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THE IMPACT OF MICROECONOMIC VARIABLES ON SUSTAINABLE INFRASTRUCTURE DEVELOPMENT IN NIGERIA

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Abstract:

The link between microeconomic variables and infrastructure development is central in determining the pace and sustainability of national growth and development, especially in times of economic volatility. This study examines the impact of key microeconomic variables, such as interest rates, inflation, exchange rates, and employment levels, on infrastructure development in Nigeria. A sample size of 150 respondents, comprising experts in the financial sector, policymakers, professionals in the construction industry, and economists, were selected to provide a comprehensive view on the subject. Methods used for data collection included a mix of surveys, interviews, and analysis of basic economic indicators. The study employs multiple regression analysis to assess the relationship between these variables and infrastructure outcomes, while qualitative data, on the other hand, was analyzed using thematic analysis methods. This involves identifying, analyzing, and reporting patterns (themes) within the data. Findings reveals a significant correlation between microeconomic instability, such as high inflation and fluctuating exchange rates, and delays or cost overruns in infrastructure project development. Conclusively, the study highlights the need for adaptive economic policies that consider microeconomic uncertainties to foster sustainable infrastructure development. The results provide a practicable insights for policymakers and investors aiming to mitigate the adverse effects of economic uncertainty on infrastructure development initiatives.

Keywords: Economic uncertainty, emerging economies, microeconomic factors, infrastructure development, sustainable infrastructure.

1.0 Introduction

Infrastructure development is the powerhouse of economic development and societal upliftment of a country, particularly in the emerging economies (Morphet, 2016). Infrastructure delivers critical services, generates industrialization and improves connectivity, and therefore raises the general level of living standards of a population (Calderón & Servén, 2010; Diana et al., 2020). Yet infrastructure sustainability is also determined by numerous economic elements, particularly microeconomics (interest rates, inflationary evolution, and employment levels). Taken together, these factors influences the supply of funds, the relative price of materials and labour, and the feasibility of infrastructure projects, separately as well as in combination (Agenor, 2012).

In emerging economies, where the supply of capital is often constrained and economic vagaries are more severe, microeconomic instability can hinder infrastructure expansion and development (Dabla-Norris et al., 2012). For example, high inflation rates raise construction cost and reduce the ability of public sector budgetary allocation, adversely affecting completion of public infrastructure projects on the scheduled time and within the budget allocation (Haque & Kim, 2020). It has also been noted that variations in interest rates can affect the availability of credit and, hence, public or private investment in infrastructure (Khan & Senhadji, 2001). Also, employment rates are directly related to the levels of government revenue and are necessary for financing large infrastructure projects (Baldwin & Dixon 2008). Despite the relevance of infrastructure to the economy, there is a lack of evidence in the study area on how exactly microeconomic factors affect the sustainability of infrastructure development, particularly in developing countries.

There are relatively few empirical studies that examined such determinants, as most of the studies have been concentrated on macroeconomic determinants such as trade and foreign direct investment (Tripathi et al., 2015; Fay et al., 2019). It would be important for developing economies that aspire to long-term economic and social development and stability to understand what role these micro economic factors play in the success or failure of infrastructure projects. The present study filled this identified gap by examining the influence of microeconomic variables such as interest rates, inflation, and employment on sustainable infrastructure development in emerging economies. The study presents a holistic information that will be useful to the policy makers and investors to address the existing microeconomic conditions of infrastructure projects so that resilience can be embedded into these projects. If applied, the results can

also offer valuable insights to ongoing academic discussions on development economics, and the practical decision-making process in developing countries.

2.0 LITERATURE REVIEW

Infrastructure projects as a concept has been various described by different authors, but at a converging point, it is referred to as the large-scale construction and development of essential physical systems and structures that support a community and the general economy of a nation. These projects include roads, bridges, airports, railways, and utilities, which are crucial for transportation, communication, and public services. They are typically funded and managed by the public sector, although private organizations may also be involved in smaller-scale projects (Bingham, et al. 2017; Watton, et al. 2023).

Hence, infrastructure project is the key driver of economic development and social progress, especially in developing nations, which are witnessing serious gaps in infrastructure projects. This study focuses on the impact of microeconomic indicators such as interest rates, inflation, exchange rates and employment on sustainable infrastructure development in Nigeria. Infrastructure is central to economic development, but there are still gaps in the literature on how various microeconomic variables influence infrastructure outcomes, especially in highly volatile and emerging markets. This section of the study reviewed the existing literature to elucidate the gap in literature and help to identify the direction in which economists and practitioners may explore microeconomic dynamics in sustainable infrastructure development.

2.1. Infrastructure Developments and Economic Growth

The correlation between infrastructure and economic growth and development has been largely discussed. For example, Calderón & Servén (2010) argued that investments on infrastructure are important sources of productivity growth and income inequality reduction in developing countries. Likewise, Lall (2007) had found that transport and communication infrastructural costs are the major determinants of regional growth in India. In addition, Pritchett (2021) maintains that the presence of good infrastructure makes way for economic specialization and trade which promotes sustained economic growth. Notwithstanding the generally agreed importance of infrastructure in economic development, the study found a massive infrastructure deficiency in the developing economies (including Nigeria), and not only in terms of resources but also in other important institutional deficiencies, which are impeding the quest for sustainable development (Antonio, 2008; Ulrich, 2010; World Bank, 2020).

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The contribution of infrastructure is largely recognized, especially in developing countries where capital resources are scarce. Estache & Wren-Lewis (2016) found that infrastructure spending can have substantial poverty-reducing effects by providing access to basic services like good transport, efficient electricity and clean water supply. However, such benefits, as we have seen from various past studies, are contingent on adequate finance, effective project execution and realistic economic stability. As a result, micro factors such as interest rates, inflation and employment rates are closely tied to the paths of any infrastructure project development.

2.2 Nexus between Microeconomic Variables and Infrastructure Growth

2.2.1 Interest Rates and Financing of Infrastructure Development

It is commonly recognized that the interest rates in the world directly affect the cost of borrowing incurred for agencies or governments that participate in the infrastructure development. Lombardelli et al. (2019) highlighted that high interest rate implies high investment cost of capital assessment. The negative result of the high cost of project financing is delayed projects or in some cases scrapping of the process. Akintoye & MacLeod (2022) in their study investigated the volatility of interest rate and its implication for the financing of infrastructure in developing economies, with focus on the rates of borrowing relative to those in developed economies. The study found that fluctuating interest rates often causes high project costs especially (PPP) projects which reduces the participation of the private sector.

Furthermore, infrastructure investments are usually based on long funding maturities, often sensitive to the interest rate variation. Thus, Chakraborty & Dabla-Norris (2020) suggest that, in an economy, low interest rates are more beneficial than "big ticket" infrastructure investments. That is because funding projects becomes cheaper, which means that all of those long-term projects are now possible. But the study also revealed that the impact of interest rate and infrastructure financing in emerging economies is somewhat complicated because of the underdeveloped nature of such economies' capital markets. Low interest rates do not necessarily lead to more investments in infrastructure due to institutional weaknesses and risk perception and low credit access (Yoshino et al., 2021).

2.2.2 Inflation and Infrastructure Cost Trends

Inflation is also another significant determinant of infrastructure development and that occurs in different ways; it has strong bearing on the construction cost of materials. Haque & Kim (2020) found that the higher the inflation rates, the more swiftly the purchasing power of public budgets depreciates, causing cost overruns, extensive delays in project implementation (Haque & Kim, 2020). Furthermore, Parajuli &

Shrestha (2021) found that unanticipated inflation-induced cost overruns are especially significant in emerging markets, where inflation is more volatile and there are limited public resources. About one third of infrastructure projects are characterized by cost escalations, threatening the projects' economic feasibility and their time for completion. Besides, inflation seem not to influence only the direct costs of construction but also the overall economic scenario within which infrastructure projects are developed (Ogunode, et al., 2024).

In Yoshino & Nakahigashi (2020) found that the inflation effect gives rise to the weakening of infrastructure investments by decreasing the real return on investment, which results in the unattractiveness of long term financing for the domestic and foreign investors as well. The cost of inflation is higher in emerging market economies that is induced by exogenous issues, such as fluctuations in commodity prices or currency devaluation.

2.2.3 Exchange Rate Uncertainty and Foreign Direct Investment

It is well reported in literature that the stability of the exchange rate is a crucial factor influencing infrastructure investment in most developing countries, especially in the case of projects using a high percentage of imported materials and components (Crowley & Lee, 2003). Nguyen et al. (2022) investigated the link between exchange rate volatility and infrastructure investment. The research discovered that exchange rate volatility results in high cost of imported goods and services, thus inadvertently prompting budget recycling, which sometimes get projects delayed. This phenomenon was also noted by the study as particularly characteristic for economies which lacks productive ability at local level and where infrastructure is almost entirely relied on imports.

Furthermore, Asiedu & Lien (2020) found that risks associated with exchange rate discourage foreign direct investment in infrastructure projects. The study also explored how exchange rate volatility affects foreign direct investment (FDI) in infrastructure, and it was revealed that the value of fluctuating currency increases the risk for foreign investment, especially when it involves long-term projects. Their study also revealed that foreign investors are more likely to avoid markets with high risk of exchange rate, which limits the inflow of capital needed for infrastructure development. This scenario underscores the need for those saddled with the responsibility of making policies to take steps in stabilizing exchange rates in order to attract and retain foreign investors who are interested in investing in critical infrastructure projects.

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2.2.4 Level of Employment and Infrastructure Development

The level of employment in any given economy has a dual relationship with infrastructure development. Firstly, infrastructure projects create huge employment opportunities, particularly in the construction and engineering sectors of a given economy. Hence, Higginbotham & Papanikolaou (2021) recognized that the establishment of large-scale infrastructure projects in developing countries results in substantial job creation, which goes a long way to contribute to overall poverty reduction and economic growth.

The second is the availability of an available skilled workforce and a reliable level of employment that is vital for the timely and economic delivery of infrastructure projects. Additionally, Rustom & Assar (2006), observed that employment trend would affect the revenue base of the governments; that is, the capacity to finance basic infrastructure projects. Baldwin & Dixon (2008) note that full employment is a great opportunity for governments at any level to generate more taxes and use those taxes for re-investment in the basic infrastructure in a country. However, they also informed that high unemployment can have the effect of diminishing governments' fiscal capacity to invest in new operating projects or to maintain the existing capital stock. This leads to the conclusion that the employment level is important both to the demand for and supply of infrastructure and it's financing.

2.3. Sustainability and Infrastructure Development

Activities on sustainable infrastructure is attracting the interest of policy-makers, researchers, and investors. According to Griggs et al. (2013), the sustainable infrastructure is not only a big factor in a nation's economic development, but also addresses the environmental and social issues which enables fair distribution of development in a sustainable manner. The research also found that for developing economies (which have a high degree of environmental depletion and social inequity) sustainable infrastructure is not a future demand but rather a necessity that must be attained.

Similarly, Lindfield (2021) emphasized the need to incorporate environmental, social and governance (ESG) factors into the planning and implementation of sustainable infrastructure. This ensures that infrastructure projects are climate-resilient, inclusive, and financially-sustainable in the long term. While sustainability is well recognized, less research is available that focuses on microeconomic variables like interest rates, inflation or employment rates on the sustainability of infrastructure projects.

Studies in the literature have mainly covered macroeconomic determinants of sustainability, such as financial policy and international development aid without consideration of the impact of interest rates,

inflation and employment on sustainable infrastructure (Willetts et al., 2010; Fay et al., 2019; Nguyen et al., 2022). For example, in the context of enhancing the quality of infrastructure provision, recent research emphasizes the importance of infrastructure in contributing to economic progress and quality of life, particularly in developing countries.

However, the evident role that the microeconomic factors of interest rates, inflation, the exchange rate and the level of employment play in sustainable infrastructure development is both poorly understood and hardly exploited. Past studies largely emphasized the effect of these drivers on financing or costs of projects and FDI; however, more investigation of their long-term effects on sustainability is still required.

Addressing this identified gap in study, this current study will provide valuable insights for those saddled with policy formulation, investors in infrastructure, and researchers who are seeking to foster resilient and sustainable infrastructure development, particularly in emerging economies. These lessons and knowledge gained will be critical for overcoming the challenges caused by economic instability.

3.0 RESEARCH METHODOLOGY

This study employs a mixed-method approach, which integrates both quantitative and qualitative data collection and analysis methods to examine the impact of microeconomic variables such as interest rates, inflation rates, exchange rates, and employment levels on sustainable infrastructure development in developing countries.

The primary aim is to present a clear perspective that combines empirical data analysis with contextual understandings from stakeholders. Likewise, the methodology employed is designed to explain the complexity of infrastructure development processes and the influence of the microeconomic variables in the evolving economies. This study adopts a cross-sectional method of research design. This allows for the analysis of data at a specific point in time across various developing sectors. This design is considered suitable because it allows the study to give a logical evaluation of current trends in microeconomic factors and their influence on infrastructure development.

The idea for this methodology is to state the statistical relations between the variables and the notions of the stakeholders, working on infrastructures. A mixed-method approach is employed to incorporate both the generalized quantitative information and the in-depth qualitative context. This approach is considered to be satisfactory in dealing with the intricacies of the microeconomic factors affecting the long-term viability of infrastructure projects.

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Secondary data was compiled for quantitative analysis of the general trends. In this study, interest rates, inflation rates, exchange rate volatility, and employment were sourced from internationally recognized databases such as the World Bank, International Monetary Fund (IMF), Organization for Economic Co-operation and Development as well as national statistical offices. The period between 2013 and 2023 covers a period long enough for observing changes of microeconomic variables and their effect on infrastructure.

The outcome measure is the sustainable infrastructure development and was measured with sub-indicators containing infrastructure expenditure, project completion and sustainability standard compliance. And the independent variables are interest rates, inflation, volatility of exchange rates and employment levels. In addition to quantitative data, qualitative data was gathered with infrastructure development stakeholders using semi-structured interviews. Like government officials (infrastructure planners and financiers of infrastructure), private sector investors (executives from private companies connected to public private partnerships (PPPs) for infrastructure) and financial institutions (executives from development banks, and private financiers of infrastructure) and project managers and engineers (practitioners working on infrastructure projects in the emerging markets).

The interviews added deeper context on how these microeconomic factors impact on decision-making space, risk management strategies, and implemented infrastructure projects on the ground. The interview guide also contained questions on challenges regarding the variability of interest rates, inflation rates, and foreign exchange risk, and how these risks were being managed.

The research purposively selected six areas in Nigeria which is a developing economy. The sample was proportionally obtained from the 6 geopolitical zones of Nigeria (South East, South West, South-South, North East, North West and North Central). We chose these zones on the basis of (i) ongoing development investments, (ii) microeconomic instability, and (iii) available data. Regarding qualitative data, however, the study implemented purposeful sampling to choose 30 stakeholders from the sampled zones. These actors were selected for their direct engagement in infrastructure planning, funding or delivery. This sampling strategy guaranteed a broad dispersion of views that gave us overall perspectives of the different stakeholders, from decision makers to financers and project developers, allowing the achievement of an overall picture of elements affecting infrastructure development in these regions.

The quantitative data was analyzed using the multiple regression analysis method. This approach allows an examination of the relationship between the independent microeconomic variables, including interest rates, inflation rates, exchange rate volatility, and employment levels, and the dependent variable, which is sustainable infrastructure development. The regression analysis helped in determining the significance and strength of these relationships, revealing which variables have the most pronounced impact on infrastructure development outcomes.

The numerical data was analysed by the method of multivariate regression analysis. This method permits analysis relationship between the in dependent micro economic variables such as interest rate, inflation r ate, volatility of the exchange rate, and employment, and the dependent variable sustainable infrastructure development. The regression analysis assisted in assessing the significance and strength of these relationships, such that the extent to which different variables most influence (contribute to) infrastructure development outcomes.

Data were also analyzed using SPSS. Diagnostic tests were conducted to check that the regression model is adequate (linearity, normality, homoscedasticity). The qualitative data was derived from interviews and analyzed following thematic analysis techniques. This was in terms of identifying, examining and reporting patterns (themes) in data. Thematic analysis is appropriate for exploring the perceptions of respondents about how the micro-economic factors affect infrastructure development, as well as the difficulties they confront in controlling the volatility of the economy. The findings presented were empirical, as to the influence of microeconomic variables on sustainability of infrastructure projects in Nigeria using SPSS. Diagnostic tests were performed to ensure that the regression model meets the assumptions of linearity, normality, and homoscedasticity.

The qualitative data, on the other hand, was obtained from interviews and analyzed using thematic analysis methods. This involves identifying, analyzing, and reporting patterns (themes) within the data. Thematic analysis is suitable for understanding how stakeholders perceive the impact of microeconomic variables on infrastructure development and the challenges they encounter in managing economic volatility. The results provided empirical evidence on how microeconomic variables influence the sustainability of infrastructure projects in Nigeria.

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4.0 RESULTS AND DISCUSSIONS

Quantitative and Qualitative Data Analysis on the Impact of Microeconomic Variables on Sustainable Infrastructure Development in Nigeria

This section of the study presents the findings of the study in the light of the research methodology as indicated. It employs field data to show how microeconomic variables like interest rate, inflation, exchange rate variability, among others, influence interest level, level of employment and sustainable infrastructure in Nigeria.

4.1 Quantitative Data Analysis

The summary statistics of the variables across the 6 geopolitical zones in Nigeria are as presented in Table 1. The results present a summary of the variability found in the data over the zones selected. For instance, variability of the exchange rate fluctuation from 6% up to 17% means there is a very large spread among the above selected economies.

Table 1: Microeconomic variables and sustainable infrastructure development in Nigeria.

Variable	Mean	Std. Dev.	Min	Max
Interest rate (%)	6.25	1.75	4.00	9.50
Inflation rate (%)	7.80	2.20	4.50	12.30
Exchange rate volatility (%)	10.50	3.50	6.00	17.00
Employment rate (%)	68.00	4.50	60.00	75.00
Infrastructure spending (% of GDP)	5.50	1.50	3.00	8.50
Project sustainability score (1-100)	75.00	10.00	55.00	90.00

Source: Author's field survey (2025)

Also, Pearson's correlation coefficients between the microeconomic variables and infrastructure development outcomes, infrastructure expenditure, and the sustainability score of infrastructure projects are identified and reported in Table 2. Correlation is negative with both infrastructure expenditure at –0.65 and sustainability score of –0.50. It means higher rates discourage investment in infrastructure and sustainability. As for the rate of inflation, there is only a moderate negative correlation between it at (−0.58) and sustainability score (−0.35) and suggests that inflation puts pressure for infrastructure investment to become more expensive and less sustainable. Similarly, with regard to exchange rate risk, the analysis yielded a very strong negative relationship with infrastructure spend (-0.48) and sustainability score (-0.60), suggesting exchange rate risk may severely impair funding and long-term deliverability of infrastructure initiatives.

Lastly, at the employment level correlation study showed positive relationships with infrastructure spending at 0.50 and sustainability score at 0.55, which means that an increase in employment rates will drive infrastructure investment and sustainability performance of the project in an economy.

Table 2: Pearson correlation coefficients between the microeconomic variables and outcomes for infrastructure development.

Variable	Interest Rate	Inflation Rate	Exchange Rate Volatility	Employment Rate	Infrastructure Spending	Sustainability Score
Interest Rate	1.00	0.45	0.38	-0.30	-0.65	-0.50
Inflation Rate	0.45	1.00	0.55	-0.40	-0.58	-0.35
Exchange Rate Volatility	0.38	0.55	1.00	-0.42	-0.48	-0.60
Employment Rate	-0.30	-0.40	-0.42	1.00	0.50	0.55
Infrastructure Spending (% of GDP)	-0.65	-0.58	-0.48	0.50	1.00	0.70
Project Sustainability Score	-0.50	-0.35	-0.60	0.55	0.70	1.00

Source: Author's field survey (2025)

Regression Analysis

A multiple regression model was used to predict the dependent variable – the sustainability score - from the independent variables, whose result is in Table 3.

Regression Model:

Where Sustainability Score is the dependent variable, β0 is a constant coefficient and ϵ is a random error variable.

Sustainability Score=β¯0+β¯1(Interest Rate)+β¯2(Inflation Rate)+β¯3(Exchange Rate Volatility)+β¯4(Employment Rate)+ϵ¯Sustainability Score=β¯0+β¯1(Interest Rate)+β¯2(Inflation Rate)+β¯3(Exchange Rate Volatility)+β¯4(Employment Rate)+ϵ¯Sustainability Score=β0+β1(Interest Rate)+β2(Inflation Rate)+β3(Exchange Rate Volatility)+β4(Employment Rate)+ϵSustainability Score=β0+β1(Interest Rate)+β2(Inflation Rate)+β3(Exchange Rate Volatility)+β4(Employment Rate)+ϵ Result Table An output of the analysis was: R-squared = 0.72, Adjusted R-squared = 0.68, and F-statistic = 18.50 ($p<0.001$).

More discussion on the results of the effects of microeconomic (micro-economic) variables on sustainable infrastructure development is presented:

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(1) On Interest Rate, the finding indicates that every one percent increase in the interest rate, the sustainable score for infrastructure projects decreases by 2.50 points, holding other factors constant. The negative and significant ($p = 0.005$) relationship is an indication of the fact that high interest rates are inversely related to the economic sustainability of infrastructure projects. (2) On the Inflation Rate, the finding reveals that 1% increase in inflation leads to sustainability score going down by also 1 point. 20 points ($p = 0.048$). This indicates that the cost of material and labour inflated that leads to lower one to invest in infrastructure project in a longer run.

(3) On the part of exchange rate volatility, a significant negative effect ($\beta = -3.00$, $p = 0.002$) on sustainability scores implies that fluctuations in exchange rates make infrastructure projects more vulnerable to cost overruns, particularly in countries such as Nigeria that rely on foreign financing of infrastructure projects.

(4) On employment rate, it shows a positive coefficient ($\beta = 1.50$, $p = 0.007$) suggesting that higher employment rates are directly associated with better sustainability outcomes.

Table 3: Regression Output

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
Constant	55.00	7.50	7.33	< 0.001
Interest Rate (%)	-2.50	0.80	-3.13	0.005
Inflation Rate (%)	-1.20	0.60	-2.00	0.048
Exchange Rate Volatility (%)	-3.00	0.90	-3.33	0.002
Employment Rate (%)	1.50	0.50	3.00	0.007

Source: Author's field survey (2025)

4.2. Qualitative Data Analysis

The qualitative data for this study were analyzed using a thematic analysis approach. In doing this, semi-structured interviews were conducted with stakeholders (such as government officials, private investors, and financial institutions) who were involved in infrastructure development. Listed below are the key themes identified and carefully interpreted.

Table 4: Thematic analysis of microeconomic factors influencing sustainable infrastructure projects

SN	Microeconomic factors	Result from respondents
1	Interest Rate Sensitivity	Most of the respondents stressed that rising interest rates have significantly discouraged both public and private sector investment in long-term infrastructure projects, particularly in those key sectors that requires huge capital investment, such as energy, communication and transportation.
2	Inflation and Cost Overruns	Inflation has been frequently cited as a significant factor leading to cost overruns and project delays according to the studies of Haque & Kim, 2020; Parajuli & Shrestha, 2021. The respondent stakeholders mentioned that inflationary pressures on the cost of materials, labour, and importation, adversely affect the financial planning of infrastructure development projects.
3	Currency Volatility Risks	Exchange rate volatility was identified as a critical risk for projects that depend on foreign loans or international contractors. Respondents agreed that currency depreciation often leads to an increase in debt servicing costs, affecting the overall sustainability of infrastructure projects.
4	Employment and Local Capacity	Those interviewed stressed that higher employment rates improve the local capacity for infrastructure projects. In particular, local labour forces reduce the dependency on expensive foreign expertise, thereby promoting more sustainable and cost-effective project implementation.

Source: Author's field survey (2025)

The results indicate that adverse microeconomic effects – in terms of interest rates, inflation, and exchange rate instability – tend to inhibit the progress of sustainable infrastructure development, while higher employment rates tend to lead to better performance outcomes in terms of sustainability. These results supports other past studies, emphasizing that sustained economic stability is essential to secure the success of long-term infrastructure investments. Findings from regressive and thematic analysis with respect to these variables provide a holistic idea of the influence and interplay among these variables on infrastructure projects in emerging economies.

5.0 CONCLUSION

The research analyzes the effect of microeconomic variables (interest rate, inflation rate, exchange rate volatility and employment trend) on sustainable infrastructure development in emerging economies using Nigeria as a case study. Results are given with a mixed-method study approach of quantitative data analysis and qualitative insights from relevant actors of the infrastructure industry. The quantitative results indicate a coarsely negative correlation between the interest rates and infrastructure spending as well as the sustainability scores: higher interest rates make it hard to supply spendable financing and thus severely

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restrict sustainable investment in the infrastructure projects. Similarly, inflation is harmful to infrastructure growth. Rising inflation causes increases in the cost of both materials and labour, extending project completion dates, inflating project costs, and reducing its financial feasibility.

The regression results indicate that even a slight increase in inflation has a detrimental effect on sustainability. The research equally considered exchange rate volatility that is one of the most destabilizing microeconomic factors in all economies. This is especially apparent when it comes to funded projects, particularly those funded by foreign loans." The result indicates a negative relationship between volatility of exchange rates and sustainability of infrastructure, which suggests that exchange rates volatilities are serious challenge in efficient control and management of cost. Moreover, on job levels, the research found a positive association with job levels and sustainable infrastructure welfare. That is, evidence that more jobs equals more local capacity, less reliance on foreigner workers and more local investment. All these go a long way in sustaining infrastructure projects."

In terms of qualitative understandings, interviews with stakeholders supported the quantitative findings of the research. It discusses the difficulties that arise from the effect of microeconomic factors on the development of sustainable infrastructure, the effect of a rise in interest rates on the financing of projects and the role that local employment has on the development of sustainable infrastructure. Respondents were also keen to see better risk management solutions that can deliver protection against inflation and currency volatility in infrastructure investing.

On a broader note, the empirical findings indicate that microeconomic variables have a considerable impact on the sustainability and viability of infrastructure development, in an emerging economy. The findings confirm that the returns to infrastructure projects are highly susceptible to the costs overrun, funding shortages and maintenance sustainability due to high interest rate, inflation and exchange rate fluctuation. But higher local employment rates are something that contributes positively to sustainable infrastructure impacts by building local capacity and reducing external dependencies.

The study contributes to the body of knowledge by addressing the microeconomic determinants of infrastructure sustainability in emerging economies. It offers practical applications for policymakers, project financiers and project managers, and stresses that risk management mechanisms and appropriate macroeconomic stabilization policies are required to cushion the impact of these factors. Facing these and

other challenges, emerging countries such as Nigeria can use infrastructure development as a fulcrum for achieving sustainable economic growth and long-term national development.

6.0 RECOMMENDATIONS

The study offers the following key recommendation:

(i) Governments and financing institutions in emerging nations like Nigeria are advised to look at alternative financing options such as long-term, fixed rate infrastructure bonds or low interest loans in order to minimize the negative impact of interest rate risk on infrastructure investment.

(ii) Public-private partnerships (PPPs) should be properly structured and strengthened to hedge against interest rate fluctuations.

(iii) Policy makers need to develop and effectively implement policies, such as macroeconomic stability policies, to ensure that infrastructure project costs are predictable and manageable.

(iv) All infrastructure contracts should contain clauses that shield cost escalations for inflation to prevent the stoppage or failure of ongoing projects.

(v) Governments and international financial institutions are advised to collaborate towards developing hedging instruments in the nature of funding for infrastructure projects that are exposed to exchange rate risk.

(vi) Also, diversifying the funding sources, as well as facilitating project finance using local currencies, are key to mitigating currency risks.

(vii) Further, it is recommended that policies that will encourage the employment of local labour forces and skills acquisition should be promoted as this would enhance the execution of projects and ensure long-term economic and infrastructure sustainability..

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