cities’ population, and the sample households were recruited from half of the kebelles (the lowest administrative units) in all woredas (districts) in each city.

We conducted the last wave of the survey (EUSS 2009) in late 2008 and early 2009 from a subsample of the original sample in four cities (Addis Ababa, Awassa, Dessie, and Mekelle), comprising 709 households.⁴ These cities were carefully selected to represent the major urban areas of the country and the original sample.⁵ Out of the 709 households surveyed, 128 were new randomly chosen households incorporated into the sample. The new households were surveyed to address the concern that the group of panel households might have become unrepresentative since 1994 when it was formed. Alem & Söderbom (2012) address this and show that there is no systematic difference between the new households and the old panel households, which implies that the panel households represent urban Ethiopia reasonably well. In addition to a specific module on SWB, the data set contains detailed information on households’ living conditions, including income, expenditure, demographics, health, education, labor market status, asset ownership, and other individual- and household-level variables.

Following most subjective well-being studies in the literature, the current paper uses responses from the following survey question as a dependent variable: “Taking everything into account, how satisfied is the household with the way it lives these days?”⁶ The respondent can answer on a scale from 1 and 5, where 1 stands for very dissatisfied to 5 for very satisfied.

Studies in psychology assume the respondent’s well-being S to be cardinal and estimate the

³Data from these major urban areas were also collected in 1994, 1995, and 1997 (see AAU & GU 1995 for details on sampling). However, the waves before 2000 did not incorporate questions on life satisfaction.

⁴Other cities were not covered due to resource constraints.

⁵See Alem & Söderbom (2012) for a detailed description of EUSS - 2008/09

⁶The life satisfaction question in 2009 was asked as, “Taking everything into account, how satisfied are you with the way you live these days?”. We assume that, in both responses, individuals respond based on how well the household is doing and control for both individual and household-level variables. This is a reasonable assumption even in the context of developed countries (see e.g., Clark et al. 2009), as is shown in our results section.

corresponding subjective well-being regression using linear models such as OLS. Thus, a linear model of life satisfaction for data with a panel dimension can be specified as:

$$s_{it} = x'_{it}\beta + \epsilon_{it} \quad (1)$$

$$\epsilon_{it} = \alpha_i + u_{it} \quad (2)$$

where x_{it} represents a vector of explanatory variables; α_i is a term capturing unobserved individual heterogeneity such as personality and motivation; and u_{it} is a normally and independently distributed error term with mean zero and variance normalized to one. The subscripts i and t refer to individuals and time periods, respectively. The fundamental problem that one faces in estimating equation (1) using OLS is the possible correlation between x_{it} and ϵ_{it} , mainly due to the presence of α_i . If such a correlation does not exist, i.e., if $E(x_{it}, \epsilon_{it}) = 0$, OLS would be consistent. However, with this assumption fulfilled, the Random Effects model, which works in a Generalized Least Square (GLS) framework that exploits the correlation of ϵ_{it} over time, would yield a more efficient estimator of the parameters in β .

Very often in applied research, however, the assumption that $E(x_{it}, \epsilon_{it}) = 0$ is a strong one, even though the u_{it} s are independently distributed. There are a number of cases under which some of the explanatory variables would be correlated with the unobserved heterogeneity term α_i . For example, in the context of the subjective well-being equation we formulated above, perception about relative standing, changes in living standard, and expectations about the future would be correlated with unobserved individual heterogeneity. α_i could also be correlated with many other variables such as educational achievement, as some household members may have a higher level of motivation to go to school. The most credible way of taking care of the unobserved heterogeneity term is application of the fixed effects model, which works through OLS estimation of the within transformation of the basic equation stated in (1). One limitation of this estimator, however, is that the coefficients of time-invariant observable characteristics cannot be identified, as they are dropped through the within transformation. If the interest is focused on the time-varying variables of the model, however, the fixed effects estimator provides the most robust parameter estimates (Wooldridge, 2010).

As an alternative to the linear models stated above, SWB regressions can be estimated using ordered probit/logit models, taking the ordinal nature of the responses into account. Several previous studies documented that the determinants of subjective well-being remain virtually the same whether one treats SWB as ordinal or cardinal.⁷ Given the fact that the fixed effects estimator is the most robust panel data model in dealing with unobserved individual heterogeneity (when panel data is available), and due to ease of estimation and interpretation, a number of previous studies on the subject used this method to analyze the determinants of SWB.⁸ In this paper, we primarily use this model to estimate SWB regressions and examine the impact of relative standing on SWB in urban Ethiopia.

⁷Refer Ferrer-i-Carbonell and Frijters (2004) for details.

⁸See e.g., Clark et al. (2009), Ferrer-i-Carbonell and Frijters (2004), Carroll et al., (2009), Alem and Colmer (2013).

3 Variables and Descriptive Statistics

We hypothesize that, controlling for city and time fixed effects, SWB depends on three categories of variables: economic and comparison variables, other household-level variables, and individual respondent characteristics. These general categories are composed of the specific variables shown in the descriptive statistics presented in Table 1.

Table 1 about here

The economic and comparison variables constitute the log value of real consumption expenditure, relative poverty, change in standard of living over the past five years, and expectation of how life will be in the future. Following the conventional practice in developing countries, our consumption measure is used as a proxy for income, and consists of expenditures on both food and nonfood items. The consumption expenditure aggregated at the household level has been adjusted for spatial and temporal price differences, using carefully constructed price indices from the survey. In order to take account of economies of scale and differences in needs, we computed consumption expenditure in adult equivalent units.

Respondents in our survey were asked to compare their poverty status with the community they live in for which they responded very rich, rich, middle income, poor, or very poor. From these responses, we created three categories comprising rich, middle income and poor. We also control for another comparison variable of oneself over time, which was constructed from the responses to the question: "What do you say about your general standard of living today compared to that of five years ago?", for which responses were given as the same, deteriorated, or improved. The other comparison variable we control for is one related to expectation about the future. The variable has been constructed from responses to the question "How do you think life will be in your community one year from now?", for which we categorized the responses as better, the same, or worse. In addition to these variables, our life satisfaction regression control for other household-level, demographic, and respondent personal characteristics. Because we have panel data collected from four cities in three rounds, we control for city and time fixed effects.

Table 2 presents selected macroeconomic indicators for Ethiopia during the period of rapid economic growth (2004-2009). Real GDP grew by 11 percent per year, on average, during this period. However, economic growth was followed by rapid inflation, with the average inflation level reaching a peak of 55.2% in June 2008. Food price inflation, which was 92% at the same time, was the main driver of the general inflation in the country. This food price inflation adversely affected the welfare of a significant proportion of the Ethiopian urban community, as documented by Alem & Söderbom (2012), and Alem and Köhlin (2013).

Table 2 about here

Table 3 presents trends in life satisfaction among households in urban Ethiopia for the period under analysis. The figure shows that the reported level of life satisfaction in urban Ethiopia is low on average: in 2009, 23% reported "Neutral" (neither satisfied nor dissatisfied) and about 39% chose either dissatisfied or very dissatisfied in life.⁹ These figures compare unfavorably with

⁹Only about 3% of the respondents chose the "very satisfied" response and hence we combined the "very satisfied" and "satisfied" responses.

the average reported levels of life satisfaction from many countries documented by Frey & Stutzer (2002). Table 3 also reveals that there was a substantial decline in reported level of life satisfaction during the period of rapid economic growth (2004-2009). In 2004, for instance, 47 percent of the respondents in urban Ethiopia reported being either satisfied or very satisfied with life. The figure declined to 39 percent in 2009. There was a corresponding 7 percentage point rise in the number of respondents reporting being dissatisfied with life in 2009. This suggests that reported average level of SWB did in fact decline, although the Ethiopian economy was growing rapidly.

Table 3 about here

4 Results

Table 4 presents estimation results for life satisfaction regressions from different linear models for respondents in urban Ethiopia. To test for the robustness of the different correlates of life satisfaction, we estimate the regression using three alternative econometric specifications: Pooled Ordinary Least Square (OLS), Random Effects, and Fixed Effects estimators, reported under columns [1]-[3]. The robust Hausman test rejects the random effects estimator (p-value of 0.000) and consequently we don't discuss the results, but rather focus on the comparison between OLS and fixed effects.

Table 4 about here

As documented in most previous studies from other countries, both regression results show that economic status, proxied by the log of real per capita consumption expenditure, is a significant determinant of life satisfaction in urban Ethiopia. OLS results suggest that doubling one's per capita income increases life satisfaction by about 0.19. However, we find a striking difference when we address unobserved household heterogeneity. The impact on SWB declines by 40 percent, from 0.19 in the OLS model to 0.11 in the fixed effects estimator, which applies a "within" transformation. The estimated coefficient of the unobserved heterogeneity term in the fixed effects regression reveals that about 45 percent of the variation in life satisfaction in urban Ethiopia can be attributed to this term.

Turning to look at the impact of our measures of comparison variables, we find that relative standing of households is a significant determinant of subjective well-being. This is in accord with previous studies in both developed and developing countries. Regression results suggest that being poor compared to others in the community has a large negative impact on subjective well-being. However, similarly here, the impact of relative poverty on SWB declines (in absolute terms) by about 10 percent from -0.60 in the OLS to -0.54 in the fixed effects regression. In order to further explore the impact of one's own economic status, and that of economic status relative to others, we created three comparable dummy variables for real consumption expenditure quintiles and estimated the OLS and fixed effects regressions.¹⁰ Results show that the impact of economic position relative to others is much higher than the impact of one's own economic status. Fixed effects results show that feeling poorer relative to the community reduces SWB by 0.55, while actually belonging in the poorest 33 percent of the income distribution reduces SWB by only 0.08. Feeling richer compared

¹⁰Regression results are available upon request.

to others, on the other hand, increases SWB by 0.21, while actually belonging in the top 33 percent of the income distribution increases SWB by only 0.07.

Consistent with previous findings in other developing countries,¹¹ we find that feeling that one's current living standard has deteriorated compared to five years ago reduces SWB, while feeling the opposite increases it. After taking account of unobserved heterogeneity through fixed effects, however, we note that the magnitude of the impact of the variable on SWB declines by 24 percent in absolute terms from -0.39 to -0.29. On the other hand, the magnitude of feeling that one's living standard improved remained the same (0.19 in both models). Both the pooled OLS and fixed effects regression results show that the negative impact of being poorer compared to others is much larger than the negative impact of being poorer over time. This strengthens the finding that respondents are more sensitive to comparisons with others than with comparisons to their own status over time.

We also find a strong impact of expectations about the future. Those who expect life to get worse in the future report a lower level of SWB and those who expect a better life report a higher level of SWB. Similarly here, we note a sizable change in the magnitude of the coefficients on SWB in the fixed effects estimator. The impact of expecting life to get worse declines by 46 percent from -0.13 in the OLS to -0.07 with fixed effects (although statistically insignificant in the latter), while the impact of expecting a better life increases SWB by 21 percent, from 0.14 in the OLS to 0.17 in the fixed effects regression. Comparison of the two regression models in general shows that OLS likely overestimates the impact of negative perceptions and underestimates the impact of positive perceptions of respondents on their subjective well-being. These results highlight the importance of being cautious in interpreting parameter estimates from SWB regressions based on cross-sectional data, as the impact of variables may not be disentangled from time-invariant unobserved heterogeneity.

Regression results suggest that other household variables are also important determinants of SWB. OLS results show that households with more members with chronic health problems report a lower level of SWB. The proportion of household members with a disability or a chronic health problem was only 6 percent on average, but the impact of the variable is large in magnitude and significant in the OLS. It is, however, insignificant in the fixed effects regression, probably due to limited variation over time. Both OLS and fixed effects regression results suggest that international remittances are important determinants of SWB. The impact of the remittance variable, however, increased substantially, from 0.11 in the OLS model to 0.21 in the fixed effects model, representing a 90 percent increase in the impact of the variable on SWB. This is the largest change in the magnitude of coefficients. The finding on the positive impact of international remittances is consistent with findings from the vast literature on the impact of international migration and remittances, which documents a positive impact on household outcomes in remittance recipient countries.¹²

Finally, regression results suggest that the respondents' personal characteristics - such as marital status, age and unemployment status - are important determinants of life satisfaction, as was found in studies of SWB in industrialized countries. Compared to married respondents, single, widowed, and separated individuals all report a lower level of life satisfaction. In addition, age exhibits

¹¹E.g., Knight, Song, and Gunatilaka, (2009); Asadullah & Chaudhury, (2012).

¹²See Adams (2011) for survey of the literature in developing countries.

the commonly documented “U” shape relationship, and unemployed respondents reported a lower level of SWB. However, many of these personal characteristics are not statistically significant in the fixed effects model, probably because of lack of variation over time. These findings indicate that the characteristics of individual respondents play an important role, although life satisfaction-related questions were asked for the whole household. However, one could argue that the exhibited effect of individual characteristics on SWB of households might be due to the fact that the 2009 wave of the SWB question was asked of individuals (not for the household). In order to address this concern, we excluded the 2009 survey and ran SWB regressions using data from only 2000 and 2004. Regression results, presented in table A.1 in the Appendix, still confirm the strong impact of personal characteristics of respondents on household SWB in urban Ethiopia; the results are very similar to those including the 2009 wave of the data.

5 Conclusion

Using three rounds of rich panel data spanning a decade, this paper investigated the correlates of SWB, with a particular focus on the role of relative standing in urban Ethiopia. The paper’s main contribution to the growing stock of knowledge on the topic in developing countries has been to investigate the impact of comparisons with others and with oneself over time, using a robust model of life satisfaction and taking into account unobserved heterogeneity. Taking advantage of the panel nature of the data, we estimated alternative models of life satisfaction regressions using OLS, Random Effects, and Fixed Effects estimators. The random effects estimator, which is based on a strong orthogonality assumption, was rejected by the robust Hausman test. Consequently, we focused on comparing results from OLS regression with fixed effects regression, which takes account of time-invariant unobserved heterogeneity through a within transformation.

Regression results suggest that both comparisons with others and with oneself over time have significant effects on subjective well-being of respondents in urban Ethiopia. Exhibiting the largest marginal effect, respondents who believe themselves to be poorer than others in their community report a significantly lower level of life satisfaction than those who perceive themselves as belonging to a middle income group. Not only is the impact of relative poverty negative, but it is higher than the impact of one’s own actual economic status. We also find a significant impact of comparison of one’s own economic status over time. Respondents who believed their living standard deteriorated over the past five years reported a significantly lower level of life satisfaction than those who believed that their living standard remained the same. On the other hand, our results show that those who believed that their living standard improved compared to five years ago reported a higher level of subjective well-being. As expected, compared to respondents who expect the future to be the same as the present, those who expect life to be better reported a higher level of life satisfaction and those with negative expectations reported a lower level.

We find a striking change in the magnitude of estimated parameters when we account for the impact of time-invariant unobserved household heterogeneity. The magnitude of the coefficient of consumption expenditure - which captures economic status - declined from 0.19 in the OLS to 0.11 in the fixed effects regression. This is a 40 percent decline in its impact. Similarly, the coefficient

of feeling poorer than five years ago declined from -0.39 in the OLS to -0.29 in the fixed effects regression. This represents a decline in magnitude of about 24 percent. The impact of feeling poorer than the community also declined (by 10 percent) from -0.60 in the OLS to -0.54 in the fixed effects regression. Comparison of the parameter estimates from the two models, on the other hand, reveals that the impact of feeling positive about how life will be in the future increases from 0.14 in the OLS to 0.17 in the fixed effects, exhibiting a 21 percent change.

We believe that our analysis adds to the rapidly growing empirical evidence in developing countries on the determinants of subjective well-being in general and the impact of relative standing in particular. It is a challenge to policy makers when subjective well-being of citizens declines in the face of rapid economic growth. This calls for a detailed investigation of the pro-poorness of the recent economic growth in the country. The fact that relative standing matters, on the other hand, implies that policies that target income distribution may have significant welfare-improving effects at both individual and community levels. However, the striking differences in the parameter estimates between OLS and fixed effects models suggest that one needs to be cautious in interpreting the impact of variables on life satisfaction using cross-sectional data, as the impact of variables cannot be disentangled from unobserved individual heterogeneity. Given the rapidly expanding documentation of panel data in many developing countries, future research could shed light on the robustness of our findings by using alternative panel data sets.

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Table 1: Descriptive Statistics of Variables 2000-2009

| Variables | Mean | SD |
|---|--------|--------|
| <i>Economic & Comparison Variables</i> | | |
| Real consumption per AEU | 155.40 | 184.03 |
| Relatively Rich | 0.03 | 0.18 |
| Relatively Poor | 0.50 | 0.50 |
| Current living standard better than five years ago | 0.27 | 0.44 |
| Current living standard worse than five years ago | 0.38 | 0.49 |
| Expect better life | 0.29 | 0.45 |
| Expect worse life | 0.39 | 0.49 |
| <i>Other Household-level Variables</i> | | |
| Number of children | 1.49 | 1.44 |
| Proportion of members unemployed | 0.23 | 0.37 |
| Proportion of members completed primary schooling | 0.35 | 0.31 |
| Proportion of members completed secondary schooling | 0.40 | 0.31 |
| Proportion of members completed tertiary schooling | 0.09 | 0.19 |
| Proportion of females | 0.57 | 0.25 |
| Proportion of members with chronic health problem | 0.06 | 0.16 |
| Household receives international remittances | 0.14 | 0.35 |
| Number of members in stable jobs | 0.82 | 1.08 |
| <i>Respondent Characteristics</i> | | |
| Single | 0.19 | 0.39 |
| Widowed | 0.25 | 0.43 |
| Divorced or separated | 0.10 | 0.30 |
| Age | 45.32 | 15.20 |
| Primary schooling completed | 0.37 | 0.48 |
| Secondary schooling completed | 0.27 | 0.45 |
| Tertiary schooling completed | 0.08 | 0.26 |
| Female | 0.66 | 0.47 |
| Unemployed | 0.09 | 0.29 |
| Disabled/suffer from a chronic health problem | 0.09 | 0.29 |
| Addis | 0.72 | 0.45 |
| Awassa | 0.09 | 0.29 |
| Dessie | 0.10 | 0.30 |
| Mekelle | 0.10 | 0.30 |
| Observations | 2931 | |

Table 2: Selected Macroeconomic Indicators of Ethiopia 2004-2010

| Variable | Units | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|--|--|-----------|-----------|-----------|-----------|-----------|-----------|
| GDP, constant prices | National currency Billions | 74.40 | 83.80 | 93.47 | 104.50 | 116.19 | 127.84 |
| GDP, constant prices | Percent change | 11.73 | 12.64 | 11.54 | 11.80 | 11.19 | 10.03 |
| GDP, current prices | National currency Billions | 86.66 | 106.47 | 131.64 | 171.99 | 248.30 | 335.38 |
| GDP, current prices | U.S. dollars | 10.05 | 12.31 | 15.17 | 19.55 | 26.64 | 32.25 |
| GDP, deflator | Index | 116.48 | 127.05 | 140.83 | 164.58 | 213.70 | 262.34 |
| GDP per capita, constant prices | National currency Units | 1,022.697 | 1,122.460 | 1,219.848 | 1,328.735 | 1,439.548 | 1,543.797 |
| GDP per capita, current prices | National currency Units | 1,191.281 | 1,426.083 | 1,717.929 | 2,186.877 | 3,076.365 | 4,049.917 |
| GDP per capita, current prices | U.S. dollars Units | 138.21 | 164.83 | 197.90 | 248.62 | 330.09 | 389.43 |
| GDP based on PPP | Current international dollar Billions | 40.76 | 47.24 | 54.39 | 62.57 | 71.11 | 79.07 |
| GDP based on PPP per capita | Current international dollar Units | 560.33 | 632.69 | 709.80 | 795.59 | 881.05 | 954.83 |
| GDP based on PPP share of world total | Percent | 0.08 | 0.08 | 0.09 | 0.09 | 0.10 | 0.11 |
| Total investment | Percent of GDP | 26.52 | 23.76 | 25.20 | 22.12 | 22.36 | 22.72 |
| Gross national savings | Percent of GDP | 24.58 | 19.98 | 18.13 | 23.54 | 19.19 | 19.54 |
| Inflation, average consumer prices | Index | 109.90 | 117.42 | 131.81 | 152.69 | 191.34 | 260.98 |
| Inflation, average consumer prices | Percent change | 8.62 | 6.84 | 12.26 | 15.84 | 25.32 | 36.40 |
| Inflation, end of period consumer prices | Index | 110.17 | 124.48 | 138.88 | 159.88 | 248.24 | 254.94 |
| Inflation, end of period consumer prices | Percent change | 1.75 | 12.99 | 11.57 | 15.12 | 55.27 | 2.70 |
| Population | Persons Millions | 72.75 | 74.66 | 76.63 | 78.65 | 80.71 | 82.81 |
| Current account balance | U.S. dollars Billions | -0.14 | -0.77 | -1.39 | -0.87 | -1.50 | -1.62 |
| Current account balance | Percent of GDP | -1.36 | -6.28 | -9.14 | -4.45 | -5.65 | -5.02 |

Source: www.imf.org - World Economic Outlook Database, April 2012.

Table 3: Trends in life satisfaction

| | 2000 | 2004 | 2009 |
|-------------------|--------|--------|--------|
| Very Dissatisfied | 9.12 | 4.14 | 9.73 |
| Dissatisfied | 34.85 | 21.60 | 28.63 |
| Neutral | 25.00 | 27.09 | 22.99 |
| Satisfied | 31.02 | 47.16 | 38.65 |
| Total | 100.00 | 100.00 | 100.00 |
| Observations | 1096 | 1111 | 709 |

Table 4: Life satisfaction regressions (2000-2009)

| | OLS | | RE | | FE | |
|---|------------|-------|-----------|-------|-----------|-------|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| <i>Economic & Comparison Variables</i> | | | | | | |
| Log real consumption per AEU | 0.191*** | 0.026 | 0.187*** | 0.025 | 0.113*** | 0.043 |
| Relatively rich | 0.207** | 0.099 | 0.215** | 0.091 | 0.201 | 0.139 |
| Relatively poor | -0.602*** | 0.038 | -0.602*** | 0.037 | -0.544*** | 0.056 |
| Current living standard better than five years ago | 0.199*** | 0.041 | 0.195*** | 0.041 | 0.199*** | 0.059 |
| Current living standard worse than five years ago | -0.385*** | 0.041 | -0.379*** | 0.039 | -0.291*** | 0.057 |
| Expect better life | 0.144*** | 0.040 | 0.145*** | 0.040 | 0.171*** | 0.055 |
| Expect worse life | -0.125*** | 0.039 | -0.123*** | 0.039 | -0.078 | 0.055 |
| <i>Other Household-Level Variables</i> | | | | | | |
| Number of children | 0.010 | 0.013 | 0.010 | 0.013 | -0.008 | 0.024 |
| Proportion of members unemployed | -0.014 | 0.046 | -0.018 | 0.046 | -0.132* | 0.070 |
| Proportion of members completed primary schooling | 0.083 | 0.093 | 0.085 | 0.095 | 0.108 | 0.153 |
| Proportion of members completed secondary schooling | 0.163* | 0.095 | 0.162* | 0.096 | 0.083 | 0.164 |
| Proportion of members completed tertiary schooling | 0.159 | 0.140 | 0.167 | 0.141 | 0.223 | 0.223 |
| Proportion of females | 0.084 | 0.074 | 0.092 | 0.072 | 0.408*** | 0.136 |
| Proportion of members with chronic health problem | -0.401*** | 0.132 | -0.401*** | 0.126 | -0.247 | 0.200 |
| Household receives international remittances | 0.112** | 0.047 | 0.118** | 0.047 | 0.210*** | 0.073 |
| Number of members in stable jobs | 0.036** | 0.015 | 0.032** | 0.016 | -0.040 | 0.026 |
| <i>Respondent Characteristics</i> | | | | | | |
| Single | -0.152** | 0.059 | -0.153*** | 0.059 | -0.130 | 0.097 |
| Widowed | -0.111** | 0.043 | -0.108** | 0.044 | -0.000 | 0.078 |
| Divorced or separated | -0.190*** | 0.058 | -0.190*** | 0.058 | -0.172* | 0.098 |

Continued on next page

Table 4 – continued from previous page

| | OLS | | RE | | FE | |
|---|------------|-------|-----------|-------|-----------|-------|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| Age | -0.015** | 0.006 | -0.015** | 0.006 | -0.013 | 0.011 |
| Age squared | 0.016** | 0.006 | 0.016*** | 0.006 | 0.015 | 0.011 |
| Primary schooling completed | 0.042 | 0.050 | 0.045 | 0.050 | 0.105 | 0.073 |
| Secondary schooling completed | 0.072 | 0.056 | 0.078 | 0.055 | 0.137* | 0.082 |
| Tertiary schooling completed | -0.010 | 0.086 | -0.012 | 0.089 | -0.114 | 0.134 |
| Female | 0.007 | 0.039 | 0.009 | 0.040 | 0.022 | 0.062 |
| Unemployed | -0.175*** | 0.055 | -0.172*** | 0.056 | -0.098 | 0.084 |
| Disabled/suffer from chronic health problem | 0.035 | 0.070 | 0.041 | 0.067 | 0.081 | 0.097 |
| Observations | 2924 | - | 2924 | - | 2924 | - |
| Individual fixed effects | No | | No | | Yes | - |
| City Fixed Effects | Yes | - | Yes | - | Yes | - |
| Time Fixed Effects | Yes | - | Yes | - | Yes | - |

OLS: Pooled OLS Estimator.
RE: Random-effects Estimator.
FE: Fixed Effects Estimator.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

A.1 Life satisfaction regressions (2000-2004)

| | OLS | | RE | | FE | |
|--|------------|-------|-----------|-------|-----------|-------|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| <i>Economic & Comparison Variables</i> | | | | | | |
| Log real consumption per AEU | 0.195*** | 0.029 | 0.195*** | 0.028 | 0.154*** | 0.056 |
| Relatively rich | 0.172 | 0.108 | 0.175* | 0.097 | 0.164 | 0.190 |
| Relatively poor | -0.595*** | 0.043 | -0.595*** | 0.042 | -0.568*** | 0.074 |
| Current living standard better than five years ago | 0.179*** | 0.046 | 0.177*** | 0.046 | 0.140* | 0.078 |
| Current living standard worse than five years ago | -0.418*** | 0.046 | -0.417*** | 0.044 | -0.344*** | 0.075 |
| Expect better life | 0.150*** | 0.045 | 0.150*** | 0.045 | 0.172** | 0.071 |
| Expect worse life | -0.101** | 0.044 | -0.101** | 0.045 | -0.081 | 0.075 |
| <i>Other Household-Level Variables</i> | | | | | | |
| Number of children | 0.018 | 0.015 | 0.018 | 0.014 | -0.007 | 0.033 |
| Proportion of household members unemployed | -0.033 | 0.050 | -0.034 | 0.049 | -0.106 | 0.088 |
| Proportion of members with completed primary schooling | 0.083 | 0.103 | 0.084 | 0.104 | 0.116 | 0.198 |
| Proportion of members with completed secondary schooling | 0.239** | 0.107 | 0.239** | 0.107 | 0.222 | 0.213 |
| Proportion of members with completed tertiary schooling | 0.325* | 0.168 | 0.325* | 0.172 | 0.196 | 0.312 |
| Proportion of females | 0.044 | 0.082 | 0.044 | 0.081 | 0.247 | 0.188 |
| Proportion of members with chronic health problem | -0.500*** | 0.146 | -0.499*** | 0.141 | -0.330 | 0.256 |
| Household receives international remittances | 0.111* | 0.058 | 0.110* | 0.058 | 0.098 | 0.107 |
| Number of members in stable jobs | 0.034* | 0.018 | 0.032* | 0.019 | -0.053 | 0.036 |
| <i>Respondent Characteristics</i> | | | | | | |
| Single | -0.109 | 0.068 | -0.110 | 0.067 | -0.092 | 0.128 |
| Widowed | -0.113** | 0.050 | -0.111** | 0.051 | 0.034 | 0.101 |
| Divorced or separated | -0.181*** | 0.065 | -0.179*** | 0.065 | -0.078 | 0.129 |

Continued on next page

Table 5 – continued from previous page

| | OLS | | RE | | FE | |
|---|------------|-------|-----------|-------|-----------|-------|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| Age | -0.014* | 0.007 | -0.014** | 0.007 | -0.014 | 0.014 |
| Age squared | 0.015** | 0.007 | 0.015** | 0.007 | 0.018 | 0.014 |
| Primary schooling completed | 0.072 | 0.057 | 0.071 | 0.056 | 0.069 | 0.093 |
| Secondary schooling completed | 0.064 | 0.062 | 0.064 | 0.060 | 0.025 | 0.103 |
| Tertiary schooling completed | 0.012 | 0.099 | 0.008 | 0.105 | -0.271 | 0.173 |
| Female | -0.021 | 0.043 | -0.021 | 0.044 | -0.066 | 0.081 |
| Unemployed | -0.213*** | 0.059 | -0.211*** | 0.060 | -0.099 | 0.102 |
| Disabled/suffer from chronic health problem | 0.122 | 0.086 | 0.123 | 0.077 | 0.156 | 0.129 |
| Observations | 2924 | - | 2924 | - | 2924 | - |
| Individual fixed effects | No | | No | | Yes | - |
| City Fixed Effects | Yes | - | Yes | - | Yes | - |
| Time Fixed Effects | Yes | - | Yes | - | Yes | - |

OLS: Pooled OLS Estimator.

RE: Random-effects Estimator.

FE: Fixed Effects Estimator.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.