CREDIT Research Paper

No. 21/04

Youth Education and Household Welfare in Tanzania

by

Livini Donath, Oliver Morrissey and Trudy Owens

Abstract

This paper examines whether the welfare difference between youth (aged 15-35) and adult (aged over 35) headed households between 2001 and 2018 is attributable to differences in educational attainment following Universal Primary Education (UPE) in Tanzania. The recentered influence function (RIF) decomposition method applied to household budget survey (HBS) data for 2001 and 2018 reveals that the increase in youth educational attainment between 2001 and 2018 is significant in explaining the difference in welfare (measured as per adult equivalent household consumption relative to the national poverty line) between the 2001 and 2018 youth cohorts. The findings suggest that if the youth in 2001 had the same education endowment as their 2018 counterparts, their welfare would have been about 20% higher. The findings also show that differences in educational attainment are significant factors explaining differences in welfare between youth and adult headed households in each year. If adults had the same level of educational attainment as the youth, their welfare would have been about 40% and 32% higher in 2001 and 2018 respectively. Although there is evidence that returns to education declined for the youth (consistent with more educated youth entering the labour market), this does not appear to have had a significant effect on household welfare.

JEL Classification: I30, O15

Keywords: welfare, youth, universal primary education, decomposition.

Centre for Research in Economic Development and International Trade, University of Nottingham

CREDIT Research Paper

No. 21/04

Youth Education and Household Welfare in Tanzania

by

Livini Donath, Oliver Morrissey and Trudy Owens

Outline

The Authors

Livini Donath is a PhD candidate at the School of Economics, University of Nottingham and an assistant lecturer at the University of Dar es Salaam, Tanzania. Oliver Morrissey and Trudy Owens are respectively Professor and Associate Professor at the School of Economics, University of Nottingham.

Corresponding Author: livini.donath@nottingham.ac.uk /livinitesha@gmail.com

Research Papers at www.nottingham.ac.uk/economics/credit/

1. Introduction

In the past two decades, Tanzania witnessed a considerable increase in education investment by the government, leading to a significant increase in enrolment across all levels (primary, secondary and tertiary). The free and Universal Primary Education (UPE) introduced in 2001 and the secondary school expansion program (known as "ward secondary schools") that began in 2006 are the two significant initiatives in the 2000s that had a substantial effect on enrolment. Following free UPE 2001, the primary school gross enrolment ratio increased from 84% in 2001 to 98.6% in 2002 and then to 109.9% in 2005.[1] During the same period, the number of primary schools increased from 11,873 to 12,286 and then to 14,257 in 2001, 2002 and 2005, respectively (United Republic of Tanzania [URT], 2005). Similarly, following the "ward secondary schools" initiative, secondary school gross enrolment increased from 20.2% in 2006 to 30.5% in 2007 and then to 36.9% in 2012. The number of secondary schools increased from 2,289 to 3,485 and then to 4,528 in 2006, 2007 and 2012, respectively (URT, 2008, 2013, 2016).

This period of expanded access to education was also a period of improvements in household welfare. Poverty incidence according to national poverty lines declined from 36% in 2001 to 26.4% in 2018 (URT, 2002, 2019). Poverty in terms of household consumption expenditure, a commonly used measure of income and welfare in developing countries (De Janvry & Sadoulet, 2016; Deaton, 2018), also improved. As a proxy for household welfare in Tanzania, the ratio of per adult household consumption to the national poverty line improved significantly from 1.79 in 2001 to 2.28 in 2018, equivalent to a 27% increase.[2]

The primary focus of this paper is to examine the extent to which differences in educational attainment between the youth cohort in 2001 (those aged between 15 and 35 who should have completed primary school before the UPE reforms)[3] and their corresponding cohort in 2018 (who should have benefited from the reforms) explain the welfare difference between the two periods. Whilst it is expected that the youth aged 15 – 35 years in 2018 (the cohort that mainly benefited from the UPE programme) should have more education than the older (adult) cohorts, it is not known if the increase in education was associated with increased

1 Gross enrolment went above 100% due to older children taking advantage of the opportunity for free schooling.

2 Authors' own calculations from the Tanzania Household Budget Surveys 2001 and 2018.

3 What age range is considered as youth varies by institution and country, e.g., United Nations (15 - 24), European Union (15 - 29), African Union (15 - 35), Uganda (18 - 30), Nigeria (18-35), Ethiopia (15-29). This study uses the Tanzanian definition which is in line with that of the African Union and define youth as all males and females aged 15 to 35 years (URT, 2007).

earnings and welfare. Also, it is unknown whether the increase in educational attainment changed the relationship between education and earnings for these age groups (that is, whether returns to education for each group increased/decreased over this period).

Recent studies of the evolution of household welfare in Tanzania focus on gender, employment status, and rural/urban categories, although education is included as a factor (Belghith et al., 2020; Khan & Morrissey, 2020). The closest paper to this study is Delesalle (2021) who investigates the effect of a UPE in 1974-78 aimed at reducing regional disparities in access to school on returns to education for household heads using a difference-in-difference approach availing of regional differences in access to schools prior to the programme. The results suggest that education increases household predicted consumption and returns to workers in all sectors (including agriculture), where returns are based on the effect of the head's education on household consumption. She also finds that education increases the probability of females working in agriculture. We study the effect of the later expansion of education with more recent data but also focus on education of household heads, comparing those headed by youth, who account for approximately 65% of the total labour force (URT, 2015, 2018), and adult headed households. With such a large share in the labour force, youth contribute substantially to the household in which they live (Aslan et al., 2019), either through the income they earn from employment or through supplying labour to household enterprises.

The paper makes two contributions to the literature on the link between education and household welfare. First, although considerable research has been devoted to welfare differences and their determinants across gender, employment, and rural/urban categories, less attention has been paid to age groups, specifically youth versus adults. Secondly, it examines how schooling gains between 2001 and 2018 are associated with household welfare changes over the period. Contrasted with previous studies which mainly examined the association between education and welfare at any given point in time, this paper examines how much of the welfare differences between 2001 and 2018 can be attributed to changes in the association between education and welfare over this period. It also explores how much of the welfare differences can be attributed to changes in educational attainment between 2001 and 2018 (i.e., the welfare effects of changes in the distribution of education).

Using data from the Tanzania household budget surveys (HBS) for 2001 and 2018 and recentered influence function (RIF) based decomposition, the findings reveal that differences in educational attainment between youth and adults significantly explain the difference in

welfare between the two groups in both years. If adults had the same level of educational attainment as the youth, their welfare would have been about 40% and 32% higher in 2001 and 2018 respectively. The findings also suggest that if the youth in 2001 had the same education endowment as their 2018 counterparts, their welfare would have been about 20% higher. Although there appears to have been a decline in returns to education for the youth, we do not find evidence that this reduced welfare.

The rest of the paper is organised as follows: Section 2 reviews the selected related literature from developing countries, followed by a detailed description of the methodology in section 3. Section 4 describes the data used in our analysis and provides descriptive statistics for the main variables. Section 5 presents the results and discussion, and section 6 concludes

2. Related Literature

Studies of determinants of household welfare in developing countries find that factors such as education, age, gender, shocks, employment status, sector of employment, place of residence and rural-urban migration have significant effects (e.g. Arouri et al., 2015; Arsalan et al., 2019; Belghith et al., 2020; Delesalle, 2021; Khan & Morrissey, 2020). In exploring these factors, previous studies have mainly categorised households in terms of gender or sector of employment of the head and place of residence (rural/urban). For Tanzania, Khan and Morrissey (2020), Arsalan et al. (2019) and Delesalle (2021) include education as one of the determinants of household welfare. Using households data from the first three waves of the Tanzania National Panel Survey (TNPS), Khan and Morrissey (2020) found that an extra year of education of the head of household is associated with about 1.2% higher level of consumption in fixed effects estimation; there was no significant effect in the instrumental variable (IV) regression. Delesalle (2021) used the same waves of the survey in combination with the 2002 Tanzania Population and Housing Census (TPHC) and estimated the consumption returns to head's education of between 7.3% and 9.3% for rural households, much larger estimates than those by Khan and Morrissey (2020). However, Delesalle (2021) estimated the effect of UPE programmes implemented between 1974 and 1978 on predicted consumption in 2002 (based on matching the 2002 census data to the TNPS). Having employed different estimation strategies, samples, and dependent variables one would expect differences in the estimates of the association between education and consumption between the two studies.

Using the proportion of members with at least secondary education, Arsalan et al. (2019) explored the association between education and household log per capita expenditure and poverty status (based on the international poverty line). The study combined population density data, satellite data and household surveys[4] from 12 developing countries, including Tanzania. They found that an increase in the number of working-age household members with secondary schooling by one person was associated with a 23% increase in expenditure for younger households and a 34% increase for older households, and a 7% and 6% decrease in poverty, respectively.[5] In a similar study on Vietnam, Arouri et al. (2015) found that a percentage point increase in household members with an upper-secondary degree was associated with 36% and 55% higher household income and consumption respectively; and a decrease in the likelihood of being poor of 20%.[6] More strikingly, they found, a percentage point increase in members with college/university degree was associated with a 92% and 71% higher level of income and consumption respectively and 19% lower likelihood of being poor.

Comparable findings emerge from studies on other developing countries using a variety of empirical strategies. Himaz and Aturupana (2018) proxied household education by year of schooling of the most educated adult member in the household to estimate the association between education and household per capita expenditure in Sri Lanka. The study applied quantile IV regression on a sample of 72,811 households (18, 203 per survey) from the Household Income and Expenditure Surveys 1990/1, 1995/6, 2001/2 and 2005/6. The findings suggest that while, in general, an extra year of schooling increases welfare by about 3.8%, the effect varies considerably across the welfare distribution with the effect declining by quantile.

Fulford (2014) estimated youth consumption returns to education for different cohorts in India. Using data from the Indian National Sample Surveys (INSS) 1983, 1987, 1993, 1999, and 2005 the study found that an extra year of education brings male cohorts 4% more consumption but provide no additional consumption for female cohorts. Alem and Söderbom (2012) found that although only higher education had a significant effect on consumption in 2004 and 2008 in Ethiopia, all levels (primary, secondary, and higher) significantly explain the growth of consumption between the years.

4 In case of Tanzania, the fourth round of TNPS

5 They categorized household as younger if the proportion of youth in the household is greater or equal to the proportion of youth in the population, and older if less than that in the population.

6 The study employed fixed effects technique on samples of 6,938, 6,882, 6,837, and 6,750 rural households from the Vietnam Household Living Standard Surveys (VHLSS) 2004, 2006, 2008, and 2010 respectively.

Studies investigating welfare differences between households or individuals classified into categories such as gender (of the head or composition), sector of employment, and residence (rural/urban) typically include dummies for the different categories in regressions to capture the welfare differences (Arouri et al., 2015; Himaz and Aturupana, 2018; Khan and Morrissey, 2020; Ayyash and Sek, 2020). Other studies analyse welfare and its determinants separately for each category (e.g., Van de Walle (2013), Delesalle (2021)). Female-headed households and households with higher proportions of female members tend to have lower welfare than their male counterparts (Ayyash and Sek, 2020). Households residing in rural areas tend to have lower welfare than their urban counterparts. Furthermore, households with most members employed in agriculture have lower welfare levels than those with the majority of members in wage employment or self-employment.

Our empirical strategy follows studies decomposing inequality or welfare differences between groups based on the seminal work of Oaxaca (1973) and Blinder (1973) and extensions (Firpo et al., 2018; Fortin et al., 2011). Belghith et al. (2020) employed Oaxaca-Blinder decomposition to examine the share of poverty reduction attributable to changes in endowments (household characteristics) and the amount due to changes in the returns to these characteristics using data from HBS 2012 and 2018. The findings suggest that between 2012 and 2018 gains in education have benefited the better-off more than the poor and that the returns to education, while increased for the better-off, significantly declined for the poor.

Ramadan et al. (2018) applied RIF regression technique to decompose the welfare gap between various socio-demographic groups (male vs female-headed, rural vs urban households, educated vs uneducated head) based on household expenditure from household surveys over 2005 to 2015 for Egypt, Tunisia, Jordan and Palestine.[7] Differences in educational attainment was one of the main determinants of the welfare gaps between male and female-headed and rural and urban households. Agyire-Tettey et al. (2018) applied a similar approach to examine the rural-urban welfare gaps for Ghana with similar results: differences in educational attainment significantly explained the welfare gaps between rural and urban households.

7 These are the 2008/2009, 2010/2011, 2012/2013 and 2014/2015 Household Income, Expenditure and Consumption Surveys (HIECS) for Egypt, the 2005 and 2010 National Survey on Household Budget, Consumption and Standard of Living (EBCNV) for Tunisia, the 2006, 2010 and 2013 Household Expenditure and Income Survey (HEIS) for Jordan and 2007, 2010 and 2011 Palestine Expenditure and Consumption Surveys (PECS) for Palestine

Skoufias & Katayama (2011) examined the welfare difference between metropolitan, urban, and rural households in Brazil's five regions. The study employed the Oaxaca-Blinder method on a sample of households from the 2003-2004 Household Budget Survey to decompose welfare differences both at the mean and at different quantiles of the welfare distribution. The findings revealed that the welfare differences are mainly attributed to differences in endowments; differences in the household head's education explained about 40% of the welfare difference between metropolitan and urban areas. The effect of education on welfare differences is heterogenous along the welfare distribution.

3. Empirical Strategy

The empirical methodology follows Firpo et al. (2009, 2018), RIF based decomposition for the mean difference between two groups. For a given dependent variable *y* and independent variables *x*, RIF decomposition uses RIF regression in combination with reweighting to decompose any statistic of interest into two parts – the difference due to endowments (characteristics or composition effect) and the difference attributed to the relationship between *y* and *x* (coefficient effect or return effect) – and to decompose the contribution of each explanatory variable on the two parts.

The baseline regression is the standard household consumption model of the form:

$$lnC_{it} = \alpha S_{it} + \beta X_{it} + \varepsilon_{it} \quad (1)$$

Where C is the household consumption to poverty line ratio (CPL)—our preferred welfare measure to account for the price differences (inflation) between surveys given the absence of good price deflators. S a vector of schooling of the household head and its square (in years); X is a vector (including a constant) of individual/household characteristics; α and β are regression parameters; ε is standard error term; and i and t index individual and time, respectively. With exogeneity assumption, (1) is usually estimated using OLS.

For any two groups, RIF decomposition uses the reweighted parameter estimates from (1) to decompose the statistic of interest into two parts as explained below. Following (Rios-Avila, 2020), the RIF decomposition (1) can be written as

$$Y = X'\beta + \varepsilon \quad (2)$$

Where X here is a vector of covariates, including years of education and its square. Suppose there is some categorical variable T such that the joint distribution function of Y, X and T is

given by $f_{Y,X,T}(y_1, x_i, T_i)$. When there are only two groups in R and T, such that $R \in [0,1]$ and $T \in [0,1]$, e.g. in our case R and T are indicator variables for the groups of interest defined by

$$R = \begin{cases} 1 \; if \; youth \\ 0 \; if \; adult \end{cases} \text{; and}$$

$$T = \begin{cases} 1 \; if \; \; 2018 \\ 0 \; if \; \; 2001 \end{cases}$$

For simplicity of derivation and without loss of generalisation, we will stick to one categorical variable, T. The joint distribution function between the measure of welfare, the covariates and T for $T = k \in [0,1]$ is given as:

$$f^k_{Y,X}(y, x) = f^k_{Y|X}(Y|X) f^k_X(X) \tag{3}$$

and its cumulative distribution function conditional on T as:

$$F^k_Y(y) = \int f^k_{Y|X}(Y|X) dF^k_X(X) \tag{4}$$

The cumulative distribution of Y conditional on T can then be used to decompose the difference in the distribution of statistic v between the two groups. Accordingly,

$$\Delta v = v_1 - v_0 = v(f^1_Y) - v(f^0_Y) \tag{5}$$

Which implies

$$\Delta v = v\left(f^1_{Y|X}(Y|X) dF(X)\right) - v\left(f^0_{Y|X}(Y|X) dF(X)\right)$$

We can rewrite (5) as

$$\Delta v = v_1 - v_c + \; v_c - v_0$$

Alternatively in a reduced form,

$$\Delta v = \Delta v_S + \Delta v_X$$

Where v_c is some counterfactual statistic defined as

$$v_c = v(f^c_Y) = v\left(f^0_{Y|X}(Y|X) dF^1_X(X)\right) \tag{6}$$

$\Delta v_S = v_1 - v_c$ is the difference attributed to the relationship between Y and X; and

$\Delta v_X = v_c - v_0$ the difference arising due to differences in characteristics, the Xs.

From $v(F_Y) = X'\beta$ it follows that

$$v_1 = E\left(RIF\left(y_i; v(f_Y^1)\right)\right) = \bar{X}^{1\prime}\hat{\beta}^1;$$

$$v_0 = E\left(RIF\left(y_i; v(f_Y^0)\right)\right) = \bar{X}^{0\prime}\hat{\beta}^0; \text{ and}$$

$$v_c = \bar{X}^{1\prime}\hat{\beta}^0$$

Since the counterfactual distribution is not observed, it is approximated as follows

$$F_Y^c = \int f_{Y|X}^0(Y|X)dF_X^1(X) \cong \int f_{Y|X}^0(Y|X)dF_X^0(X)\,\omega(X) \quad (7)$$

Where $\omega(X)$ is a reweighting factor defined as

$$\omega(X) = \frac{1-p}{p}\frac{P(T=1|X)}{1-P(T=1|X)} \quad (8)$$

with p is the proportion of people in group 1 and $P(T=1|X)$ the probability that an individual belongs to group 1 given that she has characteristics X.

The reweighting factor can be obtained after the conditional probability is estimated using a probit or logit model. Plugging the reweighting factor into (8) yields

$$v_c = E\left(RIF\left(y_i; v(f_Y^c)\right)\right) = \bar{X}^{c\prime}\hat{\beta}^c \quad (9)$$

The decomposition can then be rewritten as

$$\Delta v = \bar{X}^{1\prime}\left(\hat{\beta}^1 - \hat{\beta}^c\right) + (\bar{X}^1 - \bar{X}^c)'\hat{\beta}^c + (\bar{X}^c - \bar{X}^0)'\hat{\beta}^0 + \bar{X}^{c\prime}\left(\hat{\beta}^c - \hat{\beta}^0\right)$$

Define $\Delta v_S^p = \bar{X}^{1\prime}\left(\hat{\beta}^1 - \hat{\beta}^c\right)$, $\Delta v_S^e = (\bar{X}^1 - \bar{X}^c)'\hat{\beta}^c$, $\Delta v_X^p = (\bar{X}^c - \bar{X}^0)'\hat{\beta}^0$, and

$\Delta v_X^e = \bar{X}^{c\prime}\left(\hat{\beta}^c - \hat{\beta}^0\right)$.

Then

$$\Delta v = \Delta v_S^p + \Delta v_S^e + \Delta v_X^p + \Delta v_X^e \quad (10)$$

The component $\Delta v_S^p + \Delta v_S^e$ is called the coefficient effect which constitutes of the pure coefficient effect (Δv_S^p) and the reweighting error (Δv_S^e). The component $\Delta v_X^p + \Delta v_X^e$ is called the aggregate composition effect and constitutes the pure composition effect (Δv_X^p) and specification error (Δv_X^e). The error components help assess the quality of the reweighting and specification of the regression function; smaller and insignificant coefficients of the error

components indicate more robust results (Firpo et al., 2018; Rios-Avila, 2020). The empirical estimation of the RIF decomposition for the mean of log consumption to poverty line ratio is performed in Stata using user-written command ***Oaxaca_rif*** (Rios-Avila, 2020).

4. Data and Descriptive Statistics

This study uses data from the Tanzanian Household Budget Surveys for 2001 and 2018, which we obtained from the National Bureau of Statistics. HBS is among the most extensive household surveys in Tanzania, covering all regions of the Mainland,[8] with rich individual and household information including consumption data. Data collection for HBS 2001 took place from May 2000 to June 2001 and for HBS 2018 from December 2017 to November 2018. Both surveys employed a multi-stage cluster sampling to obtain representative samples of 22,176 and 9,552 households in 2001 and 2018, respectively. Despite the sample for 2018 being significantly smaller, the sampling still ensured representativeness at the national (Mainland) level (URT, 2019). A total of 154 households in 2001 had missing information on assets ownership and were excluded from the analysis, leaving us with a sample of 22,022 households. All households in 2018 had complete information.

4.1. Definition of the Main Variables

Households are categorised according to the head's age group: youth and adults.[9] Youth households include all households headed by a youth aged between 15 and 35, and adult households include all households headed by an adult aged over 35. Our welfare indicator is measured at the household level as the ratio of the per adult equivalent household consumption to the national poverty line and is assigned to the head of household. Given the absence of good price deflators covering 2001 to 2018, the ratio represents the relative welfare of the household at the time of the survey and helps to account for inflation and trends in earnings between the surveys. Education is the household head's level of education measured in years.

8 Tanzania (also the United Republic of Tanzania) includes the Tanzania Mainland (Tanganyika) and the islands of Zanzibar. The Mainland covers about 99% of the total area and about 98% of the total population.

9 As HBS is a general household survey there is very little information on how households were formed, such as due to marriage or migration, so we are unable to investigate determinants of youth becoming a head of household.

Household characteristics

- **CPL:** the ratio of household consumption per adult equivalent to the poverty line in logarithm form is the dependent variable in the baseline OLS regression and used to construct the RIF for the decomposition.[10]
- **poor:** a dummy variable = 1 for households below the basic needs poverty line and 0 otherwise
- **rural:** a dummy variable = 1 for households in rural area and 0 otherwise
- **hhsize:** Total number of usual members in the household

Household head characteristics

- **education:** years of schooling of the household head
- **noeducation:** a dummy variable = 1 if household head completed less than three years of primary education and 0 otherwise
- **someprimary:** a dummy variable = 1 if household head completed at least four and at most six years of primary education and 0 otherwise
- **primary:** a dummy variable = 1 if household head completed the seven years of primary education and 0 otherwise
- **somesecondary:** a dummy variable = 1 if household head completed at least two and at most three years of secondary education and 0 otherwise
- **secondary:** a dummy variable = 1 if household head completed the four years of lower secondary education and 0 otherwise
- **postsecondary:** a dummy variable = 1 if household head has more than lower secondary education and 0 otherwise
- **age:** age of the household head in years
- **female:** a dummy variable = 1 if the head of the household is female and 0 otherwise
- **married:** a dummy variable = 1 if the head of the household is married and 0 otherwise
- **agric:** a dummy variable = 1 if the main economic activity of the head of the household is agriculture/fishery and 0 otherwise
- **wage:** a dummy variable = 1 if the main economic activity of the head of the household is wage employment and 0 otherwise

10The standard solution for correcting skewness of income variables in regressions is by taking logarithm transformation. See the corrected distributions in Figure 3.

- **self:** a dummy variable = 1 if the main economic activity of the head of the household is self-employment (out of agriculture) and 0 otherwise
- **Unemployed/inactive:** a dummy variable = 1 if the head of the household is unemployed/inactive and 0 otherwise

Table 1: Summary Statistics by Age Group and Survey Year

Variable Name	2001			2018		
	Youth	Adult	Difference	Youth	Adult	Difference
Hh Characteristics						
CPL	1.71	1.40	-0.31***	2.12	1.85	-0.27***
poor	0.28	0.41	0.13***	0.20	0.28	0.09***
rural	0.80	0.80	0.00	0.66	0.69	0.03**
hhsize	5.18	6.89	1.70***	4.75	6.59	1.84***
Head Characteristics						
education	6.04	4.24	-1.80***	6.73	5.59	-1.14***
noeducation	0.18	0.42	0.24***	0.19	0.27	0.08***
someprimary	0.05	0.18	0.13***	0.08	0.10	0.02**
primary	0.71	0.33	-0.37***	0.49	0.52	0.03*
somesecondary	0.01	0.00	-0.01***	0.06	0.01	-0.05***
secondary	0.05	0.05	0.00	0.14	0.08	-0.07***
postsecondary	0.01	0.02	0.01***	0.04	0.02	-0.01**
age	29.86	51.46	21.60***	30.10	52.27	22.17***
female	0.18	0.20	003*	0.19	0.25	0.06***
married	0.85	0.80	-0.05***	0.83	0.78	0.06***
Observations	8,039	13,983	-	2,507	6,945	-

Notes: Author's calculations from HBS 2001 and 2018 data weighted using survey weights; mean value for continuous variables and share of sample for binary indicators. 'Difference' is the value for adult headed households minus the corresponding value for youth headed household (with significance * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ based on Lincom's test of mean differences).

4.2. Descriptive Statistics

Tables 1 and 2 show the means for the continuous variables and the percentage shares of binary variables included in the analysis. Table 1 shows the characteristics of youth and adult headed households for each year. The share of households headed by a youth decreased by ten percentage points from 36% in 2001 to 26% in 2018. Youth households have significantly higher consumption and lower poverty rates than adult-headed households in both years, although the differences are smaller in 2018. The CPL increased for both 2018 reflecting the

general reduction in poverty. Density plots in Figure 1 also show the differences in consumption between the two age groups. In terms of education endowment, heads defined as youth have more schooling than their adult counterparts in both years. The difference in post-primary education attainment between the two age groups significantly increased between the surveys. These results reflect the benefits of the expansion of secondary education in the mid and late 2000s.

Figure 1: Distribution of Household Consumption between Age Groups by Year

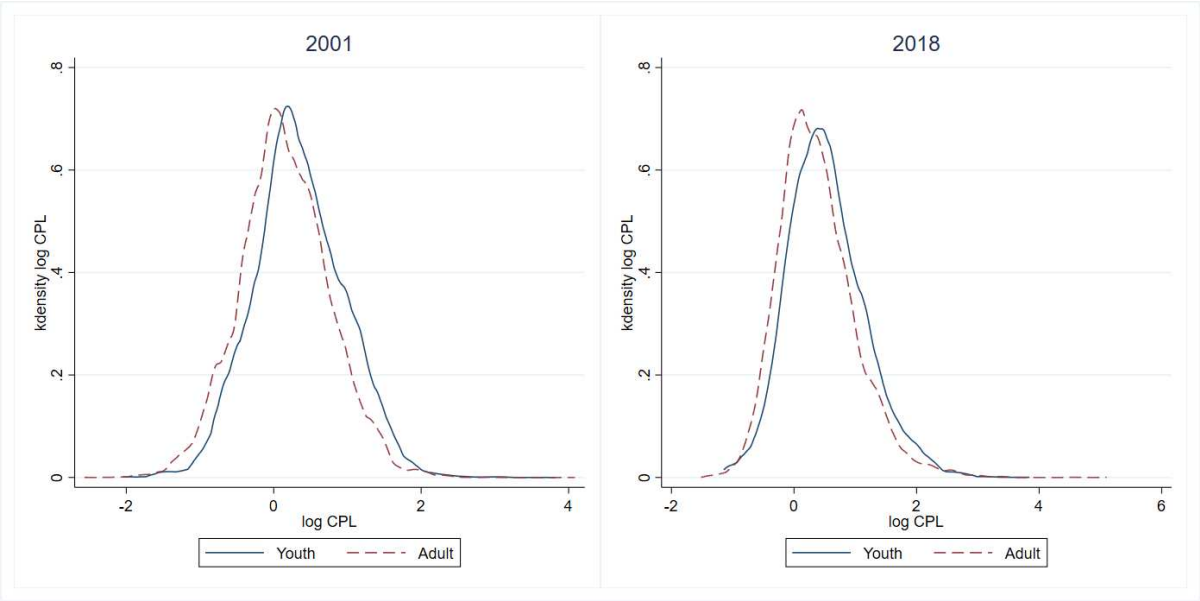

Table 2 compares the same values of characteristics of youth and adult headed households but considers the difference for each between the years (e.g, youth means in 2001 compared to 2018). Youth's average household consumption increased, and poverty rates declined significantly. The increase in youth consumption between the two periods is shown graphically by a density plot (left panel of Figure 2). Youth education also increased significantly, with the most pronounced increase at post-primary education levels. The share of youth with completed secondary education increased by about threefold, from 5% in 2001 to 14% in 2018, and the share with higher education from 1% to 4%. A large proportion of secondary school students drop out (6% of the youth in 2018) so never complete the level. The national qualifying exam in the second year of secondary school, which requires students who fail to repeat the year, may be one of the reasons.

The comparison for adult headed households is complicated by the fact that many adults in 2018 will have been in the youth category in 2001. The mean difference is included in Table 2, while Table 3 separates adult households into two groups. The first group consists of those in the youth category in 2001 (aged 35 to 53 years in 2018). The second group consists of those in the adult category in 2001 (aged 54 years and above in 2018). Table 3 shows how these two groups fare relative to adult headed households in 2001. We know from Table 1 that the youth in 2001 had more educational attainment than their adult counterparts, and so we would expect adults aged 35 to 53 years in 2018 to have more education than those aged 54 years and above, which happens to be the case. The right panel of Figure 4 shows the distribution of consumption reported in Table 3. Both groups of adult headed households in 2018 have significantly higher consumption than adult headed households in 2001. However, the 35 to 53 years age group enjoys slightly higher consumption than their 54 years and above counterparts.

Table 2: Summary Statistics by Age Between Survey Years

Variable	Youth			Adult		
	2001	2018	Difference	2001	2018	Difference
Hh Characteristics						
CPL	1.71	2.12	0.40***	1.40	1.85	0.44***
Poor	0.28	0.20	-0.08***	0.41	0.28	-0.13***
Rural	0.80	0.66	0.15***	0.80	0.69	-0.12***
Hhsize	5.18	4.75	0.43***	6.89	6.59	-0.30***
Head Characteristics						
education	6.04	6.73	0.68***	4.24	5.59	1.35***
noeducation	0.18	0.19	0.01	0.42	0.27	-0.15***
someprimary	0.05	0.08	0.03***	0.18	0.10	-0.08***
primary	0.71	0.49	-0.21***	0.33	0.52	0.19***
somesecondary	0.01	0.06	0.05***	0.00	0.01	0.01***
secondary	0.05	0.14	0.09***	0.05	0.08	0.03***
postsecondary	0.01	0.04	0.03***	0.02	0.02	0.00
Age	29.86	30.10	0.24	51.46	52.27	0.81*
Female	0.18	0.19	0.02	0.20	0.25	0.05***
Married	0.85	0.83	-0.01	0.80	0.78	-0.02*
Observations	8,039	2,507	-	13,983	6,945	-

Notes: As for Table 1 except difference is the 2018 value minus the corresponding value for 2001.

Table 3: Differences between Survey Years for Adult Headed Households

	(1)	(2)	(3)	(4)
	2001	2018	2018	Difference
Variable Name	Age >35	35<Age<=53	Age>53	(1)-(3)
Household Characteristics				
CPL	1.40	1.86	1.83	0.42***
poor	0.41	0.29	0.28	-0.13***
rural	0.80	0.67	0.71	-0.86***
hhsize	6.89	6.56	6.64	-0.27**
Head Characteristics				
education	4.24	6.28	4.51	-0.07
noeducation	0.42	0.18	0.40	-0.03*
someprimary	0.18	0.06	0.15	-0.03**
primary	0.33	0.64	0.35	-0.02
somesecondary	0.00	0.01	0.01	0.01*
secondary	0.05	0.08	0.07	0.02**
postsecondary	0.02	0.03	0.02	0.00
age	51.46	43.92	65.27	17.33**
female	0.20	0.22	0.31	0.11***
married	0.80	0.84	0.68	-0.13***
Observations	13,983	3,966	2,979	NA

Notes: As for Table 1 except difference is the value in column (3) minus the corresponding value in (1).

Figure 2: Distribution of Household Consumption between Years by Age Group

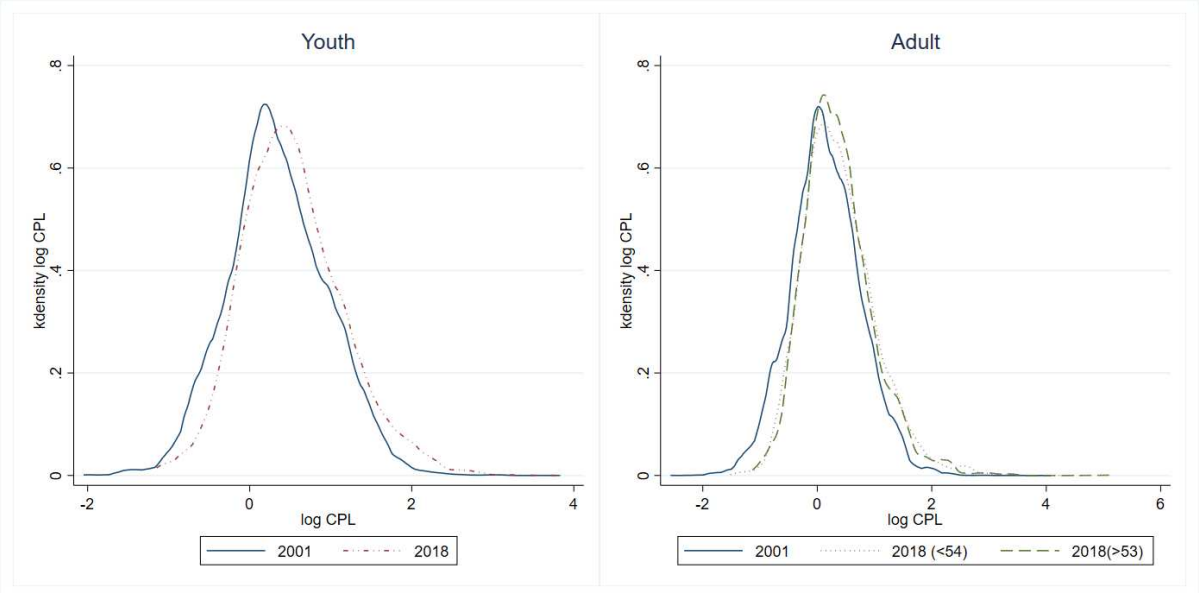

Table 4: Characteristics of Youth Headed Households by Survey Year

Var Name	2001			2018		
	Head	Other	Difference	Heads	Other	Difference
Hh Characteristics						
CPL	1.71	1.47	-0.24***	2.12	1.95	-0.17***
poor	0.28	0.38	0.10***	0.20	0.25	0.05***
rural	0.80	0.78	-0.02***	0.66	0.63	-0.03***
hhsize	5.18	6.83	1.65***	4.75	6.51	1.76***
Youth Characteristics						
education	6.04	5.48	-0.56***	6.73	7.00	0.27***
noeducation	0.18	0.22	0.04***	0.19	0.16	-0.03***
someprimary	0.05	0.15	0.10***	0.08	0.08	0.00
primary	0.71	0.58	-0.13***	0.49	0.47	-0.02***
somesecondary	0.01	0.02	0.01***	0.06	0.10	0.04***
secondary	0.05	0.03	-0.02***	0.14	0.17	0.03***
postsecondary	0.01	0.00	-0.01***	0.04	0.02	-0.02***
age	29.86	22.74	-7.12***	30.10	22.38	-7.72***
female	0.18	0.65	0.47***	0.19	0.62	0.43***
married	0.85	0.46	-0.39***	0.83	0.38	-0.45***
Observations	8,039	31,503	-	2,507	11,468	-

Notes: As for Table 1 except difference is the 2018 value minus the corresponding value for 2001.

Table 4 compares the characteristics of youth who are heads of households to youth who are not to investigate any significant differences in those youth who form a household. In both surveys, youth who do not head a household live in households with lower consumption and higher poverty rates, suggesting that relatively higher earning youth are more likely to form their own household. The educational endowment in the two groups has changed: youth who are not household heads in 2018 have more schooling than youth household heads in 2018 but this was not the case in 2001. The findings are consistent with the fact that the share of households headed by youth decreased by ten percentage points between 2001 and 2018, implying that as post-primary school enrolment rose, more youth are spending more years in education, and it appears that youth who move out to establish households (and become heads) at early ages are those with relatively low education. As this might bring about a selection problem and affect our results, we also examine how education affects youth's likelihood to head their households (see Section 5).

5. Results and Discussion

The first part of our analysis explores whether welfare returns to education for youth are different from that of adults; and whether they have changed between 2001 and 2018. Table 5 presents the results for each year and age group of OLS regression estimates for model (1). In 2001 schooling is positively and significantly correlated with welfare for both youth and adult headed households, but negatively correlated for 2018. The coefficient of schooling squared is positive and highly statistically significant across age groups and years, implying a strong convex relationship between education and welfare — each extra year of schooling is associated with higher welfare than the previous year (at least beyond some threshold if the coefficient on schooling is negative). All other included regressors have the expected sign.

The presence of the squared term complicates the interpretation of the coefficients of schooling variables. To simplify interpretation, we plot the implied welfare returns to education from Table 5 in Figure 5. The top panel of Figure 5 shows that youth headed households in 2001 had higher returns to post-primary education than adult headed households, but this advantage disappeared in 2018. The bottom panel of Figure 5, on the other hand, shows that the welfare returns to education for the youth declined significantly between 2001 and 2018. These results may be attributed to the significant gains in schooling for the youth over this period — one would expect the returns to education to decline as education attainment increases in the population.

Turning to the Reweighted RIF Oaxaca-Blinder decomposition within the years, the difference in mean household welfare between youth and adult headed households for each year is decomposed into two parts as explained in section 3: the part due to differences in characteristics/endowment (also called the explained part) and the part due to differences in returns to these characteristics (also called the unexplained part). Each of the two parts are then broken down into two subparts: the explained part into pure explained and the specification error; and the unexplained part into pure unexplained and reweighing error. A explained earlier in section 3, for more robust results both the specification and the reweighing error should be small and insignificant (Firpo et al., 2018; Rios-Avila, 2020) implying that the model is correctly specified and reweighed.

Table 5: OLS Estimates of Returns to Education by Age and Survey Year

	2001		2018	
	Youth	Adult	Youth	Adult
sch	0.026***	0.034***	-0.011*	-0.010***
	(0.005)	(0.003)	(0.006)	(0.004)
sch2	0.002***	0.001***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
age	0.059***	-0.011***	0.030	0.002
	(0.016)	(0.003)	(0.028)	(0.003)
age2	-0.098***	0.008***	-0.045	-0.002
	(0.028)	(0.002)	(0.050)	(0.003)
female	0.102***	0.010	0.085***	0.054***
	(0.015)	(0.014)	(0.028)	(0.018)
rural	-0.131***	-0.147***	-0.160***	-0.183***
	(0.014)	(0.011)	(0.025)	(0.016)
married	0.103***	0.071***	0.049	0.052***
	(0.016)	(0.014)	(0.030)	(0.019)
lnhhsize	-0.516***	-0.451***	-0.523***	-0.473***
	(0.011)	(0.008)	(0.021)	(0.011)
_cons	-0.005	1.153***	0.331	0.656***
	(0.219)	(0.082)	(0.396)	(0.099)
Others controls	Yes	Yes	Yes	Yes
AME(sch)	0.056***	0.043***	0.042***	0.027***
	(0.002)	(0.001)	(0.003)	(0.002)
Obs.	8,039	13,983	2,507	6,945
R^2	0.41	0.40	0.50	0.44

Notes: Standard errors in parentheses (significance indicated by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). Other controls included are livestock per capita, region of residence and ownership of assets.

Figure 3: Implied Returns to Education by Age Group and Year

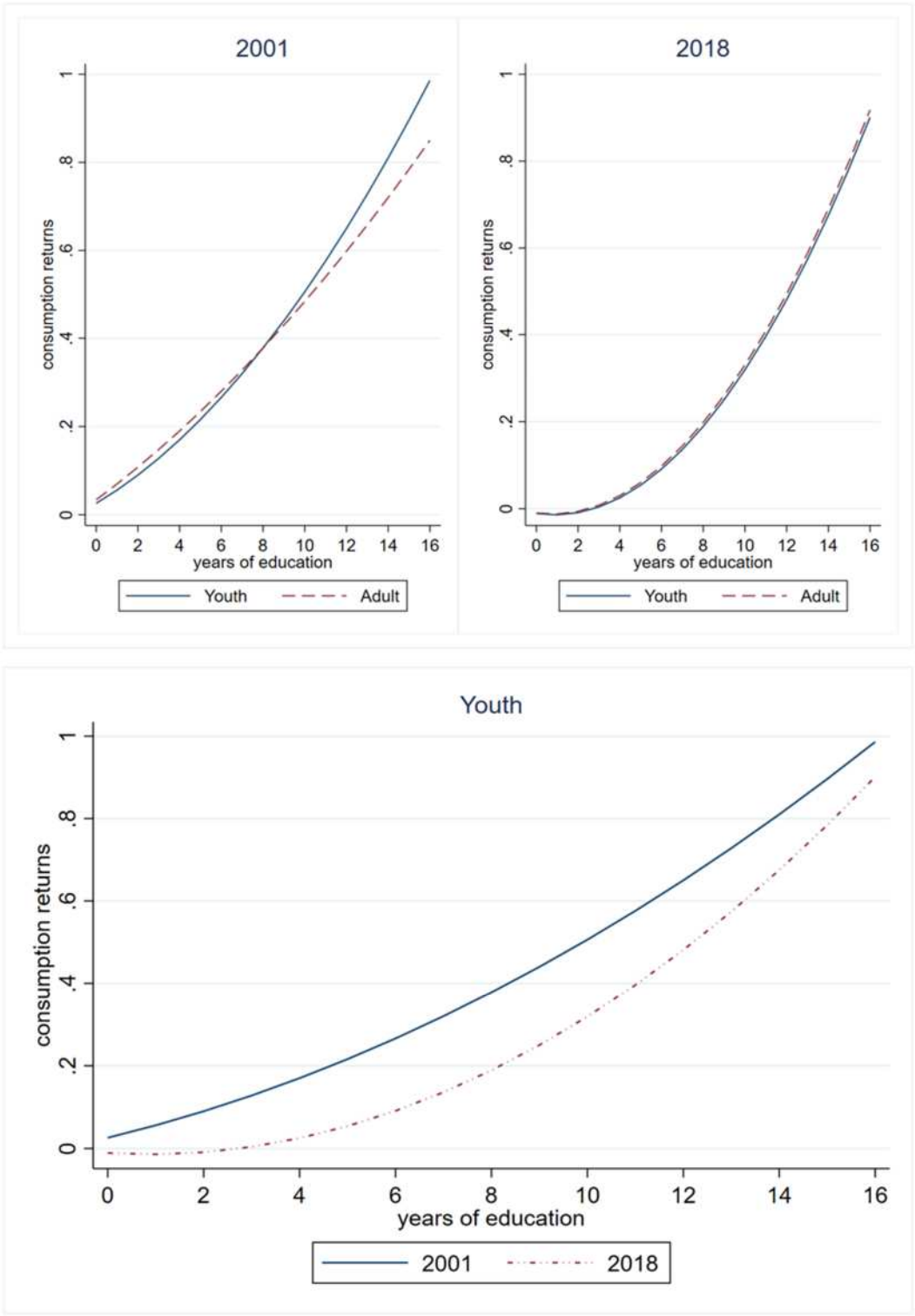

Table 6 presents the decomposition results by year. To simplify interpretation, the coefficients of the education variables (*sch* and sch^2) are aggregated[11] into one variable 'education'; the coefficient of *age* and age^2 into 'headage'; and ownership of assets, livestock per capita, and dummies for regions of residence into 'other controls'[12]. The top panel of Table 6 shows the contribution of the explained and unexplained parts to the total difference in log welfare. Only the explained component is significant in both years implying that it is only the difference in characteristics/endowment that explains differences in welfare between the two age groups. Both the specification and reweighing errors are insignificant as expected.

The breakdown of the 'Pure_explained' component in Table 6 reveals that the coefficient on education in the explained component is positive and significant, suggesting that the youths heading households have significantly better education attainment than adults heading households, consistent with what we observed in Table 1 in the previous section. It shows that a significant portion of the welfare difference between youth and adult headed households is attributable to differences in educational attainment between youths and adults that head households. Of the 'pure_explained' welfare differences of 0.251 and 0.151 in 2001 and 2018 respectively, approximately 40% and 32%[13] are attributed to differences in educational attainment between youths heading households and adults heading households. In other words, if an adult had the same level of educational attainment as a youth heading a household, their welfare would have been about 40% higher in 2001 and 32% higher in 2018. The difference in returns to education, however, does not have a significant effect on welfare. This is consistent with the regression results in Table 5 and the top panel of Figure 5, which shows slight differences in returns to education between the two age groups.

The third part of our analysis focuses on the Reweighted RIF Oaxaca-Blinder decomposition results for the youth heading households between 2001 and 2018. To assess if there is heterogeneity of the association between the difference in education and difference in welfare between the two periods, we perform the RIF decomposition by gender and place of residence. Table 7 reports the estimated coefficients of education for this decomposition. The results suggest that the difference in welfare between the two periods is mainly attributed to

11 The Stata command ***oaxaca_rif*** is calibrated for that option.

12 This is common approach in Oaxaca-Blinder decomposition literature and fits with the specification.

13 i.e., 0.101 out of 0.251 and 0.048 out of 0.151 in 2001 and 2018 respectively

differences in characteristics with evidence of heterogeneity of the effects of education across groups.[14]

Table 6: Reweighted RIF Oaxaca-Blinder Decomposition Within Survey Years

	(1) 2001	(2) 2018
Overall		
Youth	0.346***	0.531***
Counterfactual	0.093*	0.378***
Adult	0.149***	0.374***
Difference	0.197***	0.157***
Explained	0.252***	0.153***
Unexplained	-0.055	0.004
Pure_explained	0.251***	0.151***
education	0.101***	0.048***
headage	0.000	-0.002
female	0.000	-0.001**
rural	0.002*	0.002**
married	0.000	0.004***
lnhhsize	0.154***	0.145***
Other controls	-0.008	-0.049***
Pure_Unexplained	-0.422	0.643
education	0.026	0.014
age	0.207	-0.321
female	-0.011	-0.001
rural	-0.008	0.028
married	-0.023	0.081*
lnhhsize	-0.244*	-0.157
Other controls	-0.015	-0.024
constant	-0.404	1.057
Specification error	0.002	0.002
Reweight error	0.366	-0.639
N1 (youth)	8,039	2,507
N2 (adult)	13,983	6,945
N (all observations)	22,022	9,452

Notes: 'Other controls' is the aggregate effect of livestock per capita, region of residence and ownership of assets. Binary variables are normalised; significance * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in column (1) of Table 7 suggest that if the youth in 2001 had the same education endowment as their 2018 counterparts, their welfare would have been about 20% higher. Therefore, it implies that other things equal, policies that contributed to the increase in

14 The covariates included in the baseline regression.

education attainment led to improved youth welfare. The results in columns (2) and (3) suggest that although between 2001 and 2018 welfare increased more for males than females, the welfare increase attributed to the increase in education was significantly higher for females than males. Furthermore, results in columns (4) and (5) suggest that education played a more significant role in increasing the rural youth's welfare than their urban counterparts.

Table 7: Reweighted RIF Oaxaca-Blinder Decomposition for Youth

	(1) Pooled	(2) Female	(3) Male	(4) Rural	(5) Urban
Overall					
2018	0.531***	0.547***	0.527***	0.379***	0.820***
Counterfactual	0.299***	0.326***	0.314***	0.127***	0.552***
2001	0.346***	0.379***	0.339***	0.257***	0.711***
Difference	0.185***	0.168*	0.188***	0.121***	0.108
Explained	0.232***	0.221**	0.212***	0.251***	0.268***
Unexplained	-0.047	-0.053	-0.024	-0.130***	-0.160
Pure_explained	0.269***	0.171*	0.271***	0.225***	0.349***
education	0.055***	0.075***	0.055***	0.023**	0.094***
age	0.000	0.001	0.001	0.001	0.003
female	-0.000			-0.001	0.000
rural	-0.001	0.001	-0.004		
married	0.002	-0.005	0.001	0.003	-0.001
lnhhsize	0.016	0.006	-0.001	0.021	-0.032
Other controls	0.196***	0.096	0.222***	0.176***	0.287***
Pure_Unexplained	-0.100*	-0.095	-0.108*	-0.115***	-0.180
education	-0.190	-0.305*	-0.178	-0.261***	-0.181
age	0.490	0.657	0.096	0.991	-0.887
female	-0.002			0.005	0.008
rural	0.006	-0.059	0.036		
married	-0.003	0.014	0.062	0.064	-0.034
lnhhsize	0.111	-0.046	-0.034	0.025	0.003
Other controls	0.168	-0.115	0.420*	0.384***	-0.017
constant	-0.689	-0.248	-0.498	-1.289	0.943
Specification error	-0.037	0.050	-0.059	0.027	-0.081
Reweight error	0.053	0.042	0.083	-0.015	0.020
N1 (2018)	2,507	473	2,034	1,653	854
N2 (2001)	8,039	1,920	6,119	2,687	5,352
N (all observations)	10,546	2,393	8,153	4,340	6,206

Notes: As for Table 6.

5.1. Robustness Checks

Two concerns could lead to bias in the estimates presented: endogeneity of education from unobserved ability and potential endogenous youth selection into the households, whether the

factors associated with higher welfare such as education are also associated with a higher likelihood of the youth to head the household they live in. Whereas methods to address each of these issues are well documented in the literature, how to combine these methods in a RIF decomposition has not been established (Firpo et al., 2018; Rios-Avila, 2020). This shortcoming notwithstanding, and without trying to include the selection equation in the RIF decomposition model, we use a linear probability model (LPM) to assess whether education affects youth's likelihood to head the household. While the limitations of LPM are well documented, it has the advantage of allowing the inclusion of household fixed effects.

Table 8: Pooled LPM Regression Results by Gender and Place of Residence

	(1) Pooled	(2) Female	(3) Male	(4) Rural	(5) Urban
sch	0.005***	0.003**	0.003	0.006***	0.004***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
youth<26	-0.239***	-0.113***	-0.190***	-0.235***	-0.236***
	(0.005)	(0.009)	(0.015)	(0.008)	(0.007)
female	-0.316***			-0.368***	-0.269***
	(0.004)			(0.007)	(0.006)
married	0.085***	-0.030***	0.317***	0.108***	0.071***
	(0.006)	(0.008)	(0.018)	(0.010)	(0.009)
AGR	-0.004	-0.001	0.002	0.001	-0.024***
	(0.005)	(0.007)	(0.011)	(0.008)	(0.007)
WAGE	0.183***	0.099***	0.069***	0.164***	0.191***
	(0.009)	(0.017)	(0.022)	(0.020)	(0.010)
SELF	0.154***	0.106***	0.084***	0.070***	0.185***
	(0.008)	(0.017)	(0.018)	(0.016)	(0.010)
_cons	0.410***	0.130***	0.298***	0.426***	0.390***
	(0.008)	(0.012)	(0.019)	(0.012)	(0.012)
Obs.	53,517	29,231	24,286	23,206	30,311
R^2	0.72	0.89	0.93	0.70	0.74

Note: Dummies for sectors of main employment are AGR (agriculture), WAGE (wage employment) and SELF (non-agricultural self-employment); <26 is an age dummy =1 if aged less than 26 years and 0 otherwise. Robust standard errors in parentheses (* p < 0.10, ** p < 0.05, *** p < 0.01).

.

Table 9: LPM Regression Results by Year, Gender and Place of Residence

	2001					2018				
	(1) All	(2) Female	(3) Male	(4) Rural	(5) Urban	(6) All	(7) Female	(8) Male	(9) Rural	(10) Urban
sch	0.006***	0.003**	0.003	0.007***	0.005***	0.003**	0.001	0.001	0.004**	0.003
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
youth<26	-0.244***	-0.118***	-0.196***	-0.243***	-0.240***	-0.220***	-0.093***	-0.152***	-0.220***	-0.215***
	(0.006)	(0.010)	(0.017)	(0.010)	(0.008)	(0.011)	(0.021)	(0.027)	(0.013)	(0.021)
female	-0.302***			-0.374***	-0.257***	-0.348***			-0.356***	-0.332***
	(0.005)			(0.008)	(0.006)	(0.009)			(0.011)	(0.016)
married	0.082***	-0.033***	0.351***	0.117***	0.069***	0.091***	-0.021	0.220***	0.095***	0.086***
	(0.007)	(0.009)	(0.022)	(0.012)	(0.009)	(0.013)	(0.018)	(0.032)	(0.015)	(0.027)
AGR	-0.019***	-0.001	-0.001	-0.017*	-0.034***	0.042***	0.012	0.026	0.029**	0.081**
	(0.006)	(0.008)	(0.012)	(0.011)	(0.007)	(0.012)	(0.018)	(0.021)	(0.012)	(0.035)
WAGE	0.182***	0.109***	0.070***	0.172***	0.189***	0.163***	0.051	0.062	0.152***	0.179***
	(0.010)	(0.018)	(0.025)	(0.026)	(0.011)	(0.020)	(0.044)	(0.044)	(0.032)	(0.025)
SELF	0.156***	0.109***	0.097***	0.045**	0.184***	0.134***	0.094***	0.023	0.097***	0.173***
	(0.010)	(0.020)	(0.021)	(0.023)	(0.011)	(0.016)	(0.035)	(0.034)	(0.022)	(0.023)
_cons	0.419***	0.139***	0.296***	0.454***	0.397***	0.382***	0.103***	0.294***	0.387***	0.371***
	(0.010)	(0.014)	(0.023)	(0.016)	(0.012)	(0.017)	(0.025)	(0.036)	(0.019)	(0.033)
N	39,542	21,873	17,669	13,486	26,056	13,975	7,358	6,617	9,720	4,255
R^2	0.72	0.89	0.92	0.69	0.73	0.72	0.90	0.95	0.71	0.75

Notes: As for Table 8.

Table 8 shows that, after controlling for household fixed effects, more educated youth are significantly more likely to be a head of household, although the effect is small: an extra year of education is associated with about 0.005 increase in youth's probability of heading the household in which they live. The results in Table 9 reveal that after disaggregating by year, gender and place of residence, more educated youth are less likely to be household heads in 2018 than in 2001 (an extra year increases the probability of being head by 0.003 and 0.006 in 2018 and 2001 respectively). The significant association between education and headship in 2018 is generally driven by youths residing in rural areas.

Despite the significance of the coefficients of education in Tables 8 and 9, the magnitudes of effect are small. The coefficients of education that average 0.005 suggest that the probability of becoming head of household increases by only 0.5% for every year increase in schooling. Such a small estimated effect is less likely to significantly affect the estimated coefficients of education in our main results. While this signals a potential selection problem, which we acknowledge that we do not have a remedy for, we argue the low coefficient gives us cautious confidence in the main results.

6 Conclusions

This paper focused on investigating how much of the welfare difference between both youth-headed households in 2001 and 2018 and between youth and adult-headed households in each of the years can be attributable to differences in educational attainment and returns to education. The aim was to assess the impact of increased participation in education, especially following the Universal Primary Education (UPE) introduced in 2001, which mainly benefited the youth aged 15–35 years in 2018. In contrast to previous studies which mainly examined the association between education and welfare at any given point in time, this study examines both how much of the welfare differences between 2001 and 2018 can be attributed to changes in the association between education and welfare over this period, and how much can be attributed to changes in educational attainment between 2001 and 2018 (i.e., effects of change in education distribution between the period). Samples of household heads from the 2001 and 2018 HBSs were investigated using RIF decomposition of the mean.

Proxying welfare by household (per adult equivalent) consumption expenditure relative to the national poverty line, the study used a RIF OB decomposition to decompose the welfare differences between youth in 2001 and the 2018 as well as between youth and adults in each year. The analysis shows that youths, having more education than adults, enjoy higher welfare

levels than adults in both years. The difference in educational attainment between the two groups significantly explains the differences in welfare, but the difference in the returns to education does not. Comparing youth cohorts across years, the youth in 2018 have higher education and welfare levels than in 2001. The difference in welfare is significantly attributed to differences in educational attainment between 2001 and 2018. Differences in returns to education explain the welfare gap only for young women and youth residing in rural areas. However, despite the evidence of the substantial decline in returns to education between 2001 and 2018, we find no evidence that such a decline reduced welfare.

We did not control for endogeneity of education from the unobserved ability or for endogenous selection of youth to be heads of households in our welfare decomposition, which is a limitation of the analysis. The absence of suitable instrumental variables from the data is one factor, but most importantly, even with good instruments or instrument-free methods, there is no established way to combine RIF with methods to address endogeneity. We did find that education is a minor factor determining whether a young person is a head of household: an additional year of schooling increases a young member's probability to head the household by only 0.5%. Such a small effect is unlikely to significantly affect the estimated coefficients of education in our main results.

The analysis in this paper was based on comparisons of youth and adult headed households, given the difficulty in measuring education and consumption of individuals at the household level. While youth make the most significant proportion of the labour force, less than a third of them head the households they live in. As a result, we could not analyse the welfare gain resulting from gains in schooling for the youth who live in households headed by an adult. Future studies could use other surveys to analyse how the gains in schooling over this period affected the wage earnings and their distribution, with analysis at the individual level.

REFERENCES

Agyire-Tettey, F., Ackah, C. G., & Asuman, D. (2018). An Unconditional Quantile Regression Based Decomposition of Spatial Welfare Inequalities in Ghana. *Journal of Development Studies*, **54**(3), 537–556. https://doi.org/10.1080/00220388.2017.1296571

Alem, Y., & Söderbom, M. (2012). Household-Level Consumption in Urban Ethiopia: The Effects of a Large Food Price Shock. *World Development*, **40**(1), 146–162. https://doi.org/10.1016/j.worlddev.2011.04.020

Arouri, M., Nguyen, C., & Youssef, A. Ben. (2015). Natural Disasters, Household Welfare, and Resilience: Evidence from Rural Vietnam. *World Development*, **70**, 59–77. https://doi.org/10.1016/j.worlddev.2014.12.017

Arsalan, A., Tschirley, D., & Egger, E.-M. (2019). What Drives Rural Youth Welfare? The Role of Spatial, Economic, and Household Factors. International Fund for Agricultural Development (IFAD), 42. https://doi.org/10.2139/ssrn.3519981

Ayyash, M., & Sek, S. K. (2020). Decomposing Inequality in Household Consumption Expenditure in Malaysia. *Economies*, **8**(4), 83. https://doi.org/10.3390/economies8040083

Belghith, N. B. H., Karamba, W., Talbert, E., & Boisseson, P. de. (2020). *Tanzania Mainland Poverty Assessment: Tanzania's Path to Poverty Reduction and Pro-Poor Growth.* The World Bank. http://documents.worldbank.org/curated/en/254411585030305188/pdf/Part-1-Path-to-Poverty-Reduction-and-Pro-Poor-Growth.pdf

Blinder, A. S. (1973). Wage Discrimination : Reduced Form and Structural Estimates. *The Journal of Human Resources*, **8**(4), 436–455.

De Janvry, A., & Sadoulet, E. (2016). *Development Economics: Theory and Practice.* Taylor and Francis, London and New York. https://doi.org/10.4337/9781785365065.00013

Deaton, A. (2018). *The Analysis of Household Surveys* (Reissue), The World Bank, Washington D.C. https://doi.org/10.1596/0-8018-5254-4

Delesalle, E. (2021). The effect of the Universal Primary Education program on consumption and on the employment sector: Evidence from Tanzania. *World Development*, **142**, 105345. https://doi.org/10.1016/j.worlddev.2020.105345

Firpo, S. P., Fortin, N. M., & Lemieux, T. (2009). Unconditional Quantile Regressions. *Econometrica*, **77**(3), 953–973. https://doi.org/10.3982/ecta6822

Firpo, S. P., Fortin, N. M., & Lemieux, T. (2018). Decomposing wage distributions using recentered influence function regressions. *Econometrics*, **6**(2), 1–41. https://doi.org/10.3390/econometrics6020028

Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition Methods in Economics. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics Volume 4* (pp. 1–102). Amsterdam: Elsevier https://doi.org/10.1016/S0169-7218(11)00407-2

Fulford, S. (2014). Returns to education in India. *World Development*, **59**, 434–450. https://doi.org/10.1016/j.worlddev.2014.02.005

Himaz, R., & Aturupana, H. (2018). Schooling and household welfare: The case of Sri Lanka 1990 to 2006. *Review of Development Economics*, **22**(2), 592–609. https://doi.org/10.1111/rode.12355

Khan, R., & Morrissey, O. (2020). Income diversification and household welfare in Tanzania 2008 – 13, UNU-WIDER, Helsinki: *WIDER Working Papers 2020/110.*

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, **14**(3), 693–709.

Ramadan, R., Hlasny, V., & Intini, V. (2018). Inter-Group Expenditure Gaps in The Arab Region and their Determinants: Application to Egypt, Jordan, Palestine And Tunisia. *Review of Income and Wealth*, **64**(October), S145–S188. https://doi.org/10.1111/roiw.12396

Rios-Avila, F. (2020). Recentered influence functions (RIFs) in Stata: RIF regression and RIF decomposition. *Stata Journal*, **20**(1), 51–94. https://doi.org/10.1177/1536867X20909690

Skoufias, E., & Katayama, R. S. (2011). Sources of welfare disparities between and within regions of Brazil: Evidence from the 2002-2003 household budget survey (POF). *Journal of Economic Geography*, **11**(5), 897–918. https://doi.org/10.1093/jeg/lbq030

URT. (2002). *Household Budget Survey 2000/01*. National Bureau of Statistics, Dar es Salaam

URT. (2005). *Basic Education Statistics in Tanzania (BEST) 1995 - 2005.* Ministry of Education and Culture, Dar es Salaam.

URT. (2007). *National Youth Development Policy*. Ministry of Labour, Employment and Youth Development, Dar es Salaam.

URT. (2008). *The Tanzania Economic Survey 2007*. The Ministry of Finance and Economic Affairs, Dar es Salaam.

URT. (2013). *The Economic Survey 2012.* Ministry of Finance, Dar es Salaam. http://www.tanzania.go.tz/economicsurvey1/2006/index.html (Accessed 10 September 2011).

URT. (2015). *Tanzania Integrated Labour Force Survey 2014.* National Bureau of Statistics, Dar es Salaam.

URT. (2016). *National Basic Education Statistics in Tanzania (BEST) 2012 - 2016.* Ministry of Education, Science and Technology, Dar es Salaam.

URT. (2018). *National population projections.* National Bureau of Statistics and Office of the Chief Government Statistician, Dar es Salaam and Zanzibar.

URT. (2019). *Household Budget Survey 2017-18: Key Indicators Report.* National Bureau of Statistics, Dar es Salaam.

Van de Walle, D. (2013). Lasting welfare effects of widowhood in Mali. *World Development*, **51**, 1–19. https://doi.org/10.1016/j.worlddev.2013.05.005