

Monetary Policy And Human Capital Development In Selected Sub-Saharan African Countries

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Abstract

The study assessed monetary policy and human capital development in 30 selected Sub-Saharan African (SSA) countries. Panel data from the World Development Indicators (WDI) and the United Nations Development Programme (UNDP) from 1986 to 2022 were utilized for the analysis. Estimation was conducted using the Autoregressive Distributed Lag (ARDL) model. The dependent variable was human capital development, whereas the independent variables were the lending rate and exchange rate. In the long run, the results of the analysis demonstrated that the expansion of human capital during the study period was not significantly impacted by the lending and exchange rates. In contrast, both variables had a positive and considerable short-term influence on human capital development. Policymakers must recognize the interdependency of these essential components in order to handle the complexity of a dynamic global economy. The development of human capital must be a key element of economic policy frameworks, and governments as well as monetary authorities must put these plans into action. The workforce is strengthened, and overall welfare is enhanced by policies that make it easier for people to acquire quality healthcare, education, and skill development.

Keywords: Monetary Policy, Human Capital Development, Autoregressive Distributed Lag Model, Co-Integration and Error Correction.

1 INTRODUCTION

Monetary policy and human capital development must be integrated in a well-coordinated manner to achieve sustainable economic development (World Bank, 2019). Recognizing the interdependence of these elements allows nations to work toward building resilient economies that can thrive in a constantly changing environment while also withstanding setbacks. In the pursuit of inclusive growth and shared prosperity, the cooperation of monetary policy and human capital becomes an important driving force that shapes the future course of countries all over the world. Economic outcomes are greatly influenced by monetary policy, particularly in developing regions such as SSA (Ajide, 2020). There are several ways that monetary decisions impact health, education, and the general capacities of human resources, which makes the relationship that exist between monetary policy and the growth of human capital intricate (Ofori et al., 2023). This study aims to examine how these two crucial areas interact, providing a thorough overview of recent developments and existing literature. Policymakers must realize how important it is to appropriately align these aspects if they want investments in human capital to have a significant impact on individuals and society at large.

The study enhanced our understanding of the following areas: While some of the previous studies used a linear regression technique, the most recent study used the ARDL to capture both the short-term and long-term association between the variables (Asongu & Odhiambo, 2020). The focus of the new study was restricted to SSA. Given that the majority of SSA countries are impoverished and in the process of developing, this scenario was selected. This study used Human Capital Theory, developed by the economist Gary Becker in the 1960s (Becker, 1964), which is based on the idea that people can improve their economic status by investing in healthcare, education, and training, in addition to the endogenous growth model used by the previous researcher (Romer, 1990). According to this theory, human capital is an asset that produces revenue in the form of better job opportunities and increased pay (Becker, 1964). The human capital theory provided additional explanations for some human capital factors, including health care and education.

Objectives of the Study

Examining monetary policy with the development of human capital in a few chosen Sub-Saharan African nations was the study's main goal. The specific goals are to: (i) ascertain how the monetary policy rate affects

the development of human capital; (ii) examine how the currency exchange rate affects the development of human capital; and (iii) ascertain whether monetary policy and the development of human capital in a subset of sub-Saharan African nations are co-integrated.

Scope of the Study

The study covered 30 nations in SSA between 1986 and 2022. The Structural Adjustment Program era was taken into consideration while choosing the base period, and SSA nations with low to medium levels of human capital development were chosen. This is justified by the fact that most SSA nations are the least developed, with around half of their populations living in extreme poverty.

2. LITERATURE REVIEW

The study supports the findings of Muazu and Yakubu (2018), who utilized the data about 46 countries between 1980 and 2015 and the method of moments generalization to examine the variables that determine the growth of the financial sector in Africa. More importantly, they also examine the question of whether the linkage between trade openness and human capital can explain financial advancement. Their findings prove that the effects of trade openness on the private credit are stronger than on domestic credit whereas human capital is influential on financial development (Muazu & Yakubu, 2018). Openness and human capital are interdependent concepts which are related significantly to financial development. The marginal impacts analysis indicates that the trade openness (human capital) affects the private (domestic) credit relatively more than the trade openness (human capital) (Muazu & Yakubu, 2018). The bulk of evidence that we have indicates that there is no difference between trade openness and human capital accumulation in terms of evaluating financial progress in Africa.

The results are also consistent with those of Cyn-Young and Ragelio (2015) who tested the connection between poverty, financial inclusion, and income inequality in Asia. With a particular interest on the developing economies in Asia, the study aimed at identifying country specific determinants and macroeconomic factors which influence the degree of financial inclusion by conducting a regression analysis of 37 developing Asian countries. They discover that financial inclusion is strongly affected by demographics and per capita income. Also, the study demonstrates the role of financial inclusion in minimizing income inequality and poverty.

The findings are consistent with the Granger causality and co-integration between the economic growth and the total energy consumption and disaggregate energy and the electricity in China between 1995 and 2014. The study was done by Zheng and Yang (2017). Unlike the small number of provincial studies that exist on China at the present, the study employed a multivariate model where both physical capital and per capita human capital are included in the neoclassical production equation. The studies point out that human capital is twice or even thrice more economically productive than physical capital, and the role of energy was considerable as well. Moreover, the causal consequences of total energy consumption and different disaggregated energy consumption must be investigated prior to the local governments enacting specific economic and energy policies.

The discussion validates the results of Ljinli and Jie (2022), who evaluated economic stagnation before it had to be educated. The study hypothesizes that failure to coordinate the ability to exploit the potential human capital externalities, and empirically supported decreasing marginal returns to education, explains a stable poverty trap at low initial average human capital. Balanced growth can be achieved at an average human capital level beyond some threshold because there are empirically determined human capital externalities, increasing returns to scale in output. One solution to escape poverty and reach the level of human capital is mandatory public schooling or subsidies to education. appropriate labor income-financed subsidies for school time and education expenditures. Additionally, the study backs Oluwabunmi et al. (2021) investigated the dynamic interactions between Nigeria's school enrollment rates and employment rates (as measured by unemployment rates). To examine these correlations, the study used unrestricted VAR and autoregressive estimations.

The present discussion favors the new-growth theory (also known as endogenous models) (Romer, 1990) according to which as the investments in human capital rise (in particular at higher levels of education) the human capital will be capable of dynamic development and will trigger the acceleration of the long-term

growth within Nigeria. This is multiplier advantageous due to sustainable capital human development since an education led growth generates jobs in the short term. It appears, though, that in order to maintain the growth of human capital to the extent of generating jobs in the future, education would have to be linked with other cooperative elements in form of social safety nets, good governance, the creation of the private sector, and effective utilization of the people and physical resources (World Bank, 2019).

2.1 Theoretical Framework

Human capital theory serves as the foundation for this study. According to the Human Capital Theory, which was put forth by economist Gary Becker in the 1960s (Becker, 1964), people can raise their economic standing by making investments in healthcare, education, and training. This idea states that human capital is an asset that produces revenue in the form of better job opportunities and increased pay (Becker, 1964). Investments in research, education, and training foster technological advancements and innovation, which in turn foster sustained economic growth (Romer, 1990). Monetary policy is essential in creating an environment that promotes the development of human capital by preserving price and financial stability (Ofori et al., 2023).

3. RESEARCH METHODOLOGY

Research design, according to Onwumere (2021), is a methodical blueprint for scientific inquiry and analysis. The study uses the ex post facto design, which is typically employed when the features of the variables being studied cannot be changed. Ex post facto research, according to Simon and Goes (2013), is based on an event or fact that has already occurred but also using basic logic of inquiry and study, such as the experimental method. This study used annualized panel data for 30 countries in SSA between 1986 and 2022. The UNDP and the World Bank Development Indicator WDI served as the sources of the secondary data.

Model Specification

The study adopted the Bayesian estimation model used by Carl Walsh (2017) in his work, Monetary theory and policy in United States of America. The ability to assess the effects of alternative, systematic monetary policy rules as well as the effects of policy shocks on macroeconomic variables is a significant benefit of these structural models. The fundamental framework of these models can be stated as follows:

$$E_t Y_{i+1} = A_1 Y_i + A_2 X_i + B_i + u_i, \quad (1)$$

An endogenous variable vector is denoted by Y_i , while an exogenous variable vector is denoted by X_i .

Recent study adopted and modified the model as shown bellow:

$$DIH_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 RCEX_{it} + \epsilon_t \quad (2)$$

Where: DIH represents Human Capital Development, LR represents Monetary Policy Rate, RCEX represents Currency Exchange Rate and ϵ_t represents Error Term

Techniques of Analysis

The ARDL approach was used in the most current study. Finding the long-term and short-term relationships between the variables is the rationale behind this estimation technique.

Below is the ARDL model used for the estimation:

$$\Delta DIHP_t = \beta_0 + \sum_p^q \beta_1 \Delta DIHP_{t-n} + \sum_p^q \beta_2 \Delta LR_{t-n} + \sum_p^q \beta_3 RCEX_{t-n} + \theta_1 LR_t + \theta_2 RCEX_t + \epsilon_t$$

P stands for Maximum Lag, Q is Minimum Lag, t-n is Time Lag. \sum represents Summation, Δ is Differential Operator and ϵ_t represents Error Term. ARDL offers the following advantages: ARDL has both the lag of Dependent and independent variables. It models both for long-run and short and it tolerates variables with different order of integration. It is also a dynamic model that overcomes the diagnostic problem with OLS. ARDL remains efficient in the face of small sample size. It provides the opportunity to adjust and adopt any suitable lag cells.

4. DATA ANALYSIS AND RESULTS

The UNDP and the WDI provided the panel data used for estimation. We looked at thirty countries in SSA. Human development is the dependent variable. The currency exchange rate and monetary policy rate are examples of independent variables.

Descriptive Analysis Test

To investigate the nature of the data, a descriptive statistics test was conducted, as indicated in Table 4.1 below. The mean, median skewness, kurtosis, and other features that would improve accurate comprehension of the variables are displayed via descriptive statistics.

Table 4.1: Descriptive Analysis Table

	DIH	LR	RCEX
Mean	0.444047	13.76361	517.0377
Median	0.442300	12.17292	272.2636
Maximum	0.741000	113.3083	9565.082
Minimum	0.212000	1.892300	1.99E-10
Std. Dev.	0.104813	12.10472	1009.380
Skewness	0.352358	1.612055	5.060746
Kurtosis	2.779554	7.973258	36.11661
Jarque-Bera	24.80760	1598.332	54561.53
Probability	0.000004	0.000000	0.000000
Sum	484.8988	15029.86	564605.2
Sum Sq. Dev.	11.98539	159858.1	1.11E+09
Observations	1092	1092	1092

Source: Authors' computation

Table 4.1 showed that DIH averaged 0.44% and ranged from 0.21% to 0.74%, LR averaged 13.76% and ranged from 1.89% to 113.31%, RCEX averaged 517.04% and ranged from 1.99E-10 to 9565.08% of the 30 selected sub SSA countries from 1986 to 1922.

Test for stationary

Stationary is tested using Panel Unit Root Tests. The purpose of the test was to prevent spurious regression. Consequently, the stationary status of the data was ascertained using the Augmented Dickey-Fuller (ADF) unit root test.

Table 4.2: Summary of panel unit root test

VARIABLES	ADF STATISTICS	CRITICAL STATISTICS @ 5 % LEVEL	PROBABILITY VALUE	ORDER OF INTEGRATION
DIH	-5.438492	-3.413870	0.0000	1(0)
LR	-5.594402	-3.413967	0.0000	1(0)
RCEX	-31.32123	-3.413925	0.0000	1(1)

Source: Authors' computation

The result from table 4.2 showed that no unit root problem existed between monetary policy and human capital development variables. DIH and LR were integrated at order zero (level) i.e. 1(0). However, RCEX was integrated at order one i.e. 1(1).

Estimation Test

The ARDL was used in the investigation. ARDL model was applied because it offers the following advantages: ARDL has both the lag of Dependent and independent variables. It models both for long-run and short and it tolerates variables with different order of integration. It is also a dynamic model that overcomes the diagnostic problem with OLS. ARDL remains efficient in the face of small sample size. It provides the opportunity to adjust and adopt any suitable lag cells.

Table 4.3: ARDL Result of monetary policy and human capital development

Dependent Variable: D(DIH)				
Variable	Coeff.	Std. E	t-Stat	Prob.
Long-run				
LR	0.001762	0.001085	1.625066	0.1044
RCEX	1.62E-05	1.29E-05	1.251872	0.2109
C	0.322167	0.041970	7.676088	0.0000
Short-run				
D(LR)	0.000507	0.000202	2.513610	0.0121
D(RCEX)	1.33E-05	3.81E-06	3.482613	0.0005
C	0.017926	0.003749	4.780997	0.0000

Author's computation

Result from table 4,3 revealed that LR and RCEX were non-significant with p- values of 0.10, and 0.21 respectively. However, in the short run all variables had positive and significant outcomes. The poor performance of the variables in the long run could be attributed to the government inconsistent policies and inability to complete and sustain the existing viable projects.

Post estimation/Diagnostic Tests

Diagnostic or post estimation tests are those tests which are conducted after the main analysis in order to find out whether the model used for the estimation was suitable and reliable.

Test for Heteroskedasticity.

This test is employed to check for autocorrelation.

Table 4.4 Result for Heteroskedasticity test on monetary policy and human capital development

Heteroskedasticity Test: ARCH			
F-statistic	0.420301	Prob. F(1,1066)	0.5169
Obs*R-squared	0.420923	Prob. Chi-Square(1)	0.5165

Source : Author's construction.

The heteroskedasticity result looking at the chi-square result and its probability showed 0.5169 which is greater than the significance value of 0.05. This entails that the model coefficients are reliable for policy making, prescription and forecast.

ARDL Error correction/ Co-integration test

A long-term equilibrium relationship between the non-stationary variables is determined by cointegration, whereas the error correction model illustrates how the dependent variable adapts to the dynamics (changes) of the independent variables.

Table 4.5 Result of ARDL Co-integration text of monetary policy and human capital development

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.055642	0.008588	-6.478880	0.0000

Source: Author's computation.

Table 4.5 showed a probability value of 0.00. So a robust and significant cointegration existed between monetary policy and human capital development. Moreover, a significant error correction existed because the coefficient value is negative (-0.06) and the p-value (0.00) which is less than 0.05.

Cusum Test

Cusum test is a diagnostic test that shows model stability. The model is stable when the blue line sits between the two red lines.

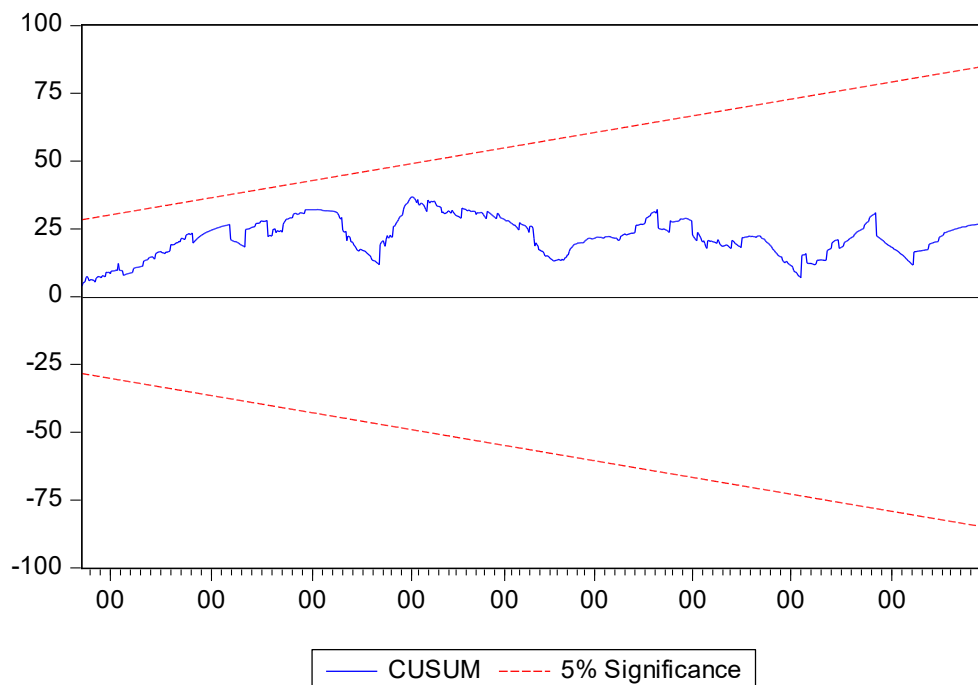


Figure 4.1: Result of Cumseyy test of monetary policy and human capital development
 Source: Author' computation from e view 10

Figure 4.1 has clearly shown that the blue line sat in between the two red lines. So, the models are stable and reliable.

5. CONCLUSION AND RECOMMENDATIONS

As a tactical tool at the central bank's disposal, monetary policy shapes the macroeconomic landscape, impacting on inflation, investment, and general economic stability. A key component of encouraging innovation, productivity, and long-term economic growth is investing in human capital, which includes health, education, and skills. Policymakers attempting to negotiate the intricacies of a quickly changing global economy must acknowledge the connection between these two crucial elements. Development of human capital is a long-term investment that improves a country's ability to adjust to changes in technology and international issues. The combination of monetary policy and human capital can be a potent engine of development when it is backed by efficient monetary policies that preserve price stability and foster an atmosphere that is favorable to economic activity.

Based on the findings of the study, we suggest the following: Each nation's Central bank and other regulatory bodies should monitor and analyze frequently the interest rate to ensure that they are successful in promoting human capital development outcomes. Reducing interest rates for college loans can make higher education more accessible. Central banks should think about implementing quantitative easing policies that distribute and modify funding rates in order to support and enhance healthcare and educational institutions.

The government should support domestic manufacturing of medical and educational products in order to lessen reliance on imports and protect against fluctuations in currency rates. For those who pay out of pocket or depend on private insurance policies connected to foreign currencies, the affordability of healthcare services may be impacted by large fluctuations in exchange rates.

REFERENCES

1. Ajide, F. M. (2020). Monetary policy and human capital development in emerging economies: Evidence from Nigeria. *Journal of Applied Economics*, 23(1), 123-145.
2. Asongu, S. A., & Odhiambo, N. M. (2020). The role of monetary policy in the transition to sustainable development in Sub-Saharan Africa. *Sustainable Development*, 28(5), 1203-1211.
3. Becker, G. S. (1964). Human capital: A theoretical and empirical analysis, with special reference to education. National Bureau of Economic Research.

4. Cyn-Young, P., & Ragelio, B. (2015). Financial inclusion, poverty, and income inequality in developing Asia. Asian Development Bank Economics Working Paper Series, 426.
5. Jinli, L., & Jie, Z. (2022). Economic stagnation before it had to be educated: A human capital-based theory. *Economic Modelling*, 115, 105956.
6. Muazu, I., & Yakubu, I. N. (2018). Trade openness, human capital and financial development in Africa. *Journal of Economic and Administrative Sciences*, 34(2), 121-142.
7. Ofori, I. K., Obeng, C. K., & Armah, M. K. (2023). Monetary policy and human development in Africa: The role of financial development. *Journal of Economic Studies*, 50(2), 345-365.
8. Oluwabunmi, O. A., Adekunle, B. S., & Otekunrin, A. O. (2021). Dynamic interactions between school enrolment and employment rates in Nigeria: Fresh evidence from a VAR and autoregressive analysis. *International Journal of Education Economics and Development*, 12(3), 287-307.
9. Onwumere, J. U. J. (2021). *Business and economic research methods*. Enugu: Vougasen Limited.
10. Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2), S71-S102.
11. Simon, M. K., & Goes, J. (2013). *Dissertation and scholarly research: Recipes for success*. Dissertation Success, LLC.
12. Walsh, C. E. (2017). *Monetary theory and policy* (4th ed.). The MIT Press.
13. World Bank. (2019). *The changing nature of work*. World Development Report 2019.
14. Zheng, X., & Yang, J. (2017). The relationship between energy consumption and economic growth in China: A multivariate analysis. *Energy Sources, Part B: Economics, Planning, and Policy*, 12(11), 998-1005.