

The Impact of Food Price Inflation on Subjective Well-being: Evidence From Urban Ethiopia

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Abstract The world has experienced dramatic food price inflation in recent years, which sparked social unrest and riots in various developing countries. In this paper, we use a novel approach to measure the impact of food price inflation on subjective well-being of urban households in Ethiopia, a country which exhibited one of the highest rates of food price inflation during 2007–2008. Using an ordered probit regression, we show that being negatively affected by a food price shock reduced subjective well-being of households significantly, although the economy was growing rapidly. We also show that relative standing has a large negative effect on subjective well-being of respondents. The fact that rapid economic growth was accompanied by a decline in citizens' average reported level of life satisfaction brings its pro-poorness into question. We argue that controlling the rise in food price and ensuring that economic growth trickles down to the average urban citizen would enhance welfare significantly.

Keywords Life satisfaction · Urban Ethiopia · Food price inflation · Economic growth · Ordered probit

1 Introduction

Global prices for major food items have been soaring in an unprecedented manner since 2005. Between 2005 and 2007, for instance; the price of maize, milk powder, wheat, and rice increased by 80, 90, 70 and 25 % respectively (Ivanic and Martin 2009). There were declines in prices for a while until June 2008, but prices for all food items, except meat and

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dairy products, soared again in December 2010, reaching historically high levels. The FAO (2011) documents that these peaks slightly surpassed peak levels exhibited in June 2008. The FAO Food Price Index (FFPI) averaged 215 points in December 2010, which was higher by 25 % compared to December 2009. Soaring food prices have been the major cause of social unrest and political instability in a number of developing countries, and consequently have been attracting attention. For example, addressing food prices hikes and food security was on the top of the G20—the group of 20 developed and leading emerging economies—agenda in 2011. One of the countries worst affected by rapid food price inflation in recent years is Ethiopia, exhibiting a peak of 92 % in July 2008 (Central Statistical Agency 2008, 2009).

A number of studies (e.g., Klugman and Loening 2007; Ivanic and Martin 2009; Cranfield and Haq 2010; Alem and Söderbom 2012) have investigated the impact of the recent food price hikes on objective measures of welfare such as consumption and poverty. These studies document that the negative impact on welfare of households in developing countries has been tremendous. In this paper, we use detailed household data from urban Ethiopia and investigate the impact of food price inflation on subjective well-being, a welfare aspect which has not been explored by earlier studies. It would be reasonable to expect that the impact on subjective well-being of urban Ethiopian households would be negative for at least three reasons: (1) the share of food in total expenditure is more than 70 % and hence an increase in the price of food would put serious financial pressure on households, (2) because almost no food production takes place in urban Ethiopia, there will not be any welfare gain from increased food prices, and (3) such covariate shocks are not insured through formal insurance mechanisms.

The practice of using subjective responses to questions on well-being has received increasing attention, and social science research on the subject has grown rapidly in the past few decades. The main message emerging from this rapidly growing area of research is that the well-being of citizens cannot be captured solely by economic measures such as income or GDP. Well-being is a broader and multidimensional concept encompassing all aspects of one's life. This approach has emerged through a number of studies showing that, in the past four decades, income in developed countries has increased significantly without a corresponding improvement in the average level of citizens' happiness. This finding is mainly a result of the fact that subjective well-being (SWB) is a positive function of income but a negative function of relative income (Easterlin 1974, 1995). Consequently, there has been an increasing reliance on self-reported SWB indicators, which appeared to be robust indicators of well-being. Researchers in this emerging field of economics propose the use of self-reported measures of well-being to analyze and evaluate the impact of various interesting and relevant variables. SWB indicators have been widely used by psychologists who favor them due to their reliability and stability over time (e.g., see Larsen et al. 1985; Pavot and Diener 1993; Winter et al. 1999). Economic research on the subject has increased rapidly in the past two decades.¹

One striking reality related to research on SWB is that much of the literature comes from studies in developed countries displaying similar impacts of a set of standard variables.² A number of studies indicate that there is a positive but diminishing impact of

¹ See Frey and Stutzer (2002) and Dolan et al. (2008) for a literature survey.

² Other studies on subjective well-being conducted in developing countries include Ravallion and Lokshin (2002) on Russia; Kingdon and Knight (2006); Bookwalter and Dalenberg (2004) and Bookwalter and Dalenberg (2009) on South Africa; Graham and Pettinato (2001, 2002) on Peru and Russia; Appleton and Song (2008), Smyth and Qian (2008), and Knight and Gunatilaka (2010) on urban China; Knight et al. (2009) on rural China; Alem and Martinsson (2011) on urban Ethiopia; and Litchfield et al. (2012) on Albania.

income on SWB, mainly due to the role of relative income, which affects SWB negatively.³ Age is an important determinant of SWB, with a robustly documented U-shaped impact—the lowest level is experienced in middle age (Blanchflower and Oswald 2004; Ferrer-i-Carbonell and Gowdy 2007). Women have been reported to have a higher level of SWB compared to men (Alesina et al. 2004), and married people report a higher level than unmarried, divorced, or separated individuals (e.g., Dolan et al. 2008; Frey and Stutzer 2002; MacKerron 2011). SWB has also been found to be positively and strongly determined by both physical and psychological health (e.g., Dolan et al. 2008). In recent years, researchers have begun using SWB studies to analyze the impact of broader variables such as air pollution (e.g., Welsch 2002, 2006; Luechinger 2009; Ferreira and Moro 2010) and climatic variables (e.g., Rehdanz and Maddison 2005; Welsch and Kuehling 2009).

The main purpose of this paper is to investigate the impact of the 2007–2008 food price inflation on subjective well-being of urban Ethiopian households. Given the fact that inflation is covariate to all respondents in a country, previous studies (e.g., Graham and Pettinato 2001; Alesina et al. 2004; Di Tella et al. 2001, 2003; Wolfers 2003)⁴ investigated its impact on subjective well-being using either cross-country or long panel data. These studies document that inflation has a consistent and robust negative impact on SWB of citizens. In this paper, we use a novel approach and measure the impact of the food price inflation on SWB by making use of households' own responses on whether and to what extent their food consumption has been affected by the shock. Investigating the impact of the recent food price inflation on subjective well-being is important in order to understand the complete effect of the shock on household welfare and formulate appropriate policies.

In short, we show that the average reported level of life satisfaction in urban Ethiopia declined during the period of rapid economic growth. Ordered probit regression results suggest that households that have been negatively affected by food price inflation reported a lower level of life satisfaction. We also investigate the role of other individual and household-level correlates of life satisfaction and show that, among other things, relative standing of households is a strong determinant of subjective well-being of respondents in urban Ethiopia. The fact that economic growth was followed by a decrease in the average level of reported life satisfaction brings the pro-poorness of the recent economic growth in Ethiopia into question. We argue that policies aiming at controlling inflation and ensuring that economic growth trickles down to the average urban citizen would enhance welfare significantly.

The remainder of the paper is organized as follows. Section 2 introduces the data and the empirical strategy. Section 3 presents descriptive statistics of relevant variables. Section 4, contains the results from an ordered probit regression, and Sect. 5 concludes the paper.

2 Data and Empirical Strategy

To investigate the impact of food price inflation on SWB of households in urban Ethiopia, we use the last wave of the Ethiopian Urban Socioeconomic Survey (EUSS) collected in 2009. EUSS is a rich panel data set containing several socioeconomic variables at the

³ Clark et al. 2008 provide an extensive survey of the literature on the relationship between income and subjective well-being.

⁴ All these studies use data from Western Europe and the United States except Graham and Pettinato (2001), who used data from Latin America.

individual and household level over time. The panel data was collected in the years 2000, 2004, and 2009. However, because Ethiopia experienced rapid inflation after 2004, and the relevant data on its impact was collected in 2009, we use data from this survey only to estimate regressions and measure the impact of the food price shock on SWB. The first two waves of the data 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.⁵ Representativeness of the major socioeconomic characteristics of the Ethiopian urban population was taken into consideration when selecting the cities initially. In proportion to the cities' population, about 1,500 households were distributed over the cities, and the sample households were recruited from half of the kebelles (the lowest administrative units) in all woredas (districts) in each city.

EUSS 2009 was collected by one of the authors in late 2008 and early 2009 from a sub-sample of the original sample in four cities—Addis Ababa, Awassa, Dessie, and Mekelle—comprising 709 households.⁶ These cities were carefully selected to represent the major urban areas of the country and the original sample.⁷ Out of the 709 households surveyed, 128 were new randomly chosen households incorporated in the sampling. 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 and Söderbom (2012) test for this and show that there is no systematic difference between the new households and the old panel households in welfare as measured by per capita consumption expenditure, 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, educational status, occupation, production activities, asset ownership, and other individual- and household-level variables.

Following most of the studies in the literature, the present paper uses responses from the following survey question as the dependent variable: "Taking everything into account, how satisfied are you with the way you live these days". 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 corresponding life satisfaction regression using linear models such as OLS. Thus, a linear model of life satisfaction can be specified as:

$$s = \mathbf{x}\beta + e, \quad e|\mathbf{x} \sim N(0, 1) \quad (1)$$

where β is a $K \times 1$ vector of parameters to be estimated, \mathbf{x} represents a vector of explanatory variables, and e is a normally distributed error term.

However, in a lot of applied research related to the economics of happiness, it is assumed that the respondent's well-being, s , is an unobserved latent outcome conventionally proxied by a self-reported life satisfaction response, s^* on an ordinal scale with various alternative categories. The estimation procedure therefore needs to account for the ordered nature of the dependent variable, which as stated above takes a value from 1 (very dissatisfied) to 5 (very satisfied). Hence:

⁵ Data from these major urban areas were also collected in 1994, 1995, and 1997 (See Alem and Söderbom 2012, for details on sampling). However the waves before 2000 did not incorporate questions on life satisfaction.

⁶ Other cities were not covered due to resource constraints.

⁷ See Alem and Söderbom (2012) for a detailed description of EUSS–2008/09.

$$s^* = \mathbf{x}\beta + e, \quad e|\mathbf{x} \sim N(0, 1) \quad (2)$$

where s^* is unobserved.

Let $\eta_1 < \eta_2 < \dots < \eta_J$ represent unknown cut points, and define

$$\begin{aligned} s &= 0 && \text{if } s^* \leq \eta_1 \\ s &= 1 && \text{if } \eta_1 < s^* \leq \eta_2 \\ &\vdots && \\ s &= J && \text{if } s^* > \eta_J \end{aligned}$$

Given the assumption of a normally distributed error term (e), one can derive the conditional distribution of s given the exogenous explanatory variables \mathbf{x} , and compute each response probability. It is straightforward to estimate the parameters η and β using the method of maximum likelihood (Wooldridge 2010) on the likelihood function, which for each individual i is given as:

$$\begin{aligned} \ell_i(\eta, \beta) &= 1[s_i = 0] \log[\Phi(\eta_1 - \mathbf{x}_i\beta)] + 1[s_i = 1] \log[\Phi(\eta_2 - \mathbf{x}_i\beta) \\ &\quad - \Phi(\eta_1 - \mathbf{x}_i\beta)] + \dots + 1[s_i = J] \log[1 - \Phi(\eta_J - \mathbf{x}_i\beta)] \end{aligned} \quad (4)$$

3 Variables and Descriptive Statistics

We hypothesize that SWB of households depends on three broad categories of variables: household-level variables, survey respondent characteristics, and city dummies. The household-level variables include real per capita consumption expenditure adjusted for adult equivalent units, variables indicating how the household was affected by food price inflation, relative position, perception on change in living standard, expectation about how life will be in the future, and other demographic, health and education related variables. Most of these variables have been widely used in previous subjective well-being studies. These general categories and the specific variables under them are shown in the descriptive statistics presented in Table 1. Below, we provide an explanation on how the main variables have been constructed.

Following the standard practice in developing countries, we use real consumption expenditure per adult equivalent units as a measure of economic status of households.⁸ Our consumption measure was computed in the following manner: We first computed aggregate household consumption expenditure by adding up reported household expenditure on food and non-food items. The non-food component of consumption includes expenditures on items such as clothing, footwear, energy, personal care, utilities, health, and education. Aggregate household consumption expenditure was converted into adult equivalences to adjust for household size and composition using the units constructed by Dercon and Krishnan (1998). To allow for spatial comparisons of consumption among households, we computed real household consumption by deflating nominal consumption expenditure using carefully constructed price indices from the survey.

⁸ There has been a longstanding debate on whether to use income or consumption expenditure to measure economic status of households in developing countries. It has been argued that income is often underreported, volatile and difficult to remember, whereas consumption is more stable and is smoothed using different formal and informal smoothing mechanisms. Deaton (1997) and Deaton and Grosh (2000) discuss the controversy in detail, and Filmer and Pritchett (2001) suggest an alternative asset index based approach.

Table 1 Definition and descriptive statistics of variables

Variables	Mean	SD
<i>Household-level variables</i>		
Log real consumption per AEU	4.779	0.673
Very negatively affected by food price inflation	0.618	0.486
Negatively affected by food price inflation	0.267	0.442
Not at all affected by food price inflation*	0.115	0.225
Relatively rich	0.020	0.139
Relatively poor	0.520	0.500
Relatively middle income*	0.460	0.499
Current living standard better than 5 years ago	0.289	0.454
Current living standard worse than 5 years ago	0.454	0.498
Current living standard same as 5 years ago*	0.257	0.437
Expect better life	0.269	0.444
Expect worse life	0.423	0.494
Expect no change in life*	0.307	0.462
Number of children	1.080	1.114
Proportion of household members unemployed	0.146	0.296
Proportion of primary schooling completed members	0.191	0.238
Proportion of secondary schooling completed members	0.497	0.288
Proportion of tertiary schooling completed members	0.144	0.233
Proportion of females	0.574	0.248
Proportion of males	0.422	0.246
Proportion of members with chronic health problem	0.072	0.161
Household receives international remittances	0.240	0.427
Household does not receive international remittances*	0.760	0.427
Number of household members in stable jobs	1.078	1.201
Household lives in own house	0.468	0.499
Household does not live in own house*	0.532	0.499
<i>Respondent characteristics</i>		
Single	0.159	0.366
Widowed	0.295	0.456
Divorced/separated	0.104	0.306
Married*	0.441	0.497
Age	47.642	14.838
Primary schooling completed	0.429	0.495
Secondary schooling completed	0.159	0.366
Tertiary schooling completed	0.113	0.317
Illiterate*	0.299	0.458
Female	0.748	0.435
Male*	0.252	0.435
Unemployed	0.051	0.220
Working/out-of-labor-force*	0.949	0.220
Disabled/suffer from chronic health problem	0.110	0.313
No disability/chronic health problem*	0.890	0.313

Table 1 continued

Variables	Mean	SD
<i>City Dummies</i>		
Lives in Addis	0.594	0.491
Lives in Awassa	0.135	0.342
Lives in Dessie	0.135	0.342
Lives in Mekelle*	0.135	0.342
Observations	709	

* Denotes reference group

Inflation is a covariate shock common to all households and it is difficult to measure its effect on welfare using objective indicators in a cross-section. Because of this, previous studies mainly used objective inflation indicators from cross-country or long panel data to measure its impact on SWB. In this paper, we apply a novel approach which makes use of households' own responses on whether and to what extent they have been affected by the food price inflation. We specifically asked households if their consumption patterns have been affected by the dramatic food price inflation the country experienced between 2007 and 2008. The respondent can answer either "very negatively", "negatively", or "not at all". We created dummy variables accordingly and controlled for them in our SWB regression. Given the fact that these variables are subjective, we do acknowledge their limitation. Nevertheless, we argue that they provide useful information on the magnitude of the impact of the shock. Alem and Söderbom (2012) investigated the impact of the food price inflation on consumption of urban Ethiopian households using rigorous econometric analysis. In order to test the robustness of their results, these authors also used subjective responses of households on the impact of the shock. Reassuringly, their results from both the subjective and objective measures appeared to be similar. This gives us the confidence that the subjective responses of households are fairly reliable and can be used to investigate the impact of the shock on SWB.

It is well established in the development economics literature that shocks (adverse events) affect welfare of households adversely in developing countries. To protect themselves from a decline in welfare due to shocks, households engage in a variety of informal insurance and coping mechanisms (Deaton 1989; Rosenzweig and Wolpin 1993; Glewwe and Hall 1998; Reardon et al. 2007; Alem and Söderbom 2012). One such mechanism is an income diversification strategy that has attracted increasing attention in the past decade: international migration. In 2006, developing countries received a total of US\$188 billion—twice the amount of official assistance—in the form of international remittances (World Bank 2006). Remittances have increased significantly over the past decades in urban Ethiopia as well. Alem (2011) documents that the proportion of the panel households receiving remittances from international sources increased by 141 % from 2004 to 2009. The period in which the country exhibited a rapid increase in remittances has also been characterized by rapid inflation, which was driven by food price inflation. There is some indication that households used remittances to cope with the food price shock.⁹ Thus,

⁹ About 20 % of the households coped with the food price shock through financial support from relatives and those who were the most vulnerable were the ones with a low level of asset ownership and an unstable labor market status (Alem and Söderbom 2012).

in our life satisfaction regressions, we control for both receiving remittances from a family member from abroad and the number of household members engaged in stable jobs.

Selected macroeconomic variables for Ethiopia for the period of rapid economic growth (2004–2010) are presented in Table 2. It can be seen that the country's real GDP grew by 11 % per annum on average. However, the double-digit growth rate in real GDP was accompanied by a double-digit and rapid inflation rate starting in 2005. The country experienced the highest rate of inflation in its history in 2008 (a 55.2 % general inflation rate). The general inflation rate presented in Table 2 was mainly driven by food price inflation, which in 2008 was about 92 %, and affected the welfare of a significant proportion of Ethiopia's urban population (Alem and Söderbom 2012).

Table 3 presents trends in life satisfaction among respondents in urban Ethiopia for the unbalanced panel (the top section) and for respondents surveyed in all the 3 years (bottom section). As it is shown in Table 3, the reported level of life satisfaction in urban Ethiopia is low on average: in 2009, 23 % responded neutral (neither satisfied nor dissatisfied) and about 39 % reported being either dissatisfied or very dissatisfied in life.¹⁰ This is low compared with findings from other countries.¹¹ One can also see from Table 3 that there was a sizable increase in reported life satisfaction between 2000 and 2004, whereas there was a corresponding decline during the period of rapid economic growth (2004–2009). In 2004, for instance, 47 % of the respondents in urban Ethiopia reported being either satisfied or very satisfied with life. The figure declined to 39 % in 2009. There was a corresponding 7 %age point rise in the number of respondents reporting to be dissatisfied with life in 2009. A similar trend is noted from the descriptive statistics for respondents surveyed in all the three periods. This may indicate that economic growth has not been accompanied by a corresponding improvement in the average level of life satisfaction in urban Ethiopia.

4 Results

Table 4 presents estimation results for the life satisfaction regression from an ordered probit model for households in urban Ethiopia. It is convenient to use marginal effects to interpret ordered probit regression results. Column 2 of Table 4 presents the marginal effects computed from the ordered probit regression, which when multiplied by 100 show the percentage point change in the probability of belonging in a particular satisfaction category for a marginal change in an explanatory variable.

For urban Ethiopian households, we find that being very negatively affected by food price inflation has a large negative impact on subjective well-being of households. Moving from not affected at all by food price inflation to being affected very negatively increases the probability of responding that one is very dissatisfied by 10.4 % points and decreases the probability that one is satisfied by 14.2 % points. Similarly, moving from not affected at all by the shock to being affected negatively increases the probability of responding that one is very dissatisfied by 6.3 % points and decreases the probability that one is satisfied by 8.3 %points.¹² These strong impacts are understandable given the fact that inflation, which

¹⁰ Only about 3% of the respondents chose the “very satisfied” response and hence we combined the “very satisfied” and “satisfied” responses.

¹¹ See Frey and Stutzer 2002 for average life satisfaction in different countries.

¹² In order to test the robustness of our results, we estimated the SWB regression using OLS and found no significant differences with those from the ordered probit regression results.

Table 2 Selected macroeconomic indicators of Ethiopia 2004–2010

Variable	Units	2004	2005	2006	2007	2008	2009	2010
GDP, constant prices	National currency	74.40	83.80	93.47	104.50	116.19	127.84	138.08
GDP, constant prices	Percent change	11.73	12.64	11.54	11.80	11.19	10.03	8.01
GDP, current prices	National currency	86.66	106.47	131.64	171.99	248.30	335.38	383.36
GDP, current prices	U.S. dollars	10.05	12.31	15.17	19.55	26.64	32.25	29.72
GDP, deflator	Index	116.48	127.05	140.83	164.58	213.70	262.34	277.64
GDP per capita, constant prices	National currency	1,022.697	1,122.460	1,219.848	1,328.735	1,439.548	1,543.797	1,628.339
GDP per capita, current prices	National currency	1,191.281	1,426.083	1,717.929	2,186.877	3,076.365	4,049.917	4,520.858
GDP per capita, current prices	U.S. dollars	138.21	164.83	197.90	248.62	330.09	389.43	350.44
GDP based on PPP	Current international dollar	40.76	47.24	54.39	62.57	71.11	79.07	86.39
GDP based on PPP <i>per capita</i>	Current international dollar	560.33	632.69	709.80	795.59	881.05	954.83	1,018.711
GDP based on PPP share of world total	Percent	0.08	0.08	0.09	0.09	0.10	0.11	0.12
Total investment	Percent of GDP	26.52	23.76	25.20	22.12	22.36	22.72	22.35
Gross national savings	Percent of GDP	24.58	19.98	18.13	23.54	19.19	19.54	20.72
Inflation, average consumer prices	Index	109.90	117.42	131.81	152.69	191.34	260.98	268.25
Inflation, average consumer prices	Percent change	8.62	6.84	12.26	15.84	25.32	36.40	2.79
Inflation, end of period consumer prices	Index	110.17	124.48	138.88	159.88	248.24	254.94	273.56
Inflation, end of period consumer prices	Percent change	1.75	12.99	11.57	15.12	55.27	2.70	7.30
Population	Persons	72.75	74.66	76.63	78.65	80.71	82.81	84.80
Current account balance	U.S. dollars	-0.14	-0.77	-1.39	-0.87	-1.50	-1.62	-1.29
Current account balance	Percent of GDP	-1.36	-6.28	-9.14	-4.45	-5.65	-5.02	-4.35

Source www.imf.org—World Economic Outlook Database, September 2011

Table 3 Trends in life satisfaction

	2000	2004	2009
<i>All households</i>			
Very dissatisfied	9.12	4.14	9.73
Dissatisfied	34.86	21.61	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
<i>Panel households</i>			
Very dissatisfied	9.71	3.71	8.68
Dissatisfied	37.75	24.45	28.63
Neutral	24.50	26.86	23.21
Satisfied	28.04	44.98	39.48
Total	100.00	100.00	100.00
Observations	457	457	457

was driven by food price inflation, was increasing quite rapidly compared to income in urban Ethiopia and the average share of food in total household expenditure during the period was over 70 %. The negative impact of inflation on subjective well-being is consistent with findings from earlier studies in industrialized countries (Alesina et al. 2004; Di Tella et al. 2001, 2003; Wolfers 2003). An important implication of this finding is that policies which aim at controlling price increases, especially prices of food, would significantly improve welfare of urban households.

Many of the other household-level variables introduced also have statistically strong impacts on life satisfaction in urban Ethiopia. As with studies for other countries, economic status measured by real per capita consumption expenditure increases the reported level of life satisfaction significantly. A 1 % increase in real per capita consumption expenditure reduces the probability of a dissatisfied response by 5.1 % points, while it increases the probability of a satisfied response by 6.8 % points. Consistent with previous studies in other countries (e.g., McBride 2001; Luttmer 2005; Ferrer-i-Carbonell 2005; Kingdon and Knight 2007; Caporale et al. 2009; Bookwalter and Dalenberg 2009; Knight and Gunatilaka 2010), the relative position of one's household is an important determinant of life satisfaction in urban Ethiopia. These variables exhibit the largest marginal effects of all variables included in the life satisfaction regressions next to the city dummies. Moving from being a middle income household to being a poor household increases the likelihood of being dissatisfied by 19.1 % points and reduces the likelihood of a satisfied response by 26.1 % points. The other comparison variables that we introduced were the change in living standard over the past 5 years and the expectation about the future. These are also important determinants of life satisfaction. Compared to feeling that the household's living standard remained the same over the past 5 years, feeling that the household's living standard deteriorated increases the likelihood of choosing a dissatisfied response by 9.2 % points and reduces the likelihood of a satisfied response by 12.3 % points.

Our regression results also confirm the hypothesis on the role of international remittances. The ordered probit regression results show that households receiving international remittances report a higher level of life satisfaction. Being an international remittance-receiving household reduces the probability of choosing a dissatisfied response by 3.3 %

Table 4 Life satisfaction regression-2009: Ordered probit results

Variables	[1] OP		[2] ME			
	Coef.	SE	Very. dissatisfied	Dissatisfied	Neutral	Satisfied
<i>Household-level variables</i>						
Log real consumption per AEU	0.183**	0.082	-0.016**	-0.051**	-0.001	0.068**
Very negatively affected by food price inflation	-0.379**	0.172	0.031**	0.104**	0.007	-0.142**
Negatively affected by food price inflation	-0.228*	0.117	0.022	0.063*	-0.002	-0.083*
Relatively rich	0.204	0.473	-0.015	-0.056	-0.007	0.078
Relatively poor	-0.713***	0.110	0.063***	0.191***	0.007	-0.261***
Current living standard better than 5 years ago	0.455***	0.129	-0.034***	-0.124***	-0.015	0.173***
Current living standard worse than 5 years ago	-0.334***	0.107	0.030***	0.092***	0.000	-0.123***
Expect better life	0.200*	0.120	-0.016*	-0.055*	-0.004	0.075*
Expect worse life	-0.320***	0.101	0.029***	0.088***	-0.001	-0.117***
Number of children	-0.008	0.044	0.001	0.002	0.000	-0.003
Proportion of household members unemployed	0.177	0.148	-0.016	-0.049	-0.001	0.066
Proportion of primary schooling completed members	0.282	0.307	-0.025	-0.079	-0.002	0.105
Proportion of secondary schooling completed members	-0.008	0.287	0.001	0.002	0.000	-0.003
Proportion of tertiary schooling completed members	-0.218	0.365	0.019	0.061	0.001	-0.081
Proportion of females	0.230	0.211	-0.02	-0.064	-0.001	0.085
Proportion of members with chronic health problem	-0.187	0.412	0.016	0.052	0.001	-0.069
Household receives international remittances	0.120**	0.051	-0.010**	-0.033**	-0.002	0.045**
Number of household members in stable jobs	0.057	0.041	-0.005	-0.016	0.000	0.021
Household lives in own house	-0.078	0.091	0.007	0.022	0.000	-0.029
<i>Respondent characteristics</i>						
Single	-0.468***	0.166	0.054**	0.125***	-0.019	-0.161***
Widowed	-0.166	0.120	0.015	0.046	-0.001	-0.061
Divorced/separated	-0.324*	0.174	0.035	0.088**	-0.010	-0.113**
Age	-0.013	0.019	0.001	0.004	0.000	-0.005
Age squared	0.016	0.017	-0.001	-0.005	0.000	0.006
Primary schooling completed	0.037	0.152	-0.003	-0.010	0.000	0.014

Table 4 continued

Variables	[1] OP		[2] ME			
	Coef.	SE	Very. dissatisfied	Dissatisfied	Neutral	Satisfied
Secondary schooling completed	0.216	0.192	-0.017	-0.060	-0.006	0.082
Tertiary schooling completed	0.124	0.253	-0.010	-0.034	-0.002	0.047
Female	0.126	0.128	-0.012	-0.035	0.000	0.046
Unemployed	0.164	0.212	-0.013	-0.045	-0.004	0.062
Disabled/suffer from chronic health problem	-0.245	0.168	0.025	0.067	-0.005	-0.087
<i>City dummies</i>						
Lives in Addis	-0.678***	0.179	0.055***	0.182***	0.016	-0.253***
Lives in Awassa	-0.654***	0.214	0.086**	0.166***	-0.039	-0.213***
Lives in Dessie	-1.165***	0.190	0.203***	0.237***	-0.110**	-0.330***
Cut 1	-2.283***	0.804				
Cut 2	-0.958**	0.412				
Cut 3	-0.163	0.797				
Pseudo R-squared	0.188					
Log-likelihood	-742.799					
Observations	709					

OP denotes ordered probit estimator, and MEOP the corresponding marginal effects

*** denotes significance at 1 %, ** at 5 %, and * at 10 %

points and increases the probability of a satisfied response by 4.5 % points. This finding is in line with Alem (2011), who documents both a significant increase in the flow of international remittances in the past decade in urban Ethiopia and that households may have been using remittances as a way out of poverty and as a livelihood diversification strategy. The other variable introduced to capture households' ability to cope with shocks, "proportion of members in stable jobs," also has a positive coefficient although it is not statistically significant. Finally, one can see from Table 4 that respondent characteristics such as marital status are also important determinants of subjective well-being. This is consistent with earlier findings, probably indicating the interdependence between individual and household subjective well-being in developing countries. The results also reveal the strong impact of location variables in affecting life satisfaction of households in urban Ethiopia. Compared to households located in Mekelle (the reference group),¹³ households in all three other cities reported a low level of life satisfaction.

5 Conclusions

Following the global trend, Ethiopia experienced one of the highest rates of food price inflation during 2007–2008. In this paper, we investigated the impact of food price inflation

¹³ Mekelle is the capital city of the Tigray regional state, located in the north of Ethiopia.

on subjective well-being of urban Ethiopian households. Given the fact that inflation is covariate with no variation across households, but its effect might vary depending on various socioeconomic characteristics, we used self-reported measures of the effects of the shock to measure its impact on subjective well-being. Our regression results indicate that being negatively affected by food price inflation has a large negative impact on subjective well-being of households. Because urban Ethiopian households don't produce food, and because they spend more than 70 % of their consumption budget on food items, such a strong negative impact is understandable. This finding is consistent with findings from earlier studies in industrialized countries which used cross-country and long panel data on objective inflation measures to measure the impact on SWB.

The paper also investigates the trends and other correlates of life satisfaction in urban Ethiopia. The period during which the data was collected was characterized by contradictory developments in the macroeconomic setup of Ethiopia: rapid economic growth coupled with a double-digit inflation rate. Life satisfaction in urban Ethiopia was generally low compared to other countries. Only about 39 % of the respondents reported being satisfied or very satisfied with life and an almost equivalent proportion reported being either dissatisfied or very dissatisfied. Moreover, there was a sizable reduction in the proportion of respondents reporting being satisfied during the period when the country experienced rapid economic growth (2004–2009).

Most of the rest of the household-level variables introduced are significant determinants of life satisfaction in urban Ethiopia. As expected, economic status as measured by per capita consumption increases the reported level of life satisfaction, while relative standing reduces it significantly with the largest marginal effect. The comparison variables introduced to capture the effect of change in living standard over the past 5 years and expectation about the future are also important correlates of life satisfaction. Compared to respondents who perceived no change in living standard over the past 5 years, respondents who perceived improvement reported a higher level of life satisfaction, while those with a negative perception reported a lower level. Similarly, having a positive expectation about the future increases reported life satisfaction, while a negative expectation reduces it.

Having a family member abroad sending money in times of need and having a higher number of household members with stable jobs also increases reported life satisfaction, which confirms the hypothesis that, in a setup where shocks are formally uninsured, households' income diversification strategies play significant roles. Our regression results also show robust impact of individual respondent characteristics such as marital status. This most likely implies that there is a significant interdependence between individual and household subjective well-being in urban Ethiopia. Finally, location variables strongly affect life satisfaction of respondents. Compared to households located in Mekelle (the reference group), households in all the other three cities reported a low level of life satisfaction.

Some important policy implications emerge from our analysis. The reported decline in life satisfaction during the period of rapid economic growth, and the negative impact of being affected adversely by food price shock on subjective well-being, most probably indicate that growth might not have trickled down to the average urban citizen. This would mean that the negative effects of the double-digit inflation outweighed the positive effects of economic growth. This is in line with findings documented by Alem and Söderbom (2012) who showed that the 2007–2008 food price inflation seriously affected consumption of households in urban Ethiopia. Taken together, this suggests that policies aiming at keeping inflation at a lower level and those ensuring that economic growth favors the average urban Ethiopian household would improve welfare significantly. Anti-inflationary

policies would be particularly crucial to reduce the likelihood of social and political unrest, which different developing countries experienced following the recent food price hikes. We also argue that the conventional positive income and negative relative standing effects provide some support for the view that economic growth (which results in an improvement in the economic status of the average citizen) and increased stable job creation would have a positive effect on citizens' welfare. In this respect, future research on what makes people feel relatively better off than others can provide additional useful insights to policy makers.

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References

- Alem, Y. (2011). *Poverty dynamics and intra-household heterogeneity in occupations: Evidence from urban Ethiopia*. Department of Economics: University of Gothenburg.
- Alem, Y., & Martinsson, P. (2011). *What do policymakers know about the factors influencing citizens' subjective well-being?*. Department of Economics: University of Gothenburg.
- Alem, Y., & Söderbom, M. (2012). Household-level consumption in Urban Ethiopia: The effects of a large food price shock. *World Development*, 40(1), 146–162.
- Alesina, A., Di Tella, R., & MacCulloch, R. (2004). Inequality and happiness: Are Europeans and Americans different? *Journal of Public Economics*, 88, 2009–2042.
- Appleton, S., & Song, L. (2008). Life satisfaction in urban China: Components and determinants. *World Development*, 36(11), 2325–2340.
- Blanchflower, D. G., & Oswald, A. J. (2004). Money, sex and happiness: An empirical study. *Scandinavian Journal of Economics*, 106(3), 393–415.
- Bookwalter, J. T., & Dalenberg, D. (2004). Subjective well-being and household factors in South Africa. *Social Indicators Research*, 65(3), 333–353.
- Bookwalter, J. T., & Dalenberg, D. (2009). Relative to What or Whom? The importance of norms and relative standing. *World Development*, 38(3), 345–355.
- Caporale, G. M., Georgellis, Y., Tsitsianis, N., & Yin, Y. P. (2009). Income and happiness across Europe: Do reference values matter? *Journal of Economic Psychology*, 30(1), 42–51.
- Central Statistics Agency (2008). Country and regional level consumer price indices, September 2008. The Federal Democratic Republic of Ethiopia.
- Central Statistics Agency (2009). Country and regional level consumer price indices, August 2009. The Federal Democratic Republic of Ethiopia.
- Clark, A., Frijters, P., & Shields, M. A. (2008). Relative income, happiness and utility: An explanation for the Easterlin Paradox and other puzzles. *Journal of Economic Literature*, 46(1), 95–144.
- Cranfield, J., & Haq, Z. (2010). What impact has food price inflation had on consumer welfare? A global analysis. Contributed paper at the 2010 AARES conference.
- Deaton, A. (1989). *Saving in developing countries: Theory and review. Proceedings of the world bank annual conference on development economics*. Washington DC: The World Bank.
- Deaton, A. (1997). *The analysis of household surveys: A microeconomic approach to development policy*. Baltimore: Johns Hopkins University Press.
- Deaton, A., & Grosh, M. (2000). Consumption. In M. Grosh & P. Glewee (Eds.), *Designing household survey questionnaires for developing countries: Lessons from 15 years of the living standards measurement study* (pp. 91–133). Oxford: Oxford University Press.
- Deron S., & Krishnan, P. (1998). Changes in poverty in rural Ethiopia 1989-1995: Measurement, robustness tests and decomposition. CSAE working paper series, 1998–1997.
- Di Tella, R., MacCulloch, R., & Oswald, A. (2001). Preferences over inflation and unemployment: Evidence from surveys of happiness. *The American Economic Review*, 91(1), 335–341.
- Di Tella, R., MacCulloch, R., & Oswald, A. (2003). The macroeconomics of happiness. *The Review of Economics and Statistics*, 85(4), 809–827.

- Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, 29, 94–122.
- Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In A. D. Paul & W. R. Melvin (Eds.), *Nations and households in economic growth: Essays in honour of Moses Abramowitz* (pp. 89–125). New York and London: Academic Press.
- Easterlin, R. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization*, 27(1), 35–47.
- Ferreira, S., & Moro, M. (2010). On the use of subjective well-being data for environmental valuation. *Environmental & Resource Economics*, 46(3), 249–273.
- Ferrer-i-Carbonell, A. (2005). Income and well-being: An empirical analysis of the comparison income effect. *Journal of Public Economics*, 89(56), 997–1019.
- Ferrer-i-Carbonell, A., & Gowdy, J. M. (2007). Environmental degradation and happiness. *Ecological Economics*, 60(3), 509–516.
- Filmer, D., & Pritchett, L. (2001). Estimating wealth effects without expenditure data or tears: An application to educational enrolments in states of India. *Demography*, 15(3), 263–279.
- Food Price Index (FAO) (2011) Retrieved from: <http://www.fao.org/worldfoodsituation/FoodPricesIndex/en/On> Jan 5, 2011.
- Frey, B. S., & Stutzer, A. (2002). *Happiness and economics*. Princeton: Princeton University Press.
- Glewwe, P., & Hall, G. (1998). Are some groups more vulnerable to macroeconomic shocks than others? Hypothesis tests based on panel data from Peru. *Journal of Development Economics*, 56, 181–206.
- Graham, C., & Pettinato, S. (2001). Happiness, markets and democracy: Latin America in comparative perspective. *Journal of Happiness Studies*, 2(3), 237–268.
- Graham, C., & Pettinato, S. (2002). Frustrated achievers: winners, losers and subjective wellbeing in new market economies. *Journal of Development Studies*, 38(4), 100–140.
- Ivanic, M., & Martin, W. (2009). Implications of higher global food prices for poverty in low-income countries. *Agricultural Economics*, 39, 405–416.
- Kingdon, G. G., & Knight, J. (2006). Subjective well-being poverty vs. income poverty and capabilities poverty? *Journal of Development Studies*, 42(7), 1199–1224.
- Kingdon, G. G., & Knight, J. (2007). Community, comparisons and subjective well-being in a divided society. *Journal of Economic Behavior & Organization*, 64(1), 69–90.
- Klugman, J. & Loening, J. (2007). Welfare impacts of food price inflation in Ethiopia. MPRA Paper No. 24892.
- Knight, J., & Gunatilaka, R. (2010). Great expectations? The subjective well-being of rural-urban migrants in China. *World Development*, 38(1), 113–124.
- Knight, J., Song, L., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China Economic Review*, 20(4), 635–649.
- Larsen, R. J., Diener, E., & Emmons, R. A. (1985). An evaluation of subjective well-being measures. *Social Indicators Research*, 17, 1–17.
- Litchfield, J., Reilly, B., & Veneiani, M. (2012). An analysis of life satisfaction in Albania: A heteroskedastic ordered probit model approach. *Journal of Economic Behavior & Organization*, 81(3), 731–741.
- Luechinger, S. (2009). Valuing air quality using the life satisfaction approach. *Economic Journal*, 119(536), 482–515.
- Luttmer, E. F. P. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics*, 120(3), 963–1002.
- MacKerron, G. (2011). Happiness economics from 35,000 feet. *Journal of Economic Surveys*, 26(4), 705–735.
- McBride, M. (2001). Relative-income effects on subjective well-being in the cross-section. *Journal of Economic Behavior & Organization*, 45(3), 251–278.
- Pavot, W., & Diener, E. (1993). The affective and cognitive context of self-reported measures of well-being. *Social Indicators Research*, 28, 1–20.
- Ravallion, M., & Lokshin, M. (2002). Self-rated economic welfare in Russia. *European Economic Review*, 46(8), 1453–1473.
- Reardon, T., Nerdegue, C., Baret, B., & Stamoulis, K. (2007). Household income diversification into rural nonfarm activities. In S. Hagglblade, et al. (Eds.), *Transforming the rural nonfarm economy: Opportunities and threats in the developing world* (pp. 115–141). Baltimore: John Hopkins Press.
- Rehdanz, K., & Maddison, D. (2005). Climate and happiness. *Ecological Economics*, 52(1), 111–125.
- Rosenzweig, M. R., & Wolpin, K. I. (1993). Credit market constraints, consumption smoothing, and the accumulation of durable production. *Journal of Political Economy*, 101(2), 223.

- Smyth, R., & Qian, X. (2008). Inequality and happiness in urban China. *Economics Bulletin*, 4(23), 1–10.
- Welsch, H. (2002). Preferences over prosperity and pollution: Environmental valuation based on happiness surveys. *Kyklos*, 55(4), 473–494.
- Welsch, H. (2006). Environment and happiness: Valuation of air pollution using life satisfaction data. *Ecological Economics*, 58(4), 801–813.
- Welsch, H., & Kuehling, J. (2009). Using happiness data for environmental valuation: Issues and applications. *Journal of Economic Surveys*, 23(2), 385–406.
- Winter, M., Morris, E. W., Gutkowska, K., Jezewska-Zychowicz, M., Palaszewska-Reindl, T., Zelazna, K., et al. (1999). Constraints, domain conditions, and well-being: Evidence from Poland during the transformation. *Journal of Consumer Affairs*, 33, 27–47.
- Wolfers, J. (2003). Is business cycle volatility costly? Evidence from surveys of subjective well-being. *International Finance*, 6(1), 126.
- Wooldridge, J. (2010). *The econometrics of cross-sectional and panel data* (2nd ed.). MIT: MIT Press.
- World Bank. (2006). *Global economic prospects: Economic implications of remittances and migration*. Washington: The World Bank Press.