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Subjective Wellbeing and Institutions: The Case of Rural Ethiopia

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Abstract

This study focuses on the role of religiosity, general and political trust, local participation, and welfare metrics on wellbeing in rural areas using the Ethiopian Rural Household Survey. Ordered probit methods that account for Heteroscedasticity reveal distinctive correlates of overall life satisfaction and momentary happiness. Broader socio-economic factors such as religiosity and political governance strongly predict life satisfaction, while largely welfare metrics drive momentary happiness. The differential role of institutions on life satisfaction and momentary happiness is in comport with Deaton's (2008) and Stevenson and Wolfers's (2008) proposition that life satisfaction and happiness are not synonymous.

Keywords: Institutions, Subjective Wellbeing, Ordered Probit, Developing Countries

JEL Classification: C25, D60, I31, Z12

1. Introduction

Research on subjective wellbeing (SWB), mainly conducted through surveys on overall life satisfaction and happiness complements the conventional measures of wellbeing such as the level of consumption, income, and wealth. It can inform policy makers about economic and other factors that society values most. The increased availability of SWB data and empirical evidence of a high correlation with the conventional measures of wellbeing has spurred an increased use of such information by economists in recent years (Krueger and Schkade, 2008)¹.

Research on the determinants of SWB has mainly focused on either cross-country or within-country analysis of developed and transition countries. The study on SWB for developing countries, however, remains limited. Developing countries, especially their rural parts, exhibit several distinctive features and merit separate treatment to understand determinants of wellbeing in these areas of the world. Some of the distinguishing characteristics of rural communities include more interdependence among community members, higher levels of religiosity, and the importance of informal institutions.

People in developing countries, especially in rural areas, are more religious as shown by various editions of the World Values Surveys. Hence, the role of religion in wellbeing would be more apparent in these areas. In religious societies, it is quite tenable to assume that people are concerned both about their current and expected after-life status when evaluating their overall wellbeing.² Hence, in a rural religious context, the concepts of life satisfaction (potentially taking into account worldly experience and the expected after-life utility) and momentary happiness (usually associated with hedonic experiences) can have different implications. The distinction between life satisfaction and happiness outcomes in a rural context can give insights into the mechanisms through which religious and other institutions affect wellbeing.

Furthermore, rural communities have developed a network of informal institutions such as funeral associations and friendly societies based on religion or geographic proximity with direct implication for wellbeing. Hence, in the absence of a strong formal judiciary system coupled with informational asymmetries, trust in individual and community engagement is important and can have strong implications for wellbeing (See, for example, Fafchamps, 1996; Bigsten et al., 2000; and Fafchamps and Minten, 2002).

A common feature of most studies of SWB published in economics journals is that they do not make a clear distinction between life satisfaction and happiness. On the one hand, some studies for developed countries such as Blanchflower and Oswald (2004) and Alesina et al. (2004) treat life satisfaction and happiness interchangeably. On the other hand, as Deaton (2008) reiterates, 'life satisfaction' and 'happiness' are not synonyms. Life Satisfaction questions ask respondents to make an overall evaluation, while happiness captures affect or temporary feelings.³ Stevenson and Wolfers (2008) in a cross-country empirical study find several puzzling outliers. For example, they observe that two of the poorest countries in their sample, Tanzania and Nigeria, report the highest average happiness levels despite both reporting lower average satisfaction with Tanzania reporting the lowest average satisfaction in their sample. This implies a need for a revisit of the relationship between life satisfaction

¹ In this study, unless specified SWB refers to both life satisfaction and momentary happiness.

² See, for example, Azzi and Ehrenberg (1975) for the determinants of religious participation.

³ Literature in psychology divides aspects of wellbeing as 'cognitive (evaluative)' and 'affect (emotional)'. The cognitive aspects are 'evaluative' which compares wellbeing against targets (benchmarks), and 'affect', which is related to 'positive and negative' feelings. We argue that life satisfaction questions are likely to elicit the evaluative aspect, while happiness questions are more likely to reflect the emotional part.

and happiness by studying their determinants using an array of socioeconomic and institutional factors.

The link between income and SWB has been at the centre of wellbeing research. Cross-sectional studies across countries reveal people in richer countries are on average more satisfied than people in poorer countries. Similarly, cross-sectional studies within countries show that more affluent individuals are more satisfied on average than their poorer counterparts. Moreover, most studies find a concave relationship between income and SWB indicating decreasing marginal returns of wellbeing from income (Easterlin, 2001; Frey and Stutzer, 2002; Blanchflower and Oswald, 2004; Diener et al., 1995).

Only a handful of papers studied SWB in developing countries. Kingdon and Knight (2007) using the 1993 South African national household survey find support for a positive role of absolute income on SWB, but a mixed role for relative income. They find that the income of close neighbours surprisingly affects SWB positively, which is in contrast to findings in developed countries; but can be explained by risk sharing and solidarity behaviour in poorer communities. Using surveys of two separate villages in Northern Ethiopia Akay and Martinsson (2011) and Akay et al. (2012) studied the role of 'positional concern' using experimental methods and found no evidence for the existence of positional concern as defined by the income of others in the community.⁴ Similarly, Asadullah and Chaudhury (2012) find a stronger effect of absolute income on SWB than relative measures for rural Bangladesh Ravallion and Lokshin (2010) find little support for positional concern (measured by relative deprivation) for most poor households in Malawi with the exception of the relatively well-off. On the other hand, Knight et al. (2009) find a stronger effect of relative income compared to own past income and the income of others than for own income in explaining SWB in China using the 2002 national household survey. Therefore, the majority of the studies in poorer countries find a relatively stronger effect of absolute income compared to relative income.

In addition to economic factors, social and institutional aspects that matter to wellbeing include religious involvement, general trust, political trust (governance), and family (marital status). Studies that find a positive role of religiosity on wellbeing include Jarvis and Northcott (1987), McCullough et al. (2000), Koenig et al. (1998), Myers (2000), and Lim and Putnam (2010). Trust on the general public and political institutions is another important factor enhancing wellbeing (see, for example, Frey and Stutzer (2000), Bjørnskov (2003), Hudson (2006), Helliwell (2006), and Diener and Diener (2009)). Other factors identified in the literature as determinants of SWB are marital status, education, health, age, and gender (For a review see, for example, Frey and Stutzer (2002) and Dolan et al. (2008)).

Our analysis reveals that religiosity, general (public) trust, confidence in the local political administration, and participation in formal and informal institutions are strongly and positively associated with wellbeing in addition to standard economic variables. We find evidence for distinctive correlates of life satisfaction and happiness. Broader socio-economic factors such as religiosity and the quality of political governance strongly correlate with satisfaction while mainly welfare metrics drive happiness.

The paper is organised as follows. Section 2 describes the data and presents some descriptive analysis. The econometric model is outlined in section 3. Section 4 presents the results and discussion. Finally, Section 5 concludes.

⁴ 'Positional concern' refers to the degree to which individuals compare their income or consumption to other reference groups. Hence, it implies that the utility a person gets from a certain income level or consumption not only depends on the absolute level but also relative to others (See, for example, Akay et al. (2012))

2. Data and Descriptive Statistics

In this study, we use the sixth round of the Ethiopian Rural Household Survey (ERHS). It was undertaken in 2004 by the Department of Economics at Addis Ababa University in collaboration with the International Food Policy Research Institute and the Centre for the Study of African Economies at the University of Oxford. The ERHS had a 7th round conducted in 2009. However, this round does not have complete religion information, as the type of religious denomination was not asked. Moreover, only female members of the households provide religiosity information in this round as the question was only directed to them. Hence, unless the household head is a female, the level of religiosity of the head is not known. Earlier rounds (prior 2004) do not have SWB information. Thus, the current study focuses on the 2004 wave. The data are obtained from Hoddinott and Yohannes (2011).

The survey was conducted in 15 villages from 15 Woredas (Districts) scattered across the major agricultural zones of the country in the four major regions, namely Tigray, Amhara, Oromia, and The Southern Nations, Nationalities, and People's Region (SNNPR). The survey is not nationally representative as it excludes pastoral and semi-pastoral areas of the country, but can broadly capture farming household behaviour in the country. Overall a total of 1477 households has been covered in at least one of the surveys until 2004.⁵ Random sampling was applied within each village, stratified by female-headed and non-female headed households (Dercon and Hoddinott, 2011).

The survey contains household level demographics and socioeconomic characteristics, agriculture and livestock information, consumption⁶, and health among others. It also contains detailed information on SWB (life satisfaction and happiness) and informal institutions such as general trust, government trust, participation, and religion.

We use two indicators of the subjective assessment of wellbeing, namely 'general life satisfaction' and 'momentary level of happiness'. In the life satisfaction question, respondents were asked level of agreement with a statement 'I am satisfied with my life'. Respondents are presented with seven possible responses 'Strongly Disagree', 'Disagree', 'Slightly Disagree', 'Neither Agree or Disagree', 'Slightly Agree', 'Agree', and 'Strongly agree'. The happiness question is framed as 'Taken all together, how would you say things are for you these days: would you say you are: 'Not too happy', 'Pretty happy', or 'Very happy'.⁷

The units of analysis are the heads of households as some of our key covariates such as religion, trust, and participation in formal and informal institutions are directed to them. Satisfaction and Happiness questions are asked twice in the survey. We use the responses of the head of households.⁸ Out of 1371 households surveyed in the 2004 round, our final dataset comprises 1,114. Some households are excluded due to missing information on variables of interest and information on some variables being provided by a member of household other than the head.

⁵ In the 2004 round, 1371 households were interviewed.

⁶ Consumption includes all food consumption in the last week comprising from own stock, purchased, and obtained as gifts in adult-equivalent terms; and non-food consumption such as cloths converted into monthly levels. It is then deflated by food price index based on local (roughly Woreda) level 1994 as a base year. Livestock is measured by tropical livestock units (TLU) by associating different weights to poultry, sheep, goats, oxen, camels, and so forth. based on their values.

⁷ In this thesis, 'satisfaction' and 'life satisfaction' are used interchangeably. Likewise, 'happiness' and 'momentary happiness' are treated as synonymous.

⁸ The SWB responses by male household heads are provided in the first part of the survey while responses by female household heads are given in part 3 of the survey. The survey has four parts conducted in the course of several days.

The frequency distributions of satisfaction and happiness responses are given in Tables 1 and 2 respectively. The satisfaction distribution indicates that the two extremes ('strongly disagree' and 'strongly agree') and the median category ('neither agree nor disagree') have a very small proportion of responses. Hence, to avoid potential instability of our model, we conflate the satisfaction responses into three categories. The first category consists of the 'strongly disagree and disagree'; the second comprising the three middle responses, i.e. 'slightly disagree, neutral, and slightly agree'; and the third category with 'agree and strongly agree'. Moreover, such conflation facilitates comparison with the happiness model. Table 3 reports the frequency distribution of the conflated satisfaction each of its cells with sizable proportions.

Table 4 presents a description of the main variables of interest and selected summary statistics. Description and summary statistics of other variables is provided in Table A1 in Appendix A.

Table 1. Frequency Distribution of satisfaction responses

I am satisfied with my life	Freq.	Per cent	Cum.
Strongly disagree	81	7.27	7.27
Disagree	260	23.34	30.61
Slightly disagree	172	15.44	46.05
Neither agree nor disagree	82	7.36	53.41
Slightly agree	257	23.07	76.48
Agree	240	21.54	98.03
Strongly agree	22	1.97	100
Total	1,114	100	

Table 2. Frequency Distribution of happiness responses

Happiness	Freq.	Per cent	Cum.
Not too happy	394	35.37	35.37
Pretty happy	586	52.6	87.97
Very happy	134	12.03	100
Total	1,114	100	

Table 3. Frequency Distribution of the conflated satisfaction responses

Satisfaction	Freq.	Per cent	Cum.
Dissatisfied	341	30.61	30.61
Neutral	511	45.87	76.48
Satisfied	262	23.52	100
Total	1,114	100	

Table 4. Summary Statistics of Main Variables of Interest

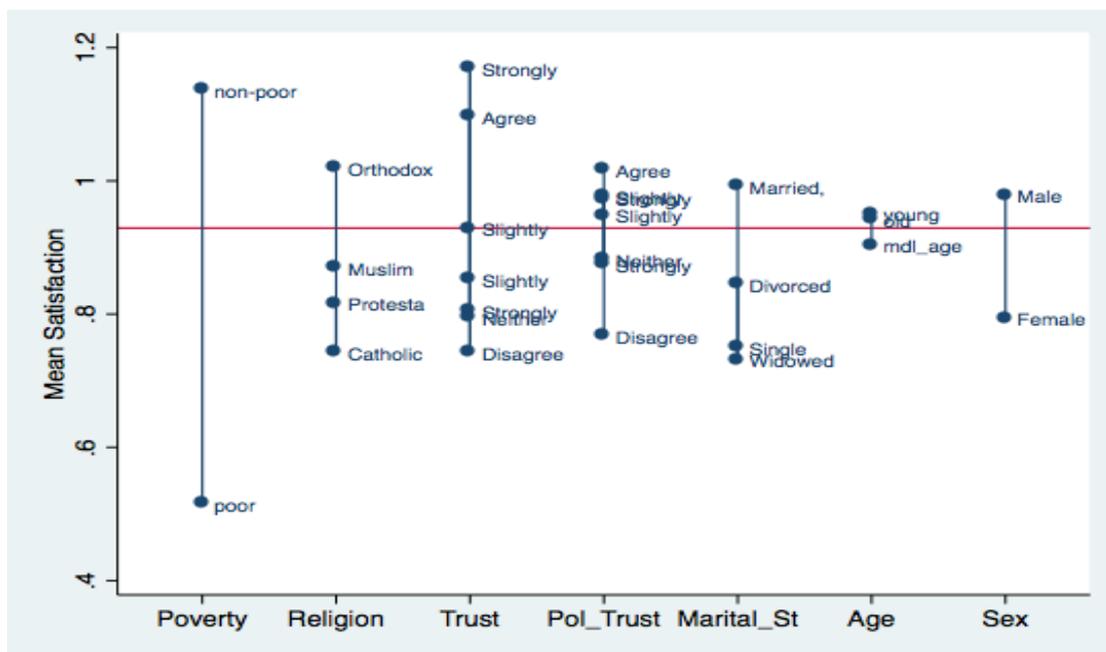
Variable	Description	N	Mean	SD	Min	Max
LIFE SATISFACTION LADDER	Life Satisfaction	1,114	0.93	0.73	0	2
HAPPINESS	Happiness	1,114	0.77	0.65	0	2
LIFE SATISFACTION LADDER	Where in the ladder is your standing? 10 best possible life, 0 the worst possible life					
LOG_CONSUMPTION_PER_CAPITA	Logarithm of real per capita consumption	1,114	4.17	0.81	0.87	7.01
LOG_LIVESTOCK	logarithm of tropical livestock units	1,114	1.1	0.72	0	3.2
TRUST	Most people can be trusted' 1(Strongly disagree) _ 7(Strongly agree)	1,114	4.37	1.71	1	7
POLITICAL_TRUST	I am Confident in the ability of local officials' 1(Strongly disagree) _ 7(Strongly agree)	1,114	4.19	1.7	1	7
PARTICIPATION	1 if Head of household has official position in local institutions, 0 otherwise	1,114	0.25	0.43	0	1
RELIGIOSITY	Church/Mosque visits per month	1,114	6.3	7.15	0	45
CATHOLIC*RELIGIOSITY	1 if Catholic, 0 otherwise	1,114	0.04	0.19	0	1
MUSLIM	1 if Muslim, 0 otherwise	1,114	0.23	0.42	0	1
PROTESTANT	1 if Protestant, 0 otherwise	1,114	0.2	0.4	0	1
OTHER_RELIGION	1 if other, 0 otherwise	1,114	0.02	0.14	0	1
CATHOLIC*RELIGIOSITY	Interaction: CATHOLIC and RELIGIOSITY	1,114	0.28	1.96	0	30
MUSLIM*RELIGIOSITY	Interaction: MUSLIM and RELIGIOSITY	1,114	1.68	5.7	0	45
PROESTANT*RELIGIOSITY	Interaction: PROTSTNT and RELIGIOSITY	1,114	1.35	3.54	0	40
OTHER_RELIGION*RELIGIOSITY	Interaction: OTHER_RELIGION and RELIGIOSITY	1,114	0.06	0.69	0	12

To examine the potential relationships between measures of SWB and other socioeconomic characteristics, a preliminary analysis correlation is warranted.

Mean satisfaction and happiness across social groups based on the status of reported poverty, religion, general trust, government trust, marital status, age and gender are shown in Figures 1 and 2 respectively. The mean levels of satisfaction and happiness are different across the lower and upper bounds in each category using a 95 per cent confidence level. For example, mean satisfaction among the households that consider themselves poor is significantly lower than that of the non-poor households. Similarly, we observe significant differences among the various groups in the happiness data

Figure 3 shows whether someone is satisfied or dissatisfied with their life when moving along the percentile spectrum of log per capita consumption. Figure 4 shows whether someone is happy or unhappy with their life when moving along the percentile spectrum of log per capita consumption. The incidence of being satisfied increases as consumption increases. The same pattern can be detected for happiness. The reverse is true for dissatisfaction and unhappiness. The strength of the role of consumption for wellbeing slightly declines as consumption increases pointing to the well-known concave relationship between income and wellbeing found in the literature (See, for example, Easterlin (1974, 2001)).⁹

Figure 1. Satisfaction and Socio-Economic Characteristics



⁹ The concave relationship between consumption and SWB in remote poor areas could be due to the absence of markets catering for diverse demand for goods and services in rural areas.

Figure 2. Happiness and Socio-Economic Characteristics

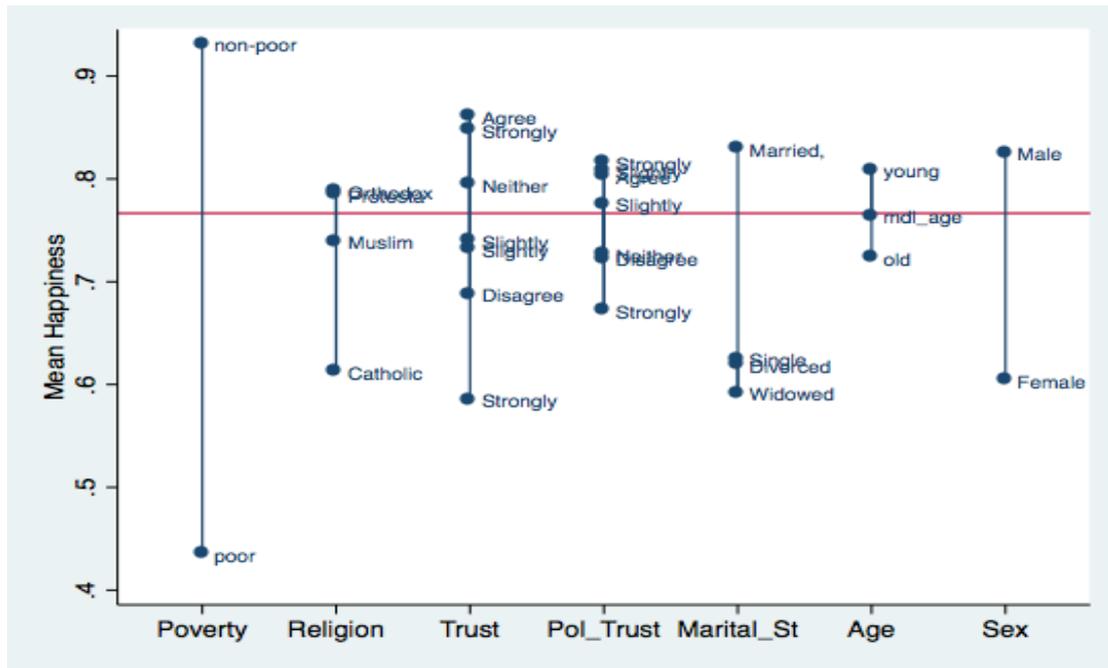


Figure 3. Satisfaction and Consumption

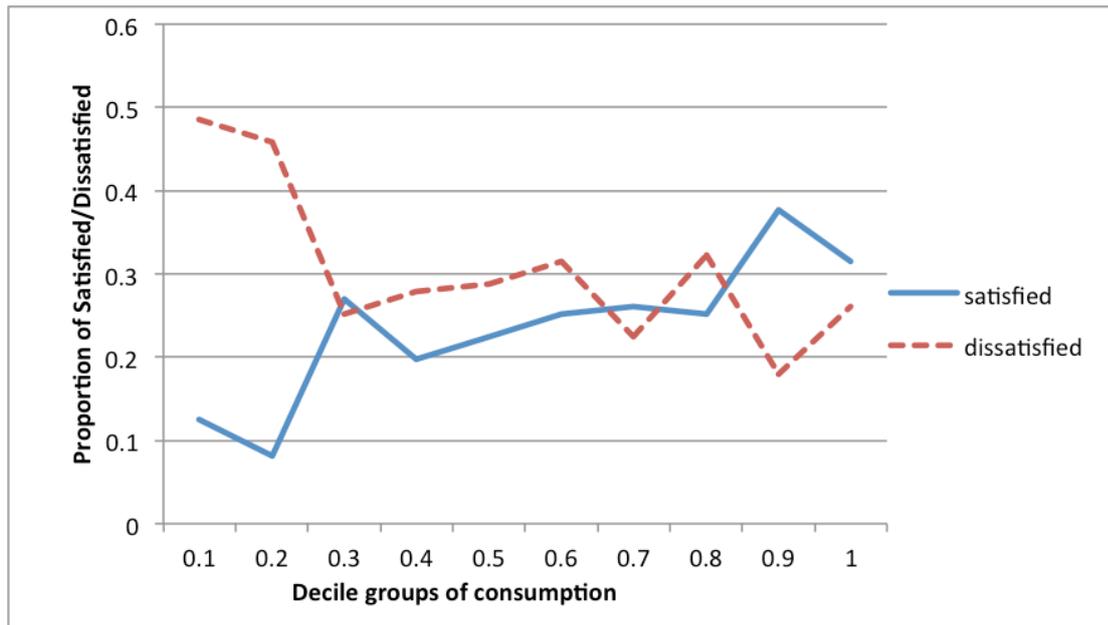


Figure 4. Happiness and Consumption

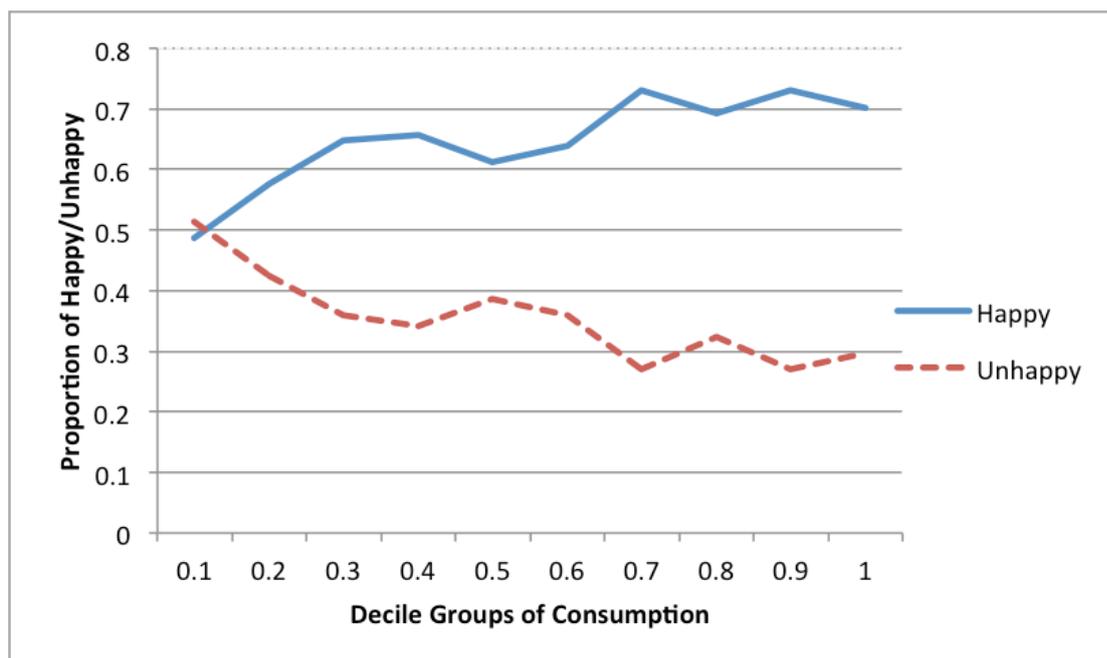


Table 5. Wellbeing and Religiosity by Religious Denomination

Religion	Satisfaction	Happiness	Religiosity
Orthodox	1.02	0.79	5.65
	-0.73	-0.65	-6.25
Catholic	0.83	0.66	7.7
	-0.77	-0.73	-6.95
Muslim	0.87	0.74	7.42
	-0.77	-0.65	-10.04
Protestant	0.82	0.78	6.73
	-0.68	-0.64	-5.15
Other	0.57	0.52	3.05
	-0.51	-0.6	-4.13
Total	0.93	0.77	6.3
	-0.73	-0.65	-7.15

Note: The number of observations is 1,114

Table 5 depicts wellbeing and religiosity levels by religious denominations.¹⁰ Followers of the Orthodox religion reported the highest life satisfaction among the denominations. However, the difference in momentary happiness among the major religious denominations is not statistically different at a 10 per cent significance level. Catholics and Muslims report the highest average religiosity levels, followed by Protestants. Protestant, however, report

¹⁰ According to the Ethiopian Population and Housing Census of 2007, 43.5 per cent of the population belongs to the Ethiopian Orthodox Church (EOC), while 33.9 per cent are Muslim. Protestants account for 18.6 per cent while traditionalists, Catholics and others account for the remainder.

the least variance in religiosity levels. The lower variance among Protestants can be explained by relatively more organised weekly Sunday services compared to followers of the other denominations (for example, EOC followers are more likely to go to church during the days dedicated to their local patron saint in addition to Sundays). Hence, the level of religiosity and variability among followers is correlated to the religious denomination.¹¹

The correlations are indicative of a potential predictive relationship between the set of our main covariates and SWB. The nature of these relationships will be explored in more detail using econometric analysis.

3. Econometric Methodology

Our analysis uses ordered probit methods in common with most of the economic literature on the determinants of SWB. However, this specification of the standard ordered probit is based on several assumptions such as homoscedasticity, which in practise may not be satisfied by the data. Subjective wellbeing data, like in many microeconomic applications, are susceptible to heteroscedastic errors. Income is an example as a possible source of such variance as people at higher ends of the income spectrum exhibit higher variation in satisfaction from income compared to those at the lower end in the spirit of Engle Law. Hence, we subject our regression models to heteroscedasticity test and address the problem by incorporating a variance function.

3.1. Standard Ordered Probit

Previous and current SWB surveys are designed to elicit a respondent's level of agreement to questions such as whether the person is satisfied with life or not, or to rate the level of wellbeing within a certain range. Since there are no units of cardinal measurements of preference, these responses are ordinal in nature. Hence, only the ordering matters without any quantitative interpretation attached to the specific number or scale used to represent such preferences.¹²

Let y_i^* represent the latent index of individual i 's utility level, which is continuous, and can take any value in the range $-\infty < y_i^* < \infty$. We assume the latent utility is related to the observed ordinal satisfaction data as:

$y = 0$	[Dissatisfied]	If	$-\infty < y_i^* < \theta_0$
$y = 1$	[Neutral]	If	$\theta_0 \leq y_i^* < \theta_1$
$y = 2$	[Satisfied]	If	$\theta_1 \leq y_i^* < \infty$

A similar formulation applies for happiness.

¹¹ Mean satisfaction and happiness levels differ among the villages. Using a non-parametric version of ANOVA test of equality of populations, the Kruskal – Wallis test, we reject equality of the means of satisfaction levels across villages (chi-squared = 86.016 with 14 D.F. probability = 0.0001). The test also rejects equality of happiness across villages (chi-squared = 86.002 with 14 D.F. probability = 0.0001).

¹² This is the more common practice in most economic research on SWB while the psychology literature has, for the most part, assumed cardinality in the SWB response, and hence uses Ordinary Least Squares (OLS) estimation methods (Ferrer-i Carbonell and Frijters, 2004).

The unobserved outcome can be expressed as a function of the respondents characteristics which are assumed to be correlates of her underlying utility (satisfaction or happiness) function. The literature assumes the relationship to be of the form

$$y_i^* = x_i' \beta + u_i \quad , \quad u_i/x \text{ is } N(0,1) \quad (1)$$

With the standard normal assumption of the error term, we can derive the conditional distribution of the SWB responses (y) given the correlates (x) by computing the general formulation

$$P(y) = \Phi(\theta_j - x' \beta) - \Phi(\theta_{j-1} - x' \beta) \quad , \quad j = 0, 1, 2 \quad (2)$$

Where $\Phi(\cdot)$ denotes the cumulative distribution function operator for standard normal. To ensure the identification of the parameters of the model location (reference) and scale need to be defined. In this paper, we estimate the model with a constant term, and to ensure identification of the thresholds we impose $\theta_0 = 0$ for the first threshold.

The normalization of the variance of the error term to 1, and hence assuming homoscedasticity ensures scaling by an arbitrary fixing. With these assumptions, equation (2) represents a well-behaved probability function amenable to estimation by maximum likelihood methods. The log – likelihood function for the model is formulated as

$$\log L = \sum_{i=1}^n \sum_{j=0}^2 m_{ij} \log[\Phi(\theta_j - x' \beta) - \Phi(\theta_{j-1} - x' \beta)] \quad (3)$$

Where $m_{ij} = 1$ if individual i 's response falls within the j 's category, and 0 otherwise.

3.2. Heteroscedastic Ordered Probit

Subjective wellbeing data, like in many microeconomic applications, are susceptible to heteroscedastic errors. Income is an example as a possible source of such variance. It is likely that people at higher ends of the income spectrum exhibit higher variation in satisfaction from income compared to those at the lower end in the spirit of Engle Law. After a certain level of income (for example, after basic needs are fulfilled), individuals are likely to have more diverse demands and hence likely to exhibit more divergent responses to specific covariates. Other potential sources of variation in responses given covariates include the level of emotional stability and age in the case of health-related wellbeing questions (Greene et al., 2014). More emotionally unstable individuals are likely to give more varied responses than emotionally stable ones. Moreover, older individuals are likely to have a more varied assessment of their health than younger individuals, who are more likely to consider themselves healthy. The existence of heteroscedasticity results in biased and inconsistent estimates of the ordered probit model (Litchfield et al., 2012; Greene and Hensher, 2010).

The existence of heteroscedasticity results in biased and inconsistent estimates of the ordered probit models (Litchfield et al, 2012).

We use diagnostic tests derived by Machin and Stewart (1990) based on general residuals developed by Gourieroux et al. (1987) to test for heteroscedasticity. The details of the derivation of the test adopted from Machin and Stewart (1990) are provided in Appendix B.

We account for heterogeneity by incorporating a variance function in the ordered probit model.

$$\sigma_i^2 = (e^{w_i\gamma})^2 \quad (4)$$

Where w_i comprises a vector of variables that are the source of the residual variance and γ is a vector of unknown parameters. We modify the standard probability response to incorporate the variance function resulting in a modified form of equation (3). The modified likelihood function now becomes (with standardised mean functions (β) , and thresholds $(\theta's)$).

$$\log L_{Hetero} = \sum_{i=1}^n \sum_{j=0}^2 m_{ij} \log \left[\Phi \frac{(\theta_j - x' \beta)}{e^{w_i \gamma}} - \Phi \frac{(\theta_{j-1} - x' \beta)}{e^{w_i \gamma}} \right] \quad (5)$$

Since there are no strong theoretical foundations as to how the sources of variance can be modelled, we follow Litchfield et al (2012) and others in modelling all of the covariates in the variance component using the modified likelihood function (5) and conduct tests to determine the significant variables to be included in the variance function (4). The variance functions based on the log of consumption per capita, the log of livestock holdings, and district dummies become significant at conventional levels for the satisfaction and happiness models respectively.

4. Results and Discussion

4.1. Main Results

Table 6 reports Standard and Heteroscedastic Ordered Probit regressions for satisfaction and happiness without including religion-religiosity interaction terms. In comport with the literature on the subject, consumption per capita, livestock ownership, general trust, government trust, participation in formal and informal institutions, and religiosity all positively predict life satisfaction. Consumption per capita, livestock ownership, and general trust positively correlate with momentary happiness.

However, as discussed in preceding sections religiosity levels are correlated with religious denominations. Moreover, since some of the denominations, typically Catholicism and Protestantism, are relatively new to the country and a minority, the implication of religiosity on wellbeing can depend on the type of religion. Hence, the inclusion of 'religion-religiosity' interactions terms is essential.¹³ Hence, our analysis relies on the estimates with the interaction terms.

¹³ Omitted variables tests (not reported) of the interactions of religion and religiosity with general trust indicate that omitting those variables is empirically justified.

Table 6. Correlates of SWB: Without Religion-Religiosity Interaction Terms

	Standard Ordered Probit				Heteroscedastic Orderd Probit			
	Satisfaction		Happiness		Satisfaction		Happiness	
	Coef.	St.Er.	Coef.	St.Er.	Coef.	St.Er.	Coef.	St.Er.
Constant	-1.66***	0.36	-0.92**	0.36	-2.09***	0.75	-0.62**	0.26
	<u>Welfare Metrics</u>							
LOG_CONSUMPTION_PER_CAPITA	.25***	0.06	.16**	0.06	0.36***	0.12	0.11**	0.04
LOG_LIVESTOCK	.51***	0.07	.48***	0.07	0.60***	0.19	0.36***	0.07
	<u>Institutions</u>							
TRUST	.11***	0.02	.05**	0.02	0.11***	0.04	0.03**	0.02
POLITICAL TRUST	.07***	0.02	0.04	0.02	0.08**	0.04	0.02	0.02
PARTICIPATION	.21**	0.09	0.01	0.09	0.27**	0.13	0.02	0.06
	<u>Religion and Religiosity</u>							
RELIGIOSITY	.014***	0.005	0.01	0.01	0.015*	0.008	0.005	0.003
CATHOLIC	-0.16	0.18	0.16	0.19	-0.06	0.21	0.11	0.10
MUSLIM	-0.21	0.15	-0.10	0.15	-0.25	0.20	-0.09	0.11
PROTESTANT	0.09	0.16	0.22	0.15	0.17	0.18	0.15	0.10
	<u>Others</u>							
VILLAGE CONTROLS	Yes		Yes		Yes		Yes	
CONTROLS	Yes		Yes		Yes		Yes	
Mu (1)	1.48***	0.06	1.81***	0.06	1.82**	0.52	1.16***	0.20
OBSERVATIONS	1114		1114		1114		1114	
	<u>Variance Function</u>							
LOG_CONSUMPTION_PER_CAPITA					0.11**	0.06		
LOG_LIVESTOCK							-0.19***	0.06
VILLAGE CONTROLS					Yes		Yes	

Note

Control variables not reported include land holding size, education, illness, gender, age, and number of younger and older children.

MU (1) refers to the first cut-off/threshold;

***, **, * denotes statistical significance at the 0.01, 0.05 and 0.10 level, respectively using two-tailed tests.

Regression results of the standard ordered probit models with religion-religiosity interactions are reported in Table 7. As shown in the table, the null hypothesis of homoscedasticity is rejected for both the life satisfaction happiness models at conventional significance level. Hence, we incorporate a variance function based on the logarithm of real consumption per capita, and the district controls for the satisfaction model. Similarly, a variance function based on the logarithm of livestock holding and the district controls is adopted to address the heteroscedasticity for the happiness model. Hence, our main analysis relies on the heteroscedastic model reported in Table 8.

The variance functions based on the log of consumption per capita and the log of livestock holdings are significant at conventional levels for the satisfaction and happiness models respectively. Likewise, district dummies are also significant in both models. As expected households at the high-end of consumption per capita report higher variability of responses in satisfaction to changes in the covariates as indicated by a significant positive coefficient in the variance function. In the happiness model, the log of livestock holding has been found to be the significant source of variation. The significant negative coefficient of log livestock in the variance function means that livestock-rich households exhibit a less varied response to happiness than their poorer counterparts. This might be taken to reflect the importance of livestock as an insulator against shocks for livestock-rich households (see, for example, Rosenzweig and Wolpin (1993) for the role of bullocks for consumption smoothing in India, and Gilligan and Hoddinott (2007) in Ethiopia).¹⁴ However, it is puzzling that this variance effect is not detected in the satisfaction equation itself. The more standard variables such as 'illness' and 'age' that are expected to be sources of variances in health-related wellbeing as suggested by Greene et al. (2014), do not yield significant variance effects in our models.

¹⁴ Gilligan and Hoddinott (2007) find that 40% of households in the ERHS data sold livestock to smooth consumption during the 2002 drought.

Table 7. Correlates of Subjective Wellbeing: Standard Ordered Probit

DEP.VAR.	SATISFACTION		HAPPINESS	
	Coef.	St.Er.	Coef.	St.Er.
CONSTANT	-1.5***	0.36	-0.86***	0.37
	<u>Welfare Metrics</u>			
LOG_CONSUMPTION_PER_CAPITA	.24***	0.06	.17**	0.06
LOG_LIVESTOCK	.51***	0.07	.48***	0.07
	<u>Institutions</u>			
TRUST	.11***	0.02	.05**	0.02
POLITICAL TRUST	.07***	0.02	0.04	0.02
PARTICIPATION	.21**	0.09	0.01	0.09
	<u>Religion and Religiosity</u>			
RELIGIOSITY	-0.001	0.01	0.003	0.01
CATHOLIC	-0.12	0.24	0.3	0.24
MUSLIM	-.33**	0.16	-0.13	0.17
PROTESTANT	-0.13	0.19	0.02	0.2
CATHOLIC*RELIGIOSITY	-0.02	0.03	-0.02	0.03
MUSLIM*RELIGIOSITY	.02*	0.01	0.002	0.01
PROTESTANT*RELIGIOSITY	.04**	0.02	.03*	0.02
	<u>Others</u>			
VILLAGE CONTROLS	Yes	-	Yes	-
CONTROLS	Yes	-	Yes	-
Mu (1)	1.48*	0.06	1.81*	0.06
	Diagnostics [P-Values in Parenthesis]			
OBSERVATIONS	1114		1114	
LOG-LIKELIHOOD VALUE	-1017.59		-930.5	
HETEROSCEDASTICITY	82.5*** (0.00)		75.3*** (0.00)	

Note

Control variables not reported include land holding size, education, illness, gender, age, and number of younger and older children.

MU (1) refers to the first cut-off/threshold;

***, **, * denotes statistical significance at the 0.01, 0.05 and 0.10 level, respectively using two-tailed tests.

Table 8. Correlates of Subjective Wellbeing: Heteroscedastic Ordered Probit

DEP.VAR.	SATISFACTION		HAPPINESS	
	Coef.	St.Er.	Coef.	St.Er.
CONSTANT	-1.83***	0.68	-0.55**	0.26
<u>Welfare Metrics</u>				
LOG_CONSUMPTION_PER_CAPITA	0.34***	0.11	0.11**	0.04
LOG_LIVESTOCK	0.57***	0.18	0.36***	0.07
<u>Institutions</u>				
TRUST	0.11***	0.04	0.03*	0.02
POLITICAL TRUST	0.08**	0.04	0.02	0.02
PARTICIPATION	0.26**	0.13	0.02	0.06
<u>Religion and Religiosity</u>				
RELIGIOSITY	-0.004	0.01	0.001	0.01
CATHOLIC	-0.09	0.25	0.22	0.14
MUSLIM	-0.40*	0.22	-0.13	0.12
PROTESTANT	-0.07	0.2	0.05	0.12
CATHOLIC*RELIGIOSITY	0.01	0.03	-0.02	0.02
MUSLIM*RELIGIOSITY	0.03*	0.02	0.004	0.01
PROTESTANT*RELIGIOSITY	0.04**	0.02	0.02	0.01
<u>Others</u>				
VILLAGE CONTROLS	Yes	-	Yes	-
CONTROLS	Yes	-	Yes	-
Mu (1)	1.75***	0.5	1.17***	0.2
<u>Variance Function</u>				
LOG_CONSUMPTION_PER_CAPITA	0.10*	0.06		
LOG_LIVESTOCK	-	-	-0.18*	0.06
VILLAGE CONTROLS	Yes	-	Yes	-
<u>Diagnostics [P-Values in Parenthesis]</u>				
OBSERVATIONS	1114		1114	
LOG-LIKELIHOOD VALUE	-998.3		-913.7	
HETEROSCEDASTICITY ¹⁵	-		-	

Note

Control variables not reported include land holding size, education, illness, gender, age, and number of younger and older children.

MU (1) refers to the first cut-off/threshold;

***, **, * denotes statistical significance at the 0.01, 0.05 and 0.10 level, respectively using two-tailed tests.

¹⁵ Since a variance function is incorporated in this model there is no need to conduct a heteroscedasticity test.

Consumption per capita and livestock holding emerge as strong predictors of both life satisfaction and happiness. An analysis of the marginal effects from the Heteroscedastic model reported in Table 9 reveals each additional consumption (in logarithmic form) makes an average individual nine percentage points less likely to report 'dissatisfied' and eight percentage points more likely to report 'satisfied'. This implies that a 5% increase in consumption decreases the probability of reporting 'dissatisfied' by 0.45 of a percentage point, and increase the probability of reporting 'satisfied' by 0.4 of a percentage point. The positive role of these welfare metrics is evident in all specifications.

In addition to own income, relative income (relative consumption) compared to neighbours or peers can potentially affect SWB. However, due to lack appropriate information on neighbours or smaller geographic unit, we have not included a measure of relative income in our main models. Most studies in developing countries have reported little or no effect of relative income on SWB. For example, Ravallion and Lokshin (2010) find little support for positional concern (measured by relative deprivation) for most poor households in Malawi with the exception of the relatively well-off. Similarly, Using surveys of two separate villages in Northern Ethiopia Akay and Martinsson (2011) and Akay et al. (2012) studied the role of 'positional concern' using experimental methods and find no evidence for the existence of positional concern as defined by the income of others in the community. One potential measure of relative income could be per capita consumption quartiles by village and include an indicator of which quartiles an individual belongs to. Regression results of our satisfaction and happiness models with this measure are provided in Table A2 in the Appendix A.16

The results reveal that religiosity has a differential role on SWB based on religious denomination. Muslims report significantly lower satisfaction levels than Orthodox Christians. Catholics and Protestants also exhibit lower satisfaction levels albeit the difference is not statistically different at a conventional level of significance. On the other hand, religious Muslims and Protestants report significantly higher satisfaction levels than Orthodox Christians revealing a differentiated role for religiosity on wellbeing. Muslims and Protestants report significantly higher religiosity levels than their Orthodox counterparts in the survey. The marginal effects, reported in Table 9, reveal that being a religious Muslim makes an individual 0.8 percentage points less likely to report dissatisfied and 0.7 percentage points more likely to report satisfied. Similarly, being a religious protestant makes an individual one percentage points less likely to report being dissatisfied and one percentage points more likely to report being satisfied. The positive role of religiosity in newly introduced religions in Ethiopia such as Protestantism can be indicative that religion can create a platform for the development of social capital for minority groups. Azzi and Ehrenberg (1975) find a similar result for racial minorities for the US.

¹⁶ The overall results remain robust to the inclusion of the quartiles of consumption. For the life satisfaction model, the fourth quartile report surprisingly lower satisfaction than the first, which could reflect the concave nature of the role of income (consumption) on satisfaction rather than an indication of the role of relative income. The other quartiles do not report a significant difference in satisfaction relative to the first one. There are no significance differences in happiness among the difference quartiles. However, since we also have a measure of consumption and village fixed effects, we cannot identify the role of relative income (consumption) in this context. Hence, the results could only be taken as indicative.

Unlike with the general life satisfaction model, religion and religiosity do not feature as significant predictors in the happiness model. This is indicative of a subtle characteristic, often overlooked in wellbeing studies, which is that respondents can differentiate between general satisfaction and momentary happiness. This is especially so in religious communities that consider future gains from religion (such as going to heaven) in their general satisfaction function but not so in happiness function as it tends to be temporary in nature. For example, a religious person who fasts and avoids feasts may report low responses for momentary happiness, but higher in the overall response to life satisfaction. Moreover, in the event of adverse circumstances, while temporary happiness can drop for religious and non-religious people alike, the overall satisfaction of religious people may not drop significantly as they are likely to attribute the bad events to the will of God (see, for example, Pollner (1989), Ellison (1991), Frey and Stutzer (2002), Inglehart and Norris (2004) regarding the soothing role of religion in times adversary.

As in many studies in developing and developed economies general trust among the people and trust in local political officials emerge as strong correlates of satisfaction and happiness in our data. In developing countries, people are dependent on each other and their community in everyday life. Labour sharing in farming and sharing of costs during important social events such as weddings and mourning are hallmarks of life in rural areas. Hence, social capital in the form of trust is an important element. Moreover, in those regions where formal political and administrative institutions are not fully developed, informal institutions based on trust play an important role in society by creating peace and stability in the community and the management of communal resources. A measure of general trust emerges as a robust determinant of SWB in our satisfaction model as reflected in its large magnitude of 0.11 of a standard deviation and its statistical significance at the 1% level. The marginal effects from the Heteroscedastic model reported in Table 9 reveal each additional level of trust makes an average individual three percentage points less likely to report 'dissatisfied' and three percentage points more likely to report 'satisfied'. Other studies that find as strong a direct effect of trust on SWB include Bjørnskov (2003) for more affluent countries, Helliwell (2003) for individual-level data across many countries controlling for national trust levels; Helliwell and Putnam (1995) using cross-country and national surveys for US and Canada; and Asadullah and Chaudhury (2012) in rural Bangladesh.

Confidence in political institutions (government trust) is a statistically robust predictor of SWB. The role of political trust on life satisfaction is not statistically different from that of the effect of general trust.¹⁷ However, while the general trust positively affects both life satisfaction and happiness, confidence in local political institutions affects life satisfaction, but not happiness. The role of local political institutions in rural households is paramount. In the context of rural Ethiopia, the role of local administrative units includes land and agricultural input allocation, arbitration during conflict, food aid distribution, and safety net participation. Hence, the confidence that households have in such institutions that play a significant role in their lives affects them directly through a sense of security and indirectly through effects on resource allocation. Studies that find a positive role of quality of governance and political freedom on SWB include Helliwell (2006) and Diener and Diener (2009), both using cross-country data. On the other hand, Veenhoven (2000) finds that a stronger role of political freedom on SWB in richer countries, while economic freedom has a stronger effect in poorer countries. Our finding implies that effective and transparent political institutions at a local level are highly beneficial for household self-reported satisfaction.

¹⁷ The Wald test indicates that we cannot reject the null hypothesis that the difference between the effects of general and political trust on life satisfaction is zero.

It is interesting to note that general trust significantly predicts life satisfaction and momentary happiness while political trust affects life satisfaction but not momentary happiness. This is a sensible result as an individual's trust in political institutions affects their overall welfare but has little significance in momentary emotions. On the other hand general trust that is crucial in the day-to-day interactions with people surrounding the individual is important for both an overall wellbeing and a momentary happiness.

Participation in local institutions in the form of having an official position in community organisations, local administrative committees, or religious institutions, is positively associated with life satisfaction while not so with happiness. ¹⁸ This implies that such positions can be fulfilling regarding the overall objective and purpose of life and the sense of contribution to society. However, shouldering the responsibility and ensuring the smooth operation of institutions in poor areas may involve stress and also use up time which otherwise would have been spent on family or other domestic activities. ¹⁹ This implies that participatory political and socio-economic institutions can boost wellbeing. Using survey data from Switzerland, Frey and Stutzer (2000) find people in regions with more developed institutions of direct democracy report significantly higher levels of self-reported wellbeing.

Similarly, the distinctive effective of religiosity on life satisfaction and happiness is another interesting finding. In line with Azzi and Ehrenberg (1975) individuals take the after-life utility into account when evaluating their overall wellbeing as reflected in religiosity being a predictor of life satisfaction but not of momentary happiness.

In summary, the differential role of institutions on life satisfaction and momentary happiness is in comport with Deaton's (2008) and Stevenson and Wolfers's (2008) proposition that life satisfaction and happiness are not synonymous.

Table 9. Marginal Effects of Selected Variables

	LIFE SATISFACTION			HAPPINESS		
	0	1	2	0	1	2
LOG_CONSUMPTION_PER_CAPITA	-0.09	0.01	0.08	-0.06	0.04	0.02
LOG_LIVESTOCK	-0.16	0.03	0.13	-0.21	0.12	0.08
RELIGIOSITY	0.001	-0.0002	-0.0009	-0.0005	0.003	0.0004
CATHOLIC*RELIGIOSITY	-0.003	0.0004	0.002	0.01	-0.005	-0.004
MUSLIM*RELIGIOSITY	-0.008	0.001	0.007	-0.003	0.002	0.001
PROTESTANT*RELIGIOSITY	-0.01	0.002	0.01	-0.01	0.007	0.004
TRUST	-0.03	0.005	0.03	-0.02	0.01	0.01
POLITICAL TRUST	-0.03	0.003	0.02	-0.01	0.01	0.004
PARTICIPATION	-0.07	0.01	0.06	-0.012	0.007	0.005

Note

The Marginal Effects are based the Heteroscedastic Ordered Probit estimates reported in Table 8.

To get a sense of the relative importance of the correlates of SWB, we can construct 'indifference curves' between any two continuous covariates whose slopes represent the

¹⁸ Such positions are usually voluntary and hence not paid.

¹⁹ The marginal effects from the Heteroscedastic model reported in Table 9 reveal that participation decreases the probability of reporting 'dissatisfied' by seven percentage and increases the probability of reporting 'satisfied' by six percentage points.

'marginal rate of substitution' between them. The indifference curves represent various combinations of two covariates that yield the same level of satisfaction. In the current application, the slopes of the indifference curves are given by the minus of the ratio of their β -coefficients (see, for example, Stewart et al. (2004) and Litchfield et al. (2012)). Table 10 reports indifference curves for an average individual for selected covariates based on the estimates of Table 6.

Focusing on the heteroscedastic models, the slopes of the indifference curves reveal that individuals are willing to sacrifice a 4% of consumption for an additional visit to a church/mosque to stay at the same level of satisfaction. This implies that the value of a visit to a church/mosque is equivalent to 4% of their per capita consumption. Similarly, one extra visit to a church/mosque per month offsets the loss in satisfaction due to a reduction of 2.5% of livestock holdings. A one point increase, which is large relative to the mean, in general trust or government trust, can compensate for 32% and 23% reduction in consumption per capita respectively. With a mean of 4.37, a one-point increase in general trust corresponds to 23% in percentage terms. Similarly, with an average of 4.19, a one-point increase in government trust corresponds to 24% in percentage terms. Therefore, a 23% increase in general trust compensates a reduction in consumption of 32%. Moreover, a 24% increase in government trust compensates for a decrease in consumption of 23%.²⁰ The sizes of the effects of trust (general and government) are surprisingly large. It can be due to the absence of formal institutions in rural areas. Since we have not adequately controlled for potential endogeneity of these factors, the results should be taken only as indicative.

Table 10. Trade-offs between Selected Covariates: Slopes of Indifference Curves

Slope for a given Satisfaction level	Standard Order Probit	Heteroscedastic Order Probit
Change in per capita consumption required to compensate for extra day in church/mosque	-0.056** (-0.03)	-0.04** (-0.02)
Change in livestock holdings required to compensate for extra day in church/mosque	-0.027** (-0.01)	-0.025** (-0.01)
Change in per capita consumption required to compensate for an extra trust level	-0.43*** (-0.13)	-0.32*** (-0.1)
Change in per capita consumption required to compensate for an extra government trust level	-0.29*** (-0.11)	-0.23*** (-0.09)

Note

Based on Table 6 for a more straightforward treatment of religiosity as we don't include interactions
 ***, **, * denotes statistical significance at the 0.01, 0.05 and 0.10 level, respectively using two-tailed tests.

4.2. Robustness, Alternative Measures and Estimation

To test the robustness of the coefficients of our main variables of interest to the inclusion of controls, we run ordered probit regression for general life satisfaction with and without various control variables. As shown in Table A3 in Appendix A, our main variables of interest are robust to the inclusion of controls.

²⁰ A t-test shows that the increase required either in general trust or government trust to offset a reduction in consumption are not statistically different at conventional levels.

To check whether conflation of our main measure of life satisfaction results in difference estimates, we run an ordered probit estimation using the seven-scale category. Column 1 of Table 11 reports the result of this exercise. The result is broadly similar to the one with conflated satisfaction measure. Column 2 provides OLS estimates of an 11-rung satisfaction question (satisfaction ladder) where respondents were asked to put themselves in a satisfaction ladder from '0' to '10' where '0' is the worst and '10' the best possible satisfaction level. Similarly, the OLS estimates are comparable to that of our main results based on ordered probit methods. For example, the OLS estimates reveal that, ceteris paribus, that a 10% increase in consumption per capita is associated with 0.029 points increase in the satisfaction. Moreover, a one point increase in the general trust and government trust is related to a 0.12 and 0.05 increase in satisfaction responses respectively. With mean values of 4.42 for the satisfaction ladder, and 4.37 and 4.19 for the general trust and political trust, respectively, the roles of such institutions on satisfaction are not trivial.

The broadly similar result for the different specifications and measures of wellbeing is indicative of the robustness of our models.

Table 11. Alternative Definitions and Estimation

Dep. Var.	7-Category satisfaction (Not conflated) Ordered Probit	11- Category Satisfaction OLS
<u>Welfare Metrics</u>		
LOG_CONSUMPTION_PER_CAPITA	0.18***	0.29***
LOG_LIVESTOCK	0.49***	0.90***
<u>Institutions</u>		
TRUST	0.10***	0.12***
POLITICAL TRUST	0.06***	0.05*
PARTICIPATION	0.23***	0.01
<u>Religion and Religiosity</u>		
RELIGIOSITY	0.0003	-0.01
CATHOLIC	-0.42	0.23
MUSLIM	-0.27	-0.21
PROTESTANT	0.07	-0.08
OTHER RELIGION	-0.07	0.23
CATHOLIC*RELIGIOSITY	0.00	-0.05
MUSLIM*RELIGIOSITY	0.02*	0.03*
PROTESTANT*RELIGIOSITY	0.04**	0.04*
RELOTHER	0.06*	-0.05
CONSTANT		-0.27
<u>Others</u>		
VILLAGE CONTROLS	Yes	Yes
CONTROLS	Yes	Yes
Mu(1)	0.98	
Mu(2)	2.10***	
Mu(3)	2.60***	
Mu(4)	2.83***	
Mu(5)	3.61***	
Mu(6)	5.19***	
N	1114	1114
R-Sq.		0.321
PSEUDO R-Sq.	0.096	

5. Conclusions

Using rich survey data from rural Ethiopia this article has studied the determinants of subjective wellbeing using a heteroscedastic ordered probit model with particular emphasis on the role religious, social, and political institutions. While our results are generally in comport with the literature, there are some differences that reflect the specificity of rural areas in developing countries.

Trust in the general public and trust in local political officials emerge as strong correlates of satisfaction and happiness. This signifies the importance of trust in areas where formal institutions are not developed. The recent devolution of power to lower administration levels in Ethiopia means well-functioning political institutions are important for household wellbeing. On a related issue, participation in formal and informal institutions emerges as a strong predictor of life satisfaction implying participatory democratic institutions even in rural areas play a crucial role in determining wellbeing.

Religiosity has a differential predictive power on wellbeing based on the religious denominations. Religious Muslims and Protestants report higher satisfaction levels than Orthodox Christians. However, religiosity is not among the statistically significant predictors of momentary happiness. The positive role of religiosity on general life satisfaction but not on momentary happiness could indicate religious individuals incorporate after-life-gains such as going to heaven, in their long-term utility function.

The level of consumption, which can capture income levels, is positively related to both general life satisfaction and happiness. The relationship is concave. Given that most of the districts in the sample are drawn from poor, vulnerable areas, it is not conceivable to think the concave relationship stems from richer households being able to meet basic material needs. A more plausible explanation is well functioning markets catering for diverse demands are weak or non-existent, and hence additional income not being translated into immediate utility.

Like any other cross-sectional analysis, a limitation of this study is the inability to control adequately for unobserved individual heterogeneity such as personality that can be particularly relevant in the SWB research. Hence, our analysis does not claim causality, as endogeneity due to omitted variable bias is not adequately addressed. The Ethiopian Rural Household Survey has religion information only in the 2004 round and hence does not permit panel data analysis for the current research. Future research can investigate the determinants of SWB in rural areas using panel data methods as data becomes available for subsequent years.

From a methodological point of view, the results indicate happiness responses tend to reflect welfare metrics; while responses to general satisfaction questions indicate that respondents evaluate their overall status of wellbeing taking into consideration broader socio-economic and institutional characteristics. Hence, happiness and general life satisfaction data convey related, yet distinctive information. The differential roles of institutions on life satisfaction and momentary happiness is in comport with Deaton's (2008) and Stevenson and Wolfers's (2008) proposition that life satisfaction and happiness are not synonymous.

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