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DOES EDUCATION PLAY A ROLE IN EXPLAINING THE RURAL–URBAN WEALTH GAP? EVIDENCE FROM TANZANIA*

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Abstract

This paper examines factors that determine differences in living standards as measured by a wealth index between rural and urban areas in Tanzania, by applying the Blinder–Oaxaca decomposition method. The rural–urban wealth gap has remained largely unchanged over time while rural–urban differences in educational attainment play a significant role in explaining this gap. Further evidence shows that the wealth gap caused by a differential return to education is also significant. Our results stress the importance of improving the quality and quantity of education in rural Tanzania in attempting to decrease the rural–urban wealth gap.

Keywords: Education, Oaxaca decomposition, rural–urban difference, Tanzania; wealth gap
JEL Classification Codes: D3, I2, O1, O5

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I. *Introduction*

Studying inequality trends and their consequences on development outcomes, such as growth, living standards, and poverty alleviation within and between countries has attracted substantial attention in the literature. There is a growing consensus that inequality both constrains future economic growth potential (Perotti, 1996; Nissanke and Thorbecke, 2006; Berg and Ostry, 2017) and limits its potential impact on poverty alleviation (Ravallion, 1997; Thorbecke and Charumilind, 2002; Nel 2006).

Tanzania has had a long record of economic reforms, beginning with a short spell when there was a private sector–led economy soon after independence (1961–1966) to a period in which there was a state-led economy (1967–1990), followed by economic liberalization and state deregulation from the early 1990s onward. As a result of economic reforms in the mid-1990s, over the last two decades, Tanzania has sustained relatively high levels of economic growth, averaging 6%–7% per annum.

Although the country's high rates of economic growth have led to employment creation and some level of poverty reduction, its impact on income inequality has not been significant (Kinyondo and Pelizzo, 2018). The Gini index in Tanzania shows that inequality has remained high at 38% in 2017, similar to 34% in 1991.[1] As Young (2013) showed, the urban–rural gap in living standards accounts for 40% of the mean country inequality. According to the World Bank (2007 and 2015), poverty is mostly a rural phenomenon in Tanzania, as over 80% of the poor and extremely poor live in rural areas, with more than half of them dependent on subsistence agriculture for their livelihoods. Moreover, in urban areas, primary schools were found to be four times more likely to have electricity, water, and sanitation than those in rural areas (World Bank et al., 2012). Given the better educational environment in urban schools, urban households would be able to enjoy a higher return to education and living standards.

We aim to understand the factors contributing to the rural–urban gap in living standards and their dynamics over time, focusing on education's role in explaining the gap. We first identify the drivers of household living standards, measured by a wealth index in Tanzania's rural and urban areas. We then examine rural–urban outcome differences by decomposing them into the part explained by differences in observable characteristics, including potentially malleable factors, such as education, and the part explained by differences in the coefficients of these characteristics using Blinder–Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973). We use the Demographic and Health Survey (DHS) data of 2004/05, 2010, and 2015 to see if any changes exist over time in the magnitude of the rural–urban gaps and the factors that explain those differences.

The reason for studying Tanzania's inequality, focusing on rural–urban differences, is mainly threefold. First, despite continued high levels of economic growth, the impact on poverty alleviation in rural areas remains low. The most recent estimates based on household budget surveys (MoFP-PEP, 2019) show that the incidence of poverty remains high—more so in rural areas (31.3%) than in urban areas (15.8%). Although rapid economic growth is typically linked with uneven regional and urban development (Kim, 2008), Atkinson and Lugo

[1] Tanzania is ranked 35th by the Gini index out of 49 listed African countries (https://www.indexmundi.com/facts/indicators/SI.POV.GINI/rankings/Africa).

(2010) have shown that inequality has contributed to a growth-poverty reduction mismatch in Tanzania. Second, even though policy reforms in the mid-1990s led to high rates of economic growth, important questions on the resulting inequality and drivers of rural–urban differences in wealth and standards of living are yet to be answered. Finally, among the outcomes of these reforms was a significant increase in public and private investments in different social sectors, particularly education. The government's decision to adopt a free primary education policy in 2002, followed by a countrywide campaign to establish at least one secondary school in every ward raised primary education's net enrollment ratio from 58.12% in 2001 to 81.33% in 2018, reaching its highest value (98.86%) in 2008.[2] Moreover, net enrollment in secondary education improved from 6.30% in 2003 to 26.55% in 2018.[3] However, the impact of these policy changes on either reducing or widening the rural–urban welfare gaps is yet to be thoroughly explored. Our study examines whether the past efforts to increase educational attainment have had any impact on reducing the rural–urban gap, which may signal the potential impact of investing in education particularly as a result of policy changes of 2002 and beyond.

Many studies on welfare and inequality prefer using consumption data over income (Deaton, 1997; Atkinson, 1991) because income tends to vary over a year, especially in developing countries where income depends mostly on agriculture. Further, a large portion of a household's income is normally from the informal sector. However, criticisms have been made over the use of monetary measures, either income or expenditure, to assess households' quality-of-living conditions and socioeconomic positions (Kim, 2019; Betti et al., 2006; Sen, 1976; Stiglitz et al., 2009). In areas where markets for many goods and services are either nonexistent or operate imperfectly (Thorbecke, 2008), the quality of expenditure data is likely to be poor. Moreover, considering that poverty is a multidimensional concept going beyond just lack of income (Greeley, 1994; Narayan et al., 2000; Stiglitz et al., 2009), other nonmonetary indicators of household welfare, for example, composite measures like the asset index, have been developed as alternative tools to classify household socioeconomic positions (Filmer and Pritchett, 1998, 2001).[4]

Our study produces several key findings. First, differences in household demographic characteristics, compositions, and education levels of the household head are substantial between rural and urban areas. Second, significant rural–urban differences in household wealth exist and these differences have remained largely unchanged. Moreover, rural–urban differences in the distribution of social services, such as electricity, water supply, health facilities, and market places, are evident. Third, education levels of the household head, household composition, and residence location are strong determinants of a household's standard of living in rural and urban areas. Lastly, after decomposing rural–urban differences, we find that education explains much of the differences.

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[2] The elimination of primary school fees marked the start of the Primary Education Development Programme (PEDP), which aimed to enhance access to primary education and the quality of teaching. Hoogeveen and Rossi (2013) found that the reform increased the enrollment rates significantly among girls, although it did not necessarily increase grade achievement.

[3] Source: UNESCO Institute for Statistics data obtained from https://data.worldbank.org/indicator/SE.PRM.NENR?locations=TZ

[4] Filmer and Pritchett's (2001) asset index proxies wealth by constructing a linear index from data on asset ownership and housing characteristics using principal component analysis (PCA) to derive weights. The wealth index included in the DHS and used in this study follows the same methodology.

The rest of this paper is organized as follows. Section 2 discusses the data and methodology, section 3 contains the results, and section 4 has the conclusion and policy implications.

II. *Data and Methods*

1. Data

In studying living standards, inequality, and poverty, especially in developing countries, the use of household consumption as a core measurement is common (Deaton, 1997). Nevertheless, these data are prone to measurement errors and reporting biases (Filmer and Pritchett, 2001). Additionally, most of the household consumption surveys are subject to design variations in the method of data capture, length of the reference period, number of items in the recall list, and nature of the cognitive task required of the respondent. These variations can result in large changes in mean consumption and distributional measure (Beegle et al., 2012), causing comparisons across countries and measurement of welfare trends within countries to become challenging (Lanjouw and Lanjouw, 2001).

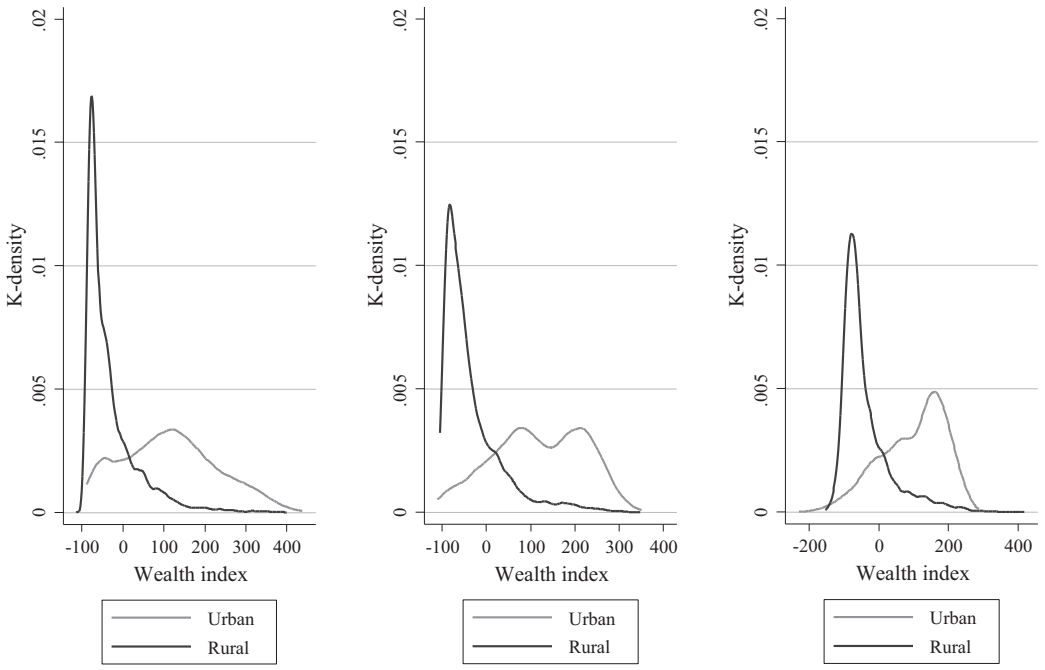
We use a wealth index, which is less prone to measurement errors than typical consumption data (Filmer and Pritchett, 2001; McKenzie, 2004). Moreover, some aspects of well-being cannot be expressed in monetary terms (Hulme and McKay, 2005; Thorbecke, 2008) and an index is an option that goes beyond monetary indicators, such as income and expenditure (Kim, 2019).

We employ the three most recent waves of Tanzania's DHS data for 2004/05, 2010, and 2015; there are six waves of data, with the first one being from 1991/92. However, the waves prior to 2004/05 do not include the wealth index, which is our primary variable of interest. The DHS data are nationally representative and cover a wide range of topics, including wealth, education, and health in developing countries. A standardized methodology, especially for survey instruments and sample design, ensures that data are highly comparable across countries and over time. Most of the variables we use are present in all the study years, except for the marital status information, which is missing in the 2004/05 dataset.

2. Variables

We use the standardized DHS wealth index as the dependent variable for ordinary least squares (OLS) regression analysis and decomposition of the rural–urban gap. The DHS wealth index is used as a composite measure of a household's cumulative living standard and is generated with a statistical procedure of principal component analysis using data on a household's ownership of selected assets (house, land, radio, television, mobile telephone, non-mobile telephone, computer, refrigerator, iron, watch, bicycle, motorcycle or scooter, animal-drawn cart, car or truck, boat with motor, and bank account), and other variables related to household wealth status, such as dwelling place characteristics (main floor materials, main wall materials, and number of members per sleeping room), type of drinking water source, type of toilet facility, type of cooking fuel, and the main source of energy for lighting (ICF, 2018). The wealth index is calculated based on a household's ownership of selected assets, rather than the

FIGURE 1. STANDARDIZED WEALTH INDEX SCORE DISTRIBUTION FOR 2004/05, 2010, AND 2015



actual value of the assets. Given that assessing the *ownership* of assets would be more precise than assessing their *value*, the index is less prone to measurement errors and reporting biases. The wealth index places individual households on a continuous scale of relative wealth (Figure 1).[5] Generally, urban wealth index distributions are skewed to the right, with fewer households at the bottom tails in all the study years, indicating higher mean wealth index scores, and fewer households at the lower quintiles than the rural areas.

To capture household human capital, we include measures of education of the household head.[6] We use dummy variables for postsecondary education, secondary education, and

[5] The PCA derives scores for each household based on the number and kinds of consumer goods they own, plus housing characteristics, such as the source of drinking water, toilet facilities, and flooring materials. The index scores have a mean of zero, where the higher the score, the better the living standards. The index value can be comparable across regions and over time if the variables used in its calculation are the same.

[6] The OLS results could be biased if the head's education is correlated with his/her unobserved factors. Unfortunately, we do not have a valid instrumental variable for education. However, unobserved variables, such as ability, are likely to be correlated positively with schooling in both rural and urban areas. This implies that in Oaxaca decomposition, under the assumption that the extent of the positive correlation between education and unobserved factors is similar between both areas, the contribution of difference in education coefficients would not be affected much by the omitted variable bias as the bias in the coefficient estimate is likely to be diminished when taking the difference in Oaxaca decomposition. Nevertheless, we note that the contribution of difference in education coefficients is likely to be overestimated if this positive correlation is greater in urban areas. Alternatively, if this positive correlation is greater in rural areas, the contribution of difference in education coefficients is likely to be underestimated.

completed primary education with incomplete primary schooling and no formal schooling as the omitted education categories. Household composition is measured by three variables describing the number of children aged under 15 years, non-elderly adults/those of working age (15–64 years), and elderly adults (65 years or above) in the household.

Demographic characteristics of the household head include age, a male dummy, and a dummy for being married (equal to one if the head is married or cohabiting with a partner and zero otherwise). Finally, we control for location of the household by using dummy variables of geographical zones: Central, Western, Southern, Southern Highlands, Northern, Lake, and Zanzibar. The omitted category for household location is the Eastern zone.[7]

3. Analyses

We perform OLS regression analyses to examine factors determining wealth for the rural, urban, and pooled samples in all the survey years. Then, we use the Blinder–Oaxaca decomposition to analyze the rural–urban wealth difference and its trend between 2004/05 and 2015. To examine wealth determinants for each type of residence (i.e., rural and urban), we first estimate the following regression model for the rural, urban, and pooled samples in each year:

$$Y_{it}=\alpha+\beta' X_{it}+\varepsilon_{it}, \tag{1}$$

where Y_{it} is the standardized wealth factor score of household i in survey year t, X_{it} is the set of explanatory variables described in section 2.2, $\beta's$ are parameters to be estimated by the OLS, and ε_i is the error term. We use robust standard errors clustered at the level of primary sampling units (survey clusters), and household sampling weights due to the non-proportional allocation of the sample to the different regions and the possible differences in response rates.

We then decompose the wealth gap between rural and urban types of residences using Blinder (1973) and Oaxaca's (1973) decomposition technique to examine whether the mean outcome differences between areas are due to differences in means of covariates ($E(X_{urban})-E(X_{rural})$) (explained) or in coefficients (unexplained). Formally, the rural–urban gap is decomposed as:

$$E(Y_{urban})-E(Y_{rural})=$$
$$[E(X_{urban})-E(X_{rural})]'\beta^*+[E(X_{urban})'(\beta_{urban}-\beta^*)+E(X_{rural})'(\beta^*-\beta_{rural})], \tag{2}$$

where the first component is the part "explained" by group differences in means of covariates, whereas the second and third terms are the "unexplained" parts, indicating the portion concerning differences in coefficients. For instance, even with the same level of education, education can widen the rural–urban gap in living standards if urban households exhibit a higher coefficient on education (i.e., a higher return of education on wealth) than rural households.

The determination of the terms in equation (2) requires an estimate for the unknown nondiscriminatory coefficients' vector β^*. One possibility would be to assume that $\beta^*=\beta_{urban}$ or $\beta^*=\beta_{rural}$, but this would result in the index number problem (Oaxaca, 1973). Other

[7] We omitted results of location variables from the tables to save space.

possibilities from the literature include using the average of coefficients from both groups by assigning a weight of 0.5 to each group's estimated coefficients (Reimers, 1983). Moreover, Cotton (1988) suggests weighting the coefficients according to the group sample sizes. We follow Neumark's (1988) proposition by using the coefficients from the pooled regression to rural and urban samples as an estimate for β^*. To prevent the pooled regression from inappropriately transferring some of the unexplained parts of the differential into the explained component and thus overestimating the explained part (Fortin, 2006; Jann, 2008), we include a group indicator in the pooled model as an additional covariate.[8]

III. *Results*

1. Descriptive Statistics

The summary statistics in Table 1 show significant differences in living standards between rural and urban households as measured by the wealth index in all the survey years.[9] Regarding demographic characteristics, across all years, there is a significant difference in the age of household heads, with urban heads being younger than their rural counterparts. Further, more household heads in rural areas are either married or cohabiting with a partner. Differences in education are also evident, especially in secondary education. The majority of household heads in both areas completed only primary education, with the share being much lower for secondary education and postsecondary education, especially in rural areas for all the years. In 2004/05, household heads in rural areas who had completed secondary education amounted to 5.8%, whereas in urban areas, this was 13.6%. In 2015, the numbers improved to 11.3% and 28.4%, respectively. Analyses of trends in Tanzania's rural–urban educational inequality by Maliti (2019) also showed that inequality based on mean years of schooling between 1991 and 2015 persisted but had been declining, especially for the age cohort of those 25 years and above than for those 15 years and above.

Sources of these educational disparities may be from both supply and demand considerations, such as spatial gaps in income and attitudes that may imply differences in parental demand (Knight and Shi, 1996) and difficulty in finding qualified teachers who are willing to settle in poor and remote rural areas (Sherman, 2008; Yusuph, 2013). Moreover, differences in income, access to electricity, running water, and healthcare are important factors in explaining rural–urban educational disparity in sub-Saharan Africa (Eloundou-Enyegue and Giroux, 2012).

Differences in rural–urban household composition have been significant over the years. Rural households appear to be larger, with a higher number of children, and the difference has

[8] Elder et al. (2010) show that the pooled Oaxaca–Blinder strategy without a group indicator overstates the role of observables in explaining the mean outcome compared to OLS with a group indicator, thereby understating unexplained differences. This means that the pooled regression coefficients on observable covariates becomes biased when the group-specific intercepts are omitted, causing the role of observables to be overstated.

[9] While one may be tempted to think that urban-rural differences decrease over time as economies develop, some studies have pointed to different patterns. For example, Hatton and Williamson (1992) showed that the rural–urban gap actually widened in the United States from the late 19th century to right before World War II, and Lundh and Prado (2015) found that the gap in Sweden changed little over the 20th century.

TABLE 1. DESCRIPTIVE STATISTICS OF DEPENDENT AND EXPLANATORY VARIABLES

Variable	2004/05			2010			2015		
	Rural	Urban	Diff. (U-R)	Rural	Urban	Diff. (U-R)	Rural	Urban	Diff. (U-R)
Dependent variable									
Mean wealth index score	-32.396	113.679	146.075***	-34.967	117.359	152.327***	-39.515	97.090	136.605***
	(65.225)	(116.448)		(66.986)	(103.093)		(71.153)	(94.178)	
Explanatory variables									
Demographic characteristics									
Sex (1=Male)	0.760	0.750	-0.010	0.758	0.761	0.003	0.760	0.747	-0.013
	(0.427)	(0.433)		(0.428)	(0.426)		(0.427)	(0.435)	
Age (years)	45.490	42.112	-3.378***	47.184	42.919	-4.265***	47.107	42.473	-4.634***
	(15.979)	(14.691)		(15.940)	(14.190)		(15.898)	(14.224)	
Marital status	--	--	--	0.758	0.708	-0.050***	0.752	0.693	-0.059***
				(0.428)	(0.455)		(0.432)	(0.461)	
Education of h/head									
Primary education	0.588	0.614	0.026**	0.598	0.576	-0.023*	0.623	0.558	-0.065***
	(0.492)	(0.487)		(0.490)	(0.494)		(0.485)	(0.497)	
Secondary education	0.058	0.136	0.078***	0.088	0.274	0.186***	0.113	0.284	0.171***
	(0.234)	(0.343)		(0.284)	(0.446)		(0.317)	(0.451)	
Postsecondary education	0.017	0.090	0.074***	0.003	0.031	0.028***	0.008	0.064	0.057***
	(0.128)	(0.287)		(0.052)	(0.173)		(0.088)	(0.245)	
Household composition									
Number of children	2.467	1.912	-0.556***	2.538	1.950	-0.588***	2.581	1.815	-0.766***
	(2.047)	(1.763)		(2.057)	(1.705)		(2.162)	(1.711)	
Number of non-elderly adults	2.521	2.729	0.208***	2.552	2.761	0.210***	2.556	2.668	0.112***
	(1.486)	(1.713)		(1.566)	(1.616)		(1.553)	(1.616)	
Number of elderly adults	0.236	0.151	-0.084***	0.263	0.145	-0.119***	0.251	0.133	-0.118***
	(0.508)	(0.419)		(0.534)	(0.396)		(0.528)	(0.386)	
Sample size (households)	7,576	2,159		7,414	2,209		8,929	3,634	

Note: These are mean values with standard deviations in parentheses. * p<0.10, ** p<0.05, *** p<0.01

widened over time. Likewise, the mean number of elderly adults in rural households is higher. In contrast, urban households consist of more non-elderly adults.[10]

The distances to the nearest health facility and marketplace, and the time to the water source are expectedly less for urban households than for rural households during the study period (Table 2). Access to electricity is also greater for urban households. There are improvements in the percentage of households with access to electricity in both areas when comparing over the years.[11] However, most of the progress is observed in urban areas, causing the rural–urban gap in access to electricity to widen over time. In 2004/05, households with access to electricity in rural areas comprised 2.9% compared to 38.1% in urban areas; in 2015, the numbers had improved to 8.7% and 55.9%, respectively.

[10] Although not reported, the majority of rural household heads engage in agricultural activities, whereas in urban areas, nonagricultural occupations, such as professional, technical, managerial, skilled/unskilled manual jobs, services, sales, clerical, and others, are more common. We do not control for occupations as they could themselves be potential outcomes and controlling for them might lead to a selection bias. Nevertheless, our results are robust to controlling for occupations.

[11] Tanzania's latest data on access to electricity (NBS, 2020) show that approximately 24.5% of rural households are connected to electricity, which is much lower than their urban counterparts (73.2%).

TABLE 2. SUMMARY STATISTICS FOR OTHER RURAL–URBAN CHARACTERISTICS

	2004/05		2010		2015	
Service delivery	Rural	Urban	Rural	Urban	Rural	Urban
Access to electricity (%)	2.86	38.12	5.27	47.71	8.72	55.89
Distance to nearest health facility (km)	--	--	4.33	1.48	3.79	1.41
			(8.55)	(6.50)	(5.25)	(1.65)
Time to water source (min)	40.80	21.36	32.82	17.09	36.23	22.65
	(57.98)	(32.74)	(40.65)	(26.87)	(52.27)	(70.34)
Distance to marketplace (km)	6.58	1.68	27.62	7.99	24.53	5.42
	(12.49)	(5.55)	(27.33)	(18.78)	(24.27)	(12.47)
Sample size (households)	7,576	2,159	7,414	2,209	8,929	3,634

Note: Standard deviations are in parentheses.

2. Determinants of Living Standards as Measured by the Wealth Index

Table 3 presents the OLS results for the rural, urban, and pooled samples. Coefficients for education dummy variables are statistically significant and positive throughout the years, whereas the magnitudes increase with the level of education.

Generally, education helps household heads improve the living standards of their families, especially in urban areas. Herrendorf and Schoellman (2018) estimated returns to education and experience by sector in 13 countries and showed smaller returns to education among agricultural workers than among those in other sectors.

Household composition is also an important determinant of household living standards. The cost of an additional child in lowering household wealth is significant, but more so in urban areas. Although the number of elderly adults in a household is an important determinant of wealth in rural areas, it is not so in urban areas. Moreover, the number of non-elderly adults (those of working age) improves wealth in rural and urban areas, with the urban sample exhibiting larger coefficients. This finding implies that household members of working age in urban areas contribute more to the welfare improvements of their families, probably because they are more educated with greater access to lucrative job opportunities.

3. Decomposition

We use coefficients from the pooled sample regressions to decompose wealth differences into two parts. The portion due to the difference in the means of covariates for every variable is calculated as $[E(X_{urban})-E(X_{rural})]'\beta^*$, whereas the portion due to differences in the coefficient is estimated as $[E(X_{urban})'(\beta_{urban}-\beta^*)+E(X_{rural})'(\beta^*-\beta_{rural})]$, where β^* is the coefficient of the respective variable from the pooled sample regression in a given year.

We find that the overall difference in wealth index between urban and rural localities and the part of the difference "explained" are largely unchanged over the study period (Table 4). The part of the gap explained by the difference in means of the observables accounted for 20.01%, 20.64%, and 22.83% of the overall difference for 2004/05, 2010, and 2015, respectively.

Table 4 shows that the portion explained by differences in mean levels of education is

TABLE 3. DETERMINANTS OF THE WEALTH INDEX SCORE

	2004/05			2010			2015		
Variables	Rural	Urban	Pooled	Rural	Urban	Pooled	Rural	Urban	Pooled
Demographic characteristics									
Marital status [1=Married]	--	--	--	1.779	14.221**	5.931**	-2.015	16.097***	4.448**
				(2.497)	(6.448)	(2.832)	(2.547)	(3.818)	(2.239)
Sex [1=Male]	-0.105	4.136	-0.290	-0.125	-5.365	-1.480	-3.361*	-18.561***	-8.933***
	(1.692)	(5.247)	(2.055)	(2.025)	(7.155)	(2.527)	(1.999)	(4.349)	(2.147)
Age of household head	0.067	-0.313	-0.037	-0.020	0.058	0.011	0.142*	-0.480***	-0.052
	(0.067)	(0.256)	(0.081)	(0.067)	(0.191)	(0.071)	(0.075)	(0.167)	(0.079)
Education of h/head									
Primary education	23.072***	58.523***	28.499***	26.945***	73.988***	33.504***	26.697***	63.257***	32.803***
	(1.795)	(9.696)	(2.454)	(2.053)	(8.189)	(2.430)	(2.290)	(5.998)	(2.397)
Secondary education	87.815***	138.283***	108.307***	115.813***	144.864***	117.695***	87.928***	114.066***	93.007***
	(7.535)	(11.413)	(6.121)	(7.823)	(9.159)	(5.567)	(6.006)	(7.142)	(4.409)
Postsecondary education	155.718***	199.894***	177.059***	225.903***	195.450***	184.529***	181.554***	170.908***	158.910***
	(10.315)	(12.700)	(7.904)	(27.046)	(16.442)	(14.876)	(17.214)	(8.755)	(6.879)
Household composition									
Number of children	-1.856***	-3.757**	-2.953***	-1.934***	-5.946***	-3.111***	-4.091***	-11.217***	-6.102***
	(0.503)	(1.729)	(0.559)	(0.405)	(1.418)	(0.447)	(0.371)	(1.208)	(0.459)
Number of non-elderly adults	4.110***	12.909***	7.383***	6.003***	13.714***	8.011***	4.280***	12.415***	6.907***
	(0.811)	(2.622)	(1.050)	(0.606)	(1.634)	(0.744)	(0.639)	(1.041)	(0.564)
Number of elderly adults	2.920*	-5.631	1.534	8.212***	-6.521	6.328***	2.256	-1.245	2.802*
	(1.724)	(9.591)	(2.296)	(2.054)	(6.818)	(2.071)	(1.687)	(4.465)	(1.690)
Observations	7,576	2,159	9,735	7,414	2,209	9,623	8,929	3,634	12,563
R-squared	0.222	0.461	0.642	0.304	0.383	0.635	0.327	0.407	0.662

Note: Robust standard errors are in parentheses. * p<0.10, ** p<0.05, *** p<0.01

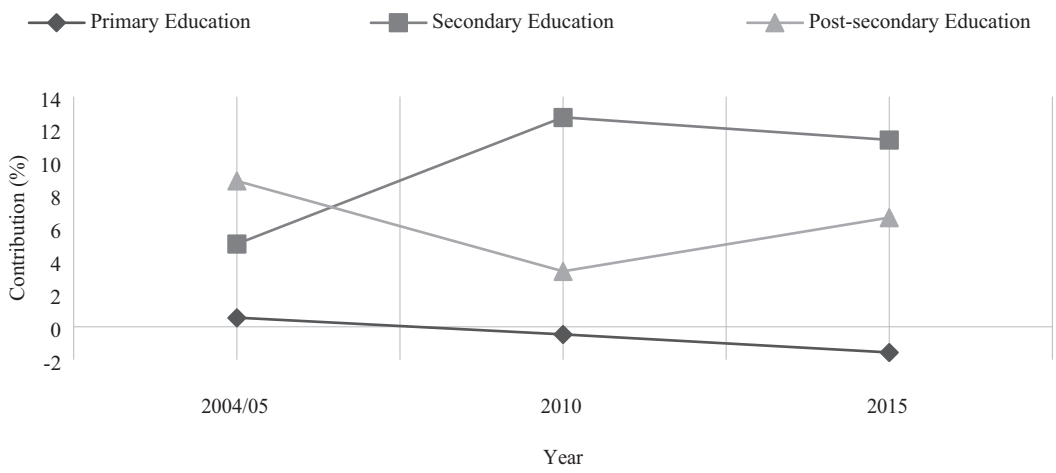
TABLE 4. OAXACA DECOMPOSITION–PERCENTAGE CONTRIBUTION

	Difference in means			Difference in coefficients		
Variables	2004/05	2010	2015	2004/05	2010	2015
Demographic characteristics						
Marital status [1=Married]	--	-0.204**	-0.084	--	4.756*	8.366***
Sex [1=Male]	0.019	0.001	0.077	-1.163	-2.718	-7.936***
Age of household head	-0.001	-0.070	0.127	-11.557	-5.224	-18.116***
Education of h/head						
Primary education	0.555**	-0.459*	-1.560***	16.668***	13.711***	13.999***
Secondary education	5.036***	12.738***	11.365***	4.251***	4.289***	4.826***
Postsecondary education	8.870***	3.373***	6.641***	2.527***	0.045	0.455
Household composition						
Number of children	1.194***	1.239***	3.285***	-6.282***	-4.492**	-8.126***
Number of non-elderly adults	1.191***	1.119***	0.554***	18.638***	13.118***	13.625***
Number of elderly adults	-0.210*	-0.649***	-0.378***	0.140	-0.536	-0.499
Constant				91.970***	69.333***	94.610***
Total	20.010***	20.644***	22.829***	79.990***	79.356***	77.171***
Observations	9,735	9,623	12,563	9,735	9,623	12,563

Note: * p<0.10, ** p<0.05, *** p<0.01

14.46, 15.65, and 16.45, accounting for more than two-thirds of the total observed differences due to difference in the means of the covariates over the years. Looking at the contribution of different education levels separately, rural–urban differences in primary education contribute the

FIGURE 2. CONTRIBUTION OF EDUCATION DIFFERENCES



least and its contribution has declined over time (Figure 2). Moreover, from 2010, differences in secondary education have contributed the most, but in the recent past, the contribution of differences in postsecondary education has been rising.

Regarding the gap caused by differences in coefficients of covariates, again, education plays a significant role in widening the rural–urban gap. Differences in the returns of primary education contribute the most to the overall difference, whereas differences in coefficients of postsecondary education contribute the least, especially in the recent past (Figure 3).

Our findings complement previous studies (e.g., Wiggins and Proctor, 2001; Eloundou-Enyegue and Giroux, 2012), showing that urban households tend to have higher educational attainment and private returns to education are higher in urban localities, especially in the formal sector. Education differences may also contribute to inequality through "nonmarket" effects of schooling, such as improvements in health, nutrition, upbringing of children, and their development of individual capabilities (Haveman and Wolfe, 1984).

Overall, rural–urban differences in education of household heads explain much of the difference compared to other covariates, with the contribution of education slightly increasing (Figure 4). Table 1 shows that education levels of household heads in urban areas are significantly higher than those in rural areas.[12] These results imply that if education levels had been similar, then the gaps would have decreased significantly. Differences in demographic characteristics explain little of the overall difference.

Moreover, differences in household composition play a small role in explaining the rural–urban gap. In rural areas, families are larger with a higher number of children, whereas in urban areas, families are smaller with a higher number of non-elderly adults. As a result of the

[12] Young's (2013) study on the urban–rural gap and migration in developing countries looked at where workers are currently located and where they were raised. Rural-to-urban migrants have substantially higher education levels than those who were raised in rural areas and stayed there. In contrast, urban-to-rural migrants have much lower education levels than those born in urban areas who remained there. Although this finding suggests the presence of sorting on education in the developing world, Mueller et al. (2019) found that contrary to the story of skilled individuals sorting to urban areas, Tanzania's rural-to-urban migrants tended to be mostly single, young, and unskilled.

FIGURE 3. CONTRIBUTION OF DIFFERENCES IN EDUCATION COEFFCIENTS

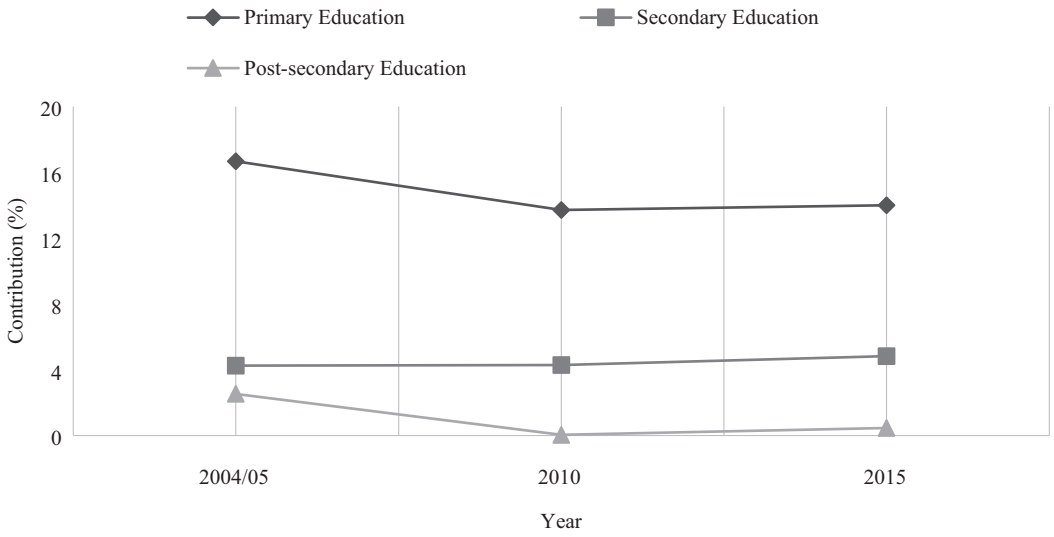
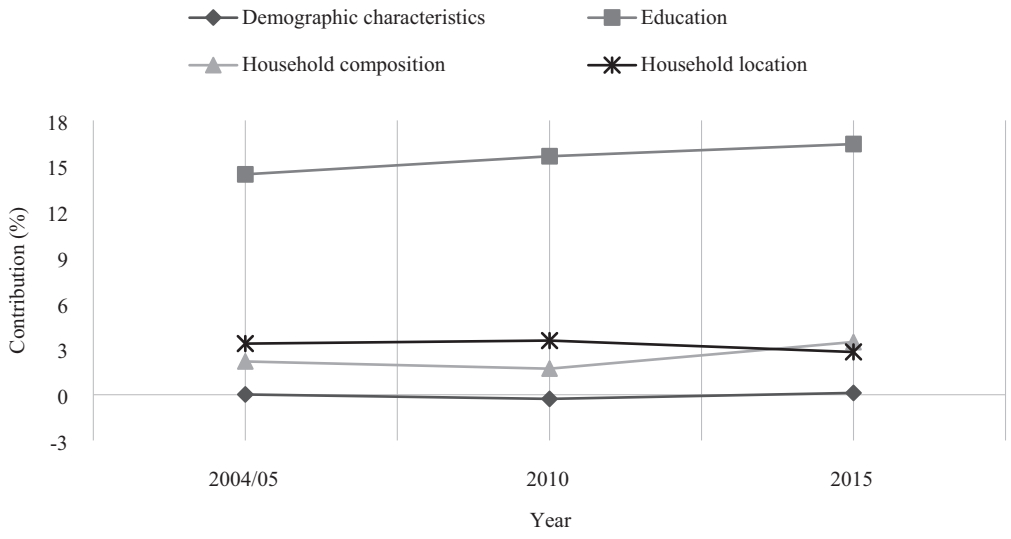


FIGURE 4. CONTRIBUTION OF DIFFERENCES IN MEANS



costs associated with having an additional child and the contribution of working-age household members to household wealth creation, these factors contribute to the widening rural–urban gaps.

IV. *Conclusion*

This study shows a significant rural–urban wealth gap in Tanzania, which has remained largely unchanged over the study period. We show that educational attainment is higher and has a stronger influence on household wealth in urban areas. As a result, education differences explain a large portion of the rural–urban gap in wealth that has persisted.

With high levels of economic growth and prevailing poverty, especially in rural areas, the growth-poverty alleviation mismatch is apparent in Tanzania and has been attributed to inequality (Atkinson and Lugo, 2010). Given the existing associations between the rural–urban wealth gap, inequality, and welfare improvements (Young, 2013), our findings have important implications for development policy and future research.

The first explanation—that education levels are higher in urban areas—suggests policy interventions to promote public and private investments in education, especially secondary and postsecondary education, in rural areas. While building more schools is important, improving the quality of education by enhancing the learning environment and infrastructure in rural areas is also necessary to narrow the rural–urban gap in education and, consequently, the wealth gap.

Moreover, the second explanation—that education offers higher rewards to household wealth in urban areas—provides further guidance to policymakers. First, efforts could be directed at increasing the productivity of the existing rural workforce, especially in the agriculture sector. These could include establishing targeted training programs developed for farmers through local community groups, continuing education centers, or other channels to equip them with new farming skills and technologies. Potentially, returns to schooling in agriculture could be significant, even though it is more brawn-based than other sectors as learning spillovers and farmers' own schooling not only increase adoption but also improve the productivity of new farming technologies (Foster and Rosenzweig, 1995). Second, in expanding the possibilities for non-farming occupations in rural areas, more efforts could be directed at investing in vocational training for diverse technical fields relevant to rural development.

This study provides evidence of differences in formal education attainment across urban and rural localities and their different magnitudes of effect on wealth. However, we recognize the importance of specific skills that reflect accumulated experience, creativity, and entrepreneurial capabilities in determining household wealth levels. Identifying and evaluating the relative importance of these factors in the distribution of wealth across rural and urban localities remain important topics for future research.

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