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An International Study of Childhood Poverty

Dynamics of Welfare and Poverty in Poor Rural and Urban Communities of Ethiopia

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Summary

This paper looks at the factors associated with household welfare and poverty and the movement of households into and out of poverty in Ethiopia. To do this, we specified an empirical model in which the dependent variables are the level and changes in real per adult consumption, the probability of being absolutely poor, and movement into and out of poverty. We employed simple ordinary least squares, logit/probit and multinomial logit methods of estimation with and without controlling for individual and community fixed effects (fixed-effect estimation). Using Young Lives Younger Cohort data, we found that the level and growth of consumption was highly dependent on households' initial level of consumption and wealth, indicating a relationship of dependence between earlier and later socio-economic status and showing that households in poor communities are trapped in poverty. The results also showed that past and more recent economic shocks were negatively related to people's welfare. Government support is crucial to lift poor households out of the poverty trap and protect households from shocks, so as to break the intergenerational transfer of poverty.

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About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in 4 countries (Ethiopia, India, Peru and Vietnam) over 15 years. **www.younglives.org.uk**

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1. Introduction

The importance of poverty reduction as an indicator of social and economic development is expressed by the fact that eradicating extreme poverty and hunger is the first of the Millennium Development Goals (MDGs), the first target being to 'halve the proportion of people whose income is less than $1 per day between 1991 and 2015'.

The proportion of the population living below the poverty line in Ethiopia declined from an estimated level of 48 per cent in 1990/1 to an estimated level of 38.7 per cent in 2004/5. In addition, a notable reduction has been observed in rural poverty and a decrease in the poverty gap index, which indicates a decline in the depth of poverty. Similarly, average per capita consumption measured in the latest Household Income and Consumption Expenditure Survey (2004/5) increased by 50 per cent compared to the average consumption expenditure at the first round of the same survey, conducted in 1995/6 (MOFED 2008a).

Ethiopia has been experiencing high growth rates continuously over the past few years. Since pursuing broad-based growth is at the centre of the country's poverty eradication agenda (MOFED 2008a), it is important to see whether households' levels of poverty are also changing. More importantly, it is necessary to single out what factors determine households' level of poverty and the changes in households' status of poverty over time.

Though there is a range of national-level poverty studies describing the profile of poverty in Ethiopia (Dercon and Shapiro 2007), some have tried to relate the dynamics of poverty to economic shocks and adverse events, while others have focused on the relationship between poverty and growth (e.g. Dercon 2002 and Bigsten et al. 2003). On the other hand, Kedir and McKay (2003) explored the factors that explain whether poverty is transient or chronic. However, their study covered only urban areas of the country. Bigsten and Shimeles (2008) analysed the persistence of poverty in both rural and urban areas in Ethiopia from 1994 to 2004 using survival analysis. The study, however, did not relate economic shocks to the dynamics of poverty. Moreover, the data used for analysis by Kedir and McKay (2003) covered only the period between 1994 and 1997. Similarly, the panel data utilised by Bigsten and Shimeles (2008) covered the period from 1994 until 2004. However, the Ethiopian economy has been achieving higher economic growth since 2004. It is, therefore, essential to undertake new studies with more recent data to understand current dynamics. This study aims to contribute to the literature by exploring the relationship between factors associated with households' welfare/poverty and the dynamics of households' poverty status, using data from Young Lives.[1]

Moreover, the available literature explains the welfare and poverty of the general population, but not the extremely poor (food-deficit) communities. This justifies the value of this study, which uses household-level data collected from poor communities (the Young Lives sample is pro-poor) and, hence, is able to shed light on the factors associated with the welfare and/or poverty of poor communities, and their likelihood of their moving into and out of poverty.

This study, therefore, adds to the existing literature by documenting and analysing new evidence on the dynamics of poverty by utilising a large panel dataset collected from

1 Young Lives is a longitudinal study of childhood poverty in four developing countries including Ethiopia. The data are described in more detail later in this section and in Section 3.

households in both rural and urban parts of Ethiopia. What makes these data unique is that they have been collected in three rounds on two cohorts of children. One of the cohorts consists of 1,000 children who were between 7.5 and 8.5 years of age in Round 1 of the survey (in 2002). The younger cohort comprises 2,000 children who were between the age of 6 and 18 months during Round 1. Round 2 of the survey was conducted in 2006 and Round 3 data were collected in 2009.

In Rounds 2 and 3 of the survey, data on important poverty status indicators such as livelihood and assets, household food and non-food expenditure, and economic changes and recent life history were collected. This is what allows for analysis of the dynamics of poverty, since with these variables at hand we were able to see the movement of households into and out of poverty over the period between the two rounds.

The Young Lives dataset contains sections with the variables that are required to compute per capita real consumption and poverty headcount index. It is, therefore, worthwhile to explore the dynamics of poverty in the Young Lives households and identify the factors associated with them.

In this endeavour, using real per adult consumption to measure individual and child welfare, this paper investigates the factors associated with welfare and poverty and explores the variables correlated with the movements of individuals into and out of poverty in poor communities. The specific objectives are:

1 to explore the factors that are associated with the level and changes in real per adult consumption in poor communities

2 to identify the factors that affect the likelihood of people of being absolutely poor in poor communities, and

3 to assess and identify the factors associated with the movement of individuals into and out of poverty in poor communities.

To this effect, different sets of models are specified. The first set of models specified examines the level and changes in *real consumption expenditure per adult.* We estimated these models using ordinary least squares (OLS) with and without individual-specific fixed effects and community fixed effects. The second set of models estimated are simple and fixed-/random-effect logit models of being absolutely poor and a multinomial logit model of moving into and out of poverty over Rounds 2 and 3.

The paper is organised as follows. Section 2 contains a brief review of literature on the theories of poverty and empirical evidence related to the factors related to it. The data, theoretical framework, models and estimation methods are explained in Section 3. Section 4 presents the key summary statistics. The econometric model estimation results and discussion are provided in Section 5. Section 6 concludes.

2. Literature review

2.1. Theories of poverty

In order to understand events associated with entry into and exit from poverty, as well as design appropriate anti-poverty policies, it is important to understand the fundamental causes of poverty. Many attempts have been made to answer the question of why people are poor. However, the literature still lacks a comprehensive theory of how to measure poverty, which may be due to the fact that poverty is complex to model. As Duncan (1984) notes, a complete explanation of why people are poor would require many interrelated theories, covering family composition, earnings, asset accumulation, transfer programmes, and the macro economy, to name but a few. The construction of this theoretical framework also affects the specification of the empirical model. Having reviewed theoretical models coined to explain reasons for poverty, we classified them into two groups: human capital theory and poverty caused by geographic disparities.

Human capital theory is a theory of earnings developed by Becker (1975) and Mincer (1974). This theory explains both individuals' decisions to invest in human capital (education and training) and the pattern of individuals' lifetime earnings, and their different levels of investment in education and training are explained in terms of their expected returns from the investment. Since investing in education and training involves both direct and indirect costs, only those individuals who believe they will be compensated by sufficiently higher lifetime earnings will choose to invest. Those who are less likely to invest in human capital are people who expect to spend less time in the labour market and those who have fewer labour market opportunities. As a result, this theory would help explain historical patterns of lower earnings and higher poverty rates among women and minorities, among others.

The pattern of lifetime earnings can also be explained by human capital theory. In general, the pattern of individuals' earnings are such that they start out low (when young) and increase with age (Becker 1975), although earnings tend to fall somewhat as individuals near retirement. Younger people are more likely to invest in human capital than older people because they have a longer remaining work life to benefit from their investment and their foregone wages are lower — costs of investing are, hence, lower. Earnings then increase rapidly with age as new skills are acquired. Finally, as workers grow older, the pace of human capital investment and thus productivity slows, leading to slower earnings growth. At the end of a person's working life, skills may have depreciated as a result of lack of continuous human capital investment and the aging process. This depreciation contributes to the downturn in average earnings near retirement age (Ehrenberg and Smith 1991). To the extent that poverty follows earnings, we might predict a similar relationship between age and poverty, with poverty more likely for the young and elderly. Earnings are only one of the determinants of poverty. Thus, human capital theory cannot be considered a complete theory of poverty.

Poverty caused by geographical disparities. This explains why poverty is most intense in certain areas and why some regions lack the economic base to compete. This theory calls attention to the fact that people, institutions and cultures in certain areas lack the objective resources needed to generate well-being and income, and that they lack the power to claim redistribution. A number of reasons are given in the literature for why some regions are associated with poverty while others are noted for their prosperity. Remoteness, certain types of natural resource endowments, political disadvantage, and weak integration can all contribute to the creation of intra-country spatial poverty traps. But spatial disadvantage

includes much more than lagging regions within a country. Morrill and Wohlenberg (1971) explain the situation associated with factors such as disinvestment, proximity to natural resources, density, and diffusion of innovation. Agglomeration theory also shows how propinquity of similar firms attracts supportive services and markets, which further attracts more firms. In reverse, the propinquity of poverty and the conditions leading to poverty or the consequences of poverty (crime and inadequate social services) generate more poverty, while competitive areas attract business clusters, drawing away from impoverished communities. The rural–urban poverty difference may be explained by this theory. Hansen (1970), as cited in Bradshaw (2006), points out, rural areas are often the last stop of technologies, and low wages and competitive pricing dominate production. The lack of infrastructure that allows development of human resources limits economic activity that might use these resources. In contrast, knowledge and capital flow to urban areas more rapidly. Thus, geographical location is partly responsible for households' poverty.

Poverty caused by household size and composition: The view of children as an integral part of the labour that can generate a household's income along with the fact that children are seen as insurance in old age, helps explain the direct relationship between fertility and poverty. This relationship takes effect through different channels (Aassve et al. 2005). Having more children reduces the share of resources to be distributed to each member of the household, and the productivity of the mother may decline due to two factors: the reduction in the resources available for her and the mother being impeded from realising her prospects of having a job. An important point to note is that although these factors induce costs to the household in the short run, as the children grow older the household may generate more resources. Therefore, it is difficult to obtain a clear-cut relationship in terms of the net effect.

In relation to the human capital theory discussed previously, the participation of children in household production reduces the extent of investment in human capital, leading to perpetuating the low-income status of a household.

The number of children families have declines as the households gets richer through two channels. The first one is due to the quantity–quality trade off as discussed by Becker and Lewis (1973). The other effect is due to the higher opportunity cost that women have to incur in terms of greater income, as in Willis (1973).

2.2. Empirical evidence on the correlates of poverty

In this section, empirical evidence that supports how the various correlates of poverty included in our analysis are related to the incidence and status of poverty of households will be discussed.

Education: Mills et al. (2004) found that the number of male household members with primary school or secondary school education and the number of female household members with secondary school education have a positive relationship with per capita expenditure. Quisumbing (2007) also found that the educational attainment of the household head has a positive relationship with the probability of never being poor. Moreover, the results of Neilson et al. (2008) showed that more-educated households have a smaller chance of falling into poverty. Similarly, Alisjahbana and Yusuf (2003) found that the education level of household head has a negative relationship with both the probability of being in chronic poverty and in transient poverty. In addition, households with higher educational levels were found to be less likely to be chronically poor in Jayaraman (2006). The same was found to be true in Kedir and McKay (2003), while Burke et al. (2007) also found that the educational level of the head of household is positively related to the probability of being consistently non-poor.

Completing primary education was found to lower the probability of being in chronic poverty in Dercon et al. (2011). Likewise, educational level of the household head was found to have a positive relationship with household welfare in Hagos and Holden (2003). Furthermore, Baulch and McCulloch (1998) found that having a household head who completed primary school and the number of household members with secondary school education has a negative relationship with the probability of a household being poor.

Location of household: Both Bigsten and Shimeles (2008) and Neilson et al. (2008) found a relationship between poverty and the location of households. Bigsten and Shimeles (2008) found that the longer households stayed in a certain poverty status the harder it was to leave that state of poverty. For urban areas, it was found that exit rates from poverty declined consistently. The probability of households slipping back into poverty was found to decline faster for rural households than for urban households. Similarly, Neilson et al. (2008) found that rural households leave poverty more than urban households. In addition, being a metropolitan household was positively related to the probability of leaving poverty.

Household composition: Having more economically dependent household members is another factor that drives households into poverty, and the likelihood of entering poverty increased by 2.7 percentage points for households with a child under the age of 6, according to McKernan and Ratcliffe (2005), for example. On the other hand, the probability of entering poverty is much higher in young adulthood than in other stages of life. McKernan and Ratcliffe (2002, 2005) find that household heads under 25 years old are significantly more likely to enter poverty according to both the Panel Study of Income Dynamics (PSID) and Survey of Income and Programme Participation (SIPP) data. And similarly, Bane and Ellwood (1986) reported that about 14.7 per cent of the poverty spell was begun by young adults who set up their own household. Therefore, the changes in household structures are quite important events.

Experience of economic shocks: Neilson et al. (2008) found that households whose heads had experienced illness exhibited a smaller chance of exiting poverty. Similarly, the results of Quisumbing (2007) showed that a shock connected with illness-related expenditure exhibited an inverse relationship with being chronically poor and a direct relationship with the probability of never being poor. In addition, illness-related income losses were found to have a negative relationship with per capita consumption. Dercon et al. (2005) also showed that real consumption is affected by death and illness of family members, which are idiosyncratic shocks. Moreover, Dercon (2002) found that percentage change in the logarithm of the previous year's rainfall was positively related to logarithm of consumption and percentage change in logarithm of rain since the previous wave. Similarly, in Thomas (2009) both current and lagged rainfall shocks were found to have a negative relationship with per capita consumption. Dercon et al. (2005) found that real consumption is affected by area wide drought shock which results from shortage of rainfall.

Assets: Quisumbing (2007) found that per capita consumption has a positive relationship with the area of land owned. Furthermore, in the microfinance site, land owned and the value of non-land assets were found to have an increasing effect on per capita consumption. Household assets were also found to have a positive relationship with the probability of being never poor.

Gender: Studies undertaken by Bane and Ellwood (1986), McKernan and Ratcliffe (2002, 2005), Naifeh (1998) and Stevens (1994) have shown that individuals in female-headed households and larger households, particularly those with more children, are less likely to exit poverty. Bane and Ellwood (1986) reported that about 10.1 per cent of individuals exited

from poverty if a household made a transition from a female-headed household to a male-headed household, while 11.1 per cent of households began a spell of poverty as the reverse transition was made. They also showed that marriage is an important way out of poverty for female-headed families, though not as important as work.

2.3. Summary of literature review

We argue that household poverty has consequences for child well-being. In line with this, Bane and Ellwood (1986) find that the highest proportion of spells of child poverty begin when the child is born (20 per cent), while Duncan and Rodgers (1988) find that the labour supply of individuals in the household other than the mother or father is the event that coincides most with children's transitions into poverty (i.e. they argue that child poverty begins when children start to supply labour to the household). Unemployment of the male head of household, or few work hours, also coincides with children moving into poverty. Becoming a single-parent family and having a head who becomes disabled are somewhat less important than these labour supply measures. Therefore, knowing the poverty dynamics of households helps understand the very reasons for child poverty.

Different methodologies were used by the studies reviewed. Most of the studies used similar methods to identify the factors that determined the incidence and dynamics of poverty. Kedir and McKay (2003), Alisjahbana and Yusuf (2003), Jayaraman (2006), and Quisumbing (2007) all used multinomial logit models to explore how the movement of households into and out of poverty is affected by different correlates of poverty. The definition of the discrete dynamics of poverty variables, however, varied among the studies. On the other hand, Baulch and McCulloch (1998) and Bigsten and Shimeles (2008) used methods of survival analysis to investigate the relationship between the dynamics of poverty and its determinants. Moreover, Bigsten and Shimeles (2008) run a logistic regression to identify the determinants of the incidence of poverty. An alternative method was used by Dercon (2002) which was a fixed effects regression that was run on a difference model to see how shocks affect household consumption.

The review of the literature presented above shows how household welfare is negatively affected by family size, particularity by the number of dependents in the household, and positively affected by the number of working family members in places where there are more jobs. Poverty is also affected negatively by family size. The head of household’s education level affects household welfare positively and affects poverty negatively (i.e. reduces poverty). However, no sufficient evidence is available for the differential role of male and female education level on household welfare and poverty. The literature also shows that both area-wide and idiosyncratic shocks affect both household welfare and poverty.

Despite the meagre literature available for Ethiopia, the studies available cover nationally representative households which include both the extreme poor and more affluent sectors. The available literature explains household welfare and poverty of the general population, but not the extreme poor (food-deficit) communities except for Kedir and McKay (2003), although they cover only urban households. Young Lives data is collected from poor food-deficit communities with the aim of explaining the welfare and poverty situations of poor communities. This justifies the value of this study which uses household-level data collected in poor communities and to explain the poverty situation and associated factors of welfare and poverty of the poor communities which Young Lives sample children belong to.

3. Data and method

3.1. Data source

This study utilised data from the Younger Cohort of the Young Lives study in Ethiopia. The survey was undertaken in 20 sentinel sites located in Addis Ababa, Oromia, Amhara, Southern Nations Nationalities and People's Region (SNNPR) and Tigray. The selection criteria adopted for the sentinel sites was that they had to be located in poor areas based on the country's food insecurity designation. Seventy-five per cent of the sentinel sites in each region were selected from high food-deficit *woredas* (districts) and 25 per cent were selected from a lower food-deficit *woreda*. Children in rural areas comprise 60 per cent of the sample and 40 per cent are from urban areas. Each region comprised 20 per cent of the total sample except for Addis Ababa (15 per cent) and SNNPR (25 per cent).

The selection of sentinel sites within regions was made based regional and local-level data on population density and prevalence of critical food deficit (dependence on food aid). Consultations were also made with regional policymakers and other stakeholders to guide the selection of sentinel sites. Within each sentinel site, a simple random sample of 100 households was taken.

To date, Young Lives has completed three rounds of its survey. Round 1 was carried out in the last quarter of 2002, sampling 1,999 children aged 6–18 months (the Younger Cohort) and 1,000 children who were 7.5 to 8.5 years old (the Older Cohort). Round 2 of the survey was conducted in 2006 and Round 3 in 2009. In all three rounds the survey was carried out during the last quarter of the year. Until Round 3, only 72 of the Younger Cohort children had died. The total attrition rate[2] over eight years has been 2.15 per cent for the Younger Cohort and 2.10 per cent for the Older Cohort, indicating an annual attrition rate of 0.27 per cent, which is extremely low. Consequently, in Round 3, the total number of households interviewed was 1,884 for the Younger Cohort and 973 for the Older Cohort.

The household questionnaires of Rounds 2 and 3 contained questions on livelihood and assets, household food and non-food expenditure, and economic changes and recent life history. The data used for the analysis are mostly obtained from this part of the questionnaire in addition to the household demography variables.

3.2. Models used and estimation methods

3.2.1 Theoretical framework

Following the work of Jalan and Ravallion (2002) and Islam (1995) as applied by Dercon (2004), we can start from the classic Ramsey model of inter-temporal consumer equilibrium in order to include production by a household facing household-specific constraints in its production process.

2 The attrition rate is defined as the number of children who were untraceable or refused to answer the questionnaire divided by the total number of children. Attrition does not include deaths, since the number of deaths within the sample is in itself a finding.

The output of a farming household is a concave production function of various privately provided inputs (physical and human capital) and publicly provided goods and services such as geographic capital, roads, and other public infrastructure and services. Under the standard Ramsey model and perfect competitive markets, marginal products of private capital are equalised across all households at a common interest even if spatial variability creates a difference in marginal productivity of capital across locations, because private capital adjusts itself to restore equilibrium. However, given the obvious existence of lack of capital and differences in human capital, it is difficult to assume a perfect competitive market.

Hence given output per worker or per person is *F* (*K*, *G*), where *G* is human capital, shocks, and spatial (location) effect on a household's own production, including the existence of various public programmes; and *K* denotes capital per worker. Output will be consumed, invested or used to repay debt. We can make the standard assumption that a household maximises an inter-temporal additive lifetime utility (utility integral):

$$\int_0^{\infty} \frac{1}{1-\sigma} C(t)^{1-\sigma}\, e^{-\rho t}\, dt \qquad (1)$$

where σ is inter-temporal elasticity of substitution, *C* is consumption, ρ is subjective rate of time preference. From this we can obtain the optimal rate of consumption growth that satisfies the Euler equation:

$$g(t) = d\ln C(t) = [F_k\,(K, G) - \rho - \delta] / \sigma \quad \text{or} \qquad (2)$$

$$g(t) = d\ln C(t) = \frac{F_k\,(K, G) - \rho - \delta}{\sigma}$$

where δ is the rate depreciation plus labour augmenting technological progress. The key feature of this model is that shocks, human capital, household composition and location (capturing public goods and services) can influence the level of consumption and consumption growth at household level through their effect on the marginal product of a household's own capital.

Using this Euler equation as motivation; assuming that the marginal product of a household's own capital at farm household level is the linear function of $K_{it\text{-}1}$ and X_{it}; and allowing for measurement error, the empirical model is given by:[3]

$$\Delta\ln Cit = \phi i + \beta Ki\,(t-1) + \xi Xi + \varepsilon i\,(i = 1,2,\ldots,N; t = 2,3,\ldots T) \qquad (3)$$

where $\Delta\ln C_{it}$ measures the growth rate of consumption for household *i* at time *t*; $K_{it\text{-}1}$ are time-varying household wealth including initial conditions, X_{it} time-varying and time invariant community variables that are exogenous to the household and ϕ_i a household fixed effect.[4]

The growth rate of consumption ($\Delta\ln C_{it}$) without ad hoc adjustment, respectively are given by:

$$\Delta\ln Cit = \alpha i + \alpha 2Ai\,(t-1) + \alpha 3Xi\,(t-1) + \alpha 4Si\,(t-1) + \varepsilon it \qquad (4)$$

or

$$\ln Cit = \alpha i + \beta \ln Ci\,(t-1) + \alpha 2Ai\,(t-1) + \alpha 3Xi\,(t-1) + \alpha 4Si\,(t-1) + \varepsilon it \qquad (5)$$

[3] For details of the derivation, see Jalan and Ravallion (2002) and Dercon (2004).

[4] Please note that the time invariant variable will not be identified in the fixed-effect model estimation.

where Δ ln *Cit* is the growth rate of consumption; ln*Cit* and ln*Ci*(*t*-1) consumption at time *t* and at time *t-1*, α_i is a fixed effect capturing the effect of variables peculiar to the *i-th* household and is constant over time, $\ln A_{it-1}$ the lagged value of asset holding; X_{it-1} are both time-varying and invariant household conditions such as lagged family size, education level and other household characteristics; S_{it-1} are lagged shocks that affect household welfare. It must be noted here that the variable *K* which represents physical capital has been substituted by *A* which represents asset holding.

Once the level of consumption expenditure is set by equation (4) or (5), we can calculate the level of poverty using a non-welfarist approach based around the idea of basic needs (Ravallion 1992). The (absolute) poverty line is set using the cost of basic needs method. First the food poverty line is defined by choosing a bundle of food typically consumed by poor people. The quantity of the bundle of food is determined in such a way as to supply the predetermined level of minimum calorific requirement (2,200 kcal). This bundle is valued at local prices. Then a specific allowance for the non-food goods, consistent with the spending pattern of the sample is added to the food poverty line. To account for non-food expenditure, the food poverty line is divided by the food share.

The Foster-Greer-Thorbecke (FGT) P_α class of poverty measures, first proposed by Foster et al. (1984) and used in order to aggregate poverty so as to measure incidence, depth and severity of poverty, is given as follows. Given real per adult (per capita) household expenditure, C_i, are ranked as:

$$C_1 \le C_2 \le .....C_q \le Z < {}_{q+1} ..... \le C_n,$$

where *Z* is the poverty line, *n* is the total population, and *q* is the number of poor people, then P_α is given by

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{Z - C_i)}{Z}\right)^\alpha \; ; \; \alpha \ge 0, \text{ for } C < Z. \qquad (6)$$

Here the parameter α reflects the policymaker's degree of aversion to inequality among poor people. When α=0, the corresponding poverty index is known as the *headcount index* (P_0). Hence P_0 corresponds to the proportion of individuals falling below the poverty line. When α=1, the poverty index is called the *poverty gap inde*x (P_1) and it measures the aggregate poverty deficit of poor people relative to the poverty line. When α**>**1, the P_α calculation gives more weight to the average income shortfall of the poorest of the poor. Thus P_2 (where α=2) measures the squared proportional shortfalls from the poverty line, which is commonly known as an index of the severity of poverty.

3.2.2 Comparison of income poverty between groups and time periods

The usual way to compare poverty indices between, say, two groups (Group 1 and Group 2) is to conduct a statistical test or means separation test. If the poverty measures are estimated from unit record data (i.e. on the basis of sample observations), it is possible to test whether the observed differences in their values are statistically significant. The hypothesis test developed by Kakwani (1993) can be used to test whether poverty indices (P_α) differ significantly between groups and over time. The null hypotheses, which are the observed differences of poverty indices between different groups, are zero (i.e. not statistically significant). The standard error of P_α measures of poverty indices is calculated using the following formula (Ravallion 1992):

$$SE(P\alpha) = \sqrt{(P\alpha 1 - P\alpha 2)/n}$$

where *SE*(.) is standard error. Consequently the standard error (*SE*) of the difference in poverty index between Group 1 and Group 2 ($SE(P_{\alpha 1} - P_{\alpha 2})$) – having a random sample n_1 and n_2, respectively is given by

$$SE(P_{\alpha 1} - P_{\alpha 2}) = \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$$

where S_1 and S_2, are the sample estimator of the variance of the asymptotic distribution of $P_{\alpha 1}\sqrt{n_1}$ and $P_{\alpha 2}\sqrt{n_2}$. That is the

$$SE(P_{\alpha 1} - P_{\alpha 2}) = \sqrt{(SE(P_{\alpha 1}))^2 + (SE(P_{\alpha 2}))^2}$$

The test statistics (*t*) given by

$t = \frac{(P_{\alpha 1} - P_{\alpha 2})}{SE(P_{\alpha 1} - P_{\alpha 2})}$ are asymptotically normally distributed with zero mean and unit variance.

In a large sample, if the calculated value of *t* has an absolute value less than 1.96 (2.58) then the difference in the poverty indices between two groups or dates is not statistically significant at the 5 per cent (1 per cent) level using two-tail test.

3.2.3 *Estimation methods and data sources*

We used real consumption expenditure per adult as a measure of household welfare because consumption expenditure is a smoothed version of household income which is relatively accurately reported by households. Households looking at their long-term income can consume more by using their savings or borrowing or deferring consumption by saving for future consumption. In order to adjust for inflation, we deflated the 2009 consumption expenditure per adult to 2006 constant prices and hence we call it real consumption expenditure per adult.

The absolute poverty line is set as the amount of money required to purchase 2,200 kilocalories per adult plus essential non-food expenditure, as defined by the Ministry of Finance and Economic Development (MOFED 2008a). First we valued the 2,200 kilocalories at 2009 prices for the survey months for each region where the Young Lives sample are located in order to account for the regional price differences. In order to obtain the poverty line, we divided the food poverty line by the share of food in total consumption expenditure. We then deflated the 2009 poverty line to the 2006 constant prices using the inflation figures reported by the Central Statistical Agency (CSA) of Ethiopia. The average price index for 2009 during the survey periods was 1.784 (see Table A1 in the Appendix for details of poverty line by region).

To investigate which variables were associated with real consumption expenditure per adult, the OLS estimation method was used. We estimated equations (4) and (5) with and without fixed effects using all rounds of data. In some cases, Round 1 data is excluded in our fixed-effect estimation because consumption expenditure was measured only for Round 2 and Round 3. In addition, to identify the association of a household's poverty status at household level, simple probit and random-effects probit regressions were adopted. We also used a multinomial logit model in order to estimate the movements of households into and out of poverty between Round 2 (2006) and Round 3 (2009).

In this paper we estimate the extent to which poverty level at one point in time is predictive of later poverty and well-being. In dynamic models of real consumption and poverty status, the coefficient of the lag of the real consumption and poverty status, respectively, are used to

measure this relationship. Other different independent variables were included to explore the determinants of the real consumption expenditure per adult and the probability of households being in absolute poverty. As was the case for the real consumption expenditure per adult model, the household composition variables, disaggregated by age and gender of household members, were included in the regression, along with the gender of the household head, and the maximum educational level of household members, classified by gender. Lagged real per adult consumption, changes in the wealth index and lagged changes in the wealth index were also used as explanatory variables.[5] In addition, community dummies and dummy variables for whether households have experienced economic shocks or adverse events that were perceived to affect their welfare negatively were also included. The shocks under consideration were the death and/or illness of household members, theft, large increases in input prices, large increases in output prices, the death of livestock, loss of a job or shutdown of a place of employment, the divorce or separation of family and natural disasters (including drought).

Two OLS estimations, with and without lagged real consumption expenditure per adult, were also made on the real consumption expenditure per adult model to make comparisons with the outcomes of the fixed-effects estimation. Similarly, two probit regressions were also run for the probability of being in absolute poverty, without taking into account the panel nature of the data, to be compared with the random effects estimates of the status of poverty model, again with and without lagged status of poverty.

A multinomial logistic regression method was used to explore the drivers of movement into and out of poverty. A discrete variable that takes on the value 0 when there has not been any change in the level of poverty, 1 when a household has moved into absolute poverty and 2 when a household has moved out of poverty between Rounds 2 and 3. The group that had not experienced any change in its poverty status was taken as base for the multinomial logit regression.

To identify which variables are the drivers of movement into and out of poverty, different independent variables were incorporated. The gender of the household head, number of household members below the age of 7 and above 65, the number of children between 7 and 17 years old, the number of male household members between the ages of 17 and 65 and the number of female family members between the ages of 17 and 65 were included as household composition variables. The highest school grade completed by the primary caregiver of the Young Lives child and the highest grade completed by the father were included to capture the effect of education on the dynamics of poverty. Different variables were also included to examine how households' levels of poverty responded to economic shocks.

Dummy variables for shocks in both rounds were included (details of the variables can be seen in Table 12, section 51.). The change in the wealth index from Round 2 to Round 3 and a dummy variable for household residence in urban areas were also incorporated in the model.

5 The wealth index is composed of housing conditions (the number of rooms and the materials the wall, roof and floor of the house are made of), ownership of durable goods (such as a radio, fridge, bicycle, TV, motorbike/scooter, motor car/truck, electric fan, mobile phone, landline, modern bed, table or chair and sofa) and access to services such as electricity, water, sanitation facilities and cooking fuel. This index ranges between 0 and 1, with a higher value reflecting more wealth.

4. Descriptive analysis

4.1. Real consumption and wealth index

In this section we describe the level and changes in real consumption, the wealth index and poverty, supported by tables of summary statistics and cross tabulations. The descriptive statistics for the rest of the explanatory variables are provided in the Appendix (see Table A2 in the Appendix).

As Table 1 shows, the real consumption expenditure per adult, which is our main indicator of welfare, was 145 birr in 2006 and increased by 3.6 per cent over three years, reaching 150 birr in 2009, indicating an annual average increase of 1.2 per cent. Urban households had higher real expenditure than rural households in both 2006 and 2009, but the gap was narrowing slightly, indicating that growth of real consumption per adult was higher in rural areas than in urban areas. The same pattern was observed for the food and non-food expenditure per adult. Food accounted for about 66 per cent of the total real consumption expenditure per adult, with urban households having a much lower food share (57.5 per cent) than urban households (71.7 per cent). Overall the share of food expenditure declined slightly for both areas. Another measure of household wealth is the wealth index, which reflects the ownership of assets. The average wealth index for the Younger Cohort sample was 0.21 in 2002. It increased slightly to 0.29 in 2006 and reached 0.33 in 2009, indicating substantial growth between the Round 1 and Round 3 surveys. The wealth index was higher for urban areas than for rural areas, but the growth in the wealth index was much higher for rural areas (at 114 per cent) than for urban areas (22 per cent).

Table 1. *Summary statistics of real per capita consumption expenditure per adult (birr) and Wealth Index, by location*

	Rural	Urban	Total
Monthly real food consumption per adult in 2006	80.66	104.09	89.93
Monthly real non-food consumption per adult in 2006	31.73	91.67	55.44
Monthly real consumption per adult in 2006	111.99	194.97	144.82
Monthly real food consumption per adult in 2009	82.51	99.84	89.37
Monthly real non-food consumption per adult in 2009	40.59	96.13	62.56
Monthly real consumption per adult in 2009	122.18	192.68	150.07
Food share in 2006	0.717	0.575	0.661
Food share in 2009	0.686	0.557	0.635
Wealth Index in Round 1	0.105	0.374	0.211
Wealth Index in Round 2	0.185	0.434	0.283
Wealth Index in Round 3	0.240	0.465	0.329

Source: Own computation from Young Lives Younger Cohort data; 2009=Round 3; 2006=Round 2.

We can also look at the level of real consumption, and changes in it, across wealth quintiles (Table 2). Monthly real consumption per adult increases as we go from the poorest to the richest quintile, which sheds light on the possible positive association between asset accumulation and access to services on the one hand and real consumption expenditure on the other. Moreover, a rise in average monthly real consumption expenditure per adult has been observed for all the wealth quintiles between Round 2 and Round 3. The difference is

only the rate of change, which was greatest for the third quintile, whose expenditure growth is around four times greater than the next biggest growth.

Table 2. *Average real per capita consumption expenditure by Wealth Index quintile (birr)*

Wealth index quintiles	Round 2	Round 3	Rate of change (%)
1 (poorest)	99.65	102.37	2.73
2	108.46	111.69	2.98
3	115.40	128.90	11.70
4	155.76	159.88	2.65
5	245.30	248.47	1.29
Total	**144.82**	**150.07**	**3.63**

Source: Young Lives Younger Cohort data.

Similarly, the average wealth index of all of the wealth quintiles increased between Rounds 2 and 3 (Table 3), which may have to do with the maturity/life-stage of the household. An exceptionally high rate of change was recorded for the poorest quintile (148 per cent) descending continuously for the higher wealth quintiles. The smallest change (0.38 per cent) was observed for the richest quintile.

Table 3. *Average wealth index, by Wealth Index quartiles*

Wealth Index quintiles	Round 2	Round 3	Rate of change (%)
1 (poorest)	0.067	0.167	148.39
2	0.164	0.220	34.28
3	0.259	0.303	16.99
4	0.374	0.401	7.23
5	0.554	0.556	0.38
Total	**0.283**	**0.329**	**16.21**

Source: Young Lives Younger Cohort data.

To identify the factors that triggered the large increase in wealth index, particularly in the poorest wealth quintile, the result was further disaggregated into consumer durables index and services quality index. The average values of these variables and the percentage change between the two rounds are presented in Table 4.

Table 4. *Service access and consumer durables indices*

Wealth Index quintiles	Service access index			Consumer durables index		
	Round 2	Round 3	% change	Round 2	Round 3	% change
1 (poorest)	0.050	0.130	161.18	0.022	0.093	322.20
2	0.211	0.294	39.49	0.040	0.125	208.75
3	0.315	0.391	24.30	0.066	0.221	236.70
4	0.478	0.503	5.31	0.135	0.347	157.31
5	0.693	0.705	1.81	0.265	0.553	108.90
Total	**0.349**	**0.404**	**15.77**	**0.105**	**0.267**	**153.50**

Source: Young Lives Younger Cohort data.

The percentage change in the consumer durables index is very wide-ranging. Although the percentage change is very large, especially for the poorest quintile, the value of the consumer durables index is much smaller in absolute terms. This could be the reason why big percentage changes are recorded. The values of the service access index are relatively higher. The trend in the percentage change of service access index for each wealth index quintile resembles the trend for percentage change in wealth index.

4.2. Characteristics of the poor and poverty dynamics

In this sub-section we examine the levels and severity of poverty among the households in our sample, the movement of those households into and out of poverty, and the characteristics of the households that had one or more spells of poverty compared to those that were never poor. As Table 5 shows, the level of absolute poverty derived from the consumption expenditure using equation (6) above, was 72 per cent in Round 2 (2006) and it declined to 68.6 per cent in 2009. The poverty gap (aggregate poverty deficit of the poor relative to the poverty line) also declined, as did the poverty severity index, the latter indicating an overall decline in inequality among Young Lives sample households. All changes in poverty indices are found to be statistically significant (see Table 5 for detail). The reductions in both the percentage of households in absolute poverty and the poverty gap indicates that households are coming out of poverty in different dimensions. It is important to look into the reasons behind the decline of all the poverty indicators so that this poverty decline can be perpetuated.

Table 5. *Poverty headcount, gap and severity indices in 2006 and 2009*

2006	Estimate	Std. Err.	95% Confidence Interval	
Headcount index (P_0)	0.722	0.010	0.702	0.743
Poverty gap index (P_1)	0.306	0.006	0.295	0.318
Poverty severity index (P_2)	0.161	0.004	0.152	0.169
2009	**Estimate**	**Std. Err.**	**95% Confidence Interval**	
Headcount index (P_0)	0.686**	0.011	[0.665	0.707]
Poverty gap index (P_1)	0.273***	0.006	[0.262	0.284]
Poverty severity index (P_2)	0.137***	0.004	[0.129	0.144]

Source: Young Lives Younger Cohort data.
P_0=Poverty headcount index; P_1=Poverty gap index; P_2=Poverty severity index;
The asterisk (*) shows statistical significance for changes between Round 2 and Round 3 in poverty indices where *= significance at 10%, ** = significance at 5%, and *** = significance at 1%.

Table A3 in the Appendix disaggregates the incidence, gap and severity of poverty for households according to their rural or urban location. As the table shows, these indices remained unchanged for urban households (at 64.4 per cent, 30 per cent and 17 per cent, respectively in both rounds) while t they decreased for households that were located in rural areas. All these changes are found statistically significant for rural areas (Table A3). Despite the fact that rural poverty decreased, poverty incidence was higher for rural areas than for urban areas, while poverty severity was higher for urban areas than for rural areas, indicating higher inequality in these areas. The difference in poverty indices between rural and urban poverty was statistically significant for only poverty incidence and severity, but not for the poverty gap, indicating that the poverty gap is not different between rural and urban areas (see Table A4 in the appendix).

Table A4 (see Appendix) examines the poverty indices according to the gender of the head of the household. While there is no significant difference in the incidence of poverty between male- and female-headed households, the poverty gap and poverty severity were higher for female-headed households than for male-headed households in 2006 though the difference in the poverty gap is not statistically significant.

We now look at the proportions of households moving into and out of absolute poverty. As Table 6 shows, the percentage of households that moved into absolute poverty in Round 3 was found to be lower than the percentage moving out of absolute poverty.

Table 6. *Number of households moving into and out of absolute poverty, 2006–2009*

	Number	Percentage
Moved into poverty	202	10.73
Moved out of poverty	273	14.51

Source: Young Lives Younger Cohort data.

Table 7 analyses this movement according to the location of the households and the gender of the household head. As the table shows, a much lower percentage of the households that became poor were located in urban areas than in rural ones, while over 70 per cent of the households escaping poverty were in urban areas.

Table 7. *Distribution of households that have moved into and out of absolute poverty, by location and gender of the head of the household, 2006–2009 (%)*

	Rural	Urban	Male-headed households	Female-headed households
Moved into poverty	62.87	37.13	79.70	20.30
Moved out of poverty	28.57	71.43	80.59	19.41

Source: Young Lives Younger Cohort data.

Table 8 presents the movement of households into and out of poverty by location and gender of the head of the household. Our results appear to indicate that rural households were more likely to move out of poverty than urban ones. The gender of the household head did not affect households' movement into or out of poverty by more than two percentage points, though female-headed households were more likely to change their poverty status. As we show later in this section, the age or education of the household head, as well as other household characteristics, seem to be correlated with a household's poverty status to a greater extent.

Table 8. *Prevalence of households that moved into and out of poverty by location and gender (%)*

	Rural	Urban	Male-headed households	Female-headed households	Total
Moved into poverty	11.17	10.07	10.49	11.82	10.73
Moved out of poverty	17.15	10.47	14.33	15.27	14.51

Source: Young Lives Younger Cohort data.

Table 9 analyses the movement of households into and out of poverty according to region. The percentage of households that moved into or of poverty was found to be much smaller for Addis Ababa compared to other regions.

Table 9. *Movement into and out of poverty by region, 2006–2009 (%)*

	Addis Ababa	Amhara	Oromia	SNNP	Tigray
Moved into poverty	6.93	12.38	26.73	33.13	20.79
Moved out of poverty	6.23	26.37	23.44	25.64	18.32

Source: Young Lives Younger Cohort data.

We also estimated the effect of the sample households' previous poverty status on the risk of their being poor in the current period. In dynamic models of poverty, the coefficient of the lag of the poverty index is used to measure this relationship. Before dealing with multivariate methods, we can simply understand the existence this relationship by calculating simple conditional probabilities. In this fashion, the probability of a household being in a given state (poor or non-poor) in the current period (Round 3) given its status in the earlier one (Round 2) is estimated and presented in Table 10. Considering the total sample, of those households that were observed to be poor in Round 3, 75 per cent of them were also poor in Round 2, with negligible differences between rural and urban sites (Table 10). In other words, if we randomly select a poor household in Round 3, this household has a 0.75 probability of having been poor in the previous period as well. Similarly, when we consider the non-poor households of Round 3, a significant number of households were able to maintain their previous status though the magnitude is significantly lower than the case of the poor.

Table 10. *Contingency table of poor and non-poor between Round 2 and Round 3 (%)*

	Urban			Rural			Total		
Round 3 Round 2	Non-poor	Poor	Total	Non-poor	Poor	Total	Non-poor	Poor	Total
Non-poor	45.3	54.7	53.7	54.2	45.8	15.1	48.0	52.0	30.4
Poor	24.1	75.9	46.3	25.4	74.6	84.9	25.0	75.0	69.6
Total	35.5	64.5	100	29.7	70.3	100	32.0	68.0	100

Source: Own computation from Young Lives Younger Cohort data.

This indicates that the current poverty status of households is highly correlated with their previous status. Once the household slips into poverty, it is more likely to stay poor in the next periods.

It is believed that poor households have distinct characteristics compared to non-poor households. Looking at the socio-economic characteristics of these groups is important to shape the multivariate analysis, to be presented in the next section. In this section, therefore, we present the socio-economic characteristics of households disaggregated into durations of poverty (never poor, once poor and twice poor) for both urban and rural sites. As is common in panel studies (Haddad and Ahmed 2003), the characteristics are the initial period characteristics, most of which are also used in the multivariate analysis. The results for the urban and rural sub-samples are reported in Tables A5 and A6 (in the Appendix), respectively.

Table 11. *Selected household characteristics by poverty duration*

Household characteristics	Never poor (R2 and R3)	Once poor (R2 or R3)	Twice poor (R2 and R3)
Family size	5.45	5.94	6.60
Number of dependents	2.98	3.34	4.03
Average age of the household head (years)	40.96	43.05	43.70
Head's mean schooling (grade)	6.50	3.91	2.01
Average education of the HH members (grade)	6.38	4.63	2.80
Land holding (hectares)	0.68	0.73	0.90
Number of oxen	0.87	0.92	1.00
Asset index	0.24	0.21	0.22
Wealth index	0.38	0.27	0.16

Source: Young Lives Younger Cohort data.

The descriptive results presented in Table 11 show that the household structure of the never poor and always poor households was found to be different. Households with large family sizes, more economically dependent members, and an older household head were found to be poorer. On the other hand, households with smaller family sizes and lower dependency rates as well as led by a younger head were observed to be more to be less poor or never poor. Similar trends could be observed when we summarise these characteristics for absolutely poor and non-poor households separately for both time periods.

Two education indicators, namely, mean schooling or grade (in years) of the household head and mean grade of all members in a given household are used to see the link between educational level and poverty status. Here, we could be able to establish the clearest linkage between poverty and education, whichever proxy is used for education. Households with low levels of education are more likely to be chronically poor and vice-versa. We can also see a clearer pattern of education when households are categorised into poor and non-poor in the two time periods. This may indicate that better education leads to favourable poverty status. High educational achievement makes households able to move out of consumption poverty not only through increasing their average income but also by increasing their flexibility to consume more.

Wealth indices are other dimensions of or proxies to poverty. These measures of poverty are believed to have a strong correlation among them. Similarly, the result presented in Table 11 revealed that poor households are associated with low wealth indices. For example, the wealth indices of the never-poor and twice poor household were estimated to be 0.38 and 0.16, respectively, showing the wealthier households are more likely to consume more and be out of poverty. When we compare the asset and wealth status of households across time, it has shown a substantial improvement for both poor and non-poor households.

5. Estimation results and discussion

In order to identify factors associated with the change and growth rate of real consumption per adult, we estimated equations (4) and (5) using simple and fixed-effect OLS models. In the simple OLS model, we sequenced the dependent variables and the explanatory variables, where the explanatory variables are lagged by one or more periods. In the fixed-effect estimation method, we used only two rounds of data. We also estimated a simple logit/probit and fixed/random effect logit/probit as well as multinomial logit model to assess the factors associated with absolute poverty and changes in poverty status. The main results are provided in Tables 12 to 16, with supporting summary statistics of variables used in estimations presented in the Appendix in Tables A7 to A10.

5.1. Household welfare measured by real per adult consumption

Ordinary least square (OLS) estimates of equations (4) and (5) are provided in Table 12 and those of fixed-effect estimates are found in Table 13 (see Tables A8 and A9 in the Appendix). Here we have three versions: in the first version the dependent variable is the logarithm of real consumption per adult in 2009, but it includes the lagged logarithm of real consumption in order to identify whether households' earlier poverty status is predictive of later poverty. In versions 2 and 3, the dependent variable is the growth rate of real consumption per adult, except the third version does not include community dummies.

Wealth index is expected to be positively associated with real per adult consumption. Our results show that an increase in the wealth index (that is, the accumulation of more wealth), is positively associated with real per adult consumption in 2009 and with the growth of real consumption per adult. This association is robust and does not change when community dummies are added to the model, indicating that household welfare and the growth rate of consumption per adult is robustly and positively associated with the accumulation of more wealth.

The results also show that real consumption in 2009 (Round 3) has a positive and statistically significant association with consumption in Round 2, with an elasticity of 0.33, which shows a convergence in consumption over time, but also a relationship between earlier and later poverty status. The results also highlight that when households are living in urban areas, they tend to have lower growth of consumption by 16 per cent, consistent with theory of geographic disparities. This result is statistically significant when community dummies are not included. When community dummies are included, the urban residence dummy becomes insignificant. The reason behind this may be that the community dummies are located in either urban or rural areas and hence take away some of the community-specific effects that could have been attributed to the effect of living in an urban area.

One usually expects that, controlling for other factors, the level of real consumption per adult will decline in female-headed households. However, our results show that the level of real consumption per adult increased. These results are statistically significant at the 1 per cent significance level and their statistical significance did not go away when we added community dummies. These kinds of results have been obtained in many surveys, including the nationally representative survey conducted by Central Statistical Agency of Ethiopia

(MOFED 2008a). One reason for this may be that female-headed households have the right to keep land even if they live in urban areas, while the reverse is true for men.

Initial household composition has very little association with the level of real consumption expenditure. The only statistically significant variable is the number of family members between the ages of 7 and 17, which is negatively associated with real consumption in 2009 and positively associated with the growth of real consumption per adult.

We have also tried to find the association between the level of real consumption per adult and the primary caregiver's and paternal levels of education. Consistent with human capital theory, we found a positive and statistically significant association been both and the level of real per adult consumption. From the result, we can infer that when the level of education of the primary caregiver and the father increases by one year, real per adult person consumption increase by 2.5 per cent and 1.3 per cent, respectively, indicating that the education level of the primary caregiver (usually the mother) is more important than that of the father.

We have included in the regression various incidences of shocks (since Round 1, in 2002) that are perceived by the households to affect their welfare negatively. Among the idiosyncratic shocks, we found that shocks that happened between 2002 and 2006, such as the death and illness of family members and divorce or separation of family, and shocks that occurred between 2006 and 2009 such as job loss and drought, have a negative and statistically significant association with the level of real per adult consumption in 2009. This clearly tells us that not only recent shocks, but also previous shocks, have long-lasting effects on household welfare.

Although large increases in the food purchased by households had no statistically significant effect on the logarithm of real per adult consumption, they were found to have a statistically significant effect on the growth rate of real per adult consumption. Moreover, the effect of a household being located in an urban area was found to have a negative relationship with the dependent variable, unlike the case in the regression on the logarithm of real per adult consumption. The number of household members between the ages of 7 and 17 years was found to have a positive effect on the growth rate of real per adult consumption, in contrast to its effect on the logarithm of real per adult consumption.

To check for the robustness of the results, similar regressions were performed on the level values of the dependent variables rather than the logarithmic values of the variables. The results of the regressions were found to be more or less the same (see Table A8).

Table 12. *OLS estimates of logarithm of real per adult consumption expenditure in 2009 and growth rate of real per adult consumption*

	Logarithm of real per adult consumption	Growth rate of real per adult consumption	Growth rate of real per adult consumption (without community dummies)
Log real consumption expenditure per adult	0.333***		
	(16.416)		
Urban residence dummy (2006)	0.379***	0.078	-0.161***
	(3.473)	(0.567)	(-4.123)
Change in wealth index between Round 2 and Round 3	0.522***	0.703***	0.601***
	(5.232)	(5.591)	(4.691)
Dummy for female-headed household	0.092***	0.118***	0.119***
	(3.090)	(3.126)	(3.136)
Number of household members below 7 and above 65 years	-0.012	0.038**	0.029
	(-0.875)	(2.206)	(1.604)
Number of household members between 7 and 17 years	-0.016**	0.029***	0.028***
	(-2.059)	(2.996)	(2.741)
Number of male household members between 17 and 65 years	0.020	0.013	0.028
	(1.230)	(0.622)	(1.315)
Number of female household members between 17 and 65 years	0.016	0.007	0.009
	(0.931)	(0.340)	(0.394)
Highest grade completed by primary caregiver	0.025***	-0.001	0.004
	(6.511)	(-0.188)	(0.795)
Highest grade completed by father	0.013***	-0.001	-0.002
	(4.088)	(-0.321)	(-0.458)
Round 2 shocks			
Dummy for death or illness of household members	-0.043**	-0.067**	-0.062**
	(-2.016)	(-2.452)	(-2.277)
Dummy for death of livestock	0.021	0.045	0.048
	(0.817)	(1.383)	(1.434)
Dummy for increased input prices since R1	0.023	0.007	-0.025
	(0.910)	(0.233)	(-0.832)
Dummy for decreased output prices since R1	0.041	0.024	0.052
	(0.883)	(0.405)	(0.867)
Dummy for drought	0.014	0.047	-0.005
	(0.426)	(1.151)	(-0.150)
Dummy for divorce or separation of family	-0.145***	-0.111*	-0.115*
	(-2.852)	(-1.721)	(-1.744)
Dummy for place of employment shutdown or job loss	-0.038	0.030	-0.011
	(-1.099)	(0.670)	(-0.251)
Round 3 shocks			
Dummy for death or illness of household members	0.024	0.020	0.029
	(1.163)	(0.739)	(1.091)
Dummy for large increase in input price since Round 2	-0.050	-0.052	-0.033
	(-0.670)	(-0.556)	(-0.344)
Dummy for large decrease in output price since Round 2	0.095	0.054	-0.014
	(1.278)	(0.580)	(-0.148)
Dummy for large increase in the food purchased by household	-0.054	0.025	0.094**
	(-1.514)	(0.566)	(2.222)
Dummy for death of livestock	0.014	-0.003	-0.002
	(0.594)	(-0.112)	(-0.055)
Dummy for place employment shutdown or job loss	-0.062*	-0.052	-0.088**
	(-1.885)	(-1.269)	(-2.096)
Dummy for divorce or separation of family	0.053	0.041	0.035
	(0.942)	(0.580)	(0.470)
Dummy for drought	-0.062**	-0.039	-0.076**
	(-2.252)	(-1.110)	(-2.330)
Community dummies	Yes	Yes	NO
Constant	2.999***	-0.093	-0.068
	(20.802)	(-0.673)	(-1.020)
Number of observations	1,881	1,881	1,881
R^2	0.487	0.134	0.050
Adjusted R^2	0.474	0.111	0.038

Source: Own estimation using Young Lives Younger Cohort data; Δ stands for change .
Note: *** p<0.01, ** p<0.05, * p<0.1.

The fixed-effect estimation, which controls for household-specific effects in addition to the rest of the explanatory variables, identified types of factors similar to those associated with the real per adult consumption expenditure. In these fixed-effect estimates, only time-varying variables can be kept in the model, while the time invariant variables will drop from the model. The results are provided in Table 13. From the fixed-effect estimates, we found that the wealth index had a positive and statistically significant relationship with real per adult consumption. Real per adult consumption increases by 7.2 per cent when wealth index increases by 10 per cent. This indicates that the wealth of a household is important to increasing the welfare of family members and preventing them from shortfalls in consumption.

While the maximum education of female family members in a household has a statistically significant and positive association with real per adult consumption, we could not find any statistically significant effect of maximum education of male family members. This again indicates that education of females, particularly current and future mothers, is key to increasing the welfare of household members, including children.

Household composition is also found to affect real per adult consumption. The number of male and female family members aged 7 or less, is found to have a statistically significant association with real per adult consumption. The numbers of female family members between 7 and 17 years and aged 65 or more are found to have a negative and statistically significant relationship with consumption. On the other hand, the number of male family members between 18 and 64 is found to have a positive and statistically significant relationship with real per adult consumption.

We have tried to see the effect of shocks on real per adult consumption in the fixed-effect panel data setting. Once we control for the household-specific fixed effects, only the death and illness of family members and job losses have a statistically significant relationship with real per adult consumption with the latter negative and the former unexpectedly positive. Other than this, we could not establish that shocks affected real per adult consumption. However, this does not mean shocks do not have an effect on real per adult consumption because we may not have enough variation in incidence of shocks across time.

Table 13. *Fixed-effect regression of logarithm of real per adult consumption*

	Coefficient (t-ratio)
Wealth Index	0.724***
	(5.817)
Maximum education of female members in the household	0.004
	(1.644)
Maximum education of male members in the household	0.003
	(0.933)
Number of male family members up to 7 years old	-0.056**
	(-2.359)
Number of male family members between age 7 and 17	-0.016
	(-0.663)
Number of male family members between 17 and 65 years	0.064**
	(2.516)
Number of male family members over age 65 years	0.010
	(0.125)
Number of female family members up to 7 years old	-0.108***
	(-4.721)
Number of female family members between age 7 and 17	-0.079***
	(-3.476)
Number of female family members between 17 and 65 years	-0.011
	(-0.426)
Number of female family members over age 65 years	0.036
	(0.521)
Dummy for death and illness of HH members	0.044**
	(2.151)
Dummy for theft	0.036
	(1.138)
Dummy for increased input prices	0.006
	(0.229)
Dummy for decreased output prices	-0.003
	(-0.108)
Dummy for death of livestock	-0.018
	(-0.742)
Dummy for place employment shutdown or job loss	-0.053*
	(-1.653)
Dummy for divorce or separation of family	0.068
	(1.269)
Dummy for natural disaster including drought	-0.008
	(-0.287)
Constant	4.697***
	(54.616)
Number of observations	3,764
Number of groups	1,883
Within R^2	0.050
Between R^2	0.319
Overall R^2	0.256

Source: Young Lives Younger Cohort data.
Note: *** p<0.01, ** p<0.05, * p<0.1.

5.2. Poverty incidence

Using each household poverty status computed, we estimated the probability of a household being absolutely poor in order to see the factors associated with the probability being absolutely poor with and without conditionality on the households' poverty status in 2006 using a simple logit/probit estimation. The explanatory variables included in the logit/probit model are lagged dummy variable for being poor, change in wealth index, urban residence dummy, female-headed household dummy, initial household composition, parents' level of education, and shocks experienced by the household between 2002 and 2006 (Round 2) and between 2006 and 2009 (Round 3). The simple logit/probit models are also estimated with and without community dummies and we found the results were the same except that including community dummies reduced the magnitude of the coefficients slightly, but not much. The results are provided in Table 14.

The probability that a household is absolutely poor in 2006 has a statistically significant positive association with the probability of its being poor in 2009 (individuals are more likely to be poor if they were poor in earlier periods). In a pair-wise correlation, poverty is higher in rural areas than in urban areas. Here, controlling for other factors, poverty is higher in urban areas than in rural areas, which is quite contrary to what was expected. However, the urban dummy is statistically significant at the 10 per cent significance level when lagged poverty indicator is excluded in the regression, showing that no robust relationship exists between place of residence and poverty. There is also no statistically significant relationship between the gender of the household head and the probability of being poor though the coefficient for female-headed dummy variable is negative. However, when we dropped community dummies, we found female-headed households had lower poverty than male-headed households, indicating this relationship is location-specific.

The Wealth Index is expected to be negatively associated with the probability of being poor. As expected, there is a significant negative association between probability of being poor and a change in the wealth Index. The coefficient for a change in the wealth index remained significant across all estimates including estimates with and without community dummies and with and without lagged poverty status, indicating the robustness of the relationship between a change in the wealth index and the probability of being poor.

With regard to the household composition, the number of children below 7 and adults above 65 years old and the number of children between 7 and 17 years old are found to have positive and statistically significant associations with the likelihood of a household being poor, while the number of adults has a negative, but statistically insignificant relationship with the probability of being poor. As expected, the highest grade completed by mothers/caregivers and by fathers has a negative and highly statistically significant relationship to the poverty status of households.

We have included both very recent and relatively distant idiosyncratic and area-wide shocks that are perceived to affect household welfare negatively. The result shows that the probability of being poor is higher when households are hit by shocks such as divorce or the separation of family members and job loss that affected households between 2002 and 2006. The probability of being poor is also higher when households were hit by job loss and drought between 2006 and 2009. The above-mentioned relationships are only statistically significant when community dummies are excluded, except for job loss and the divorce or separation of family members.

We also estimated a random and fixed-effects logit model of the probability of being in absolute poverty on a set of time-varying variables. We obtained more or less the same pattern between the simple logit and random-effect models and fixed-effect logit model but the dummy variables for shocks become statistically insignificant in the fixed-effect model because fixed-effect controls for household-specific effects, which are captured by the shocks in the simple logit and random-effect estimates. A Hausman test was conducted to see which of the two models, i.e., fixed effects or random effects, would be more appropriate. We rejected the null hypothesis, in which case it is better to take the fixed-effects estimates than the random-effects estimates.

The Wealth index is found to have a statistically significant negative effect on the probability of being poor. This result remained unchanged when we use the fixed-effect instead of the random-effect model. With respect to household composition, we found the same result to that of simple probit model estimates: household members below the age of 7 and between 7 and 17 years old have a statistically significant positive effect on the probability of being poor. It is also possible to interpret the change in the number of children below the age of 7 as an economic shock that resulted from the unexpected birth of a child in the fixed-effects estimation. Moreover, the probability of being poor increases when the number of female family members of working age increases. The results with respect to household composition are robust and indicate that a bigger family size and a larger number of children increase the possibility of being poor.

Unexpectedly, the incidence of incidence of some shocks (death and illness of family members, increased input prices, and droughts) among households was found to have a negative association with the probability of being in absolute poverty, while, as expected, place of employment shut down or job loss had a positive and statistically significant effect on the probability of being in absolute poverty. However, in the fixed-effect estimation, none of the dummy variables for shocks are statistically significant.

Table 14. *Estimates of probit model of absolute poverty in 2009*

	Version 1 Coef/t	Version 2 Coef/t	Version 4 coef/t	Version 4 coef/t
Lagged absolute poverty	0.747***		1.004***	
	-8.959		-13.787	
Dummy variable for urban residence	0.458	0.576*	0.154	0.068
	-1.323	-1.68	-1.54	-0.708
Change in wealth index between Round 2 and Round 3	-1.406***	-1.132***	-1.464***	-1.262***
	(-4.017)	(-3.302)	(-4.563)	(-4.074)
Dummy for female headed household	-0.125	-0.122	-0.159*	-0.157*
	(-1.160)	(-1.154)	(-1.654)	(-1.712)
Number of children below 7 and above 65 years old	0.066	0.102**	0.049	0.081*
	-1.306	-2.083	-1.06	-1.831
Number of children between 7 and 17 years old	0.061**	0.087***	0.033	0.065***
	-2.189	-3.202	-1.265	-2.637
Number of male family members > 17 and less than 65 years	-0.036	-0.054	-0.021	-0.028
	(-0.589)	(-0.926)	(-0.388)	(-0.547)
Number of female family members > 17 and less than 65 years	-0.056	-0.038	-0.001	0.025
	(-0.875)	(-0.610)	(-0.026)	-0.477
Highest grade completed by primary caregiver	-0.068***	-0.082***	-0.049***	-0.063***
	(-4.918)	(-6.106)	(-4.090)	(-5.587)
Highest grade completed by father	-0.040***	-0.048***	-0.028***	-0.038***
	(-3.544)	(-4.438)	(-2.863)	(-4.009)
Shocks between Round 1 and Round 2				
Dummy for death or illness of HH members	0.006	-0.041	0.058	0.008
	-0.082	(-0.546)	-0.834	-0.125
Dummy for death of livestock	0.016	0.045	-0.021	0.018
	-0.184	-0.522	(-0.254)	-0.222
Dummy for increased input prices	0.025	0.014	-0.056	-0.149**
	-0.283	-0.167	(-0.723)	(-2.016)
Dummy for decreased output prices	-0.031	-0.061	0.033	0.008
	(-0.192)	(-0.394)	-0.222	-0.053
Dummy for drought	0.041	0.034	0.08	0.056
	-0.358	-0.299	-0.937	-0.672
Dummy for divorce or separation of family	0.605***	0.617***	0.426**	0.384**
	-3.209	-3.29	-2.46	-2.269
Dummy for place employment shutdown or job loss	0.06	0.089	0.181	0.194*
	-0.45	-0.69	-1.534	-1.728
Shocks between Round 2 and Round 3				
Dummy for death or illness of household members	0.053	0.054	0.05	0.056
	-0.701	-0.739	-0.745	-0.861
Dummy for large increase in input prices	0.181	0.103	0.164	0.109
	-0.684	-0.408	-0.665	-0.472
Dummy for large decrease in output price dummy	-0.317	-0.259	-0.344	-0.369
	(-1.205)	(-1.031)	(-1.400)	(-1.617)
Dummy for increase in the food bought by households	0.056	0.106	-0.05	0.046
	-0.468	-0.907	(-0.474)	-0.456
Dummy for death of livestock	-0.056	-0.045	-0.107	-0.138*
	(-0.673)	(-0.550)	(-1.387)	(-1.858)
Dummy for place employment shutdown or job loss	0.241*	0.254**	0.390***	0.450***
	-1.871	-2.024	-3.353	-4.047
Dummy for divorce or separation of family	-0.164	-0.213	-0.073	-0.119
	(-0.818)	(-1.085)	(-0.388)	(-0.663)
Dummy for drought	0.087	0.127	0.213***	0.283***
	-0.932	-1.379	-2.579	-3.508
Community dummies (results omitted)	Yes	Yes	No	No
Constant	0.155	0.632*	-0.03	0.624***
	-0.444	-1.842	(-0.172)	-3.844
Number of observations	1,848	1,848	1,883	1,883
R^2				
Adjusted R^2	0.276	0.241	0.174	0.092

Source: Young Lives.
Note: *** p<0.01, ** p<0.05, * p<0.1

Table 15. *Random and fixed effect estimates of logit model of being absolute poor*

	Random effect	Fixed effect
Wealth Index	-6.097***	-3.749***
	(-13.536)	(-4.046)
Maximum education of female members in the household	0.001	-0.004
	(0.042)	(-0.196)
Maximum education of male members in the household	-0.007	-0.004
	(-0.482)	(-0.200)
Number of male family members less than or equal to 7 years old	0.327***	0.603***
	(4.014)	(3.260)
Number of male family members between age 7 and 17	0.356***	0.231
	(5.564)	(1.302)
Number of male family members > 17 and less than 65 years	0.085	-0.219
	(1.310)	(-1.054)
Number of male family members > =65 years	-0.125	0.015
	(-0.508)	(0.026)
Number of female family members less than or equal to 7 years old	0.301***	0.637***
	(3.683)	(3.700)
Number of female family members between age 7 and 17	0.293***	0.481***
	(4.737)	(2.748)
Number of female family members > 17 and less than 65 years	0.181***	0.152
	(2.657)	(0.778)
Number of female family members > =65 years	0.104	-0.062
	(0.441)	(-0.096)
Dummy for death and illness of HH members	-0.191*	-0.184
	(-1.715)	(-1.186)
Dummy for theft	-0.114	0.209
	(-0.673)	(0.934)
Dummy for increased input prices	-0.537***	-0.211
	(-3.385)	(-1.016)
Dummy for decreased output prices	-0.221	-0.097
	(-1.304)	(-0.454)
Dummy for death of livestock	-0.210	-0.004
	(-1.587)	(-0.022)
Dummy for place employment shutdown or job loss	0.709***	0.116
	(3.866)	(0.455)
Dummy for divorce or separation of family	-0.343	-0.606
	(-1.248)	(-1.582)
Dummy for natural disaster including drought	-0.244*	-0.301
	(-1.791)	(-1.601)
Constant	2.102***	
	(7.916)	
/lnsig2u	1.120***	
	(7.855)	
Number of observations	3,766	952
Number of groups	1,883	476
Hausman tes (Ch-square (P-Value)t X^2=96 (0.000) reject the random effect		
Chi (19)		75.92
Prob>Chi (19)		0.000

note: *** p<0.01, ** p<0.05, * p<0.1

5.3. Movement into and out of poverty

In this section, we discuss the results of multinomial logit model estimated in order to analyse and assess the factors associated with movement into and out of poverty between Round 2 (2006) and Round 3 (2009). We categorise the dependent variable into three: households whose poverty status remained unchanged in the two rounds, those who moved from being non-poor to poor (moved into poverty), and those moved out of poverty between the two rounds. When we estimate the multinomial logit model, the left category (base category) is 'poverty status remained unchanged' and hence the estimated 'moved into poverty' and 'moved out of poverty' are relative to the base group. The results are presented in Table 16. We estimated two versions, one with community dummies and one without to see if inclusion of community dummies affects the results substantially.

The results of the multinomial logit regression showed that being an urban household reduces the probability of households moving out of poverty though it is only statistically significant when community dummies are dropped from the model. We do not find also any statistical relationship between gender of the household head and movement into and out of poverty. On the other hand, the change in the wealth index is found to have a positive and statistically significant relationship with the probability of moving out of poverty and a negative and statistically significant relationship with the probability of moving into poverty, showing the importance of asset accumulation and access to services for moving out of poverty.

The number of children between 7 years and 17 years old and the number of household members below the age of 7 and above 65 years old are found to have a negative relationship with the likelihood of moving into poverty, which is quite unexpected. On the other hand, these two groups exhibited a negative relationship with the probability of moving out of poverty, perhaps because of increased dependency in the household.

Moreover, some dummy variables included to capture the effect of households' experience of shocks were found to have a statistically significant association with the change in households' poverty status. Households that experienced large increases in input prices between Rounds 1 and 2 and Rounds 2 and 3 are found to have a positive relationship with the probability of moving into poverty. Similarly, the dummy variable for divorce and separation of family between Rounds 1 and 2 is found to have a positive relationship with the probability of moving into poverty. Though only statistically significant when community dummies are dropped, households' experience of job loss or shutdown of place of employment between Rounds 2 and 3 has a negative relationship with the probability of moving out of poverty. The results with respect to incidences of shocks indicate that those such as divorce and increases in input prices have a long-lasting effect on household poverty and hence imply the need to protect people from shocks so as to prevent households from falling into poverty. Perhaps strengthening social protection programmes are the key in this respect.

Table 16. *Estimates of multinomial logit model of movement into and out of poverty (No movement as base category)*

	Version 1		Version 2a	
	Moved into poverty	Moved out of poverty	Moved into poverty	Moved out of poverty
	coef/t	coef/t	coef/t	coef/t
Urban residence dummy	-1.187	-0.410	0.003	-0.615***
	(-1.462)	(-0.607)	(0.014)	(-2.915)
Change in wealth index between R2 and R3	-1.541*	2.904***	-0.884	2.820***
	(-1.883)	(4.135)	(-1.139)	(4.228)
Dummy for female-headed households	-0.060	0.173	0.043	0.240
	(-0.243)	(0.837)	(0.191)	(1.217)
No. of children below 7 and above 65 years old	-0.359***	-0.156	-0.336***	-0.188*
	(-2.987)	(-1.572)	(-2.903)	(-1.942)
No. of children between 7 and 17 years old	-0.157**	-0.025	-0.155**	-0.022
	(-2.406)	(-0.471)	(-2.407)	(-0.414)
No. of male family members between 17 and 65 years	-0.145	-0.164	-0.161	-0.097
	(-0.951)	(-1.311)	(-1.148)	(-0.810)
No. of female family members between 17 and 65 years	0.009	0.133	-0.044	0.086
	(0.058)	(1.087)	(-0.319)	(0.743)
Highest grade completed by primary caregiver	-0.009	-0.009	-0.019	0.006
	(-0.308)	(-0.325)	(-0.650)	(0.247)
Highest grade completed by father	-0.005	0.009	0.003	0.010
	(-0.185)	(0.392)	(0.138)	(0.489)
Shocks between Rounds 1 and 2				
Dummy for death and illness of household members	0.166	-0.141	0.243	-0.110
	(0.949)	(-0.932)	(1.519)	(-0.771)
Dummy for death of livestock	0.049	0.231	0.043	0.227
	(0.244)	(1.353)	(0.221)	(1.375)
Dummy for large increase in input prices	0.074	-0.083	0.319*	-0.071
	(0.381)	(-0.482)	(1.833)	(-0.444)
Dummy for large decrease in output prices	0.435	0.318	0.347	0.216
	(1.281)	(1.012)	(1.123)	(0.718)
Dummy for drought	0.304	-0.048	0.301	-0.045
	(1.210)	(-0.203)	(1.551)	(-0.267)
Dummy for divorce or separation of family	1.070***	0.028	0.907***	-0.077
	(3.199)	(0.075)	(2.929)	(-0.213)
Dummy for place employment shutdown or job loss	-0.245	-0.140	-0.079	-0.319
	(-0.899)	(-0.488)	(-0.308)	(-1.179)
Shocks between Rounds 2 and 3				
Dummy for death or illness	0.117	-0.057	0.111	-0.022
	(0.697)	(-0.385)	(0.700)	(-0.156)
Dummy for large increase in input price	2.036*	0.418	1.933*	0.428
	(1.951)	(0.738)	(1.861)	(0.772)
Dummy for large decrease in output price	-1.920*	-0.232	-1.623	-0.195
	(-1.842)	(-0.411)	(-1.566)	(-0.353)
Dummy for increase in the food the household buys	0.100	0.207	-0.189	0.332
	(0.369)	(0.809)	(-0.792)	(1.462)
Dummy for death of livestock	-0.164	0.056	-0.046	0.065
	(-0.854)	(0.341)	(-0.253)	(0.420)
Dummy for place employment shutdown or job loss	-0.035	-0.233	-0.052	-0.512*
	(-0.139)	(-0.822)	(-0.217)	(-1.892)
Dummy for divorce or separation of family	-0.082	0.093	-0.027	0.072
	(-0.194)	(0.232)	(-0.067)	(0.184)
Dummy for drought	-0.418**	-0.199	-0.338*	-0.307*
	(-1.990)	(-1.057)	(-1.743)	(-1.859)
Community dummies	Yes	Yes	No	No
Constant	-0.800	-1.332**	-1.189***	-1.575***
	(-1.034)	(-1.973)	(-2.988)	(-4.432)
Number of observations (total=1,883)	202	274	202	274
Pseudo R^2	0.0989	0.0989	0.0424	0.0424

Notes: *** p<0.01, ** p<0.05, * p<0.1

[a] Results for community dummies are excluded to save space while Version 2 is estimated without community dummies.

To check for the robustness of the results, an additional regression was run with a dependent variable (see Table A10) with the categories: never poor, moved into poverty, moved out of poverty and remained poor. The category for those households that have remained non–poor was taken as a base category for the regression. The results of the regression showed that households' experience of divorce or separation of family members in Round 2 has the same relationship with the probability of moving into poverty. However, the relationship between households' experience of large increases in input prices was not robust enough. Although the statistical significance of households' experience of large increase in input prices no longer existed, a negative relationship with the probability of moving out of poverty was obtained for the same economic shock. The statistical significance of households' experience of large decrease in output price remained the same with the change in the nature of the dependent variable.

6. Conclusions

Starting from the classic Ramsey model of inter-temporal consumer equilibrium, we derived a reduced form model of consumption growth in which wealth, initial household circumstances and shocks experienced by households are the main factors. Once consumption expenditure was determined by the reduced form equation resulting from the equilibrium, we computed the FGT P_{α} class of poverty measures to estimate poverty from real per adult consumption over time. Using these models as the conceptual framework, we specified an empirical model of real per adult consumption growth and the probability of being absolutely poor, as well as movement into and out of poverty, as functions of place of residence, community dummies and initial household conditions such as lagged real per adult consumption, change in the wealth index, household characteristics, education of parents and shocks encountered by households within the preceding decade.

We employed fixed-effect estimation methods in order to estimate the growth of consumption model and the logit model of being absolutely poor. We also employed a multinomial logit model of movement of households into and out of absolute poverty. The models employed fit the data very well so that we can predict household welfare. Moreover, we found that the results were not sensitive to model re-specifications, indicating the robustness of the results obtained. Therefore, we are able to successfully identify the factors associated with the level and growth of real per adult consumption, the probability of households being absolutely poor and the movement of people into and out of poverty for poor communities in Ethiopia.

We found people's level and growth of consumption and movement out of poverty are positively related to initial level of consumption and wealth index. On the other hand, the probability of households being in absolute poverty and movement of households into poverty are negatively associated with initial level of consumption and wealth index. These results are robust and the results remained unchanged when we include and exclude community dummies and control for household-specific fixed effects. These results support the hypothesis that poverty today depends on the status of well-being and poverty in the past.

The fact that the level and growth of consumption are highly dependent on the initial level of consumption and wealth indicates a relationship between earlier and later poverty status and shows that households in poor communities are trapped in poverty. Therefore, government

support is crucial to free poor households from the poverty trap so as to break the intergenerational transfer of poverty and prevent children from being poor.

The numbers of children below the age of 7 and between 7 and 17 years old have a negative impact on both the level and growth of the real per adult consumption and movement of households out of poverty.

The education of the mother/primary caregiver and the father are also found to have a positive relationship with consumption growth and movement of households out of poverty. They also have a negative effect on the probability of being absolutely poor and the movement of households into absolute poverty.

The various shocks that affect household economic conditions and welfare are negatively related to their level and growth of real per adult consumption expenditure and their probability of moving out of poverty, and positively related to the probability of being absolutely poor and the probability of moving into poverty.

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Appendix

Table A1. *Poverty line per month by region (birr)*

Region	Poverty line at 2009 prices	Poverty line at 2006 prices	Price index in 2009 during survey periods (2006=100)
Addis Ababa	719	416	1.727
Amhara	261	151	1.729
Oromia	244	135	1.802
SNNP	212	117	1.819
Tigray	284	154	1.843

Source: Own computation using CSA data.
Poverty line computed based on 2,200 kilocalories per day per adult plus essential non-food items.

Table A2. *Descriptive statistics of explanatory variables used in regressions*

Description of variables	Mean
Movement into poverty	0.107333
Movement out of poverty	0.145058
Dummy for female-headed households	0.184812
Change in the number of male HH members below the age of 7	-0.26182
Change in the number of male HH members between the ages 7 and 17	0.336697
Change in the number of male HH members between the ages 17 and 65	0.265003
Change in the number of male HH members older than 65 years	0.029209
Change in the number of female HH members below the age of 7	-0.19968
Change in the number of female HH members between the ages 7 and 17	0.287308
Change in the number of female HH members between the ages 17 and 65	0.277217
Change in number of female HH members older than 65 years	0.035051
Change in the average educational level of household members	-1.44391
Access to credit in Round 2	0.098248
Dummy variable for urban households	0.395645
Lagged Service Access Index	0.348646
Illness of household members	0.451938
Large increase in input prices	0.374934
Death of livestock	0.314923
Drought	0.34307
Dummy for Amhara	0.201806
Dummy for Oromia	0.201806
Dummy for SNNP	0.251195
Dummy for Tigray	0.202868

Source: Young Lives Younger Cohort data.

Table A3. *Poverty indices by location in 2006 and 2009*

Location of residence Type of poverty index	Estimate	Std. Err.	[95% Conf.	Interval]	Rural/urban	2006 vs 2009
P_0		**Round 2**				
Rural	0.773	0.012	0.749	0.798	***	***
Urban	0.644***	0.018	0.610	0.679		
P_1						
Rural	0.311	0.007	0.297	0.325		***
Urban	0.299	0.010	0.279	0.320		
P_2						
Rural	0.154	0.005	0.145	0.163	**	***
Urban	0.171**	0.007	0.156	0.185		
P_0		**Round 3**				
Rural	0.713	0.013	0.686	0.739		
Urban	0.644	0.018	0.610	0.679		
P_1						
Rural	0.256	0.007	0.243	0.269		
Urban	0.298	0.010	0.278	0.318		
P_2						
Rural	0.116	0.004	0.108	0.124		
Urban	0.168	0.007	0.153	0.182		

P_0=Poverty headcount index; P_1=Poverty gap index; P_2=Poverty severity index.

Table A4. *Poverty indices by gender of the household head in 2006 and 2009*

	Estimate	Std. Err.	[95% Conf.	Interval]	Headship	Round 2
P_0		**Round 2**				
Male-headed household	0.723	0.011	0.701	0.746		**
Female-headed household	0.718	0.024	0.671	0.766		
P_1						
Male-headed household	0.301	0.007	0.288	0.314	**	***
Female-headed household	0.330	0.015	0.301	0.358		**
P_2						
Male-headed household	0.155	0.004	0.147	0.164	***	***
Female-headed household	0.183	0.010	0.162	0.203		***
P_0		**Round 3**				
Male-headed household	0.685	0.012	0.662	0.709		
Female-headed household	0.687	0.025	0.638	0.736		
P_1						
Male-headed household	0.270	0.006	0.258	0.283		
Female-headed household	0.285	0.013	0.258	0.311		
P_2						
Male-headed household	0.135	0.004	0.127	0.143		
Female-headed household	0.143	0.009	0.126	0.161		

P_0=Poverty head count index; P_1=Poverty gap index; P_2=Poverty severity index;

Table A5. *Selected urban household characteristics different poverty duration*

Household characteristics	Never poor	Once poor	Twice poor
Family size	5.56	5.64	6.32
Number of dependents in the HH	2.95	2.94	3.54
Average age of the household head	41.41	42.54	44.19
Head's mean schooling (grade)	8.07	5.79	2.98
Average education of HH members	7.81	6.41	4.23
Asset index	0.22	0.15	0.13
Wealth index	0.48	0.39	0.29

Table A6. *Selected rural household characteristics for different poverty duration)*

Household characteristics	Never poor	Once poor	Twice poor
Family size	5.23	6.24	6.70
Number of dependents in the HH	3.03	3.72	4.21
Average age of the household head	40.09	43.52	43.55
Head's mean schooling (grade)	3.44	2.14	1.65
Average education of the HH members	3.59	2.95	2.28
Number of oxen	2.28	1.72	1.31
Land holding (hectares)	1.59	1.32	1.17
Asset index	0.29	0.28	0.26
Wealth index	0.19	0.15	0.11

Table A7. *Community dummies used in the regressions*

Community variable	Location	Proportion in the sample
comm_1	urban	0.0462
comm_2	urban	0.0271
comm_3	urban	0.0207
comm_4	urban	0.0186
comm_5	urban	0.0276
comm_6	urban	0.0457
comm_7	rural	0.0473
comm_8	rural	0.0483
comm_9	rural	0.0520
comm_10	rural	0.0489
comm_11	rural	0.0473
comm_12	Urban	0.0462
comm_13	rural	0.0478
comm_14	rural	0.0510
comm_15	Urban	0.0483
comm_16	Urban	0.0292
comm_17	Urban	0.0074
comm_18	Urban	0.0127
comm_19	rural	0.0483
comm_20	rural	0.0520
comm_21	rural	0.0505
comm_22	rural	0.0510
comm_23	Urban	0.0462
comm_24	rural	0.0505

Table A8. *OLS estimates of real per adult consumption and changes in real per adult consumption*

	Real per adult consumption	Change in real per adult consumption (with community dummies)	Change in real per adult consumption (without community dummies)
	coef/t	coef/t	coef/t
Lagged monthly real consumption per adult	0.365***		
	(18.279)		
Urban residence dummy	65.016***	29.574	-20.511***
	(3.074)	(1.125)	(-2.794)
Change in wealth index between Round 2 and Round 3	103.827***	124.677***	110.447***
	(5.367)	(5.180)	(4.591)
Household is female-headed	17.865***	18.945***	21.339***
	(3.086)	(2.629)	(2.986)
Number of children below 7 and above 65 years old	-3.402	1.727	0.893
	(-1.268)	(0.518)	(0.265)
Number of children between 7 and 17 years old	-2.154	4.227**	4.044**
	(-1.425)	(2.267)	(2.143)
Number of male family members > 17 and less than 65 years	5.875*	4.256	6.125
	(1.827)	(1.063)	(1.526)
Number of female family members > 17 and less than 65 years	2.766	1.076	0.617
	(0.830)	(0.259)	(0.148)
Highest grade completed by primary caregiver	4.917***	0.012	0.453
	(6.580)	(0.013)	(0.508)
Highest grade completed by father	2.080***	-0.141	-0.068
	(3.397)	(-0.186)	(-0.091)
Dummy for death and illness of HH members	-5.577	-9.606*	-9.837*
	(-1.333)	(-1.845)	(-1.931)
Dummy for death of livestock	1.797	8.483	8.108
	(0.361)	(1.369)	(1.297)
Dummy for increased input prices	0.692	-2.950	-8.806
	(0.143)	(-0.490)	(-1.539)
Dummy for decreased output prices	5.725	5.112	9.151
	(0.632)	(0.454)	(0.816)
Dummy for drought	4.850	6.147	2.881
	(0.766)	(0.780)	(0.456)
Dummy for divorce or separation of family	-36.833***	-29.709**	-29.394**
	(-3.724)	(-2.414)	(-2.365)
Dummy for place of employment shutdown or job loss	-12.418*	-0.874	-4.181
	(-1.829)	(-0.104)	(-0.498)
Death or illness dummy	2.988	1.765	1.407
	(0.732)	(0.348)	(0.281)
Increase in input price dummy	-13.832	-1.701	3.770
	(-0.955)	(-0.094)	(0.208)
Increase in input price or decrease in output price dummy	16.577	-5.651	-14.441
	(1.153)	(-0.316)	(-0.805)
Increase in the food I buy	-14.926**	1.622	9.622
	(-2.175)	(0.190)	(1.216)
Death of livestock dummy	3.409	0.812	0.095
	(0.722)	(0.138)	(0.017)
Dummy for place of employment shutdown or job lose	-10.347	-9.712	-13.536*
	(-1.629)	(-1.228)	(-1.723)
Dummy for divorce or separation of family	5.015	-1.771	-3.077
	(0.457)	(-0.130)	(-0.222)
Drought dummy	-12.822**	-7.866	-11.174*
	(-2.381)	(-1.174)	(-1.823)
Community dummies	Yes	Yes	NO
Constant	64.210***	-16.198	-5.127
	(3.003)	(-0.613)	(-0.408)
Number of observations	1,881	1,881	1,881
R^2	0.447	0.087	0.038
Adjusted R^2	0.433	0.064	0.026

Source: Young Lives Younger Cohort data.
Note: *** p<0.01, ** p<0.05, * p<0.1.

Table A9. *Fixed-effect regression of real per adult expenditure*

	Coefficient (T-ratio)
Wealth Index	125.919***
	(5.419)
Maximum education of female members in the household	1.134**
	(2.328)
Maximum education of male members in the household	-0.163
	(-0.322)
Number of male family members less than or equal to 7 years old	-5.214
	(-1.168)
Number of male family members between age 7 and 17	-3.546
	(-0.812)
Number of male family members > 17 and less than 65 years	11.901**
	(2.523)
Number of male family members > =65 years	-4.371
	(-0.301)
Number of female family members less than or equal to 7 years old	-17.488***
	(-4.099)
Number of female family members between age 7 and 17	-14.576***
	(-3.439)
Number of female family members > 17 and less than 65 years	-7.214
	(-1.519)
Number of female family members > =65 years	23.083*
	(1.778)
Dummy for death and illness of HH members	4.811
	(1.261)
Dummy for theft	9.505
	(1.626)
Dummy for increased input prices	5.062
	(0.991)
Dummy for decreased output prices	-8.470
	(-1.523)
Dummy for death of livestock	-2.881
	(-0.645)
Dummy for place of employment shutdown or job loss	-7.793
	(-1.313)
Dummy for divorce or separation of family	14.027
	(1.403)
Dummy for natural disaster including drought	-0.328
	(-0.065)
Constant	135.516***
	(8.445)
Number of observations	3,764
Number of groups	1,883.000
Within R^2	0.041
Between R^2	0.269
Overall R^2	0.216

Source: Young Lives Younger Cohort data.
Note: *** p<0.01, ** p<0.05, * p<0.1.

Table A10. *Estimates of multinomial logit model of movement into and out of poverty ('Never poor' as base category)*

	Version 1			Version 2		
	Moved into poverty	Moved out of poverty	Remained poor	Moved into poverty	Moved out of poverty	Remained poor
	coef/t	coef/t	coef/t	coef/t	coef/t	coef/t
Urban residence dummy	0.057	-1.300**	-0.579	-0.324	-0.980***	-0.416*
	(0.909)	(0.014)	(0.159)	(0.261)	(0.000)	(0.051)
Change in wealth index between R2 and R3	-1.465	2.727***	-0.595	-1.657**	2.172**	-1.057
	(0.137)	(0.003)	(0.465)	(0.078)	(0.011)	(0.127)
Dummy for female-headed households	0.022	0.060	0.025	0.029	0.115	-0.041
	(0.942)	(0.827)	(0.920)	(0.914)	(0.641)	(0.834)
No. of children below 7 and above 65 years old	0.247**	-0.081	0.205**	0.228**	-0.153*	0.105
	(0.016)	(0.414)	(0.018)	(0.018)	(0.098)	(0.152)
No. of children between 7 and 17 years old	0.130	0.273***	0.454***	0.068	0.135*	0.263***
	(0.127)	(0.000)	(0.000)	(0.387)	(0.061)	(0.000)
No. of male family members between 17 and 65 years	-0.132	-0.105	-0.047	-0.104	-0.049	-0.009
	(0.199)	(0.238)	(0.552)	(0.279)	(0.557)	(0.896)
No. of female family members between 17 and 65 years	0.059	0.070	-0.046	0.074	0.137	0.077
	(0.588)	(0.481)	(0.612)	(0.446)	(0.115)	(0.274)
Highest grade completed by primary caregiver	0.008	0.000	0.005	-0.002	0.006	0.006
	(0.502)	(0.984)	(0.577)	(0.845)	(0.524)	(0.422)
Highest grade completed by father	-0.190***	-0.159***	-0.297***	-0.137***	-0.125***	-0.194***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Shocks between Rounds 1 and 2						
Dummy for death and illness of HH members	-0.118	-0.387*	-0.366**	0.112	-0.252	-0.177
	(0.595)	(0.059)	(0.046)	(0.568)	(0.166)	(0.223)
Dummy for death of livestock	0.363	0.628**	0.441**	0.283	0.518**	0.306
	(0.169)	(0.011)	(0.047)	(0.265)	(0.026)	(0.122)
Dummy for large increase in input prices	0.084	-0.161	0.044	-0.160	-0.544***	-0.590***
	(0.726)	(0.476)	(0.824)	(0.453)	(0.008)	(0.000)
Dummy for large decrease in output prices	0.168	0.021	-0.221	0.336	0.191	-0.026
	(0.713)	(0.963)	(0.585)	(0.430)	(0.650)	(0.942)
Dummy for drought	0.440	-0.027	0.048	0.399	0.089	0.146
	(0.181)	(0.933)	(0.863)	(0.118)	(0.709)	(0.469)
Dummy for divorce or separation of family	2.100***	1.209**	1.531***	1.538***	0.661	0.703*
	(0.000)	(0.027)	(0.002)	(0.001)	(0.189)	(0.099)
Dummy for place employment shutdown or job loss	-0.094	-0.064	0.232	0.197	0.014	0.383
	(0.788)	(0.859)	(0.436)	(0.539)	(0.966)	(0.117)
Shocks between Rounds 2 and 3						
Dummy for death or illness	0.092	-0.127	-0.008	0.160	0.038	0.110
	(0.666)	(0.519)	(0.964)	(0.406)	(0.830)	(0.443)
Dummy for large increase in input price	1.847*	0.065	-0.085	1.980*	0.271	0.119
	(0.094)	(0.919)	(0.874)	(0.070)	(0.654)	(0.792)
Dummy for large decrease in output price dummy	-2.038*	-0.137	-0.251	-2.300**	-0.600	-0.875*
	(0.064)	(0.828)	(0.637)	(0.035)	(0.318)	(0.051)
Dummy for increase in the price of food the household buys	0.484	0.695**	0.488*	0.212	0.728***	0.518**
	(0.145)	(0.030)	(0.071)	(0.468)	(0.010)	(0.020)
Dummy for death of livestock	-0.264	-0.070	-0.099	-0.386*	-0.288	-0.413**
	(0.279)	(0.755)	(0.621)	(0.093)	(0.168)	(0.017)
Dummy for place employment shutdown or job loss	0.462	-0.003	0.643**	0.718**	0.180	0.947***
	(0.188)	(0.994)	(0.035)	(0.027)	(0.612)	(0.000)
Dummy for divorce or separation of family	-0.058	0.155	0.504**	0.235	0.294	0.695***
	(0.832)	(0.554)	(0.027)	(0.352)	(0.204)	(0.000)
Dummy for drought	-0.377	-0.214	-0.331	-0.191	-0.146	-0.227
	(0.488)	(0.690)	(0.475)	(0.709)	(0.772)	(0.572)
Community dummies	Yes	Yes	Yes	No	No	No
Constant	-0.820	-0.293	0.506	-0.619	-0.257	0.937**
	(0.269)	(0.669)	(0.402)	(0.301)	(0.644)	(0.033)
Number of observations (total=1,883)	202	273	1,086	202	273	1,086
Pseudo R^2	0.2325			0.0928		

Note: *** p<0.01, ** p<0.05, * p<0.1.

Dynamics of Welfare and Poverty in Poor Rural and Urban Communities of Ethiopia

This paper looks at the factors associated with household welfare and poverty and the movement of households into and out of poverty in Ethiopia. To do this, we specified an empirical model in which the dependent variables are the level and changes in real per adult consumption, the probability of being absolutely poor, and movement into and out of poverty. We employed simple ordinary least squares, logit/probit and multinomial logit methods of estimation with and without controlling for individual and community fixed effects (fixed-effect estimation). Using Young Lives Younger Cohort data, we found that the level and growth of consumption was highly dependent on households' initial level of consumption and wealth, indicating a relationship of dependence between earlier and later socio-economic status and showing that households in poor communities are trapped in poverty. The results also showed that past and more recent economic shocks were negatively related to people's welfare. Government support is crucial to lift poor households out of the poverty trap and protect households from shocks, so as to break the intergenerational transfer of poverty.

Young Lives
An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in 4 countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the 4 study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Pankhurst Development Research and Consulting plc*
- *Save the Children (Ethiopia programme)*
- *Centre for Economic and Social Sciences, Andhra Pradesh, India*
- *Save the Children India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarollo (GRADE), Peru*
- *Instituto de Investigación Nutricional, Peru*
- *Centre for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
- *General Statistics Office, Vietnam*
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