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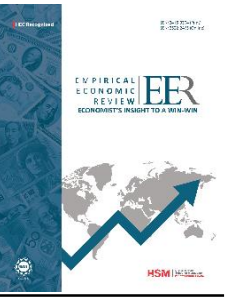

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Good Governance, Public Health Expenditure and Economic Growth in Africa Nations: A Panel Data Approach

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Abstract

The study investigates the good governance, public health expenditure and economic growth in eight countries (Algeria, Cameroon, Egypt, Ghana, Kenya, Morocco, Nigeria and South Africa) in Africa, using panel data which spans between 1996-2020. The study data gathered are real gross domestic product which is dependent variable while, export, import, total health expenditure, education and governance proxied government effectiveness which were sourced from WDI and WGI database, 2021. The study adopted Hausman and Wald, Pedroni residual cointegration, fixed and random effects and Dumitrescu Hurlin panel causality tests as an estimating technique. It was revealed from outcome that cointegration test indicates long run nexus among the variables during the periods under review. Also, Hausman and Wald findings that fixed effects as an estimating technique proved to be appropriate for the analysis. Thus, the result revealed from fixed effects findings that public health expenditure is inversely significant affect economic growth in each country. While it was revealed that both public health expenditure and government effectiveness exert negative significant effect on economic growth. Meanwhile lagged of public health expenditure, government effectiveness and population exert positive effect on economic growth. From panel causality findings revealed that there is bidirectional causal nexus among the variables. In light of this, the study ends with policy suggestions that will undoubtedly, go beyond the sustainable development objectives, which are not even close to being realistic in the chosen nations. Furthermore, the health sector has to be improved immediately, particularly in the areas of timely delivery and high-quality investment. Low performance is a result of insufficient transparency and unproductive targets for total health spending. Thus, in order to enhance health condition via investing in health care, investments in the health sector, particularly those related to healthcare quality, should be closely scrutinised and managed.

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Keywords: public health expenditure, good governance, economic growth

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Introduction

In recent years, there has been an increasing recognition of the crucial importance of public health expenditure and effective governance in promoting fair and balanced economic growth and development as opined by Sadeh et al. (2020). Understanding the correlation between governance, health expenditure, and economic growth is particularly crucial in the African context, where healthcare systems often face significant challenges. Hence, in order to tackle persistent inequality and eradicate poverty, it is necessary to strive for inclusive economic expansion. However, in order to attain sustainable and fair economic growth, several prerequisites must be fulfilled, including access to top-notch healthcare, effective governance systems, and substantial expenditures in the health sector. The concept of governance is complex and encompasses the principles of legal authority, responsibility, transparency, and participation. It provides the structure for effective policy formation, the optimal allocation of resources, and the provision of essential public goods like as healthcare. Moreover, robust governance guarantees the optimal allocation and utilization of public resources, such as healthcare expenditure, resulting in enhanced health outcomes and overall economic progress and advancement. Therefore, good governance and increased investment in healthcare have been considered as the ultimate solution for attaining fair economic growth, particularly in the aftermath of the epidemic. This is especially true in light of the fact that the pandemic has been stopped. In 2022, the Africa Development Bank carried out analytical research that revealed that African states faced substantial issues during the COVID-19 era. The majority of these challenges were mostly caused by the weak healthcare infrastructure that existed in these nations. Furthermore, severe disruptions occurred in the international trade and foreign currency sectors, both of which are essential sources of revenue for a great number of African states. Several nations in Sub-Saharan Africa saw a dramatic decrease in oil prices, which had a negative influence on their capacity to maintain their financial stability.

Universally, it is thought that more than 620 million individuals throughout the world are patients with COVID-19, with around 6,550,000

fatalities being documented during the course of the disease. The COVID-19 event was not a good experience for the African continent, particularly for the four countries that were stated before regarding the continent. In response to COVID-19, healthcare personnel were sent to various wards; nevertheless, there simply were not enough of them to meet the need within the facility. There is a clear contradiction between the response code and the recruiting of elderly people into rescue squads at medical institutions due to a lack of younger healthcare staff. This is due to the fact that elderly people are more vulnerable to the transmission of Covid-19 than younger people. There was a lack of sufficient and convenient availability of the non-critical staff members that healthcare institutions needed in order to provide the highest possible level of care to their patients. This circumstance is, in fact, a manifestation of Nigeria's inadequate crisis management, which is a direct result of the country's health care system, which is not entirely functional.

A number of concerns, including but not limited to unemployment, insecurity, corruption, trade restrictions, a drop in oil prices, weak fiscal policies, and inflation, were among the factors that contributed to the instability of the Nigerian economy prior to the development of the COVID-19 crisis. Regrettably, the efforts of the administration to halt the spread of the virus have only served to exacerbate the already precarious economic situation in the country. Because of this, the gross domestic product of the nation finally fell below 4% in the beginning of the year 2020, reaching 1.87% and -6.10% in the first and second quarters, respectively. This is a decrease of 0.23 and 8.22%, which is much lower than the 2.10 and 2.12% that were recorded in the first and second quarters of 2019, as postulated by Ataguba (2020). Furthermore, the pandemic problem may result in a decrease of 1.1% in Egypt's gross domestic product (GDP) from the same quarter in the fiscal year 2018-2019 to the fourth quarter (April to June) of the fiscal year 2019-2020. It is possible that the COVID-19 emergency response package implemented by the Egyptian government caused a fall in GDP of 8.7% during the fourth quarter. Taking into account the emergency response package, we anticipate that the annual growth rate will be 3.8% for the first year of the 2019/2020 fiscal year. Should the emergency action plan not have been implemented, the annual growth rate in the first year of 2019/2020 might have slipped to as low as 1.9 percent. It has been determined by Breisinger et al. (2020) that the industry sector has

been the most affected, with a decline of 10.9%, followed by the services sector, which has had a decline of 8.3%.

Furthermore, the Covid-19 problem halted the country's 7% annual pace of rapid growth between 2017 and 2019, and by the year 2020, notably in March while the country was under lockdown, the amount of commodities that were exported had drastically dropped. There was thus a downturn in the economy, which finally resulted in households suffering losses. As asserted by Baquedano et al. (2021) that with projections that, the poverty rate is expected to increase from 25.5% in 2019 to 25.5% in 2020. At the same time, the South African economy had already seen a number of setbacks prior to the onset of the COVID-19 crisis in 2019. The economy had experienced an average growth rate of 1% between the years 2012 and 2021, which led to a decrease of 5.6% in per capita income during this time period and an increase of 13% in inflation. a further issue is the difficulty of dealing with electrical shortages. The unfortunate reality is that the high unemployment rate, which reached an astounding 35.3% in the fourth quarter of 2021, is a significant obstacle to the achievement of progress in terms of living standards. While this is going on, the unemployment rate for young people between the ages of 15 and 24 is the highest in the world, coming in at 66.5%.

It is possible to improve human capital, increase labor productivity, and decrease poverty and inequality through the allocation of public health spending in a way that is both effective and equitable. It is very necessary for a population to have access to high-quality medical care in order for them to be healthier and more productive. Moreover, this is essential for the achievement of sustained economic growth that is beneficial to all sectors of society. Furthermore, the World Health Organization (WHO, 2001), allocating public funds towards essential healthcare and preventive measures may be beneficial for individuals who are living in poverty. This is because it specifically targets the distinct health requirements of marginalized communities and strives to promote inclusivity.

It is possible to establish a mutually beneficial relationship between public health expenditures, inclusive economic growth, and efficient governance. By ensuring that public health expenditure is distributed in a manner that is both effective and equitable, good governance contributes to the improvement of health outcomes and the promotion of economic growth that is inclusive. Through the cultivation of a politically and economically

empowered populace that calls for increased accountability and openness in the allocation and administration of public resources, including healthcare spending, economic growth may be able to make a contribution to good governance. The fact that there is a link between public health expenditures, inclusive economic growth, and effective governance highlights the significance of strong governance practices in directing decisions about health expenditures in a way that contributes to fair development outcomes and promotes inclusive economic growth. In order to successfully implement an all-encompassing strategy, it is essential to have actions that are coordinated in order to achieve economic growth objectives, optimize health expenditures, and strengthen governance structures.

Therefore, this study investigates aims to find out whether public health spending, the population, primary education, export, import, and institutional quality indicators are taken into consideration unconditionally, or if rule of law, corruption control, regulatory quality, political stability, and voice and accountability are used as proxied by governance effectiveness, both of which foster and ultimately lead to positive synergistic economic growth and economic recovery in Algeria, Cameroon, Egypt, Ghana, Kenya, Morocco, Nigeria and South Africa (ACEGKMNS). Using panel data, these data were sourced from the World Development Indicators and Worldwide Governance Indicators for the years 1996 to 2020. However, the study used fixed effects, random effects, and the husmann test to compare which of the two is the best match. The rest of the paper is organized into four sections: the review of related literature addressed in section two while the materials and procedures are covered in section three. Section four highlights the results of findings and section five concludes the study with policy recommendations.

Literature Review

Conceptual Review

An overview of the conceptual analysis of the key concepts of the work is undertaken in this section. Accordingly, Olaniyi and Adekanmbi (2022) defined healthcare spending as the total amount spent on healthcare across the economy, which includes all costs associated with nursing homes, prescriptions pharmaceuticals, hospitals, home health agencies, and personal healthcare. It is a contributing element and driver of a country's economic progress and state of health. It generally includes any payments

or outlays for medical treatment, preventative care, rehabilitation, community health initiatives, promotion, management and control of the healthcare system, and capital investment with the primary goal of enhancing health. Health expenditure generally represents the total amount of money spent by both the government and private individuals on the utilization of healthcare facilities. In fact, out of pocket expenditure is a major component of private health expenditure. It encompasses the supply of reproductive health services, nutrition programmers, emergency health relief programmers and other allied expenditure. The World Bank (1992) described good governance as the efficient utilization of authority in the management of a nation's economic and social resources for the aim of development. The importance of effective institutions, responsibility, transparency, and respect to legal norms cannot be overstated when it comes to the promotion of sustainable development and the reduction of poverty.

Stiglitz (1998) place a strong emphasis on the necessity of efficient governance in terms of promoting economic growth and lowering inequality. Good governance, in his view, is the promotion of policies that are inclusive and beneficial to all sectors of society, the guarantee that varied points of view are taken into consideration, and the enhancement of decision-making procedures that are designed to engage participation. The capacities approach to development proposed by Sen (2015) emphasizes the need of efficient governance in the process of developing the capabilities and liberties of individuals. It is his belief that the establishment of institutions that uphold fundamental rights and work to improve the well-being of people is essential to the process of establishing an atmosphere in which individuals are able to pursue their goals and feel content.

In the work that he has produced, Fukuyama (2014) investigates the process of political development and the formation of the state in relation to the idea of good governance. He contends that the capacity of the state to deliver public goods, uphold the rule of law, and guarantee social order, in addition to the efficiency of governance institutions, is an essential component of good governance. All of these variables, taken together, contribute to the legitimacy and stability of the political system. More so, the term "public health expenditure" is used to describe the financial resources allocated by governments and other public organizations to programmers aimed at preserving, promoting, and optimizing the health of the population. Multiple academics have undertaken research and put forth

various hypotheses for the allocation of public health funds. Several renowned scholars have offered their explanations of these topics, accompanied by citations to substantiate their research. According to the World Health Organization (2014), public health expenditure refers to the monetary worth of all products and services, regardless of whether they are bought or directly delivered, that are utilized for public health operations. This term is applicable to both direct and indirect expenses. This highlights the need of having adequate financial resources to guarantee citizens' access to vital medical services, prevent illness, and enhance the efficiency of healthcare systems.

Economist and health policy specialist Cutler (2007) emphasizes the importance of public health investment in enhancing the health outcomes of the population. He suggests that allocating more funds towards preventive measures such as immunizations, screenings, and health education might lead to substantial reductions in expenditures on costly treatments for chronic diseases, resulting in considerable long-term savings. The study undertaken by Glied and Stabile (2012), a health policy researcher, investigates the correlation between public health expenditure and health outcomes. Given the proven evidence that primary care and preventative interventions targeting the socioeconomic factors influencing health can enhance general well-being and mitigate healthcare inequalities, he underscores the necessity of allocating financial resources to support these initiatives. In the same vein, Berman and Gelman (2019) introduced the notion of "health aid effectiveness". The purpose of this idea is to evaluate the influence of public health spending on the health results of low-income nations. Furthermore, they contend that the success of health aid schemes is primarily determined by the efficacy and equity in the allocation of cash, in addition to the quantity provided. Mills (2010), equally opined that a health economist, specializing in analyzing the allocation of public funds for healthcare. In her proposal, she refers to the process of allocating funds to public health treatments that provide the greatest health benefits relative to their costs as "allocative efficiency". This outlines the procedure for securing the allocation of funding to certain therapies.

Economic growth, on the other hand, is an efficient and resilient growth strategy that must bring in new opportunities for economic development while guaranteeing that each and every group of human beings has equitable rights to these chances (Ali & Son, 2007). In other words, every group as

well as individual must be accommodated in the economic growth process without being ignored due to their own situations. Economic growth refers to the consistent increase in a country's tangible production of goods and services over a prolonged duration. The annual rate of growth of a country's gross domestic product (GDP), which measures the total value of all goods and services produced inside its borders, is commonly employed to assess this increase (Mankiw et al., 1992). Acemoglu and Robinson (2012) argue that economic growth is essential for improving the standard of living, reducing poverty, and creating opportunities for prosperity and employment. It enables a nation to provide its citizens with improved infrastructure, healthcare, and education. In addition, it fosters improvements in productivity, technological advancements, and enhanced global competitiveness (Barro, 1997).

More so, economic growth is a term that refers to economic expansion that benefits all elements of society, particularly those who have been historically marginalized or excluded from the process of progress. Within the realm of economic growth, several ideas have been proposed by a variety of scholars. A number of well-known academics have provided their interpretations of these concepts, along with references to support their work, which are as follows: According to Rodrik (2004), a well-known economist, good institutions are extremely important in the process of encouraging growth that is both equitable and sustainable. In his argument, he asserts that in order to achieve economic growth, it is necessary to establish institutions and policies that address inequality, encourage the expansion of human capital, and provide everyone the opportunity to participate in the economy. Stiglitz, who was awarded the Nobel Prize in economics, is a renowned authority on the ways in which social and economic policies may contribute to the promotion of fair growth. His argument is that in order to achieve the growth of the economy and reduce poverty, it is necessary to address inequality, make investments in healthcare and education, and promote fair competition. Icelandic economist Gylfason (2001) focuses on the relationship between fair growth and natural resources. It is his contention that in order to achieve economic growth in nations that are abundant in resources, it is necessary to ensure that resource rents are distributed in a fair manner, to encourage accountability and openness in resource governance, and to ensure that natural resource management is carried out effectively.

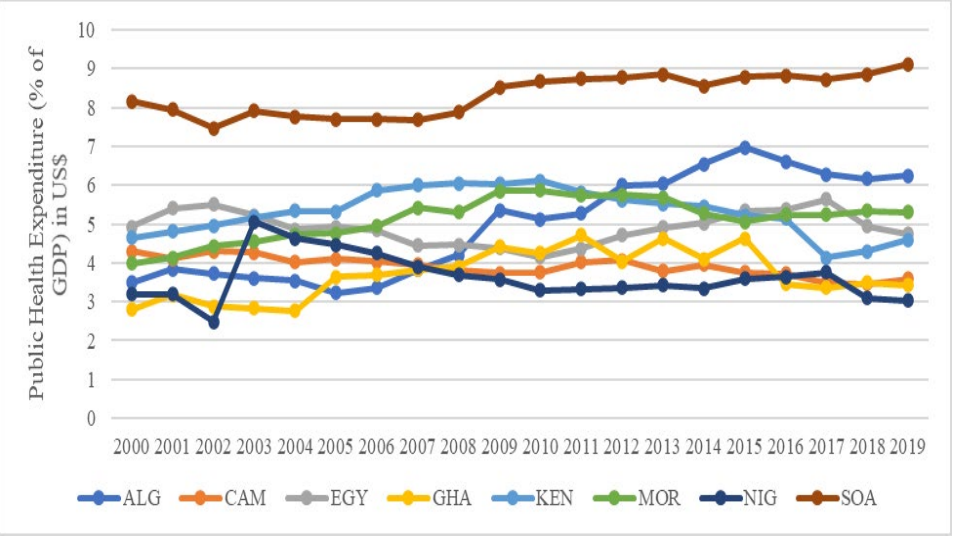
In a similar vein, Biswas et al. (2017) claims that the economic side of the theory's description is not entirely true because the non-economic income component should also be taken into account. For instance, poverty alleviation should not only take into account economic investment in disadvantaged areas, but also increase the poor's involvement in economic activity. Based on the findings of Connor (2015), economic growth may be defined as growth that is both long-term and prospective, and it places equal importance on both quality and quantity. In order to achieve the rapid and all-encompassing improvement of economic quality, it is necessary to ensure that there is a growth that is both sustainable and inclusive.

Stylized Facts

This study section contains facts that have been stylized to represent each country's expectations for public health over the time period under consideration, as seen in Figure 1 below.

Figure 1

Stylized Facts on Good Governance, Health Expenditure and Economic Growth in Africa Nations



Note. ALG = Algeria, COM = Cameroon, EGY = Egypt, GHA = Ghana, KEN = Kenya, MOR = Morocco, NIG = Nigeria & SOA = South Africa

As can be seen from Figure 1, Nigeria spends less than 3% of its national budget on public health, which is in direct opposition to WHO (2014), which believes that 20% of the national budget should go toward health expenditure. In the year 2001, the Abuja declaration also made the same claim, saying that 15% of the budget should go toward health. This shows that Nigeria is far behind in terms of spending on public health. Moreover, Ghana unquestionably has poor health expenditures, as shown on Figure 1, where its health expenditures are lower than the WHO-approved threshold of 20%. While Algeria is higher and better than the other selected African nations, Cameroon is also below the WHO-approved level, along with Morocco and Egypt, and is therefore much closer to the desired rate. On a lighter side, as shown in figure 1, South Africa has the highest percentage. This suggests that South Africa invests more in public health. It makes sense that it belongs to the BRICS bloc, which includes the most industrialized countries, as this makes it possible.

Empirical Review

A research project was carried out by Millia et al. (2021) to investigate the influence that imports and exports have on the expansion of Indonesia's economy. The information that was utilized is comprised of time series data for the years 2004Q1-2018Q1, which contains information regarding the economy, imports, and exports. The findings of the test using the autoregressive distributed lag model reveal that both import and export have a major impact on the growth of the economy, both in the short run and in the long run. A drop of one percent in imports leads in a commensurate rise of one point seven percent in economic growth over an extended period of time, whereas a rise of one point one percent in exports results in an improvement of one point eight-point three percent in economic growth.

Guisan and Exposito (2010) conducted research to examine the quality of life, the effectiveness of the government, the amount of money spent on healthcare, and the educational system in both Asia and Africa. For the purpose of effectively enhancing health spending and quality of life in accordance with the Millennium Development Goals (MDGs), the objective is to suggest a few essential activities that are targeted at improving local and global collaboration. The statistics indicate that increasing expenditure on education is the major technique for increasing spending on health care. As part of the good effects that education has on health, there are preventative measures that can be taken to avoid harmful conditions such

as starvation, water pollution, and other unpleasant circumstances. Additionally, there are therapeutic activities that may be taken by increasing access to high-quality and quantity health care. We investigate indicators of gender equality as well as issues related to quality of life.

The review of past works on the link between good governance, expenditure on health and the attainment of economic growth is presented in this section. For instance, multiple studies have examined the relationship between public health expenditure, inclusive economic growth, and effective governance in African nations. Aregbeshola et al. (2019) conducted a study examining the impact of health system inputs and governance on health outcomes in 46 sub-Saharan African countries. The study found that increased health spending and improved governance had a significant influence on health outcomes, leading to enhanced population health.

Nopiana et al. (2022) conducted an analysis to determine the extent to which imports, exports, and currency rates influenced the economic development of Indonesia. An approach that is quantitative is taken in this kind of research. Secondary data were given by the World Bank in the form of time collections spanning the years 1989 to 2018 for the records that were included in the observation that was mentioned originally. The assessment of the data is carried out by the utilization of time series tools, and multiple regression evaluations are utilized. Specifically, the data demonstrated that both the exchange rate and import indices contributed to the expansion of the economy. On the other side, the export variable has a potentially detrimental effect on the expansion of the economy.

In the research that they conducted by Zhang et al. (2022) examined China's commitment to inclusive and ecologically viable development and growth, as well as the country's reliance on imports in the luxury tourist business. Panel data from thirty different provinces in China were used for the research, which covered the years 2010 through 2019. According to the findings of the study, the enactment of inclusive green growth has the possibility to dramatically improve the quality of travel. There is a threshold effect that is antagonistic to inclusive green development when imports are relied upon. The influence of inclusive green growth begins to reduce at a certain threshold (38.65), and then it begins to increase again after reaching that barrier. The research offers important information for emerging nations

like China, particularly when taking into consideration the effects of COVID-19 and the growing anti-globalization attitude.

In addition, Asongu et al. (2018) investigated the relationship between economic development, health expenditures, and the quality of governance in a group of forty-four African nations. The findings indicated that there is a clear connection between economic growth, expenditures on healthcare, and the quality of government. This highlights the significance of efficient governance in terms of supporting the efficient allocation of resources towards healthcare and encouraging economic growth that is both fair and balanced.

In their study, Ojo and Ojo (2022) looked at the expenses that are connected to the expansion of the economy, education, and health care in Nigeria. Time series data from the World Development Indicator (WDI) were utilized, and the years 1981 through 2019 were included in the time period covered. Over the course of the research, an error correction model was investigated, and the findings revealed that the amount of money spent by the government on health and education had a positive and substantial impact on the way it interacted with economic growth.

Through the use of time series data, Thanha et al. (2020) conducted an analysis of public expenditures, public governance, and economic development that occurred between the years 2006 and 2015. For the purpose of this inquiry, the method of estimation that was utilized was a sequential model that involves two stages. As a result of the study's results, it was discovered that good governance, which is characterized by lower informal costs, raised openness, and policy that is entirely in partiality, serves as vital to strengthening the effect of government expenditures on economic growth in Vietnamese regions, particularly when it collaborates with the private sector as a whole.

Farag et al. (2013) used time series data spanning from 1995 to 2006 that were sourced from world development index to explore health expenditures, health outcomes, and the influence of effective governance. The study used a panel approach with a fixed effects analysis. As a result of sound governance, the outcome shows that government spending on health has a statistically significant impact on lowering infant mortality. This shows that effective governance may increase the amount spent on health care.

Biadgilign et al. (2019) studied the relationship between child malnutrition, urbanization, public health spending, and good governance in Ethiopia. The study adopted a pooled data analysis estimate on global governance, global population trends, and global development between 2000 and 2016. Stunting was found to be related to governmental efficiency, the standard of regulations, and corruption prevention. This shows that while other factors have a major impact on decreasing child undernourishment, there is no statistically significant link between health expenditure and urbanization and childhood poor nutrition.

Makuta and O'Hare (2015) probed the interaction between excellent governance, public health spending and health outcomes. Time series data from the years 1996 to 2012 are used in this research study. As an estimator method, the study used cross sectional, fixed effects, and Generalized Method of Moments. The conclusions showed that public health expenditure per capita exerted a significant influence on health outcomes.

The relationship between government health spending and sustainable economic development was explored by Gillani et al. (2021) utilizing Asian countries as a framework for ecological footprint consumption sustainability. Time series data from the World Development Indicator, spanning the years 2000 to 2018, was used. A panel with fixed effects was chosen as the estimation method. According to the results, Asian economies' under-five and newborn mortality rates are improved by GDP per capita, immunization, trade openness, and the use of basic water service infrastructure.

Hu and Mendoza (2013) examined the relationship between good governance and public spending on children's health status using time series data from the years 2000 through 2020 acquired from the World Bank Database. Panel data regression with the fixed effects method served as the estimation strategy. The paper concluded that better governance metrics will raise the effectiveness of public health expenditures and enhance the child's health. Consequently, it is advised to enhance good governance, raise public health spending and government investment in health infrastructure, as well as raise the gross domestic product and the employment of women, in order to enhance physical status, particularly in countries that have higher child mortality rates.

Using data that covered the years 1995 through 2017 and was derived from worldwide governance indicators and world development indicators, Rizvi (2019) evaluated health spending, institutional quality, and economic growth in 20 South, East Asian, and Pacific growing economies. It was decided to adopt the OLS approach as an estimation method. It was discovered that if health spending increased by 100% after being adjusted for the effectiveness of government spending, then economic growth would undoubtedly increase by 5%.

In developing nations, Bedir (2016) investigated the relationship between the amount of money spent on healthcare and the amount of income. Both the gross domestic product (GDP) per capita and health expenditures increased across the board, despite the fact that the economic structure of each nation and the amount of money spent on healthcare varied. As a result of the study, a mutually beneficial relationship between the Czech Republic and the Russian Federation was developed. Furthermore, data that supports the health perspective was discovered in the countries of Egypt, Hungary, Korea, South Africa, and the Philippines by researchers. It has been observed that economic status has a significant influence on the amount of money spent on medical care in emerging nations.

Between the years 1995 and 2014, Aboubacar and Xu (2017) conducted research on the correlation between the increase of GDP and the amount of money spent on healthcare in Sub-Saharan Africa. The GMM estimate method was utilized throughout the course of the inquiry. The findings indicate that there is a positive connection between the two variables, which is statistically significant. This suggests that the amount of money spent on health care has a substantial impact on the expansion of the region's economy. It has been discovered that control factors such as foreign direct investment (FDI), the active population, and gross domestic savings have a major impact on the growth of the regional economy. However, it would appear that the financing provided by the government for development has little impact on the growth of the regional economy. Furthermore, the data would seem to indicate that access to medical care is not a luxury but rather a need in the region of Sub-Saharan Africa. Consequently, Sub-Saharan Africa has to strengthen its economy by adopting healthcare systems that are both efficient and effective, boosting expenditure on healthcare, making

the most of its young population, and attracting direct investment from outside the region.

An investigation on the relationship between the quality of governance (QoG) and the amount of money spent on public health in Sub-Saharan Africa (SSA) between the years 1996 and 2011 was carried out by Makuta and O'Hare (2015). The findings of the study reveal that investing in public health results in considerable improvements in health outcomes. This is demonstrated by a direct elasticity range of -0.35 to 0.60 for life expectancy and -0.09 to -0.11 for death rates among children under the age of five. As a result of the fact that countries with greater Quality of Governance (QoG) exert a more substantial influence on health outcomes, the total effect of Public Social Health (PSH) is improved when there is an improvement in QoG. One possible explanation for this result is that the allocation of resources was improved, and higher resource efficiency was achieved. There would be an improvement in health outcomes if the QoG in Sub-Saharan Africa (SSA) were to be enhanced. To be more specific, an increase in public spending on health (PSH) would have a bigger impact on lowering mortality among children under the age of five (U5M) and increasing life expectancy in countries with better levels of quality of life in comparison to nations with lower levels of QoG.

Shafa et al. (2023) conducted a study using panel data from 2000 to 2020 to examine the relationship between health outcomes and good governance in a specific group of African countries. The study was conducted from 2000 to 2020. Based on the results of the panel unit root tests, the actual gross domestic product, health outcomes, and indicators of good governance have shown no significant changes. In contrast, health expenditures and foreign aid exhibit stationarity at the first difference. The results obtained through the use of the Generalized Method of Moments (GMM) indicate that indicators of good governance have statistically significant positive effects on health outcomes in the selected African nations. There was a statistically significant positive correlation between the gross domestic product (GDP) of the selected African nations and their health outcomes. The selected African nations demonstrate a positive and statistically significant correlation between life expectancy and health outcomes. The expenses related to medical treatment exert a positive and statistically significant influence on the outcomes of healthcare in the selected nations. Foreign aid has a statistically significant positive effect on

health outcomes in the selected African nations. The study's findings suggest that African countries may experience accelerated economic growth by ensuring the effective and consistent functioning of key indicators of good governance, such as political stability, voice and accountability, and control of corruption.

The authors Banik et al. (2023) conducted research to determine the extent to which quality of governance (QoG) plays a role in mitigating the effect of healthcare spending on human development. During the course of the research, a Windmeijer finite sample-corrected system-generalized method of moments (sys-GMM) estimate approach was utilized. This procedure was applied to a panel dataset that included 161 countries that were monitored between the years 2005 and 2019. The method of principal component analysis (PCA) was utilized in the research project to generate a unique measure for evaluating the quality of governance. This metric is developed from six different governance components. The empirical study conducted by the authors has showed that increasing funding for healthcare alone will not be adequate to improve human growth. In terms of overall health expenditures, PSnAT had the greatest favorable effect, which ultimately led to an improvement in human well-being. Moreover, there is a statistically significant relationship between spending and the Good Governance Index (GGI) in sub-Saharan African economies (SSA), with a favorable but small effect on economies in South Asia, and an adverse but very little effect on low-income countries (LICs). Such is the situation for economies in South Asia.

From the above literature review, there are some gaps been identified. Thus, there is a dearth of comparative study among different African states since the evaluated studies focus on specific African regions or countries. Conducting a comprehensive examination of the impact of public health expenditure and effective governance on inclusive economic growth in many African nations might provide valuable insights. Moreover, most of the analyzed studies had a limited time span, ranging from a few years to two decades. An in-depth examination of the enduring impacts of public health investment and effective governance on economic growth in Africa will greatly enhance our understanding of long-term trends and dynamics. Moreover, the literature under scrutiny discusses the importance of contextual factors such as income distribution, regional variations, and economic structure. In order to have a comprehensive understanding of the

distinct impacts of these factors on inclusive development outcomes in Africa, particularly in the selected African nations under study, further investigation is required to examine their interactions with public health expenditure and effective governance. Conversely, literature reviews primarily focus on quantitative research that use panel data and econometric approaches. Supplementing quantitative data with qualitative analysis, such as case studies or interviews, can provide a more comprehensive comprehension of the possibilities, challenges, and intricacy involved in achieving equitable growth through public health investment and good governance. In order to fully understand the connection between public health spending, economic growth, and good governance in Africa, it is necessary to do more comprehensive and context-specific research. This research should consider many African nations, examine extended-term patterns, assess cause-and-effect connections, and integrate qualitative analysis.

Moreover, the utilization of Panel data in this study enables researchers to simultaneously investigate both cross-sectional (individual-specific) and temporal (time-related) variations. This enhances the understanding of the events under investigation by reflecting the dynamic nature of interactions all through time and among different entities. Compared to either cross-sectional or time series data alone, it provides a larger sample size, which can enhance the statistical power of the research. This leads to more robust results and more precise calculations regarding the links being investigated. A more precise rationale is to consider unobserved individual- or time-specific characteristics that may influence the relationships of interest. To mitigate potential biases in estimation and address unobserved variability, researchers might use fixed effects or random effects models. Ultimately, employing techniques such as instrumental variables or difference-in-differences estimations allows for the identification of causal connections and addresses issues related to endogeneity and selection bias. This enables a more precise evaluation of the causal connections between variables. Researchers can analyze the influence of one variable on another in subsequent periods by capturing delayed effects and dynamic interactions throughout time.

Finally, Algeria, Cameroon, Egypt, Ghana, Kenya, Morocco, South Africa, and a great number of other African countries are all included in the study, which enables us to investigate the ways in which public health

spending and governance influence economic growth in a variety of diverse circumstances. The ability to recognize similarities, distinctions, and best practices across nations is made feasible as a result of this, which can open the road for more policy and expertise exchange. Procedures for making decisions and policies that are driven by data are given more credibility as a consequence of the findings of the study. It is possible that policymakers may be able to derive concrete proposals for improved governance systems, more effective expenditures on public health, and more equitable economic growth from it. With the help of these recommendations, the governments of these countries will have a greater chance of accomplishing their socioeconomic development objectives. These guidelines will serve as a guide for their strategy and targeted efforts. This research has the potential to provide new information to the existing body of knowledge concerning the relationships that exist between inclusive development, public health spending, and accountability in governance. Extensive empirical research may lead to a number of outcomes, including the discovery of new information, the validation or refutation of already established hypotheses, and the enhancement of academic understanding of these intricate systems. On top of that, it has the potential to motivate scholars working in related domains to further their work. As a result of the broad range of countries that were taken into consideration throughout the research, the findings of the study are significantly beneficial for international organizations, donor organizations, and development professionals who are working in these countries. This study has the potential to enhance governance procedures, healthcare financing, and inclusive development initiatives in South Africa, Egypt, Ghana, Kenya, Morocco, and Cameroon, as well as in Egypt, Cameroon, Ghana, and all of the countries in between.

Theoretical Underpinning and Model Specification

This study hinged on the endogenous growth models and that incorporate the strategy through in which public health expenditures impact socioeconomic growth and economic development. In contrast to neoclassical growth, it emphasizes that economic growth results from internal factors within an economic system rather than external influences. Thus, endogenous growth model, investments in human capital, invention, and expertise are key catalysts of economic progress. These factors equally form the necessity for robust organizations in the public and private sectors

to foster creativity and offer rewards for creative thinking in both people and enterprises.

Solow (1956) noted that, all things being equal, nations with more savings will have increased per capita incomes. According to Solow's model, the two main factors affecting per capita income globally are population growth and savings rates. Buchanan (1965) created a theoretical framework that urged government agencies to boost healthcare expenditure regardless of need. This hypothesis emphasizes the inefficiencies of the health system.

Model Specification

The focus of the paper is to determine and evaluate the short and long run relationship between economic growth, public health spending, and good governance in Nigeria. Thus, the study adopted and modified the work of Rizvi (2019) in order to investigate the impact of good governance and public health expenditure on economic growth during the post-pandemic era:

$$GDP = f(POP, XP, IMP, HE, GFCF, EDU, GE) \quad (1)$$

When GDP is used to measure GDP per capita, XP denotes export, IMP represents import, HE represents health expenditure, GFCF represents gross fixed capital formation, EDU denotes education and GE stands governance effectiveness and f stands for the functional relationship between the variables. In light of this, the model is modified to RGDP, GE, POP, HE, EDU, XP and IMP as in equation 2

$$RGDP = f(POP, XP, IMP, HExp, EDU, GE) \quad (2)$$

$$RGDP_t = \alpha_0 + \alpha_1 POP_t + \alpha_2 XP_t + \alpha_3 IMP_t + \alpha_4 HExp_t + \alpha_5 EDU_t + \alpha_6 GE_t + \mu_t \quad (3)$$

Where μ represents error term and α_1 to α_6 represent parameter estimates, while α_0 represents constant.

$$LRGDP_t = \alpha_0 + \alpha_1 LPOP_t + \alpha_2 LXP_t + \alpha_3 LIMP_t + \alpha_4 LHExp_t + \alpha_5 LEDU_t + \alpha_6 LGE_t + \mu_t \quad (4)$$

L stands for the variables' natural logarithms. This is highly consequential to prevent a huge volatility in the variables. Every other variable has remained as defined above. On a-priori

$$\frac{\Delta LnRGDP}{\Delta LnPOP} > 0 <, \frac{\Delta LnRGDP}{\Delta LnXP} > 0, \frac{\Delta LnRGDP}{\Delta LnIMP} > 0 <, \frac{\Delta LnRGDP}{\Delta LnHExp} < 0, \frac{\Delta LnRGDP}{\Delta LnEDU} > 0 <, \frac{\Delta LnRGDP}{\Delta LnGE} > 0.$$

Thus, variables interactions in term of granger causality model. From the equation 4

$$\Delta LnRGDP_t = + \sum_{j=1}^{n} \alpha_{ij} LnRGDP_{t-1} + \sum_{j=1}^{n} \alpha_{ij} POP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnXP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnIMP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnHExp_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnEDU_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnGE_{t-j} + \mu_{1t} \quad (5)$$

$$\Delta LnPOP_t = + \sum_{j=1}^{n} \alpha_{ij} LnPOP_{t-1} + \sum_{j=1}^{n} \alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnXP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnIMP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnHExp_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnEDU_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnGE_{t-j} + \mu_{2t} \quad (6)$$

$$\Delta LnXP_t = + \sum_{j=1}^{n} \alpha_{ij} LnXP_{t-1} + \sum_{j=1}^{n} \alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnPOP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnIMP_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnHExp_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnEDU_{t-j} + \sum_{j=1}^{n} \alpha_{ij} LnGE_{t-j} + \mu_{3t} \quad (7)$$

$$\Delta LnIMP_t = +\sum_{j=1}^{n}\alpha_{ij}LnIMP_{t-1} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnPOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnXP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnHExp_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnEDU_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnGE_{t-j} + \mu_{4t} \quad (8)$$

$$\Delta LnHExp_t = +\sum_{j=1}^{n}\alpha_{ij}LnHExp_{t-1} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnPOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnXP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnIMP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnEDU_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnGE_{t-j} + \mu_{5t} \quad (9)$$

$$\Delta LnEDU_t = +\sum_{j=1}^{n}\alpha_{ij}LnEDU_{t-1} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnPOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnXP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnIMP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnHExp_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnGE_{t-j} + \mu_{6t} \quad (10)$$

$$\Delta LnGE_t = +\sum_{j=1}^{n}\alpha_{ij}LnGE_{t-1} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnPOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnXP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnIMP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnHExp_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnEDU_{t-j} + \mu_{7t} \quad (11)$$

Hence, i and j denote lag lengths of the variables

Table 1

Variables' Descriptions and Sources

Variables	Descriptions	Hypothesized Sign	Variables
RGDP	Real gross domestic product	Dependent Variable	WDI, 2021

Variables	Descriptions	Hypothesized Sign	Variables
HExp	Total Public health Expenditure	- or +	WDI, 2021
POP	Population growth	+	WDI, 2021
XP	Exportation of goods and services	- or +	WDI, 2021
IMP	Importation of goods and services	-	WDI, 2021
EDU	Primary education	- or +	WDI, 2021
GE	Control of Corruption Perception Estimate	+	WGI, 2021

Note. WDI denotes World Development Indicators and WGI represents Worldwide Governance Indicators.

Results and Discussion

Table 2 show the summary statistics of real gross domestic product (RGDP), total population (POP), export (XP), import (IMP), total health expenditure (HEXP), education (EDU) and government effectiveness (GE) by selected countries in Africa. The variation of average value was reported among the variables during the periods under investigation. And the previous year values are far below what is on record in previous years going by the downward trend in RGDP performance in terms of influx in recent times. The mean values of 41.7 by approximation is recorded for the seven variables used for this study of real gross domestic product which implies that there is favorable and conducive enough for the variables to interact. It should be noted that the high value mean implies positivity of the absolute values and positive values of population, export, import, health expenditure, education and government effectiveness; it implies they are strong and effective. Population, export, import, health expenditure, education and government record the mean value of 2.44%, 10.86%, 10.49%, 45.56%, 3.91% and 20.38% respectively, suggesting that these contribute below and above to RGDP. In essence, there seems to be instability in the rate of economic growth in ACEGKMNS during the period under investigation.

Table 2

Descriptive Statistics for Each Country (ACEGKMNS)

Countries	Statistics	RGDP	HExp	POP	XP	IMP	EDU	GE
ALGERIA	Mean	13.57224	2.447263	7.84993	8.59662	10.51275	2.56185	6.48668
	Maxi.	72.24148	3.42597	2.34614	5.84573	8.17520	5.809523	7.69231
	Mini.	5.41137	0.777662	8.67372	10.24481	3.023707	1.698586	-0.230692
	Std. Dev.	17.94671	0.987922	0.75797	0.247373	4.72859	1.755375	13.45006
	Obs.	200	200	200	200	200	200	200
CAMEROON	Mean	12.56243	2.467261	9.86994	6.49637	14.55075	13.819189	12.58867
	Maxi.	72.29349	34.477496	22.14615	24.74773	18.09610	6.809947	17.69232
	Mini.	4.04138	1.787552	8.573728	10.25581	2.025607	0.677586	0.244692
	Std. Dev.	27.94881	0.687722	0.747624	0.227378	25.92855	1.656585	13.44706
	Obs.	200	200	200	200	200	200	200
EGYPT	Mean	4.68245	3.457255	10.86774	11.49667	25.54485	3.955189	10.38776
	Maxi.	72.28349	24.467496	32.14615	20.74773	28.09522	6.903427	17.49231
	Mini.	11.04139	0.637772	9.494729	6.24581	7.026707	1.697586	-0.245692
	Std. Dev.	7.956712	0.983432	0.747277	0.147778	24.92667	1.677485	21.45305
	Obs.	200	200	200	200	200	200	200
GHANA	Mean	6.211520	45.47188	53.26456	22.425007	5.472520	39.76324	58.37316
	Maxi.	72.851000	48.87000	61.48700	32.866268	6.282000	43.96500	62.07700
	Mini.	5.371000	39.79100	45.35000	14.400722	4.700000	35.45200	55.13300
	Std. Dev.	0.450619	2.953471	5.782911	57.43316.	0.464209	2.511795	2.381170
	Obs.	200	200	200	200	200	200	200
KENYA	Mean	16.25760	25.98364	3753611.	24.19980.	42.22192	12280281	21.55840
	Maxi.	72.87000	48.87000	16945753	15.866871	58.05400	26015786	55.66800
	Mini.	5.371000	6.260000	5.953000	5.889000	6.038000	42.76000	5.183000
	Std. Dev.	18.44493	20.68473	6831147.	5663523.	16.75830	10532638	23.65861
	Obs.	200	200	200	200	200	200	200
MOROCCO	Mean	16.25760	25.98364	3753611.	2419980.	42.22192	12280281	21.55840
	Maxi.	72.87000	48.87000	16.945753	15.866871	58.05400	26.015786	55.66800

Countries	Statistics	RGDP	HExp	POP	XP	IMP	EDU	GE
	Mini.	5.371000	6.260000	5.953000	5.889000	6.038000	42.76000	5.183000
	Std. Dev.	18.44493	20.68473	6831147.	5663523.	16.75830	10532638	23.65861
	Obs.	200	200	200	200	200	200	200
NIGERIA	Mean	8.141114.	5.986200	42.78724	55.53104	15.39921	3.107440	27.79704
	Maxi.	72.23198	61.80100	46.84300	61.98100	20.90278	31.65400	30.64600
	Mini.	6.094272.	5.029000	36.98900	49.55700	10372734	2.796000	23.65400
	Std. Dev.	18.47903.	0.562019	3.297200	4.311003	32.50645.	0.216783	1.840938
	Obs.	200	200	200	200	200	200	200
SOUTH AFRICA	Mean	8.077414.	7.032687.	7.669520	46.09552	8.361810	11.93988	4.097680
	Maxi.	72.23198	46.20829.	36.98900	61.98100	20.03278	16.81915	23.65400
	Mini.	6.94272.	5.029000	5.781000	41.72100	49.55700	2.796000	3.017000
	Std. Dev.	1874872.	1784479.	6.115898	3.633937	4180645.	3010791.	4.079797
	Obs.	200	200	200	200	200	200	200

Table 3

Estimate of Panel Unit Root Test: Summary

	Test Types	RGDP	Hexp	POP	XP	IMP	EDU	GE
ALGERIA	Levin; Lin & Chu t*	-5.5183	-6.5394	-8.7692	-17.4937	-6.0370	-8.2884	-4.7743
	Im; Pesaran and Shin W-Stat	-9.35499	-17.3201	-6.7864	-9.2245	-6.2430	-9.1142	-8.4890
	ADF - Fisher Chi-square	22.4687	21.6905	13.9549	10.2675	11.0284	15.2691	26.9138
	PP - Fisher Chi-square	18.1332	14.8334	9.5815	11.5720	12.9881	19.1780	13.0151
	Order of Integration	I(1)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)
CAMEROON	Levin; Lin & Chu t*	-6.6376	-19.7245	-8.1982	-13.1003	-5.6415	-10.462	-7.4547
	Im; Pesaran and Shin W-stat	- 6.2380	-9.7638	-6.3165	-12.2122	-8.0595	-7.5543	-10.1078
	ADF - Fisher Chi-square	40.5934	25.2600	60.5597	31.8011	51.1856	41.2300	48.7800
	PP - Fisher Chi-square	23.9066	29.5945	44.4554	21.5630	28.2308	30.6435	22.9922
	Order of Integration	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)
EGYPT	Levin; Lin & Chu t*	-5.0091	-6.0826	-6.0049	-11.0920	-14.0950	-15.255	-8.2479

	Im; Pesaran and Shin W-stat	-7.0374	-8.0375	-5.0117	-10.3999	-9.2138	-11.248	-7.3145
	ADF - Fisher Chi-square	32.7649	41.2964	27.1717	22.4401	30.3857	36.5091	44.0374
	PP - Fisher Chi-square	33.2964	51.8932	20.3740	45.3937	55.1395	29.0826	49.0375
	Order of Integration	I(1)	I(0)	I(1)	I(0)	I(1)	I(1)	I(0)
GHANA	Levin; Lin & Chu t*	-7.6776	-8.3741	11.2538	-6.3235	-8.1656	-5.4936	-7.7473
	Im; Pesaran and Shin W-stat	-8.4401	-6.3937	-5.3235	-10.5867	-9.1557	-6.0924	-7.3999
	ADF - Fisher Chi-square	57.7331	31.5732	47.7649	35.2345	51.3322	62.7862	61.4585
	PP - Fisher Chi-square	37.7145	54.7629	38.0239	24.3121	34.8478	46.2311	37.8717
	Order of Integration	I(1)	I(0)	I(1)	I(0)	I(1)	I(1)	I(0)
KENYA	Levin; Lin & Chu t*	-7.6882	-5.1694	-4.0625	-4.4310	-5.3548	-6.4555	-3.6374
	Im; Pesaran and Shin W-stat	-6.8248	-8.9351	-5.8820	-3.3917	-2.7487	-3.5231	-10.1452
	ADF - Fisher Chi-square	55.3338	54.2714	45.4763	37.5268	43.4427	50.5265	41.4766
	PP - Fisher Chi-square	31.9325	39.4152	42.5467	53.8528	26.7742	29.6752	33.5648
	Order of Integration	I(1)	I(0)	I(1)	I(1)	I(1)	I(0)	I(1)
MOROOCCO	Levin; Lin & Chu t*	-3.6151	-6.3249	-4.6046	-4.5545	-3.3476	-3.9358	31.645
	Im; Pesaran and Shin W-stat	-5.1148	-5.4443	-3.5875	-3.0206	-5.0357	-2.4851	-15.396
	ADF - Fisher Chi-square	36.2957	37.5756	28.3711	64.1434	40.4525	44.1234	84.3724
	PP - Fisher Chi-square	32.2144	27.3551	21.4888	55.3536	35.2533	32.2064	11.4754
	Order of Integration	I(0)	I(1)	I(1)	I(1)	I(1)	I(0)	I(1)
NIGERIA	Levin; Lin & Chu t*	-3.0453	-4.1239	-3.2115	-12.1363	-4.4446	-3.8722	-4.235
	Im; Pesaran and Shin W-stat	-3.1328	-2.2266	-4.6542	-10.1248	-5.0115	-7.7620	-4.682
	ADF - Fisher Chi-square	55.4365	61.4676	61.2928	31.7645	18.6222	61.7241	61.558
	PP - Fisher Chi-square	52.1847	43.3403	29.5454	45.6343	30.0378	21.9372	19.164
	Order of Integration	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)	I(1)
SOUTH AFRICA	Levin; Lin & Chu t*	-7.0054	-4.0344	-3.1991	-14.2776	-10.8853	-5.4672	-4.2444
	Im; Pesaran and Shin W-stat	-4.0339	5.2645	-6.8727	-14. 6238	-24.4771	-3.2844	-4.3677
	ADF - Fisher Chi-square	67.9787	40.4216	48.5363	44.5115	53.7057	51.8665	61.7864
	PP - Fisher Chi-square	54.4884	32.1637	43.5681	38.6460	72.5587	62.9822	19.7825
	Order of Integration	I(0)	I(0)	I(0)	I(1)	I(0)	I(0)	I(1)

Table 4

Summary of Panel Unit Root Test for the Eight Countries

Types of Tests	RGDP	HExp	POP	XP	IMP	EDU	GE
Levin, Lin & Chu t*	-12.4131	-13.734	-16.1556	-27.974	-26.184	-13.5069	-23.234
Im, Pesaran & Shin W-stat	-9. 59223	-7.6963	-12.7161	-14.534	-11.102	-6.15953	-14.113
ADF-Fisher Chi-square	339.534	819.335	1251.1	1564.7	1246.5	371.504	1446.4
PP-Fisher Chi-square	230.021	1159.52	2957.53	1011.49	887.434	255.417	667.454
Integrated Order	*I(0)*	*I(0)*	*I(0)*	*I(0)*	*I(0)*	*I(0)*	*I(0)*

The results of the unit root tests from the aforementioned Table showed that the variables are integrated in different orders of integration using the following estimating techniques Levin; Lin & Chu t*, Im; Pesaran & Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square, with variables; RGDP, POP XP, IMP, POP, HEXP, and GE from the chosen countries: Algeria, Cameroon, Egypt, Egypt, Ghana, Kenya, Morocco, Nigeria, and South Africa. Therefore, in the same manner, the data from eight African nations that have been pooled together demonstrates that all of the variables display stationarity at the level, which implies that the integrated order is zero (Table 4).

The results from Table 5 of pedroni residual cointegration revealed the long-run nexus between regressand and regressors. It was found that after juxtapose decision rule and p-values in which they are greater (>) and lower (<) than the 5% critical value. Then we conclude that the null hypothesis implies that long run nexus does not exist among the chosen variables for the study, but if discovered the p-values fall below the 5% critical value. However, from the above results it was revealed that there more of p-values that are lower than 5%. This indicates that we fail to accept the null hypothesis but definitely accept the alternative hypothesis that both dependent which is economic growth and explanatory variables do have long run nexus.

Table 5

Pedroni Residual Cointegration Test Estimate For ACEGKMNS

Obs.: 200					Cross-sections included: 25				
H_0: Absence of Cointegration					Assumption: Deterministic intercept and trend				
ALGERIA					CAMEROON				
lag length: 1									
Ha: Common AR Coefs. (Within-Dimension)					Ha: Common AR Coefs. (Within-Dimension)				
	Statistic	Prob.	Statistic	Prob.		Statistic	Prob.	Statistic	Prob.
Panel rho-Stat.	5.2761	0.001	3.4318	0.001	Panel rho-Stat.	6.7951	0.001	3.5607	0.001
Panel PP-Stat.	-2.9578	0.004	-13.217	0.000	Panel PP-Stat.	-3.2646	0.000	-10.213	0.000
Panel ADF-Stat.	-6.2009	0.000	-8.2517	0.000	Panel ADF-Stat.	-5.1476	0.000	-8.4974	0.000
Ha: Individual AR Coefs. (BTW-Dimension)					Ha: Individual AR Coefs. (BTW -Dimension)				
	Statistic	Prob.				Statistic	Prob.		
Group rho-Stat.	4.6701	0.001			Group rho-Stat.	4.3068	0.001		
Group PP-Stat.	-15. 678	0.000			Group PP-Stat.	-13.697	0.000		
Group ADF-Stat.	-9.6685	0.000			Group ADF-Stat.	-7.0678	0.000		
EGYPT					GHANA				
Ha: Common AR Coefs. (Within-Dimension)					Ha: Common AR Coefs. (Within-Dimension)				
	Statistic	Prob.	Statistic	Prob.		Statistic	Prob.	Stat	Prob.
Panel rho-Stat.	3.2789	0.001	4.3333	0.001	Panel rho-Stat.	5.3130	0.001	7.0857	0.001
Panel PP-Stat.	-2.7838	0.004	-4.7109	0.000	Panel PP-Stat.	-12.588	0.001	-16.774	0.000
Panel ADF-Stat.	-4.4764	0.002	-3.0538	0.000	Panel ADF-Stat.	-5.4437	0.000	-4.8423	0.000
Ha: Individual AR Coefs. (BTW -Dimension)					Ha: Individual AR Coefs. (BTW -Dimension)				
	Statistic	Prob.				Statistic	Prob.		
Group rho-Stat.	6.7123	0.001			Group rho-Stat.	4.5309	0.001		
Group PP-Stat.	-7.4035	0.000			Group PP-Stat.	-21.287	0.000		

Obs.: 200					Cross-sections included: 25				
H_0: Absence of Cointegration					Assumption: Deterministic intercept and trend				
Group ADF-Stat.	-5.3579	0.000			Group ADF-Stat.	-8.6929	0.000		
KENYA					MOROCCO				
Ha: Common AR Coefs. (Within-Dimension)					Ha: Common AR Coefs. (Within-Dimension)				
	Statistic	Prob.	Statistic	Prob.		Statistic	Prob.	Statistic	Prob.
Panel rho-Stat.	6.2061	0.001	6.4313	0.001	Panel rho-Stat.	7.7982	0.001	6.5637	0.001
Panel PP-Stat.	-2.9578	0.025	-11.214	0.000	Panel PP-Stat.	-1.2674	0.000	-9.2214	0.000
Panel ADF-Stat.	-7.2089	0.000	-7.2519	0.000	Panel ADF-Stat.	-5.1416	0.000	-6.7496	0.000
Ha: Individual AR Coefs. (BTW -Dimension)					Ha: Individual AR Coefs. (BTW -Dimension)				
	Statistic	Prob.				Statistic	Prob.		
Group rho-Stat.	4.6017	0.001			Group rho-Stat.	5.3358	0.001		
Group PP-Stat.	-12. 6986	0.000			Group PP-Stat.	-10.6367	0.000		
Group ADF-Stat.	-11. 5668	0.000			Group ADF-Stat.	-7.0860	0.000		
NIGERIA					SOUTH AFRICA				
Ha: Common AR Coefs. (Within-Dimension)					Ha: Common AR Coefs. (Within-Dimension)				
	Statistic	Prob.	Statistic	Prob.		Statistic	Prob.	Stat	Prob.
Panel rho-Stat.	5.2781	0.001	4.3734	0.001	Panel rho-Stat.	6.3138	0.001	6.08579	0.001
Panel PP-Stat.	-2.7830	0.001	-8.7110	0.000	Panel PP-Stat.	-18.598	0.000	-15.784	0.000
Panel ADF-Stat.	-4.4745	0.002	-6.0515	0.000	Panel ADF-Stat.	-9.4497	0.000	-7.8323	0.000
Ha: Individual AR Coefs. (BTW -Dimension)					Ha: Individual AR Coefs. (BTW -Dimension)				
	Statistic	Prob.				Statistic	Prob.		
Group rho-Stat.	9.7116	0.001			Group rho-Stat.	5.5300	0.001		
Group PP-Stat.	-8.4805	0.000			Group PP-Stat.	-22.285	0.000		
Group ADF-Stat.	-8.3579	0.000			Group ADF-Stat.	-5.6949	0.000		

Table 6

Estimators of Selection Criteria Tests

ALGERIA	Outcome Hausman Tests: Effects of Random. Cross Section Effects of Random			
	Tests Summary	Chi-Sq. Stat.	Chi-Sq. *df.*	Prob.
	Cross-Section Random	32.73839	8	0.000
	Wald Test		*df*	Prob.
	F-stat.	13.67626	(8, 149)	0.000
	Chi-square	28.91027	8	0.000
CAMEROON	Outcome Hausman Tests: Effects of Random; Cross Section Effects of Random			
	Test Summary	Chi-Sq. Statistic	Chi-Sq. *df.*	Prob.
	Cross-section random	34.90591	8	0.000
	Wald Test		*df*	
	F-stat.	22.39576	(8, 163)	0.000
	Chi-square	126.2761	8	0.000
EGYPT	Outcome Hausman Tests: Effects of Random; Cross Section Effects of Random			
	Tests Summary	Chi-Sq. Stat.	Chi-Sq. *d.f.*	Prob.
	Cross-section random	107.5461	8	0.000
	Wald Test	Value	*df*	Prob.
	F-stat.	16.8709	(8, 149)	0.000
	Chi-Sq.	106.859	8	0.000
GHANA	Outcome Hausman Tests: Random Effects. Cross Section Random Effects			
	Summary Tests	Chi-Sq. Stat.	Chi-Sq. *df.*	Prob.
	Cross-Section Random	72.79186	8	0.000
	Wald Test	Value	*df*	Prob.
	F-stat.	26.07341	(8, 149)	0.000
	Chi-square	158.4664	8	0.000

KENYA	Outcome Hausman Tests: Random Effects. Cross Section Random Effects			
	Tests Summary	Chi-Sq. Stat.	Chi-Sq. *df.*	Prob.
	Cross-section random	31.78839	8	0.000
	Wald Test		*df*	
	F-stat.	15.67616	(8, 149)	0.000
	Chi-square	97.90270	8	0.000
MOROCCO	Outcome Hausman Tests: Random Effects. Cross Section Random Effects			
	Test Summary	Chi-Sq. Statistic	Chi-Sq. *df*	Prob.
	Cross-Section Random	30.91049	8	0.000
	Wald Test		*df*	
	F-stat.	19.36947	(8, 163)	0.000
	Chi-Sq.	81. 6126	8	0.000
NIGERIA	Outcome Hausman Tests: Random Effect; Cross Section Random Effect			
	Test Summary	Chi-Sq. Stat.	Chi-Sq. *d.f.*	Prob.
	Cross-Section Random	37.5461	8	0.000
	Wald Test:	Value	*df*	Prob.
	F-stat.	67.8709	(8, 149)	0.000
	Chi-square	106.858	8	0.000
SOUTH AFRICA	Outcome Hausman Tests: Random Effect; Cross Section Random Effects			
	Tests Summary	Chi-Sq. Stat.	Chi-Sq. *d.f.*	Prob.
	Cross-Section Random	62.71886	8	0.000
	Wald Test:	Value	*df*	Prob.
	F-stat.	24.01741	(8, 149)	0.000
	Chi-Sq.	137.4464	8	0.000

However, Hausman and Wald tests usage in this context is to juxtapose between the pool, fixed or random in knowing the best selection technique to be adopted that will give us best result without any iota of spurious outcome. More so, the Wald test is also adopted to know the most appropriate and best estimators for this study. Consequently, null hypothesis (Ho) acceptability is rejected with the aid of Hausman test and if discovered that the calculated probability value is lower than 5%. Therefore, it then concludes that recommendation was made to choose the alternative hypothesis (Ha), which gives a clarity that the fixed effects model is fit and suitable for this analysis. At the same time the tests are made by Wald technique as well in determining if the estimated parameters are equally equivalent to zero (0) or to one (1). Hence, if the calculated probability value is lower than that of 5% critical value, we fail to accept null hypothesis. Thus, in line with our rule of decision, we therefore come to conclusion with recommendation that fixed effects is empirical for the study.

Tables 6 and 7 give the blueprint to this criterion, that is, if the coefficient of determination (R^2) is higher than the Durbin-Watson (DW) statistics, the results of the regression are erroneous. Thus, the R-square for the fixed effects findings is lower than for DW statistics at all levels. The results of the regression, however, are devoid of fictitious issues.

One of the key variables for this study is government effectiveness which, is positively and statistically related to real gross domestic product, at 1%, 5%, and 10%, which has an impact on regressand (RGDP). This indicates that a unit increase in government effectiveness will bring about a rise in economic growth in the selected Africa countries. Also, this implies that an effective government will definitely bring about positive change on others, such as control of corruption, rule of law, voice and accountability, political stability / absence of violence / terrorism and as well regulatory quality, if all these variables are effectively working, there would be a trigger in the growth of the economy. Thus, this finding corroborates with the study by Alam et al. (2017) who assessed government effectiveness and economic growth in some selected high- and low-income countries. In addition, the second essential component is the expenditures made on medical care, which demonstrates a negatively correlated link that is statistically significant. According to these findings, a quickening of the pace of economic development will be the result of an increase in the

amount of money spent on health care. Consequently, it is possible to draw the conclusion that this result may have been caused by a wide variety of different circumstances. Inadequate utilization of persons who are members of the first generation may limit economic growth and other difficulties relating to this issue. The majority of the African countries that were included in this study had a significant rise in their expenditures on health care; nevertheless, this did not have a significant impact on the economy. As a direct result of this, there was a noteworthy increase in the number of deaths and the prevalence of diseases. This conclusion is consistent with the findings of the study that was carried out by Gillani et al. (2021), which investigates the connection between sustainable economic growth and the amount of money that the government spends on health care in Asian countries, with a particular emphasis on the amount of ecological footprint consumption.

Moreover, neither the export nor the import variables are important in predicting economic growth in the final outcome. Education (EDU) was found to have a strong positive impact on economic growth in the chosen African nations (ACEGKMNS). This suggests that the RGDP in these areas will increase due to increased education there is also a corroborate outcome with the work by Millia et al. (2021). The findings from the estimation of all levels, however, do support the findings of Barro (2013), who concluded that that a good education has a favorable effect and is important for economic development in their investigations.

Government effectiveness (GE) is positively related to economic growth with the expected variable at the all levels. That is, Algeria, Cameroon, Egypt, Ghana, Kenya Morocco, Nigeria and South Africa are important to RGDP in terms of major influence, considering the overall result. This indicates that a unit increase in GE will result in an increase in economic growth. This finding confirms previous studies by Doumbia, (2019) Ivanyna and Salerno (2021), and Ianchovichina and Lundstrom(2009) that GE is positively correlated with economic growth.

Table 7
Estimation of Panel Regression Results by Each Country (ACEGKMNS)

	POOLED OLS		Prob.	FIXED MODEL			RANDOM MODEL		
	Coeff	S. Error		Coeff	S. Error	Prob.	Coeff	S. Error	Prob.
ALGERIA									
C	0.935	0.346	0.007	10.502	2.236	0.000	0.089	0.345	0.001
D(RGDP(-1))	0.776	0.023	0.000*	0.842	0.036	0.000*	0.868	0.022	0.000*
D(POP(-1))	-0.134	0.024	0.000*	-0.582	0.185	0.000*	-0.137	0.024	0.000*
XP	-0.003	0.005	0.370	-0.012	0.007	0.084*	-0.004	0.002	0.125
GE	0.006	0.014	0.324	-0.154	0.044	0.000	0.003	0.016	0.564
HEXP	0.012	0.004	0.042*	0.022	0.015	0.100*	0.012	0.005	0.023*
EDU	0.103	0.011	0.000*	0.146	0.024	0.000*	0.120	0.010	0.000*
R-squared		0.993			0.991			0.992	
F-statistic		5319.620			1857.310			4378.600	
DW-stat		1.483			1.668			1.598	
CAMEROON									
C	0.525	0.310	0.072	3.037	2.388	0.204	0.565	0.316	0.074
D(RGDP(-1))	0.752	0.023	0.000*	0.693	0.031	0.000*	0.738	0.033	0.000*
D(POP(-1))	-0.181	0.020	0.000*	-0.345	0.147	0.010*	-0.190	0.021	0.000*
XP	-0.010	0.002	0.812	0.000	0.007	0.984	-0.002	0.002	0.720
GE	-0.044	0.001	0.000*	-0.075	0.030	0.054*	-0.046	0.010	0.000*
HEXP	0.018	0.005	0.002*	0.018	0.014	0.200	0.020	0.005	0.001*
EDU	0.195	0.020	0.000*	0.233	0.024	0.000*	0.204	0.010	0.000*
R-squared		0.986			0.988			0.983	
F-statistic		3234.067			1145.060			2635.401	

	POOLED OLS		Prob.	FIXED MODEL			RANDOM MODEL		
	Coeff	S. Error		Coeff	S. Error	Prob.	Coeff	S. Error	Prob.
DW-stat		1.491			1.676			1.522	
				EGYPT					
C	0.057	0.300	0.845	8.527	2.661	0.001	0.047	0.205	0.776
D(RGDP(-1))	0.581	0.026	0.000*	0.305	0.027	0.000*	0.570	0.018	0.000*
D(POP(-1))	-0.336	0.022	0.000*	-1.013	0.157	0.000*	-0.326	0.015	0.000*
XP	0.005	0.003	0.110	0.035	0.003	0.000*	0.005	0.002	0.010*
GE	-0.064	0.028	0.025*	-0.096	0.047	0.044*	-0.064	0.010	0.000*
HEXP	-0.002	0.004	0.530	0.018	0.005	0.003*	-0.002	0.003	0.482
EDU	0.373	0.023	0.000*	0.506	0.020	0.000*	0.363	0.016	0.000*
R-squared		0.991			0.994			0.980	
F-statistic		5403.508			3479.625			5403.508	
DW-stat		1.052			1.060			1.041	
				GHANA.					
C	0.924	0.346	0.009	11.504	3.247	0.002	1.090	0.345	0.003
D(RGDP(-1))	0.875	0.025	0.000*	0.833	0.036	0.001*	0.868	0.024	0.000*
D(POP(-1))	-0.125	0.026	0.000*	-0.683	0.185	0.000*	-0.136	0.024	0.000*
XP	-0.005	0.003	0.370	-0.012	0.007	0.084*	-0.006	0.003	0.226
GE	0.006	0.014	0.614	-0.163	0.042	0.000*	0.003	0.012	0.781
HEXP	0.001	0.002	0.070*	0.021	0.016	0.100	0.010	0.004	0.031*
EDU	0.102	0.011	0.000*	0.145	0.023	0.000*	0.010	0.002	0.000*
R-squared		0.991			0.992			0.980	
F-statistic		5194.610			1846.310			4365.700	
DW-stat		1.483			1.748			1.397	

	POOLED OLS		Prob.	FIXED MODEL			RANDOM MODEL		
	Coeff	S. Error		Coeff	S. Error	Prob.	Coeff	S. Error	Prob.
				KENYA					
C	0.522	0.200	0.081	3.037	2.387	0.204	0.565	0.316	0.074
D(RGDP(-1))	0.553	0.022	0.000*	0.692	0.030	0.000*	0.737	0.021	0.001*
D(POP(-1))	-0.180	0.021	0.000*	-0.344	0.145	0.020*	-0.190	0.020	0.000*
XP	-0.001	0.001	0.811	0.000	0.004	0.983	-0.002	0.001	0.811
GE	-0.023	0.001	0.000*	-0.074	0.041	0.053*	-0.045	0.011	0.000*
HEXP	0.014	0.003	0.001*	0.017	0.013	0.200	0.011	0.004	0.001*
EDU	0.195	0.022	0.001*	0.232	0.043	0.000*	0.202	0.010	0.001*
R-squared		0.967			0.986			0.974	
F-statistic		3256.068			1137.062			2539.412	
DW-stat		1.492			1.675			1.524	
				MOROCCO					
C	0.055	0.302	0.845	8.526	2.632	0.001	0.054	0.203	0.746
D(RGDP(-1))	0.581	0.025	0.001*	0.304	0.026	0.000*	0.581	0.017	0.001*
D(POP(-1))	-0.335	0.022	0.000*	-1.012	0.157	0.000*	-0.335	0.014	0.000*
XP	0.001	0.003	0.112	0.033	0.002	0.000*	0.004	0.002	0.010*
GE	-0.063	0.028	0.024*	-0.067	0.045	0.043*	-0.064	0.021	0.000*
HEXP	-0.001	0.002	0.632	0.012	0.002	0.002*	-0.002	0.002	0.423
EDU	0.373	0.034	0.000*	0.307	0.0233	0.000*	0.334	0.013	0.000*
R-squared		0.995			0.994			0.993	
F-statistic		5401.507			3694.625			5401.507	
DW-stat		1.043			1.080			1.043	

	POOLED OLS		Prob.	FIXED MODEL			RANDOM MODEL		
	Coeff	S. Error		Coeff	S. Error	Prob.	Coeff	S. Error	Prob.
NIGERIA									
C	0.543	0.302	0.062	3.002	2.387	0.203	0.546	0.315	0.005
D(RGDP(-1))	0.743	0.033	0.000*	0.645	0.021	0.000*	0.736	0.021	0.000*
(POP(-1))	-0.172	0.032	0.000*	-0.345	0.147	0.010*	-0.161	0.023	0.000*
XP	-0.005	0.004	0.023	0.001	0.006	0.945	-0.003	0.002	0.822
GE	-0.044	0.012	0.001*	-0.075	0.041	0.045*	-0.057	0.011	0.000*
HEXP	0.017	0.003	0.004*	0.017	0.025	0.031	0.022	0.004	0.001*
EDU	0.177	0.023	0.000*	0.244	0.045	0.000*	0.203	0.004	0.000*
R-squared		0.988			0.985			0.983	
F-statistic		3254.068			1145.061			2633.411	
DW-stat		1.491			1.687			1.563	
SOUTH AFRICA.									
C	0.055	0.302	0.877	8.538	2.672	0.001	0.055	0.204	0.778
D(RGDP(-1))	0.581	0.027	0.000*	0.305	0.022	0.000*	0.581	0.018	0.000*
D(POP(-1))	-0.347	0.024	0.000*	-1.024	0.167	0.000*	-0.335	0.015	0.000*
LOGXP	0.004	0.005	0.112	0.039	0.003	0.000*	0.004	0.001	0.001*
GE	-0.067	0.023	0.025*	-0.087	0.045	0.032*	-0.067	0.022	0.002*
HEXP	-0.004	0.006	0.631	0.017	0.006	0.001*	-0.004	0.003	0.484
EDU	0.365	0.025	0.001*	0.508	0.028	0.000*	0.365	0.026	0.000*
R-squared		0.991			0.994			0.993	
F-statistic		5406.508			3478.625			5406.508	
DW-stat		1.044			1.170			1.044	

Intriguingly, as can be seen from the table that is located above, the coefficients of export and government effectiveness reveal that they are positive and equally statistically significant, and that they anticipate economic growth for the whole country (ACEGKMNS) levels within the time period that is being investigated. The significance of the increase in the export of commodities and the efficiency of the government in expanding economic activity, which ultimately leads to economic growth in Nigeria, is demonstrated by this. The findings of this study provided support for the research conducted by Chand et al. (2020). Additionally, when looking at the F-statistics for the values of the nations, it appears that the outcome findings accurately depict the model that is both well stated and well fit. All of the explanatory variables, also known as regressors, provide a comprehensive and meaningful explanation for the changes that occur in the regressand, which is referred to as economic growth. Listed below in Table 8 are the outcomes of the Dumitrescu Hurlin panel causality tests that were performed on pairs of individuals. Therefore, this demonstrates how the variables that were utilized in this study and the African countries (ACEGKMNS) that were selected are related to one another at the same time.

Table 8

Pairwise Dumitrescu Hurlin Panel Causality Estimate Results for the Whole Countries

Sample: 1996-2020	Lags: 2	Zbar-Stat.	Prob.	Results
H_0	W-Stat.			
POP does not granger cause RGDP	6.9124	9.461	0.000	↔
RGDP does not granger cause POP	13.718	37.471	0.000	
XP does not granger cause RGDP	4. 4694	6. 5253	0.000	↔
RGDP does not granger cause XP	14.213	31.977	0.000	
IMP does not granger cause RGDP	6. 1900	5.8019	0.000	↔
RGDP does not granger cause IMP	17.443	41.491	0.000	
HEXP does not granger cause RGDP	5. 7223	6.5953	0.000	↔
RGDP does not granger cause HEXP	9.4155	23.851	0.000	
EDU does not granger cause RGDP	4. 4932	3.8175	0.004	↔
RGDP does not granger cause EDU	5. 1764	5.6105	0.003	
GE does not granger cause RGDP	6. 1900	5.8039	0.000	↔
RGDP does not granger cause GE	15.424	30.491	0.000	

Note. (↔) Denotes Bidirectional Causality, (→) Denotes Unidirectional Causality & (Χ) Denotes No Causality

In addition, as can be seen from Table 8, the variables are put through a Dumitrescu Hurlin panel granger causality estimate. In conclusion, the results imply that the dependent RGDP (regressand) and explanatory variables (regressors) POP, XP, IMP, HEXP, EDU, and GE are causally related in both directions. This is due to the probability values being lower than the 5% crucial value. Clearly, one explanation for the difference in results between the core variables in Table 8 could be that rises or decreases in healthcare expenditures have significant impact on economic growth, but that impact may be favorable or unfavorable given the abundance of other factors that affect economic growth and make a significant contribution to economic growth.

However, while considering the study's overall findings, it is important to note that the variables considered were those of relevance to the study in relation to economic growth, particularly health expenditure and good governance. The finding so validated the research conducted by Rizvi (2019) into health spending, institutional quality, and economic growth. The outcome showed that the pace of growth will undoubtedly accelerate on its own if health expenditure through government effectiveness is used wisely. That is, economic growth in ACEGKMNS countries will be facilitated by rising health spending and improved government performance.

Conclusion and Policy Recommendations

The purpose of this study is to analyze good governance, public health expenditure, and economic growth using data from eight countries in Africa (ACEGKMNS). These nations are chosen from the African continent and span the years 1996 to 2020. The variables that were used in the research were gathered from the databases of the World Development Indicators and worldwide governance indicators. These variables included economic growth, which was represented by real gross domestic product, population, export, import, public health expenditure, education, and the good governance which proxied by effectiveness of the government. As a method for estimating the data, the research utilized panel OLS, Hausman and Wald tests, Pedroni residual cointegration test, fixed effects and random effect estimators, and the Dumitrescu Hurlin panel causality tests. All of these methods were utilized in order to estimate the data. The findings demonstrated that there is a connection between the variables that were

investigated in each country as well as in the collective nations over the long period. Furthermore, it was discovered that the fixed effects estimator is preferred over the other estimating strategies with regard to the Hausman and Wald tests. As a consequence, the empirical result of the fixed effects model demonstrates that the lag in public health expenditure at lag 1 has an inverse impact on real GDP, but the lag in export, import, and education has a substantial positive influence on the outcome variables from the selected African nations.

Thus, in Nigeria, it was observed that only population and imports that inversely related economic growth, whereas government effectiveness is otherwise positively impact. As it can also be seen that in Cameroon and Kenya, health spending and population growth have a negative and statistically significant impact on economic growth, whereas lagged health spending, population growth, education, and export have a positive and statistically significant impact the growth of the economy on predictions. Population and imports both have a negative, significant impact on economic growth in South Africa, but lagged health spending and government effectiveness show a positive, statistically significant impact and a projected variable this finding supports the study by Zhang et al. (2022). Additionally, the results for the countries of Nigeria, Cameroon, and Morocco indicate that government effectiveness and public health expenditure inversely and significantly forecast economic growth, whereas lagged health spending and government effectiveness have positive and significant impact on the projected variable, this result equally corroborate with the work by Guisan et al. (2010). When all of the countries that were utilized for this research were considered together, it was shown that imports do not have a substantial influence on the expansion of the economy. Despite the fact that both health expenditure and government effectiveness are negative predictors of economic development, lagged health expenditure, government effectiveness, and population all exert a positive influence on the overall result of the economies of the selected nations during the periods that are being investigated. Consequently, this conclusion is consistent with the research conducted by Nopiana et al. (2022) in terms of the growth of the economy and imports, however the other variables that were utilized for the study are in opposition to the findings.

Panel causality tests were conducted between RGDP as the dependent variable and explanatory factors at levels across a selection of countries. The results of these tests are presented in Table 12. There is a bi-directional causal link between HEXP, RGDP, and other variables at the national level in five of the nations that were chosen. These countries are Algeria, Cameroon, Ghana, Morocco, and Egypt. However, in the countries of Nigeria, Ghana, and South Africa, there is only one route of causation from RGDP to HEXP, and there is no cascading impact from HEXP to RGDP. This is in contrast to the situation in other countries. With regard to the overall level outcome, there is a causal connection that goes in both directions between the regressand RGDP and all of the regressors HEXP, XP, IMP, EDU, and GE. In the long term, this indicates that economic expansion is intended to be the source of all of the regressors for the economy.

One of the lessons to learn from the outcome result of the fixed effects conclusion is that, during the study period, health expenditure and government effectiveness had a statistically significant beneficial impact on

economic growth. By implication, this suggests that increasing public health spending will result in more economic growth and that if this is not complemented by increased government efficiency, growth will unavoidably slow. Whereas many studies corroborated the findings of this analysis, some studies actually viewed public health spending as an insignificant element that impacts economic growth. A lot of research has already been done on African countries as regard governance, health expenditure on economic growth, but there is a dearth of studies on economic growth, public health spending, and good governance in African nations specifically Algeria, Cameroon, Egypt, Ghana, Kenya, Morocco, Nigeria and South Africa as a case study. As a result of its under-researched status, this field requires additional attention from scholars. Because it will advance knowledge in all fields and the like, this effort is extremely important. They ought to develop and put into action policies that promote and hasten high-quality investment in the health sector. Also, in order to increase the effectiveness of current and upcoming health-related programs, economies must review and reconstruct them. Developing countries should spend more overall on the health sector in order to improve the system and boost effective government efficiency. Additionally, they must track targets at regional levels in addition to the sustainable development goals. They

should place more emphasis on the health sector, particularly on the quality of the investments and results. Inadequate accountability and counterproductive goals for total expenditures, particularly health spending, are the cause of low performance. Investments in the health sector, and particularly their quality, should be carefully examined and monitored since, in order to improve health status by investing in health care, excellent governance is more important than anything else.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

Data availability is not applicable as no new data was created.

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