

The Rate of Return on Education for Wage Employed Workers in Malawi: Evidence from Integrated Household Survey

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Abstract: *This empirical study utilizes data obtained from the recent Malawi Integrated Household Survey to estimate the rates of returns on education in the context of wage employment. The calculations are conducted using the basic and extended Mincerian earning functions. The results suggest that, on average, an increase of one year in schooling is associated with a 5% increase in lifetime earnings. The findings align with the assumptions and conclusions documented in analogous investigations. Moreover, there exists empirical evidence indicating that the returns on investment in education increase proportionally with the amount of education attained. The research revealed that there exists a marginal disparity in the educational return between male and female workers, with males exhibiting a slightly greater rate. The presented empirical evidence offers policy makers a foundation for endorsing investments in higher education due to its potential for generating better returns. Additionally, it supports the advocacy for poverty alleviation measures that prioritize education as a solution to livelihood difficulties.*

Keywords: Returns on education, wage employment, Mincerian earning functions, lifetime earnings, and investment in education

1. Introduction

The global importance of education in fostering enhanced productivity is a well-established notion within the academic discourse (Mincer, 1974; Becker, 1975). To effectively realize this objective, it is imperative that educational stakeholders, both public and private, prioritize a comprehensive examination of educational outcomes within the context of each respective country (Psacharopoulos & Patrinos, 2002; Chirwa, 2009). Extensive research endeavors in this domain have been conducted in both emerging and industrialized nations, employing diverse methodological approaches to estimate educational returns (Hanushek & Kim, 1995; Siphambe, 2000). Notably, these studies have, at times, yielded varying results, underscoring the complexity of the topic (Psacharopoulos, 1994). The enduring relevance of investigating educational returns remains apparent, especially in light of the evolving socio-economic landscape, which includes the profound impact of the COVID-19 pandemic on global economic dynamics. As such, this study seeks to assess the rate of return to education in Malawi, utilizing data sourced from the national integrated survey.

Country Context

There are around 18 million people living in Malawi, and 70% of them are below the poverty line, which is \$1.90 per day for each person (National Statistics Office, 2018). The distribution of income is unequal, with the poorest quintile of households receiving only 7% and the richest quintile receiving 50%. The majority of people—nearly 85%—live in rural areas most of them engaged in low-yielding subsistence farming. Recent census data revealed that the median age of Malawians is 17 years old, and 75% of them are under 35. The country has a fairly young population that is expanding quickly. By 2038, the population is projected to double, placing strain on the economy, which depends

heavily on agriculture, as well as the already-scarce public services.

The Gross Domestic Product (GDP) of Malawi rose by just 0.8% in 2020, the worst pace of growth since the recession of 2011. The COVID-19 pandemic's emergence hindered growth and led the government of Malawi and other nations to enact stringent regulations in an effort to stop the virus's spread. These measures—lockdowns, social isolation, and travel bans—reduced local and international economic activity and transactions, causing negative demand and supply shocks that negatively impacted the majority of the economy's sectors. The industries most impacted were those providing lodging and food, transportation, education, wholesale and retail, health, and manufacturing. Production in these areas decreased from what it was in 2019 (Malawi Annual Economic Report, 2022).

Malawi's official education system is organized in an 8-4-4 fashion. The larger definition of ECD includes children from birth to eight years old, with ECD centers concentrating on serving children from three to five years old. Primary schooling lasts eight years and begins at age six. Secondary education lasts four years, while postsecondary education lasts four to five years. Students take the Primary School Leaving Certificate of Education (PSLCE) at the conclusion of their primary education. Students are eligible to take the Malawi School Certificate of Education (MSCE) and Junior Certificate of Education (JCE) in their second year of secondary school after completing four years of secondary education. A variety of credentials are offered through tertiary education, starting with professional certificates, diplomas, degrees, and a Master's or Doctorate.

Since the country's independence in 1964, the health and education sectors have always been top priorities for the

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Government of Malawi (GoM). Precisely, Malawi spent 4.8% of its GDP on health in 2017, and 4.7% of GDP in 2018 was spent on education. The nation's socioeconomic development has long been viewed as requiring a number of tools, one of which is education. The country demonstrates its prioritization of education in several ways. For instance, the Malawi Growth and Development Strategy III, 2017–2022, lists education and skill development as two of its five key priority areas and human capital development as one of its 2063 Vision Framework's seven enablers [4]. Public spending on education has climbed from 4% of GDP in 2015 to 5.1% in 2019, or 21% of total public spending, since that time. The question that still remains amidst the different challenges, such as COVID - 19 and slow economic activity, is, "Does education really pay as much as it has been said?" The rates of return to education for paid workers in Malawi are examined in this study to establish how much individuals are gaining from education - related investments

2. Rate of Return on Education: Literature Review

2.1. Theoretical and Analytical Framework

The empirical research on the rate of return on education has been primarily motivated by the human capital hypothesis. The primary tenet of the human capital theory is that education increases worker productivity and, as a result, income (Mincer, 1974; Becker, 1975). This is predicated on the idea that firms don't pay exorbitant wages since they operate in competitive markets. The form of contracts and the type of employment, however, may affect the relationship between human capital factors and incomes in many developing nations, including Malawi.

The existence of three basic types of labor markets, namely rural, urban informal, and urban formal (modern sector), in developing nations is widely acknowledged in the development literature. These labor markets have different characteristics, including seasonality and demand uncertainty, nature of contracts, and structure of wages and earnings (Byres et al., 1999; Ray, 1998; Hess and Ross, 1997; Pal, 1996 and 1997; Adams, 1991). Chirwa and Matita (2009) observed that several authors who have studied returns to education failed to recognise the different types of employment that exist in developing countries. The two argued that the developing countries tend to have rural and informal employment sectors which have different repercussions with regards to one's level of education.

With the application of what have come to be known as Mincerian earning functions, the human capital theory is where the conventional methodology for assessing returns to education is created (Psacharopoulos, 1994; Willis, 1986). The earnings from employment data on people with different levels of education can therefore be used to estimate the private rates of return on further years of education.

$$\ln(W_i) = \theta_0 + \theta_1 S_i + \beta_1 E_i + \beta_2 E_i^2 + \sum_{k=3}^n \beta_k F_i + \mu_i \quad (1)$$

The variables in this equation are defined as follows: for every individual i , W is the observed earnings, S is the cumulative number of years the individual spent in schooling, E represents the individual's years of experience,

and F is a vector of control variables, whereas μ is the error representing unobserved effects on the dependent variable and θ_0 is the estimated equation estimate.

Once a regression of this Mincerian return to education has been performed on empirical data, the coefficient θ_1 is interpreted as private rate of return to education. Considering that this is a log - linear model the coefficient of years of schooling (θ_1) is multiplied by 100 to obtain the percentage return for one additional year spent in school.

Mincer (1974) established the following condensed assumptions in order to develop his human capital model: (i) investment costs in schooling are only opportunity costs, or forgone earnings, and not direct costs; (ii) the duration of an individual's presence on the labor market is independent of the level of studies he or she has achieved, and it is assumed that his or her presence is continuous; that is, he or she does not leave the labor market either voluntarily or involuntarily

Over the decades, authors such as Card (1994), Alderman et al. (1996), Magoula and Psacharopoulos (1999), and Siphambe (2000) have criticized the estimation model above on the basis that it suffers from self - selection and endogeneity problems. Their argument has centered around the assumption that returns to education are standard across the different levels of education. Precisely, the standard Mincerian model for estimating education returns considers the one additional year of learning in primary to have equal returns to that in secondary as well as university. Practically, this has been questionable because when one drops out of primary school and joins the labor force, the level of skills attained will be totally different from those attained by those graduating from secondary school and university. Similarly, their compensation in the labor market will differ. Based on these concerns, the estimation model for returns to education has been revised to capture categorical variables that represent the completed level of education. The revised estimation model is presented as follows:

$$\ln(W_i) = \theta_0 + \sum_{j=1}^n \theta_j EL_{ji} + \beta_1 E_i + \beta_2 E_i^2 + \sum_{k=3}^n \beta_k F_i + \mu_i \quad (2)$$

The definition of the variables is similar to equation (1) above. Equation (2) has however, introduced dummy variable EL representing the level of education completed by the individual.

2.2. Existing Empirical Studies

Evidence on the rate of return on education in both rich and developing nations is widely available. Based on fundamental Mincerian earnings functions, comparative analyses of the returns to education between groupings of nations conducted in the 1990s show that returns to education are higher in low - income countries (11%) than in high - income countries (7%). (Psacharopoulos, 1994).

Recent research in several African nations have consistently found that Mincerian returns to education rise with level of education. Since it is unlikely that primary school students forego adult wages, Wambugu (2001), Manda & Mwabu (2001), and others found in Kenya that the private returns to

education generally rise with education level and that the Mincer model may overestimate the cost of primary education while underestimating the returns to education. Simpambe (1999) in Botswana, Okuwa (2004) in Nigeria, Lassibille & Tan (2005) in Rwanda, and Kahyarara & Teal (2007) in Tanzania, among others, found similar results. There is evidence that the average returns to education are highest in Sub - Saharan Africa and Latin America and the Caribbean. Few studies have been conducted in Malawi on returns to education. One of the well - known studies is that of Chirwa and Matita (2009). The two used the 2005 Integrated Household Survey (IHS - 3) to estimate returns to education. They found that one additional year of education in Malawi increased one's earnings by 10%.

Similar to education, health is a significant aspect of an individual's human capital. An individual who maintains good health and receives adequate nutrition will exhibit less absenteeism and increased productivity in the workplace. Hence, it is unsurprising that these characteristics exert an influence on private incomes, similar to the impact of schooling. Schultz (1996) conducted an econometric analysis to examine the returns associated with human capital in Côte d'Ivoire and Ghana. The study focused on differentiating between various forms of human capital. In addition to the duration of formal education, the researcher incorporates the variables of adult height and weight - to - height - squared (Body Mass Index) in order to assess the influence of childhood nutrition and adult health and

nutrition, respectively. Both variables, particularly the latter, exhibit a strong and positive correlation with private incomes, observed in both genders. Strauss and Thomas (1998) provide a comprehensive survey of the existing body of work that examines the impact of health and nutrition on productivity and income. The authors highlight that the association is most pronounced in regions characterized by severe malnutrition and poor health conditions, which are commonly observed in low - income developing nations. Furthermore, it is worth noting that in developing nations, labor is heavily reliant on physical prowess and stamina, hence underscoring the paramount significance of sound health (Strauss & Thomas, 1998, pp.767, 813).

3. Model Specification and Data

3.1. Model Specification

This study uses the extended Mincerian earnings functions in equation (2), which has been specified as follows:

$$\ln(W_i) = \theta_0 + \theta_1 PRIM + \theta_2 JSEC + \theta_3 SSEC + \theta_4 ALEVEL + \theta_5 DIP + \theta_6 DEG + \theta_7 MA + \theta_8 PHD + \beta_1 E_i + \beta_2 E_i^2 + \sum_{k=3}^n \beta_k F_i + \mu_i$$

Variables

Table 1 below presents definitions of the variables used in this study:

Table 1: Definition of study variables

Ln (W)	Log of wages
PRIM	Dummy variable =1 if the employee completed primary education and =0 if otherwise.
JSEC	Dummy variable =1 if the employee completed junior secondary education and =0 if otherwise.
SSEC	Dummy variable =1 if the employee completed senior secondary education and =0 if otherwise.
ALEVEL	Dummy variable =1 if the employee completed A - Level education and =0 if otherwise.
DIP	Dummy variable =1 if the employee completed diploma y education and =0 if otherwise.
DEG	Dummy variable =1 if the employee completed degree education and =0 if otherwise.
MA	Dummy variable =1 if the employee completed Masters and =0 if otherwise.
PHD	Dummy variable =1 if the employee completed PhD and =0 if otherwise.
E	Experience
B	Employment types controls

3.2. Data

The Malawi's Fifth Integrated Household Survey (IHS - 5), a national household survey conducted by National Statistics Office (NSO) in 2019 - 2020, was the source for the data used in this study. Two - stage stratification was used to randomly sample the households. The first stage involved randomly choosing enumeration regions, and the second stage involved randomly choosing 20 families from each chosen enumeration area based on a household list (NSO, 2005). The analysis is based on a sample of people with salaried jobs who are at least 15 years old. Hence, the private rates of return on education projected only apply to wage or salaried jobs in both the official and informal sectors. Due to data limitations, the analysis does not quantify the returns to self - employment and farming, despite the fact that a large majority of Malawians are subsistence farmers.

4. Empirical Results

4.1. Descriptive statistics

Table 1 below presents descriptive statistics of key variables used in the model. The table shows that the workers in the sample earned an average monthly income of MWK 42, 589.3. The table also reveals that on average Malawians attain 9.7 years of schooling, which is equivalent to 10 years in junior secondary school. The descriptive statistics also indicate that on average, the workers had 19 years of working experience. With regards to education attainment, the table presents a bell - shaped distribution, with most of the workers having an average secondary school qualification and very few attaining degree, masters, and PhD qualifications.

The employees in this study were drawn from a variety of industries with different employment engagement conditions. Private employers both companies and

individuals constituted over 68%. Employers who engaged workers with no formal contract accounted for 44%. This is so common with the Malawian economy which has private employers who engage employees with verbal agreements.

Table 1: Descriptive Statistics

Variable	Mean	Std. Deviation
Log of wage	4.629390	0.4791152
Years of schooling	9.70	4.606
Years of experience	19.14	12.963
Years of experience squared	534.30	692.819
Primary school	0.1117	0.31506
Junior Secondary school	0.1195	0.32447
Senior secondary school	0.2344	0.42372
A - Level	0.0256	0.15801
Diploma and Technical education	0.0818	0.27414
Degree	0.0384	0.19224
Masters	0.0089	0.09390
PhD	0.0004	0.01886
Employer Type		
Parastatal	0.0292	0.16832
Public works	0.0021	0.04616
Church Organization	0.0409	0.19812
Political party	0.0004	0.01886
Contract	0.2284	0.41987
Private company	0.3202	0.46663
Private individual	0.3686	0.48250
No - Contract	0.4393	0.49640

4.2. Econometric Analysis

Table 2, below presents regression estimation results using two models. The first model used dummy variables for education levels and captured education qualifications for the completed level and control variables. The second model used years of education and control variables.

The overall results reveal that one year of additional education in Malawi increases earnings by 5%, holding all other factors constant. This result presents a 50% decline in

returns to education when compared to earlier studies done by Chirwa and Matita (2009). One may argue that given the high numbers of students graduating from institutions of higher learning, companies now demand relatively higher education for jobs that were done by lower - level qualified people. For instance, before the introduction of free primary education in Malawi, individuals would join the workforce in decent jobs such as banks and other financial institutions with just a senior secondary school certificate. This is unlike today, when most of these jobs now require higher qualifications, such as degrees, which implies more years of education for the very same positions

The results also reveal that it is rewarding for young people to attain more years of education as well as higher level qualifications. This is based on the evidence that individuals who attained completion certificates for the following levels Primary, Junior Secondary, Senior Secondary, Diploma, Degree, Masters and PhD, earned 10.9%, 16.5%, 34.4%, 65.9%, 90.2%, 119.9% and 179.2% more than those who neither attended school nor had any qualification.

A comparative analysis of returns to education based on the type of employer, whether one is working for the government, a parastatal, a private individual, or a company, revealed several dynamics. Using government as the base category for comparison, the study shows evidence that Malawi government workers earned a relatively higher monthly income than those employed by church organizations, private companies, private individuals, and other employers. There is demonstrated evidence that employees who worked for parastatal organizations and political parties earned more than government workers in Malawi.

Table 2 regression results also indicate that there are observable differences between workers who are working permanently and those on contract. The permanent employees earned 12 % and 21 % more than those on contract and on no - contract respectively.

Table 2: Mincerian Functions with controls (full sample)

	<i>Model 1</i>		<i>Model 2</i>	
Years of experience	0.017*	10.883	0.017*	10.495
Years of experience squared	0.000*	- 9.407	0.000*	- 8.104
Education levels				
Primary school	0.109*	5.092	-	
Junior Secondary school	0.165*	7.735	-	
Senior secondary school	0.344*	18.156	-	
A - Level	0.387*	9.204		
Diploma and Technical education	0.659*	24.352	-	
Degree	0.902*	25.06	-	
Masters	1.199*	17.549	-	
PhD	1.792*	5.374		
Years of schooling			0.050*	27.974
Employer type				
Parastatal	0.067***	1.695	0.070***	1.690
Public works	0.015	0.112	- 0.008	- 0.053
Church Organization	- 0.005	- 0.149	- 0.002	- 0.051
Political party	0.445	1.334	0.398	1.130
Private company	- 0.019	- 1.025	- 0.03156	- 1.59433
Private individual	- 0.117*	- 5.68	- 0.131*	- 6.091
Other employment (exclude govt)	- 0.25	- 3.044	- 0.292	- 3.364
Employment Contract				
Contract	- 0.125*	- 6.561	- 0.118*	- 5.927

No - contract	- 0.212*	- 11.436	- 0.243*	- 12.565
Gender differences				
Female worker	- 0.067*	- 4.69	- 0.055*	- 3.649
Constant	4.42*	150.366	4.157*	112.560
R - squared	151.562		0.464	
F - statistic	0.521		186.198	
Prob > F	0.000		0.000	
N	2810		2810	

Notes: *Superscripts* *, ** and *** denotes statistically significant at 1%, 5% and 10% level, respectively.

An estimation of the rate of return on education disaggregated by gender reveals that males have a higher rate of education return (5.1%) than females (4.6%). These results differ with previous studies on education returns in Malawi by Chirwa and Matita (2009), who found the rate of education return to be higher for females than males. These findings could be attributed to the numerous girl education support interventions that have aided girl child education.

5. Conclusion and Policy Recommendations

This study estimated the rates of return on education in Malawi. The results are consistent with the assumptions and findings that have been observed in similar studies. The results though show a 50% decline in returns to education between 2005 and 2019. Similarly, the study also found that returns to education are positive, meaning that it is still beneficial for investors or young people who would like to increase their education levels

One of the policy recommendations is that education still remains a key solution to alleviating poverty. Due to the fact that returns to education are positive, governments may lobby poor households to send their children to school with the aim of decreasing their poverty levels.

The fact that higher education has the best returns on investment suggests that people who are able to attain such levels will probably be able to recoup their initial investment. In such circumstance, government funding of higher education would not be required to encourage students to continue their education. The opening of new universities in recent years is likely to lessen this pressure, even though at the moment the demand for places that has resulted from the rapid expansion of primary schools continues to outweigh the increased number of university places. The main issue is the high competition for university space due to long periods of neglect in the expansion of university facilities.

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