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Pay Period and the Distributional Effect of Education on Earnings: Evidence from Recentered Influence Function

by

Livini Donath, Oliver Morrissey and Trudy Owens

Abstract

This paper employs Recentered Influence Function (RIF) regressions to examine the distributional effect of education on earnings in East Africa, using data from the Living Standards and Measurement Study (LSMS) for Malawi, Tanzania, and Uganda. Taking into consideration the pay period of the workers, the paper investigates how education affects earnings at various points of the earnings distribution; how education affects earnings inequality; and how much of the gender gap in earnings can be attributed to gender differences in educational attainment. Results show heterogenous effects of education on earnings along the earnings distribution in all pay periods. Generally, the effect is more substantial for workers reporting monthly earnings than their daily and weekly counterparts. The results also show that in each pay period, there is significant wage inequality between workers in the top decile of earnings and those in the bottom four deciles. Education can either increase or reduce wage inequality depending on the period in which the worker is paid, i.e., education is associated with an increase in inequality for workers paid weekly and reduced inequality for those paid daily and monthly. Significant gender gaps in earnings were found for Tanzania and Uganda but not for Malawi. The decomposition results suggest that gender differences in educational attainment significantly explain the gender wage gap for Tanzania and Uganda. The paper recommends, rather than pooling, researchers should obtain separate estimate for each period for more reliable results.

JEL Classification: I20, J24, J31, J40, O15

Keywords: Earnings decomposition, wage inequality, pay period, Tanzania

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

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1. Introduction

Earning gaps between different groups and their determinants have been extensively explored over the last three decades (Fortin et al., 2011). Studies on earning gaps have been approached from several angles including gender (e.g. Chi & Li, 2014; Nix et al., 2016; Seneviratne, 2020; Yahmed, 2018), rural vs urban (e.g. Daoud & Fallah, 2016), sector of employment - public vs private or formal vs informal (e.g. Bargain & Kwenda, 2015; Kerr & Teal, 2015; Kwenda & Ntuli, 2018; Tansel et al., 2020), and firm ownership (e.g. Foster-Mcgregor et al., 2015). Research has also analysed the determinants and trend of earnings inequality within groups of workers, whereby inequality between any two periods is compared (e.g. Arabsheibani et al., 2018; Borrowman & Klasen, 2020; Firpo et al., 2018; Lee & Wie, 2017; Rios-Avila, 2020).

Although labour market information on earnings are recorded over different periods (for developing countries usually day, week, month, and year), empirical analysis aggregates reported earnings to a common unit. This may be appropriate for countries with well-developed labour markets, but may generate bias in developing countries with imperfect and heterogeneous labour markets, including those in Sub-Saharan Africa (SSA) where pay periods such as daily or weekly are most common in the informal sector. Donath et al. (2021) have shown that, in East Africa, the relationship between earnings and education varies across workers reporting wage earnings daily, weekly, and monthly and pooling these groups of workers lead to biased estimates of returns to education. Since pooling the periods can bias estimates of returns to education, it is also likely to bias estimates of the distributional effect of education on earnings because the pay periods have different earnings distributions.

Building on Donath et al. (2021), this paper adds to the literature by analysing the distributional effect of education within each of the three pay periods (daily, weekly and monthly) and examining how gender differences in educational attainment explain gender earning gaps and inequality in Malawi, Tanzania and Uganda. Specifically, the paper seeks to answer three questions. Firstly, for each pay period, how does a change in education distribution affect the (unconditional) distribution of earnings? Secondly, does education's role in explaining the (unconditional) distribution of earnings differ along the earnings distribution? Lastly, do gender differences in education attainment significantly explain the gender earnings gap within the pay periods?

To the best of our knowledge, this is the first study in SSA to analyse the link between education and earnings distribution while considering the pay period's effect. The aim is to better understand the effects of education on the earnings distribution and the gender earnings gap in East Africa, which is essential to devise education policies and programs to curb earnings inequality.

Using comparable nationally representative data from Malawi, Tanzania, and Uganda, we employ Recentered Influence Function (RIF) Regressions to examine how the distributional effect of education on wage earnings vary by pay period. We begin by employing unconditional quantile regressions (Firpo et al., 2009) to examine the possible heterogeneous effects of education on earnings and how these effects vary when workers report wages over different periods. We then employ the reweighted RIF Oaxaca-Blinder decomposition (Firpo et al., 2018; Rios-avila, 2020) to assess how education explains gender earnings inequalities within each pay period.

Results show that there is heterogeneity in the effects of a change in the distribution of education on the distribution of earnings across pay periods. Generally, the effect is stronger for workers reporting monthly earnings compared to their daily and weekly counterparts. The results of how education contributes to earnings inequality within the pay periods suggests that if the average education of the population were to increase by a year, it would reduce earnings inequality for workers paid daily and monthly but increase inequality for workers paid weekly. The results also show that gender differences in educational attainment significantly explain the earnings differences between female and male workers in Tanzania and Uganda.

Finally, as an extension, this paper seeks to answer the above questions while exploring a particular type of casual employment specific to Malawi, namely *ganyu*. Applying similar analysis, the findings show that an increase in the population's average education by a year increases the mean wage of *ganyu* workers by 7 – 16% depending on their quantile of the earnings distribution. About seven per cent of the gender wage gap can be attributed to gender differences in educational attainment. This suggests that policies to raise female education endowments would reduce gender earnings inequality in the *ganyu* labour market.

It is worth noting that pooling the periods together gives an incomplete picture of the distribution effects of education on earnings. For example, in the case of Malawi (excluding *ganyu*) and Uganda where most of the workers report earnings monthly, the results show that pooling yields estimates of the effects of education on earnings which are biased towards those from the monthly sample. This reiterates the need to estimate for each of the periods separately for a more informative inference.

The rest of the paper is organised as follows: Section 2 provides an overview of the related literature. Section 3 describes the empirical methodology used, followed by Section 4 on data and description. Section 5 presents the results and discussions, and Section 6 concludes.

2. Literature Review

Labour earnings account for a sizable proportion of individual incomes and thus are important in explaining income inequality (Peichl & Pestel, 2015). The determinants of earnings inequality between different groups or its trend over time have consequently attracted much research over the last three decades. Ever since the seminal works of Oaxaca (1973) and Blinder (1973), economists have developed several methodological frameworks to analyse earnings inequality. Recent research has focused on formulation and application of methods that go beyond mean decomposition to other inequality measures such as variance, quantiles (conditional and unconditional), inter-quantile range and the Gini. We do not discuss the different methods here; for a review, see Fortin, Lemieux, & Firpo (2011).

While most research on earnings inequality has focused on developed countries, little research on this matter has been undertaken in SSA. However, with increasing availability of data over the past decade, there has been a growing body of empirical research across the region. Given that in labour market surveys workers report wages over different pay periods (such as hourly, daily, weekly etc.), these studies usually have aggregated these wages into a common earnings measure such as monthly or annual earnings. Peichl & Pestel (2015) argue that the distribution of such a common measure of earnings is affected by the components that are used in its construction. As this has been the practice in the literature, we summarise the main studies on SSA.

One of the dimensions of inequality that has received considerable attention is the gender earnings inequality/gap. The consensus is that, like many other regions of the world, males earn considerably more than females (Agesa et al., 2013; Joseph & Leyaro, 2019; Nix et al., 2016; Nordman et al., 2011). Many papers have explored what factors determine the earnings differentials across gender. According to Nix et al. (2016), the gender wage gap is predominantly explained by differences in returns to the observable characteristics, although differences in endowments do matter. They also found that the coefficients of the determinants of the earnings gap between gender vary across the earnings distribution and sectors of employment. Because males generally have more education than females, increasing education endowments of women would raise women's wages and thus reduce the gender gap in earnings (Agesa et al., 2013; Joseph & Leyaro, 2019).

Studies have also linked the observed gender gap in earnings to labour market discrimination against women. Elu & Loubert (2013) used data from Tanzania to show that ethnicity contributes to discrimination in the labour market leading to lower wages for women. Elu & Loubert (2013) observed a significant discrimination against women from Chagga, Haya, Sambaa, and Zaramo ethnic groups from the middle of the distribution through the top while women from Nyamwezi are discriminated across all quantiles of earnings. Fisher et al. (2021) applied Oaxaca-Blinder decomposition technique on a sample of South African workers and found that the unexplained component of the Oaxaca-Blinder is significantly larger than the explained component implying gender discrimination against women in the labour market. Nonetheless, Fisher et al. (2021) did not show how much of the wage gap could be attributed to gender differences in education or any other worker characteristics. A close related study by Khan & Majid (2020) used similar methodology and data from 12 developing countries (including Ghana and Kenya from SSA) to show that being female is associated with a lower reservation wage. Only 12.2% of the gender difference in reservation wage could be explained suggesting possible discrimination against women, forcing them to accept lower wages. Kim (2020) found that much of the gender earnings gap for the youth in Malawi is attributable to gender differences in returns to characteristics while

Kilic, Palacios-López, & Goldstein (2015) examined gender differences in agricultural productivity (as measured by plot gross value of output) using nationally representative data from Malawi. They applied both the Oaxaca-Blinder type decomposition and RIF regressions to decomposing the productivity differences both for the mean and at various quantiles of the productivity distribution. They found that gender differences in education endowments were only significant in explaining the productivity inequality at the mean and centre of the productivity distribution. Women had higher returns to education than men. Thus, assigning their coefficients to men would increase men's productivity and widen the gender gap further.

Numerous studies have also considered earnings differentials between public and private sector workers, with a definite gap in favour of the public sector (Bargain & Kwenda, 2015; Kerr & Teal, 2015; Kwenda & Ntuli, 2018; Nielsen & Rosholm, 2001). Nielsen &

Rosholm (2001), applied quantile regressions on three waves of household data from Zambia and found that the returns to education varied along the earnings distribution, however, there existed a larger gap for those in the bottom end of the distribution across all education levels. Bargain & Kwenda (2015) employed OLS, Quantile and fixed effects regressions with sector dummies to examine sectorial wage gap in South Africa. They found a significant heterogeneity within sector of employment but substantial informal sector wage penalty at low end of wage distribution. A significant portion of the wage gap between formal and informal sector could be attributed to better skills possessed by formal sector workers. Kwenda & Ntuli (2018), on the other hand, employed the Oaxaca-Blinder decomposition method on an extensive cross-sectional dataset[1] from South Africa. They found that the distribution effects of education on wages differed within and across sectors of employment. Across sectors, the effect was higher in the private than the public sector. Within the public sector, the distributional effect of education declined by quantile while within the private sector, the effect of education was non-monotonic: initially declined and then increased by quantile.

Earnings differences between periods has also been widely explored to analyse trends in earnings inequality. Essama-Nssah, Paul, & Bassolé (2013) used expenditure data for 2001 and 2007 in Cameroon to analyse income inequality between the two periods. They employed the RIF decomposition method and found that returns to education varied slightly along the earnings distribution (not very heterogenous), were positive and statistically significant across quantiles, and were on average higher for 2001 than 2007.

Although research on earnings inequality in SSA has increased in recent years, what is noticed in all the previous studies (regardless of the kind or measure of inequality) is the conventional method of aggregating earnings to a common unit. So far, researchers have disregarded the importance of pay periods on inequality decomposition. Donath et al. (2021) shows that the relationship between earnings and education may vary across workers reporting wage earnings over different periods (daily, weekly, and monthly). We believe that pooling all the workers together and aggregating their earnings to a common unit might also lead to biased estimates of the distributional effect of education on earnings. This paper aims to fill this gap by estimating the distributional effects of education on earnings as well as in decomposing the earnings gap between gender by pay period.

1 The Post-Apartheid Labour Market Series (PALMS)

3. Empirical Strategy

We adopt the following extended Mincer equation (with education assumed to be exogenous)[2] to model the relationship between education and earnings.

$$Y_{it} = \alpha_1 S_{it} + \alpha_2 S_{it}^2 + \delta Z_{it} + \mu_{it} \quad (1)$$

Where Y_{it} is the log of wage earnings, S and S^2 are individual's years of schooling and its quadratic, Z_{it} is a vector (containing a constant) of individual characteristics (age in years and its square, logarithm of number of weeks worked over the last twelve months, and dummies for gender, rural residence, individuals observed more than once, and survey year), i and t are subscripts for individual and time respectively and μ is a standard error term. The parameters[3] of interest are α_1 and α_2.

3.1 RIF Regression

For simplicity and mathematical convenience, we rewrite the linear regression (1) in the following form:

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

Where $E(\varepsilon) = 0,\ Y = [y_1, y_2, \ldots., y_n]$ is a vector of the observed values of Y, and X is a vector (containing the constant) of all explanatory variables. The influence function of the observed value y of the distribution statistic of interest $v(F_Y)$ is defined as $IF(y; v)$. The RIF is then defined as

$$RIF(y; v) = v(F_Y) + IF(y; v) \quad (3)$$

Such that the statistic of interest can be obtained by integration. That is,

$$v(F_Y) = \int IF(y; v)\, dF(y) \quad (4)$$

[2] Note that in RIF regression decomposition, we ignore endogeneity due to unobserved ability and selection into employment categories because the methods to address them are not yet available (Kwenda & Ntuli, 2018).

[3] On a few occasions, we assume $\alpha_2 = 0$ to simplify interpretation.

The expectation of the RIF conditional on X (the explanatory variables) is modelled as a linear function of X as:

$$E[RIF(Y;v)|X] = v(F_Y) = X'\beta \tag{5}$$

Where β is a vector of parameters which can be estimated using OLS.

For quantiles, RIF is given by

$$RIF(Y;q_\tau) = q_\tau + \tau - \frac{1\{Y \le q_\tau\}}{f_Y(q_\tau)} \tag{6}$$

q_τ can be estimated from the data by sample quantile $\widehat{q_\tau}$ whereas $f_Y(\widehat{q_\tau})$ can be estimated using Kernel density. The RIF for quantile of Y is an indicator variable (that is, $1(Y \le q_\tau)$) which takes the value of 1 if the outcome variable is less than or equal to the quantile q_τ. It can, therefore, be modelled using a linear probability model (LPM), probit or a non-parametric binomial model (Firpo et al., 2009). Empirically, estimation of the RIF regressions for quantiles of log wages (or any other statistic such as interquantile share ratio in our case) can be performed in Stata using user-written command ***rifhdreg*** (Rios-avila, 2020).

3.2 RIF Decomposition

To examine gender wage gap and gender differences in earnings inequality within the pay periods, we employ RIF based decomposition, an extension of Oaxaca-Blinder (OB hereafter) methodology proposed by Firpo et al. (2009) and further extended by Firpo et al. (2018). RIF decomposition uses RIF regression in combination with reweighting to decompose any statistic of interest into two parts: the difference due to endowments (characteristics or composition effect) and the difference due to wage structure effects (coefficient effect). Using this decomposition, the contribution of each explanatory variable on the two parts can be examined. In addition, the decomposition shows the size of the specification and reweighting errors which are essential in assessing the accuracy of the model. Following (Rios-avila, 2020), the derivation of RIF decomposition is as follows. Recalling (2), i.e., $Y = X'\beta + \varepsilon$, suppose there is some categorical variable T such that the joint distribution function of Y, X and T is given by $f_{Y,X,T}(y_i, x_i, T_i)$. For only two groups ($T = 0$ and $T = 1$) the joint distribution function is given as:

$$f^k_{Y,X}(y,x) = f^k_{Y|X}(Y|X) f^k_X(X) \tag{7}$$

Where $T = k \in [0,1]$; and its cumulative distribution function conditional on T as:

$$F_Y^k(y) = \int f_{Y|X}^k(Y|X)dF_X^k(X) \quad (8)$$

In our case T is an indicator variable for gender defined by

$$T = \begin{cases} 1 \ if \ \ female \\ 0 \ \ if \ \ male \end{cases}$$

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

$$\Delta v = v_1 - v_0 = v(f_Y^1) - v(f_Y^0) \quad (9)$$

Which implies

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

We can rewrite (8) as

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

Or alternatively in a reduced form,

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

Where v_c is some counterfactual statistic defined as

$$v_c = v(f_Y^c) = v\left(f_{Y|X}^0(Y|X)dF_X^1(X)\right) \quad (10)$$

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

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

Recall (5), $v(F_Y) = X'\beta$

It follows therefore that

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

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

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

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

$$F_Y^c = \int f_{Y|X}^0(Y|X)dF_X^1(X) \cong \int f_{Y|X}^0(Y|X)dF_X^0(X)\,\omega(X) \quad (11)$$

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

$$\omega(X) = \frac{1-p}{p}\frac{P(T=1|X)}{1-P(T=1|X)} \quad (12)$$

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

The reweighting factor can be obtained after the conditional probability is estimated using a probit or logit model. Plugging the reweighting factor into (10) yields

$$v_c = E\left(RIF\left(y_i; v(f_Y^c)\right)\right) = \bar{X}^{c\prime}\hat{\beta}^c \qquad (13)$$

The decomposition can then be rewritten as

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

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

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

Then

$$\Delta v = \Delta v_S^p + \Delta v_S^e + \Delta v_X^p + \Delta v_X^e \qquad (14)$$

The component $\Delta v_S^p + \Delta v_S^e$ is called the aggregate wage structure effect which is made up of the pure wage structure effect (Δv_S^p) and the reweighting error (Δv_S^e). The component $\Delta v_X^p + \Delta v_X^e$ is called the aggregate composition effect and is made up of the pure composition effect (Δv_X^p) and specification error (Δv_X^e). The error components help assess the quality of the reweighting as well as that of the specified regression function (Rios-avila, 2020); if they turn out to be large and statistically significant, we should be cautious of drawing conclusions.

Like for RIF regression, empirical estimation of the RIF decomposition for the mean of log wages and the quantile share ratio of wages is performed in Stata using user-written command ***oaxaca_rif*** (Rios-avila, 2020).

4. Data and Descriptive Statistics

This paper uses data from two rounds of the Malawi Integrated Household Survey (IHS) conducted in 2010/11 and 2016.17, four waves of the Tanzania National Panel Survey (TNPS) conducted between 2008 and 2016 and five waves of the Uganda National Panel survey (UNPS) conducted between 2009 and 2017. The IHS, TNPS and UNPS are large nationally representative surveys conducted by the World Bank (in collaboration with countries' statistical agencies) under the Living Standards Measurement Study (LSMS) project. The surveys used similar questionnaires, hence easing comparability across the countries.

We restrict our analysis to individuals aged 15 – 65 inclusive, who have positive values of wages. After cleaning the data, we obtained samples 5,816,[4] 11,215, and 4,631 individuals for Malawi, Tanzania and Uganda, respectively. The literature and data availability guide the variables included. Table 1 shows the names and definitions of each variable used in the analysis.

Table 2 shows, for each country and pay period, the means and standard deviations for the continuous variables and the percentage composition of the categorical variables in the sample. Earnings are annualised and expressed monthly and thus comparable across countries and pay periods. Workers in Malawi earn more than those in Tanzania and Uganda across the pay periods. In all three countries, workers reporting earnings monthly are the highest wage earners (mostly in formal employment). Workers reporting earnings by week are the lowest wage earners in Tanzania and Uganda. Compared to the other countries, in Tanzania the wage penalty associated with working in daily or weekly employment is enormous. That is, workers reporting earnings by day and by week earn no more than a third of their counterparts who report earnings by month.

As far as education is concerned, there are a few issues that could potentially affect our results. While workers in Malawi have more years of schooling compared to Tanzania and Uganda, monthly earners have more education than their daily and weekly counterparts in all three countries. In Tanzania, there are no workers with higher education reporting earnings by day or week. In Malawi, only 12% of the workers reporting earnings by day and 4% of those reporting earnings by week have higher education, while in Uganda 3% and 8% of the workers reporting earnings by day and week respectively have higher education.

4 Not including off-own-farm Labour (*ganyu*).

Table 1: Definition of Variables Used in the Analysis

Variable	Description
Log(earnings)	Logarithm of annualised earnings (expressed monthly).
sch	Individual’s total number of years of schooling.
age	Individual’s age in years. Its square is included to capture the non-linear relationship between earning and age.
noeduc	educational dummy, 1 if less than primary education and 0 otherwise.
primary	educational dummy, 1 if completed primary education and 0 otherwise.
secondary	educational dummy, 1 if completed ordinary/advanced secondary education and 0 otherwise.
higher	educational dummy, 1 if completed post-secondary (diploma/university) education and 0 otherwise.
female	a gender dummy, 1 for females, included to capture the effects of gender on wages.
rural	location dummy, 1 for employment in rural areas, is used to control for rural-urban wage differentials.
panel	a dummy (for Tanzania and Uganda), 1 for individuals observed more than once since we are using an imperfect panel survey.
year	year dummy (for Malawi), 1 for 2016 and 0 for 2010 since we are using pooled cross-section data.
weeks	Logarithm of the number of weeks worked in the past 12 months.

Table 2: Summary Statistics for the Main Variables Used in Analysis

Country &Sample	Obs.	Earnings($/month) Mean	SD	sch Mean	SD	age Mean	SD	weeks Mean	SD	primary %	secondary %	higher %	female %	rural %	panel %	year
Malawi																
Daily	182	206.42	251.48	9.03	4.51	36.80	10.20	36.75	13.99	20	29	12	26	67	NA	74
Weekly	505	174.26	289.04	7.15	3.91	34.94	10.35	35.51	14.71	24	10	4	30	66	NA	53
Monthly	5,129	226.84	339.20	9.26	4.12	35.85	10.71	39.63	12.69	26	24	14	25	49	NA	50
Pooled	5,816	221.04	332.38	9.05	4.16	35.79	10.66	39.13	13.01	26	23	13	25	52	NA	51
Ganyu	16,528	33.76	53.52	4.77	3.52	33.42	11.89	15.64	12.66	14	2	0.0	51	92	NA	64
Tanzania																
Daily	3,738	38.91	87.35	5.26	3.21	33.14	11.92	15.32	15.39	57	4	0	40	78	25	NA
Weekly	1,929	32.54	85.08	5.28	3.24	33.64	12.08	13.62	15.16	56	5	0	36	82	19	NA
Monthly	4,830	123.90	161.28	8.16	3.69	33.34	11.89	34.95	16.00	51	27	7	38	53	41	NA
Pooled	11,215	69.10	126.88	6.35	3.67	33.37	11.93	22.10	18.38	55	13	3	38	70	45	NA
Uganda																
Daily	1,262	78.92	103.44	6.35	3.53	30.99	10.84	36.04	14.57	34	11	3	20	64	39	NA
Weekly	589	76.34	109.07	6.97	3.81	32.77	11.44	35.27	14.87	32	12	8	29	72	15	NA
Monthly	2,765	114.19	139.02	9.85	4.39	34.71	11.06	39.38	12.45	29	16	31	37	56	56	NA
Pooled	4,631	99.66	127.84	8.51	4.41	33.46	11.18	37.89	13.54	31	14	20	31	61	57	NA

Source: Author's computations from IHS, TNPS and UNPS. Note: 'Mean' (for the continuous variables) is the arithmetic mean. The last two column shows % observed multiple times for Tanzania and Uganda (panel) and % in 2016 for Malawi (year) respectively. The figures are adjusted by survey weights.

Figures 1-3 compare the distribution of earnings by pay period for each country. Figure 1 shows the distribution for Malawi. Because 88% of the workers report earnings by month, the distribution of the pooled periods looks very similar to that of workers who report earnings by month. This is also true for Uganda, where 60% of the workers report their earnings by month (Figure 3). For Tanzania, however, the distribution for the pooled periods is very different from those of the disaggregated pay periods (Figure 2). While the distribution for those reporting earnings by month and pooled for Tanzania are left-skewed, we observe more complicated shapes for the distribution curves for those reporting earnings by day and week.

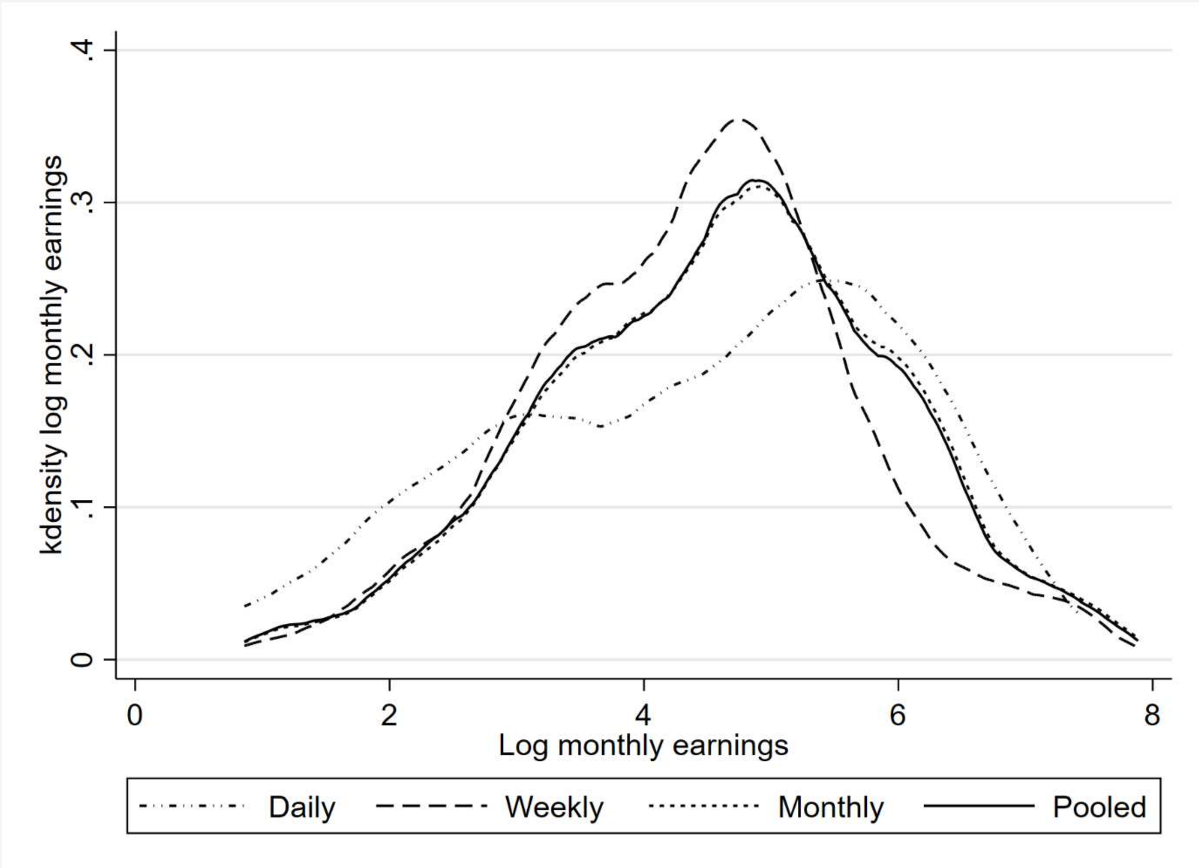

Figure 1: Distribution of Monthly Earnings by Pay Period - Malawi

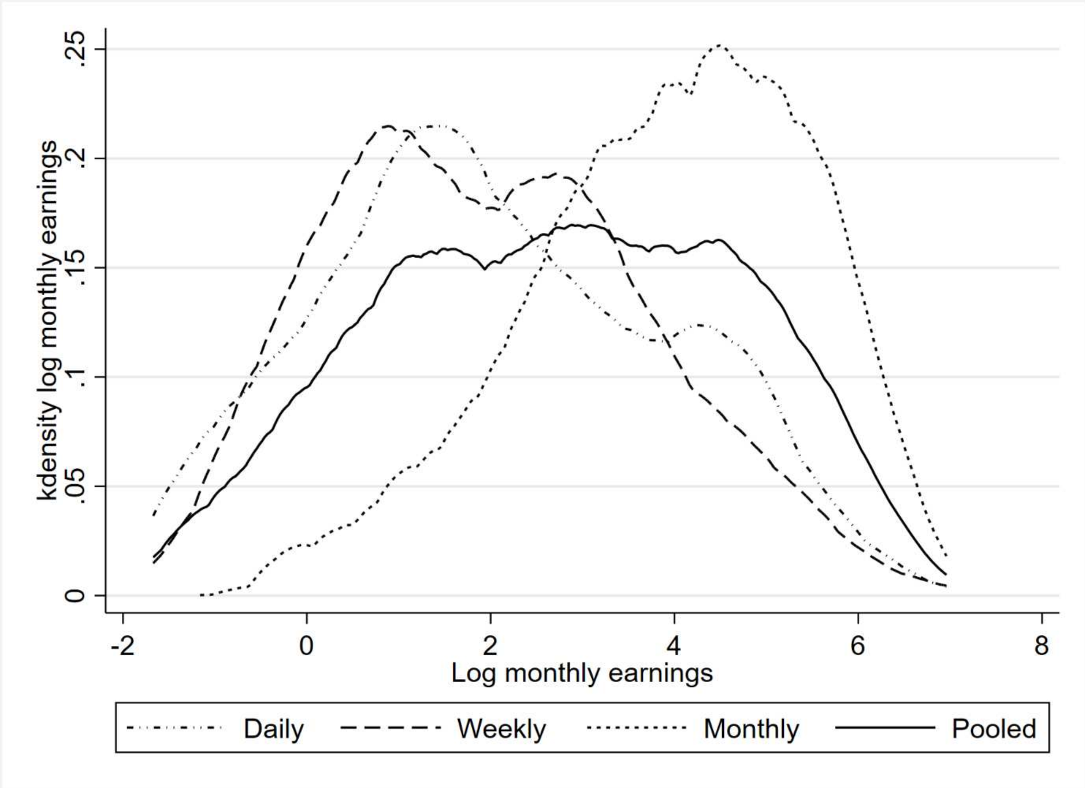

Figure 2: Distribution of Monthly Earnings by Pay Period - Tanzania

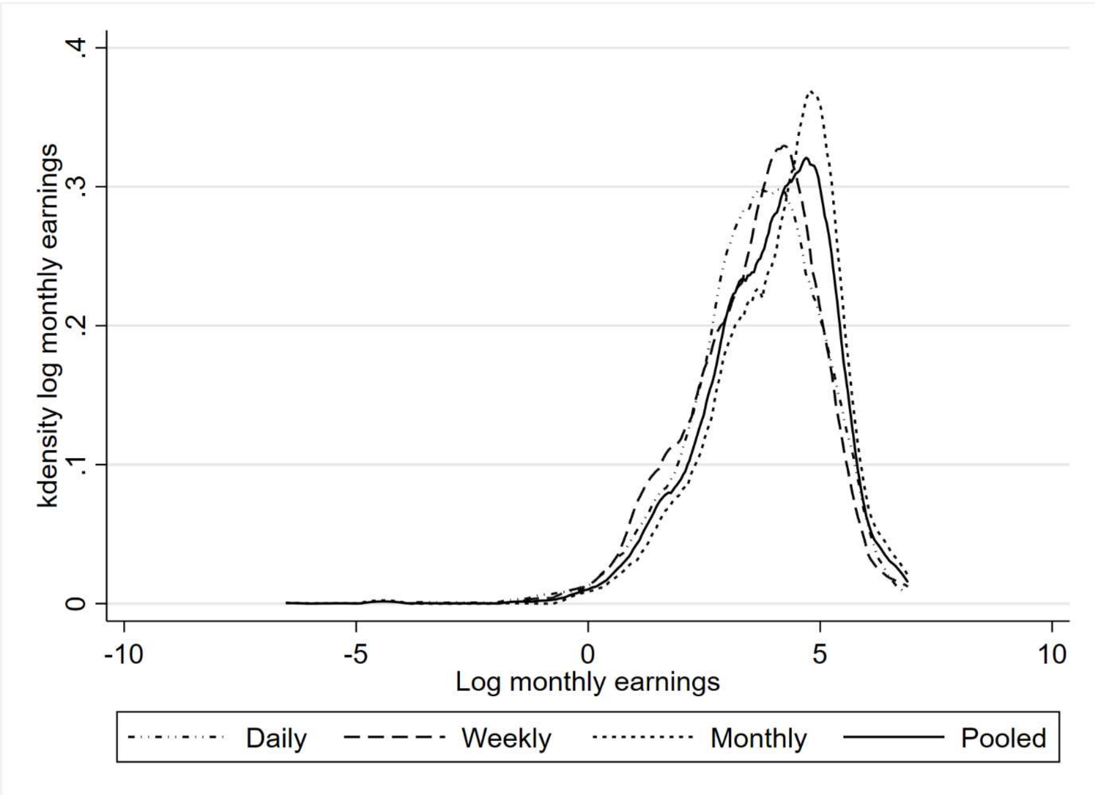

Figure 3: Distribution of Monthly Earnings by Pay Period - Uganda

Figures 4 – 6 show the cross-sectional relationship between earnings and education by pay period. The bars show the mean earnings (monthly $US) by years of education. As expected, on average more years of education are associated with higher earnings in all three countries. The relationship is especially vivid for workers reporting earnings by month.

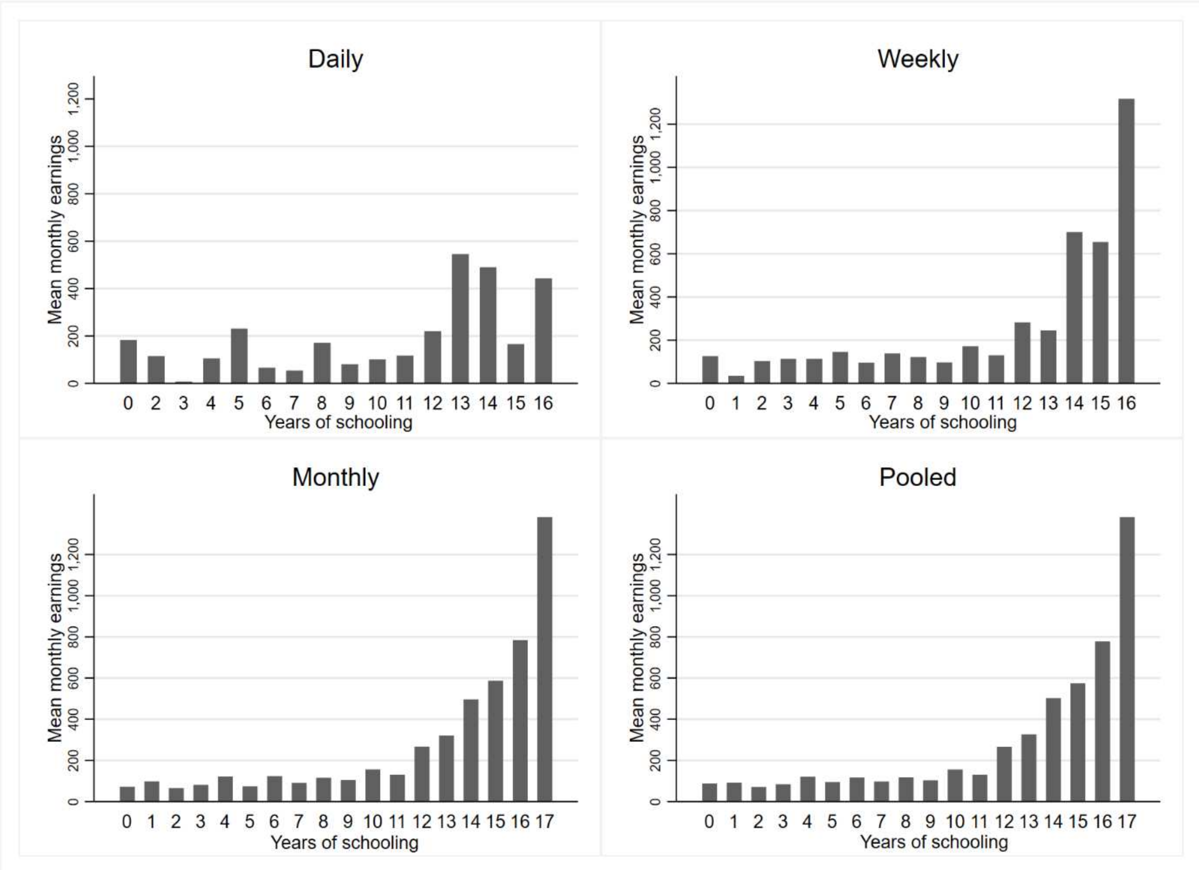

Figure 4:Distribution of Earnings by Education and Pay Period in Malawi

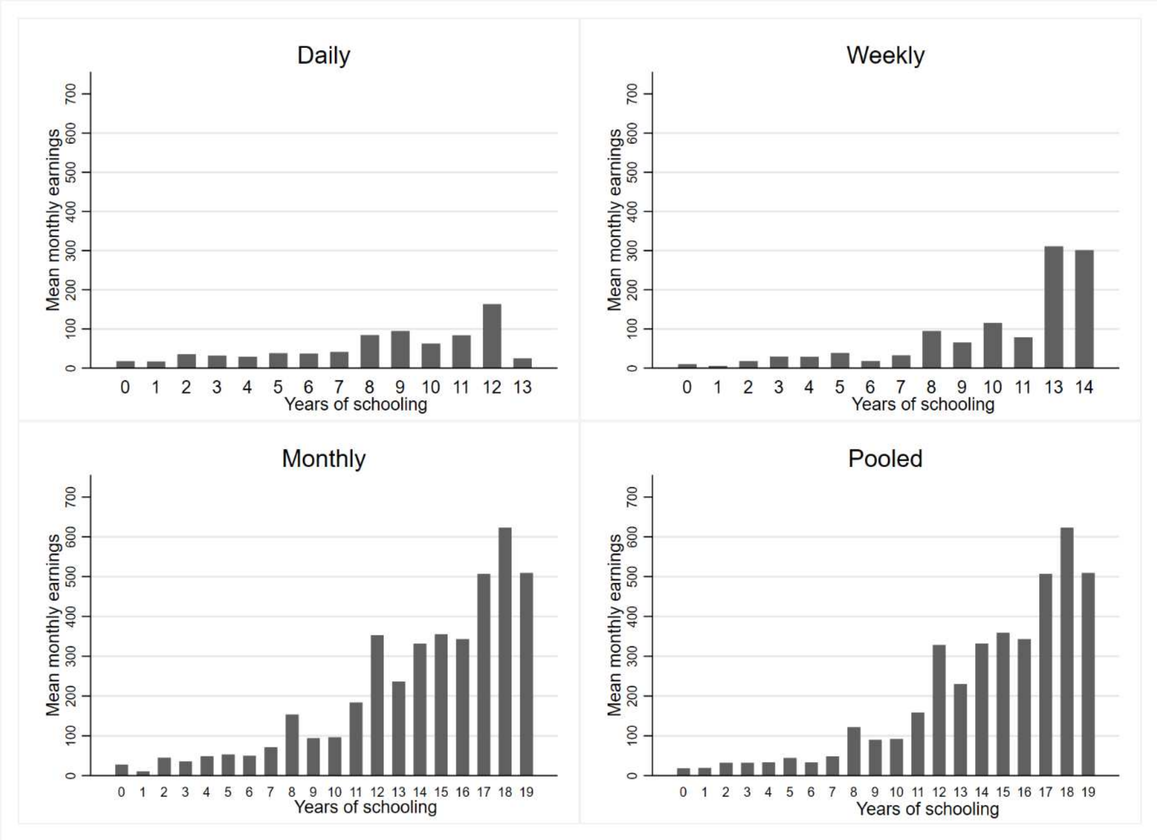

Figure 5: Distribution of Earnings by Education and Pay Period in Tanzania

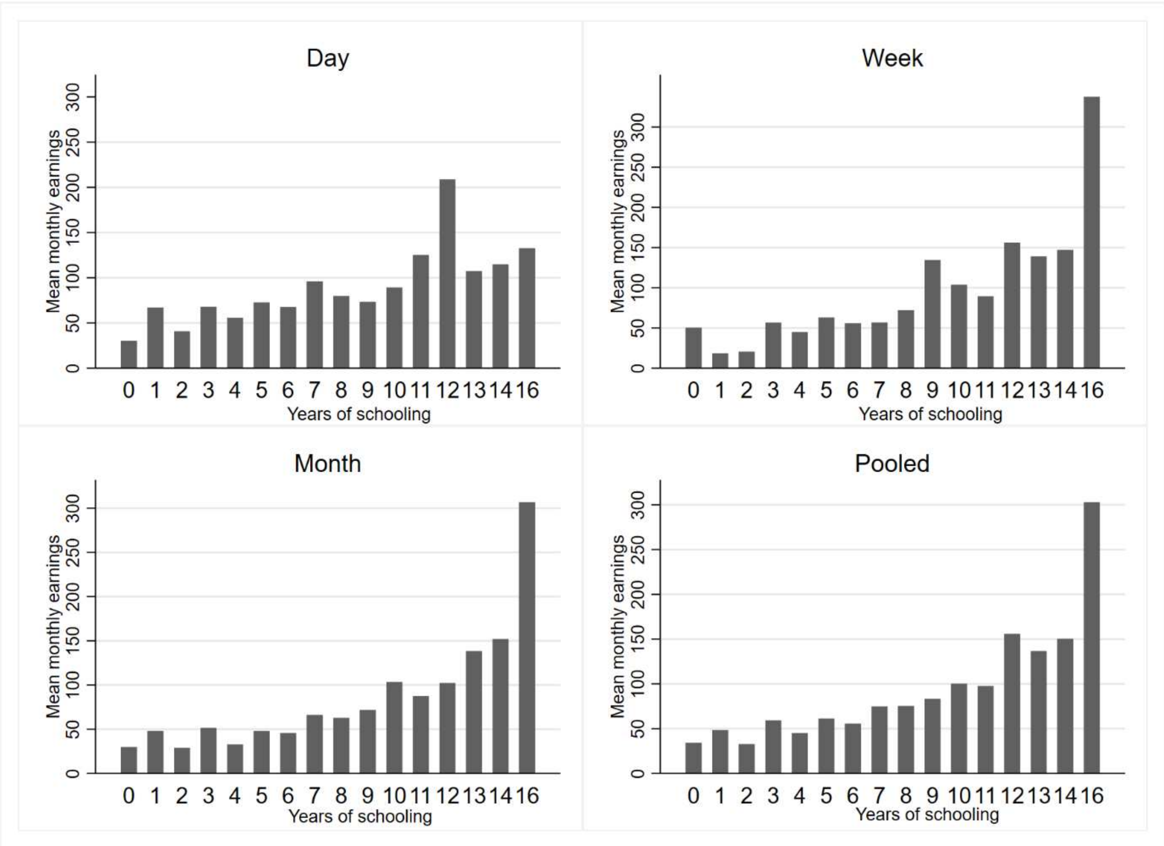

Figure 6: Distribution of Earnings by Education and Pay Period in Uganda

5. Results and Discussion

5.1. RIF Regression

In this section, we present estimates based on RIF regressions. For each country and pay period, we analyse how education affects the distribution of earnings of the workers. That is, using unconditional quantile regressions, we examine the possible heterogeneous effects of education on earnings and how these effects vary when workers are paid over different periods. The coefficients of education measure the expected change in the unconditional distribution of the earnings (as measured by quantiles of log earnings) when there is a small change in the distribution of education (Rios-avila, 2020).

Owing to its easy interpretability, we begin by presenting the results for linear specification (assuming $\alpha_2 = 0$ in equation (1)). Tables 3, 4 and 5 present the results of the distribution effects of education in Malawi, Tanzania, and Uganda, respectively, for the selected unconditional quantiles of earnings. The first three panels (A, B and C) show the estimates when the samples are disaggregated by the pay periods—daily, weekly, and monthly. The last panel shows the estimates when all pay periods are pooled[5] and earnings aggregated to a common unit. The detailed results for all nine quantiles by pay period are shown in Appendix Tables A1 – A13.

Table 3 shows the RIF regression results for Malawi. Education affects individuals at different points of the earnings distribution differently, and within the corresponding earnings distributions, education affects individuals in different pay periods differently. Since the latter is the focus of our study, it deserves more interpretation. The effect of a change in the distribution of education for the daily sample decreases with the quantiles of earnings for quantiles above the centre of the distribution.

The results in Table 3 suggest that an increase of the population education by one year increases the mean of wages by approximately 12% at the centre of the distribution compared to only approximately 4% increase at the top of the distribution. For the weekly sample, the effect increases monotonically from about 0.7% at the bottom end to 21% at the top end of distribution. No specific pattern is observed for the monthly or the pooled samples.

5 Like the usual practice in the literature.

Table 3: Unconditional Quantile Regression for Malawi

	(1) q(10)	(2) q(25)	(3) q(50)	(4) q(75)	(5) q(90)
A. Daily					
sch	0.103**	0.091**	0.119***	0.072**	0.039
	(0.043)	(0.043)	(0.042)	(0.037)	(0.042)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.190	3.205	4.583	5.618	6.298
R^2	0.25	0.33	0.35	0.16	0.11
N	182	182	182	182	182
B. Weekly					
sch	0.007	0.058***	0.081***	0.151***	0.206***
	(0.021)	(0.018)	(0.016)	(0.023)	(0.040)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.946	3.602	4.592	5.365	6.243
R^2	0.50	0.44	0.38	0.30	0.23
N	505	505	505	505	505
C. Monthly					
sch	0.076***	0.139***	0.133***	0.168***	0.123***
	(0.008)	(0.007)	(0.006)	(0.007)	(0.007)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.893	3.694	4.702	5.544	6.304
R^2	0.39	0.46	0.50	0.38	0.20
N	5,129	5,129	5,129	5,129	5,129
D. Pooled					
sch	0.070***	0.125***	0.128***	0.161***	0.123***
	(0.007)	(0.006)	(0.005)	(0.007)	(0.006)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.841	3.672	4.692	5.558	6.298
R^2	0.39	0.45	0.48	0.37	0.19
Obs.	5,816	5,816	5,816	5,816	5,816

Notes: Bootstrap standard errors computed by 500 replications in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). Panel A (pooled) shows the naïve estimates of the distributional effects of education corresponding to existing literature. Full results with all variables available upon request.

Figure 7 plots the coefficients of education from Table 3. The trend observed in the pooled regression results is consistent with the month sample but not with the day or week samples. This suggests that pooling biases the results in favour of the month sample. In countries where workers are employed primarily by the month converting all wages to a monthly figure will not distort any findings. However, in a country where workers are more likely to be paid by day or week this could lead to a bias in any results.

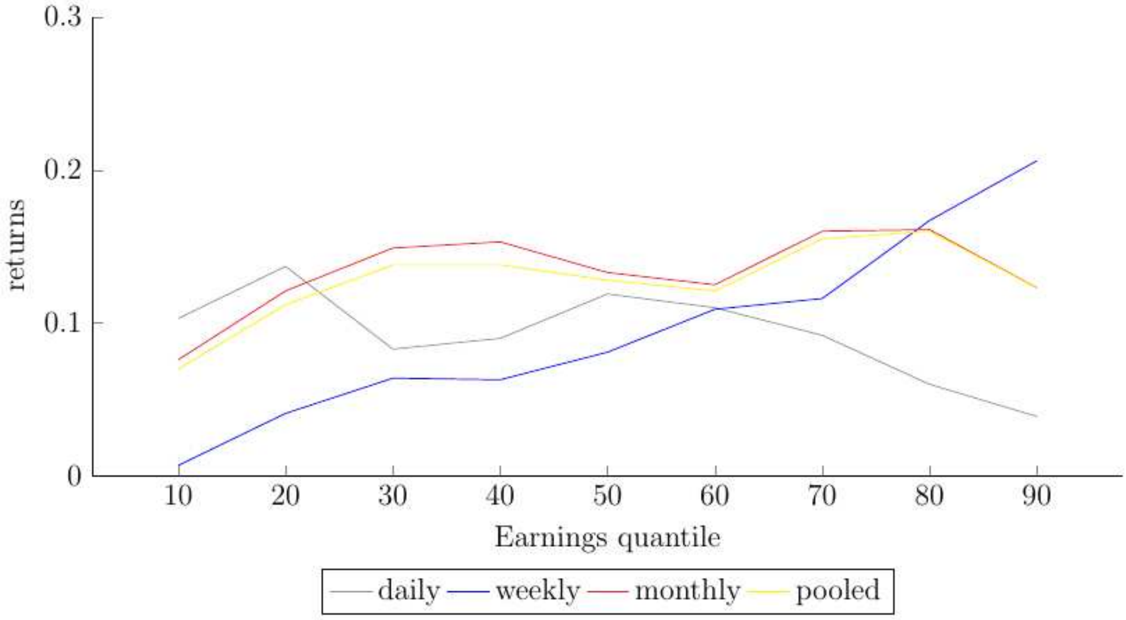

Figure 7: RIF returns - Malawi

Table 4 presents the RIF regression results for Tanzania, illustrated in Figure 8 (with detailed results for all nine quantiles in appendix tables A6 – A9). As for Malawi, Table 4 and Figure 8 show that in Tanzania, there is heterogeneity in the distributional effects of education across pay periods. Returns to monthly are much higher, increase up the 40th quantile and are then flat. Generally, returns increase gently but with no significant effect of increase in education on wage for workers at the bottom of the distribution in the daily (peaking at the 70th quantile) and weekly (returns increase sharply after 70th quantile) samples. Comparing the estimates from Panel A, B and C relative to panel D in Table 4, it indicates that the common practice in the literature of pooling all the pay periods together and aggregating the earnings to a common unit leads to biased estimates of the distributional effects of education.

Table 4: Unconditional Quantile Regression for Tanzania

	(1) q(10)	(2) q(25)	(3) q(50)	(4) q(75)	(5) q(90)
A. Daily					
sch	-0.014	0.026**	0.030***	0.068***	0.042***
	(0.012)	(0.011)	(0.010)	(0.013)	(0.012)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	-0.274	0.789	2.091	3.854	4.922
R^2	0.19	0.41	0.53	0.44	0.20
Obs.	3,738	3,738	3,738	3,738	3,738
B. Weekly					
sch	0.006	0.030**	0.046***	0.091***	0.127***
	(0.016)	(0.012)	(0.011)	(0.016)	(0.019)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	-0.232	0.752	2.048	3.342	4.509
R^2	0.23	0.44	0.60	0.48	0.27
Obs.	1,929	1,929	1,929	1,929	1,929
C. Monthly					
sch	0.069***	0.119***	0.176***	0.177***	0.167***
	(0.010)	(0.008)	(0.007)	(0.008)	(0.009)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.137	3.178	4.352	5.203	5.838
R^2	0.45	0.51	0.44	0.29	0.19
N	4,830	4,830	4,830	4,830	4,830
D. Pooled					
sch	-0.003	0.023***	0.125***	0.174***	0.171***
	(0.007)	(0.006)	(0.008)	(0.006)	(0.007)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	0.307	1.545	3.199	4.615	5.461
R^2	0.30	0.55	0.58	0.37	0.20
Obs.	11,215	11,215	11,215	11,215	11,215

Notes: As for Table 3.

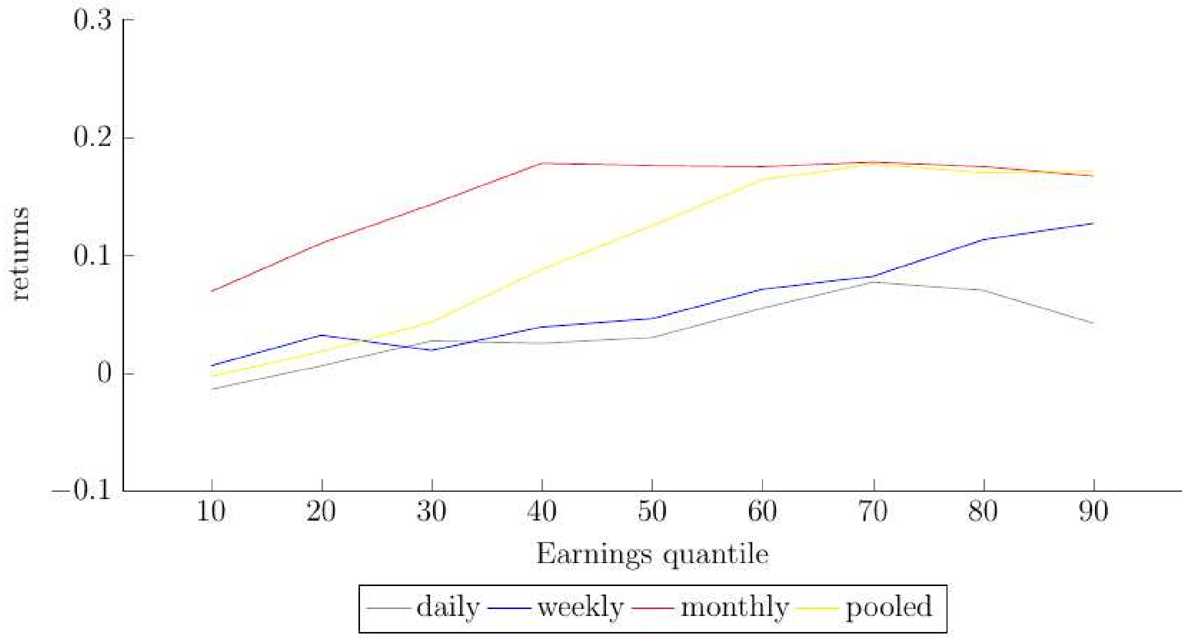

Figure 8: RIF returns – Tanzania

Finally, Table 5 reports the distribution effects of education in Uganda, illustrated in Figure 9 (with detailed results for all nine quantiles in appendix tables A10 – A13). As for Malawi and Tanzania, in Uganda, there is also heterogeneity in the effects of education across pay periods and throughout the earnings distribution. Table 5 and Figure 9 show that, along the earnings distribution, while education significantly increases earnings across the quantiles, the effect is higher at lower quantiles for monthly (peaking at 40^{th} quantile), generally declining for daily and gradually increasing for the weekly sample. This suggests that education is vital in reducing earnings inequality for workers paid daily and monthly but will increase inequality for workers paid weekly. On the other hand, comparing the pay periods, an additional year of education in the population increases the mean of earnings by a higher proportion for workers paid monthly relative to their daily and weekly counterparts.

Tables 3 – 5 show, in all pay periods, there is considerable difference in the RIF mean between the top and bottom deciles implying high degree of earnings inequality. Using RIF regression, we examine whether education is a significant determinant of earnings inequality, measured by the interquantile share ratio (*iqsr*) defined as the ratio of the share earned by the top 10% relative to bottom 40% within each pay period. The results are presented in Table 6.

Table 5: Unconditional Quantile Regression for Uganda

	(1) q(10)	(2) q(25)	(3) q(50)	(4) q(75)	(5) q(90)
A. Daily					
sch	0.107***	0.114***	0.094***	0.090***	0.074***
	(0.022)	(0.015)	(0.012)	(0.013)	(0.015)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	1.786	2.774	3.719	4.580	5.270
R^2	0.36	0.39	0.31	0.21	0.11
Obs.	1,262	1,262	1,262	1,262	1,262
B. Weekly					
sch	0.071**	0.082***	0.111***	0.116***	0.127***
	(0.028)	(0.019)	(0.017)	(0.017)	(0.027)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	1.568	2.756	3.793	4.424	5.179
R^2	0.275	0.443	0.376	0.226	0.142
Obs.	589	589	589	589	589
C. Monthly					
sch	0.136***	0.156***	0.171***	0.109***	0.091***
	(0.016)	(0.010)	(0.009)	(0.006)	(0.007)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.160	3.242	4.350	5.059	5.544
R^2	0.45	0.45	0.44	0.27	0.15
Obs.	2,765	2,765	2,765	2,765	2,765
D. Pooled					
sch	0.105***	0.118***	0.153***	0.110***	0.092***
	(0.010)	(0.007)	(0.007)	(0.007)	(0.006)
covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	1.931	3.052	4.055	4.846	5.446
R^2	0.41	0.42	0.38	0.26	0.14
Obs.	4,631	4,631	4,631	4,631	4,631

Notes: As for Table 3.

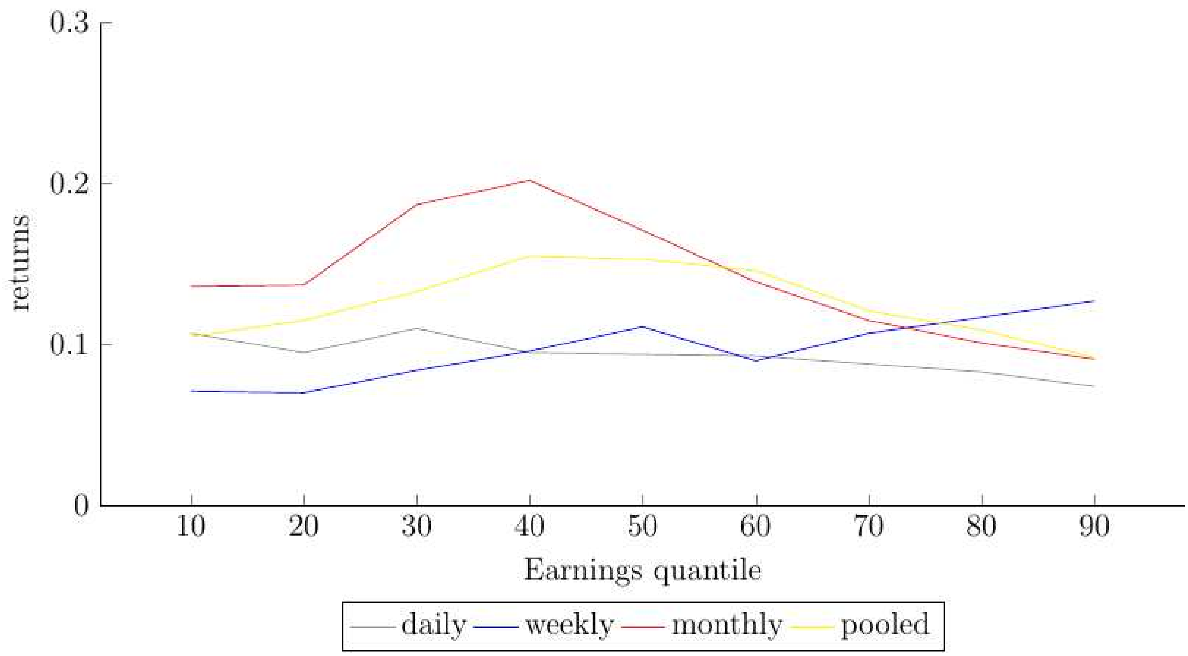

Figure 9: RIF returns – Uganda

Table 6 shows that there is significant wage inequality between the workers in the top decile of earnings and those in the bottom four deciles. Panel A shows that in Malawi the inequality is highest among workers paid daily and lowest among those paid monthly. Workers in the top decile earn approximately ten times as much as those in the bottom 40%. However, despite the high inequality within workers paid daily, education does not seem to significantly drive the inequality. For workers paid weekly, an increase in education in the population by one year would result in an increase in wage inequality by 9%,[6] other things equal. This implies that conditional on working and paid weekly, education is likely to benefit those in higher paying jobs. For workers paid monthly, an increase in average education in the population by a year will reduce inequality by 1.7%.

Panel B presents the results for Tanzania. Inequality is very high among workers in daily and weekly where those in the top decile earn at least 35 times as much as those in the bottom four deciles. Increase in education would worsen the inequality although not significantly for workers paid daily. In contrast, for workers paid monthly, education reduces inequality, but the coefficient is not statistically significant. The last panel (Panel C) shows the results for Uganda. For workers paid daily and monthly, an increase in education in the

6 That is (0.744/8.138)*100.

population by one year would result in a reduction in wage inequality by 5% and 9%, respectively. For those paid daily, increase in education would worsen the inequality but the coefficient is not statistically significant.

Table 6: Education and Wage Inequality (*iqsr*) by Country and Pay Period

	(1) Daily	(2) Weekly	(3) Monthly	(4) Pooled
A. Malawi				
sch	-0.615	0.744^{***}	-0.126^{*}	-0.072
	(0.479)	(0.248)	(0.065)	(0.060)
covariates	Yes	Yes	Yes	Yes
iqsr	10.021	8.138	7.373	7.495
R^2	0.23	0.13	0.10	0.11
Obs.	182	505	5,129	5,816
B. Tanzania				
sch	0.295	2.669^{***}	-0.011	2.321^{***}
	(0.514)	(0.835)	(0.083)	(0.216)
covariates	Yes	Yes	Yes	Yes
iqsr	36.546	35.055	6.799	24.819
R^2	0.13	0.04	0.32	0.38
Obs.	3,738	1,929	4,830	11,215
C. Uganda				
sch	-0.322^{***}	0.259	-0.505^{***}	-0.347^{***}
	(0.112)	(0.264)	(0.074)	(0.056)
covariates	Yes	Yes	Yes	Yes
iqsr	6.037	7.101	5.389	6.051
R^2	0.15	0.16	0.20	0.17
Obs.	1,262	589	2,765	4,631

Notes: *iqsr* is the interquantile share ratio defined as the ratio of the share earned by the top 10% relative to bottom 40% within each pay period. Bootstrap standard errors computed by 500 replications in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). Full results with all variables available upon request.

Figures 10-12 plot the marginal effects for the quadratic specification of returns against years of schooling for selected quantiles (10th, 50th and 90th); detailed results are in appendix Tables A14 – A16. Figure 10 -12 show a concave relationship for workers in the bottom decile and strong convex relationship for workers in the top decile of earnings. This suggest that, in all three countries, an increase in education in the population is more likely to benefit the higher than the lower earnings workers and hence likely to increase inequality.

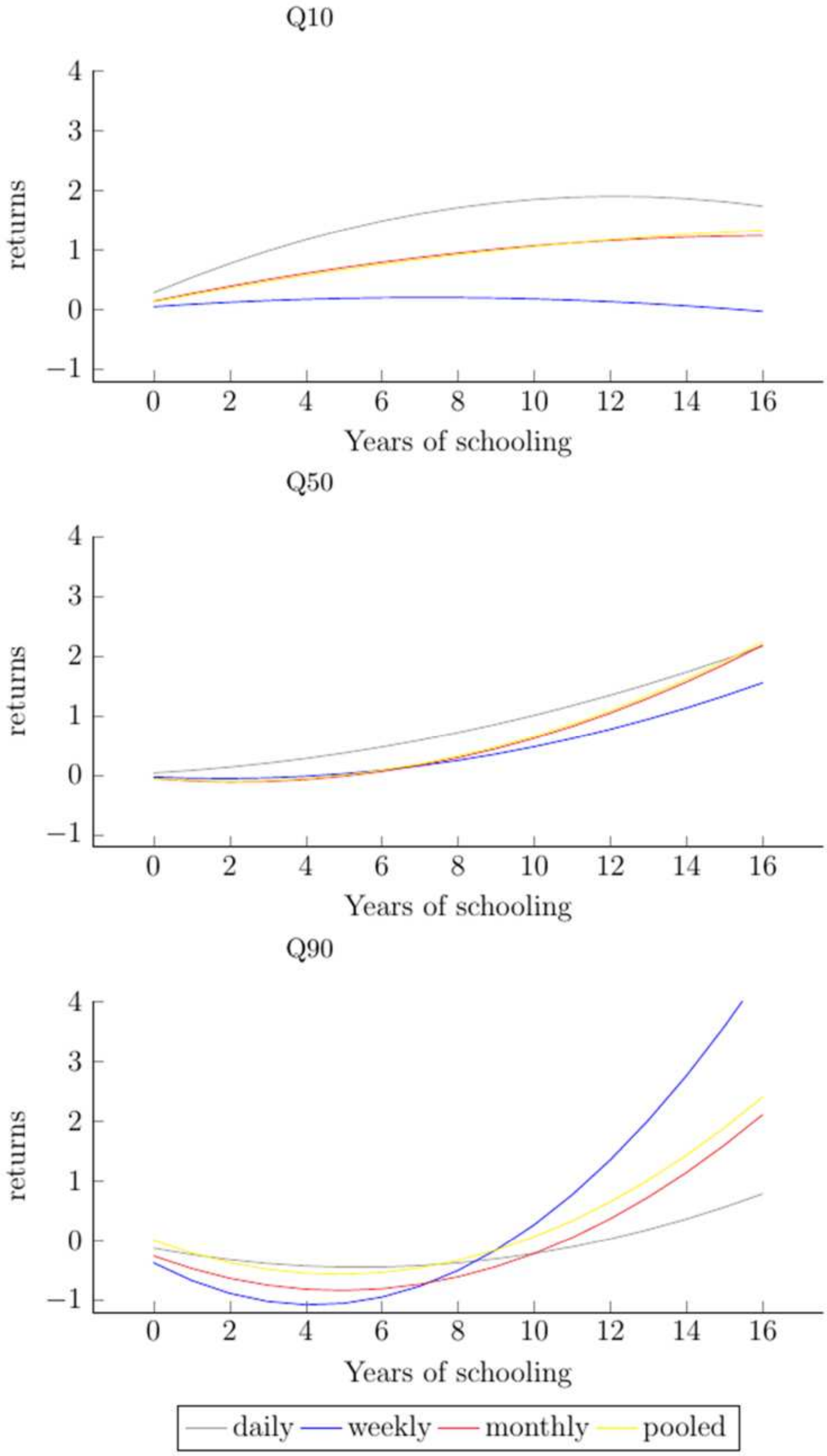

Figure 10: RIF coefficients of education (quadratic) - Malawi

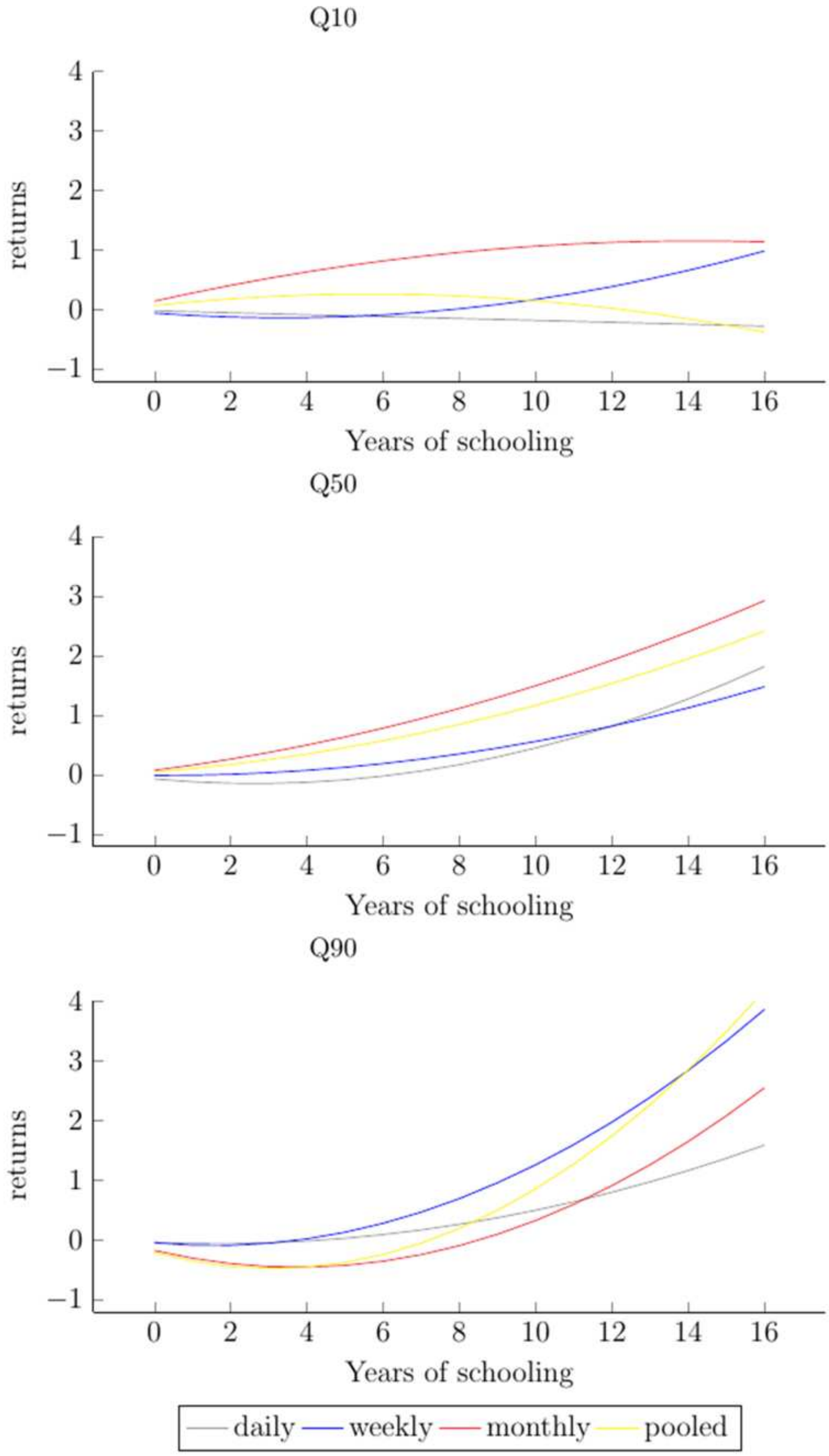

Figure 11: RIF coefficients of education - Tanzania

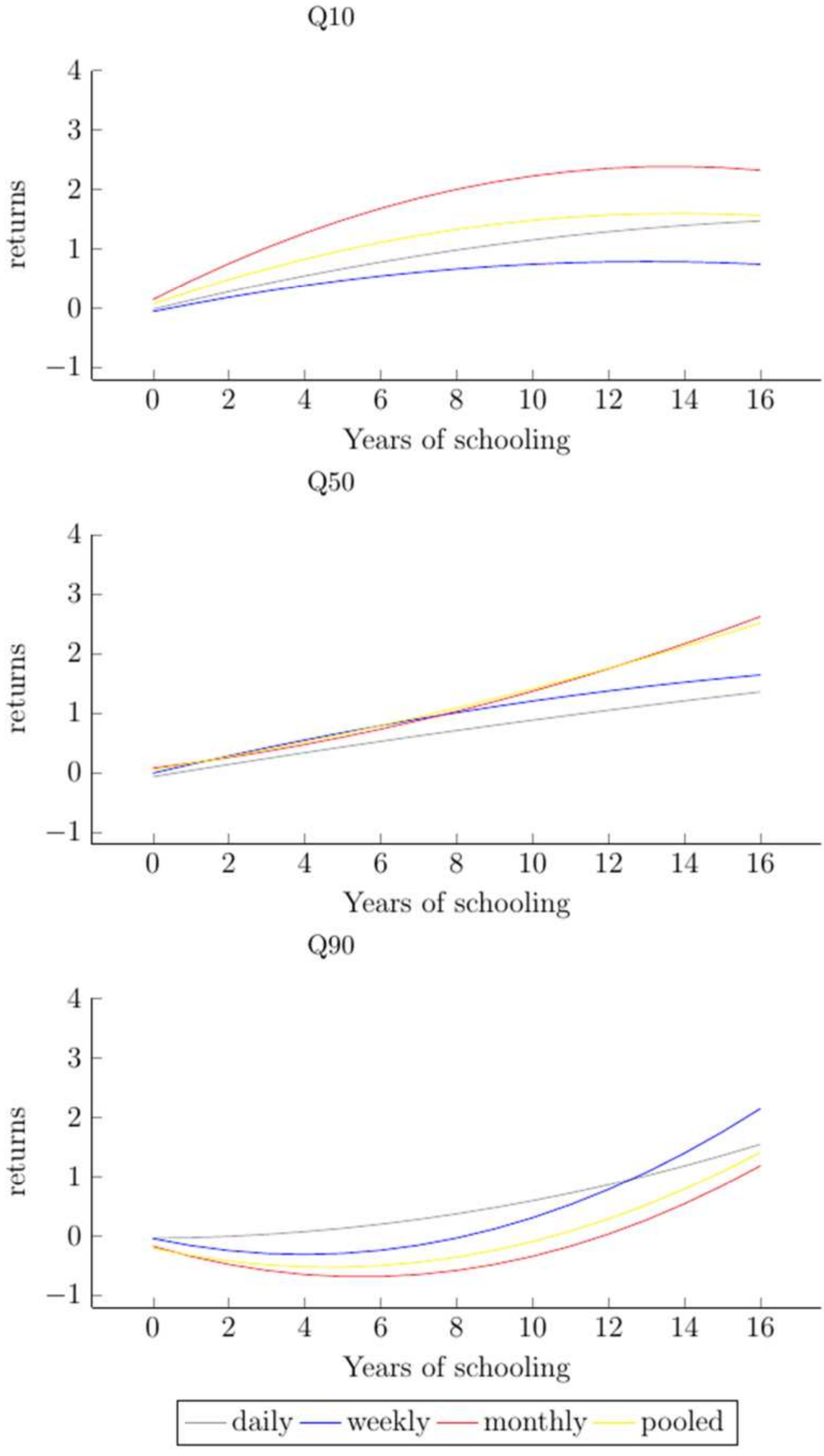

Figure 12: RIF coefficients of education – Uganda

For workers in the top decile, the effects of education are very small (even negative for Malawi) for early years of schooling but increase rapidly after about the 6th year, regardless of the pay period. Figures 10-12 also show that an increase in education in the population generates different earnings outcomes depending on the pay period (and on the level of education).

Table 7: Gender Differences in Earnings (US$ per month) by Period and Country

	Daily	Weekly	Monthly	Pooled
A. Malawi				
Male	77.68	100.02	99.15	98.49
Female	78.07	78.97	100.19	97.04
Difference	-0.39	21.05*	-1.04	1.45
Obs. Male	133	361	3,864	4,358
Obs. Female	49	144	1,265	1,458
Obs. Total	182	505	5,129	5,816
B. Tanzania				
Male	15.69	11.37	74.13	28.21
Female	3.71	3.69	41.42	10.98
Difference	11.98***	7.68***	32.71***	17.23***
Obs. Male	2,400	1,246	3,015	7,142
Obs. Female	1,338	683	1,815	4,073
Obs. Total	3,738	1,929	4,830	11,215
C. Uganda				
Male	43.98	41.83	65.22	54.48
Female	16.54	19.46	40.75	31.43
Difference	27.44***	22.37***	24.47***	23.05***
Obs. Male	981	422	1,743	3,156
Obs. Female	281	167	1,022	1,475
Obs. Total	1,262	589	2,765	4,631

Notes: Earnings reported as the geometric mean in $US (so not directly comparable to Table 2); Difference is geometric mean for males minus mean for females (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

5.2. RIF Decomposition

In this subsection, we assess the role of education in explaining inequality in gender earnings by pay period. We begin by comparing the differences in means of earnings and educational attainment between male and female workers as well as gender differences in returns to education. Table 7 shows the raw gender differences in wages. For Tanzania and Uganda female workers have lower wage earnings than their male counterparts across the pay periods, whereas for Malawi only females paid weekly have lower wage earnings than males. Tables 8 and 9 summarise the gender differences in educational attainment and returns to education, respectively. Table 8 shows that in all three countries there are significant differences in educational attainment between female and male workers. As expected, in most pay periods, female workers have lower educational attainment than their male counterparts. Table 9, on the other hand, shows that although returns are higher for females in most cases the differences are not statistically significant.

Table 8:Gender Differences in Education Endowment by Period and Country

	Daily	Weekly	Monthly	Pooled
A. Malawi				
Male	9.48	7.45	9.13	8.99
Female	7.73	6.44	9.66	9.23
Difference	1.75	1.01*	-0.53***	-0.23
Obs. Male	133	361	3,864	4,358
Obs. Female	49	144	1,265	1,458
Obs. Total	182	505	5,129	5,816
B. Tanzania				
Male	5.79	5.83	8.18	6.68
Female	4.46	4.31	8.11	5.81
Difference	1.34***	1.51***	0.07	0.86***
Obs. Male	2,400	1,246	3,015	7,142
Obs. Female	1,338	683	1,815	4,073
Obs. Total	3,738	1,929	4,830	11,215
C. Uganda				
Male	6.59	7.21	9.69	8.36
Female	5.37	6.35	10.12	8.83
Difference	1.22***	0.86*	-0.43*	-0.46**
Obs. Male	981	422	1,743	3,156
Obs. Female	281	167	1,022	1,475
Obs. Total	1,262	589	2,765	4,631

Notes: Mean years of education; Difference defined as arithmetic mean for males minus arithmetic mean for females (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

Following Rios-avila (2020) and Firpo et al. (2018) we then decompose the gender differences in the mean of log of earnings as well as the difference in wage inequality by country and pay period (see appendix Tables A17-A28 for decomposition for quantiles of log earnings). Tables 10 - 12 present the results for the reweighted RIF OB gender decomposition by pay period for each of the three countries. For each pay period the first column (odd numbered columns) shows the results for mean decomposition and the second column (even numbered columns) the results for interquantile share ratio decomposition. Counterfactual is the estimated distribution of earnings, showing what would female mean wages (or inequality) be if they had the coefficients of male. Explained refers to the part of the gap due to gender differences in characteristics/endowments. Unexplained refers to the part of the gap due to gender differences in returns to those characteristics. The pure components are the differences net of specification and reweight errors.

Table 9: Gender Differences in Returns to Education by Period and Country

	Daily	Weekly	Monthly	Pooled
A. Malawi				
Male	0.091	0.115	0.148	0.142
Female	0.148	0.105	0.198	0.182
Difference	-0.057*	0.010	-0.05***	-0.040***
Obs. Male	133	361	3,864	4,358
Obs. Female	49	144	1,265	1,458
Obs. Total	182	505	5,129	5,816
B. Tanzania				
Male	0.054	0.077	0.133	0.093
Female	0.025	0.055	0.177	0.123
Difference	0.029***	0.022**	-0.044***	-0.030***
Obs. Male	2,400	1,246	3,015	7,142
Obs. Female	1,338	683	1,815	4,073
Obs. Total	3,738	1,929	4,830	11,215
C. Uganda				
Male	0.085	0.091	0.140	0.139
Female	0.118	0.109	0.158	0.158
Difference	-0.033***	-0.018	-0.018***	-0.019***
Obs. Male	981	422	1,743	3,156
Obs. Female	281	167	1,022	1,475
Obs. Total	1,262	589	2,765	4,631

Notes: Difference is the returns (AME(sch)) for males minus the corresponding value for females (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

Table 10 reports the decomposition results for Malawi and shows that there is no substantial gender difference in earnings. Females paid by day and monthly have slightly higher wages than that of males, but the difference is not statistically significant. Table 10 also shows that with exception of workers paid daily, there is no significant differences in wage inequality between male and females. Wages for males who are paid daily are more unequally distributed than their female counterparts, but education does not seem to significantly explain the gender difference in inequality.

Table 10: Reweighted RIF OB Decomposition by Period and Gender—Malawi

	Daily		Weekly		Monthly		Pooled	
	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overall								
Male	4.353***	11.844***	4.605***	7.825***	4.597***	7.170***	4.590***	7.317***
Counterfactual	4.345***	9.751***	4.478***	8.637***	4.735***	8.728***	4.692***	8.812***
Female	4.358***	5.556***	4.369***	8.991***	4.607***	7.936***	4.575***	8.039***
Difference	-0.005	6.288**	0.237*	-1.166	-0.010	-0.765	0.015	-0.722
Explained	0.008	2.093	0.128	-0.812	-0.138***	-1.558***	-0.102***	-1.496***
Unexplained	-0.013	4.195	0.109	-0.354	0.128***	0.793	0.117***	0.773
Pure explained	0.000	1.522	0.128	-0.814	-0.139***	-1.553***	-0.104***	-1.431***
education	0.018	-0.071	-0.004	-0.604	-0.112***	-0.647***	-0.091***	-0.667***
covariates	-0.018	1.593	0.132	-0.210	-0.026	-0.906***	-0.012	-0.763***
Pure unexplained	0.034	3.657	0.094	-0.323	0.114***	0.772	0.102***	0.755
education	-0.494	13.757	0.206	6.624	-0.118	0.879	-0.079	1.284
covariates	-0.674	40.147	-1.170	30.730	0.027	-0.049	-0.160	3.204
constant	1.202	-50.248	1.058	-37.677	0.205	-0.058	0.341	-3.733
Specification error	0.008	0.571	-0.000	0.002	0.001	-0.005	0.001	-0.065
Reweight error	-0.047	0.538	0.015	-0.031	0.014*	0.021	0.015**	0.019
Obs. Male	133	133	361	361	3,864	3,864	4,358	4,358
Obs. Female	49	49	144	144	1,265	1,265	1,458	1,458
Obs. Total	182	182	505	505	5,129	5,129	5,816	5,816

Notes: *iqsr* is the interquantile share ratio defined as the ratio of the share earned by the top decile relative to the bottom four deciles within each sex and pay period. P-values calculated from bootstrap (500 replications) standard errors (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combined mean.

Table 11 reports RIF gender decomposition by period for Tanzania. The mean wage for males in Tanzania is higher than for females across the pay periods. Nonetheless, the mean difference is more substantial for workers reporting daily earnings relative to their weekly and monthly counterparts. Specifically, males that report daily earnings earn 1.4 log points higher than their female counterparts, compared to 1.1 and 0.6 higher, respectively, for males reporting weekly and monthly earnings.

The results in Table 11 suggest that education is among the significant factors explaining the gender wag gap in daily and weekly. Of the pure explained gender gap in earnings, differences in education explains approximately 7% and 14% for workers paid daily and weekly, respectively. This suggests that if females in daily and weekly had the same level of education endowments as males, their wage earnings would have been respectively 7% and 14% higher. In addition, the findings for Tanzania also show that gender differences in returns to education explains the earnings gap for workers paid weekly and monthly. Precisely, of the pure unexplained gender gap in earnings, difference in returns to education between males and females explains approximately 22% and 47% for those in weekly and monthly respectively. Note that the coefficient of education for monthly is negative implying that females have higher returns to education than males. On the other hand, the results from the interquantile share ratio decomposition in Table 11 suggest that education does not play a significant role in explaining the inequality differences across gender in Tanzania. Table 11 shows that in both the mean and *iqsr* decomposition there are some significant[7] specifications and reweight errors but these are relatively small.

Table 11:Reweighted RIF Oaxaca-Blinder Decomposition by Period and Gender—Tanzania

Period	Daily		Weekly		Monthly		Pooled	
RIF	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overall								
Male	2.753***	25.249***	2.431***	30.233***	4.306***	5.153***	3.340***	17.167***
Counterfactual	1.959***	41.047***	1.760***	35.435***	4.088***	6.648***	2.951***	27.568***
Female	1.312***	25.070***	1.306***	15.749***	3.724***	9.104***	2.396***	38.566***
Difference	1.441***	0.179	1.125***	14.485***	0.582***	-3.951***	0.944***	-21.400***
Explained	0.794***	-15.798***	0.671***	-5.202**	0.218***	-1.495***	0.389***	-10.401***
Unexplained	0.647***	15.977***	0.454***	19.686***	0.364***	-2.456***	0.555***	-10.998***
Pure explained	0.810***	-17.786***	0.659***	-14.952***	0.215***	-1.469***	0.384***	-9.848***
education	0.055***	-0.210	0.094***	0.400	-0.008	-0.037	0.028***	-0.974***
covariates	0.755***	-17.576***	0.565***	-15.352***	0.223***	-1.432***	0.356***	-8.874***
Pure unexplained	0.726***	13.832***	0.519***	20.072***	0.340***	-2.237***	0.549***	-11.369***
education	0.034	-7.010	0.112*	3.787	-0.159*	-1.713	-0.115***	-17.536***
covariates	0.872***	-33.075	-0.037	-39.091	0.125	22.662***	0.236	37.625**
constant	-0.180	53.916	0.444	55.376*	0.374	-23.186***	0.428**	-31.458*
Specification error	-0.016**	1.988	0.012	9.750***	0.003	-0.026	0.005**	-0.553
Reweight error	-0.079***	2.146***	-0.064***	-0.386	0.024**	-0.219*	0.006	0.371
Obs. Male	2,400	2,400	1,246	1,246	3,015	3,015	7,142	7,142
Obs. Female	1,338	1,338	683	683	1,815	1,815	4,073	4,073
Obs. Total	3,738	3,738	1,929	1,929	4,830	4,830	11,215	11,215

Notes: As for Table 10.

Table 12 presents the corresponding results for Uganda. Like Tanzania, the mean wage for males in Uganda is higher than that of females across the pay periods, and gender earnings gap is wider for workers reporting daily earnings relative to their weekly and monthly counterparts. In addition, while males are on average better paid than females, males' wages are more equally distributed than females' wages. The findings show that while gender differences in education attainment play a significant role in explaining the gender earnings gap across the pay periods, gender differences in returns to education do not.

7 As the results are from two-steps estimation, increasing the bootstrap replications may lower the significance.

Of the pure explained gender gap in earnings, differences in education explains approximately 37%, 38% and 33% for workers paid daily, weekly, and monthly respectively. This implies that if females in daily and weekly had the same level of education endowments as males, their wage earnings would have been more than a third higher. Because females paid monthly have higher educational attainment than their male counterparts, the coefficient is negative pointing out that if females had the same level of education as males then their wages would have been about a third lower. The results from the interquantile share ratio decomposition in Table 12 shows a significant difference in inequality between male and female who are paid monthly. This finding shows that if females in monthly had the same level of education endowments as males, their inequality would have been about 10% higher.

Table 12: Reweighted RIF Oaxaca-Blinder Decomposition by Period and Gender—Uganda

Period	Daily		Weekly		Monthly		Pooled	
RIF	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*	Mean	*iqsr*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Overall								
Male	3.784***	5.082***	3.734***	5.689***	4.178***	4.776***	3.998***	5.176***
Counterfactual	3.335***	7.213***	3.491***	7.087***	4.039***	5.858***	3.901***	6.821***
Female	2.806***	6.015***	2.968***	8.994***	3.707***	6.220***	3.448***	7.510***
Difference	0.978***	-0.933	0.766***	-3.305	0.470***	-1.444**	0.550***	-2.334***
Explained	0.449***	-2.131**	0.243**	-1.398	0.138***	-1.082***	0.097**	-1.645***
Unexplained	0.529***	1.198	0.523***	-1.907	0.332***	-0.362	0.454***	-0.689
Pure explained	0.452***	-1.969***	0.235**	-1.445*	0.135***	-1.051***	0.096**	-1.538***
education	0.167***	-0.686***	0.090**	-0.533	-0.045*	0.108**	-0.043**	-0.474***
covariates	0.286***	-1.283**	0.145	-0.912	0.181***	-1.159***	0.140***	-1.063***
Pure unexplained	0.602***	0.714	0.548***	-1.963	0.327***	-0.346	0.443***	-0.686
education	-0.086	-1.366	-0.131	-3.701	-0.148	1.918	-0.256***	3.034*
covariates	1.596**	-17.619*	-0.475	-9.744	-0.576	5.670	-0.299	10.289
constant	-0.908	19.699*	1.154	11.481	1.051**	-7.934	0.998***	-14.010*
Specification error	-0.003	-0.162	0.008	0.046	0.003	-0.031	0.001	-0.107
Reweight error	-0.073	0.484	-0.025	0.056	0.005	-0.016	0.011	-0.003
Obs. Male	981	981	422	422	1,743	1,743	3,156	3,156
Obs. Female	281	281	167	167	1,022	1,022	1,475	1,475
Obs. Total	1,262	1,262	589	589	2,765	2,765	4,631	4,631

Notes: As for Table 10.

5.3. Distributional Effects of Education in *Ganyu* Labour

This subsection presents the analysis and results for *ganyu* labour. It follows the same approach employed in the main analysis. It begins by examining how an increase in education in the population affects the distribution of earnings at different unconditional quantiles of earnings. It then goes further to explore whether gender differences in education significantly explain the wage gap between male and female workers in *ganyu*.

Table 13 reports the distribution effect of education for *ganyu* workers using both linear and quadratic specification of the earnings function. The coefficients from the linear specification shows that an increase in the population's average education by a year increases the mean wage of *ganyu* workers by 7 – 16% depending on the quantile of earnings distribution. Figure 13 shows that at the 90th quantile, the predicted returns are more convex than at the 10th and 50th quantiles which implies that an increase in education is more likely to benefit the higher than the lower wage earners.

Table 13: Unconditional Quantile Regression (RIF) Results for *Ganyu*

	(1) q(10)	(2) q(25)	(3) q(50)	(4) q(75)	(5) q(90)
Linear					
sch	0.070***	0.125***	0.128***	0.161***	0.123***
	(0.007)	(0.006)	(0.005)	(0.007)	(0.006)
Covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.841	3.672	4.692	5.558	6.298
R^2	0.39	0.45	0.48	0.37	0.19
Obs.	5,816	5,816	5,816	5,816	5,816
Quadratic					
sch	0.126***	0.083***	-0.061***	-0.167***	-0.258***
	(0.026)	(0.020)	(0.014)	(0.017)	(0.024)
sch2	-0.003**	0.003**	0.012***	0.020***	0.024***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Covariates	Yes	Yes	Yes	Yes	Yes
RIF mean	2.841	3.672	4.692	5.558	6.298
R^2	0.39	0.45	0.49	0.41	0.25
Obs.	5,816	5,816	5,816	5,816	5,816

Notes: Bootstrap standard errors computed by 500 replications in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). Full results with all variables included in the RIF regression available upon request.

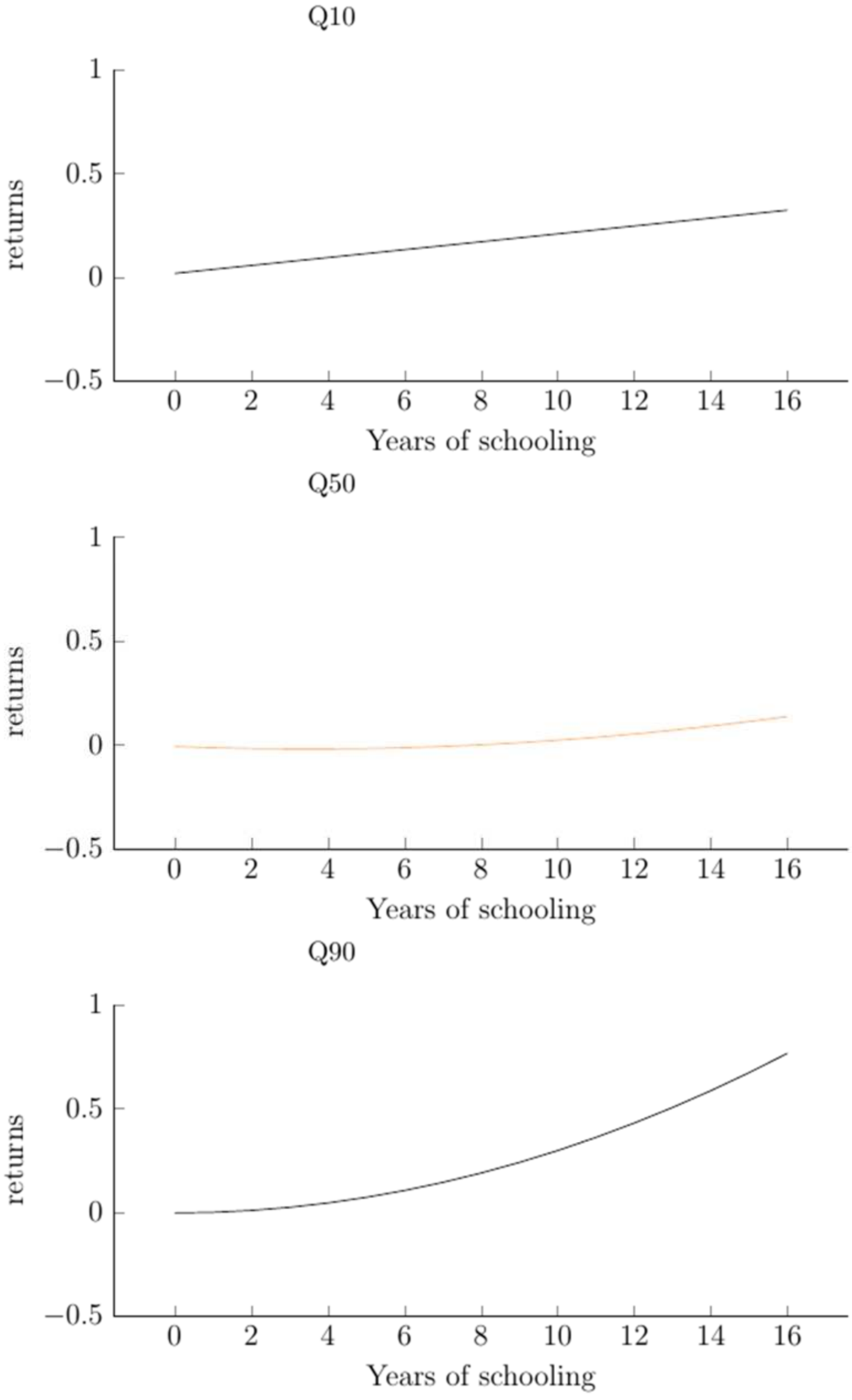

Figure 13: RIF coefficients of education – *Ganyu*

Tables 14, 15 and 16 show gender differences in earnings, education attainment and returns to education, respectively. Males have higher earnings, more schooling and higher returns to schooling. Table 17 reports the results for gender wage gap decomposition. Males in *ganyu* earn higher than females in both rural and urban areas. The results suggest that gender differences in education explain about 7% of the pure explained wage gap and the effect is slightly higher (8.5%) in urban areas. Since males are better endowed with education than females, the results imply that raising the female endowment of education to the male level would increase females' earnings and narrow the earnings gap in both rural and urban areas.

Table 14: Gender Differences in Earnings (US$ per month) by Location in *Ganyu*

	All	Rural	Urban
Male	16.74	15.51	37.65
Female	8.59	8.35	12.73
Difference	7.15***	6.16***	24.92***
Obs. Male	8,282	7,570	712
Obs. Female	8,246	7,681	565
Obs. Total	16,528	15,259	1,277

Notes: As for Table 7.

Table 15: Gender Differences in Education Attainment by Location in *Ganyu*

	All	Rural	Urban
Male	5.51	5.33	7.30
Female	4.06	3.93	5.68
Difference	1.45***	1.40***	1.62***
Obs. Male	8,282	7,570	712
Obs. Female	8,246	7,681	565
Obs. Total	16,528	15,259	1,277

Notes: As for Table 8.

Table 16: Gender Differences in Returns to Education by Location in *Ganyu*

	All	Rural	Urban
Male	0.022	0.019	0.053
Female	0.013	0.011	0.049
Difference	0.009***	0.008***	0.004
Obs. Male	8,282	7,570	712
Obs. Female	8,246	7,681	565
Obs. Total	16,528	15,259	1,277

Notes: As for Table 9.

Table 17: Reweighted RIF OB Decomposition by Gender– *Ganyu*

	(1) All	(2) Rural	(3) Urban
Overall			
Male	2.898***	2.816***	3.713***
Counterfactual	2.528***	2.504***	2.865***
Female	2.250***	2.230***	2.507***
Difference	0.648***	0.586***	1.206***
Explained	0.370***	0.312***	0.848***
Unexplained	0.278***	0.275***	0.358**
Pure Explained	0.371***	0.312***	0.850***
education	0.027***	0.022***	0.073***
covariates	0.343***	0.289***	0.777***
Pure Unexplained	0.336***	0.321***	0.492***
education	0.043	0.036	0.170
covariates	0.364**	0.515***	0.589
constant	-0.070	-0.230	-0.268
Specification error	-0.001	0.000	-0.002
Reweight error	-0.058**	-0.046	-0.133
Obs. Male	8,282	7,570	712
Obs. Female	8,246	7,681	565
Obs. Total	16,528	15,259	1,277

Notes: All other OLS regressors included in the RIF regression. P-values calculated from bootstrapped standard errors with 500 replications (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$). The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combined mean.

6. Conclusion

Education is among the key factors that determine the levels of earnings among workers. But is the effect of education on earnings the same for low and high wage earners? Studies seeking to answer this question have mainly done so while aggregating various pay periods to a common period. This paper re-examined the relationship between education and earnings along the unconditional earnings distribution, taking into consideration the effects of pay period. Using nationally representative data from Malawi, Tanzania and Uganda and RIF regression techniques, we found that estimates significantly differ across the pay periods in all three countries. Generally, the effect of education is stronger for workers reporting monthly earnings compared to their daily and weekly counterparts, consistent with formal sector workers being more likely to be paid monthly.

Examination of the RIF means by the unconditional quantile of earnings revealed a considerable earnings inequality between low-wage and high-wage workers. To assess if education is a significant factor in explaining this, wage inequality is measured by the interquantile share ratio of the top decile of earnings to the bottom four deciles (bottom 40%). The findings from RIF regression reveal that education can either contribute to increasing or reducing wage inequality depending on the period in which the worker is paid. Education is found to increase inequality for workers paid monthly (suggesting higher wages for more skilled workers) and reduce inequality for those paid daily and monthly (perhaps because more educated workers are recent or temporary entrants with less on the job experience).

The paper investigated how much of the gender differences in earnings and inequality can be attributed to gender differences in educational attainment for each of the pay periods. Employing RIF decomposition, we found that gender differences in education significantly explain the gender wage gap for workers paid daily and weekly for Tanzania, and in all pay periods for Uganda, while there was no significant gender wage gap for Malawi. This suggests that, for Tanzania and Uganda, policies targeting increasing female education attainment could narrow the gender wage gap. Further decomposition of the inequality within gender shows that inequality is higher among women compared to men, but the difference is mainly insignificant. An extension examined the distributional effects of education on earnings for casual (*ganyu)* workers in Malawi. An increase in the population's average education by a year increases the mean wage of *ganyu* workers by 7 – 16% depending on the quantile of earnings distribution. Decomposition shows that the gender differences in education explain about 7% of the pure explained wage gap and the effect is slightly higher in urban areas.

The findings show that education can significantly reduce the gender earnings gap. Further data and analysis would be required to identify policies to achieve gender equality, such as increasing girls' enrolment in all levels of education and addressing inequalities in the labour market (in terms of the types of work available).

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APPENDICES

Table A1: RIF Regression Results by Quantile of Earnings for Malawi (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.103**	0.137***	0.083*	0.090**	0.119***	0.110***	0.092**	0.060	0.039
	(0.043)	(0.045)	(0.043)	(0.043)	(0.042)	(0.039)	(0.036)	(0.037)	(0.042)
age	0.069	0.049	0.019	0.097	0.094	0.036	0.059	0.020	-0.032
	(0.117)	(0.112)	(0.137)	(0.133)	(0.109)	(0.103)	(0.091)	(0.087)	(0.083)
age2	-0.086	-0.054	-0.013	-0.085	-0.092	-0.000	-0.027	-0.002	0.081
	(0.145)	(0.138)	(0.176)	(0.164)	(0.137)	(0.131)	(0.118)	(0.113)	(0.108)
female	-0.069	-0.039	0.227	0.601	-0.009	-0.091	-0.118	-0.178	-0.225
	(0.433)	(0.384)	(0.418)	(0.464)	(0.379)	(0.327)	(0.341)	(0.310)	(0.281)
rural	0.138	-0.233	-0.540	-0.644*	-0.664*	-0.353	-0.077	-0.320	-0.473
	(0.392)	(0.377)	(0.404)	(0.371)	(0.379)	(0.360)	(0.351)	(0.351)	(0.363)
year	0.483	0.077	1.163**	1.659***	1.433***	1.131***	0.821***	0.524*	0.456**
	(0.450)	(0.508)	(0.581)	(0.506)	(0.426)	(0.364)	(0.317)	(0.270)	(0.226)
weeks	1.863***	2.442***	2.195***	2.063***	1.655***	1.123***	0.789***	0.611***	0.298*
	(0.593)	(0.465)	(0.410)	(0.323)	(0.316)	(0.254)	(0.191)	(0.160)	(0.166)
_cons	-6.937**	-7.854***	-5.957**	-7.246***	-4.947**	-1.768	-0.361	2.300	4.951***
	(3.004)	(2.657)	(3.023)	(2.678)	(2.493)	(2.028)	(1.952)	(1.828)	(1.579)
RIFmean	2.190	2.785	3.509	3.998	4.583	5.026	5.497	5.782	6.298
r2	0.255	0.363	0.311	0.356	0.348	0.295	0.221	0.123	0.106
Obs.	182	182	182	182	182	182	182	182	182

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: RIF Regression Results for Malawi (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.007	0.041**	0.064***	0.063***	0.081***	0.109***	0.116***	0.167***	0.206***
	(0.021)	(0.020)	(0.016)	(0.016)	(0.016)	(0.018)	(0.023)	(0.028)	(0.040)
age	0.018	0.089*	0.143***	0.092**	0.094**	0.057	0.076**	0.055	0.055
	(0.057)	(0.046)	(0.048)	(0.044)	(0.040)	(0.038)	(0.037)	(0.040)	(0.052)
age2	-0.027	-0.116**	-0.171***	-0.110**	-0.101**	-0.039	-0.069	-0.037	-0.012
	(0.068)	(0.059)	(0.061)	(0.055)	(0.051)	(0.049)	(0.048)	(0.053)	(0.070)
female	-0.172	-0.058	-0.008	-0.062	-0.123	-0.140	-0.053	-0.012	0.234
	(0.169)	(0.161)	(0.145)	(0.140)	(0.133)	(0.133)	(0.143)	(0.155)	(0.233)
rural	-0.100	-0.473***	-0.664***	-0.525***	-0.456***	-0.497***	-0.353**	-0.183	-0.014
	(0.171)	(0.161)	(0.151)	(0.162)	(0.144)	(0.142)	(0.156)	(0.174)	(0.277)
year	0.698***	1.319***	1.600***	1.419***	1.243***	0.968***	0.973***	0.842***	1.098***
	(0.172)	(0.170)	(0.158)	(0.186)	(0.165)	(0.145)	(0.150)	(0.157)	(0.212)
weeks	2.088***	1.512***	1.179***	1.106***	0.970***	0.779***	0.678***	0.478***	0.409***
	(0.342)	(0.154)	(0.132)	(0.106)	(0.098)	(0.092)	(0.085)	(0.086)	(0.101)
_cons	-4.853***	-4.108***	-3.865***	-2.184**	-1.685**	-0.257	-0.045	0.829	0.730
	(1.804)	(1.009)	(1.006)	(0.911)	(0.856)	(0.856)	(0.798)	(0.891)	(1.162)
RIF Mean	2.946	3.395	3.867	4.296	4.592	4.942	5.255	5.608	6.243
R2	0.500	0.421	0.440	0.402	0.379	0.355	0.307	0.268	0.226
Obs.	505	505	505	505	505	505	505	505	505

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: RIF Regression Results for Malawi (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.076***	0.121***	0.149***	0.153***	0.133***	0.125***	0.160***	0.161***	0.123***
	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
age	0.053***	0.074***	0.091***	0.096***	0.068***	0.060***	0.054***	0.050***	0.039***
	(0.019)	(0.016)	(0.013)	(0.012)	(0.010)	(0.010)	(0.012)	(0.013)	(0.012)
age2	-0.056**	-0.080***	-0.089***	-0.091***	-0.059***	-0.049***	-0.040**	-0.037**	-0.027*
	(0.023)	(0.020)	(0.016)	(0.015)	(0.013)	(0.013)	(0.015)	(0.016)	(0.016)
female	-0.150**	-0.179***	-0.119***	0.027	0.036	-0.075*	-0.110**	0.025	-0.046
	(0.061)	(0.049)	(0.045)	(0.049)	(0.040)	(0.041)	(0.046)	(0.056)	(0.057)
rural	-0.279***	-0.322***	-0.179***	-0.076	-0.087**	-0.203***	-0.167***	-0.127***	-0.250***
	(0.049)	(0.049)	(0.047)	(0.048)	(0.037)	(0.036)	(0.044)	(0.049)	(0.065)
year	0.944***	1.167***	1.402***	1.507***	1.467***	1.567***	1.641***	1.450***	0.962***
	(0.051)	(0.049)	(0.053)	(0.062)	(0.052)	(0.054)	(0.058)	(0.063)	(0.062)
weeks	2.360***	1.767***	1.556***	1.252***	0.958***	0.793***	0.659***	0.506***	0.310***
	(0.141)	(0.077)	(0.064)	(0.064)	(0.040)	(0.037)	(0.039)	(0.040)	(0.032)
_cons	-7.691***	-5.903***	-5.628***	-4.490***	-2.233***	-1.097***	-0.509*	0.575*	2.710***
	(0.682)	(0.431)	(0.354)	(0.344)	(0.262)	(0.258)	(0.290)	(0.298)	(0.271)
rifmean	2.893	3.468	3.908	4.266	4.702	4.998	5.374	5.790	6.304
r2	0.394	0.439	0.487	0.491	0.495	0.481	0.423	0.336	0.196
Obs.	5129	5129	5129	5129	5129	5129	5129	5129	5129

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: RIF Regression Results for Malawi (pooled)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	q(10)	q(20)	q(30)	q(40)	q(50)	q(60)	q(70)	q(80)	q(90)
sch	0.070***	0.112***	0.138***	0.138***	0.128***	0.121***	0.155***	0.160***	0.123***
	(0.007)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)
age	0.052***	0.076***	0.097***	0.093***	0.070***	0.059***	0.057***	0.045***	0.041***
	(0.018)	(0.015)	(0.013)	(0.012)	(0.010)	(0.010)	(0.011)	(0.012)	(0.012)
age2	-0.057***	-0.084***	-0.098***	-0.090***	-0.063***	-0.047***	-0.044***	-0.029*	-0.028*
	(0.022)	(0.019)	(0.017)	(0.015)	(0.012)	(0.013)	(0.014)	(0.015)	(0.016)
female	-0.153***	-0.150***	-0.084*	-0.013	0.028	-0.076*	-0.102**	0.029	-0.026
	(0.057)	(0.046)	(0.044)	(0.046)	(0.040)	(0.039)	(0.045)	(0.052)	(0.053)
rural	-0.276***	-0.320***	-0.233***	-0.178***	-0.139***	-0.249***	-0.196***	-0.175***	-0.249***
	(0.047)	(0.043)	(0.043)	(0.047)	(0.034)	(0.033)	(0.039)	(0.044)	(0.059)
year	0.933***	1.175***	1.419***	1.419***	1.425***	1.485***	1.526***	1.389***	0.952***
	(0.054)	(0.049)	(0.054)	(0.055)	(0.049)	(0.053)	(0.060)	(0.061)	(0.056)
weeks	2.427***	1.720***	1.517***	1.297***	0.965***	0.798***	0.646***	0.528***	0.313***
	(0.142)	(0.072)	(0.063)	(0.052)	(0.035)	(0.035)	(0.036)	(0.035)	(0.026)
_cons	-7.803***	-5.689***	-5.488***	-4.221***	-2.193***	-0.978***	-0.425	0.630**	2.633***
	(0.655)	(0.403)	(0.353)	(0.297)	(0.247)	(0.250)	(0.266)	(0.265)	(0.258)
rifmean	2.841	3.427	3.876	4.354	4.692	4.995	5.360	5.797	6.298
r2	0.388	0.421	0.469	0.475	0.475	0.458	0.402	0.324	0.191
Obs.	5816	5816	5816	5816	5816	5816	5816	5816	5816

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: RIF Regression Results for Malawi (*Ganyu*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	q(10)	q(20)	q(30)	q(40)	q(50)	q(60)	q(70)	q(80)	q(90)
sch	0.022***	0.017***	0.019***	0.011***	0.008**	0.013***	0.019***	0.026***	0.026***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
age	0.027***	0.040***	0.048***	0.046***	0.048***	0.050***	0.044***	0.047***	0.044***
	(0.009)	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)
age2	-0.030***	-0.047***	-0.055***	-0.056***	-0.059***	-0.061***	-0.053***	-0.054***	-0.052***
	(0.012)	(0.009)	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.008)	(0.009)
female	-0.126***	-0.176***	-0.266***	-0.325***	-0.392***	-0.437***	-0.467***	-0.513***	-0.523***
	(0.038)	(0.028)	(0.029)	(0.024)	(0.024)	(0.025)	(0.025)	(0.028)	(0.035)
rural	0.019	-0.060	-0.086**	-0.161***	-0.295***	-0.365***	-0.473***	-0.624***	-0.847***
	(0.060)	(0.048)	(0.042)	(0.041)	(0.042)	(0.042)	(0.048)	(0.062)	(0.085)
year	1.109***	1.375***	1.520***	1.605***	1.584***	1.393***	1.263***	1.144***	0.808***
	(0.047)	(0.042)	(0.039)	(0.043)	(0.038)	(0.044)	(0.029)	(0.033)	(0.030)
weeks	1.324***	1.215***	1.156***	1.112***	1.028***	0.964***	0.939***	0.917***	0.745***
	(0.047)	(0.032)	(0.025)	(0.022)	(0.023)	(0.019)	(0.019)	(0.021)	(0.023)
_cons	-3.791***	-3.058***	-2.639***	-1.919***	-1.179***	-0.555***	0.204*	0.852***	2.300***
	(0.247)	(0.179)	(0.141)	(0.129)	(0.133)	(0.119)	(0.123)	(0.132)	(0.154)
rifmean	0.523	1.277	1.740	2.192	2.569	2.942	3.371	3.834	4.423
r2	0.310	0.447	0.516	0.540	0.529	0.488	0.430	0.347	0.200
Obs.	16528	16528	16528	16528	16528	16528	16528	16528	16528

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: RIF Regression Results for Tanzania (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	-0.014	0.006	0.027***	0.025**	0.030***	0.055***	0.077***	0.070***	0.042***
	(0.012)	(0.012)	(0.010)	(0.011)	(0.010)	(0.012)	(0.013)	(0.012)	(0.012)
age	0.035	0.025	0.057***	0.057***	0.075***	0.079***	0.076***	0.071***	0.056***
	(0.022)	(0.021)	(0.016)	(0.016)	(0.017)	(0.020)	(0.019)	(0.017)	(0.016)
age2	-0.033	-0.030	-0.069***	-0.074***	-0.101***	-0.101***	-0.094***	-0.085***	-0.064***
	(0.029)	(0.028)	(0.023)	(0.022)	(0.023)	(0.026)	(0.025)	(0.023)	(0.021)
female	-0.384***	-0.407***	-0.613***	-0.815***	-1.012***	-1.153***	-1.189***	-0.991***	-0.633***
	(0.130)	(0.102)	(0.073)	(0.076)	(0.080)	(0.089)	(0.095)	(0.086)	(0.062)
rural	0.037	0.051	-0.162**	-0.321***	-0.637***	-0.999***	-1.327***	-1.085***	-0.698***
	(0.094)	(0.080)	(0.068)	(0.068)	(0.080)	(0.102)	(0.131)	(0.132)	(0.119)
panel	-0.243**	-0.178**	-0.214***	-0.275***	-0.304***	-0.366***	-0.183*	-0.073	-0.141
	(0.100)	(0.086)	(0.077)	(0.073)	(0.077)	(0.091)	(0.098)	(0.100)	(0.097)
weeks	0.894***	1.339***	1.333***	1.347***	1.440***	1.553***	1.550***	1.142***	0.680***
	(0.111)	(0.059)	(0.052)	(0.047)	(0.054)	(0.059)	(0.061)	(0.053)	(0.033)
_cons	-2.768***	-2.806***	-2.615***	-1.883***	-1.593***	-1.044***	-0.261	1.157***	2.916***
	(0.388)	(0.372)	(0.316)	(0.299)	(0.329)	(0.367)	(0.390)	(0.339)	(0.298)
rifmean	-0.274	0.500	1.129	1.631	2.091	2.812	3.475	4.194	4.922
r2	0.193	0.371	0.458	0.495	0.528	0.524	0.486	0.381	0.198
Obs.	3738	3738	3738	3738	3738	3738	3738	3738	3738

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: RIF Regression Results for Tanzania (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.006	0.032**	0.019	0.039***	0.046***	0.071***	0.082***	0.113***	0.127***
	(0.016)	(0.013)	(0.013)	(0.013)	(0.011)	(0.013)	(0.015)	(0.016)	(0.019)
age	0.048*	0.049**	0.036*	0.039**	0.040**	0.050***	0.056***	0.039*	0.031
	(0.028)	(0.021)	(0.019)	(0.019)	(0.018)	(0.018)	(0.019)	(0.023)	(0.028)
age2	-0.056	-0.053*	-0.040	-0.045*	-0.048*	-0.062**	-0.069***	-0.045	-0.028
	(0.038)	(0.028)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.030)	(0.038)
female	-0.348***	-0.315***	-0.429***	-0.591***	-0.714***	-0.598***	-0.550***	-0.746***	-0.783***
	(0.107)	(0.101)	(0.092)	(0.078)	(0.088)	(0.091)	(0.096)	(0.097)	(0.103)
rural	0.698***	0.469***	0.380***	0.200**	-0.135	-0.488***	-0.886***	-1.166***	-1.554***
	(0.124)	(0.092)	(0.087)	(0.093)	(0.088)	(0.109)	(0.150)	(0.170)	(0.235)
panel	-0.003	0.057	-0.024	0.020	-0.119	-0.142	-0.126	-0.444***	-0.430***
	(0.114)	(0.104)	(0.099)	(0.100)	(0.097)	(0.100)	(0.117)	(0.128)	(0.154)
weeks	0.884***	1.042***	1.246***	1.348***	1.456***	1.360***	1.273***	1.068***	0.907***
	(0.060)	(0.061)	(0.057)	(0.063)	(0.057)	(0.061)	(0.059)	(0.061)	(0.072)
_cons	-3.312***	-2.951***	-2.344***	-1.970***	-1.350***	-0.760**	-0.011	1.513***	2.979***
	(0.552)	(0.398)	(0.361)	(0.351)	(0.353)	(0.370)	(0.395)	(0.436)	(0.532)
rifmean	-0.232	0.457	0.999	1.526	2.048	2.503	2.948	3.642	4.509
r2	0.234	0.382	0.513	0.566	0.601	0.573	0.526	0.414	0.272
Obs.	1929	1929	1929	1929	1929	1929	1929	1929	1929

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: RIF Regression Results for Tanzania (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.069***	0.110***	0.143***	0.178***	0.176***	0.175***	0.179***	0.175***	0.167***
	(0.010)	(0.009)	(0.008)	(0.009)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)
age	0.143***	0.181***	0.187***	0.160***	0.116***	0.079***	0.055***	0.024**	0.007
	(0.023)	(0.016)	(0.013)	(0.014)	(0.011)	(0.010)	(0.009)	(0.009)	(0.011)
age2	-0.177***	-0.205***	-0.196***	-0.155***	-0.103***	-0.058***	-0.031**	0.008	0.030*
	(0.027)	(0.019)	(0.016)	(0.017)	(0.013)	(0.013)	(0.012)	(0.013)	(0.016)
female	-0.218***	-0.298***	-0.511***	-0.547***	-0.455***	-0.351***	-0.261***	-0.163***	-0.086*
	(0.075)	(0.070)	(0.057)	(0.053)	(0.046)	(0.044)	(0.044)	(0.045)	(0.050)
rural	-0.260***	-0.391***	-0.349***	-0.393***	-0.317***	-0.224***	-0.187***	-0.175***	-0.185***
	(0.066)	(0.056)	(0.051)	(0.047)	(0.041)	(0.037)	(0.040)	(0.042)	(0.046)
panel	-0.013	0.037	0.022	0.118**	-0.029	-0.151***	-0.205***	-0.202***	-0.264***
	(0.060)	(0.052)	(0.048)	(0.051)	(0.044)	(0.043)	(0.045)	(0.048)	(0.056)
weeks	2.482***	1.797***	1.510***	1.175***	0.848***	0.607***	0.455***	0.300***	0.155***
	(0.155)	(0.087)	(0.063)	(0.053)	(0.033)	(0.025)	(0.023)	(0.022)	(0.021)
_cons	-9.396***	-7.517***	-6.435***	-4.833***	-2.364***	-0.535***	0.728***	2.133***	3.482***
	(0.717)	(0.473)	(0.364)	(0.373)	(0.247)	(0.208)	(0.193)	(0.188)	(0.194)
rifmean	2.137	2.863	3.465	3.853	4.352	4.701	5.021	5.368	5.838
r2	0.445	0.482	0.502	0.483	0.444	0.384	0.322	0.263	0.185
Obs.	4830	4830	4830	4830	4830	4830	4830	4830	4830

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: RIF Regression Results for Tanzania (pooled)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	-0.003	0.018***	0.043***	0.088***	0.125***	0.164***	0.177***	0.170***	0.171***
	(0.007)	(0.006)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)	(0.007)
age	0.018	0.040***	0.064***	0.102***	0.125***	0.126***	0.100***	0.070***	0.034***
	(0.014)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.008)	(0.008)
age2	-0.030	-0.057***	-0.088***	-0.123***	-0.139***	-0.124***	-0.088***	-0.051***	-0.003
	(0.018)	(0.015)	(0.014)	(0.014)	(0.013)	(0.012)	(0.011)	(0.011)	(0.011)
female	-0.477***	-0.668***	-0.676***	-0.691***	-0.709***	-0.724***	-0.587***	-0.369***	-0.184***
	(0.059)	(0.061)	(0.044)	(0.049)	(0.045)	(0.043)	(0.037)	(0.039)	(0.035)
rural	0.124**	-0.100**	-0.302***	-0.532***	-0.700***	-0.695***	-0.581***	-0.361***	-0.286***
	(0.049)	(0.045)	(0.040)	(0.040)	(0.046)	(0.051)	(0.046)	(0.045)	(0.047)
panel	-0.138**	-0.117***	-0.043	-0.071*	0.003	0.021	-0.076**	-0.153***	-0.183***
	(0.054)	(0.044)	(0.041)	(0.038)	(0.041)	(0.039)	(0.037)	(0.036)	(0.040)
weeks	1.405***	1.712***	1.826***	1.659***	1.493***	1.154***	0.823***	0.509***	0.307***
	(0.054)	(0.046)	(0.045)	(0.039)	(0.041)	(0.028)	(0.023)	(0.015)	(0.014)
_cons	-3.507***	-3.814***	-3.880***	-3.701***	-3.388***	-2.441***	-0.658***	1.028***	2.698***
	(0.277)	(0.232)	(0.223)	(0.215)	(0.219)	(0.201)	(0.181)	(0.162)	(0.152)
rifmean	0.307	1.155	1.880	2.572	3.199	3.745	4.380	4.836	5.461
r2	0.299	0.500	0.582	0.596	0.576	0.505	0.432	0.308	0.204
Obs.	11215	11215	11215	11215	11215	11215	11215	11215	11215

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: RIF Regression Results for Uganda (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.107***	0.095***	0.110***	0.095***	0.094***	0.093***	0.088***	0.083***	0.074***
	(0.022)	(0.017)	(0.014)	(0.013)	(0.012)	(0.013)	(0.013)	(0.013)	(0.015)
age	-0.027	0.028	0.069***	0.105***	0.104***	0.095***	0.095***	0.116***	0.096***
	(0.041)	(0.028)	(0.025)	(0.025)	(0.023)	(0.020)	(0.020)	(0.020)	(0.020)
age2	0.033	-0.042	-0.090***	-0.142***	-0.135***	-0.123***	-0.121***	-0.143***	-0.115***
	(0.056)	(0.039)	(0.034)	(0.034)	(0.032)	(0.028)	(0.027)	(0.026)	(0.027)
female	-0.672***	-0.735***	-0.652***	-0.767***	-0.723***	-0.747***	-0.601***	-0.579***	-0.452***
	(0.215)	(0.151)	(0.117)	(0.112)	(0.103)	(0.100)	(0.094)	(0.087)	(0.088)
rural	-0.213	-0.239**	-0.283***	-0.334***	-0.416***	-0.422***	-0.337***	-0.264**	-0.360***
	(0.139)	(0.094)	(0.087)	(0.087)	(0.091)	(0.088)	(0.098)	(0.103)	(0.115)
panel	0.046	0.034	-0.080	-0.084	-0.090	-0.079	0.019	0.096	0.075
	(0.135)	(0.098)	(0.088)	(0.093)	(0.091)	(0.091)	(0.093)	(0.102)	(0.113)
weeks	2.388***	1.812***	1.394***	1.154***	0.989***	0.855***	0.705***	0.573***	0.421***
	(0.236)	(0.136)	(0.110)	(0.089)	(0.068)	(0.059)	(0.053)	(0.049)	(0.046)
_cons	-6.297***	-4.350***	-3.237***	-2.512***	-1.561***	-0.575	0.110	0.512	1.919***
	(1.003)	(0.663)	(0.559)	(0.497)	(0.457)	(0.397)	(0.380)	(0.382)	(0.387)
rifmean	1.786	2.543	3.029	3.348	3.719	4.104	4.389	4.801	5.270
r2	0.360	0.413	0.378	0.345	0.309	0.283	0.222	0.183	0.113
Obs.	1262	1262	1262	1262	1262	1262	1262	1262	1262

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: RIF Regression Results for Uganda (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.071**	0.070***	0.084***	0.096***	0.111***	0.090***	0.107***	0.117***	0.127***
	(0.028)	(0.023)	(0.018)	(0.017)	(0.017)	(0.016)	(0.018)	(0.019)	(0.027)
age	0.018	0.042	0.069*	0.101***	0.105***	0.062**	0.110***	0.124***	0.120***
	(0.059)	(0.044)	(0.035)	(0.035)	(0.032)	(0.028)	(0.028)	(0.024)	(0.029)
age2	-0.010	-0.059	-0.088*	-0.127***	-0.133***	-0.071*	-0.125***	-0.145***	-0.133***
	(0.075)	(0.059)	(0.048)	(0.046)	(0.044)	(0.037)	(0.037)	(0.032)	(0.037)
female	-0.707**	-0.713***	-0.828***	-0.634***	-0.716***	-0.591***	-0.479***	-0.417***	-0.169
	(0.280)	(0.194)	(0.170)	(0.156)	(0.132)	(0.129)	(0.132)	(0.131)	(0.152)
rural	-0.482***	-0.614***	-0.687***	-0.528***	-0.405***	-0.388***	-0.299**	-0.314*	-0.225
	(0.178)	(0.140)	(0.134)	(0.145)	(0.135)	(0.138)	(0.146)	(0.164)	(0.196)
panel	0.217	0.153	-0.076	-0.044	-0.148	-0.124	-0.089	-0.137	-0.318*
	(0.220)	(0.182)	(0.173)	(0.166)	(0.146)	(0.138)	(0.140)	(0.172)	(0.180)
weeks	1.850***	2.123***	1.464***	1.192***	0.978***	0.810***	0.541***	0.517***	0.376***
	(0.336)	(0.246)	(0.156)	(0.111)	(0.096)	(0.071)	(0.074)	(0.064)	(0.075)
_cons	-5.161***	-5.243***	-2.959***	-2.492***	-1.615**	0.054	-0.031	0.221	0.972
	(1.444)	(1.123)	(0.900)	(0.733)	(0.688)	(0.587)	(0.554)	(0.525)	(0.667)
rifmean	1.568	2.490	3.031	3.416	3.793	4.125	4.282	4.739	5.179
r2	0.275	0.460	0.437	0.379	0.376	0.298	0.258	0.223	0.142
Obs.	589	589	589	589	589	589	589	589	589

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A12: RIF Regression Results for Uganda (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.136***	0.137***	0.187***	0.202***	0.171***	0.139***	0.115***	0.101***	0.091***
	(0.016)	(0.010)	(0.011)	(0.010)	(0.009)	(0.006)	(0.007)	(0.006)	(0.007)
age	0.125***	0.121***	0.141***	0.138***	0.124***	0.085***	0.040***	0.012	-0.000
	(0.032)	(0.024)	(0.020)	(0.019)	(0.015)	(0.013)	(0.012)	(0.011)	(0.014)
age2	-0.156***	-0.140***	-0.157***	-0.153***	-0.132***	-0.080***	-0.025	0.004	0.020
	(0.040)	(0.030)	(0.025)	(0.024)	(0.020)	(0.018)	(0.016)	(0.015)	(0.019)
female	-0.386***	-0.321***	-0.336***	-0.416***	-0.315***	-0.253***	-0.272***	-0.280***	-0.266***
	(0.101)	(0.064)	(0.065)	(0.063)	(0.053)	(0.048)	(0.047)	(0.044)	(0.055)
rural	0.014	-0.094	-0.189***	-0.251***	-0.214***	-0.269***	-0.313***	-0.390***	-0.486***
	(0.098)	(0.063)	(0.065)	(0.065)	(0.055)	(0.048)	(0.046)	(0.047)	(0.056)
panel	0.321***	0.377***	0.323***	0.279***	0.252***	0.126**	0.037	-0.019	-0.060
	(0.108)	(0.079)	(0.077)	(0.075)	(0.060)	(0.053)	(0.050)	(0.050)	(0.059)
weeks	3.191***	1.724***	1.350***	1.026***	0.699***	0.499***	0.365***	0.303***	0.230***
	(0.279)	(0.111)	(0.080)	(0.062)	(0.047)	(0.040)	(0.034)	(0.028)	(0.028)
_cons	-12.842***	-6.864***	-5.966***	-4.333***	-2.292***	-0.208	1.627***	2.931***	3.957***
	(1.325)	(0.652)	(0.477)	(0.442)	(0.334)	(0.271)	(0.234)	(0.204)	(0.232)
rifmean	2.160	2.983	3.430	3.941	4.350	4.659	4.861	5.161	5.544
r2	0.450	0.449	0.450	0.454	0.435	0.379	0.299	0.226	0.150
Obs.	2765	2765	2765	2765	2765	2765	2765	2765	2765

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13: RIF Regression Results for Uganda (pooled)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
sch	0.105***	0.115***	0.133***	0.155***	0.153***	0.146***	0.121***	0.109***	0.092***
	(0.010)	(0.007)	(0.006)	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)
age	0.063**	0.064***	0.101***	0.119***	0.107***	0.101***	0.072***	0.054***	0.024**
	(0.026)	(0.017)	(0.014)	(0.014)	(0.013)	(0.011)	(0.009)	(0.009)	(0.010)
age2	-0.087***	-0.083***	-0.124***	-0.141***	-0.122***	-0.109***	-0.071***	-0.045***	-0.013
	(0.034)	(0.022)	(0.019)	(0.018)	(0.017)	(0.015)	(0.012)	(0.012)	(0.014)
female	-0.643***	-0.549***	-0.515***	-0.580***	-0.510***	-0.388***	-0.322***	-0.309***	-0.279***
	(0.096)	(0.063)	(0.053)	(0.050)	(0.046)	(0.044)	(0.038)	(0.038)	(0.043)
rural	-0.134*	-0.190***	-0.208***	-0.325***	-0.256***	-0.254***	-0.290***	-0.306***	-0.362***
	(0.076)	(0.050)	(0.049)	(0.050)	(0.046)	(0.042)	(0.041)	(0.042)	(0.049)
panel	0.340***	0.252***	0.215***	0.193***	0.182***	0.190***	0.115***	0.052	0.011
	(0.083)	(0.062)	(0.052)	(0.053)	(0.049)	(0.046)	(0.039)	(0.041)	(0.044)
weeks	2.978***	1.929***	1.381***	1.125***	0.855***	0.602***	0.443***	0.345***	0.260***
	(0.184)	(0.090)	(0.056)	(0.047)	(0.038)	(0.041)	(0.026)	(0.022)	(0.020)
_cons	-10.318***	-5.907***	-4.391***	-3.540***	-2.090***	-0.848***	0.816***	1.940***	3.407***
	(0.810)	(0.413)	(0.325)	(0.303)	(0.272)	(0.262)	(0.199)	(0.168)	(0.176)
rifmean	1.931	2.770	3.251	3.678	4.055	4.375	4.705	5.054	5.446
r2	0.411	0.438	0.409	0.404	0.376	0.355	0.292	0.240	0.141
Obs.	4631	4631	4631	4631	4631	4631	4631	4631	4631

Notes: Bootstrap standard errors (computed by 500 replications) in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: Unconditional Quantile Regression for Malawi

	(1) q(10)	(3) q(25)	(5) q(50)	(7) q(75)	(9) q(90)
A. Daily					
sch	0.278*	0.042	0.031	-0.096	-0.130
	(0.165)	(0.144)	(0.140)	(0.132)	(0.126)
sch2	-0.011	0.003	0.006	0.011	0.011
	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
RIF mean	2.190	3.205	4.583	5.618	6.298
R^2	0.26	0.33	0.35	0.17	0.12
N	182	182	182	182	182
B. Weekly					
sch	0.046	0.030	-0.037	-0.179***	-0.376***
	(0.073)	(0.062)	(0.048)	(0.058)	(0.095)
sch2	-0.003	0.002	0.008***	0.023***	0.040***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.008)
RIF mean	2.946	3.602	4.592	5.365	6.243
R^2	0.50	0.44	0.39	0.36	0.31
N	505	505	505	505	505
C. Monthly					
sch	0.137***	0.103***	-0.064***	-0.177***	-0.260***
	(0.027)	(0.021)	(0.013)	(0.017)	(0.024)
sch2	-0.004***	0.002**	0.012***	0.021***	0.024***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
RIF mean	2.893	3.694	4.702	5.544	6.304
R^2	0.40	0.46	0.52	0.43	0.25
N	5,129	5,129	5,129	5,129	5,129
D. Pooled					
sch	0.126***	0.083***	-0.061***	-0.167***	-0.258***
	(0.026)	(0.020)	(0.014)	(0.017)	(0.024)
sch2	-0.003**	0.003**	0.012***	0.020***	0.024***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
RIF mean	2.841	3.672	4.692	5.558	6.298
R^2	0.39	0.45	0.49	0.41	0.25
Obs.	5,816	5,816	5,816	5,816	5,816

Note: Bootstrap standard errors computed by 500 replications in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Panel D (pooled) shows the estimates of the distributional effects of education corresponding to existing literature. Full results with all variables available upon request.

Table A15: Unconditional Quantile Regression for Tanzania

	(1) q(10)	(3) q(25)	(5) q(50)	(7) q(75)	(9) q(90)
A. Daily					
sch	-0.016	0.030	-0.069**	-0.081**	-0.035
	(0.038)	(0.031)	(0.030)	(0.037)	(0.036)
sch2	0.000	-0.000	0.011***	0.016***	0.008*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
RIF mean	-0.274	0.789	2.091	3.854	4.922
R^2	0.19	0.414	0.530	0.442	0.199
Obs.	3,738	3,738	3,738	3,738	3,738
B. Weekly					
sch	-0.054	-0.011	-0.009	-0.003	-0.041
	(0.044)	(0.033)	(0.035)	(0.039)	(0.059)
sch2	0.007	0.005	0.006*	0.010**	0.019**
	(0.004)	(0.003)	(0.004)	(0.004)	(0.007)
RIF mean	-0.232	0.752	2.048	3.342	4.509
R^2	0.24	0.44	0.60	0.49	0.28
Obs.	1,929	1,929	1,929	1,929	1,929
C. Monthly					
sch	0.147***	0.116***	0.076***	-0.065***	-0.170***
	(0.035)	(0.025)	(0.016)	(0.012)	(0.019)
sch2	-0.005***	0.000	0.006***	0.014***	0.020***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
RIF mean	2.137	3.178	4.352	5.203	5.838
R^2	0.45	0.51	0.45	0.32	0.24
Obs.	4,830	4,830	4,830	4,830	4,830
D. Pooled					
sch	0.074***	0.050***	0.046***	-0.088***	-0.202***
	(0.019)	(0.016)	(0.014)	(0.010)	(0.012)
sch2	-0.006***	-0.002**	0.006***	0.020***	0.028***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
RIF mean	0.307	1.545	3.199	4.615	5.461
R^2	0.30	0.55	0.58	0.40	0.28
Obs.	11,215	11,215	11,215	11,215	11,215

Note: Bootstrap standard errors computed by 500 replications in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Panel D (pooled) shows the estimates of the distributional effects of education corresponding to existing literature. Full results with all variables available upon request

Table A16: Unconditional Quantile Regression for Uganda

	(1) q(10)	(3) q(25)	(5) q(50)	(7) q(75)	(9) q(90)
A. Daily					
sch	0.161**	0.223***	0.106***	0.040	-0.003
	(0.081)	(0.048)	(0.040)	(0.037)	(0.044)
sch2	-0.004	-0.008***	-0.001	0.004	0.006
	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)
RIF mean	1.786	2.774	3.719	4.580	5.270
R^2	0.36	0.39	0.31	0.21	0.12
Obs.	1,262	1,262	1,262	1,262	1,262
B. Weekly					
sch	0.135	0.154**	0.154***	0.027	-0.118*
	(0.088)	(0.061)	(0.054)	(0.045)	(0.070)
sch2	-0.005	-0.005	-0.003	0.006**	0.017***
	(0.006)	(0.004)	(0.004)	(0.003)	(0.006)
RIF mean	1.568	2.756	3.793	4.424	5.179
R^2	0.28	0.45	0.38	0.23	0.17
Obs.	589	589	589	589	589
C. Monthly					
sch	0.340***	0.240***	0.074***	-0.095***	-0.204***
	(0.060)	(0.034)	(0.022)	(0.017)	(0.022)
sch2	-0.012***	-0.005***	0.005***	0.012***	0.017***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)
RIF mean	2.160	3.242	4.350	5.059	5.544
R^2	0.46	0.45	0.44	0.30	0.20
Obs.	2,765	2,765	2,765	2,765	2,765
D. Pooled					
sch	0.229***	0.206***	0.103***	-0.071***	-0.154***
	(0.039)	(0.023)	(0.019)	(0.013)	(0.017)
sch2	-0.008***	-0.005***	0.003***	0.011***	0.015***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
RIF mean	1.931	3.052	4.055	4.846	5.446
R^2	0.41	0.42	0.38	0.28	0.18
Obs.	4,631	4,631	4,631	4,631	4,631

Note: Bootstrap standard errors computed by 500 replications in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Panel D (pooled) shows the estimates of the distributional effects of education corresponding to existing literature. Full results with all variables available upon request.

Table A17 : Returns to Education by Gender and Period - Malawi

	Daily		Weekly		Monthly		Pooled	
	female	male	female	male	female	male	female	male
sch	0.012	-0.052	-0.162***	-0.082**	-0.095***	-0.056***	-0.095***	-0.057***
	(0.123)	(0.094)	(0.048)	(0.038)	(0.016)	(0.009)	(0.016)	(0.009)
sch2	0.008	0.008	0.017***	0.012***	0.015***	0.011***	0.014***	0.011***
	(0.008)	(0.006)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
age	0.088	-0.005	0.105***	0.067**	0.033***	0.062***	0.046***	0.060***
	(0.087)	(0.076)	(0.034)	(0.026)	(0.011)	(0.007)	(0.011)	(0.007)
age2	-0.085	0.021	-0.136***	-0.067**	-0.024	-0.058***	-0.043***	-0.056***
	(0.113)	(0.094)	(0.047)	(0.033)	(0.015)	(0.008)	(0.014)	(0.008)
rural	-0.919***	-0.085	-0.229*	-0.363***	-0.121***	-0.213***	-0.152***	-0.232***
	(0.334)	(0.248)	(0.132)	(0.096)	(0.039)	(0.022)	(0.038)	(0.022)
year	0.138	1.106***	1.171***	0.981***	1.302***	1.284***	1.248***	1.243***
	(0.361)	(0.258)	(0.121)	(0.090)	(0.037)	(0.021)	(0.036)	(0.021)
weeks	1.187***	1.306***	1.198***	0.977***	1.226***	1.094***	1.206***	1.084***
	(0.268)	(0.201)	(0.084)	(0.065)	(0.034)	(0.023)	(0.032)	(0.022)
constant	-2.020	-1.381	-2.156***	-0.874	-1.927***	-1.816***	-1.971***	-1.690***
	(1.892)	(1.588)	(0.630)	(0.537)	(0.232)	(0.143)	(0.223)	(0.143)
AME(sch)	0.148***	0.091***	0.105***	0.115***	0.198***	0.145***	0.182***	0.142***
	(0.043)	(0.032)	(0.014)	(0.012)	(0.006)	(0.003)	(0.005)	(0.003)
R^2	0.58	0.44	0.77	0.63	0.80	0.76	0.77	0.72
Obs.	49	133	144	361	1,265	3,864	1,458	4,358

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A18 : Returns to Education by Gender and Period - Tanzania

	Daily		Weekly		Monthly		Pooled	
	female	male	female	male	female	male	female	male
sch	-0.032	-0.013	-0.114***	0.010	0.016	0.036***	-0.050***	-0.002
	(0.027)	(0.020)	(0.027)	(0.022)	(0.014)	(0.013)	(0.009)	(0.008)
sch2	0.006*	0.006***	0.019***	0.006***	0.009***	0.006***	0.014***	0.007***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
age	0.033***	0.064***	0.039***	0.049***	0.079***	0.097***	0.060***	0.069***
	(0.012)	(0.010)	(0.012)	(0.012)	(0.009)	(0.008)	(0.007)	(0.006)
age2	-0.043***	-0.077***	-0.046***	-0.054***	-0.062***	-0.094***	-0.060***	-0.073***
	(0.016)	(0.014)	(0.016)	(0.016)	(0.012)	(0.010)	(0.009)	(0.007)
rural	-0.571***	-0.493***	-0.092	-0.255***	-0.215***	-0.302***	-0.300***	-0.356***
	(0.072)	(0.050)	(0.075)	(0.063)	(0.035)	(0.030)	(0.032)	(0.025)
panel	-0.452***	-0.128***	-0.042	-0.178***	0.025	-0.122***	-0.051*	-0.113***
	(0.068)	(0.048)	(0.073)	(0.063)	(0.036)	(0.030)	(0.029)	(0.022)
weeks	1.036***	1.226***	1.018***	1.135***	1.107***	1.047***	1.083***	1.141***
	(0.024)	(0.018)	(0.022)	(0.020)	(0.025)	(0.023)	(0.012)	(0.010)
constant	-0.704***	-1.144***	-1.090***	-0.965***	-2.669***	-2.085***	-1.776***	-1.364***
	(0.227)	(0.190)	(0.228)	(0.222)	(0.159)	(0.154)	(0.118)	(0.103)
AME(sch)	0.148***	0.091***	0.105***	0.115***	0.198***	0.145***	0.182***	0.142***
	(0.043)	(0.032)	(0.014)	(0.012)	(0.006)	(0.003)	(0.005)	(0.003)
R^2	0.64	0.72	0.78	0.78	0.77	0.66	0.80	0.76
Obs.	1,338	2,400	683	1,246	1,815	3,015	4,073	7,142

errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A18: Returns to Education by Gender and Period - Uganda

	Daily		Weekly		Monthly		Pooled	
	female	male	female	male	female	male	female	male
sch	0.108***	0.111***	0.076	0.040	0.054**	0.071***	0.074***	0.066***
	(0.040)	(0.029)	(0.051)	(0.044)	(0.023)	(0.020)	(0.017)	(0.015)
sch2	0.001	-0.002	0.003	0.004	0.005***	0.003***	0.004***	0.003***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
age	-0.005	0.085***	0.092***	0.072***	0.093***	0.066***	0.078***	0.064***
	(0.026)	(0.016)	(0.034)	(0.023)	(0.016)	(0.012)	(0.012)	(0.009)
age2	0.011	-0.111***	-0.112**	-0.082***	-0.097***	-0.069***	-0.084***	-0.073***
	(0.035)	(0.022)	(0.046)	(0.030)	(0.021)	(0.016)	(0.017)	(0.012)
rural	-0.175	-0.282***	-0.298**	-0.377***	-0.171***	-0.276***	-0.142***	-0.288***
	(0.117)	(0.063)	(0.147)	(0.108)	(0.052)	(0.045)	(0.045)	(0.035)
panel	-0.151	0.044	-0.322	-0.001	0.249***	0.133***	0.143***	0.147***
	(0.128)	(0.062)	(0.204)	(0.119)	(0.059)	(0.048)	(0.048)	(0.036)
weeks	1.178***	1.260***	1.229***	1.043***	1.112***	1.132***	1.140***	1.151***
	(0.068)	(0.047)	(0.092)	(0.067)	(0.044)	(0.044)	(0.034)	(0.029)
constant	-1.461***	-2.469***	-3.117***	-1.452***	-3.247***	-2.331***	-3.022***	-2.005***
	(0.508)	(0.300)	(0.663)	(0.481)	(0.274)	(0.264)	(0.222)	(0.182)
AME(sch)	0.118***	0.085***	0.109***	0.091***	0.158***	0.139***	0.145***	0.110***
	(0.016)	(0.009)	(0.018)	(0.013)	(0.007)	(0.006)	(0.005)	(0.004)
R^2	0.58	0.52	0.64	0.50	0.70	0.56	0.69	0.54
Obs.	281	981	167	422	1,022	1,743	1,475	3,156

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A19: Returns to Education by Gender and Period - Ganyu

	(1) female	(2) male
sch	0.003	0.002
	(0.007)	(0.007)
sch2	0.001*	0.002***
	(0.001)	(0.001)
age	0.036***	0.046***
	(0.004)	(0.004)
age2	-0.042***	-0.055***
	(0.005)	(0.005)
rural	-0.206***	-0.432***
	(0.031)	(0.029)
year	1.168***	1.270***
	(0.017)	(0.016)
weeks	0.987***	1.023***
	(0.009)	(0.009)
_cons	-1.205***	-1.002***
	(0.079)	(0.078)
AME(sch)	0.013***	0.022***
	(0.003)	(0.002)
R^2	0.742	0.766
Obs.	8,246	8,282

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A20: OB RIF Gender Decomposition by Quantile for Malawi (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.204***	2.800***	3.465***	3.782***	4.638***	5.136***	5.545***	5.924***	6.343***
Counterfactual	2.224***	2.851***	3.561***	3.935***	4.631***	5.058***	5.419***	5.762***	6.242***
Female	2.294***	2.888***	3.737***	4.230***	4.565***	5.005***	5.421***	5.664***	6.189***
Difference	-0.090	-0.088	-0.271	-0.448	0.073	0.131	0.123	0.260	0.154
Explained	-0.020	-0.051	-0.096	-0.153	0.007	0.078	0.126	0.162	0.101
Unexplained	-0.070	-0.037	-0.175	-0.294	0.066	0.053	-0.003	0.098	0.053
Pure explained	0.006	-0.024	-0.121	-0.139	-0.011	0.141	0.127	0.011	0.086
education	0.116	0.079	0.008	-0.055	0.002	0.025	0.024	-0.020	-0.005
covariates	-0.109	-0.103	-0.129	-0.084	-0.013	0.117	0.103	0.031	0.091
Pure unexplained	-0.001	0.037	-0.102	-0.220	0.115	0.108	0.032	0.114	0.087
education	0.834	-0.269	-1.232	-1.819	-2.042*	-1.138	-0.871	-0.054	1.699
covariates	0.508	-9.582	-7.637	-1.515	3.372	2.109	-0.171	3.201	2.367
_cons	-1.344	9.889	8.767	3.113	-1.215	-0.863	1.074	-3.034	-3.979
Specification error	-0.027	-0.027	0.026	-0.014	0.018	-0.063	-0.001	0.151	0.015
Reweight error	-0.068	-0.074	-0.074	-0.074	-0.049	-0.055	-0.035	-0.016	-0.035
Obs. Male	133	133	133	133	133	133	133	133	133
Obs. Female	49	49	49	49	49	49	49	49	49
Obs. Total	182	182	182	182	182	182	182	182	182

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A21: OB RIF Gender Decomposition by Quantile for Malawi (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	3.058***	3.462***	3.976***	4.269***	4.671***	5.043***	5.307***	5.693***	6.254***
Counterfactual	2.774***	3.401***	3.754***	4.233***	4.538***	4.898***	5.243***	5.611***	6.130***
Female	2.675***	3.342***	3.755***	4.171***	4.378***	4.744***	5.048***	5.398***	6.239***
Difference	0.383	0.120	0.221	0.098	0.292*	0.299*	0.258*	0.294	0.014
Explained	0.284	0.061	0.222	0.036	0.132	0.145	0.064	0.082	0.124
Unexplained	0.099	0.059	-0.001	0.062	0.160	0.154	0.195	0.213	-0.110
Pure explained	0.197	0.166	0.147	0.119	0.130	0.138	0.097	0.057	0.108
education	0.002	0.027	0.033	0.007	0.006	-0.001	-0.001	-0.035	-0.055
covariates	0.194	0.139	0.115	0.112	0.123	0.139*	0.098	0.093	0.163**
Pure unexplained	0.070	0.038	-0.012	0.048	0.150	0.144	0.182	0.198	-0.127
education	-0.512	0.177	0.618	0.391	0.680*	0.171	-0.083	-0.191	0.109
covariates	-0.634	-4.027	-1.528	-1.550	-0.696	-3.256*	-1.075	-2.938*	-0.571
_cons	1.216	3.889	0.898	1.207	0.166	3.229*	1.340	3.327*	0.335
Specification error	0.087	-0.104	0.075	-0.083	0.003	0.006	-0.033	0.024	0.016
Reweight error	0.030	0.020	0.012	0.014	0.010	0.010	0.013	0.015	0.018
Obs. Male	361	361	361	361	361	361	361	361	361
Obs. Female	144	144	144	144	144	144	144	144	144
Obs. Total	505	505	505	505	505	505	505	505	505

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A22: OB RIF Gender Decomposition by Quantile for Malawi (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.939***	3.482***	3.921***	4.350***	4.670***	4.985***	5.362***	5.770***	6.283***
Counterfactual	2.911***	3.588***	3.988***	4.435***	4.799***	5.183***	5.566***	6.018***	6.514***
Female	2.709***	3.375***	3.870***	4.429***	4.718***	4.960***	5.417***	5.938***	6.370***
Difference	0.229***	0.108	0.051	-0.079	-0.048	0.025	-0.055	-0.168***	-0.087
Explained	0.028	-0.105	-0.067	-0.085	-0.128**	-0.198***	-0.204***	-0.249***	-0.231***
Unexplained	0.202***	0.213***	0.118*	0.006	0.080*	0.223***	0.149**	0.080	0.144**
Pure explained	0.054	-0.061	-0.087*	-0.117**	-0.156***	-0.194***	-0.238***	-0.253***	-0.245***
education	-0.029**	-0.069***	-0.097***	-0.111***	-0.119***	-0.119***	-0.146***	-0.171***	-0.161***
covariates	0.084*	0.007	0.010	-0.007	-0.038	-0.076**	-0.092**	-0.082**	-0.083***
Pure unexplained	0.190**	0.202***	0.105*	-0.006	0.067	0.209***	0.133**	0.063	0.126*
education	0.102	0.081	-0.607**	-0.050	-0.044	0.054	-0.233	-0.174	-0.252*
covariates	1.057	0.166	-1.156	-0.099	0.974*	0.866	-0.588	-1.441**	-0.696
_cons	-0.968	-0.045	1.868*	0.143	-0.863	-0.712	0.954	1.678**	1.074
Specification error	-0.027	-0.044	0.020	0.032	0.028	-0.004	0.034	0.004	0.013
Reweight error	0.012	0.011	0.013	0.013	0.013*	0.014*	0.016**	0.017**	0.018***
Obs. Male	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864
Obs. Female	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
Obs. Total	5,129	5,129	5,129	5,129	5,129	5,129	5,129	5,129	5,129

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A23: OB RIF Gender Decomposition by Quantile for Malawi (Pooled)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.914***	3.476***	3.907***	4.345***	4.670***	4.993***	5.353***	5.760***	6.281***
Counterfactual	2.837***	3.495***	3.943***	4.372***	4.769***	5.129***	5.521***	5.973***	6.475***
Female	2.706***	3.358***	3.831***	4.340***	4.754***	5.004***	5.367***	5.891***	6.349***
Difference	0.208***	0.118	0.076	0.005	-0.085**	-0.012	-0.014	-0.131**	-0.068
Explained	0.077	-0.019	-0.036	-0.027	-0.099**	-0.137***	-0.168***	-0.212***	-0.194***
Unexplained	0.131*	0.137**	0.112**	0.032	0.015	0.125***	0.154***	0.081	0.126**
Pure explained	0.076	-0.034	-0.060	-0.088**	-0.123***	-0.154***	-0.191***	-0.207***	-0.203***
education	-0.017	-0.047***	-0.074***	-0.087***	-0.095***	-0.097***	-0.121***	-0.145***	-0.144***
covariates	0.092*	0.014	0.014	-0.001	-0.028	-0.058*	-0.070**	-0.062**	-0.059***
Pure unexplained	0.116*	0.125**	0.098*	0.018	0.001	0.110**	0.138***	0.065	0.109**
education	0.053	0.101	-0.430**	-0.086	-0.004	-0.011	-0.231	-0.166	-0.020
covariates	0.215	-0.501	-1.573*	-0.476	0.686	0.492	-0.718	-1.498***	-0.432
_cons	-0.152	0.524	2.102**	0.580	-0.682	-0.370	1.088*	1.729***	0.561
Specification error	0.014	0.012*	0.014*	0.014**	0.014**	0.015**	0.016**	0.017***	0.018***
Reweight error	0.002	0.015	0.024	0.060	0.023	0.018	0.023	-0.005	0.009
Obs. Male	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358	4,358
Obs. Female	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458
Obs. Total	5,816	5,816	5,816	5,816	5,816	5,816	5,816	5,816	5,816

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A24: OB RIF Gender Decomposition by Quantile for Malawi (*Ganyu*)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	0.872***	1.566***	2.020***	2.481***	2.929***	3.312***	3.689***	4.161***	4.715***
Counterfactual	0.410***	1.093***	1.567***	2.082***	2.555***	2.944***	3.378***	3.850***	4.471***
Female	0.221***	0.989***	1.495***	1.875***	2.231***	2.657***	2.958***	3.409***	3.931***
Difference	0.651***	0.578***	0.526***	0.607***	0.698***	0.655***	0.731***	0.753***	0.784***
Explained	0.462***	0.473***	0.453***	0.400***	0.374***	0.368***	0.311***	0.311***	0.244***
Unexplained	0.190***	0.105**	0.073**	0.207***	0.324***	0.287***	0.420***	0.442***	0.539***
Pure explained	0.532***	0.496***	0.465***	0.407***	0.379***	0.372***	0.363***	0.335***	0.280***
education	0.035***	0.052***	0.036***	0.018**	0.027***	0.037***	0.034***	0.037***	0.033***
covariates	0.497***	0.444***	0.429***	0.389***	0.352***	0.335***	0.329***	0.298***	0.247***
Pure unexplained	0.246***	0.175***	0.145***	0.278***	0.386***	0.345***	0.475***	0.497***	0.585***
education	-0.110	0.045	0.069	0.071	0.026	0.044	0.067*	0.020	-0.072
covariates	-0.675	0.018	0.641**	0.964***	0.563**	0.240	0.274	0.611**	-0.308
_cons	1.032*	0.112	-0.565*	-0.756**	-0.203	0.060	0.134	-0.133	0.965***
Specification error	-0.071	-0.023	-0.012	-0.007	-0.005	-0.004	-0.052*	-0.024	-0.036**
Reweight error	-0.056***	-0.071***	-0.073***	-0.071***	-0.062***	-0.057***	-0.055***	-0.056***	-0.046***
Obs. Male	8,282	8,282	8,282	8,282	8,282	8,282	8,282	8,282	8,282
Obs. Female	8,246	8,246	8,246	8,246	8,246	8,246	8,246	8,246	8,246
Obs. Total	16528	16528	16528	16528	16528	16528	16528	16528	16528

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A25: OB RIF Gender Decomposition by Quantile for Tanzania (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	0.090*	0.925***	1.664***	2.241***	2.817***	3.481***	4.165***	4.730***	5.218***
Counterfactual	-0.358***	0.141	0.732***	1.395***	1.842***	2.445***	3.013***	3.854***	4.765***
Female	-0.661***	-0.242***	0.475***	0.906***	1.237***	1.670***	2.132***	2.755***	3.603***
Difference	0.751***	1.167***	1.190***	1.335***	1.580***	1.811***	2.033***	1.975***	1.615***
Explained	0.448***	0.784***	0.932***	0.846***	0.975***	1.035***	1.152***	0.876***	0.454***
Unexplained	0.303***	0.383***	0.258***	0.489***	0.605***	0.776***	0.881***	1.099***	1.161***
Pure explained	0.809***	0.996***	0.964***	1.062***	1.123***	1.133***	0.885***	0.622***	0.377***
education	0.029	0.068***	0.046**	0.040*	0.092***	0.103***	0.092***	0.073***	0.032*
covariates	0.780***	0.928***	0.918***	1.022***	1.031***	1.030***	0.793***	0.549***	0.345***
Pure unexplained	0.340***	0.461***	0.355***	0.583***	0.701***	0.875***	0.983***	1.201***	1.228***
education	-0.296**	0.135	0.227*	0.138	0.053	0.022	0.102	0.005	0.026
covariates	0.261	0.426	1.690**	0.661	1.080*	1.294**	1.645**	1.811**	1.520**
_cons	0.375	-0.099	-1.562*	-0.215	-0.433	-0.442	-0.764	-0.615	-0.319
Specification error	-0.361***	-0.212***	-0.032	-0.216***	-0.148**	-0.097	0.267***	0.254***	0.077
Reweight error	-0.037***	-0.078***	-0.097***	-0.094***	-0.096***	-0.099***	-0.102***	-0.102***	-0.067***
Obs. Male	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Obs. Female	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338	1,338
Obs. Total	3,738	3,738	3,738	3,738	3,738	3,738	3,738	3,738	3,738

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A26: OB RIF Gender Decomposition by Quantile for Tanzania (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	0.124*	0.823***	1.477***	2.032***	2.447***	2.895***	3.563***	4.123***	4.899***
Counterfactual	-0.176**	0.295***	0.736***	1.175***	1.645***	2.222***	2.718***	3.321***	4.158***
Female	-0.417***	0.014	0.490***	0.837***	1.173***	1.650***	2.170***	2.724***	3.337***
Difference	0.541***	0.809***	0.987***	1.195***	1.274***	1.246***	1.393***	1.400***	1.562***
Explained	0.300***	0.528***	0.741***	0.857***	0.802***	0.673***	0.845***	0.803***	0.741***
Unexplained	0.240*	0.281***	0.247***	0.338***	0.472***	0.573***	0.548***	0.597***	0.822***
Pure explained	0.457***	0.620***	0.788***	0.796***	0.783***	0.817***	0.811***	0.730***	0.611***
education	0.027	0.058*	0.095***	0.080***	0.093***	0.127***	0.122***	0.140***	0.162***
covariates	0.430***	0.562***	0.693***	0.716***	0.690***	0.690***	0.689***	0.590***	0.449***
Pure unexplained	0.257**	0.323***	0.306***	0.408***	0.555***	0.655***	0.629***	0.684***	0.902***
education	0.083	-0.013	0.024	0.196	0.280**	0.059	0.031	0.124	0.123
covariates	-0.371	0.086	1.189	0.305	0.471	-0.833	-1.072	-0.583	-0.473
_cons	0.544	0.249	-0.907	-0.093	-0.196	1.429*	1.669**	1.144	1.252
Specification error	-0.157	-0.091	-0.047	0.061	0.019	-0.143**	0.034	0.073	0.129
Reweight error	-0.016	-0.042**	-0.059**	-0.070***	-0.083***	-0.082***	-0.080***	-0.087***	-0.081***
Obs. Male	1,246	1,246	1,246	1,246	1,246	1,246	1,246	1,246	1,246
Obs. Female	683	683	683	683	683	683	683	683	683
Obs. Total	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A27: OB RIF Gender Decomposition by Quantile for Tanzania (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.437***	3.230***	3.708***	4.220***	4.559***	4.803***	5.128***	5.499***	5.900***
Counterfactual	2.148***	2.761***	3.446***	3.918***	4.374***	4.720***	5.014***	5.333***	5.783***
Female	1.774***	2.565***	2.982***	3.415***	3.746***	4.227***	4.663***	5.067***	5.702***
Difference	0.663***	0.665***	0.726***	0.804***	0.814***	0.576***	0.465***	0.432***	0.198***
Explained	0.290***	0.469***	0.262***	0.302***	0.185***	0.083	0.114**	0.166***	0.117***
Unexplained	0.374***	0.196***	0.464***	0.503***	0.629***	0.493***	0.351***	0.266***	0.082*
Pure explained	0.382***	0.395***	0.329***	0.230***	0.195***	0.153***	0.124***	0.112***	0.092***
education	-0.001	-0.004	-0.006	-0.007	-0.008	-0.009	-0.010	-0.012	-0.014
covariates	0.383***	0.399***	0.335***	0.237***	0.203***	0.162***	0.134***	0.124***	0.106***
Pure unexplained	0.343***	0.154**	0.428***	0.473***	0.603***	0.470***	0.332***	0.254***	0.073
education	0.019	0.445*	0.441**	0.170	-0.243	-0.646***	-0.512***	-0.402***	-0.331***
covariates	-2.052	1.947**	1.100	-0.195	-1.221**	-0.917*	0.092	0.513	1.053***
_cons	2.375	-2.238**	-1.114	0.497	2.066***	2.033***	0.753	0.144	-0.650
Specification error	-0.092	0.074	-0.067	0.072**	-0.010	-0.070	-0.010	0.054*	0.024
Reweight error	0.031	0.043*	0.036*	0.030*	0.026*	0.023**	0.019**	0.012	0.009
Obs. Male	3,015	3,015	3,015	3,015	3,015	3,015	3,015	3,015	3,015
Obs. Female	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815	1,815
Obs. Total	4,830	4,830	4,830	4,830	4,830	4,830	4,830	4,830	4,830

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A28: OB RIF Gender Decomposition by Quantile for Tanzania (Pooled)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	0.732***	1.644***	2.345***	3.001***	3.663***	4.155***	4.664***	5.079***	5.565***
Counterfactual	0.230***	1.089***	1.795***	2.496***	3.120***	3.714***	4.368***	4.831***	5.460***
Female	-0.131***	0.642***	1.181***	1.824***	2.440***	2.998***	3.572***	4.239***	5.104***
Difference	0.863***	1.002***	1.165***	1.176***	1.223***	1.157***	1.092***	0.840***	0.461***
Explained	0.502***	0.555***	0.550***	0.505***	0.543***	0.442***	0.296***	0.248***	0.105***
Unexplained	0.361***	0.448***	0.615***	0.671***	0.680***	0.716***	0.796***	0.592***	0.355***
Pure explained	0.543***	0.588***	0.596***	0.592***	0.501***	0.364***	0.240***	0.167***	0.075***
education	0.026**	0.026***	0.032***	0.051***	0.054***	0.048***	0.029**	0.018	-0.004
covariates	0.517***	0.562***	0.564***	0.541***	0.447***	0.316***	0.210***	0.150***	0.079***
Pure unexplained	0.362***	0.449***	0.614***	0.668***	0.673***	0.707***	0.785***	0.579***	0.340***
education	0.358***	0.271**	0.186*	0.079	-0.060	-0.107	-0.317***	-0.691***	-0.681***
covariates	0.662	1.531***	0.990**	0.637	0.923**	-0.063	-1.192***	-0.994***	-0.191
_cons	-0.658	-1.354***	-0.563	-0.048	-0.190	0.877**	2.294***	2.264***	1.213***
Specification error	-0.041	-0.033	-0.046	-0.087***	0.042	0.078**	0.056**	0.081***	0.031
Reweight error	-0.001	-0.001	0.001	0.003	0.007	0.009	0.011	0.013**	0.015***
Obs. Male	7,142	7,142	7,142	7,142	7,142	7,142	7,142	7,142	7,142
Obs. Female	4,073	4,073	4,073	4,073	4,073	4,073	4,073	4,073	4,073
Obs. Total	11,215	11,215	11,215	11,215	11,215	11,215	11,215	11,215	11,215

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A29: OB RIF Gender Decomposition by Quantile for Uganda (Daily)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.115***	2.785***	3.246***	3.617***	3.966***	4.278***	4.576***	4.957***	5.398***
Counterfactual	1.426***	2.381***	2.763***	3.245***	3.562***	3.957***	4.285***	4.649***	5.214***
Female	1.147***	1.800***	2.307***	2.516***	3.033***	3.288***	3.549***	3.958***	4.478***
Difference	0.968***	0.986***	0.940***	1.101***	0.933***	0.990***	1.027***	1.000***	0.920***
Explained	0.689***	0.404**	0.484***	0.372***	0.404***	0.321***	0.290***	0.309***	0.185*
Unexplained	0.279	0.582***	0.456***	0.729***	0.529***	0.670***	0.737***	0.691***	0.736***
Pure explained	0.703***	0.598***	0.505***	0.482***	0.413***	0.383***	0.319***	0.271***	0.204***
education	0.185**	0.242***	0.201***	0.197***	0.189***	0.176***	0.142***	0.128***	0.093**
covariates	0.517***	0.356***	0.305***	0.285***	0.224***	0.207***	0.177***	0.144***	0.110**
Pure unexplained	0.420**	0.669***	0.528***	0.793***	0.580***	0.711***	0.776***	0.723***	0.760***
education	0.031	-0.319	-0.034	-0.199	-0.276	-0.179	-0.031	-0.114	-0.167
covariates	2.169	1.049	1.510	1.536	1.340	0.888	0.407	1.279	0.912
_cons	-1.780	-0.061	-0.948	-0.544	-0.484	0.002	0.399	-0.443	0.015
Specification error	-0.014	-0.195	-0.022	-0.110	-0.009	-0.062	-0.028	0.038	-0.019
Reweight error	-0.141	-0.088	-0.072	-0.064	-0.051	-0.041	-0.039	-0.032	-0.024
Obs. Male	981	981	981	981	981	981	981	981	981
Obs. Female	281	281	281	281	281	281	281	281	281
Obs. Total	1,262	1,262	1,262	1,262	1,262	1,262	1,262	1,262	1,262

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A30: OB RIF Gender Decomposition by Quantile for Uganda (Weekly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	1.914***	2.763***	3.210***	3.720***	3.954***	4.320***	4.401***	4.842***	5.380***
Counterfactual	1.563***	2.467***	3.041***	3.348***	3.798***	4.156***	4.304***	4.727***	5.301***
Female	1.283***	1.791***	2.369***	2.712***	3.125***	3.539***	3.804***	4.253***	4.756***
Difference	0.631***	0.972***	0.841***	1.008***	0.828***	0.781***	0.597***	0.589***	0.623***
Explained	0.351	0.296	0.169	0.371**	0.155	0.163	0.096	0.115	0.079
Unexplained	0.280	0.676***	0.671***	0.637***	0.673***	0.617***	0.500***	0.474***	0.545***
Pure explained	0.494*	0.381**	0.312**	0.257**	0.165*	0.159*	0.159*	0.141*	0.071
education	0.116	0.126**	0.130**	0.130**	0.071	0.061	0.084	0.079	0.024
covariates	0.377	0.254	0.182	0.127	0.094	0.098	0.075	0.061	0.048
Pure unexplained	0.303	0.706***	0.695***	0.663***	0.698***	0.640***	0.529***	0.500***	0.577***
education	0.406	-0.169	0.057	0.070	0.271	-0.319	-0.650*	-0.439	-0.765*
covariates	1.587	-0.908	-0.759	0.342	-0.208	-1.581	-1.032	-0.245	0.054
_cons	-1.689	1.783	1.396	0.251	0.635	2.539*	2.212	1.184	1.288
Specification error	-0.143	-0.085	-0.143	0.114	-0.010	0.004	-0.063	-0.025	0.007
Reweight error	-0.024	-0.029	-0.023	-0.026	-0.026	-0.022	-0.029	-0.026	-0.032
Obs. Male	422	422	422	422	422	422	422	422	422
Obs. Female	167	167	167	167	167	167	167	167	167
Obs. Total	589	589	589	589	589	589	589	589	589

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A31: OB RIF Gender Decomposition by Quantile for Uganda (Monthly)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.546***	3.206***	3.684***	4.100***	4.427***	4.714***	5.034***	5.234***	5.588***
Counterfactual	2.127***	2.920***	3.411***	4.021***	4.388***	4.693***	4.969***	5.228***	5.609***
Female	1.724***	2.582***	3.048***	3.525***	3.999***	4.418***	4.640***	4.976***	5.332***
Difference	0.822***	0.623***	0.636***	0.575***	0.428***	0.296***	0.394***	0.258***	0.256***
Explained	0.419***	0.286***	0.273***	0.078	0.039	0.021	0.065	0.005	-0.021
Unexplained	0.403***	0.338***	0.364***	0.497***	0.388***	0.275***	0.329***	0.253***	0.276***
Pure explained	0.350***	0.203***	0.137**	0.130**	0.100**	0.058	0.040	-0.004	-0.026
education	-0.033*	-0.048*	-0.064*	-0.063*	-0.055*	-0.045*	-0.038*	-0.034*	-0.033*
covariates	0.383***	0.251***	0.201***	0.193***	0.155***	0.103***	0.078***	0.030	0.007
Pure unexplained	0.400***	0.334***	0.357***	0.489***	0.377***	0.265***	0.323***	0.250***	0.275***
education	0.122	-0.612	0.493	-0.028	-0.386	-0.276	-0.073	-0.125	0.020
covariates	-0.247	-0.784	-1.130	-0.362	-0.569	-0.254	0.159	0.135	0.155
_cons	0.525	1.730	0.994	0.879	1.332*	0.794	0.238	0.240	0.100
Specification error	0.069	0.083	0.135***	-0.052	-0.061	-0.038	0.026	0.009	0.006
Reweight error	0.003	0.004	0.007	0.008	0.011	0.010	0.006	0.003	0.001
Obs. Male	1,743	1,743	1,743	1,743	1,743	1,743	1,743	1,743	1,743
Obs. Female	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022
Obs. Total	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.

Table A32: OB RIF Gender Decomposition by Quantile for Uganda (Pooled)

	(1) q(10)	(2) q(20)	(3) q(30)	(4) q(40)	(5) q(50)	(6) q(60)	(7) q(70)	(8) q(80)	(9) q(90)
Overall									
Male	2.370***	3.034***	3.455***	3.900***	4.166***	4.532***	4.816***	5.103***	5.502***
Counterfactual	1.931***	2.803***	3.333***	3.736***	4.179***	4.512***	4.831***	5.168***	5.515***
Female	1.422***	2.304***	2.808***	3.228***	3.586***	3.975***	4.420***	4.783***	5.224***
Difference	0.949***	0.731***	0.647***	0.671***	0.580***	0.557***	0.396***	0.320***	0.278***
Explained	0.439***	0.231***	0.122**	0.163***	-0.013	0.020	-0.014	-0.065*	-0.013
Unexplained	0.510***	0.500***	0.525***	0.508***	0.593***	0.537***	0.411***	0.385***	0.291***
Pure explained	0.335***	0.212***	0.159***	0.083**	0.060	0.020	-0.018	-0.051**	-0.092***
education	0.007	0.005	-0.011	-0.031	-0.051**	-0.065***	-0.076***	-0.080***	-0.087***
covariates	0.328***	0.208***	0.169***	0.114***	0.111***	0.085***	0.058***	0.029**	-0.005
Pure unexplained	0.505***	0.492***	0.513***	0.493***	0.579***	0.522***	0.397***	0.374***	0.282***
education	0.230	-0.322	-0.247	-0.240	-0.502***	-0.636***	-0.547***	-0.313***	-0.162*
covariates	0.383	-0.652	-0.529	-0.671	-0.533	-0.757	-0.486	-0.061	0.076
_cons	-0.108	1.466	1.290	1.405*	1.614***	1.914***	1.430***	0.748*	0.368
Specification error	0.104*	0.019	-0.037	0.081**	-0.073	-0.000	0.004	-0.014	0.079***
Reweight error	0.005	0.007	0.012	0.014	0.014	0.015**	0.014**	0.012**	0.009**
Obs. Male	3,156	3,156	3,156	3,156	3,156	3,156	3,156	3,156	3,156
Obs. Female	1,475	1,475	1,475	1,475	1,475	1,475	1,475	1,475	1,475
Obs. Total	4,631	4,631	4,631	4,631	4,631	4,631	4,631	4,631	4,631

Notes: P-values computed from bootstrap standard errors (500 replications). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The significance of coefficients on 'Male' and 'female' implies that the mean for each group is significantly different from their combine mean.