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DEPARTMENT OF ECONOMICS

Working Paper No. 2009/05

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Department of Economics
University of Malawi
Chancellor College
PO Box 280
Zomba
Malawi

Tel: +265 (0) 1 524 222 / 1 525 021 (D)
Tel: +265 (0) 1 524 256
Fax: +265 (0) 1 525 021
Email: economics@chanco.unima.mw
Web: http://www.economics.chanco.mw

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Rural - Urban Welfare Inequalities in Malawi: Evidence from a Decomposition Analysis [*]

Mirriam M. Matita [†] and Ephraim W. Chirwa [#]
University of Malawi - Chancellor College

Abstract: This study investigates the extent of the rural-urban welfare inequalities in Malawi using a national representative sample and examines factors that contribute to such inequalities. The study uses both the Oaxaca-Blinder (1973) and Machado-Mata (2005) techniques to decompose the welfare gap. The results of the decomposition show that 59% of the welfare gap can be explained by differences in characteristics, particularly physical assets and education. The remaining 41% of the welfare gap is explained by discrimination. The Machado-Mata procedure shows that both the covariate and returns effects are larger at the top of the distribution. However, the covariate effects dominate the whole distribution of consumption, implying that urban households are better off than rural residents due to differences in characteristics.

1. Introduction

The relationship between urban and rural sectors in many developing countries is characterized by an economic dualism - the coexistence of a modern urban sector and a traditional rural sector. This dualism has facilitated the isolated treatment of issues affecting each space. The key premise is that the lack of economically optimal rural-urban linkages is bad for economy-wide growth because it divides societies, leads to inefficiencies, and is a root cause of inequality, which is in itself growth inhibiting (World Bank, 2005). In Malawi, like any other developing country, there are substantial rural-urban differences in the incidence of poverty. About 52.4% of the Malawi population in 2005 was rated to be living below the

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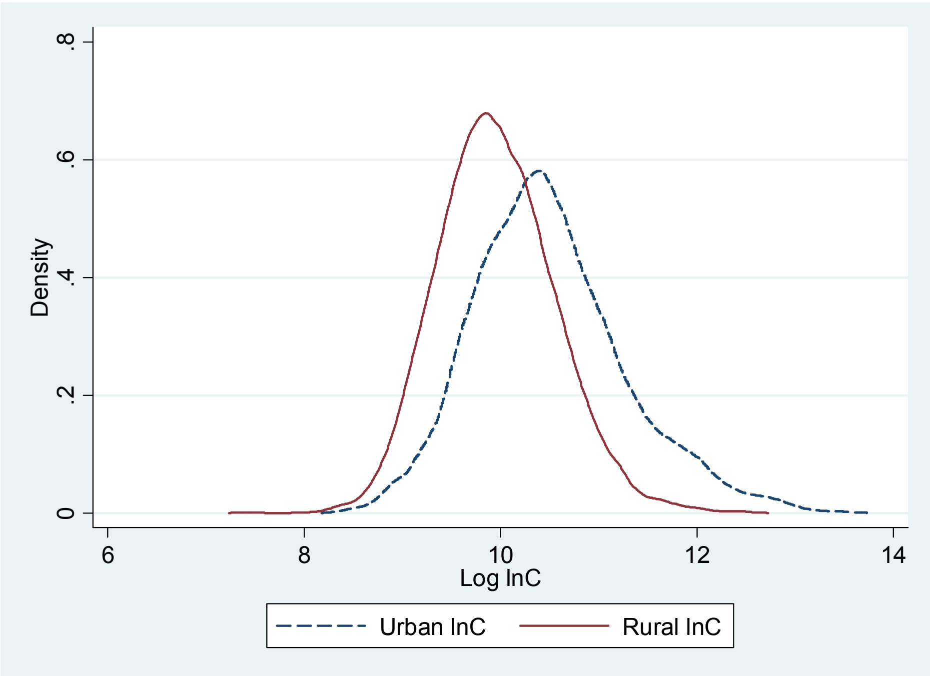
[†] Advisor; Financial Governance, GTZ/MGPDD, HB House, Off Paul Kagame Road, P/Bag 387, Lilongwe. Email: muhomemirriam@yahoo.co.uk.
[#] Professor of Economics, Department of Economics, University of Malawi, Chancellor College, PO Box 280, Zomba. Email: echirwa@yahoo.com.

poverty line (NSO, 2005). The study also finds that 55.9% and 25.4% of rural and urban population were in poverty, respectively. About one in every five people lives in dire poverty such that they cannot even afford to meet the minimum standard for daily-recommended food requirement.

The rural-urban inequality is further illustrated in Figure 1 of the kernel density estimates of urban and rural household welfare. The urban density is clearly to the right of the rural density, implying that for the same level of consumption, there are more people in urban than rural areas. It is also apparent that the difference between rural and urban densities is greater in the right tail of the density. The urban rich are better off than their rural counterparts to a greater extent than the urban poor are better off than the rural poor.

Figure 1 Kernel Densities of Natural Logarithm of Real Consumption Expenditure per Adult Equivalent (lnC)



A large and expanding literature exists which tries to shed light on the nature and extent of poverty.[1] In Malawi, these studies include Bokosi (2006), Mukherjee and Benson (2003), Government of Malawi (2001). However, these studies do not attempt to investigate the causes of welfare differentials between rural and urban areas in

[1] For an extensive survey of this literature see Lipton and Ravallion (1995).

Malawi. The purpose of this study, therefore, is to address existing gaps in the poverty literature by systematically investigating the causes of welfare differential between rural and urban areas in Malawi.

The remainder of this paper is organized as follows. Section 2 reviews existing literature paying particular attention to measurement and decomposition of welfare issues. Section 3 outlines the methodology employed to study welfare inequalities in Malawi. This is followed by a detailed presentation and discussion of results from estimated welfare model and inequality decompositions. The final section draws conclusions and implications from the study results.

2. Review of literature

Literature suggests two alternative approaches to measuring welfare. The first approach of measuring welfare is the money metric utility approach which measures levels of living by the money required to sustain them (Samuelson, 1974). The second approach is the concept of welfare ratios, in which welfare is measured as multiples of a poverty line (Blackorby and Donaldson, 1987).

With the money metric utility, a household is assumed to have a consumption problem in which it chooses the consumption of individual goods to maximize utility within a given budget and at given prices (Deaton and Zaidi, 2002). Browning and Chiapori (1998) show that if behaviour of the household is efficient it will maximize the weighted sum of each member's utility, subject to the budget constraint. Each utility function may depend on consumption (*x)* and leisure (*l)* of all household members. It is also conditioned by observables that affect tastes (such as age, gender and education) denoted φ and unobservable taste heterogeneity of all members (μ). Therefore, the household seeks to:

$$\begin{aligned} &\text{Maximize} \quad \textstyle\sum_m U_m(l, x, \varphi, \mu) \\ &\text{subject to} \quad px = \textstyle\sum_m \left[W_m (T_m - l_m) + Y_m\right] \qquad (1) \end{aligned}$$

where p is a vector of prices, W are wages, T is total time, U are individual welfare weights, subscript *m* indicates money metric utility and *Y* is non-labour income. This model is often modified or extended to yield welfare functions. However, money-metric measures such as the above only adequately reflect individual material well-being if the household has access to a market at which it can purchase all goods at given prices (Carter and May, 1999;

Ravallion, 1996). Goods such as available safe water and sanitation services, which have large indivisibility and public good components make it impossible for a single household to marginally purchase more of such goods. More generally, others[2] would argue that access to safe water, adequate shelter are better indicators of welfare and human possibility than are incomes or expenditure-based measures.

On the other hand, welfare ratios basic idea is to express the standard of living relative to a baseline indifference curve. In poverty analysis, a natural choice is the poverty indifference curve, the level of living that marks the boundary between being poor and non-poor. The welfare ratio is then, the ratio of the household's expenditure to the expenditure required to reach the poverty indifference curve, both expressed at the prices faced by the household. Unlike money metric utility, the welfare ratio is a pure number – the standard of living as a multiple of the poverty line. The welfare ratio is advantageous for purposes of distributional analysis. In particular, much policy is conducted on the basis that transfers of money are more valuable the lower in the distribution is the recipient. This may take the form of a focus on poverty where the poor are given preference over the non-poor, which can cause difficulties in the context of money metric utility (Blackorby and Donaldson, 1988). Nonetheless, welfare ratios do not necessarily indicate welfare correctly. For instance, it is possible for a policy to make someone better off and yet decrease their welfare ratio which is not the case with money metric utility measure of welfare.

Inequality decomposition is a standard technique for examining the contribution to inequality of particular characteristics. Inequality could be conceptualized as a dispersion of a distribution, whether one is focusing on income, consumption or some other welfare indicator or attribute of the population. Inequality is a broader concept than poverty in that it is defined over the whole distribution, not only the censored distribution of individuals below a certain poverty line (World Bank, 1999).

Several measures have been proposed in literature for characterizing inequality in the distribution of income or expenditure (Kakwani, 1980; Glewwe, 1986; Fields, 1980; Thiel, 1979; Sen, 1973; Shorrocks, 1984, and Litchfield, 1999). Of interest is one proposed by Fields (1997), which allows one to assess the importance of household specific attributes in explaining the level of inequality, where the amount explained by each factor is independent of the inequality measure used. The method involves running a standard set of regressions. An alternative approach is the quantile regression methodology, where instead of estimating the

[2] See Todaro and Smith (2006), Younger (2003) and Sen (1999).

mean of a dependent variable conditional on the values of the independent variables, one estimates the median: minimizing the sum of the absolute residuals rather than the sum of squares of the residuals as in ordinary regressions. It is possible to estimate different percentiles of the dependent variables, and so to obtain estimates for different parts of the income or expenditure distribution (Deaton, 1997).

Various attempts have been made to investigate the factors affecting a household's welfare or poverty incidence. Most empirical studies, however, have focused on determinants of poverty (Geda *et al.,* 2001; Mukherjee and Benson, 2003). Decomposition approaches has been extensively used to analyze wage differentials. Other decompositions have been across caste poverty incidence (Gang *et al.,* 2002), or across gender differentials (Albrecht *et al.,* 2006). Some of the studies that have used the decomposition approach in the analysis of welfare and poverty incidence include Nguyen *et al.* (2006) and Bhaumik *et al.* (2006).

Using the Vietnam Living Standards Surveys from 1993 and 1998 Nguyen *et al.* (2006) examined inequality in welfare between urban and rural areas. Real per capita household consumption expenditure was used as a measure of welfare despite observations that usage of per capita values may give a distorted picture of intra-household allocation of resources (Skoufias *et al.,* 1999). This is because the consumption requirements of people differ by age, sex and other demographic characteristics. The urban-rural gap was found to be primarily due to differences in covariates such as education, ethnicity, and age. Further results from quantile regression decomposition indicated that household characteristics explained the welfare gap at lowest quantiles.

In a similar study, Bhaumik *et al.* (2006) decomposed differences in poverty incidence (headcount ratio) using estimates from a regression equation. The decomposition is done following the Oaxaca methodology which overcomes the dependency path problem. This is a problem that arises when sequentially replacing the value associated with one of the groups with the corresponding values of other (or comparison) groups in order to compute the contribution of an individual variable or its coefficient towards the overall difference in the gap. Nevertheless, the Oaxaca method is not without fault. The method tends to concentrate on the mean level of consumption and not the entire distribution which might be more informative.

In a related study, Gang *et al.* (2002) with results from decompositions concluded that allocating more resources towards scheduled group children and shifting the educational focus from higher education to primary and secondary schools will decrease the discrepancy in poverty incidence between the scheduled groups and non-scheduled households in India. The decomposition analysis revealed that differences in characteristics explain the poverty rate gap more than differences in coefficients.

In this study, we decompose differences in welfare into characteristics effects and coefficients or discrimination effects using the decomposition techniques proposed by Oaxaca (1973), Blinder (1973) and Machado-Mata (2005).

3. Model specification and data

3.1 The welfare model

Our welfare model is adapted from Mukherjee and Benson (1998) and specified as follows:

$$\ln C_j = \beta_0 + \sum_{i=1}^{n} \beta_j X_{ij} + \varepsilon_i \quad (2)$$

where C_j is annual consumption of household j in Malawi Kwacha (MK); X_j is a set of exogenous household characteristics or other determinants, and ε is a random error term. The best method of measuring welfare remains the subject of debate among researchers (see Ravallion, 1996). We use consumption per adult equivalent which allows comparisons between households of different sizes and composition as the welfare measure (Skoufias *et al.*, 1999). Adult equivalent scales (AES) are used to convert household real expenditure into money metric utility measure of individual welfare as follows:

$$AES = (A + \sum a_{ij} K_{ij}) \quad (3)$$

where A is the number of adults in the household, i is the age group and j is sex of the household member. K_{ij} is the non-adult person in age group i for sex j, a_{ij} is the equivalence for age group i for sex j. Household size is then measured not in number of persons, but in number of adult equivalents (Grebremedhin and Whelan, 2005; Deaton, 1997). Consumption per adult equivalent is then found by dividing the total household consumption expenditure by number of adult equivalents. We use Ordinary Least Squares to estimate the semi-log functional form welfare equation.

Our explanatory variables include demographic characteristics, education, farm and non-farm activities, and seasonality. The demographic variables include age in years of household head, sex of household head, marital status of household head and household size. The education variables are specified as categorical variables of maximum education level attained by any adult aged 20 to 59 years in the household. Education categories include: primary education, secondary education, and tertiary education dummies with no education dummy variable as the reference category. Non-farm activities in the model include whether household head is engaged in formal wage employment and household access to credit for business or farming purposes are included as dummy variables. Farm activities include land cultivated and value of livestock owned per adult equivalent which are perceived important assets in Malawi.[3] We also include the number of crops the household cultivated that are not maize or tobacco as a measure of the diversity in crop cultivation. Since tobacco is the main cash and export crop, a tobacco dummy is included to capture the importance of its cultivation on welfare. In an agricultural based economy, seasonality is an important variable that can affect welfare. We therefore account for possible disparities in consumption between lean and marketing periods by including seasonal dummies.

3.2 The decomposition of welfare differentials

There are several methods of decomposing welfare. This study decomposes welfare gap at the mean using the Oaxaca - Blinder (1973) and Machado-Mata (2005) methodology which decomposes the gap across the entire distribution of consumption.

Following Blinder (1973) we estimate regressions of the form (2) above using Ordinary Least Squares Method for rural - group that suffers discrimination and urban - advantaged group of households.

$$\ln C_j^R = \beta_0^R + \sum_{i=1}^{n} \beta_j^R x_{ij}^R + \varepsilon_i^R \qquad (4)$$

$$\ln C_j^U = \beta_o^U + \sum_{i=1}^{n} \beta_j^U X_{ij}^U + \varepsilon_i^U \qquad (5)$$

where the superscript R indicates the rural area and superscript U indicates the urban areas. Given equations (4) and (5), the portion of the differential explained by the regression is computed as

[3] In computing the log value of livestock, the following animals are considered: cattle, goats, sheep, pigs and chickens. The missing log values of livestock and other physical assets were recoded following the approach in Chirwa (2007) and Sherlund *et al.* (2002) where the natural logarithm of zero is equated to one-tenth of the smallest non-zero value in the sample.

$\sum_j \beta_j^U \bar{x}_j^U - \sum_j \beta_j^R \bar{x}_j^R$, and the amount which is captured by the shift coefficient as $\beta_0^U - \beta_0^R$. The latter is typically attributed to discrimination or bias.

The explained part of the differential comes from both differences in the coefficients, β_j^R and β_j^U , and differences in the average characteristics, $\bar{x}^R$ and $\bar{x}^U$. Specifically,

$$\ln C_j^U - \ln C_j^R = \beta_0^U - \beta_0^R + \sum_j \beta_j^U \bar{x}_j^U - \sum_j \beta_j^R \bar{x}_j^R \quad (6)$$

The explained component can be written as:

$$\sum_j \beta_j^U \bar{x}_j^U - \sum_j \beta_j^R \bar{x}_j^R = \sum_j \beta_j^U (\bar{x}_j^U - \bar{x}_j^R) + \sum_j \bar{x}_j^R (\beta_j^U - \beta_j^R) \quad (7)$$

where the first sum on the right hand side of the equation is the value of the advantage in endowments possessed by the rural as evaluated by rural households equation. The second sum is the difference between how the rural equation would value the characteristics of the urban group and how the urban equation actually values them. In other words, the first sum is "attributable to the endowments" while the second is "attributable to the coefficients".

An alternative formulation of the above is the Oaxaca (1973) methodology, formulated as:

$$C^U - C^R = (x^U - x^R)\beta^U + x^R(\beta^U - \beta^R) \quad (8)$$

where x is a vector of average values of welfare-determining characteristics, β is the vector of coefficients and, U and R superscripts denote urban and rural areas, respectively.

The first term on the right hand side of the equation (8) measures that part of the gap explained by welfare differences in average characteristics. The second term is the residual component which accounts for differences in unobservable characteristics and welfare discrimination. The first term is often interpreted as the size of the welfare gap if there were no discrimination. Under this interpretation, (8) uses urban welfare coefficient estimates as the proxy for welfare structure in the absence of discrimination (Christie and Shannon, 2001). Generally, in literature the coefficients of the dominant group relative to the comparison group are used in the counterfactual hence the use of urban coefficients in this study. The two methods described above have been dubbed the Oaxaca-Blinder method of decomposition in literature.

The disadvantage with the Oaxaca-Blinder decomposition is that it only concentrates on the mean level of consumption when it is also important to focus on the entire consumption profile. To enrich our understanding of welfare inequality in Malawi, in addition to the Oaxaca-Blinder decomposition, we use the Machado-Mata (2005) methodology of decomposition. This method requires estimation of quantile regressions and is advantageous because it allows for covariates to have marginal effects (returns) that vary with household's position in the welfare distribution. The mean regression methods described above cannot reveal such variations (Nguyeni *et al.,* 2006).

We estimate equation (2) above for rural and urban households, then constructing a counterfactual distribution of rural *ln* C using urban distribution covariates. This counterfactual distribution estimates the distribution of rural *ln* C that would have prevailed if the rural households were endowed with the urban distribution of household characteristics but received the returns that pertain to the rural area. The contribution of the differences in distribution of covariates to the rural-urban gap is estimated by comparing the counterfactual and empirical rural distribution. The remaining gap is attributed to the combined differences in the returns to the covariates.

The study examines how the relationship between *ln* C and household characteristics differ between rural and urban areas at various quantiles of the *ln* C distribution. Following the work of Nguyen *et al* (2006), this is done by estimating the regression of the form:

$$Q_\theta \left\langle \ln C \middle| X, U \right\rangle = \beta_\theta^0 + X\beta_\theta + U\varphi_\theta^0 + UX\delta_\theta \qquad (9)$$

where ln C is log total annual consumption expenditure per adult equivalent for a household, $Q_\theta \left\langle \ln C \middle| X, U \right\rangle$ is the θ^{th} conditional quantile of ln C, β_θ^0 is the regression intercept, U is the urban dummy (taking a value of 1 for urban and 0 otherwise), X is the covariate matrix (including all regressors except U), U*X is a matrix of interactions between the urban dummy and all covariates. The β_θ represents the returns to covariates at the θ^{th} quantile. The coefficients φ_θ^0, δ_θ give the θ^{th} quantile intercept and slope differential associated with the urban location.

The counterfactual distribution can be denoted as $F\left\langle \ln C^{*} \middle| Z^{U}, \beta^{R} \right\rangle$, where Z is distribution of covariates and β is the collection of vector of quantile regression coefficients (returns) at the various quantiles.[4] $F\left\langle \ln C^{*} \middle| Z^{U}, \beta^{R} \right\rangle$ is constructed using the Machado-Mata[5] algorithms. The decomposition compares the counterfactual distribution with the empirical urban and rural *ln* C distributions, defined as $\ln C^{*}(\theta), \ln C^{U}(\theta)$ and $\ln C^{R}(\theta)$ respectively. The difference between the θ^{th} quantile of the urban and rural distributions is given as:

$$\ln C^{U}(\theta) - \ln C^{R}(\theta) = \left[\ln C^{U} - \ln C^{*}(\theta)\right] + \left[\ln C^{*}(\theta) - \ln C^{R}(\theta)\right] \qquad (10)$$

The first term on the right-hand side of the equation (10) above is the returns effect which measures the contribution of the difference in returns to the rural-urban gap at the θ^{th} quantile. The second term is the covariates effect which measures the contribution of the covariates values to the rural-urban gap at the θ^{th} quantile.

3.3 Data sources

We use data from the second Integrated Household Survey done in 2004-2005 by the National Statistical Office (NSO). The survey collected information from a representative sample of 11,280 households (9,840 rural households and 1,440 urban households). The sampling design is representative at both national and district level hence the survey provides reliable estimates for those areas. The usable sample size is 8,941 and 1,402 households in rural and urban areas, respectively. The data is analyzed using STATA Version 10.0.

4. Results and discussion

4.1 Descriptive statistics

Table 1 presents the descriptive statistics for the variables that are hypothesized to determine household welfare. The statistics show a slight but significant difference in the mean log consumption per adult equivalent between urban and rural households at MK10.473

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[4] The superscripts R and U denote rural and urban where as the asterisk implies generated values.
[5] See Albrecht et al (2006) for the econometrics underlying the Machado-Mata quantile regression decomposition technique.

and MK9.899, respectively. Striking differences exist with regard to maximum education level in the households. The highest level of education attained by urban household adults is junior secondary education with a rate of 21%, against 13% attaining primary education in rural areas. These household heads have 37 (urban) and 41 (rural) years of age on average. The majority of urban households (53%) work for a wage as opposed to 22% in rural areas.

Table 1 Descriptive Statistics of Model Variables

Variable	Urban		Rural	
	Mean	Std. Dev	Mean	Std. Dev
Log of consumption (ln C)*	10.473	0.807	9.899	0.686
Age of household head (age_hd)*	37	12.051	41	14.396
Age of household head squared (age_hdsq)*	1485	1071	1859	1345
Dummy if female household head (sexhd)*	0.147	0.354	0.209	0.406
Dummy if married household head (maristat)*	0.749	0.434	0.773	0.419
Household size (hhsize)*	4.425	2.310	4.777	2.303
Dummy if maximum education is primary (maxeduc2)*	0.161	0.368	0.126	0.332
Dummy if maximum education is junior secondary (maxeduc3)*	0.215	0.411	0.106	0.308
Dummy if maximum education is senior secondary (maxeduc4)*	0.195	0.397	0.039	0.193
Dummy if maximum education is non-university diploma (maxeduc5)*	0.031	0.172	0.0038	0.0615
Dummy if maximum education is university graduate (maxeduc6)*	0.049	0.216	0.0026	0.051
Dummy if household head works for a wage (wagejob)*	0.531	0.499	0.222	0.415
Acreage of land cultivated per adult equivalent (aeland)	0.120	0.297	1.609	33.943
Log of value of physical assets per adult equivalent (lnaelvsval)*	-0.912	3.117	3.355	4.429
Log of value of livestock per adult equivalent (lnaevassets)*	6.699	3.101	4.982	3.264
Dummy if households cultivates tobacco (tob_dum)*	0.0399	0.196	0.212	0.409
Number of crops cultivated except maize and tobacco (divcrops)*	6.779	7.909	14.986	3.896
Dummy if household had access to credit (credit)*	0.080	0.271	0.130	0.336
Dummy if marketing season (mktseason)	0.501	0.500	0.502	0.500

Notes: For all categorical variables, mean is the proportion of those respondents with dummy variable 1. All variables were tested for statistical significance between rural and urban samples. The asterisk * and ** imply significant difference at 1% and 20% respectively.

In terms of household size, rural residents have registered a maximum of 27 as opposed to 15 members in urban households. Although the difference is not statistically significant, rural households own a greater percentage of land per adult equivalent relative to urban households. Furthermore, about 21% of rural households cultivate tobacco whereas this activity is only undertaken by 4% of the urban sample population. With regard to access to credit, the proportion difference between rural and urban areas is statistically significant at 1% level of significance. Although the financial system is more developed in urban areas than in rural areas, on average access to credit is better in rural areas. About 13% of rural sample population accessed credit as opposed to 8% in urban areas.

4.2 Econometric analysis of the welfare model

Table 2 presents regression results for urban and rural welfare models. These results were obtained having examined the models robustness and reliability. Approximately, the urban model explains 55% of the variability in welfare. On the other hand, the rural model explains only 41% of the variation in welfare among rural households. However, on overall both models are statistically significant at 1% level of significance based on the F-Statistic and we reject the hypothesis that all parameters except the constant are equal to zero. With a few exceptions, the signs on the parameters are as expected.

We find a statistically significant effect of age on welfare in the rural areas at 1% level. Households headed by older individuals in rural areas, *ceteris paribus*, tend to enjoy lower welfare than those headed by younger individuals. In contrast, in the urban centre the level of household welfare does not seem to be determined by the age of the head. Similar results were found by Mukherjee and Benson (2003) in their study on determinants of poverty in Malawi.

The model also considered age squared of the household head which was found to be significant and positive in rural areas, with the bottom of the U-shape at approximately 38 and 71 years in urban and rural areas, respectively. This implies that, *ceteris paribus* at household head age of less than 38 or 71, the addition of another year by the household head reduces per adult equivalent consumption, but at a decreasing rate.

Table 2 OLS Estimation Results of Welfare Models

Variable	Urban			Rural		
	coeff.	*t-ratio*	*elasticity*	*coeff.*	*t-ratio*	*elasticity*
intercept	10.2250	67.85	-	10.6012	188.60	-
age_hd	-0.0030	-0.43	-	-0.0100	-4.29[a]	-0.0010
agehdsq	0.00004	0.58	-	0.00007	2.89[a]	$7.20e^{-06}$
sexhd	-0.0996	-1.64	-	-0.1017	-4.15[a]	-0.0103
maristat	-0.1806	-3.52[a]	-0.0172	-0.1804	-7.34[a]	-0.0182
hhsize	-0.1285	-15.36[a]	-0.0123	-0.1363	-40.59[a]	-0.0138
maxeduc2	-0.0144	-0.35	-	0.0759	4.40[a]	0.0077
maxeduc3	0.1811	4.36[a]	0.0173	0.0923	4.76[a]	0.0093
maxeduc4	0.3722	8.23[a]	0.0355	0.2546	8.00[a]	0.0257
maxeduc5	0.6452	6.85[a]	0.0616	0.6111	5.23[a]	0.0617
maxeduc6	1.1079	12.72[a]	0.1058	0.6734	3.90[a]	0.0680
wagejob	0.0312	0.98	-	0.0337	2.36[b]	0.0034
aeland	0.1765	2.51[b]	0.0169	0.00029	1.61	-
lnaevasset	0.1093	15.73[a]	0.1093	0.0691	35.22[a]	0.0691
lnaelvstval	-0.0109	-2.10[b]	-0.0109	0.0024	1.77[c]	0.0024
tob_dum	-0.1382	-1.66[c]	-0.0132	0.1328	9.29[a]	0.0134
divcrops	-0.0018	-0.78	-	-0.0094	-6.07[a]	-0.0095
credit	0.0554	0.95	-	0.0897	5.24[a]	0.0091
mktseason	0.1204	4.05[a]	0.0115	0.1762	15.69[a]	0.0178
R^2 = 0.5461 F-statistic (18, 1383) = 88.77 Prob. > F = 0.000 N = 1402				R^2 = 0.4109 F-statistic (18, 8922) = 88.05 Prob. > F = 0.000 N = 8941		

Notes: The t-statistics are based on robust standard errors. Superscripts *a*, *b* and *c* indicate significance at 1%, 5% and 10% levels, respectively.

There is also a gender dimension to welfare. The sex of the household head is statistically significant at 1% in the rural welfare model but insignificant in urban areas. Incidentally, the negative sign for gender of household head reflects that being female, the welfare level is lower than being male-headed household. This is not surprising given the multiple responsibilities and greater constraints that women face in Sub-Saharan Africa in trying to access resources and services than men (Cleaver, 1993). Datt *et al.* (2000) find similar results in the analysis of determinants of poverty in Mozambique. The estimation results also show that the married household heads have lower welfare level, than those otherwise.

In terms of the number of people in the household, we find negative and statistically significant coefficients at 1% level in both rural and urban areas. This is a common finding in the welfare studies (see for instance Lipton and Ravallion 1995; Lanjouw and Ravallion, 1995) implying that welfare enjoyed is reduced by having larger households. The level of household welfare declines by approximately 12.9% and 13.6% in urban and rural areas, respectively from a unit change in the household size. This reflects high dependency levels for households with relatively more children members or the fact that household members are not working or they are being remunerated poorly, which in totality leads to a reduction in per adult equivalent consumption.

The maximum education level attained by any adult household member significantly contributes to welfare in both rural and urban areas except for basic primary education in urban areas. This implies that basic education would not suffice to increase household's welfare in urban areas of Malawi. Similar findings were obtained in Eritrea by Arneberg and Pederson (2001) pointing to the need for complementary factors to be provided alongside with education so as to alleviate poverty. The estimated coefficients of education levels which are significant at 1% are consistently positive, confirming the expectation that education attainment enhances welfare. The increase in urban welfare is higher than in rural areas, possibly corroborating the fact that the remunerative economic opportunities from education in rural areas of Malawi are very few (National Economic Council, 2000).

With respect to wage employment, we find that in rural areas, working for a wage significantly contributes to welfare. The coefficient is statistically significant at 5% level. The median welfare of a rural household whose head is wage-employed is 3.4% higher than that of a household head in other forms of employment. Although the coefficient of wage employment is positive in urban areas, it is not statistically significant. Hence, self employed and wage employed households enjoy same level of welfare in urban areas.

Acreage of land cultivated is found to be statistically significant at 5% level in urban areas. Increasing per adult equivalent cultivatable land in urban areas would change a household's welfare by 18%. The striking part of the results is the non-significance of land in rural areas contrary to Mukherjee and Benson (2003). Nonetheless, Geda *et al*. (2001) observed that land is important in poverty reduction in as far as its quality is improved and the necessary complementary inputs such as fertilizer that may enhance productivity are made available to the households.

In terms of value of livestock owned, the coefficients are statistically significant at 5% and 10% level in urban and rural cases, respectively. Unlike in urban areas, the value of livestock owned positively affects welfare in rural areas. The positive impact of livestock value on welfare in rural areas is consistent with results obtained by Mukherjee and Benson (2003). In Malawi the majority of urban dwellers do not possess livestock, and if they do, it is at low scale resulting in low relative value of livestock owned.

The possession of other physical assets was also considered as potential determinant of welfare. The variable significantly affects a household's welfare in both rural and urban areas at 1% level. Welfare changes by the proportions 11% and 6.9% in urban and rural areas, respectively from a change in value of possessed other assets. The cultivation of tobacco significantly contributes to welfare and it is statistically significant at 10% and 1% in urban and rural areas, respectively. In the rural model, the coefficient is positive meaning that the average welfare levels for households cultivating tobacco is 14.2% higher than those not engaging in tobacco cultivation. On the other hand, with cultivation of tobacco in urban areas the household realizes a welfare decline equivalent to 12.9%.

The welfare declining effect of tobacco cultivation possibly reflects the increased marketing and processing costs faced by urban farmers growing the crop usually estate-based where they face the principle–agent relationship. World Bank (2003) argues that the contribution of estates to tobacco produced has declined due to reduced prices and profitability of tobacco and lack of wood for curing. In addition, the liberalization of burley tobacco has reduced the availability of labour that could be used by urban farmers. The benefits from tobacco are further reduced by the introduction of the intermediate buyers system which provides a channel for tenants to bypass the estates.

Crop diversification significantly affects welfare in rural areas with the coefficients being statistically significant at 1% level. The negative relationship could perhaps suggest that the returns from these crops are not positively significant. Landholding size is the major constraint limiting the income-earning potential of smallholders in Malawi. Alwang and Siegel (1999) observe that land scarcity is exacerbated by food security concerns in Malawi. Owing to lack of confidence in markets, smallholders plant a high percentage of their land to low-value food staples. In their study they found that diversification, although rational, results in relatively lower income levels. However, these results are contrary to what Mukherjee and Benson (2003) found using 1998 integrated household survey that crop diversification positively contributes to welfare in rural areas in Malawi.

Access to credit for farming or business purposes significantly contributes to welfare of the household in rural areas with the coefficients being significant at 1% level. The average welfare level of households that accessed credit in rural areas is 9.38% higher than that of households that did not access credit. This is consistent with findings by Geda *et al.* (2006) in Ethiopia that credit is an important component of consumption smoothing and hence it is pro-poor as it enhances the welfare of the households. However, access to credit is not significant in urban areas. We find seasonality to be an important factor in explaining welfare and the coefficients are statistically significant in both models at 1% level. The results reveal that during marketing period, the median welfare level is 13% and 19% higher than that obtained during lean periods in urban and rural areas, respectively.

4.3 Rural- urban gap decomposition results

We present the findings from decompositions of welfare gap into characteristics and coefficients effects using both the Oaxaca-Blinder method and across the entire distribution using the Machado-Mata procedure.

4.3.1 Oaxaca-Blinder decomposition

Table 3 shows results from the Oaxaca-Blinder decomposition method. The predicted mean annual consumption is MK10.47 and MK9.90 for urban and rural areas, respectively. The overall rural-urban gap is estimated at MK0.57. In a similar study, Nguyen *et al.* (2006) find an existing welfare gap between rural and urban areas of 0.520 in Vietnam. The welfare gap in Malawi is broken into the explained component 0.339, representing 59% of the total gap and the unexplained component of 0.235, which accounts for 41% of the total gap. The explained gap is attributed to differences in household characteristics, whereas the unexplained gap is due to discrimination or pure bias.

The largest contributor to the welfare gap explained by endowments is the value of physical assets in the household with a 20% share. This is followed by education characteristics and crop diversification. The education characteristics account for 17.4% of the welfare gap. Chirwa and Matita (2009) find that returns to education are much higher in urban areas compared with the rural areas, particularly returns to higher levels of education. The disaggregated results further show that the coefficients effects of various education categories are quite small, while the characteristics effects are substantial. This underlines the importance of obtaining higher level of education for household members as it is the gap in the education attainment between the rural and urban households that is one of the major causes of welfare inequality.

Table 3 Oaxaca – Blinder decompositions of the welfare gap results

Causal Factor	Amount Attributable to Characteristics		Amount Attributable to Coefficients	
	Estimate	Share (%)	Estimate	Share (%)
age_hd	0.041	7.14	0.255	44.43
agehdsq	-0.027	-4.70	-0.039	-6.79
sexhd	0.006	1.05	0	0
maristat	0.004	0.70	0	0
hhsize	0.048	8.36	0.034	5.92
maxeduc	0.100	17.42	0.050	8.71
wagejob	0.010	1.74	-0.002	-0.35
aeland	0	0	0.022	3.83
lnaevasset	0.117	20.38	0.269	46.86
lnaelvstval	-0.010	-1.74	0.012	2.09
tob_dum	-0.023	-4.01	-0.011	-1.92
Divcrops	0.077	13.41	0.052	9.06
credit_dum	-0.004	-0.70	-0.002	-0.35
mktseason	0	0	-0.028	-4.88
Intercept	0	0	-0.376	-65.51
Total	**0.339**	**59%**	**0.235**	**41%**

Notes: A + sign indicates advantage for urban; a - sign indicates advantage for rural households. Components may not add to totals due to rounding. Share is the ratio of the contribution of each factor to the 'predicted' overall difference in welfare in percentage terms.

The explained component results show that accessing credit, cultivation of tobacco, value of livestock possessed and age squared variables favour the rural households, while the gaps in the remaining variables all disfavour the rural households. The constant term also contributes to reducing the welfare gap reflecting the underlying differences between the two groups which are not captured by the other explanatory variables.

The major factors creating bias in welfare against the rural areas are ownership of physical assets followed by age of the household head, accounting for 46.9% and 44.4% of the discrimination, respectively. This is not surprising given that the mean value of physical assets owned by rural households is MK 5,673 relative to MK45, 257 in urban households. The sex of the household head and his/her marital status do not account for existing welfare differences due to bias. We find that seasonal factors explain existing discrimination in Malawi against urban areas. This result complements our OLS findings that during marketing period the median welfare level is higher in rural than urban areas.

4.3.2 Machado-Mata decomposition results

We estimate a restricted version of equation (9) that includes only the intercept and the urban dummy and present results in Table 4. This gives a clear description of the degree to which the rural-urban gap increases at higher quantiles since the estimates of φ_θ^0 are estimates of the rural-urban gap at the designated quantiles. The coefficients labelled 'base' are the estimates of *ln* C for the base category: a rural household. The coefficients labelled 'urban' are the coefficients on the urban dummy. This gives the difference in *ln* C between θ^{th} percentile of urban distribution and the θ^{th} percentile of the rural distribution. Multiplying the coefficients by 100 indicates approximately the percentage by which urban households real annual consumption per adult equivalent exceed those of rural household. These coefficients are statistically significant and increase across the quantiles.

Table 4 Estimates of the rural-urban gap at the mean and at various quantiles

Category	OLS	Quantiles				
		5th	25th	50th	75th	95th
Base	9.8985	8.8246	9.4298	9.8762	10.3402	11.0467
Urban	0.5744	0.3908	0.4876	0.5427	0.6198	0.9013

Notes: All estimates are statistically significant at 1% level of significance.

The coefficients on the urban dummy reflect the differences in distribution of covariates and differences in returns to those covariates. We estimate a full model (equation 9) that includes interactions of the urban dummy with all the remaining covariates. The results for the quantiles 5, 25, 50, 75 and 95 are presented in Appendix Table 1.[6] The coefficient on the urban dummy measures the rural-urban gap that is unexplained by the covariates in the regressions. After controlling for covariates, the unexplained gaps are negative and statistically significant at the 5th, 25th and 50th percentiles only. This implies that at higher quantiles (0.75 and 0.95) there is no statistical evidence of discrimination. The unexplained gap increases as we move up the quantiles and declines again at the 95th quantile.

The patterns of returns to education across quantiles vary between rural and urban households. The maximum education

[6] In some quantile regressions there are statistically insignificant coefficients. For the purposes of decomposition, same specification is used at all quantiles.

attained by any adult in the household is statistically insignificant in the 5th quantile except for the category of senior secondary, which is significant at 10% level. This is not surprising given that households in 5th quantile spend only 1% of their income towards education (NSO, 2005)[7]. Returns to education tend to increase with subsequent higher quantiles. For instance, base returns to senior secondary education range from approximately 0.119 to 0.227 and were highly significant (1%) in all quantiles except 5th percentile (5%). In addition, although the rural returns remained positive for the entire distribution across all quantiles, this is not the case with the urban differentials. The urban returns to education are negative and significant at the 50th and 75th percentile for primary education. The negative returns to primary education in urban areas are consistent with OLS results obtained in this analysis. The implication is that rural households are better off with primary education than their urban counterparts at the 50th and 75th percentiles.

For rural households, returns from employment in wage paid job are statistically significant at 25th percentiles only. The urban differential is negative and statistically significant at 5% level at 95th percentile only. It follows at the top of the distribution of *ln* C; wage employment of the household head in urban areas is welfare reducing than in rural areas. Thus, extending opportunities of wage employment improves welfare in rural areas.

With regard to the value of other physical assets in the household, both the base returns and the urban differentials remained positive and statistically significant at 1% level except at the top of the distribution for the urban case. Furthermore, rural returns remained essentially about the same ranging from 0.06 to 0.08.

The results for the tobacco dummy are consistent with those obtained using OLS in that cultivation of tobacco positively and negatively contribute to welfare in rural and urban areas, respectively. The rural returns from cultivating tobacco ranged from 0.071 to 0.187 across the entire distribution, with the variable insignificant at the 5th percentile.

Turning to the credit access variable we see that the base category remained positive and significant for the entire distribution at different levels. This is consistent with expectation that credit access for business and farming purposes enhances welfare. Households accessing credit were better off in rural areas at the 25th percentile that has registered higher return of 0.114. On the other hand, the differential impact of credit in urban areas is negative

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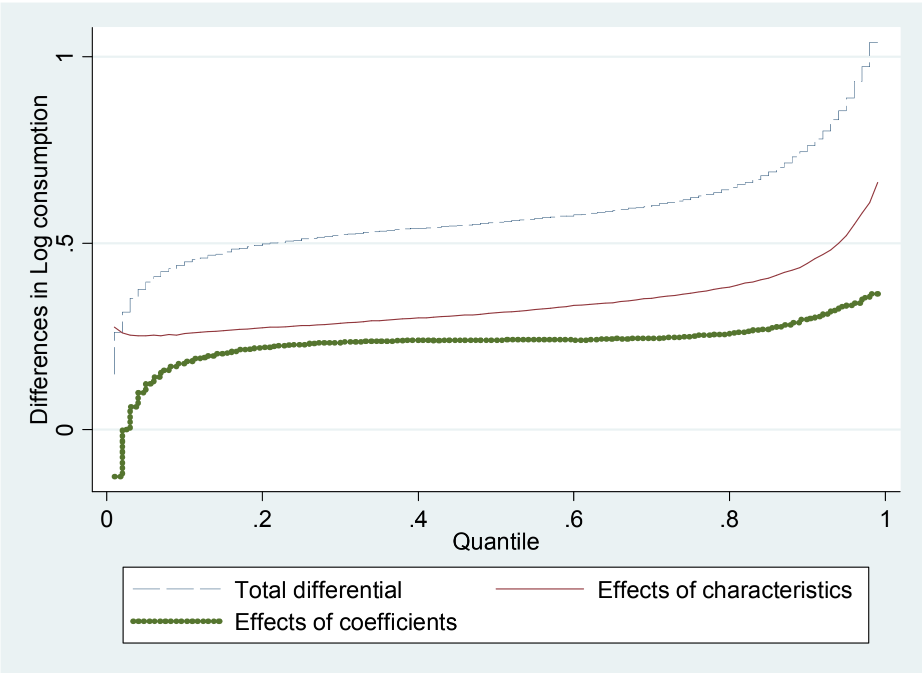
[7] To be interpreted with caution since usage is made of household per capita quantile and not per adult equivalent.

throughout the distribution and statistically insignificant across all quantiles.

The coefficients of other variables like age of household head, age squared, and sex of household head among others do not display particularly interesting patterns across quantiles. However, marginal effects discussed above generally vary across quantiles. To summarise, the effects of covariates and returns on the size and change in the rural-urban gap, the Machado-Mata (2005) decomposition is employed.

The Machado-Mata procedure decomposes the welfare gap into that proportion due to differences in characteristics between the regions and due to differences in the returns to the characteristics for the entire distribution. We obtain the counterfactual distribution that gives the log consumption distribution that rural household would enjoy if they had the same characteristics as urban households. Figure 2 shows the returns and covariates effects for quantiles 5 to 95, with 95% confidence bounds. The observed total differential gap is increasing as we move up to higher levels of welfare. Additionally, the differences in log consumption are closer to zero and one at lowest quantiles and highest quantiles, respectively. The welfare differentials are thus smaller at lower quantiles as compared to higher quantiles. The pattern displayed by the characteristics effect is such that between the 20^{th} and 60^{th} percentiles, the effect is approximately the same. This is also true for coefficient effects between the 20^{th} and 60^{th} percentiles. Furthermore, it can be seen that both effects are larger at higher quantiles, resulting in a larger rural-urban gap at higher quantiles. In other words, positive discrimination exists consistently across the entire distribution and this is more pronounced among the rich households.

Figure 2 Decomposition of Differences in Distribution of lnC

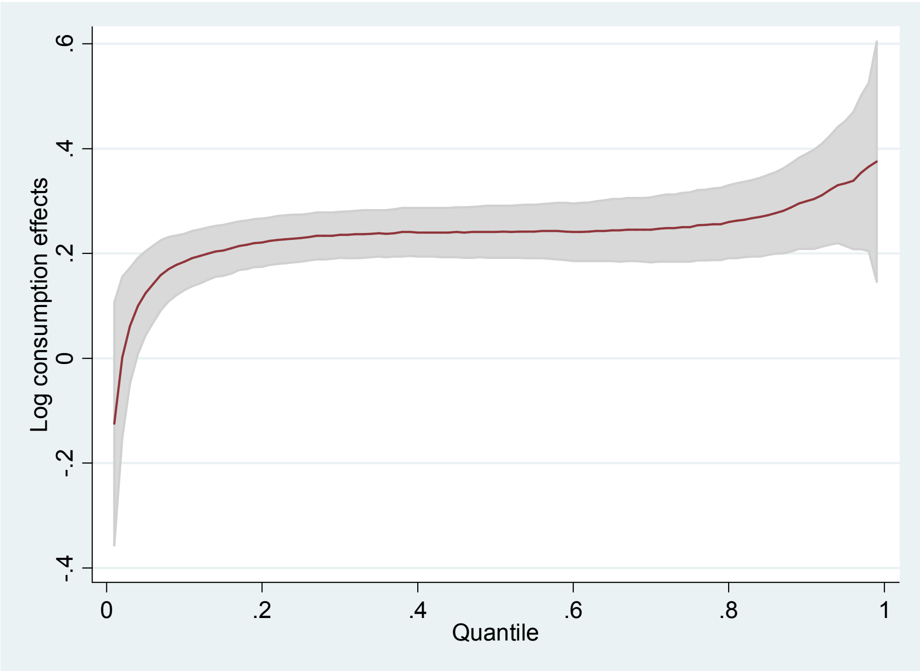


The dominance of covariate effects throughout the distribution means that for the Malawian households, differences in household characteristics matter more than differences in returns to those characteristics. Furthermore, the dominance of the covariates over returns effects at the top of the distributions means that for the most well-off households, their attributes are paid less by urban markets. That is, even though the urban households have relatively higher returns, the welfare gap is caused primarily by the differences in characteristics.

In contrast to these results, Nguyen et *al*. (2006) found that characteristics effects and returns effects dominated at the bottom and top of the log consumption distribution in Vietnam, respectively. Arguably, this reflected that the poor typically work in jobs that pay little above the subsistence level; hence rural-urban variation in market returns is not important among the poor.

The effects of discrimination in Malawi on welfare levels are further confirmed by the graphical presentation in Figure 3. Although discrimination is observed across all quantiles, it is more pronounce at the highest quantile. The effects of log consumption range from 0 to approximately 4.

Figure 3 Effects of Coefficients (discrimination)



We reconcile the results from the Oaxaca-Blinder decomposition and the Machado-Mata decomposition. There is agreement on the results from the two procedures that a greater proportion of welfare differentials in Malawi are explained by characteristics effects. However, the results are enriched by the Machado-Mata procedure where it is clear that the effects of characteristics are dominant across the entire distribution not only at the mean. Again, it is observed that discrimination exists across the entire distribution and is more pronounced among the rich which was not forthcoming from the Oaxaca-Blinder decomposition results. It can therefore, be stated that the Machado-Mata procedure gives a better picture of the welfare differential in Malawi.

6. Conclusion and policy implications

The study set out to investigate the rural-urban welfare inequalities in Malawi based on Integrated Household Survey of 2004-2005. This has been done in two stages: (1) by examining the determinants of welfare in rural and urban areas using Ordinary Least Square and Quantile regressions; (2) by decomposing welfare inequality into the relative contribution of endowments and discrimination using Oaxaca-Blinder (1973) and Machado-Mata (2005) decomposition methods.

We find that socio-economic and demographic factors do influence household welfare in rural and urban areas. Interestingly, in urban areas, age of the household head, primary education among other variables does not influence welfare of the household. The study further find that accessing credit for business or farming purposes and wage employment of household head boosts household's welfare in rural areas only.

It is also evident that welfare inequalities between rural and urban areas resulting from household endowments exist in Malawi. Results from the Oaxaca-Blinder decomposition indicate existence of welfare inequality gap between rural and urban areas. This is largely explained by differences in characteristics which account for 59% of the gap. The remaining 41% of the gap is attributable to discrimination. In addition, the Machado-Mata procedure of decomposition indicates that both covariate and returns effects are larger at the top of the distribution as is the rural-urban welfare gap. The covariate effects dominate the whole distribution of consumption. In other words, urban households are better off than their rural counterparts in Malawi due to differences in characteristics.

The findings presented in this study hold several implications for the design of poverty reduction strategies. The first relates to the importance of both human and physical capital endowments in determining welfare in Malawi. The importance of education for both rural and urban households cannot be overemphasized as education represents an important policy tool that can be used to escape poverty by households and reduce the rural-urban welfare inequality. The study also indicates the importance of smaller household sizes in ensuring higher welfare levels. The current fertility rate of six children per woman[8] should be reduced as a matter of urgency as this will reduce the dependency ratio.

The non-significance of cultivated land per adult equivalent in rural areas suggests that farming will be increasingly unable to sustain the livelihoods of many land-constrained households. There is need to improve the quality of land and provide the necessary complementary inputs such as fertilizer that enhance its productivity. In addition, deliberate polices to ensure substantial

[8] See NSO and ORC Macro (2005).

shifts in labor from agriculture to non-farm sectors in the rural areas could contribute to poverty reduction.

A major source of the differences in welfare between rural and urban households lies in the endowments of marketable characteristics. Hence, policies for reducing poverty and the rural-urban gap should include education and employment opportunities. The creation of opportunities for wage employment can be achieved by raising agricultural productivity among farmers; and by increasing opportunities for self-employment. Microfinance is particularly relevant for increasing the productivity of self-employment in the informal sector of the economy. Microfinance would enable farmers to purchase the inputs they need to increase their productivity, as well as financing a range of activities adding value to agricultural output and in the rural off-farm economy.

Development policies that increase returns to characteristics can promote rural-urban linkages and poverty reduction. Specifically, the rural-urban disparity in returns to characteristics could best be addressed by enhanced labour market flexibility and investment in infrastructure in rural areas. This would allow the flow of goods, services and labour to regions that provide better returns.

The study has attempted to assess rural-urban welfare inequalities in Malawi using data from the second Integrated Household Survey. Nonetheless, the study inherits weaknesses of the data source since the survey was not designed to take care of the specific needs of the present study. For instance the study failed to use the crop diversification variable measured as an index due to the unavailability of data on land allocated to different crops. Regardless of that the study has greatly benefited from the same. A further limitation of the study is that while both consumption and income are useful money metrics of welfare, they fall short of non-monetary measures of welfare such as health, security, literacy, leisure, political vote among others in the definition of welfare indicator.

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Appendix

Table 1 Quantile Regression Results

Variable	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
	β (t-ratio)	β (t-ratio)	β (t-ratio)	β (t-ratio)	β (t-ratio)
urban	-1.1693	-0.5338	-0.3845	-0.2924	-0.3921
	(-4.90)[a]	(-2.94)[a]	(-2.27)[b]	(-1.27)	(-1.28)
age_hd	-0.0103	-0.0098	-0.0116	-0.0082	-0.0119
	(-2.34)[b]	(-3.25)[a]	(-4.25)[a]	(-2.28)[b]	(-2.14)[b]
uage_hd	0.0286	0.0014	0.0058	0.0106	0.0231
	(2.51)[b]	(0.15)	(0.70)	(0.99)	(1.26)
Agehdsq	0.0000688	0.0000644	0.000086	0.00006	0.0001
	(1.48)	(2.03)[b]	(3.00)[a]	(1.61)	(1.83)[c]
uagehdsq	-0.000270	0.0000125	-7.39E-06	-0.00005	-0.00017
	(-2.41)[b]	(0.13)	(-0.08)	(-0.42)	(-0.83)
sexhd	-0.0865	-0.1007	-0.077	-0.0899	-0.1513
	(-1.88)[c]	(-3.41)[a]	(-2.78)[a]	(-2.35)[b]	(-2.24)[b]
usexhd	0.0344	0.0166	0.0906	-0.0226	-0.0125
	(0.34)	(0.22)	(1.28)	(-0.24)	(-0.09)
maristat	-0.1234	-0.1563	-0.1372	-0.1697	-0.3567
	(-2.68)[a]	(-5.26)[a]	(-4.98)[a]	(-4.50)[a]	(-5.43)[a]
umaristat	0.0914	0.0301	0.0019	-0.0637	-0.0048
	(0.96)	(0.45)	(-0.03)	(-0.78)	(-0.04)
hhsize	-0.1331	-0.1448	-0.1399	-0.1364	-0.1252
	(-27.17)[a]	(-42.31)[a]	(-41.76)[a]	(-27.74)[a]	(-12.60)[a]
uhhsize	0.013	0.0261	0.0179	0.0043	-0.0082
	(0.99)	(2.64)[a]	(1.83)[c]	(0.30)	(-0.32)
maxeduc2	0.0261	0.0607	0.0753	0.0855	0.0654
	(0.75)	(2.65)[a]	(3.65)[a]	(3.16)[a]	(1.56)
umaxeduc2	0.0352	-0.0452	-0.119	-0.2	0.1518
	(0.40)	(-0.74)	(-2.13)[b]	(-2.77)[a]	(1.44)
maxeduc3	0.0357	0.0573	0.0755	0.1235	0.1766
	(0.95)	(2.30)[b]	(3.36)[a]	(4.22)[a]	(3.87)[a]
umaxeduc3	0.0072	0.0889	0.133	0.0949	0.1244
	(1.08)	(1.49)	(2.49)[b]	(1.38)	(1.26)
maxeduc4	0.1191	0.2089	0.3108	0.3257	0.2266
	(1.94)[c]	(5.20)[a]	(8.61)[a]	(6.91)[a]	(3.03)[a]
umaxeduc4	0.1893	0.1043	0.0886	0.132	0.4531
	(1.76)[c]	(1.47)	(1.38)	(1.63)	(3.85)[a]
maxeduc5	0.1489	0.4995	0.733	0.858	0.8053
	(1.01)	(4.21)[a]	(6.75)[a]	(5.84)[a]	(4.45)[a]
umaxeduc5	0.3527	0.0659	-0.0771	-0.0758	-0.0741
	(1.51)	(0.40)	(-0.52)	(-0.39)	(0.26)
maxeduc6	0.1152	0.2275	0.9059	1.055	0.9346
	(0.54)	(1.63)	(6.95)[a]	(6.35)[a]	(3.59)[a]
umaxeduc6	0.544	0.8024	0.2334	0.2066	0.2993
	(2.13)[b]	(4.65)a	(1.48)	(1.02)	(0.99)
wagejob	0.0363	0.0335	0.0182	0.0262	0.0483
	(1.25)	(1.77)[c]	(1.06)	(1.17)	(1.38)
uwagejob	-0.0218	0.0115	0.02	-0.0777	-0.1866
	(-0.34)	(0.27)	(0.50)	(-1.47)	(-2.25)[b]

aeland	0.0002	0.00011	0.00053	0.0004	0.00006
	(0.71)	(0.54)	(3.07)[a]	(3.07)[a]	(0.32)
uaeland	0.3121	0.0953	0.1011	0.1774	0.6212
	(3.46)[a]	(1.41)	(1.75)[c]	(2.37)[b]	(4.20)[a]
lnaevasset	0.0819	0.0628	0.0667	0.0649	0.0718
	(27.81)[a]	(32.47)[a]	(31.40)[a]	(20.62)[a]	(11.98)[a]
ulnaevasset	0.0833	0.0654	0.0435	0.0326	0.0168
	(11.33)[a]	(11.69)[a]	(6.68)[a]	(3.05)[a]	(0.82)
lnaelvstval	0.0037	0.0058	0.0026	0.0028	-0.0069
	(1.40)	(3.28)[a]	(1.58)	(1.30)	(-2.12)[b]
ulnaelvstval	-0.0306	-0.0146	-0.0117	-0.0043	0.0132
	(-3.55)[a]	(-2.16)[b]	(-1.90)[c]	(-0.53)	(1.11)
tob_dum	0.0705	0.1019	0.1543	0.1623	0.187
	(2.46)[b]	(5.40)[a]	(9.08)[a]	(7.28)[a]	(5.43)[a]
utob_dum	-0.178	-0.218	-0.2781	-0.3235	-0.1892
	(-1.22)	(-2.10)[b]	(-3.06)[a]	(-2.70)[a]	(-1.35)
divcrops	-0.0074	-0.0098	-0.0077	-0.0102	-0.01
	(-2.47)[b]	(-4.95)[a]	(-4.32)[a]	(-4.30)[a]	(-2.73)[a]
udivcrops	0.0069	0.0086	0.0057	0.0075	0.0006
	(1.35)	(2.41)[b]	(1.79)[c]	(1.83)[b]	(0.09)
credit	0.0773	0.1136	0.0889	0.0579	0.1077
	(2.24)[b]	(5.00)[a]	(4.33)[a]	(2.15)[a]	(2.54)[b]
ucredit	-0.1275	-0.0316	0.0125	-0.0613	-0.1352
	(-1.26)	(-0.43)	(0.19)	(-0.70)	(-1.06)
mktseason	0.1359	0.1718	0.1836	0.1811	0.1491
	(5.95)[a]	(11.54)[a]	(13.63)[a]	(10.22)[a]	(5.33)[a]
umktseason	0.0835	-0.0053	-0.1123	-0.0877	-0.0491
	(1.40)	(-0.13)	(-3.06)[a]	(-1.82)[c]	(-0.66)
intercept	9.6826	10.2855	10.5849	10.8934	11.6036
	(90.98)[a]	(140.95)[a]	(159.12)[a]	(124.24)[a]	(85.23)[a]

Note: Superscripts *a*, *b* and *c* denote significance at 1%, 5% and 10% levels, respectively. The prefix u indicates an interaction of the urban dummy and the variable.

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