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Impact of Foreign Aid and Human Capital Development on Economic Growth in the West African Monetary Zone Region*

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Abstract This study investigates the impact of foreign aid and human capital development on economic growth in the West African Monetary Zone (WAMZ) region, from 1999 – 2023. The study employs the autoregressive distributed lag (ARDL) model for the analysis. The results of the findings reveal that the impact of foreign aid in WAMZ, both in the short-run and long-run is negative but significant only in the long-run, however, human capital development is positive, only in the long-run. Furthermore, the findings indicate that economic growth and human capital development are causally related while foreign aid and economic growth are not. Therefore, the study recommends that aid donors should collaborate with multilateral organizations like the International Monetary Fund (IMF), as they are better suited to manage, oversee and promote economic growth projects. Meanwhile, the governments of WAMZ should strategically invest in vital sectors to increase resilience and self-sufficiency and establish macroeconomic environment that reduces reliance on foreign aid. Also, the policymakers in the WAMZ should ensure universal access to high-quality education that meets the demand of the labour market, and make investments in health-care delivery systems. Ultimately, the study contributes to a deeper understanding of the dynamics between aid-inflows, human capital, and economic growth in the region.

Keywords Economic growth, health expenditure, official development assistance, secondary school enrolment, WAMZ.

JEL Classification F35, F43, I15, I25.

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1. INTRODUCTION

It is crucial to note that human capital development and foreign aid have existed for a long time before documented proof that they could have a substantial impact on economic growth surfaced. According to the OECD (2020), foreign aid is the assistance provided by donor nations and multilateral organizations with the goal of advancing the welfare and economic development of underdeveloped nations. In this study, foreign aid is represented or proxied as official development assistance (ODA), which is a specific type of foreign aid that focuses on economic development and welfare. The Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD), adopted ODA as the "gold standard" of foreign aid in 1969.

Loans, project aid, food aid, emergency relief, bilateral grants, multilateral financial inflows, and technical assistance are all examples of foreign aid. In essence, foreign aid is divided into two categories: bilateral aid, which goes straight from donors to aid recipient nations, and multilateral aid, which is disbursed through development partners and intermediate organizations such as the International Monetary Fund and the World Health Organization. The efficiency of aid programs, corruption, and dependency are some of the issues and complaints leveled against foreign help. Critics contend that aid might occasionally impede recipient nations' growth and prolong a cycle of dependency.

On the other hand, human capital development consists of the knowledge, skills, and health that people accumulate throughout their lives, enabling them to realize their potential as productive members of society. This requires investing in people through nutrition, health-care, quality education, jobs and skills. In this study, human capital development is represented or proxied by two prominent indicators – 'government expenditure on health' and 'gross secondary school enrolment'.

The essentiality of human capital in accelerating the growth and development of every economy has become a major concern of developing countries especially in Sub-Saharan Africa. Investment in human capital through quality education and health-care delivery system is widely recognized by governments as one of the most potent strategies for concretizing both short-term and long-term development plans in the face of the prevailing human capital development crisis in developing countries.

According to the micro-macro paradox described by Mosley (1986), foreign aid is viewed as a human development facilitator in the economies of the countries that receive it after it is thought to be successful in resolving important development issues. Economic planning methods generally prioritize the de-

velopment of human capital through investments in healthcare, education, and training, according to Ewubare (2018). Therefore, turning citizens into productive workers who can propel economic growth and development is a prerequisite for human capital development. Human capital development has frequently been emphasized as the most reliable source of economic growth in emerging nations' growth affairs (Teixeira and Queiros, 2016). However, because of the saving gap, many developing nations invest significantly less in the development of human capital than is necessary; as a result, foreign aid is sometimes viewed as a substitute strategy for achieving economic growth.

Numerous sociocultural complexities and a plethora of development issues have plagued efforts by international donors to increase the quality of human capital in order to support economic growth in developing countries. As the major focus of this discussion, the West African Monetary Zone region offers numerous examples of nations where the development of human capital has not yet materialized, as their economies continue to lag behind.

However, the West African Monetary Zone (WAMZ) faces a complex interplay of challenges in its pursuit of economic growth, with the dynamics of foreign aid and human capital development playing crucial roles. Despite the massive influx of foreign aid, the significant investments in health care and education, and the extremely slow rate of economic growth, the effect of these factors on the WAMZ's economic expansion is still debatable. Thus, it is now essential to conduct an empirical study to look at how foreign aid and the development of human capital affect economic growth in the WAMZ.

This study's objective is to use the six WAMZ aid-receiving nations – Ghana, Guinea, Liberia, Nigeria, Sierra Leone, and Gambia – to: (i). investigate the impact of foreign aid on economic growth in WAMZ member countries in the short-run and long-run. (ii). examine the effect of human capital development on economic growth in WAMZ member countries in the short-run and long-run. (iii). examine the causality between foreign aid and human capital development in promoting economic growth in WAMZ.

Considering the challenges that affect foreign aid and human capital development in WAMZ, the study will address and answer the following research questions: (i). what is the impact of foreign aid on economic growth in WAMZ member countries in the short-run and long-run? (ii). what is the effect of human capital development on economic growth in WAMZ member countries in the short-run and long-run? (iii). is there any causality between foreign aid and human capital development in promoting economic growth in WAMZ?

1.1. OVERVIEW OF THE WEST AFRICAN MONETARY ZONE

The West African Monetary Zone (WAMZ) is a group of countries in West Africa that have come together to promote economic integration and monetary cooperation. The monetary zone countries are Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone. These countries are all anglophone except Guinea which is francophone. The idea of a common currency and monetary union has been a significant part of the region's economic agenda. Discussions about regional economic integration and a common currency in West Africa began in the 1990s. The primary aim was to enhance economic stability, promote trade, and foster overall development in the region. To achieve this, the West African Monetary Institute (WAMI) was established in 2000 in Accra, Ghana. It functions as a specialist organization to help the WAMZ and the West African Economic and Monetary Union (WAEMU) attain a common currency.

Divergent economic policies, varying degrees of institutional ability, and economic differences among member nations have all presented obstacles to the path towards a single currency. The implementation of the unified currency has been delayed in part because of these difficulties. WAMZ is still striving to meet the requirements for the implementation of a single currency. Regular reviews of progress are conducted, and any issues are addressed with modifications. Due to the difficulties in bringing the economies of the various member nations into alignment, the schedule for the adoption of a common currency has changed over time.

It is appropriate to choose the WAMZ as the case study because of the lack of agreement regarding the effectiveness of aid, the perceived institutional influence in aid management, and the challenges with human capital development. These factors have made it necessary to attempt to assess the impact of foreign aid and the effect of human capital development on economic growth in WAMZ region.

2. LITERATURE REVIEW

This section is divided into two parts: the first, details the empirical literature; and the second highlights the gaps in the literature.

2.1. EMPIRICAL LITERATURE

This section is divided into two: The literature on foreign aid, and human capital development on economic growth.

2.1.1. Empirical Literature on Foreign Aid and Economic Growth

Three different schools of thought have emerged from the numerous studies on the efficacy of foreign aid in developing and underdeveloped countries that have been carried out in recent years. First, proponents of international aid contend that it can boost poor nations' economies (Harb and Hall, 2019; Sothan, 2018; Arndt *et al.*, 2010). Two are those who argue that aid has a detrimental effect on growth, such as Babalola and Shittu (2020) and Dreher and Langlotz (2020). The third group contends that the sort of aid donors utilizes and the recipient nation's attributes – such as ownership, commitment, governance, and institutional capacity – determine how effective aid is.

Tefera and Odhiambo (2020) try to draw attention to the arguments around the relationship between aid and growth from both a theoretical and empirical standpoint. They maintain that the contentious question of whether foreign aid promotes development in underdeveloped nations will never be resolved. The evaluation concludes that the connection or link is the most empirically explored area, despite the fact that the study employs a detailed investigation of the theoretical and empirical literature on the aid-growth nexus, the findings are still ambiguous and debatable. There are two schools of thought: aid effectiveness, or those who support aid, and aid ineffectiveness, or those who oppose aid. Proponents of aid contend that aid has a favorable impact on growth, while opponents of aid discover that aid either has no effect at all or has a harmful impact. On the other hand, aid providers think that official development assistance often has a beneficial effect on growth and that aid inflows to productive sectors boost economic expansion. The authors recommend that donors and governments should consider the aforementioned assumption when making judgments on aid financing.

Adams and Elassal (2020) examine whether aid flows contribute to economic growth or growth divergence between a sample of Asian and African countries over the period 1980 – 2015. The independent variables for the analysis are chosen using both empirical research and theoretical expectations, and the panel data fixed-effects model is used for both the African and Asian samples. The empirical findings show that there is no correlation in aid flows between Asia and Africa in terms of development divergence or long-term growth pathways. However, governance structure is the reason for growth dispersion in Africa. The authors come to the conclusion that in order to guarantee that aid gets to the appropriate routes or conduits in the recipient countries, aid donor nations need to take on more supervisory and monitoring responsibilities. Additionally, the authors believe that countries with sound macroeconomic policies and greater

macroeconomic stability should receive foreign aid in order to guarantee efficiency.

Hongli and Vitenu-Sackey (2023) assess the effectiveness of foreign aid on the development of Africa and why Africa as the recipient of aid is still suffering in poverty and underdevelopment. The scope of the study focuses on 50 African countries from 1996 – 2017, and adopts the generalized linear model, Arellano-bond dynamic panel data estimations (GMM two-step approach), and Granger causality for the analysis. The findings demonstrate that foreign aid and economic development have a dynamic and statistically linear relationship. The authors conclude that the undermining factors stagnating the effectiveness of aid-growth relationships in Africa are corruption, poverty, low level of human capital development, political instability, insecurity, and poor institutional quality. On the way forward, they recommend that policymakers should focus on technical assistance and educational projects that could strengthen institutions rather than other developmental projects to propagate steady development and promote long-run growth programme.

Ozyılmaz (2022) investigates how foreign aid affects emerging nations' economic expansion. The 20 nations that received the most foreign aid worldwide were the focus of the author's attention. Foreign aid has a statistically significant negative impact on economic growth, according to the study's findings, which uses the random effects, fixed effects, and pooled least squares methodologies. Furthermore, the results of the control variables – inflation, population, and foreign direct investments – show that while population has a negative impact on economic growth, inflation has a statistically negligible influence. Foreign direct investments have a favourable effect on the growth of the 20 countries that received the most aid globally.

Nwude *et al.* (2023) utilize the level of income, domestic capital formation, and labour participation rate as control variables to determine the effects of foreign aid on economic growth in Sub-Saharan African countries from 1982 – 2018. The paper applies the pooled mean group estimation approach for the empirical evaluation of the analysis and concludes that the only factor influencing economic growth in low-income, low-middle-income, and upper-middle-income nations over the short and medium terms, respectively, is bilateral foreign aid. Additionally, the results show that while Anglophone Sub-Saharan African countries suffer from multilateral aid, bilateral aid has a favourable impact on economic growth for Francophone nations. According to the report, the authors recommend that the Sub-Saharan African nations require more bilateral help in order to boost production to promote economic growth.

Using panel data from 1996 to 2017 and the autoregressive distributed lag (ARDL) methodology, Babalola and Shittu (2020) conduct a region-specific study to investigate the relationship between foreign aid and economic growth in West Africa. The findings show that foreign aid has no short- or long-term effect on growth in the West African region. In fact, when the index of institutional indicators was included in the research, they found a negative correlation between aid and economic growth. Due to interaction effect, the influence of foreign aid on economic growth is lessened when institutional infrastructures are improved.

In another related study, Azam and Feng (2021) analyse the impact of foreign aid on economic growth in developing countries. The authors apply both fixed-effects and robust least squares estimators for the study, which covers 37 low-income, lower-middle-income, and upper-middle-income countries, between 1985 and 2018. They conclude that while foreign inflow generally boosts economic growth, there are conflicting results when the sample is broken down into various socioeconomic brackets. The findings also show that while exports boost economic growth in low-income nations, external aid is scarce. While foreign aid has little influence on economic growth in lower middle-income countries, foreign direct investment and aid have beneficial effect on economic growth in higher middle-income countries.

Anyanwu and Wabekwa (2022) analyse the asymmetrical link between economic growth and foreign aid in the countries of the West African Monetary Zone (WAMZ) between 1985 and 2018. For the empirical analysis, they use the non-linear autoregressive distributed lagged (NARDL) model. The results show that the long-term relationships between foreign aid and growth are not balanced. Furthermore, the results indicate that multilateral help contributes to the WAMZ's economic growth in the long run, whereas bilateral aid has minimal effect on growth. Granger causality shows that both bilateral aid and multilateral aid, as well as economic growth and multilateral aid, have a unidirectional causal link. The policy implications of the findings demonstrate the importance of both bilateral and multilateral aid inflows for WAMZ economic growth. They recommend that bilateral donors should channel their aid through multilateral organizations, and conclude that multilateral aid is a more effective means of boosting economic growth in the WAMZ region in the long-run. Obu-Cann *et al.* (2022) investigate the effect of foreign aid on economic growth in Ghana, while employing stock of human capital, physical capital and foreign direct investment as independent variables, for the period 1975 – 2010. The study adopts the ordinary least squares (OLS) technique for the analysis, and finds that foreign aid is beneficial, while its impact on Ghana's economic growth is negligible. In

order to promote economic growth in Ghana, the authors advise the government to implement efficient monitoring systems, regulations, and strategies that can result in the effective use of foreign aid.

2.1.2. Empirical Literature on Human Capital Development and Economic Growth

The fourth sustainable development aim, which asserts that high-quality education is essential to the development of human capital, is inferred and heavily emphasized by Bekele *et al.* (2024). According to the report, the most important global policy initiative is the development of human capital for sustainable economic growth. They contend, however, that there are a number of drawbacks to human capital development, such as the inadequacy of human capital measurement and educational quality aspects. Thus, from 2000 to 2020, the authors examine how human capital growth affects economic sustainability in 30 Sub-Saharan African nations. The study uses the augmented mean group model in its empirical estimation, including the years of education and return on education, as well as the influence of institutional and political issues. The results of the findings reveal that economic sustainability in Sub-Saharan African nations is significantly impacted negatively by human capital development. They authors conclude and recommend that policymakers should look for other ways to achieve the objectives of economic sustainability, such as re-evaluating the architecture of human capital development as a whole and prioritizing high-quality education above access to it.

Wirajing *et al.* (2023) examines the impact of human capital on economic growth in 48 African countries from 2000 – 2019. The study applies the generalized method of moments technique to analysis and conclude that economic growth in Africa is positively influenced by human capital development. Also, the findings show that internet penetration and foreign direct investments interact with human capital to produce positive net impacts on economic growth. The authors recommends that policymakers should channel more resources to the education and health sectors to improve human capital development as a prerequisite to ensure a stable and sustainable economic growth.

In a related study, Munkaila *et al.* (2022) examines the impact of education expenditure on economic growth of west African monetary zone member countries from 2004 – 2018 and employs autoregressive distributed lag (ARDL), pool mean group (PMG) with correlation matrix, cross sectional dependence test and panel unit root test for the analysis. Based on the data, the authors draw the conclusion that, over the long term, education spending has a significant impact

on economic growth, whereas capital formation and regulatory quality do not. All of the variables are statistically insignificant in the short term. The study recommends that WAMZ region should increase its budgetary allocation to the minimum benchmark of 26% in education share of total budgetary allocation in line with the United Nations Educational, Scientific and Cultural Organisations (UNESCO).

Mercedes (2021) examines the relationship between health and growth, while assuming that, along with education, health is a vital part of a region's human capital. The potential endogeneity between growth and health is applied as a control for the author's application of instrumental variable regressions using dynamic panel data, together with a number of population health status metrics and a health index produced by principal component analysis. The findings of the analysis indicate that a change in health status has a positive impact on regional output, whereas proxy indicators for health constraints have a negative impact on regional performance. The study's conclusions support the notion that spending on health and education is crucial for enhancing human capital, economic growth, and individual well-being.

Oladipo and Ogbodo (2024) in a single country analysis, investigate the impact of government expenditure on health and education on Nigeria's economic growth from 1986 – 2022. They employ the Non-linear Autoregressive Distributed Lag model to explore the link between health and education expenditures and their impact on economic growth. The results of the findings show that spending on health and education has a major effect on Nigeria's economy and support the sectors' crucial role in fostering long-term economic growth and the development of human capital. The report suggests that the Nigerian government should give healthcare and education spending more priority than just budgetary allotments and stress the importance of using resources wisely and effectively.

Munkaila *et al.* (2024) investigate the impact of health expenditure on economic growth of West African Monetary Zone (WAMZ) region from 2002 – 2019. The study uses the dynamic panel autoregressive distributed lag (ARDL) model, panel unit root tests, and cross-sectional dependence test as econometric tools for analysis. The findings indicate that whereas private health expenditure has a positive impact on the economic growth of WAMZ member nations, public health spending has a negative impact on the economy. Furthermore, the study's analysis reveals that life expectancy is positive and has significant impact on economic growth of the WAMZ countries. The authors recommend that governments should boost funding for the health sector to promote and sustain the long-term economic growth of the WAMZ countries.

Shobowale *et al.* (2022) assess the direct effects of human capital development and choose total factor productivity components – technology and infrastructure on economic growth in some Sub-Saharan African Countries from 1981 – 2020. The study employs the panel least square method and applied the augmented Solow growth model. The variables for the analysis are the growth rate of real gross domestic product (RGDP) as the dependent variable while the explanatory variables are human capital development, physical infrastructure index, research and development, labour force growth, share of private investment in GDP, trade openness, financial openness, and share of total government expenditure. The study concludes that human capital development on its own is not sufficient to bring about the required economic growth and advises on the need for complementary factors such as technology and infrastructure to drive human capital to actualise its full potential.

Overall, there is limited research on WAMZ in relation to foreign aid, human capital development and economic growth. Few studies focused on the WAMZ region, while a few looked at economic growth, human capital development, and foreign aid. Overall, there are few thorough studies applying the ARDL technique in the literature on how foreign aid and human capital development affect economic growth in WAMZ. The majority of the literature concentrates on the financial facets of developing human capital, such as spending on health and education. To offer a more thorough knowledge of the influence of human capital development on economic growth, the study investigates non-monetary factors such as secondary school enrolment (SSENR).

By filling in these gaps in the literature through empirical research, theoretical developments, methodological innovations, and policy-oriented analyses, the study will contribute to a better understanding on how foreign aid and human capital development affect economic growth in the WAMZ. Also, the study will employ the use of current data with the right estimation method and robustness checks, and it will show more reliable results about the nature of the causality between foreign aid on economic growth, and the development of human capital on economic growth in the WAMZ region.

3. METHODOLOGY

3.1. DATA AND STUDY VARIABLES

The data for the empirical analysis is country-level secondary data. The panel of six WAMZ nations used in this study's data set spans the years 1999 to 2023. The data is extracted from the World Bank World Development Indicators

Variable Code	Variable Description	Definition	Data Source	Previous Studies
GDPGR	GDP Growth Rate	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars.	World Bank (2023)	Dependent variable
ODAS	Foreign Aid	Official development assistance (ODA).	World Bank (2023)	Dreher and Langlotz (2020)
GEXPH	Health	Ratio of total government health expenditure to GDP.	World Bank (2023)	Obasuyi and Ovenseri-Ogbomo (2022)
SSENR	Secondary School Enrolment	Total secondary school enrolment as a percentage share of gross school enrolment.	World Bank (2023)	Adeyemi and Ogunsola (2016)
GFC	Gross Fixed Capital	Gross fixed capital formation (% of GDP). Total value of producer's acquisition of fixed assets such as land improvements, plant, machinery, and equipment purchase.	World Bank (2023)	Ullah (2018)
INFL	Inflation	Increase in general price level in the economy.	World Bank (2023)	Veledinah (2014)
RIR	Real Interest Rate	Lending interest rate adjusted for inflation as measured by the GDP deflator.	World Bank (2023)	Adamu (2013)

Table 1: DESCRIPTION OF VARIABLES. Source: Author's compilation. Table 1 highlights the variable codes, variable description, definition, the source of data, and the previous studies that used the variables for its analysis.

(2023). Seven variables were used in this study. The dependent variable is the GDP growth rate (GDPGR) while the explanatory or independent variables are foreign aid, proxied as official development assistance (ODAS) and human capital development, proxied as government expenditure on health (GEXPH) and secondary school enrolment (SSENR). Three control variables were used in this study, and they are gross fixed capital formation (GFC), inflation (INFL) and real interest rate (RIR).

3.2. METHOD OF ANALYSIS

The method of analysis for the study is the application of the Autoregressive Distributed lag (ARDL) methodology. It is a statistical method used in econometrics to analyse the long-term and short-term relationships among multiple time series variables. The model is also designed to express both short-term dynamics and long-term equilibrium relationships among the variables.

3.3. MODEL SPECIFICATION

This study's application of the Cobb-Douglas production function serves as its theoretical foundation. Handsaker and Douglas (1937) developed the use of proxy variables (H and T) to represent technology and human capital, despite Cobb and Douglas (1934) not specifically including human capital. Thus, the following is the specification for the revised Cobb-Douglas model:

$$Y = AK^{\alpha}(HL)^{\beta}, \tag{1}$$

where

$Y =$ economic growth or output
$K =$ physical capital
$H =$ human capital level
$L =$ labour
$A =$ total factor productivity
$\alpha =$ elasticity of capital input with respect to output
$\beta =$ elasticity of labour input with respect to output

In econometric form, (1) is expressed as:

$$Y = AK^{\alpha}(HL)^{\beta}e^{\mu t}. \tag{2}$$

Transforming (2)into log-linear form gives:

$$\log Y = \alpha_0 + \alpha_1 \log K + \beta \log(H + L) + W.$$

Therefore, the expanded model will be in the form:

$$\begin{aligned} \text{GDPGR}_{it} = {} & \beta_0 + \beta_1 \text{SSENR}_{it} + \beta_2 \text{GEXPH}_{it} + \beta_3 \text{ODAS}_{it} + \beta_4 \text{GFC}_{it} \\ & + \beta_5 \text{INFL}_{it} + \beta_6 \text{RIR}_{it} + \mu_{it}, \end{aligned} \tag{3}$$

where (Y) is output and proxied as GDP growth rate (GDPGR); K is stock of physical capital and proxied as foreign aid (ODAS), human capital development was proxied by government expenditure on health (GEXPH) and secondary school enrolment (SSENR) and GFC is gross fixed capital formation, RIR is real interest rate and INFL is inflation; i represents the six WAMZ countries and t stands for time.

Now, $\text{GDPGR}_{it} = f(\lambda_{it})$, where $\text{GDPGR}_i t$ is economic growth of the countries (i) at time t, where $i = 1, 2, 3, \ldots, n$.

The structural form of (3) is expressed as:

$$\text{GDPGR}_{it} = \beta_0 \pm \xi_i \sum_{i=1}^{n} \lambda_{it-1} + \mu_{it}. \tag{4}$$

Hence, the autoregressive distributed lag version of (4) is expressed as follows:

$$Y_{it} = \beta_0 + \eta_i \sum_{i=1}^{n} Y_{it-i} + \xi_i \sum_{i=0}^{n} \lambda_{it} + \mu_{it}.$$

The estimated dynamic model of (4) captures both short-run and long-run effects and it is presented as follows:

$$\begin{aligned} \Delta\text{GDPGR}_{it} = {} & \alpha_1 + \lambda_1 \text{GDPGR}_{it-1} + \lambda_2 \text{SSENR}_{it-1} + \lambda_3 \text{GEXPH}_{it-1} \\ & + \lambda_4 \text{ODAS}_{it-1} + \lambda_5 \text{GFC}_{it-1} + \lambda_6 \text{INFL}_{it-1} + \lambda_7 \text{RIR}_{it-1} \\ & + \sum_{i=1}^{n} \beta_t \Delta\text{GDPGR}_{it-1} + \sum_{i=0}^{n} \beta_t \Delta\text{SSENR}_{it-1} + \sum_{i=0}^{n} \beta_t \Delta\text{GEXPH}_{it-1} \\ & + \sum_{i=0}^{n} \beta_t \Delta\text{ODAS}_{it-1} + \sum_{i=0}^{n} \beta_t \Delta\text{GFC}_{it-1} + \sum_{i=0}^{n} \beta_t \Delta\text{INFL}_{it-1} \\ & + \sum_{i=0}^{n} \beta_t \Delta\text{RIR}_{it-1} + \mu_{it}. \end{aligned} \tag{5}$$

3.3.1. A Priori Expectation

$$\lambda_1 > 0, \lambda_2 > 0, \lambda_3 > 0, \lambda_4 > 0, \lambda_5 > 0, \lambda_6 > 0, \lambda_7 > 0,$$

α_0 is the intercept in the model. $\beta_t > 0$, are the impacts measuring parameters of the respective variables captured in the model. μ_t is the stochastic disturbance term that captures every other variable that influences economic growth but not included in the estimation model. Therefore, (5) becomes the fundamental equation for this study; and forms the underlying framework on which subsequent estimations, analysis and discussions on the theme of this study are based. All variables are defined below:

4. DATA ANALYSIS AND DISCUSSION

Table 2 displays the summary or descriptive statistics while table 3 shows the correlation among the variables for economic growth (GDPGR), government expenditure on health (GEXPH), secondary school enrolment (SSENR), gross fixed capital (GFC), official development assistance (ODAS), inflation (INFL) and real interest rate (RIR) in WAMZ for the period 1999 – 2023. The summary statistics revealed that the data set in the panel is balanced. The total is expected to be 148 data points. This descriptive or summary statistics are reported in table 2.

Statistic	GDPGR	GEXPH	SSENR	INFL	ODAS	GFC	RIR
Mean	4.333	5.875	15.256	12.677	7.126	31.688	22.317
Median	4.811	4.261	14.173	10.860	3.585	18.059	10.868
Maximum	26.524	20.413	35.006	41.510	103.337	135.056	110.052
Minimum	-30.145	2.453	5.030	0.845	-0.840	4.128	-29.708
Std. Dev.	5.433	3.378	6.382	7.702	14.295	33.450	31.367
Skewness	-1.776	1.572	1.016	1.528	4.888	1.820	1.561
Kurtosis	17.443	5.924	4.211	5.369	28.310	4.873	4.242
Jarque-Bera	1364.146	113.689	34.506	92.211	4539.736	103.317	69.633
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	641.272	869.511	2257.941	1876.142	1054.644	4689.887	3302.892
Sum Sq. Dev.	4338.461	1677.035	5987.446	8719.493	30038.982	164478.033	144629.499
Observations	148	148	148	148	148	148	148

Table 2: DESCRIPTIVE STATISTICS. Source: Author's computation using E-views 13. Table 2 presents the summary statistics for the variables of interest in the study, while showing the mean, median, standard deviation and range values of GDP growth rate (dependent variable – GDPGR). It also highlights the skewness, sum square deviation and observation of the data set.

	GDPGR	GEXPH	SSENR	INFL	ODAS	GFC	RIR
GDPGR	1.000	-0.024	0.132	-0.065	-0.011	0.037	0.125
GEXPH	-0.024	1.000	-0.064	-0.127	0.221	-0.377	-0.280
SSENR	0.132	-0.064	1.000	0.177	-0.244	0.118	0.319
INFL	-0.065	-0.127	0.177	1.000	-0.160	0.033	0.170
ODAS	-0.011	0.221	-0.244	-0.160	1.000	-0.194	-0.095
GFC	0.037	-0.377	0.118	0.033	-0.194	1.000	-0.203
RIR	0.125	-0.280	0.319	0.170	-0.095	-0.203	1.000

Table 3: CORRELATION MATRIX. Source: Author's computation using E-views. The correlation matrix shows the Pearson's correlation coefficients between dependent and independent variables. The results show a strong positive correlation.

Table 3, displays the correlation coefficient for the variables used. The estimated correlation coefficient reports that none of the variables is highly correlated with each other; hence, the model is expected to have no multicollinearity issues when estimated.

4.1. STATIONARITY TEST AND LAG SELECTION CRITERIA

The unit root results presented in table 4 are the IPS test proposed by Im et al. (2003) for the panel unit root test. Using the Augmented Dickey-Fuller (ADF) tests, at levels, GDPGR, SSENR, GEXPH, GFC and INFL are stationary at 5%, 5%, 5%, 5% and 1% level of significance respectively while ODAS and RIR are not stationary. However, at first difference, all the variables are stationary. Specifically, GDPGR, SSENR, GEXPH, GFC, INFL, ODA and RIR are stationary at 1%, 1%, 5%, 1%, 1%, 1% and 1% respectively. The order of cointegration for some of the variables is $I(0)$ and $I(1)$. This mixed order of cointegration makes ARDL suitable for the estimation. Lag selection is crucial and essential when estimating an equation with the ARDL model, whether it be for a panel or time series.

4.2. STABILITY AND DIAGNOSTIC TESTS

In panel ARDL estimation, stability test is conducted on an individual member of the panel to ensure dependability and trustworthiness of the outcomes, it is essential to assess the model's stability. The purpose of these tests is to evaluate the applicability and stability of the model used in this study.

At Level	GDPGR	SSENR	GEXPH	GFC	INFL	ODAS	RIR
With Constant							
t-Statistic	0.000**	0.091**	0.849**	0.934**	0.002***	0.793	0.001
Prob.	0.025	0.012	0.041	0.038	0.002	0.003	0.064
With Constant & Trend							
t-Statistic	0.003*	0.104*	0.000	0.049	0.246**	0.862**	0.004*
Prob.	0.055	0.092	0.162	0.148	0.011	0.014	0.069
Without Constant & Trend							
t-Statistic	0.001	0.710	0.147	0.893	0.538**	0.732***	0.800***
Prob.	0.168	0.345	0.629	0.265	0.027	0.005	0.001
At First Difference	d(GDPGR)	d(SSENR)	d(GEXPH)	d(GFC)	d(INFL)	d(ODAS)	d(RIR)
With Constant							
t-Statistic	0.000***	0.000***	0.000**	0.000***	0.002***	0.000***	0.000***
Prob.	0.000	0.000	0.012	0.000	0.000	0.001	0.000
With Constant & Trend							
t-Statistic	0.000***	0.000***	0.001*	0.000***	0.001***	0.000***	0.000***
Prob.	0.001	0.000	0.053	0.000	0.000	0.003	0.000
Without Constant & Trend							
t-Statistic	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Prob.	0.000	0.000	0.001	0.000	0.000	0.000	0.000

Table 4: UNIT ROOT TEST. Source: Author's computation using E-views 13. (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%.

Statistic	Value
R-Square	0.827987
Adjusted R-square	0.720917
Normality Test	803.39 (0.452107)
Serial Correlation	1.6324 (0.2044)
Heteroscedasticity Test	0.411231 (0.8126)

Table 5: DIAGNOSTIC TEST RESULTS. Source: Author's computation using E-views. Numbers in parentheses are probabilities, Jarque Bera Normality Test was utilised, and serial correlation is with Breusch-Godfrey serial correlation Lagrange Statistics, Heteroscedasticity test is with Breusch-Pagan-Godfrey test.

4.3. ESTIMATED LONG-RUN AND SHORT-RUN COEFFICIENTS

4.3.1. Short-Run Coefficients

The pooled mean group (PMG) estimator, which permits homogeneity of the long-run estimation while still permitting short-run estimation for the various individual panel members, was preferred by the Hausman test. The short-run results in table 6 below, show the impact of GEXPH, SSENR, INFL, ODAS are negative, however, only GEXPH is statistically significant at 5%. The impact of the remaining variables – GFC and RIR are positive. However, while GFC is statistically significant, RIR is insignificant. Specifically, a unit change in GEXPH will cause economic growth in WAMZ member countries to decline by over 70 units, however, statistically significant in the short run.

Furthermore, the impact of SSENR in the short-run is also negative and statistically insignificant. Thus, a percentage increase in secondary school enrolment will cause economic growth in WAMZ member countries to also decline by 4%.

In the same vein, the impact of foreign aid (ODAS) is negative (-1.34) and statistically insignificant with a p-value of (0.406). Therefore, a unit change in ODAS will lead to 1.34 units decrease in economic growth in WAMZ member countries. Also, the impact of foreign aid is negative in the short run.

D.GDPGR	Coefficient	Std. Error	z	$P > \|z\|$	[95% Conf. Interval]
ECT	-0.750	0.094	-7.990	0.000	[-0.934, -0.566]
GEXPH	-0.704	0.307	-2.300	0.022	[-1.305, -0.103]
SSENR	-0.044	0.147	-0.300	0.763	[-0.332, 0.243]
INFL	-0.081	0.060	-1.340	0.181	[-0.199, 0.038]
ODAS	-0.000	0.000	-0.830	0.406	[-0.000, 0.000]
GFC	0.043	0.022	1.990	0.046	[0.001, 0.086]
RIR	0.150	0.100	1.490	0.135	[-0.047, 0.346]
CONST	2.328	1.427	1.630	0.103	[-0.468, 5.124]

Table 6: SHORT RUN RESULT. Source: Author's computation using Stata 17. The short-run results show that the impact of GEXPH, SSENR, INFL, ODAS are negative, however, only GEXPH is statistically significant at 5%, while the remaining variables – GFC and RIR are positive.

4.3.2. Long-Run Coefficients

In the long-run, the impact of GEXPH and SSENR are positive, while SSENR is statistically significant at 5%, GEXPH is not statistically significant. Even though the impact of foreign aid (ODAS) is negative, it is also statistically significant at 5% with a p-value of 0.003. Specifically, in the long-run, a percentage change in government expenditure on health will cause economic growth in WAMZ member countries to increase by 20%. For secondary school enrolment, a unit increase in enrolment, will lead to 22 units increase in economic growth in WAMZ member countries. For foreign aid (ODAS), a unit change in foreign aid will lead to 9.03 units decrease in economic growth in WAMZ.

The effect of inflation and GFC are also negative. While INFL is statistically insignificant, GFC is statistically significant with a p-value of 0.007. therefore, an increase in inflation rate will cause economic growth to fall by 6% while a unit change in GFC will cause GDP in WAMZ to fall by 8%. Real interest rate on the other hand, has a positive impact on economic growth in WAMZ. A change in RIR will cause economic growth in WAMZ to increase by 4 units.

The establishment of a long-run relationship follows the assumptions and criteria of Banerjee *et al.* (1998), which proposed that models must satisfy the long-run relationship with negative and statistically significant error correction terms.

D.GDPGR	Coefficient	Std. Error	z	$P > \|z\|$	[95% Conf. Interval]
GEXPH	0.206	0.411	0.500	0.616	[-0.599, 1.011]
SSENR	0.225	0.097	2.330	0.020	[0.035, 0.414]
INFL	-0.062	0.050	-1.240	0.216	[-0.159, 0.036]
ODAS	-0.000	0.000	-3.000	0.003	[-0.000, -0.000]
GFC	-0.084	0.031	-2.680	0.007	[-0.146, -0.023]
RIR	0.040	0.036	1.100	0.271	[-0.031, 0.111]

Table 7: LONG RUN RESULT. Source: Author's computation using Stata 17. Table 7 shows that the impact of GEXPH and SSENR (human capital development) are positive, while SSENR is statistically significant at 5%, GEXPH is not statistically significant. Although, foreign aid (ODAS) is negative, it is statistically significant at 5% with a p-value of 0.003.

4.4. GRANGER CAUSALITY TEST

To examine the causality between human capital development and foreign aid on economic growth in WAMZ, the pairwise Granger causality tests is adopted, and the result is displayed in table 8 below. The null hypothesis that GEXPH does not Granger cause GDPGR is accepted given a p-value greater than 0.05 (i.e., P=0.0899) and a large f-statistics. However, the null hypothesis that GDPGR does not Granger cause GEXPH is rejected given a p-value of 0.0022 which is less than 0.05 and a large f-statistics of 6.3950, in other words, GDPGR Granger cause GEXPH.

More so, the null hypothesis that SSENR does not Granger cause GDPGR and that GDPGR does not Granger cause SSENR is also accepted given their p-values. In the same manner, the null hypothesis that ODAS does not Granger cause GDPGR, and that GDPGR does not Granger cause ODAS is also accepted. Finally, the hypothesis that SSENR does not Granger cause GEXPH is accepted. However, we fail to reject the null hypothesis that GEXPH does not Granger cause SSENR. In other words, we reject the hypothesis and conclude that GEXPH Granger cause SSENR given a p-value of 0.0007. In summary, there is unidirectional causality between human capital development and economic growth, however, there is no causality between foreign aid and economic growth in WAMZ member countries. Refer to table 3.

Null Hypothesis	Obs.	F-Statistic	Prob.
GEXPH does not Granger Cause GDPGR	136	2.454	0.090
GDPGR does not Granger Cause GEXPH	136	6.395	0.002
SSENR does not Granger Cause GDPGR	136	2.086	0.128
GDPGR does not Granger Cause SSENR	136	0.039	0.962
ODAS does not Granger Cause GDPGR	136	1.178	0.311
GDPGR does not Granger Cause ODAS	136	1.004	0.369
GFC does not Granger Cause GDPGR	136	0.471	0.625
GDPGR does not Granger Cause GFC	136	0.134	0.875
SSENR does not Granger Cause GEXPH	138	0.002	0.999
GEXPH does not Granger Cause SSENR	138	7.751	0.001

Table 8: GRANGER CAUSALITY TEST. Source: Author's computation using E-views 13. The results of the causality between human capital development and foreign aid on economic growth in WAMZ, is run using the pairwise Granger causality tests, as displayed.

4.5. SUMMARY OF THE ANALYSIS (RESULTS)

The essence of this study is to investigate the impact of foreign aid and human capital development on economic growth in WAMZ region. It specifically evaluates the effect of government expenditure on health, secondary school enrolment and official development assistance on economic growth in WAMZ countries. The research also examines the impact of government expenditure on health, secondary school enrolment and official development assistance on economic growth in the short-run and long-run in WAMZ member countries. While in another dimension it determines the causality between foreign aid and human capital development, and economic growth in WAMZ.

To achieve the basic objective of this research and to ascertain a comprehensive and robust outcome, the study adopted secondary data approach with a panel of six WAMZ countries covering the period 1999 to 2023. The World Development Indicators of the World Bank served as the source of the data for the study. The variables included for the study include the GDP growth rate (dependent variable), government expenditure on health, official development assistance, secondary school enrolment, gross fixed capital formation, inflation rate and real interest rate which were obtained from the world development indictors.

Due to its dynamic nature; the ability to estimate each variable at different lag period and the nature of the data which were all stationary at first difference, the research preferred panel ARDL estimation technique with PMG estimator chosen as the most suitable for the analysis. The IPS test proposed by Im et al. (2003) for the panel unit root was chosen because it is widely used, and its output is said to be robust. The variables were stationary at either level or first difference and statistically significant. This justified the reason for using the panel ARDL estimation technique for the analysis.

The model estimated shows there exist a co-integration between the dependent and independent variables. The outcome of the analysis revealed that both in the short-run and long-run, the impact of foreign aid (ODAS) is negative but statistically significant only in the long-run. In the various WAMZ countries, the impact of ODAS is mixed. While it is positive for some, it is negative for others and while it is statistically significant for some, it is not significant in others. To be more precise, the impact of ODAS is negative for Nigeria, Ghana, Guinea, and Sierra-Leone and positive for Liberia and the Gambia.

In investigating the impact of human capital development on economic growth in WAMZ, the findings show that the impact of GEXPH and SSENR is positive and significant in the long-run. The pairwise Granger causality result reveals that there is no causality between foreign aid and economic growth in WAMZ

countries however, there is a causality between human capital development and economic growth. The post-estimation tests also revealed perfect stability with no specification errors just as the CUSUM and CUSUM of Square were within the region of stability.

5. CONCLUSION AND RECOMMENDATIONS

Based on the findings, the study concludes that the impact of foreign aid and human capital development have effect on economic growth in the WAMZ region. The results of the study emphasize that foreign aid has no significant impact on economic growth while human capital development promotes economic growth in the WAMZ countries. Additionally, we can unequivocally declare that the WAMZ region's economic growth and the development of human capital are causally related. The study's overall findings support the necessity for a solid and consensus conclusion that the WAMZ countries' economic growth is influenced by both official development assistance and the development of human capital.

Given the results of the findings, and based on the first objective, the study recommends that aid donors should collaborate with multilateral aid organizations like the World Health Organization, United Nations, and International Monetary Fund (IMF) to disburse aid because they are thought to be better suited to oversee, manage, and assist economic growth programs. Also, given the negative results of foreign aid in promoting economic growth, the study recommends that policymakers in the WAMZ should invest in vital sectors that reduce reliance on outside assistance, like agriculture, renewable energy, and domestic industries, in order to increase resilience and self-sufficiency, considering the detrimental effects of foreign aid on fostering economic growth.

To improve the quality of human capital in the WAMZ, as per the second objective, it is recommended that governments should invest more heavily in health and education to engender human capital development. This can be achieved through enhancing access to quality education to all children, up to at least secondary school level as this will contribute to lifting large segments of the population to productive activities. Enhancing public expenditure on health can also lead to improved health outcomes, increased productivity, and overall human capital development leading to greater output.

Governments in the WAMZ should tie aid to accountability, transparency, and governance improvements based on the findings of the causality test which addresses the third objective of the study. Aid ought to be subject to the imple-

mentation of particular institutional changes that increase its ability to support economic growth, such as rule of law, anti-corruption, and effective public services. It is imperative that authorities in the WAMZ should integrate the educational system with the demands of the labour market, which include science, technology, engineering, and mathematics (STEM) fields, in order to improve human capital development.

Contributions to knowledge: Through the empirical analysis and econometric modeling, the study provides empirical evidence on the impact of foreign aid and human capital development on economic growth in the WAMZ. The results offer insights into the relationship between foreign aid, human capital development and economic growth thus, contributing to the body of knowledge on the effectiveness of foreign aid and human capital development in promoting economic growth in WAMZ member countries. Focusing on the WAMZ member countries provides a specific regional perspective on the impact of human capital development and economic growth. This regional focus allows for a nuanced understanding of the challenges and opportunities faced by these countries in promoting healthcare and education investments leading to secondary school enrolment for sustainable economic development.

Limitations: The study may be constrained by data limitations, such as data availability, quality, and reliability. Inaccuracies or gaps in the data used for the analysis could potentially impact the robustness and generalizability of the findings. The ARDL model used in the study makes certain assumptions about the relationships between variables and the nature of the data. These assumptions may not fully capture the complexity of the relationships between foreign aid, human capital development, and economic growth in the WAMZ. Also, the study focuses specifically on WAMZ and may not be directly applicable to other regions or countries. The findings and recommendations of the study may have limited generalizability beyond the context of the WAMZ.

Causal relationships between variables, such as the direction of causality between aid, human capital development and economic growth, may be subject to endogeneity issues. The study's ability to establish causal relationships may be limited by potential endogeneity problems.

Suggestions for further studies: Conducting a longitudinal analysis that extends the time period beyond 1999 – 2023 could provide insights into the long-term trends and dynamics of foreign aid and human capital development impact on economic growth in the WAMZ. Examining how these relationships evolve over time can offer valuable information for policymakers and researchers. Comparative studies that analyse the effectiveness of foreign aid and human capital

development in different regions or countries within Africa could help identify factors that contribute to successful aid utilization and economic growth. Contrasting the experiences of various regions can offer valuable lessons for optimizing aid strategies.

Complementing quantitative analysis with qualitative research methods, such as interviews, case studies, or focus groups, can provide a deeper understanding of the mechanisms through which foreign aid and human capital development influence economic growth in the WAMZ. Qualitative insights can offer context-specific perspectives and enrich the analysis.

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