International Journal of Financial Management and Economics

P-ISSN: 2617-9210
E-ISSN: 2617-9229
IJFME 2024; 7(2): 01-06
www.theeconomicsjournal.com
Received: 02-05-2024
Accepted: 05-06-2024

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Study of the determinants of inclusive economic growth in a sample of West African countries using the generalized method of moments (GMM) model for panel data for the period (2010-2022)

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DOI: https://doi.org/10.33545/26179210.2024.v7.i2.320

Abstract
The study examined the factors that influence inclusive economic growth in West African nations between 2010 and 2022. The Generalized Method of Moments (GMM) model was used to analyze panel data. The Human Development Index (HDI) served as a measure of inclusive economic growth. The independent variables included in this study were gross capital formation, foreign direct investment, trade openness, primary school enrollment, and wide money supply. The primary results demonstrate a detrimental correlation between trade openness and inclusive growth, implying that the studied West African nations derive little advantages from globalization. Conversely, increased rates of enrollment in primary school, the development of financial systems, and the inflow of foreign direct investment have a favorable impact on economic growth, specifically aiding disadvantaged groups and diminishing poverty. The collective independent factors account for approximately 44% of the fluctuations in inclusive growth. This study offers significant findings on the factors that influence economic growth in emerging nations, emphasizing the critical role of innovation, education, and financial development as primary determinants.

Keywords: Comprehensive economic GROWT, West African countries, generalized moments model (GMM), human development index (HDI), globalization

Introduction
Economists devote considerable attention to the study of economic growth because of its significance in identifying the most relevant causes. Economic growth is a key macroeconomic measure that reflects a country's economic activity and is manifested in individual income and well-being. Hence, attaining substantial economic growth is a fundamental aim for any economic or political system, and the majority of policies and actions implemented by governments are aimed at accomplishing this purpose, whether via direct or indirect means. Moreover, the assessment of the advancement and triumph of an economic or political system, as well as the effectiveness of the implemented policies, typically relies on the attained rates of growth.

Consequently, economists have been eager to elucidate the mechanisms behind this progress by comprehending its theoretical and practical factors throughout different phases of economic thinking. In addition, a multitude of practical research and theoretical frameworks have examined this subject throughout history. At first, ideas were based on the conventional paradigm, which saw labor and capital as the primary elements influencing economic growth. Later, in the 1930s there appeared another method which stated that additional factors also affected the rate of growth. The Harrod-Domar model, formulated by Singer (1939-1949), established that the pace of economic growth in a society is determined by three key factors: the rate of savings which has implications on the availability and productivity of funds for investments, and the rate of population growth.

In 1956, another model was put in place known as Solow model which added other variables into the traditional production function this include technological progress.

In the 1980s and 1990s, new models of endogenous growth were developed that included elements such as technology, innovation, and population to characterize long-term growth. These models also postulated on the objectives of economies of scale in production and placed much value on human capital which would be valued through education and health. These investments are made based on innovation processes and impact primarily on the technological advance, thus promoting higher growth rates in the economy. Thus, human capital was added to physical capital as some of the factors that define the trend rate of economic growth.

These research reached a consensus on some fundamental components that contribute to economic growth, including labor, physical and human capital, and technological progress. However, they diverged in other aspects, including trade, financial openness, and government expenditure, which were additional drivers to the ones mentioned before. Furthermore, additional factors considered were the level of attainment in attaining both internal and external economic stability, the progress made in developing the financial sector, the prevailing political and social circumstances, and the effectiveness of government economic programs.

In conclusion, it can be stated that all theories examining the factors that influence economic growth have largely focused on understanding these factors within the context of developed countries and explaining the extent of growth in these nations. Undoubtedly, industrialized nations possess certain attributes that set them apart from emerging ones. The goal of the study is to ascertain the validity of the identified elements as predictors of economic growth in emerging nations. Excluding underdeveloped countries, what factors determine inclusive development in these nations?

Therefore, the objective of this study was to ascertain the primary factors that contribute to inclusive economic growth in a selection of developing nations and investigate strategies to expedite their growth rate in order to narrow the gap with developed countries. The study hypothesis posited that the factors influencing economic growth in rich nations may not be entirely applicable to emerging nations. The study was partitioned into four components in the following manner.

- **Part (1):** Theoretical Framework and Introduction.
- **Part 2:** Review of Existing Literature.
- **Part 3:** Data and Methodology.
- **Part 4:** Findings and Conclusions.

First: Theoretical Framework

1. Theoretical Reference for Determinants of Economic Growth

Economic growth refers to the augmentation in the monetary worth of products and services generated by the domestic economy. The conventional method of measurement is calculating the percentage growth in real GDP. Several ideas have examined the matter of economic growth and the factors that determine it. Theories of economic growth originated from the classical approach, which posited that capital accumulation could be attributed to either enhanced efficiency through specialization and division of labor, as proposed by Adam Smith, or to an increase in profit rates, as argued by Ricardo and Malthus, who regarded the profit rate as the primary driver of economic growth.

The classical approach asserts that each economy possesses a stable GDP, and any departure from this equilibrium is transitory, ultimately reverting back to the equilibrium state. This concept is founded on the notion that when GDP expands, the population will also rise, hence exerting a detrimental effect on GDP as a result of heightened demand on finite resources by a greater population. As a result, the GDP will ultimately decline and revert back to its stable condition. In contrast, if the GDP strays from the steady state, there will be a decrease in population, resulting in a decrease in the demand for resources. Consequently, the GDP will revert to its equilibrium level.

The Schumpeterian growth model is founded upon three primary concepts: (a) sustained growth is a consequence of innovations; (b) innovations emerge from entrepreneurial ventures motivated by the potential for exclusive profits; (c) new innovations supplant outdated technology. Put simply, progress entails the process of creative destruction.

The entrepreneur plays a vital role in Schumpeter's explanation of the process of economic progress. Schumpeter's concept disrupts the cyclical flow by introducing innovation in the shape of a new product. This new product plays a crucial role in driving societal growth by initiating and propelling it ahead. Entrepreneurship and management positions are distinct in that a manager mostly supervises the operations of an organization, whereas an entrepreneur assumes a greater level of risk. Schumpeter praised the importance of the entrepreneur, emphasizing their functional qualities. As per his statement, entrepreneurs are required to.

a) Recognize the potential for innovation.
b) Overcome social and psychological barriers that hinder the introduction of new things.
c) Direct means of production into new channels.
d) Convince bankers to provide the necessary financing for innovations.
e) Encourage other producers in their field to take risks.
f) Create a favorable environment for satisfying desires as a natural motivator.
g) Provide leadership.
h) Bear a high degree of risk in the economic world.

The neoclassical theory of economic growth, developed by Solow (1956) and Swan (1956), is another prominent theory in this field. Both autonomously devised very uncomplicated development models that concentrate on three aspects that impact economic growth: labor, capital, and technology, notably technical breakthroughs. An conclusion of the model is that in the short run, economic growth is only influenced when the economy moves towards a new stable level of production. Moreover, the pace at which the economy approaches its stable condition is influenced by the rate at which capital accumulates during its improvement. Capital accumulation is influenced by two factors: the savings rate, which is the proportion of production utilized to build additional capital instead of being spent, and the pace of capital accumulation. In this model, the long-term growth rate is defined exogenously, indicating that it is specified outside to the model.

These models commonly predict that the economy will inevitably move towards a stable pace of growth. However, this is contingent exclusively upon the pace of technological advancement and the rate at which the work force expands. The model is based on four key assumptions: continuous returns to scale, falling marginal productivity of capital, exogenously dictated technical advancement, and substitutability between capital and labor. The model emphasizes that the savings or investment ratio is a crucial factor in determining short-term economic development. The prediction is based on the idea that economies with lower income levels will have quicker growth rates compared to those with higher income levels.

Modern growth theory, namely the endogenous growth theory, aligns with the Solow model in recognizing technical advancement as the primary driver of economic growth. However, it diverges by attributing the determination of technological progress to internal factors inside the model, rather than external factors. It is impacted by investments in research and development or capital investment. Several models have been developed based on this notion, including.

1. **Romer's Model (1986) [6]:** This model emphasizes the importance of research and development, arguing that the accumulation of knowledge can effectively compensate for the diminishing marginal productivity of fixed capital. This implies that economic growth can continue in the long term without being subject to diminishing returns.
2. **Lucas's Model (1988) [7]:** Lucas emphasized the significance of human capital in driving economic growth, demonstrating that it fosters self-perpetuating (or endogenous) economic growth through the accumulation of human capital.

2. Literature Review

Mater and Mostafa performed a research on the factors that influence economic growth in emerging nations. In order to accomplish this objective, the study utilized a pioneering technique known as Artificial Neural Networks (ANN) and implemented it on a sample of 27 developing nations spanning from 2000 to 2018. The study found that the primary factors influencing economic growth in emerging nations are consumption, followed by savings and capital accumulation. However, these nations do not experience economic growth as a result of elements highlighted by contemporary and traditional theories, such as technical advancement, human development, institutional quality, governance, foreign direct investment, economic freedom, and political stability.

Robert Barro conducted a research that examined the factors that influence economic development and investment. The study included panel data from over 100 nations, which were studied from 1960 to 1995. The statistics demonstrate a pattern of conditional convergence, indicating that the rate of increase of per capita GDP is inversely correlated with the starting level of per capita GDP. This correlation holds true even after controlling for factors like as government policies, institutions, and the characteristics of the national population. In the case of Chile, the projected annual growth rate of per capita GDP from 1996 to 2006 is 3.0%, which is higher than the average rate of 1.6% seen in the sample. Chile's greater growth forecasts may be attributed to several factors, including a comparatively low amount of government spending, a strong rule of law and investment environment, and a low fertility rate. Chile's levels of education, inflation, and international openness are about ordinary, which means they do not account for the disparity in growth rates. The negative impact of convergence arises from the fact that Chile is particularly affluent compared to the overall sample.

Study by Mihaela & *et al*.

The analysis conducted by Mihaela and her colleagues revealed that prolonged deceleration in development patterns might result in significant social and political challenges for the V4 nations (the Czech Republic, Slovakia, Hungary, and Poland) as well as Romania. It may also pose a danger to impede the advantages that may arise from the prospective convergence with advanced nations in the European Union. Therefore, it is imperative for the V4 economies and Romania to devise strategies that would enable them to attain sustained economic expansion while simultaneously bolstering their global competitiveness. This study presents an empirical examination of the elements that might potentially influence sustained economic growth in the aforementioned five nations. The analysis undertaken over the period 2003-2016 employed Bayesian generalized ridge regression. The primary findings revealed that foreign direct investment bolstered economic development in all nations with the exception of Slovakia. Overall, education spending was the only area that had a direct positive impact on GDP in the Czech Republic, while R & D spending had some positive effects in Romania, Hungary, and the Czech Republic.

Study by Researchers from the International Monetary Fund (2020)

One empirical research conducted by the International Monetary Fund (IMF) based on the impact of overall growth in a sample of southeast Asian countries. The studies shown that all countries of ASEAN experienced significant economic growth and shown a considerable reduction in poverty level during the latest decades. But, it was noted that incomes are not equally distributed and the level of income inequality remains the same. The purpose of this research is to find out the factors that may have to do with fostering sustainable and balanced economic development in ASEAN countries. To measure the general development, the index that includes the income increase and growth of the stock stock exchange is used. The findings of the study on how structural factors influence total economic growth and its subcomponents, which a multinational committee carried out, show that financial redistribution, gender equality through women employment, productivity improvement, FDI inflows, technological advancement especially through the use of digital technology, and savings are vital in bringing comprehensive growth. In the light of conventional economic performance, the evaluation of the shown scenarios results in the conclusion that the set measures of financial redistribution and market-oriented structural reforms might considerably stimulate the overall development in ASEAN.

Study by KHAN & *et al.*, 2016 [11]

The study titled "Measuring and Determinants of Inclusive Growth: As highlighted by KHAN & *et al*. in the paper titled ‘Inclusive Growth in Pakistan: A Case Study of Pakistan (1990-2012)’ inclusive growth is majorly propelled by equality of opportunity. Employment and other development possibilities are generated through the means of fast and sustainable economic growth which is inclusive in nature. Its goal is to improve the quality and equality of opportunities and eliminate unfair or inadequate differences between people and groups, so that growth is not limited or concentrated. The first objective of the study was to actually estimate inclusive growth, and the second was to then theoretically and empirically decompose the drivers. The research used the method developed by the Asian Development Bank, which is based on the assignment of weights and scores to many factors that allows for the production of an index of inclusive growth. This metric includes aspects such as economic development, distribution of wealth, health, and political systems. If we compare the results with other countries, it can be concluded that Pakistan has an average level of success in the context of growth with greater inclusion. Additional analysis done using ARDL reveals the fact that macroeconomic stability and expansion of social finance are other factors that are central to inclusiveness, poverty and inequality. Furthermore, certain adjustments have to be made to the trade sector to improve its effectiveness in promoting inclusion.

Study by Hazmi & *et al*., 2022 [12]

The study titled "Measuring and Determinants of Inclusive Growth: The research study by Hazmi & *et al*.: ‘‘Policy Brief on High Economic Growth, No Guarantee of Better Welfare for All: Findings from Indonesia’, published in 2022 made several assertions that highlighted the fact that high economic growth did not always lead to better welfare of the people. Due to this, the world has slowly come to accept the notion of inclusive growth as a possible solution. The Indonesian government has shown a good political will towards the achievement of more reasonable growth by integrating the idea of inclusive growth into its the medium term national development framework for the years 2015-2019 (RPJMN) and 2020-2024 RPJMN. However, according to the growth indicator, which measures the trends of the parameters, it can be stated that, on balance, inclusiveness is still shrinking. This means that, there are many a region and urban centers that have not been fully and fairly economically developed. It is crucial to have a positive and strong partnership between the central and regional governments in implementing the objectives set in the RPJMN.

The study suggested conducting additional research to examine the congruence between RPJMN and the development plans formulated by local governments. It also suggested examining the performance of the agricultural sector, the expenses of the local governments, conditional cash transfers, and the effectiveness of health insurance and internet facilities for a more inclusive and enhanced economic evolution in the vulnerable sectors. According to the report, these issues should remain top-priority for the government and the population should be encouraged to use the internet as the digital economy is rapidly growing. One must realise that the government has to intervene to make internet tariffs friendly to those with the lowest levels of income.

Second: Standard Methodology

1. Data Description and Specified Model

Since the study sought to establish the nature of association between the dependent variable comprised of the comprehensive growth variable of HDI and the chosen influential independent variables, the research employed a panel data. This was chosen because it uses cross sectional and time series data at the same time; this has several advantages such as the fact that using cross sectional and time series data will give more informative data with high variability. In the same way, panel data have less linear relationship between variables than pooled data, have more degrees of freedom and are generally more efficient. They also assist in estimating impacts that cannot be accurately determined from the conventional cross-sectional or time series data. Moreover, the use of panel data is more effective in examining more complicated behaviors. In other words, these data contribute extra variables to the study that cannot be obtained with cross-sectional or time-series data sets only.

The model was estimated using the Generalized Method of Moments (GMM). The model took the following form:

$$LNHDI = a0 + a1LNCP + a2LNFDI + a3LNOP + a4LNED + a5LNM3 + U$$

Where the dependent variable is

LNHDI = Represents the logarithm of the Human Development Index (HDI), which reflects inclusive growth.

And the explanatory variables included

LNCP = Represents the logarithm of Gross Capital Formation (% of Gross Domestic Product).

LNFDI = Represents the logarithm of Foreign Direct Investment, net inflows (% of Gross Domestic Product).

LNOP = Represents Trade (% of Gross Domestic Product).

LNED = Represents School Enrollment, Primary (% of total).

LNM3 = Represents Broad Money (% of Gross Domestic Product).

Table 1: Presentation and Discussion of Analysis Results

Dependent Variable: LNHD				
Method: Panel Generalized Method of Moments				
Sample (adjusted): 2011 2022				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.805714	1.251695	-3.839363	0.0003
LNCP	0.181147	0.136528	1.326811	0.1902
LNFDI	0.142571	0.081789	1.743157	*0.0870
LNOP	-0.947867	0.227939	-4.158430	***0.0001
LNED	0.681875	0.211400	3.225516	***0.0021
LNM3	1.082302	0.246426	4.392002	***0.0001
R-squared	0.440989			
J-statistic	1.74E-18			

The results from Table (1) demonstrate a non-significant statistical relationship between the Human Development Index as the dependent variable (LNHD) and the explanatory variables. Despite the positive indication between investment expenditure – capital formation (LNCP) and human development, the relationship was not statistically significant if the p-value exceeds 0.05. This suggests that these investments might have been associated with financial corruption in these countries and did not have a positive impact on people's lives.

However, there was a positive correlation between Foreign Direct Investment (LNFDI) and human development (LNHD), indicating that the influx of foreign direct investment positively affected the improvement of the Human Development Index. This is because foreign direct investment contributes to job creation, brings in more foreign currency, facilitates the transfer of technology, technical expertise, and skills to host countries. It also increases the supply of goods and services in the economy, potentially improving the balance of payments situation, boosting economic growth, and consequently reducing poverty.

As for the Trade Openness Index (LNOP), it exhibited a negative relationship with inclusive growth. Globalization did not bring significant gains to the poor due to the weak local production base, which turned these countries into mere suppliers of raw materials and markets for the products of advanced countries. This unequal opportunity to benefit from international trade led to a deterioration in their balance of payments and fluctuations in their returns due to the narrow production base, making globalization, represented by free international trade, a cause of poverty spread in low-income countries.

Regarding the Primary Education Enrollment Index (LNED), it showed a positive impact on development. This aligns with economic theory, as an increase in primary education enrollment enhances the opportunities for the poor to benefit from economic growth and improves the situation of vulnerable groups.

Similarly, the Broad Money Supply Index (LNM3), representing financial development in this study, demonstrated a positive role in reducing poverty. The results suggest that financial institutions in these countries provided the necessary financing for the poor to increase their productive assets, improve their income, and protect them from economic crises.

The independent variables collectively explain about 44% of the variance in the dependent variable, inclusive growth, as indicated by the R-squared value.

Thirdly: Conclusion and Recommendations

Conclusion

1. The study revealed a negative relationship between trade openness and inclusive growth. This suggests that the benefits of globalization may not have translated into significant gains for the West African countries included in the sample. This is attributed to weaknesses in the local production base, which may have reduced the positive effects of international trade, making these countries primarily suppliers of raw materials without achieving significant gains.
2. There is a positive impact of primary education enrollment and financial development on economic growth, indicating the importance of investing in human capital and strengthening the financial sector. The results align with economic theories emphasizing the role of education in enhancing opportunities for the poor and the positive contribution of financial institutions in poverty reduction and economic stability.
3. The study revealed a positive relationship between foreign direct investment and human development. Foreign direct investment is seen as a catalyst for employment, technology transfer, and comprehensive economic growth. The results indicate that increasing foreign direct investment can contribute to improving the Human Development Index, reflecting positive outcomes in terms of employment, technological advancement, and overall economic welfare for the population.
4. Despite the positive indications, the total capital formation did not show statistical significance regarding human development. The study suggests that investments in capital formation may be associated with aspects of financial corruption, raising questions about the effectiveness of these investments in positively impacting people's lives.
5. The positive role of financial development, as indicated by the broad money supply index, suggests that well-functioning financial institutions play a crucial role in poverty reduction. Financial institutions that provide necessary financing for the poor can enhance their productivity, improve their income, and protect them during economic crises.
6. The collective independent variables explain about 44% of the variance in inclusive growth, highlighting the multifaceted nature of economic development. While the identified determinants contribute significantly, other unexplored variables may also play roles in shaping economic growth in West African countries.

Recommendations

1. Given the positive impact of primary education enrollment on inclusive growth, policymakers should prioritize investment in education. Enhancing educational opportunities may contribute to long-term economic development, empower vulnerable groups, and reduce poverty.
2. The negative relationship between trade openness and overall growth indicates the need for a careful approach to globalization. Policymakers should focus on diversifying the production base, ensuring fair trade practices, and creating policies that distribute the benefits of international trade more equitably.
3. Policymakers should persist in the promotion of FDI inflows; it has been argued to have long-standing, positive impact on employment, technology transfer, and growth. It can be concluded that establishing conditions that encourage FDI and ensuring that the policies enhancing its benefits are at their optimal level can facilitate inclusive development.
4. Therefore, while total capital formation does not seem to exert significant pressure on the achievement of the HDI, a few worrisome issues arise: Financial corruption. Government and other welfare institutions should encourage transparency and efficiency in investment and provide mechanisms of detecting and preventing corruption in financial processes.
5. This positive and ambiguous relation of financial development with poverty reduction also suggest that a sound financial system is crucial. The policy makers should direct their efforts towards policies that encourage people to have access to credit, and such other financial services, which can provide a sound financial base for economic development and eradicating poverty.
6. Although the above mentioned determinants help in explaining a good deal of the variation on inclusive growth, there is still scope for further research to investigate other potential determinants that might also impact on economic development in the West African region. Knowledge of these can prove helpful to achieve the overall goal and also give a clue to policy makers on where to focus.
7. It is therefore important that government policy

formulates sound mechanisms for monitoring and evaluation with a view of evaluating the efficiency of policies that seek to unlock the growth of the economy. This will allow for constant monitoring and necessary amendments to be made so as to foster sustainable development in recognition of the achievement of the set development goals.

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