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Human Capital Development and Labour Market Outcomes in Africa: Evidence from Sub-Saharan African Countries

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Abstract
The abilities and qualities of labour that influence productivity include higher education, on-the-job training and health. Investment in these improves the abilities of the labour force to innovate and adopt new technologies. Thus, policy dimensions towards building human capital make the difference between inclusive growth and jobless economic growth that leaves large segments of the society behind. However, Sub-Saharan African (SSA) countries are bedeviled by poor performance of their labour markets mostly characterized by rising rate of unemployment, low labour productivity, among others. This study examines the effect of human capital development on labour market outcomes in Sub Saharan African countries while capturing labour market outcomes with labour productivity. Given that education, health and life expectancy are integrals of human capital investments and often viewed as factors determining a country's labour force, they are employed within a dynamic panel analysis framework using the Generalized method of Moments for 30 SSA countries from 2000-2019. In most developing countries, particularly SSA, the public sector is often significantly larger than the private sector. Given the role of policymakers in labour market performance, the study introduces government effectiveness as a control variable. Empirical results reveal that government expenditure on health and life expectancy exert significant effect on labour productivity, with government expenditure on health being positive and life expectancy being negative. Similarly, the effect of government expenditure on education is insignificant for labour productivity. Government effectiveness affects labour productivity positively and significantly. The study reiterates the importance of human capital in labour market outcomes while suggesting the need for policies that will ensure adequate investment in human capital.
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1. Introduction

For many decades, researchers have been able to confirm the claim that, humans are the most important and potential source of productivity. Therefore, human capital is considered a measure of the skills, education, abilities and other characteristics that affect a worker's productive capacity and earning potential. It is expressed as the "knowledge, skills and abilities that enables the creation of personal, social and economic well-being" (Riley, 2001). Human capital (human resource) is identified as the beginning and end of all forms of capital. It plays a central role as a complement to physical capital and is very important in the development of natural resources (Farid et al, 2012).

Relevant literature over the years highlight the fact that labour is the most important source of productivity in any country. Of all forms of capital, human capital remains the most relevant. Both economic theory and empirical literature recognize human capital as a major determinant of economic growth. Also, human capital has been found very essential for growth of output and hence productivity, in many developing countries, due to the teeming population and increasing labour force (Farid et al, 2012).

Education increases labour efficiency and productivity, and thus produces skilled labour capable of guiding the economy on the path of sustainable growth. According to empirical evidence from literature, labour market outcomes impacted by education usually include wages and earnings; employment/unemployment; worker productivity/GDP per worker; hours worked; nature of work; worker's health and fringe benefits (Alina and Alexandra, 2012). However, labour productivity is closely connected to economic growth, competitiveness and standard of living of the economy. It represents the total volume of output (measured by GDP), produced per worker at a given time. Labour productivity as an economic indicator, gives an insight into the efficiency and quality of human capital in the production process.

GDP per person employed was used as an indicator to measure the performance of the Millennium Development Goals (MDG) in its attempt to eradicate poverty and hunger. Furthermore, it has also been proposed as a measure of progress in promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work under the Sustainable Development Goals (SDGs). The economic performance of a country can be couched under increased employment or effective work by employed persons. In this regard, labour productivity can be viewed as a measure of economic performance. The factors affecting the productivity of labour include: stock of capital goods, physical and institutional infrastructures, health and skills of workers (human

capital) and technological advancement. All these identified driving forces of labour productivity are important for formulating policies such as labour market policies in order to support economic growth of a nation (Campbell, 2007; Campbell et al, 2016).

High labour productivity is often associated with investments in human capital involving specific education/ training policies and preference for special health care facilities. There are different indicators of economic growth, of which the most commonly used is GDP. While some authors have employed nominal GDP, others have used real GDP, GDP per capita and more recently GDP per person employed. As established by Durlauf et al. (2004) as well as Jones (1997), GDP per person employed is a better measure of productivity and economic growth.

Statistics has shown that the (SSA) region records the worst economic performance globally, with an average reduction from about 4.75 percent in 2010 to 2.4 percent in 2018 (IMF, 2019). SSA countries are bedevilled by poor labour market performance mostly characterized by rising unemployment and low labour productivity. Moreover, as the world economy is transitioning into the 4th industrial revolution, the role of human capital development in enhancing labour productivity and hence labour market outcomes, cannot be overemphasized.

The general goal of human capital investment is to improve the quality of human life. However, health care delivery in Sub-Saharan Africa has been dismal over the years (Faruk et al., 2020; Wang et al., 2021). Health expenditure as a percentage of gross domestic product (GDP) in SSA was recorded at 5.09 percent in 2018, which is far below 12.46% of the Organization for Economic Cooperation and Development (OECD) countries. Government expenditure on health is meagre for this group of countries, leading to inadequate health facilities, poor remuneration of health workers amongst other factors accounting for the poor state of health in these countries.

Despite improvements in total life expectancy rate at birth for SSA countries, from 50 in 2000 to 62 in 2019, a huge number of their population still reside in slums, have limited access to food supply and clean water, and lack quality health care and education (Salman and Atya, 2012, WDI, 2020). For this group of countries, there are evidences of severe health conditions that could affect labour productivity such as heart conditions, diabetes, asthma and other respiratory related diseases. Literature has also established that most SSA countries are inefficient in converting health expenditure into improved health status compared to other developing regions (Gupta et al. 2000; Herrera and Pang, 2005; Kapsoli and Grigoli 2013).

Furthermore, the basic transmission of education to economic growth is through participation of educated individuals in the labour market. As important as it is for the citizens to be educated, it is much more important that these educated individuals participate actively in the productive sectors of the economy. Since education is an important factor for broad based economic growth, expenditure on education is considered as a form of investment. Government expenditure on education as a percentage of total government expenditure has increased marginally in SSA countries from 15.60% in 2000 to 16.19% in 2013 and then 17.88% in 2018 (World Bank, 2020). However, this has not translated into substantial labour productivity as productivity remains low in Sub-Sahara Africa. Labour productivity can be a medium for poverty eradication and reducing income inequality if its gains are equally distributed (ILO, 2019a).

Against this backdrop, the main objective of this paper is to investigate the effects of human capital development via its integrals on labour market outcomes in some selected sub-Saharan African countries. The paper contributes to the existing literature by employing three measures of human capital development (education, health and life expectancy) as against most studies that have employed either education or health. Similarly, most studies on human capital development have examined its effect on economic growth, while a few that have considered labour market outcomes are country-specific or industry-specific studies. This study deviates from others by analysing the effect of human capital development on labour market outcomes in selected SSA countries as against most studies that have focused on human capital investment and economic growth in the sub-region.

2. Literature Review

This section is a critical review of previous studies both theoretical and empirical on human capital development and labour market outcomes.

2.1. Theoretical Underpinning

Theoretical and empirical literature are saddled with the debate on human capital being or not being the core determinant of economic growth. In the light of this, different theories have emerged to validate (disvalidate) this assertion. The classical model is the earliest attempt to explain the differences in growth between countries. The model assumes that capital explains the differences in the growth divergences of nations looking at the three markets (the labour market, output market and money market) of a hypothetical economy. The 'Classicals' assume that when there is full employment in the economy, i.e. the demand for labour equals its supply; and as such, the market clears. Secondly, the real variables are all determined independent of the nominal money stock, the money stock play no role on real variables; therefore, the system exhibits money neutrality. It is evident in the model that growth is determined by two factors; capital and labour. The stock, utilization, and productivity of these factors explain why some nations do better than others.

The Neoclassical growth theory is an advancement of the submissions by the Classicals and examines the determinant of long-term economic growth. The 'Neoclassicals' reveal significant contributions from technical progress defined as an exogenous factor (through inputs such as physical capital and labour). In the model, there is an aggregate production function which exhibits constant returns to scale in labour and capital. The aggregate production function results in diminishing returns with respect to capital accumulation. An important principle of this model is that, under the decreasing returns on capital, output per worker does not increase indefinitely.

The quest for sufficient growth theory led to the emergence of new ideas; an endogenous growth model, advocated by Romer. An important contribution of this model is the introduction and inclusion of human capital in the production function to explain the variation in growth of countries. The endogenous growth model criticizes the universality of the law of diminishing-returns to-scale with respect to capital accumulation. In realistic terms, if a firm invests in capital, and employs healthy, well-educated and skilled workforce, labour efficiency in the use of capital and technology will increase the marginal productivity of labour. Therefore, there will be no slowing down of the economy; and the economy is likely to experience increased growth. Proponents of this model argue that the impact of the increased human capacity leads to a shift in the production function and thus leading to increasing returns to scale rather than slowing growth. Therefore, technology and human capital are determined inside the model i.e., they are "endogenous" to the system.

Similarly, the Human Capital theory addresses the role of investment in education. Education is seen as a crucial part of human capital that is as valuable as an investment in physical capital. This theory has found that human skills and productivity contribute to the development process and are as important as finances, natural wealth, and physical plants. This theory stresses the role of education in increasing the productivity of workers in low skilled professions. The higher the level of education, the greater the stock of human capital in the society. This paper is however anchored on the submissions of the Neoclassical growth model.

2.2. Empirical Literature Review

Literature has shown that huge investment in education and health have a great potential for achieving labour productivity. The available literature on the outcomes of the "New Labour Market" in developing countries stress the fact that, nations that have succeeded in changing their educational systems according to their technological capabilities have successfully improved labour productivity and economic development. Government budgetary allocation to education, sets off an intergenerational process of poverty reduction. This is because, well-educated people are more likely to ensure sound education and basic health requirements for their children. The achievements of East Asian countries in the realm of labour productivity and hence national productivity, were largely due to successful strategies enhanced by adequate investment in human beings, via education and health. Such adequate investment in people determines the availability of skilled workers who can meet the needs of the "new labour market".

Becker (1964) and Mincer (1974) have severally viewed education and training as the main source of human capital formation via investment in human capital integrals, which in turn exerts positive influence on life time earnings of labour. Also, Alfred Marshall, stressed several decades ago that investment in education is significant and germane to economic growth of any nation, and hence it is regarded as a national investment. According to him, the capital which is invested in human beings is considered as most precious and valuable. Furthermore, Schultz in his own submission, found that, growth in agricultural productivity was possible for most countries not only as a result of land or physical capital, but mainly due to new skills and knowledge which served as a drive to agricultural transformation. He emphasized the fact that this is the trend in developed economies of the world.

In a documentation by United Nations Economic Commission for Africa, human capital is classified as relating only to knowledge, skills, attitudes, physical and administrative efforts in human beings. All of these are necessary among other things to produce adequate and quality goods and services (Campbell and Agbiokoro, 2014). While a plethora of studies exist on human capital development and economic growth at country and regional levels (Akinlo and Oyeleke, 2020; Karambakuwa et al, 2019; Rangongo and Ngakwe, 2019; Ogundare and Awokuse, 2018) amongst others, very few studies have examined the effect of human capital development on labour market outcomes. The few identified studies have employed different indicators in their measure of labour productivity. A study examined wages from different demographic groups and employed grouped data to estimate the returns to different levels of education. Findings showed that education positively influences labour force participation and productivity. Results suggests that higher levels of educational attainment exert significantly positive influence on wages. This implies that, employees with higher education qualifications earn wages between 30 to 45 per cent higher than employees with lower qualifications (Creedy et al, 2000).

A comprehensive research investigated the effect of health on labour market outcomes. A self-reported measure of general health obtained from a survey was used to estimate the effect of health on male wages using a simultaneous equation model. Results show that good health positively affects wages and is an important contribution to an employee's productivity while poor health leads to absenteeism or reduce productivity of affected workers (Forbes et al,2010). Thus, the importance of investment in human capital via its integrals cannot

be overemphasized. Another research was carried out using the growth accounting approach in evaluating human capital as a complement to physical capital in the advancement of economic growth and labour productivity in 31 SSA countries from 1975-2008. While employing the framework put forward by Pritchett (2001) and Weil (2013), findings revealed that physical capital growth accounts for substantial growth in real Gross Domestic Product, while human capital growth also contributes positively to real GDP. Results also showed that the effect of labour and human capital was lower in SSA countries than in high-income countries (Zelleke et al 2013).

However, Pritchett (2001) in a similar study conducted earlier, using cross-sectional data on the same set of countries arrived at a totally different result. Results show that human capital has an insignificant negative relationship with output. Human capital has been thought to be more likely to increase the returns of skilled people. In a study for the European Union countries, using the Pooled OLS and Fixed Effect Models, findings showed that human capital significantly improves the growth of labour productivity in the EU (Mačiulytė-Šniukienė and Matuzevičiūtė, 2018). A study for Malaysia was analysed with data spanning from 2009 to 2012. The Generalized Least Squares (GLS) model was estimated and results showed that human capital improves labour productivity in Malaysia, while a greater impact was recorded for health than education (Arshad and Ab malik, 2015).

A similar analysis was conducted for Nigeria using the Ordinary Least Square (OLS) technique for data ranging from 1970-2013. Findings showed a bidirectional causality existing between health and per capita income employed as a proxy for labour productivity. Conversely, a unidirectional causality was reported from education to per capita income (Ugwu and Suleiman, 2015). Campbell and Ojo (2021) examined the effect of human capital development on poverty in Nigeria. The study utilized both descriptive and inferential statistics to capture the nature of relationship existing between investment in human beings and poverty in Nigeria. Results indicate a positive relationship between human capital development and poverty. This implies that, vibrant investment in human capital will not translate to poverty reduction instantly. Thus, the need to provide equal opportunities for inclusive growth which requires vibrant investment in human beings accompanied by increased employment opportunities, competitiveness and support for private sector engagement. In a related study, Campbell (2019) hinted that, those countries which are able to pull out of poverty, are those that diversified their economies away from agriculture into other productive and modern economic activity sectors. This leads to overall increase in productivity level and expansion in income.

A comparison was done for Nigeria and South Africa, and it was discovered that both human and physical capital affect labour productivity in both countries, though South African productivity was more responsive to changes in physical capital. For Nigeria, school enrolment had a negative relationship with labour productivity (Olarewaju et al. 2020).

The effect of human capital development on labour productivity in Nigeria was again analysed using three human capital proxies (life expectancy rate, tertiary enrolment and secondary school enrolment) between 1980 and 2016. Results from the ARDL estimation revealed that secondary school enrolment and life expectancy positively influence labour productivity in Nigeria in the long run while tertiary enrolment has positive influence on labour productivity in the short run (Okowa and Vincent, 2019).

3. Methodology

3.1. Theoretical Framework and Model Specification

The study hinges upon the Neoclassical growth model propounded by Solow (1956). The theory submits that economic growth is influenced by labour, capital and technology. Therefore, the production function is given as: Y = AF (K, L), where Y represents economic growth as measured by gross domestic product (GDP), K represents capital, L represents labor and A is technology. However, the augmented version of the model as established by Mankiw et al (1992) specified the Cobb Douglas production function as:

$$Y_t = K(t)^{\alpha} H(t)^{\beta} (A(t) L(t))^{1-\alpha-\beta} \quad \text{(1)}$$

where Y is output, A is technology, K is physical capital, H is human capital, and L is labour. The parameters α and β are the output elasticities with respect to physical and human capital. This study adopts the augmented model as used by Tiwari and Mutascu (2011) as well as Ogundari and Awokuse (2018) with some modification. The model is given as:

$$y_{it} = f(hc_{it}, k_{it}, y_{it-1}, in_{it}) \quad \text{(2)}$$

where yit denotes labour productivity, hcit is human capital; kit denotes physical capital; yit −1 represents lagged value of labour productivity; init represents government effectiveness. The dynamic model for the study using the GMM technique is given as:

$$Y_{it} = \emptyset Y_{it-1} + \beta_1 GEE_{it} + \beta_2 GEH_{it} + \beta_3 LE_{it} + \beta_4 GFCF_{it} + \beta_5 GOV_{it} + \mu_i + \varepsilon_{it} \quad \text{(3)}$$

where Yit represents labour productivity measured with output per worker, Yit-1 is the lagged value of labour productivity, GEEit, GEHit and LEit represent government expenditure on education, government expenditure on health and life expectancy, all measuring human capital, GFCFit represents gross fixed capital formation, and GOVit represents government effectiveness used as a proxy for institutional quality. Country specific effects and error term are denoted by μ_i *and* ε_{it} respectively.

3.2. Data Sources

Sample period and countries are based on the availability of data, ranging from 2000 to 2019. The study employs a balanced panel data of 30 SSA countries with data sourced from World Development Indicator (WDI), World Governance Indicators (WGI) and International Labour Organization (ILO) statistical database.

3.3. Estimation Technique

The generalized method of moments model, which can be used for dynamic panel data developed by Arellano and Bond (1991) and Blundell and Bond (1998) is employed for this study. In dynamic panel data, the cause and effect relationship for underlying phenomena is generally dynamic over time (Ullah et al., 2017). In an attempt to measure this, dynamic panel data estimation techniques leverage lags of the dependent variables as explanatory factors. Lagged values of the dependent variables are therefore used as instruments to control this endogenous relationship. The GMM model, which is generally used for panel data, provides consistent results in the presence of different sources of endogeneity, namely "unobserved heterogeneity, simultaneity and dynamic endogeneity" (Wintoki, Linck, & Netter, 2012).

GMM estimators can be created using two types of transformation methods: first-difference transformation (one-step GMM) and second-order transformation (two-step GMM). The first-difference transformation (one-step GMM) does, however, have significant drawbacks. If a variable's most recent value is absent, the first-difference transformation (which subtracts a variable's past value from its current value) may result in the loss of too many observations (Roodman, 2009). Arellano and Bover (1995) advocated using a second order transformation to avoid data loss due to the internal transformation problem with the first-step GMM (two-step GMM).

The second-order transformation (two-step GMM) uses 'forward orthogonal deviations,' which implies that instead of deducting previous data from the present value of a variable, the two-step GMM model subtracts the average of all future available observations (Roodman, 2009). A two-step GMM model delivers more efficient and consistent estimates for the involved coefficients in the case of a balanced panel dataset (Arellano & Bover, 1995).

The study employed therefore employed the Generalized Method of Moments (GMM) technique because the technique is applicable in cases where the number of countries studied (N) is greater than the years of observation (T) i.e. (N>T). Similarly, the technique controls for endogeneity of regressors. However, the system GMM estimator is preferred to the difference estimator due to its reliability and efficiency. The two-step system GMM estimates is also more robust to heteroskedasticity and panel-specific autocorrelation than the one-system GMM (Akinbode et al, 2020). Post-estimation diagnoses for the GMM framework will include the test for serial correlation, using the Arellano and Bond (1991) test as well as the Hansen tests for instrument validation.

4. Results and Discussion

4.1. Pre-estimation analyses – descriptive statistics and correlation analyses

Table 1: Descriptive Statistics

	OUTPUT	**GEE**	**GEH**	**LE**	**GFCF**	**GOVT**
Mean	3901.29	5.49	5.29	57.73	2.09	-0.75
Median	2642.74	3.75	4.73	57.93	5.89	-0.75
Maximum	24339.90	27.46	19.72	74.51	4.35	1.05
Minimum	3861.039	-1.55	1.78	39.44	2.50	-1.79
Std. Dev	3861.03	5.35	2.26	7.02	4.79	0.53

Source: Author's Computation (2021).

Table 1 shows that output has a mean of $3901.29 implying that, on the average, labour productivity per worker is $3901.29 between 2000 and 2019 with a minimum of $3861.039 and a maximum of $24339.90 recorded over the period. Government expenditure on education and health in SSA countries have mean values of $5.49 and $5.29, while the average life expectancy of SSA citizens is 57.73 years. Gross fixed capital formation also has an average value of $2.09, while government effectiveness was recorded at -0.75 for the period studied.

Table 2: Correlation Matrix

	OUTPUT	GEE	GEH	LE	GFCF	GOVT
OUTPUT	1					
GEE	-0.120	1				
GEH	-0.379	0.091	1			
LE	0.261	-0.013	-0.117	1		
GFCF	-0.038	0.375	-0.129	0.065	1	
GOVT	-0.102	0.303	0.029	0.304	-0.003	1

Source: Author's Computation (2021)

Similarly, table 2 shows no evidence of correlation existing between the explanatory variables.

4.2. Presentation of Results

Following the rule of thumb for selection between Difference and System GMM as established by Bond (2001), four techniques of estimations were used. These methods are Pooled OLS, OLS -Fixed effect, Difference-GMM and System- GMM. However, results will be based on the System GMM having satisfied the necessary conditions.

Table 3. Presentation of Results

Dependent Variable: LnOutput per worker						
Variables	Pooled OLS	Fixed effect OLS	One step Diff GMM	Two Step Diff GMM	One Step System GMM	Two Step System GMM
LnOutput per worker (-1)	1.0004*** (0.0000)	0.9964*** (0.0000)	0.9609*** (0.0000)	0.9553*** (0.0000)	0.9802*** (0.0000)	0.9813*** (0.0000)
Ln GEH	0.0076 (0.1348)	-0.0028 (0.7408)	-0.0073 (0.7249)	-0.0069*** (0.0002)	0.0063 (0.6721)	0.0053** (0.0361)
lnGEE	-0.0004 (0.2521)	0.0005 (0.4517)	-0.0008 (0.4653)	-0.0016 (0.2571)	0.0003 (0.7655)	0.0004 (0.4617)
lnGFCF	0.0027*** (0.0014)	0.0024 (0.1394)	0.0047 (0.1247)	0.0049*** (0.0019)	0.0027 (0.3879)	0.0028 (0.2364)
lnLE	-0.0544*** (0.0014)	-0.0487* (0.0595)	-0.0033 (0.9567)	-0.0036 (0.8170)	-0.0279 (0.6019)	-0.0372*** (0.0015)
GOVT	0.0168** (0.0001)	0.0179** (0.0302)	0.0625** (0.0115)	0.0647*** (0.0000)	0.0245* (0.0664)	0.0250*** (0.0000)
Hansen (p value)	------	-------	0.164	0.351	0.185	0.462
AR(1)			0.000	0.090	0.002	0.053
AR(2)			0.255	0.561	0.321	0.453
Observations	454	454	396	396	396	396
Instruments			135	30	135	30

***, ** and * indicate significance at 1%, 5% and 10% respectively.

Source: Author's Computation (2021)

Results from the two-step system GMM shows that two indicators of human capital (government expenditure on health and life expectancy) have significant effect on labour productivity. Government expenditure on health positively influences labour productivity at 5 percent significance level. This implies that a percentage increase in government expenditure on health will increase labour productivity by 0.0053 percent. This result is not far-fetched as a healthy worker tends to be productive at work. This corroborates findings by Ragupathi and Ragupathi (2020), Ugwu (2015) as well as Matthew and Fasina (2010).

On the contrary, life expectancy has a negative relationship with labour productivity as it is seen that a percentage increase in life expectancy will reduce labour productivity by 0.037 percent. This does not conform with a-priori expectation and deviates from studies such as Akinbode et al (2020), Adedeji and Akinlo (2016), and Waziri et al. (2015). Government effectiveness influences labour productivity positively with a unit increase in government effectiveness increasing labour productivity by 0.025 percent. This validates findings by Doan (2019) and Kpognon and Bah (2019). Government effectiveness will increase labour productivity through the formulation and implementation of sound labour policies and providing a conducive environment for labour to thrive. Government expenditure on education and gross fixed capital formation have no significant effect on labour productivity. This shows that governments of SSA countries have not invested significantly enough in the education sector for labour to benefit from.

Post-diagnostic results show that there is no evidence of serial correlation in the estimated model. In confirming the consistency of the GMM estimates, the Hansen test of 0.462 reveals that the instrumental variables are valid.

5. Conclusion

The study examined the effect of human capital on labour market outcomes proxied by output per worker in SSA. Data spanning from 2000 to 2019 was obtained for 30 SSA countries from WDI, WGI and ILO statistical database. Two-step system-GMM results showed that two out of the three measures of human capital employed (government expenditure on health as well as life expectancy) exert significant influence on labour productivity. While government expenditure on health influences labour productivity positively, life expectancy exerts negative influence on labour productivity. Thus, human capital significantly contributes to labour productivity in SSA.

The study recommends that there is a strong need for the development of the educational sector of SSA

countries. Governments of countries in the sub-region should increase the share of allocation directed to this sector, so as to improve the sector's contribution to productivity. This corroborates the saying that "an educated nation, is a wealthy nation". Similarly, countries in the sub-region should invest more in physical capital to increase labour productivity. Research and development should be encouraged for innovations and inventions to emerge.

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