MACRO ECONOMICS VARIABLES AND STOCK MARKET PERFORMANCE IN NIGERIA

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DEPARTMENT OF FINANCE

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DECLARATION

I, **Precious AIGBEKEAN** do hereby declare that this project is entirely my work and composition. The work embodied in this project has not been submitted by another candidate for any degree and is not currently being submitted for any other degree. All references made to the works of other persons have been duly acknowledged.

Precious AIGBEKEAN	**DATE**
(DECLARANT)	

CERTIFICATION

We, the undersigned certify that this research work was submitted by **Precious AIGBEKEAN** and it is hereby approved for the partial fulfilment of the requirement for the award of Bachelor of Science (B.Sc.) degree in Finance, University of Benin, Benin City.

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DEDICATION

This project work is dedicated to Almighty God for his guidance during my undergraduate programme.

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Abstract

This study investigated the impact of key macroeconomic variables on stock market performance in Nigeria over the period 1990 to 2023. Specifically, the study examines the influence of inflation rate, unemployment rate, GDP growth, interest rate, exchange rate, and crude oil prices on stock market capitalization, which serves as a proxy for market performance. Employing the Fully Modified Ordinary Least Squares (FMOLS) technique well-suited for addressing cointegration and correcting for endogeneity and serial correlation, the study found that inflation has a positive and statistically significant effect on stock market performance, while unemployment exerts a significant negative impact. In contrast, GDP growth, interest rate, exchange rate, and crude oil price exhibit statistically insignificant effects. These results suggest that while some macroeconomic indicators directly influence market performance, others may be mediated through structural and institutional factors. The study recommended targeted inflation control, employment generation, economic diversification, and coordinated macroeconomic policy reforms to strengthen the responsiveness of Nigeria's stock market to economic fundamentals.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The Nigerian stock market, represented by the Nigerian Exchange Group (NGX), plays a critical role in the nation's economic landscape, providing a platform for companies to raise capital while offering investors opportunities for portfolio diversification. The NGX has experienced considerable growth over the years, with its market capitalization crossing the N70 trillion mark in May, 2025 (Sylva, 2025). Despite this growth, the Nigerian stock market remains highly volatile, influenced by both internal and external macroeconomic variables. Stock market performance, defined as the returns generated from stock investments over a specific period, serves as a key indicator of economic health. In Nigeria, this performance is profoundly shaped by macroeconomic factors such as inflation, interest rates, exchange rates, and GDP growth, in addition to company fundamentals and investor sentiment (Agboola & Yusuf, 2021). Historical episodes, such as the financial crises of the late 2000s and the COVID-19 pandemic in 2020, have demonstrated how macroeconomic shocks can trigger severe downturns in the Nigerian stock market. These events further highlight the market's sensitivity to macro-level dynamics (Aderemi, Adamu, & Olatunji, 2022).

Essentially, stock market performance plays a pivotal role in assessing the attractiveness of Nigeria’s capital market to both domestic and international investors. Robust performance typically signals favorable macroeconomic conditions, including stable inflation and steady GDP

growth, which enhance investor confidence and promote long-term investment. On the other hand, economic instability, often reflected in fluctuating exchange rates, rising inflation, or policy uncertainty, can precipitate bearish market trends and capital flight (Umar, Mustapha, & Musa, 2023). The interconnectedness of macroeconomic variables and stock market performance is particularly evident in key sectors such as banking and telecommunications, which dominate the NGX in terms of market capitalization. For instance, during the 2008–2009 global financial crisis, the Nigerian banking sector experienced massive devaluations as a result of tight monetary conditions and declining investor confidence (Igoni, Ogiri, & Orlu, 2020).

Macroeconomic factors are broadly defined as systemic indicators that shape national economic performance, including inflation, interest rates, GDP growth, unemployment, crude oil prices, and exchange rates (Babatunde & Akinwale, 2023). These variables have increasingly influenced Nigeria's stock market due to the globalization of financial systems and the country's growing integration into international capital markets. Historical economic reforms, particularly the Structural Adjustment Program (SAP) introduced in 1986, signified a paradigm shift in Nigeria's economic management. The SAP focused on deregulation, privatization, and financial liberalization. It aimed to realign macroeconomic fundamentals, and its aftermath underscored the importance of managing macroeconomic variables to ensure market resilience and investor trust (Alabi, Okafor, & Adegboye, 2023). Post-SAP developments, such as the establishment of autonomous foreign exchange markets and monetary policy reforms, further integrated the stock market with broader macroeconomic policies.

Macroeconomic factors can significantly impact both the Nigerian economy and the performance of its stock market. Empirical evidence suggests that high inflation tends to depress stock returns by diminishing real investment value and increasing production costs for listed firms (Onyeiwu & Okeke, 2022). Crude oil price volatility, especially relevant given Nigeria's status as a major oil exporter, has also been linked to swings in stock market indices. This is because government revenues and foreign exchange reserves are closely tied to oil earnings. Moreover, interest rate hikes, often used to combat inflation, typically reduce stock valuations by increasing the cost of capital and lowering consumer spending (Eze, Nwankwo, & Okorie, 2022). Exchange rate fluctuations likewise affect foreign investor sentiment and domestic purchasing power, thereby influencing stock demand. In contrast, periods of stable GDP growth have historically aligned with bullish stock trends. For example, in the early 2000s, Nigeria experienced sustained growth rates averaging 6 to 7 percent annually, which corresponded with increased stock market participation and rising capitalization (Oshadami, Olowookere, & Akinyele, 2023). Considering this background, this study aims to examine the effects of selected macroeconomic variables on stock market performance in Nigeria.

1.2 Statement of the Research Problem

The relationship between macro-economic factors and stock market performance in Nigeria remains a crucial area of research due to the volatility and complexity of the country's financial markets. Macro-economic factors such as inflation, interest rates, exchange rates, and money supply play a pivotal role in shaping stock market performance, but the nature of these

relationships is still inconclusive. While some studies suggest that favourable macro-economic conditions lead to positive stock market performance (Parab & Reddy, 2020; Aremo, Olabisi, & Adeboye, 2020), others report negative impacts (Temuhale & Achugbu, 2019; Odiche & Udeorah, 2020), creating uncertainty for investors and policymakers. The inconsistency in these findings suggests the need for further exploration, especially in light of the structural and market-specific characteristics of the Nigerian economy.

Prior research has extensively examined the relationship between selected macro-economic factors and stock market performance in Nigeria. For instance, studies by Odiche and Udeorah (2020), Ayuba, Balago, and Dagwom (2018), and Majeed (2022) report a positive relationship between factors like money supply and stock market performance, implying that increased liquidity fosters market growth. On the contrary, studies by Ali, Nzotta, Akujuobi, and Nwaimo (2020), Aremo et al. (2020), and Temuhale and Achugbu (2019) find negative relationships, particularly with inflation and exchange rates, suggesting that macro-economic instability undermines investor confidence and market performance. These contrasting results highlight the complex interplay between economic indicators and stock market dynamics, underscoring the need for additional studies to resolve these inconsistencies. Furthermore, the above studies focus on conventional macro-economic factors like inflation, interest rates, and exchange rates, while factors such as unemployment and crude oil prices remain underexplored.

Methodologically, there are significant gaps in previous research on stock market performance and macro-economic factors in Nigeria. Many studies, such as those by Ali et al. (2020) and

Ayuba et al. (2018), rely on GARCH models and ordinary least squares (OLS), both of which have limitations in handling long-run relationships and structural breaks. FMOLS (fully modified ordinary least squares), on the other hand, provides superior efficacy by addressing long-run dynamics and mitigating the shortcomings of OLS, yet its use remains limited in the Nigerian context. Moreover, existing FMOLS-based studies focus on outdated time frames, such as 1985–2014 (Ahmad et al., 2015; Aremo et al., 2020) and 1986–2019 (Temuhale & Achugbu, 2019; Odiche & Udeorah, 2020). To address this gap, the present study will employ the FMOLS model over an expanded period from 1990 to 2023, ensuring a more comprehensive analysis of the current macro-economic landscape and stock market interactions in Nigeria.

1.3 Research Questions

Arising from the above research problem, the following research questions are raised:

i. How does the inflation rate affect stock market performance in Nigeria?
ii. What is the relationship between unemployment rate and stock market performance in Nigeria?
iii. How does GDP growth influence stock market performance in Nigeria?
iv. To what extent do crude oil prices impact stock market performance in Nigeria?
v. How does the interest rate affect stock market performance in Nigeria?
vi. What is the effect of exchange rate on stock market performance in Nigeria?

1.4 Research Objectives

The broad objective of this study is to examine selected macroeconomic variables and stock market performance in Nigeria. Specifically, the study will:

i. examine the effect of the inflation rate on stock market performance in Nigeria;
ii. assess the relationship between unemployment rate and stock market performance in Nigeria;
iii. investigate the influence of GDP growth on stock market performance in Nigeria;
iv. determine the impact of crude oil prices on stock market performance in Nigeria;
v. analyze the effect of interest rates on stock market performance in Nigeria; and
vi. evaluate the effect of exchange rate on stock market performance in Nigeria.

1.5 Research Hypotheses

The following null hypotheses shall be tested:

H_{01}: The inflation rate has no significant effect on stock market performance in Nigeria.

H_{02}: There is no significant relationship between unemployment rate and stock market performance in Nigeria.

H_{03}: GDP growth has no significant influence on stock market performance in Nigeria.

H_{04}: Crude oil prices have no significant impact on stock market performance in Nigeria.

H_{05}: Interest rates have no significant effect on stock market performance in Nigeria.

H_{01}: Exchange rate have no significant effect on stock market performance in Nigeria.

1.6 Scope of the Study

This purpose of this study is to examine macroeconomic variables and stock market performance in Nigeria. Specifically, the study will establish the effect of inflation rate, unemployment rate, GDP growth, crude oil price, interest rate and exchange rate on stock market performance in Nigeria. The study will cover a time frame of 34years (1990-2023). The choice of this period is to ensure that the observations are adequate enough for conducting a longitudinal analysis, as well as ascertaining the long run effect of macroeconomic variables on stock market performance in Nigeria through the adoption of the FMOLS estimation technique. Moreover, the choice of the base year (1990) is to reflect those periods after the implementation of the structural adjustment programme (SAP) by the government, the occurrence of the 2008 global financial crisis and COVID-19.

1.7 Significance of the Study

This research study holds substantial significance for various stakeholders, offering insights that can aid in decision-making, policy formulation, and strategic planning.

Investors: For both institutional and individual investors, understanding how macroeconomic variables such as inflation, interest rates, and crude oil prices affect stock market performance is crucial for making informed investment decisions. Such knowledge enables investors to

anticipate market trends, optimize portfolio management, and mitigate risks associated with economic fluctuations.

Corporations and Business Leaders: Companies listed on the Nigerian Exchange Limited are directly affected by changes in stock market performance. Insights from this research can assist corporate executives in predicting market movements and aligning their strategic plans with broader economic trends. This can lead to more effective financial planning, better capital allocation, and enhanced shareholder value.

Financial Analysts and Economists: For analysts and economists, this research provides a foundation for developing models that forecast stock market performance based on key macroeconomic indicators. Such forecasts can be invaluable for providing advisory services, developing investment strategies, and conducting risk assessments for clients and institutions.

Government and Regulatory Bodies: For institutions like the Central Bank of Nigeria (CBN) and the Securities and Exchange Commission (SEC), this research offers critical insights into how monetary and fiscal policies influence the stock market. It aids in the creation of policies that enhance market stability, promote economic growth, and foster a conducive environment for investment.

Foreign Investors: Nigeria's stock market is of interest to foreign investors seeking opportunities in emerging markets. This study can help foreign investors understand the risks and opportunities presented by the Nigerian market, particularly how economic variables like

exchange rates and crude oil prices affect returns. Such information can help them make better-informed decisions regarding foreign direct investment and portfolio management.

Public Sector and General Public: The broader public, including potential investors, can benefit from this research by gaining insights into how macroeconomic conditions impact their savings and investments. Additionally, understanding stock market dynamics can foster greater financial literacy and encourage more participation in capital markets, which is critical for national economic development.

Academic and Research Community: The study adds to the existing body of knowledge on the intersection of macroeconomics and financial markets, particularly within the Nigerian context. It offers a basis for further empirical studies, encouraging a deeper understanding of how external economic variables affect stock markets in emerging economies.

1.8 Limitation of the Study

A significant limitation of this study is the difficulty in obtaining consistent and reliable data covering 34 years for the seven macroeconomic variables—inflation rate, unemployment rate, GDP growth, crude oil price, interest rate, exchange rate, and stock market performance. In Nigeria, long-term data collection often faces challenges such as discrepancies between sources, missing data, and inconsistent reporting standards. To address this issue, the study relies on data from reputable institutions like the World Bank, Central Bank of Nigeria (CBN), and National Bureau of Statistics (NBS), ensuring standardized, accurate, and consistent data for analysis.

Another limitation involves the use of the FMOLS model which is limited to certain assumptions including homoscedasticity, absence of serial correlation, among others. These limitations can potentially affect the accuracy of the findings. To mitigate this, the study applies a series of diagnostic tests for serial correlation, heteroscedasticity, and model stability, ensuring the robustness and reliability of the FMOLS model and improving the validity of the results.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter conducts an in-depth examination of the literatures that are relevant and linked with the subject of this study. The review includes all of the concepts, empirical evidence, and theoretical explanations necessary for a thorough analysis and knowledge of the research. It gives an understanding of how other researchers view selected macroeconomic variables and stock market performance.

2.2 Conceptual Review

2.2.1 Concept of Stock Market

The stock market is an exchange system that deals in long-term securities (Jhingan, 2014). It provides businesses with fixed and working capital, as well as medium and long-term financing to federal, state, and local governments. As a result, the stock market includes the institutions and mechanisms that pool and make medium- and long-term funds available to corporate entities and governments. According to Donwa and Odia (2020), this is made possible by some critical roles played, such as channeling resources, promoting reforms to modernize the financial sectors, financial intermediation capacity to link the deficit to surplus sector of the economy, and a veritable tool in the mobilization and allocation of savings among competitive uses that are critical to the economy's growth and efficiency. Stock exchanges, in general, serve as both a primary and secondary market. It serves as a primary market because it allows governments,

business corporations or companies, municipalities, and other incorporated bodies to raise capital by channeling the financial savings of investors and potential investors into productive economic ventures. Similarly, it is a secondary market in the sense that investors can exchange their securities for cash. According to (Kapila, 2022), this reduces investment risk and aids in the preservation of liquidity.

Similarly, Caporale, Howells, and Soliman (2014) contend that the establishment of stock markets, as well as their efficient and effective management, are required if an economy is to maximize capital allocation efficiency. In contrast to banks, which only lend to well-established and relatively safe borrowers, stock markets in their most extreme form can finance risky, productive, and innovative investment projects (Caporale, et al., 2014). Fundamentally, stock markets can provide mechanisms for the liquid trading and pricing of a wide variety of financial instruments, allowing risk to be spread between capital raisers and investors and matching capital raisers' maturity preferences. This is typically a long-term endeavor, whereas the interests of investors are usually more immediate. In another sense, it encourages investment, which lowers the cost of capital and contributes to long-term economic growth (Caporale, et al., 2014; Kapila, 2022).

2.2.2 Stock Market Indices

Stock market indices are components or measures that show how the market's activities have increased or expanded. Increases in size and improvements in stock market elements such as market capitalization, total value of traded transactions, all share index, turnover ratio, market capitalization, ratio number of deals, total listed equity volume of transaction, total new issues,

total listing, market share index, listed securities can all be seen as indicators (Eneisik, Ogbonnaya & Onuoha, 2021).

2.2.2.1 Market Capitalization and All Share Index

Morrel (2007) opines that market capitalization is calculated by multiplying the market share price per share by the number of shares outstanding. Changes in share price and number of shares issued cause market capitalization to fluctuate. Investors use a company's market capitalization to determine the value of its shares. Domestic market shares, shares of foreign companies solely listed on stock exchanges, ordinary and preferred shares of domestic companies, and shares without voting rights are all included in the market cap value, according to Muchaonyerwa (2021).

Olson (2005) defines market capitalization as the price of a stock multiplied by the number of shares outstanding at any given time. For all companies listed on a given stock exchange, market capitalization is the sum of individual outstanding shares divided by their prices.

The All-Share Index is a set of statistical data that is calculated every year to track changes in the value of commodities and securities. The price of all or some market constituents is used to create the index, which is usually expressed as a percentage change from the base period. Indices are important indicators of an economy's or financial market's performance (Eneisik, Ogbonnaya & Onuoha, 2021).

2.2.2.2 Value of Transaction

The total value of transactions traded on the stock market exchange divided by the gross domestic product is the value of a transaction. It calculates the organized trading of firm equity

as a percentage of national output and should reflect economic liquidity. The transaction's total value adds to the market capitalization ratio (Popoola, Ejemeyovwi, Alege, Adu & Ademola, 2017). The values of a transaction, according to Raymond (2014), are the monetary amount of a transaction that may require the services of a certified or licensed appraiser to complete. Every stock listed on the exchange has a value traded that is a product of the stock's price and the volume of the stock traded that day. The total amount invested in the market for a given day, week, month, and year is calculated by adding the value of each stock that was traded on that day.

2.2.2.3 Market Turnover

Kenneth et al. (2019) noted that market turnover is defined as the total value of stock traded divided by the total market capitalization for a given period. Another way to determine how active or liquid a stock market is is to use this metric. Before deciding to invest in the stock market, portfolio investors and other investors consider how quickly or easily they can buy and sell securities when the need arises.

A stock market's turnover ratio is simply a measurement of how frequently stocks change hands. It's used to figure out how quickly stocks are turned into cash. A low turnover ratio tells potential investors that the stock price is unaffected by large, sudden purchases made as a result of the stock's abundance. A high turnover ratio indicates to the investor that an increase in purchases would have a significant impact on the stock due to the scarcity of data. While a higher ratio indicates greater stock demand, it also implies higher brokerage fees or transaction costs, which,

if uncontrolled, could reduce returns (Investopedia, 2013). A stock market's turnover ratio is determined by dividing the value traded by the market capitalization.

2.2.3 Macroeconomic Variables

Macroeconomic variables, commonly used in economic analyses to gauge the overall health and trends of an economy, have been defined in several ways by recent academic research. Broadly, macroeconomic variables represent measurable indicators that reflect economic performance, such as inflation rates, interest rates, gross domestic product (GDP), and exchange rates. According to Abakare (2019), these variables encapsulate the economic environment and provide insights into the broader economic forces that can influence individual and institutional behavior. Similarly, Okoro (2020) argues that macroeconomic variables serve as critical inputs for policymakers and investors to understand the economic landscape and predict future economic outcomes. Johnson (2021) expands this definition by emphasizing that macroeconomic variables are integral in understanding systemic risks within financial markets, as they often determine trends in aggregate demand and supply, impacting overall economic stability. These definitions collectively suggest that while the specifics may vary, macroeconomic variables are unified by their role in offering a quantitative representation of the economy's state and influencing decisions across both public and private sectors.

. In recent years, the Nigerian stock market has demonstrated high sensitivity to fluctuations in key macroeconomic indicators, with several studies illustrating a direct correlation between these variables and stock returns. For instance, research by Ijeoma and Godwin (2019) revealed that

inflation and interest rates significantly affect stock returns in Nigeria, where high inflation rates tend to erode purchasing power, subsequently decreasing investor confidence and lowering stock market performance. Similarly, Eze and Onyekachi (2020) found that exchange rate volatility has a profound impact on the Nigerian stock market, as currency depreciation can discourage foreign investments, thereby reducing market liquidity. This relationship was further corroborated by Adebayo (2021), who demonstrated that periods of economic instability, marked by fluctuating GDP growth rates, align with reduced investor activity and overall market downturns. These studies collectively suggest that macroeconomic variables are not merely background indicators but active determinants of stock market dynamics in Nigeria. Understanding these linkages is essential for investors and policymakers seeking to anticipate and mitigate risks within the Nigerian financial markets.

2.2.3.1 Inflation Rate

Inflation rate, a fundamental macroeconomic variable, has been extensively defined in recent literature, reflecting its complex impact on economic dynamics. According to Palley (2020), inflation rate is the sustained increase in the general price level of goods and services within an economy over a specific period, which leads to a decline in purchasing power. This definition aligns with the perspective of Taylor (2019), who posits that inflation is essentially a continuous upward adjustment in prices, primarily driven by demand-pull and cost-push factors. These perspectives emphasize the persistent nature of inflation rather than short-term price fluctuations, highlighting its prolonged impact on economic stability. Similarly, Baker (2021) describes

inflation as a macroeconomic condition where the aggregate price level rises persistently, often due to expansive monetary policies, supply shocks, or rising production costs. These definitions collectively underscore a common understanding of inflation as a prolonged, economy-wide phenomenon rather than isolated price hikes.

Asogwa and Amadi (2020) found that in the Nigerian context, rising inflation rates have an adverse effect on stock market returns, primarily because inflation erodes the real value of future cash flows from investments, thereby diminishing stock valuations. Similarly, Adebiyi (2021) argued that high inflation contributes to increased uncertainty in the market, leading investors to demand higher risk premiums, which further depresses stock prices. In contrast, some studies suggest that the impact of inflation on stock returns can vary depending on the sector; for example, Omodero (2022) found that while inflation negatively impacts most sectors, it can occasionally boost returns in sectors like commodities, where prices tend to rise alongside inflation. This nuanced relationship illustrates that while inflation generally hampers stock market performance in Nigeria, sectoral dynamics may occasionally moderate its impact. Given the persistent high inflation rates in Nigeria, the stock market remains highly sensitive to inflationary pressures, which poses challenges for portfolio diversification and long-term investment planning (Adediran & Siyanbola, 2023). Consequently, understanding inflation's impact on stock returns is crucial for Nigerian investors seeking to navigate inflationary cycles and mitigate risks effectively.

2.2.3.2 Unemployment Rate

The unemployment rate, a critical macroeconomic indicator, is commonly defined as the percentage of the labour force that is jobless but actively seeking employment (Blanchard, 2019). Various authors have nuanced this definition based on labour market dynamics and socio-economic factors. For instance, Banerjee and Bhattacharya (2020) underscore the importance of measuring not just joblessness but also the intensity and duration of the job search, as prolonged unemployment can have distinct socio-economic impacts. Similarly, Akerlof (2021) highlights the distinction between voluntary and involuntary unemployment, suggesting that individuals who are temporarily between jobs should be differentiated from those unable to find employment despite active efforts. This differentiation is also echoed by Jensen (2022), who introduces the concept of "structural unemployment," wherein joblessness results from a mismatch between the skills of the labour force and the demands of the labor market. Together, these definitions illustrate that the unemployment rate is not merely a measure of people without jobs, but a reflection of various factors such as labour market frictions, structural shifts in the economy, and individual job search behaviour.

Unemployment rate has a significant impact on stock market returns, as high unemployment tends to diminish consumer spending, reducing corporate revenues and thus investor confidence (Adeniyi, 2021). A study by Ojo and Ogunleye (2022) found that rising unemployment rates in Nigeria are often correlated with declining stock market performance, primarily because investors view high unemployment as an indicator of economic stagnation. Additionally,

Okonkwo (2023) highlights that Nigeria's high youth unemployment rate exacerbates this impact, as younger demographics represent a large consumer base whose spending power is curtailed by joblessness. This reduction in spending power directly affects the profitability of companies listed on the Nigerian Stock Exchange, leading to lower stock valuations. Furthermore, Emmanuel (2023) suggests that sustained high unemployment erodes business confidence, prompting companies to delay or reduce investment in growth initiatives, which further depresses stock prices. Thus, empirical evidence from Nigeria underscores that the unemployment rate is a crucial determinant of stock market returns, as it influences both consumer demand and corporate investment, making it a critical variable for investors in the Nigerian financial markets.

2.2.3.3 GDP Growth

Gross Domestic Product (GDP) growth, a critical macroeconomic indicator, reflects the overall economic performance and is widely used to assess a country's economic health. GDP growth is conventionally defined as the increase in the value of all goods and services produced within an economy over a specific period, often indicating the efficiency and productivity of a nation's economy (Gabaix & Koijen, 2021). According to Barro (2020), GDP growth is a measure that captures the rate of expansion in an economy, indicating the effectiveness of economic policies and external conditions. Similarly, Jones and Olken (2018) define GDP growth as a comparative metric that evaluates changes in the economic output of a country across different periods, often used to benchmark economic progress. Although definitions converge on the idea of economic

expansion, some scholars argue for a more nuanced understanding. For example, Acemoglu and Restrepo (2020) suggest that GDP growth should account not only for increases in output but also for qualitative improvements in technology, capital efficiency, and labor productivity. These perspectives highlight the multifaceted nature of GDP growth as both a quantitative and qualitative measure, integrating productivity gains and economic diversification.

Studies indicate that positive GDP growth in Nigeria is typically associated with enhanced stock market performance, as economic expansion boosts corporate profitability and, in turn, investor valuations (Okonkwo & Ujunwa, 2021). For instance, Ezeoha (2019) found that periods of GDP growth in Nigeria positively impacted stock market returns by attracting foreign direct investments and improving corporate earnings. Furthermore, Ogege and Mojekwu (2021) argue that GDP growth contributes to increased liquidity in financial markets, thereby promoting higher stock valuations and trading volumes. However, despite these positive correlations, the volatility of Nigeria's GDP due to oil price fluctuations and political instability sometimes weakens this relationship, as noted by Adewale and Olufemi (2022). This instability can lead to inconsistent investor confidence and speculative trading behavior, which may decouple stock market returns from GDP growth trends. Thus, while GDP growth generally supports stock market returns in Nigeria, the correlation is moderated by external factors, underscoring the complex relationship between macroeconomic stability and stock market performance.

2.2.3.4 Crude Oil Prices

Crude oil prices represent the monetary value per barrel of crude oil in international markets, a metric that is widely acknowledged to impact economic activity globally. Various authors have attempted to conceptualize crude oil prices with slight nuances in interpretation. According to Li and Zhou (2019), crude oil prices are determined through a dynamic interaction of supply and demand factors, including geopolitical tensions, production costs, and market speculation. Similarly, Xu and Li (2021) emphasize that oil prices are driven by both global economic conditions and oil-producing countries' policies, highlighting that prices fluctuate in response to factors such as OPEC decisions and technological advancements in extraction methods. This aligns with the perspective of Baffes and Kabundi (2020), who posit that oil prices are heavily influenced by macroeconomic indicators and the strategic reserves held by countries, which affect both short-term and long-term prices. These definitions converge on the understanding that crude oil prices are not static; they are subject to a complex array of influences that extend beyond mere supply and demand to include political and technological dimensions. Thus, crude oil prices can be seen as a barometer for global economic health, reflecting shifts in market dynamics and international relations (Li & Zhou, 2019; Xu & Li, 2021; Baffes & Kabundi, 2020).

Studies have empirically shown that fluctuations in crude oil prices have a profound effect on the Nigerian stock market. A rise in oil prices generally leads to increased revenue for the Nigerian government and oil-exporting firms, enhancing investor confidence and positively impacting

stock returns (Bello & Adekoya, 2021). Conversely, a decline in oil prices can lead to fiscal deficits and reduced public expenditure, which in turn dampens investor confidence and negatively affects stock performance (Ogiri & Ikenna, 2019). Furthermore, Balcilar and Ozdemir (2022) found that volatility in crude oil prices increases market uncertainty, leading to higher risk premiums and reduced stock returns in emerging markets like Nigeria. The sensitivity of Nigeria's stock market to oil price volatility underscores the importance of oil prices as a critical determinant of economic and financial stability in the country. These studies collectively highlight that for Nigeria, a nation with limited economic diversification, crude oil prices are intrinsically linked to stock market dynamics, reinforcing the notion that macroeconomic stability in oil-dependent economies is closely tied to global energy markets (Bello & Adekoya, 2021; Ogiri & Ikenna, 2019; Balcilar & Ozdemir, 2022).

2.2.3.5 Interest Rates

Interest rates, a fundamental macroeconomic variable, are defined in multiple ways, reflecting differing emphases on their role and impact within the economy. According to Mishkin (2018), interest rates represent the cost of borrowing or the opportunity cost of holding money, highlighting their dual role as a charge for credit and as a foregone return on alternative investments. This conceptualization aligns with Fama and French (2019), who define interest rates as the equilibrium price determined in financial markets where the demand for funds meets supply, encapsulating both the return on saved funds and the expense for borrowers. Similarly, Bernanke (2020) extends this view by describing interest rates as a tool for regulating economic

activity, influenced by central banks to stabilize prices and support growth. These definitions converge on the understanding that interest rates are crucial not only as a financial metric but also as a policy instrument with broad implications for economic stability.

Studies show that fluctuations in interest rates significantly affect investor sentiment and capital allocation in Nigerian financial markets. According to Adekoya and Oliyide (2021), rising interest rates generally lead to lower stock market returns as higher rates increase the cost of borrowing for firms, thereby compressing corporate profits and discouraging equity investment. Furthermore, Ezeani (2022) argues that elevated interest rates shift investor preference towards fixed-income securities, reducing demand for stocks and consequently dampening returns in the stock market. Research by Ogunmuyiwa and Awodipe (2020) similarly demonstrates that in Nigeria's context, where inflationary pressures are persistent, interest rate adjustments often induce volatility in stock prices, as investors respond to changes in monetary policy by reallocating their portfolios. Thus, the sensitivity of Nigerian stock market returns to interest rates underscores the broader influence of macroeconomic variables on financial markets, with implications for policy makers in managing interest rate policies to stabilize the stock market and foster economic growth.

2.2.3.6 Exchange Rate

The concept of exchange rate holds a central position in macroeconomic discussions, especially in the context of international finance and trade. Exchange rate, broadly defined as the value at which one country's currency can be exchanged for another's, has been described from varying

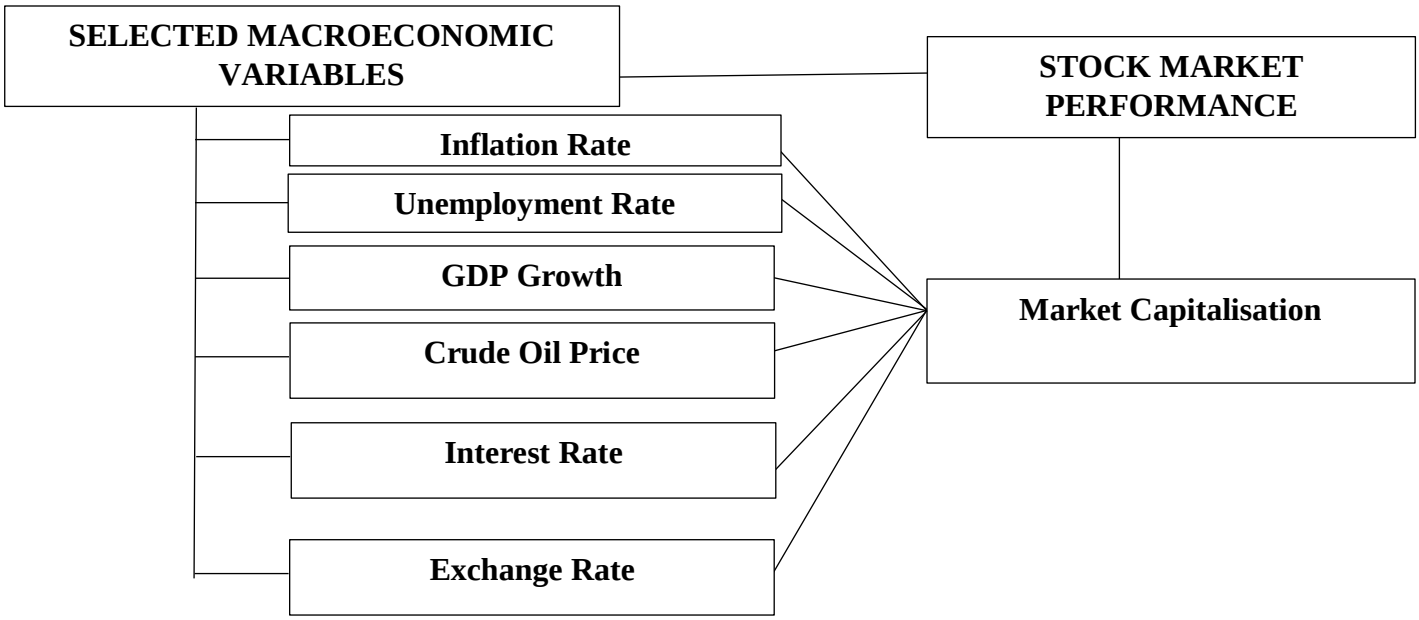
perspectives by different scholars. According to Mensi, Hammoudeh, and Nguyen (2021), exchange rate reflects the economic conditions of a country and can serve as a benchmark for international economic comparison. In a similar line, Gupta and Dhar (2018) view exchange rate as a mechanism that facilitates trade between countries, acting as an intermediary in determining the relative prices of goods and services in different economies. Meanwhile, Adebiyi and Bello (2019) offer a nuanced understanding by emphasizing the role of exchange rate in determining purchasing power parity and affecting cross-border investment flows. These definitions underscore the multifaceted nature of exchange rate, encompassing not only the transactional aspect of currency exchange but also its function in broader economic stability and competitiveness. A synthesis of these perspectives suggests that exchange rate acts as both a facilitator of international trade and a determinant of economic resilience, as it reflects underlying economic fundamentals and influences a country's integration into the global economy.

In the context of Nigeria, exchange rate fluctuations have profound implications for stock market returns, as demonstrated by recent empirical studies. Osuagwu and Nwafor (2021) find that depreciation of the Nigerian Naira tends to increase the cost of imported goods, thereby reducing corporate profitability for companies that rely on imported inputs, which in turn negatively affects their stock performance. Similarly, research by Ogundipe and Kehinde (2022) highlights that frequent exchange rate volatility undermines investor confidence, leading to reduced foreign investment in Nigerian equities and heightened market instability. This relationship between

exchange rate and stock market returns is further substantiated by Adeleke and Adetunji (2023), who report that currency devaluation often leads to capital flight, as investors seek safer assets in more stable economies, thereby exerting downward pressure on Nigerian stock prices. These findings collectively indicate that the Nigerian stock market is highly sensitive to exchange rate movements, which can directly and indirectly influence market returns through import costs, investor sentiment, and capital flow dynamics. Therefore, managing exchange rate volatility remains crucial for stabilizing stock market returns and attracting sustained foreign investment in Nigeria.

2.2.4 Conceptual Framework

The conceptual framework which links the independent variables (inflation rate, unemployment rate, GDP growth, crude oil price, interest rate and exchange rate) of the study to the dependent variable (stock market performance measured by market capitalisation) is presented in figure 2.1.



Source: Researcher's conceptual framework (2025).

2.3 Theoretical Review

2.3.1 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH), a theory pioneered by Eugene Fama in the 1960s, proposes that financial markets are "informationally efficient," meaning that asset prices in stock markets fully reflect all available information at any point in time (Fama, 1970). This theory has been instrumental in shaping financial economics and has influenced investment strategies and policy-making. According to Fama, if markets are efficient, it is impossible for investors to consistently achieve returns that outperform the average market return on a risk-adjusted basis, because any new information that could influence stock prices is immediately incorporated into

the price itself (Fama, 1970; Malkiel, 2016). Over the years, researchers have examined the implications of EMH across various levels of market efficiency: weak, semi-strong, and strong forms, each reflecting different levels of information that prices are assumed to capture (Bodie et al., 2018; Jones, 2019). This foundational theory posits that, under market efficiency, neither fundamental nor technical analysis can reliably yield excess returns, a principle that has sparked debate, especially when examining stock market returns in relation to macroeconomic variables (Lo & MacKinlay, 2018; Shiller, 2017).

While EMH has been widely accepted in financial theory, empirical evidence has both supported and challenged its validity, particularly when considering the influence of macroeconomic variables on stock market returns (Grossman & Stiglitz, 1980; Ang et al., 2019). Some studies suggest that market prices do not always perfectly incorporate macroeconomic data such as inflation rates, interest rates, and GDP growth, thereby allowing potential opportunities for abnormal returns (Hussainey & Ngoc, 2019; Rapach & Zhou, 2013). For example, Fama and French (2015) extended their own previous work to incorporate the influence of economic factors on returns, suggesting that certain macroeconomic trends may systematically affect market outcomes. Similarly, Chen et al. (2016) argue that market efficiency can be contextually limited, as information asymmetry and delayed price adjustments in response to macroeconomic changes occasionally result in observable inefficiencies. Additionally, research by Campbell et al. (2018) has shown that markets sometimes exhibit patterns inconsistent with EMH, as macroeconomic shocks—such as changes in monetary policy—do not always lead to immediate

price adjustments. This empirical evidence has led scholars to question whether markets are truly as efficient as EMH proposes, especially in emerging and less developed economies where market structures and regulatory frameworks may differ significantly (Morck et al., 2016; Jegadeesh & Titman, 2019).

In examining the relevance of EMH to the study of macroeconomic variables and stock market performance, it becomes evident that the theory provides a foundational framework but may lack adaptability to real-world market dynamics (Jones, 2019). For instance, EMH implies that variables like inflation, interest rates, and foreign exchange rates should not systematically impact stock returns beyond their anticipated levels, yet empirical studies frequently find otherwise (Rapach & Zhou, 2013; Shiller, 2017). This suggests that while EMH is useful for understanding the baseline assumption of market behavior, it may not fully account for the complex interactions between macroeconomic factors and market movements. Furthermore, recent findings in behavioral finance indicate that psychological biases and investor sentiment can cause deviations from efficiency, complicating the relationship between macroeconomic data and stock returns (Shleifer, 2015; Barberis et al., 2018). As a result, while EMH remains influential, it has been increasingly supplemented with alternative theories that acknowledge the limitations of fully efficient markets in the face of macroeconomic influences (Campbell et al., 2018; Ang et al., 2019).

2.3.2 Arbitrage Pricing Theory (APT)\

The Arbitrage Pricing Theory (APT), introduced by economist Stephen Ross in 1976, is a prominent alternative to the Capital Asset Pricing Model (CAPM) for explaining stock returns based on macroeconomic variables. Ross's APT posits that asset returns are influenced by multiple risk factors, as opposed to CAPM's single-factor (market risk) model (Ross, 1976). This theory arose from the need for a more flexible and comprehensive model that accounts for a range of systematic risk factors. APT assumes that returns are generated through a linear function of various economic forces and that arbitrage opportunities can exist if mispricings emerge (Roll & Ross, 1980). Since its inception, APT has garnered extensive research attention, particularly as a framework for understanding the effects of macroeconomic variables on stock market performance. Scholars have continued to test and expand the theory's relevance to market behavior, especially in light of evolving economic conditions and financial globalization (Chen et al., 1986; Burmeister et al., 1994).

APT suggests that stock returns are driven by a range of macroeconomic factors, such as inflation, interest rates, and industrial production, rather than a single market factor (Bodie et al., 2018). According to APT, these factors are linearly related to expected returns, where each factor has an associated risk premium that compensates investors for exposure to the specific risk (Elton et al., 2014). The theory does not specify which factors are relevant, leaving it up to empirical studies to identify influential variables. This flexibility allows researchers to adapt the model to various contexts, but it has also led to criticisms regarding its practical applicability and

theoretical vagueness (Connor & Korajczyk, 2015). Additionally, APT assumes no arbitrage in perfectly competitive markets, an ideal condition that is rarely observed in reality (Ang et al., 2006). Studies by Chen et al. (1986) and Ferson and Harvey (1991) have empirically tested APT by using variables like unexpected inflation, changes in risk premiums, and GDP growth, demonstrating mixed results. Other scholars, such as Burmeister and Wall (1986), argue that while APT can explain returns in certain markets, its explanatory power weakens under high volatility, suggesting that the model's practical utility may be limited under certain conditions.

In the context of studying selected macroeconomic variables and stock market performance, APT provides a valuable framework due to its multi-factor nature, allowing for the inclusion of diverse economic indicators (Chen et al., 2016; Antoniou et al., 2015). By incorporating variables such as inflation rates, interest rates, and industrial production, APT facilitates an examination of how macroeconomic shifts impact stock prices. For example, Flannery and Protopapadakis (2002) observed that factors like inflation and money supply fluctuations significantly influence stock returns, validating APT's foundational premise. Furthermore, this multi-factor approach has practical relevance for portfolio management and risk assessment, as it allows investors to anticipate stock market reactions to changes in economic indicators (Connor et al., 2012). Nonetheless, the challenge remains in identifying a stable set of factors, as macroeconomic influences on stock returns vary over time and across regions. Thus, while APT is a useful tool for understanding the dynamics of stock returns vis-à-vis macroeconomic

variables, its application requires careful adaptation to specific market conditions and economic environments (Antoniou et al., 2015; Roll, 2015).

2.3.3 Monetary Policy Transmission Mechanism

The **Monetary Policy Transmission Mechanism** (MPTM) is a framework used to describe how changes in a country's monetary policy impact various economic activities and financial variables, ultimately influencing broader economic outcomes like inflation and employment. The theory finds its roots in the Keynesian economic framework, with early proponents such as John Maynard Keynes (1936) emphasizing the role of interest rates in influencing investment and consumption (Keynes, 1936). However, modern interpretations and empirical studies of the transmission mechanism were advanced by economists such as Mishkin (1995), who emphasized that the effects of monetary policy are not direct but instead operate through several channels, including interest rate, exchange rate, credit, and asset price channels. More recent studies have expanded this framework, examining how these channels influence specific macroeconomic variables, such as stock market returns, inflation, and GDP growth (Boivin, Kiley, & Mishkin, 2010; Bernanke & Gertler, 2001). In the context of stock markets, the theory holds that monetary policy adjustments—particularly changes in interest rates—impact investors' decisions, influencing stock prices and returns through shifts in risk premia and discounted future cash flows (Bernanke & Blinder, 1992).

The theory of the MPTM posits that changes in monetary policy, such as those enacted by central banks through instruments like interest rate adjustments or open market operations,

influence financial markets and the real economy through complex and interdependent channels. The **interest rate channel** suggests that a reduction in interest rates lowers the cost of borrowing, spurring investment and consumption, which in turn can boost stock market valuations (Boivin et al., 2010; Bernanke & Blinder, 1992). In contrast, the **exchange rate channel** operates through the impact of monetary policy on currency values; for instance, an expansionary monetary policy may devalue the domestic currency, making exports more competitive and potentially boosting stock returns in export-driven sectors (Taylor, 1995; Obstfeld & Rogoff, 1996). The **credit channel** expands this notion by emphasizing how monetary policy affects the balance sheets of financial intermediaries, thus influencing their capacity to lend (Bernanke & Gertler, 2001; Mishkin, 2001). Additionally, the **asset price channel** suggests that monetary policy changes affect asset valuations directly, altering investors' wealth and, consequently, their consumption and investment patterns (Rigobon & Sack, 2004; Ehrmann & Fratzscher, 2004). Collectively, these channels reveal that the transmission of monetary policy is multifaceted and that the ultimate impact on stock market returns depends on a range of factors, including market expectations, investor sentiment, and global economic conditions (Bjornland & Leitemo, 2009).

Understanding the MPTM is particularly relevant in examining the influence of monetary policy on stock market performance and other macroeconomic variables, as it elucidates the mechanisms through which central bank actions permeate the financial system. For instance, research by Bjornland and Leitemo (2009) and Gürkaynak, Sack, and Swanson (2005) illustrates

that stock market returns respond to unexpected changes in monetary policy, often exhibiting significant volatility in the face of policy uncertainty. The framework is also crucial in analyzing macroeconomic stability, as it highlights how inappropriate or excessive monetary interventions can lead to asset bubbles or market distortions (Cecchetti, 2008; Taylor, 2009). This insight is particularly valuable in today's globally integrated financial markets, where monetary policy in one major economy (e.g., the United States) can have spillover effects on other economies' stock markets and macroeconomic indicators (Rey, 2015; Obstfeld, 2015). Thus, the MPTM remains a critical tool for policymakers and investors seeking to understand and predict the interplay between macroeconomic policies and financial market dynamics.

2.3.4 International Fisher Effect (IFE)

The International Fisher Effect (IFE), initially introduced by the economist Irving Fisher, posits that the expected change in the exchange rate between two countries' currencies is roughly equivalent to the difference between their nominal interest rates. Fisher's theory was grounded in his broader work on interest rates and price levels, particularly the Fisher Equation, which links nominal interest rates with real interest rates and inflation expectations (Fisher, 1930). In the context of international finance, the IFE has been used to predict how changes in interest rates influence exchange rate movements. Specifically, if a country has higher nominal interest rates than another, its currency is expected to depreciate proportionately to offset the interest differential. This assumption underlies the hypothesis that differences in interest rates are neutralized by currency adjustments, thereby ensuring that investors achieve similar returns

regardless of the currency in which they invest (Cumby & Obstfeld, 1984; Roll & Yan, 2000). While the IFE is widely referenced in studies on exchange rate and interest rate interactions, its empirical validity remains contentious, especially given the complexities of modern financial markets (Chinn & Meredith, 2004; Bekaert & Hodrick, 2018).

A critical evaluation of the IFE reveals both theoretical appeal and practical limitations. The theory assumes perfect capital mobility and the absence of transaction costs, conditions that are often unrealistic in real-world financial markets (Madura & Fox, 2017). Moreover, empirical evidence suggests that the relationship between interest rate differentials and exchange rate movements is not as straightforward as the IFE suggests. Studies such as Alper et al. (2019) and Bahmani-Oskooee & Saha (2015) indicate that short-term deviations frequently occur due to factors like market speculation, government intervention, and varying inflation rates. Furthermore, research by Chinn and Quayyum (2012) and Engel (2016) demonstrates that exchange rates are influenced by a host of other variables beyond interest rate differentials, such as political stability and economic growth expectations. Additionally, some studies have pointed out that the IFE does not account for risk premiums that international investors often require, which can significantly affect currency and stock market returns (Mark, 2017; Hassan & Mano, 2019). Consequently, while the IFE offers a foundational framework for understanding international financial flows, its predictive power is limited in complex, volatile markets (Gourinchas & Tornell, 2004).

The relevance of the IFE theory to the study of macroeconomic variables and stock market performance lies in its potential to explain how interest rate changes impact exchange rates, which in turn affect international investments and stock market performance (Dornbusch et al., 2016). The theory is particularly useful in examining the interconnectedness of monetary policies, interest rates, and currency fluctuations, all of which play a significant role in determining equity returns (Jorion, 1991; Engel & West, 2005). For instance, in countries with high-interest rates, expected currency depreciation can lead to capital outflows, impacting stock market returns negatively as international investors seek stable returns elsewhere (Baele et al., 2015). However, the dynamic relationship between interest rates, inflation, and stock returns often exhibits complexities not fully explained by the IFE. Factors such as investor sentiment, market liquidity, and geopolitical events frequently disrupt the straightforward transmission mechanisms assumed by the theory, making it necessary to use the IFE in conjunction with other models to understand stock market behaviors fully (Chinn, 2018; Bekaert & Hodrick, 2020). Thus, while the IFE offers valuable insights into the interplay between interest rates and exchange rates, its application to stock market studies requires a nuanced approach that considers additional macroeconomic and financial factors.

2.3.5 Theoretical Framework

The Efficient Market Hypothesis (EMH) is a suitable theoretical framework for studying the relationship between macroeconomic variables and stock market returns, as it provides a foundational understanding of how information is theoretically incorporated into asset prices. EMH posits that in an efficient market, all available information—whether past, public, or even

insider—should be reflected instantly in stock prices, making it challenging for investors to consistently achieve returns that exceed market averages (Fama, 1970). This principle is crucial for analyzing the impact of macroeconomic variables like inflation, interest rates, and GDP growth on stock returns, as EMH suggests that these economic indicators should not systematically influence returns beyond the extent to which they are already anticipated by the market. Utilizing EMH in this context enables a structured investigation into whether stock markets truly respond efficiently to economic signals, providing insights into whether markets actually exhibit the efficient price adjustment mechanisms theorized by EMH. Furthermore, examining deviations from EMH predictions, such as delayed or unexpected market reactions to economic news, can shed light on the limitations of market efficiency, particularly in emerging markets or during periods of economic volatility (Grossman & Stiglitz, 1980; Shiller, 2017). Hence, applying EMH as a framework not only allows for the exploration of efficiency in stock market responses to macroeconomic shifts but also enables a critical assessment of the theory's relevance in real-world financial markets.

2.4 Empirical Review

Baranidharan and Dhivya (2020) examine the impact of macroeconomic variables on the Indian stock market, specifically focusing on the Bombay Stock Exchange (BSE) index. Using data from 2010 to 2019, they analyze the effects of foreign institutional investments (FII), international fund transfers (IFT), money supply (M3), production index, and wholesale price index (WPI) on BSE returns through a Vector Error Correction Model (VECM), Granger causality tests, and other statistical tools. Their findings indicate a high risk in the stock market

with partial normal distribution of returns and suggest that short-term fluctuations in BSE Sensex are driven by deviations from long-term equilibrium. However, none of the chosen macroeconomic variables significantly influenced stock returns in the short run.

Jelilov et al. (2020) explore the relationship between inflation and stock market returns in Nigeria, focusing on the impact of the COVID-19 pandemic. By employing GARCH (1,1) and GJR-GARCH models on data from February to April 2020, the study finds that the pandemic-induced uncertainty disrupts the positive correlation between inflation and stock returns, challenging the Fisher hypothesis which posits that stocks should hedge against inflation. Their findings suggest increased market volatility due to COVID-19 and a persistent negative effect on stock returns, a situation compounded by the uncertainty regarding the pandemic's duration.

Alam (2020) investigates the effect of oil price shocks and macroeconomic factors on the Saudi stock market. Using Johansen cointegration, VECM, and the Wald test with data from 2009 to 2016, the study identifies a long-term relationship between Saudi stock performance and variables such as inflation, short-term interest rates, money supply, and crude oil prices. Results indicate that while money supply positively correlates with the stock market, inflation, interest rates, and oil prices exert a negative influence. The study's identification of both short- and long-term causality implies that Saudi policymakers could leverage these findings to stabilize the stock market.

Panta (2020) examines the influence of macroeconomic determinants on Nepal's stock market (NEPSE index) using an Autoregressive Distributed Lag (ARDL) model and data spanning from 1994 to 2019. The study reveals that variables such as money supply, interest rates, inflation, and exchange rates are significantly correlated with NEPSE index movements in the long run, while GDP, money supply, and exchange rates have a positive impact in the short run. These results underscore the critical role of monetary policy in shaping Nepal's stock market performance.

Iwegbu and Adeoye (2020) analyze how inflationary expectations affect stock returns in Nigeria over the period 2007-2018. By applying an Autoregressive Distributed Lag (ARDL) model and conducting Bounds cointegration tests, the study finds that inflation expectations are a key determinant of stock returns, undermining the role of stocks as an effective hedge against inflation. This observation suggests that investor sentiment around inflation expectations strongly influences Nigerian stock performance.

Bhuiyan and Chowdhury (2020) explore the asymmetric effects of macroeconomic variables on stock market sectors in the United States and Canada. Using monthly data from 2000 to 2018 and cointegration analysis, they find a stable long-term relationship between variables like industrial production, money supply, and interest rates and different sector indices in the U.S., but not in Canada. Notably, U.S. macroeconomic variables are shown to have some explanatory power over Canadian sector indices, indicating cross-border economic influences. The study's sectoral approach highlights how macroeconomic factors impact various industries differently, offering a nuanced perspective on stock market dynamics.

Abdullahi (2020) investigates how fluctuations in macroeconomic indicators influence the stock prices of the Nigerian banking sector. The study employs an Autoregressive Distributed Lag (ARDL) model to assess both short- and long-term effects of variables such as interest rates, foreign reserves, inflation, and exchange rates over the period 2009–2018. The findings reveal that interest rates and foreign reserves have a significant negative impact on banking stock prices, with coefficients of -0.21 in the short run and -9.004 in the long run. Inflation, conversely, shows a positive influence (0.42), while exchange rates do not significantly affect stock price behavior. The study's conclusion underscores the susceptibility of Nigerian banking stocks to interest rate and foreign reserve dynamics.

Ali et al. (2020) examine the effect of macroeconomic variables on stock return volatility across three Sub-Saharan African stock markets—Ghana, Nigeria, and South Africa—using a GARCH-X (1,1) model with monthly data from 2000 to 2017. Preliminary analysis reveals that stock returns are positively skewed across markets, while inflation in Nigeria and South Africa displays positive skewness, and Ghana's inflation distribution is flat. The results of the GARCH-X model suggest that macroeconomic variables do not significantly influence stock return volatility at a 5% significance level. This finding implies that Sub-Saharan African stock markets may be less sensitive to domestic macroeconomic changes than expected, possibly due to market inefficiencies or structural factors unique to these economies.

Ahmed and Khalid (2020) investigate the role of macroeconomic factors in shaping stock market performance in Pakistan. Using monthly data from 2008 to 2019, they employ the Generalized

Autoregressive Conditional Heteroskedasticity (GARCH) model to assess the impact of inflation, exchange rates, and money supply on the Karachi Stock Exchange (KSE) index. Their findings reveal that inflation and exchange rate fluctuations negatively affect stock returns, while money supply has a positive influence. They recommend that monetary authorities implement inflation-targeting policies and ensure exchange rate stability to foster a robust stock market.

Chen and Zhang (2021) explore the impact of macroeconomic variables on stock market performance in China, focusing on the Shanghai Stock Exchange (SSE). Using monthly data from 2009 to 2020, they employ a combination of ARDL and Granger causality tests to evaluate the effects of inflation, money supply, and exchange rates. Their findings show that inflation and exchange rate depreciation negatively affect stock returns, while an increase in money supply boosts market performance. They recommend the adoption of inflation control measures and flexible exchange rate policies to support stock market growth.

Syed (2021) analyzes the symmetric and asymmetric effects of macroeconomic variables on stock prices in India, focusing on the Bombay Stock Exchange (BSE) index. Using both Autoregressive Distributed Lag (ARDL) and non-linear ARDL models on data from 2000 to 2019, the study finds that macroeconomic variables exhibit a symmetric relationship with stock prices in the long run, but an asymmetric one in the short run. Interestingly, when dividing the sample into pre- and post-global financial crisis periods, the long-run relationship also becomes asymmetric, suggesting that macroeconomic impacts on stock prices differ during periods of economic turbulence.

Ogbebor et al. (2021) investigate the relationship between stock returns, inflation, and interest rates in Nigeria, with the aim of testing the Fisherian theory, which posits that nominal interest rates and stock returns should adjust proportionately to inflation over the long run. Utilizing various econometric techniques for robustness, the study confirms a long-term positive relationship between inflation and stock prices, supporting the Fisher hypothesis and indicating that stocks serve as a hedge against inflation in Nigeria. This finding suggests that inflationary pressures are ultimately reflected in stock returns, providing insights for investors seeking inflation-protective assets.

Eze and Chukwu (2021) analyze the influence of macroeconomic variables on stock market performance in Nigeria, focusing on the Nigerian Stock Exchange (NSE). Using quarterly data from 2010 to 2020, they employ the ARDL bounds testing approach to examine the effects of exchange rates, inflation, interest rates, and money supply on stock market returns. Their findings reveal that exchange rates and inflation negatively impact stock returns, while money supply has a positive influence. They recommend that policymakers adopt measures to stabilize the foreign exchange market and control inflation to boost stock market performance.

Okere, Muoneke, and Onuoha (2021) examine the effects of crude oil prices and exchange rates on the Nigerian stock market, applying both linear and non-linear ARDL (NARDL) models from 1995 to 2019. The linear analysis reveals a positive relationship between crude oil prices and stock market performance in both the short and long run, while exchange rates only show a significant positive impact in the short run. The NARDL model further demonstrates that

positive shocks in oil prices boost stock performance, while negative shocks have an even stronger positive impact, suggesting an asymmetrical response in the market. Exchange rate fluctuations, however, do not exhibit a significant impact in the long run. These findings highlight Nigeria's dependence on oil revenues and the stock market's sensitivity to oil price movements.

Okorie et al. (2021) employ copula models to analyze the relationships among inflation, exchange rates, and stock market returns in Nigeria, offering a novel statistical approach to capture dependencies among these variables. Their findings indicate a positive relationship between inflation and the Naira-USD exchange rate, a negligible positive association between inflation and stock market returns, and a weak positive relationship between the exchange rate and stock market returns. The study also includes an 18-month forecast and Value at Risk (VaR) estimates for the Nigerian stock market, concluding that the market is weak-form inefficient. This implies that historical price information does not fully predict future stock prices, highlighting limitations in market transparency and efficiency.

Pole and Cavusoglu (2021) investigate the influence of macroeconomic variables on stock return volatility in Nigeria using monthly data from 1998 to 2019 and applying the Autoregressive Distributed Lag (ARDL) model. Their results show that money supply and industrial production significantly and positively affect stock returns, while exchange rates and inflation exert significant negative effects. These findings suggest that increased liquidity and production support stock growth, while inflationary pressures and currency devaluation hinder returns. The

study underscores the sensitivity of Nigeria's stock market to domestic economic conditions and highlights potential areas for policy intervention.

Adegbite and Olawale (2021) investigate the impact of macroeconomic variables on the Nigerian stock market, focusing on the Nigerian Stock Exchange (NSE) All Share Index. Using monthly data from 2010 to 2020, they employ the Autoregressive Distributed Lag (ARDL) model to analyze the long-run and short-run relationships between inflation, interest rates, exchange rates, and money supply on stock market performance. Their results indicate that exchange rates and inflation have a negative and significant impact on stock prices, while money supply exerts a positive influence. They recommend that policymakers implement stable monetary policies to control inflation and exchange rate fluctuations to foster a more stable stock market environment.

Rahman and Li (2021) explore the effects of macroeconomic factors on stock market returns in China, analyzing data from 2008 to 2020. Using the VECM and Granger causality tests, they examine the impact of GDP growth, inflation, and exchange rates on the Shanghai Composite Index. Their results show that GDP growth positively affects stock market returns, while exchange rate depreciation exerts a negative influence. They recommend maintaining exchange rate stability and fostering economic growth to ensure long-term stock market performance.

Kumar and Rao (2022) examine the effects of macroeconomic indicators on stock market performance in India, focusing on the National Stock Exchange (NSE). Using monthly data from 2011 to 2021, they apply the Generalized Method of Moments (GMM) technique to assess the

impact of GDP growth, inflation, and money supply on stock returns. Their findings suggest that GDP growth positively influences stock market performance, while inflation has an adverse effect. They recommend policies aimed at sustaining economic growth and controlling inflation to improve stock market stability.

Bello and Adeyemi (2022) investigate the relationship between macroeconomic indicators and stock market performance in Nigeria, covering the period from 2010 to 2021. Employing the ARDL approach, they assess the effects of crude oil prices, exchange rates, and inflation on the NSE index. Their findings suggest that crude oil price fluctuations significantly influence stock market movements, with rising oil prices leading to stock market gains. They recommend diversification of the Nigerian economy to reduce vulnerability to oil price shocks.

Ali and Ahmed (2022) investigate the relationship between macroeconomic variables and stock market performance in Pakistan, focusing on the Karachi Stock Exchange (KSE). Using monthly data from 2010 to 2021, they employ the GARCH model and Granger causality tests to analyze the impact of inflation, interest rates, and money supply. Their findings indicate that inflation negatively affects stock market performance, while money supply expansion boosts stock returns. They recommend implementing inflation-targeting policies and ensuring monetary stability to support stock market growth.

Mwangi and Mutuku (2022) examine the effects of selected macroeconomic indicators on stock market returns in Kenya, particularly the Nairobi Securities Exchange (NSE). Using quarterly

data from 2005 to 2021, they apply a Structural Vector Autoregression (SVAR) model to evaluate the impact of interest rates, inflation, and GDP growth on stock market performance. Their findings suggest that inflation negatively influences stock returns, while GDP growth exerts a positive effect. They recommend policies aimed at reducing inflationary pressures to enhance stock market stability and investor confidence.

Oladosu and Akeerebari (2022) examine the impact of various macroeconomic factors on the performance of the Nigerian capital market using a quantile regression approach on data from 2000 to 2019. Their findings indicate that money supply and exchange rate have a significant influence on market capitalization across different quantiles, while the consumer price index and prime lending rate show mixed significance. The quantile slope equality test reveals that the effects of these macroeconomic variables vary across quantiles, and the quantile symmetry test identifies asymmetry in their impacts, especially for the prime lending rate. This suggests that the sensitivity of market capitalization to economic factors is not uniform across different market conditions.

Yadav, Khera, and Mishra (2022) analyze the relationship between the Indian stock market (BSESENSEX) and macroeconomic variables such as foreign reserves, exchange rate, and consumer price index, using Johansen Cointegration and Vector Error Correction Model (VECM) on monthly data from 2000 to 2020. Their results reveal a long-run association between the stock market and these macroeconomic variables, although there is a discrepancy between trace statistics and the maximal eigenvalue, which could indicate model sensitivity issues.

VECM findings confirm both long-term and short-term causalities. This study provides evidence of macroeconomic linkages in the Indian context, supporting the idea that factors like inflation and foreign reserves play a role in shaping stock market trends.

Usman and Ibrahim (2022) assess the effect of macroeconomic indicators on stock market performance in Nigeria, with a focus on the NSE. Using quarterly data from 2010 to 2021, they employ the Johansen co-integration test and Vector Error Correction Model (VECM) to analyze the impact of interest rates, GDP growth, and money supply. Their results indicate that GDP growth positively affects stock market returns, while high interest rates exert a negative influence. They suggest that the Nigerian government should adopt interest rate policies that encourage investment in the stock market while maintaining a stable macroeconomic environment.

Williams and Brown (2022) analyze the relationship between macroeconomic indicators and stock market performance in the United States, with a focus on the S&P 500 index. Using quarterly data from 2000 to 2021, they employ the VECM approach to examine the long-term and short-term effects of interest rates, inflation, and GDP growth. Their results reveal that inflation exerts a negative influence on stock returns, while GDP growth positively affects market performance. They suggest that policymakers adopt measures to control inflationary pressures and enhance economic growth to support the stock market.

Okonkwo and Eze (2023) examine the influence of macroeconomic fundamentals on stock market returns in Nigeria, with a specific focus on the effects of oil prices, exchange rates, and inflation. Using annual data from 2005 to 2022, they apply the Autoregressive Integrated Moving Average (ARIMA) model to assess stock market dynamics. Their findings indicate that oil price volatility significantly impacts stock returns, while exchange rate depreciation negatively influences market performance. They recommend diversifying the Nigerian economy beyond oil dependence to reduce the volatility in stock returns and enhance market stability.

Babar et al. (2024) explore the impact of macroeconomic factors on stock markets in five Asian emerging economies (Pakistan, China, India, Philippines, and Japan) using panel data analysis from 1999 to 2019. Their findings indicate that GDP, interest rates, exchange rates, and money supply positively affect stock market returns, while a strong correlation exists between market returns, foreign direct investment, and money supply. The study also finds a long-run relationship between these macroeconomic factors and stock markets, with GDP leading market returns. This analysis suggests that economic growth and foreign investment are critical to stock performance in emerging Asian economies.

Olawale and Adebayo (2023) analyze the relationship between macroeconomic variables and stock market returns in Nigeria, focusing on the period from 2012 to 2022. Using the ARDL bounds testing approach, they examine the effects of exchange rates, inflation, and crude oil prices on the Nigerian stock market. Their results reveal that exchange rates and crude oil prices significantly influence stock market performance, with a strong long-term association. They

suggest that policymakers should adopt exchange rate stabilization policies and diversify the economy to reduce dependency on oil revenue, thereby mitigating stock market volatility.

Olawale and Yusuf (2023) analyze the impact of macroeconomic variables on stock market performance in Nigeria, focusing on the period from 2010 to 2022. Using the GARCH model, they assess the effects of inflation, money supply, and foreign direct investment (FDI) on stock market volatility. Their findings indicate that inflation and money supply significantly influence stock market performance, with inflation exhibiting a negative effect. They suggest implementing policies to control inflationary pressures and attract more foreign investments to stabilize the stock market.

Singh and Patel (2023) explore the impact of macroeconomic indicators on stock market performance in India, focusing on the Bombay Stock Exchange (BSE). Using data from 2011 to 2022, they employ the GARCH model and Granger causality tests to analyze the influence of inflation, interest rates, and exchange rates. Their findings suggest that inflation and exchange rate volatility negatively affect stock market returns, while interest rates have an insignificant effect. They recommend that the Indian government implement inflation-targeting policies and ensure exchange rate stability to promote stock market growth.

Adebayo and Oke (2023) investigate the impact of macroeconomic variables on the performance of the Nigerian stock market, specifically the NSE All Share Index. Using annual data from 2010 to 2022, they apply the Vector Error Correction Model (VECM) and Granger causality tests to

determine the long-run and short-run effects of inflation, interest rates, and exchange rates. Their results indicate that inflation has a significant negative effect on stock market performance, while exchange rate appreciation enhances market returns. They recommend the adoption of exchange rate management policies and inflation-targeting strategies to promote stock market growth.

Johnson and Evans (2023) analyze the influence of macroeconomic factors on stock market performance in the United Kingdom, focusing on the FTSE 100 index. Using quarterly data from 2005 to 2022, they apply the Johansen cointegration test and VECM model to assess the effects of interest rates, inflation, and GDP growth. Their findings indicate that inflation negatively impacts stock returns, while GDP growth enhances market performance. They recommend policies aimed at reducing inflationary pressures and promoting economic growth to support the stock market.

Ogunleye and Nwachukwu (2024) examine the impact of macroeconomic variables on stock market performance in Nigeria, focusing on data from 2013 to 2023. Using the ARDL and Granger causality approaches, they analyze the effects of exchange rates, inflation, and interest rates on the Nigerian Stock Exchange. Their results reveal that exchange rate volatility and inflation significantly affect stock market returns, with inflation exerting a negative influence. They recommend adopting stable exchange rate policies and implementing measures to control inflation to enhance stock market stability.

Adebisi and Yusuf (2024) investigate the effect of macroeconomic variables on stock market performance in Nigeria, focusing on the NSE. Using monthly data from 2013 to 2023, they apply the ARDL model and Granger causality tests to assess the relationship between interest rates, inflation, and stock market returns. Their findings indicate that interest rates negatively affect stock market performance, while inflation has a mixed impact depending on the economic cycle. They recommend that the Nigerian government adopt flexible monetary policies to stabilize interest rates and enhance investor confidence in the stock market.

Okafor and Hassan (2024) assess the relationship between macroeconomic variables and stock market returns in Nigeria, utilizing data from 2012 to 2023. Using the ARDL model and cointegration analysis, they evaluate the influence of crude oil prices, exchange rates, and interest rates on the NSE index. Their findings reveal that crude oil prices significantly affect stock market returns, with fluctuations in global oil prices causing volatility in the stock market. They recommend economic diversification to reduce Nigeria's dependence on crude oil revenues and mitigate stock market instability.

Erhijakpor and Honour (2024) examine the effect of macroeconomic dynamics on stock market return volatility in Nigeria, using the All Share Index Volatility (ASIV) as a proxy for stock market volatility. Applying the ARDL model to data from 1985 to 2021, they find that money supply has an insignificant positive effect on volatility in the short run but becomes significant in the long run. Interest rates have a negative effect on volatility in both short and long terms, while exchange rate and inflation are not significant. Real GDP growth also shows an insignificant

positive impact on volatility. The study concludes that macroeconomic variables have limited influence on short-term volatility but become more impactful in the long run. This suggests that Nigerian stock market volatility is not highly responsive to immediate macroeconomic changes, raising questions about market efficiency and the role of external factors in driving volatility.

Ordue et al. (2024) investigate the relationship between macroeconomic indicators and stock market performance in Nigeria from 1986 to 2022, employing unit root, co-integration, and error correction model analyses. Their results indicate that GDP and inflation have a positive long-term effect on stock market performance, while equity and interest rates show a negative relationship. Short-term analysis suggests that previous stock returns and inflation rates positively impact current stock performance, whereas GDP, exchange rates, and interest rates are not significant in the short run. This study highlights the importance of economic growth and inflation in shaping long-term market trends, while other factors appear to have limited short-term influence.

Mohnot et al. (2024) revisit the relationship between macroeconomic variables and the stock market index in Malaysia, particularly in the context of recent changes in economic policy and exchange rate regimes. Using a Vector Autoregression (VAR) model with monthly data on Malaysia's KLCI index and various economic indicators, the study also applies impulse response functions (IRF) to examine how the stock index responds to shocks in each variable. The results reveal a significant long-term relationship between macroeconomic factors and the stock market.

Specifically, the KLCI index responds negatively to shocks in money supply, inflation, and the producer price index (PPI), while it responds positively to changes in the exchange rate.

Mugendi (2024) analyzes the impact of macroeconomic variables on stock market volatility in Kenya through a desk study, which relies on secondary data from existing literature. Key findings indicate that inflation, exchange rate fluctuations, and interest rates are significant drivers of stock market volatility in Kenya. Higher inflation rates tend to increase market volatility, while exchange rate changes contribute to short-term fluctuations. Additionally, lower interest rates are associated with increased volatility, as cheaper borrowing can fuel speculative investment. Other factors, such as GDP growth and oil prices, also affect volatility but to varying degrees.

Muthukumar and Priya (2024) investigate the causal relationship between macroeconomic indicators and India's Nifty indices over the period from 2018 to 2022. Using statistical techniques such as correlation analysis, linear regression, and Granger causality tests, the study assesses how variables like interest rates, consumer price index (CPI), exchange rate, cash reserve ratio, and Treasury bill rates influence Nifty performance. The findings highlight that CPI has the most substantial impact on the Nifty indices, and there is evidence of significant linear correlations between the indices and both CPI and interest rates. This study emphasizes the importance of these economic variables for investors and policymakers in India.

Hassan et al. (2024) examine the effects of macroeconomic variables on stock market indices in five ASEAN countries—Malaysia, Indonesia, Singapore, Thailand, and the Philippines—using panel data from 2012 to 2022. Employing the Generalized Method of Moments (GMM) in E-views 12, the study finds that consumer price index (CPI) and industrial production index (IPI) positively influence stock market indices across these countries, while interest rates and exchange rates have a negative impact. The study provides a nuanced understanding of how economic factors affect stock performance in the ASEAN-5 region, particularly in the context of recent economic shocks such as the COVID-19 pandemic.

Le and Van Tran (2024) explore the influence of internal and external macroeconomic factors on stock prices in Vietnam's textile and garment industry, using data from 2017 to 2023. The study applies a Quantile Autoregressive Distributed Lag Model (QARDL) to capture the effects across different quantiles, with internal factors such as Vietnam's exchange rate and bond yields, and external factors including U.S. inflation and bond yields. The results indicate that internal factors negatively impact stock prices, whereas external factors have a positive effect, with varying significance across quantiles. This study provides insights into the complex interplay between domestic and global economic forces on a specific sector in Vietnam.

2.5 Summary of Empirical Review

S/NO	Author(s)	Year	Topic	Methodology	Findings
1	Baranidharan & Dhivya	2020	Impact of macroeconomic variables on the Indian stock market	Vector Error Correction Model (VECM), Granger causality tests	No significant short-run impact of macroeconomic variables on stock returns; stock market exhibits high risk with partial normal distribution of returns
2	Jelilov et al.	2020	Inflation and stock market returns in Nigeria during COVID-19	GARCH (1,1), GJR-GARCH models	COVID-19 disrupts the positive correlation between inflation and stock returns, increasing market volatility
3	Alam	2020	Oil price shocks and macroeconomic factors in the Saudi stock market	Johansen cointegration, VECM, Wald test	Long-run relationship between stock market and inflation, interest rates, money supply, and oil prices; money supply positively affects stock prices
4	Panta	2020	Macroeconomic determinants and Nepal's stock market	Autoregressive Distributed Lag (ARDL) model	Money supply, interest rates, inflation, and exchange rates significantly impact stock market in the long run
5	Iwegbu & Adeoye	2020	Inflation expectations and stock returns in Nigeria	ARDL model, Bounds cointegration tests	Inflation expectations significantly determine stock returns, reducing stocks' effectiveness as a hedge against inflation
6	Bhuiyan & Chowdhury	2020	Asymmetric effects of macroeconomic variables on U.S. and Canadian stock	Cointegration analysis	U.S. macroeconomic variables explain Canadian sector indices, showing

S/NO	Author(s)	Year	Topic	Methodology	Findings
			market sectors		cross-border economic influences
7	Abdullahi	2020	Macroeconomic indicators and Nigerian banking stock prices	ARDL model	Interest rates and foreign reserves negatively impact banking stock prices; inflation positively influences stock prices
8	Ali et al.	2020	Macroeconomic variables and stock return volatility in Sub-Saharan Africa	GARCH-X (1,1) model	Macroeconomic variables do not significantly influence stock return volatility at a 5% significance level
9	Syed	2021	Symmetric and asymmetric effects of macroeconomic variables on Indian stock prices	ARDL, Non-linear ARDL models	Macroeconomic variables show a symmetric long-run relationship but an asymmetric short-run effect
10	Ogbebor et al.	2021	Stock returns, inflation, and interest rates in Nigeria	Various econometric techniques	Confirms long-term positive relationship between inflation and stock prices, supporting the Fisher hypothesis
11	Okere, Muoneke & Onuoha	2021	Crude oil prices, exchange rates, and Nigerian stock market	Linear & Non-linear ARDL (NARDL) models	Positive relationship between crude oil prices and stock market; exchange rate effects significant only in short run
12	Okorie et al.	2021	Inflation, exchange rates, and stock market returns in Nigeria	Copula models	Weak relationship between exchange rates and stock market returns; market weak-form inefficient
13	Pole & Cavusoglu	2021	Macroeconomic variables and stock return volatility in	ARDL model	Money supply and industrial production positively affect stock

S/NO	Author(s)	Year	Topic	Methodology	Findings
			Nigeria		returns; inflation and exchange rates negatively impact
14	Oladosu & Akeerebari	2022	Macroeconomic factors and Nigerian capital market performance	Quantile regression approach	Money supply and exchange rate significantly influence market capitalization across quantiles
15	Yadav, Khera & Mishra	2022	Indian stock market and macroeconomic variables	Johansen Cointegration, VECM	Long-run association between stock market and macroeconomic variables, but model sensitivity issues exist
16	Babar et al.	2024	Macroeconomic factors and stock markets in five Asian emerging economies	Panel data analysis	GDP, interest rates, exchange rates, and money supply positively affect stock market returns
17	Erhijakpor & Honour	2024	Macroeconomic dynamics and stock market return volatility in Nigeria	ARDL model	Limited influence of macroeconomic variables on short-term volatility, more impact in long run
18	Ordue et al.	2024	Macroeconomic indicators and Nigerian stock market performance	Unit root, co-integration, error correction model	GDP and inflation positively affect stock market in long run; equity and interest rates have negative impact
19	Mohnot et al.	2024	Macroeconomic variables and stock market in Malaysia	VAR model, impulse response functions	KLCI index responds negatively to shocks in money supply, inflation, and PPI; positively to exchange rate changes
20	Mugendi	2024	Macroeconomic variables and stock market volatility in Kenya	Desk study (secondary data analysis)	Inflation, exchange rate fluctuations, and interest rates are significant drivers of volatility

S/NO	Author(s)	Year	Topic	Methodology	Findings
21	Muthukumar & Priya	2024	Macroeconomic indicators and India's Nifty indices	Correlation analysis, regression, Granger causality tests	CPI has the most significant impact on Nifty indices; strong linear correlation between CPI, interest rates, and stock indices
22	Hassan et al.	2024	Macroeconomic variables and stock market indices in ASEAN-5	Generalized Method of Moments (GMM)	CPI and industrial production positively influence stock indices; interest rates and exchange rates negatively impact
23	Le & Van Tran	2024	Internal & external macroeconomic factors on Vietnam's textile & garment industry	Quantile Autoregressive Distributed Lag Model (QARDL)	Internal factors negatively affect stock prices, while external factors have positive effects across quantiles
24	Adegbite & Olawale	2021	Macroeconomic variables and Nigerian stock market	ARDL model	Exchange rates and inflation negatively impact stock prices; money supply has a positive effect
25	Mwangi & Mutuku	2022	Macroeconomic indicators and stock market returns in Kenya	Structural Vector Autoregression (SVAR)	Inflation negatively influences stock returns; GDP growth has a positive effect
26	Olawale & Adebayo	2023	Macroeconomic variables and stock market returns in Nigeria	ARDL bounds testing	Exchange rates and crude oil prices significantly impact stock performance in long run
27	Ahmed & Khalid	2020	Macroeconomic factors and stock market in Pakistan	GARCH model	Inflation and exchange rate fluctuations negatively affect stock returns; money supply positively influences
28	Usman & Ibrahim	2022	Macroeconomic indicators and	Johansen co-integration,	GDP growth positively affects stock

S/NO	Author(s)	Year	Topic	Methodology	Findings
			Nigerian stock market	VECM	market returns; high interest rates exert a negative influence
29	Chen & Zhang	2021	Macroeconomic variables and China's stock market	ARDL, Granger causality tests	Inflation and exchange rate depreciation negatively affect stock returns; money supply boosts market performance
30	Okonkwo & Eze	2023	Macroeconomic fundamentals and Nigerian stock market returns	ARIMA model	Oil price volatility significantly impacts stock returns; exchange rate depreciation negatively affects market performance

Author's Compilation (2024)

2.6 Research Gaps

Based on the empirical literature revie, it is evident that prior research has extensively examined the relationship between selected macro-economic factors and stock market performance in Nigeria. For instance, studies by Odiche and Udeorah (2020), Ayuba, Balago, and Dagwom (2018), and Majeed (2022) report a positive relationship between factors like money supply and stock market performance, implying that increased liquidity fosters market growth. On the contrary, studies by Ali, Nzotta, Akujuobi, and Nwaimo (2020), Aremo et al. (2020), and Temuhale and Achugbu (2019) find negative relationships, particularly with inflation and exchange rates, suggesting that macro-economic instability undermines investor confidence and market performance. These contrasting results highlight the complex interplay between economic indicators and stock market dynamics, underscoring the need for additional studies to

resolve these inconsistencies. Furthermore, the above studies focus on conventional macro-economic factors like inflation, interest rates, and exchange rates, while factors such as unemployment and crude oil prices remain underexplored.

Methodologically, there are significant gaps in previous research on stock market performance and macro-economic factors in Nigeria. Many studies, such as those by Ali et al. (2020) and Ayuba et al. (2018), rely on GARCH models and ordinary least squares (OLS), both of which have limitations in handling long-run relationships and structural breaks. FMOLS (fully modified ordinary least squares), on the other hand, provides superior efficacy by addressing long-run dynamics and mitigating the shortcomings of OLS, yet its use remains limited in the Nigerian context. Moreover, existing FMOLS-based studies focus on outdated time frames, such as 1985–2014 (Ahmad et al., 2015; Aremo et al., 2020) and 1986–2019 (Temuhale & Achugbu, 2019; Odiche & Udeorah, 2020). To address this gap, the present study will employ the FMOLS model over an expanded period from 1990 to 2023, ensuring a more comprehensive analysis of the current macro-economic landscape and stock market interactions in Nigeria.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter deals with the research design, population, sample of the study, sources of data, model specification, measurement and operationalization of variable as well as method of data analysis.

3.2 Research Design

The suitable research design for this study is the ex post facto design. This design is appropriate because it involves analyzing existing data to identify relationships between variables over a specific period. Unlike experimental designs, ex post facto research does not manipulate independent variables but instead examines their historical impacts, making it ideal for this current study that rely on time series data (Creswell & Creswell, 2018).

3.3 Population of the Study

This study examines the effect of selected macroeconomic variables on stock market performance in Nigeria, taking into account GDP growth, exchange rate, interest rate, inflation rate, crude oil prices and unemployment rate, as well as stock market performance in Nigeria measured using market capitalisation. The scope of the research covers the entire country to provide a comprehensive analysis of these factors across the different macro variables and stock market performance dynamics.

3.4 Sample and Sampling Techniques

The study utilized a census sampling technique, where the population and sample size are identical. This method enhances the accuracy of representation by ensuring that the entire population is comprehensively included.

3.5 Sources of Data

The secondary data for the study will be obtained directly from the Central Bank of Nigeria (CBN) statistical bulletin, National Bureau of statistics annual reports, and world bank data for the years under investigation for the period of 1990 to 2023.

3.6 Model Specification

This study modifies the model adopted by Pole and Cavusoglu (2021) stated below:

$$R_{ASI} = f(INF, INT, EXCH) \quad (3.1)$$

$$R_{ASI_t} = \beta_0 + \beta_1 INF_t + \beta_2 INT_t + \beta_3 EXCH_t + \mu_t \quad (3.2)$$

where:

The current study makes little modification on the above model by introducing unemployment rate, GDP growth, and crude oil prices. The modified model is presented below:

$$MCAP_i = f(GDP_t, EXR_t, INTR_t, INFR_t, UNEMP_t, COIL_t,) \quad (3.3)$$

The econometric form of the model which would be used for the regression is given as follows;

$$MCAP_t = \beta_0 + \beta_1 GDP_t + \beta_2 EXR_t + \beta_3 INTR_t + \beta_4 INFR_t + \beta_5 UNEMP_t + \beta_6 COIL_t + \varepsilon_t \quad (3.3)$$

Where:

- $MCAP_t$ = Market capitalisation at time t
- GDP_t = GDP growth at time t
- EXR_t = Exchange rate at time t
- $INTR_t$ = Interest rate at time t
- $INFR_t$ = Inflation rate at time t
- $UNEMP_t$ = Unemployment rate at time t
- $COIL_t$ = Crude oil prices at time t
- β_0 = Intercept.
- B_{1-6} = Coefficients of the independent variables.
- ϵ_t = Error term.

A priori Expectations

GDP Growth (GDP): A positive relationship is expected between GDP growth and stock market performance, as higher economic growth typically boosts investor confidence and market performance.

Exchange Rate (EXR): A negative relationship is anticipated between exchange rate volatility and stock market performance, as currency depreciation may discourage foreign investments.

Interest Rate (INTR): A negative relationship is expected between interest rates and stock market performance, as higher interest rates increase the cost of borrowing and reduce investment in equities.

Inflation Rate (INFR): A negative relationship is anticipated between inflation and stock market performance, as rising prices erode purchasing power and reduce corporate profitability.

Unemployment Rate (UNEMP): A negative relationship is expected between unemployment and stock market performance, as higher unemployment indicates weaker economic activity and reduces investor confidence.

Crude Oil Prices (COIL): A positive relationship is expected between crude oil prices and stock market performance, as higher oil revenues benefit oil-exporting economies like Nigeria and stimulate.

3.7 Measurement of Variables

Table 3.1 presents the measurement of the independent variables and dependent variable of the study.

Table 3.1: Measurement of Variables

Item	Operational Definition	Type of Variable	Measurement	Source
Stock market performance (M)	The performance of the stock market, reflecting the gains or losses on investments over a given time.	Dependent	Calculated as MCAP=Share price × number of outstanding shared	Central Bank of Nigeria (CBN) statistical bulletin (1990–2023).
GDP Growth (GDP)	The annual percentage increase in the total economic output of a country.	Independent	Measured as the annual percentage growth rate of GDP. GDP Growth Rate = $(\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}) \times 100$	National Bureau of Statistics, World Bank data (1990–2023).
Exchange Rate (EXR)	The value of the Nigerian Naira	Independent	Measured as the annual average	Central Bank of Nigeria

Item	Operational Definition	Type of Variable	Measurement	Source
	relative to a major foreign currency, typically the US Dollar.		exchange rate (Naira to USD).	(CBN) statistical bulletin, World Bank data (1990–2023).
Interest Rate (INTR)	The cost of borrowing or the return on savings as determined by monetary policies.	Independent	Measured as the annual average lending rate in percentage (%).	Central Bank of Nigeria (CBN) statistical bulletin (1990–2023).
Inflation Rate (INFR)	The annual percentage increase in the general price level of goods and services in an economy.	Independent	Measured as the annual percentage change in the Consumer Price Index (CPI).	National Bureau of Statistics annual reports (1990–2023).
Unemployment Rate (UNEMP)	The proportion of the labor force that is unemployed and actively seeking employment.	Independent	Measured as the annual unemployment rate in percentage (%).	National Bureau of Statistics annual reports (1990–2023).
Crude Oil Prices (COIL)	The price per barrel of crude oil in the international market, reflecting its economic value.	Independent	Measured as the annual average price of crude oil (USD per barrel).	World Bank data, Central Bank of Nigeria (CBN) statistical bulletin (1990–2023).

(Source: Author's compilation, 2025)

3.8 Method of Data Analysis

The data analysis for this study employs the Fully Modified Ordinary Least Squares (FMOLS) technique, a robust econometric method designed for estimating long-term relationships in time series data, especially when the variables are non-stationary and exhibit cointegration (Park, 1992). Before applying FMOLS, the analysis includes essential preliminary tests. To determine

the stationarity of the variables, unit root tests such as the Augmented Dickey-Fuller (ADF) test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test were conducted (Kwiatkowski et al., 1992; Dickey & Fuller, 1981). If the variables are found to be integrated of the same order, typically I(1), a cointegration test, such as the Johansen approach, was used to confirm the existence of a long-run equilibrium relationship among the variables (Johansen, 1991). Once cointegration is established, FMOLS is applied to generate efficient and unbiased estimates of the long-term coefficients, addressing potential issues of endogeneity and serial correlation in the residuals. To ensure the reliability and validity of the model, diagnostic tests such as the Durbin-Watson test for autocorrelation and the White test for heteroscedasticity is performed (White, 1980; Durbin & Watson, 1971).

CHAPTER FOUR

DATA PRESENTATION AND ANALYSES

4.1 Introduction

This chapter presents and analyzes a time series dataset from 1990 to 2023, sourced from the Central Bank of Nigeria, the National Bureau of Statistics, and the World Bank. Analysis was conducted with EViews 12, and results are displayed in tables with detailed explanations. The chapter is divided into sections on data presentation, hypothesis testing, and a discussion of the findings.

4.2 Data Presentation and Interpretation

This section begins with an initial evaluation of the study's variables through descriptive statistics and stationarity tests (e.g., unit root assessments). It then examines relationships among variables using correlation analysis and checks for long-term equilibrium with cointegration testing. To ensure the regression model's robustness, diagnostic tests are performed: the Breusch-Godfrey test for serial correlation, the Breusch-Pagan test for heteroscedasticity, and the Ramsey RESET test for model misspecification.

Table 4.1: Descriptive statistics

	MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
Mean	12492.88	0.039141	181.7388	13.88971	138.0288	0.040082	105.5794
Maximum	75202.90	0.153290	899.8900	26.00000	643.7800	0.057100	1833.000
Minimum	16.30000	-0.020400	9.300000	6.000000	15.51000	0.030700	11.03000
Std. Dev.	17235.98	0.037705	171.6162	3.849533	152.8137	0.005729	306.6552
Skewness	1.950792	0.598960	2.408737	0.653449	1.687996	1.610029	5.488691
Kurtosis	6.832550	3.819462	10.17664	4.739458	5.378394	4.883226	31.43949
Jarque-Bera	42.37362	2.984253	105.8423	6.706071	24.15995	19.71335	1316.519
Probability	0.000000	0.224894	0.000000	0.034978	0.000006	0.000052	0.000000
Observations	34	34	34	34	34	34	34

Source: Researcher's compilation (2025)

The descriptive statistics presented in Table 4.1 provide a comprehensive overview of the distributional characteristics of the selected macroeconomic and financial variables: Market Capitalization (MCAP), Gross Domestic Product Growth (GDP), Exchange Rate (EXR), Interest Rate (INTR), Inflation Rate (INFR), Unemployment Rate (UNEMP), and Crude Oil Price (COIL). A comparative analysis of these statistics reveals notable differences in central tendencies, dispersion, and distributional normality across the variables.

Starting with the mean values, Market Capitalization (MCAP) records the highest average at 12,492.88, highlighting its relatively large scale compared to the other variables. Crude Oil Price (COIL) follows with an average of 105.58, while Inflation Rate (INFR) and Exchange Rate (EXR) also report high means of 138.03 and 181.74 respectively. GDP growth and unemployment rate have relatively low mean values at 0.039 and 0.040 respectively, reflecting their nature as proportion-based indicators. In terms of central tendency, this underscores the

differing scales and units of measurement among the variables, which must be accounted for in further statistical modeling.

The standard deviations reflect considerable disparities in the variability of these variables. MCAP and COIL display high levels of dispersion, with standard deviations of 17,235.98 and 306.66 respectively, indicating high volatility or fluctuation in these domains. Similarly, INFR and EXR exhibit considerable variability (152.81 and 171.62), while GDP, UNEMP, and INTR are relatively more stable, as evidenced by their lower standard deviations of 0.0377, 0.0057, and 3.85 respectively. These disparities suggest that financial variables (e.g., MCAP and COIL) are more volatile than macroeconomic indicators such as GDP and unemployment.

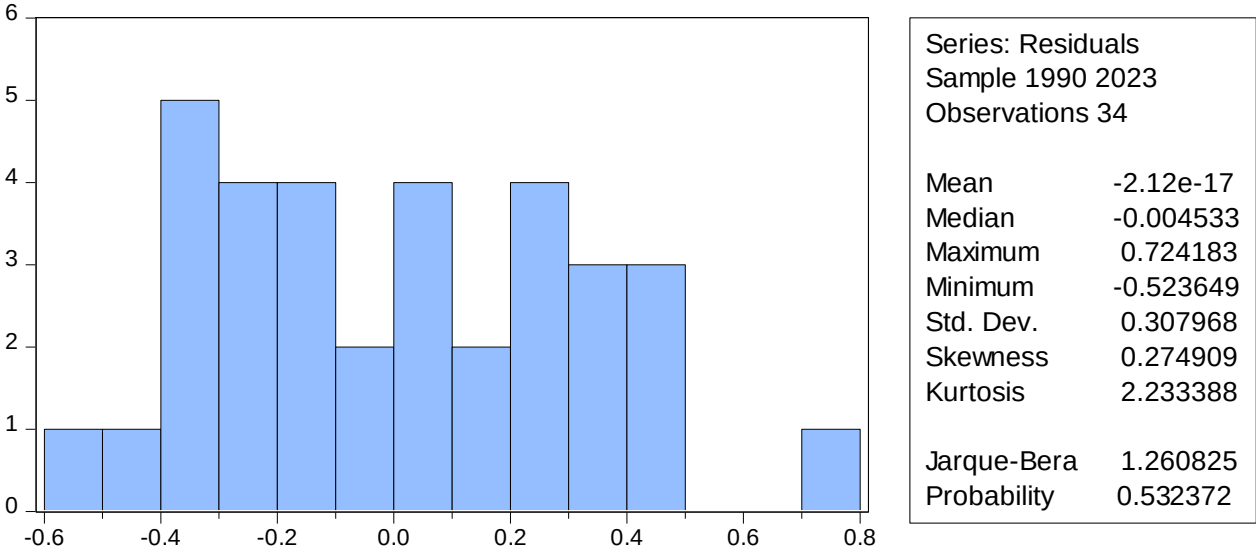
Skewness values suggest that most variables are positively skewed, indicating the presence of a long right tail in their distributions. Notably, COIL exhibits extremely high positive skewness (5.49), followed by EXR (2.41) and MCAP (1.95), implying that extreme high values are more frequent in these variables. This is further corroborated by their kurtosis values, where COIL demonstrates extreme leptokurtosis at 31.44, indicative of heavy tails and the presence of outliers or extreme events, such as oil price shocks. EXR and MCAP also have high kurtosis values at 10.18 and 6.83, respectively, suggesting non-normal distributions with peaked characteristics. Conversely, GDP, INTR, UNEMP, and INFR have skewness and kurtosis values closer to normal distribution benchmarks, though they still deviate slightly, particularly in the case of INFR (skewness = 1.69; kurtosis = 5.38).

The Jarque-Bera (JB) test for normality further supports these findings. The null hypothesis of normal distribution is rejected at the 1% level for MCAP, EXR, INTR, INFR, UNEMP, and

COIL, as their p-values are significantly below the 0.05 threshold. This confirms the presence of non-normality in the distribution of these variables. The GDP growth rate, however, has a JB probability of 0.225, indicating that it does not significantly deviate from normality and is the only variable among the set to pass the normality test.

Figure 4.1 presents the aggregate normality graph of the variables.

Figure 4.1: Aggregate Normality Graph



Source: Eviews 10

From Figure 4.1, the p.value of 0.5323 is greater that 0.05, thus it is inferred that on aggregate the variables of the study are normally distributed.

Table 4.2 Unit Root Tests

At Levels Panel 1				First Difference Panel 2		
Variable	**ADF Test Statistic**	**95% Critical ADF Value**	**Remark**	**ADF Test Statistic**	**95% Critical ADF Value**	**Remark**
MCAP	-4.750557	-2.954021	Stationary	-7.486033	-2.960411	Stationary
GDP	-3.011587	-2.954021	Stationary	-8.357632	-2.957110	Stationary
EXR	0.579374	-3.595026	Non-Stationary	-4.263213	-3.595026	Stationary
INTR	-5.066024	-3.552973	Stationary	-5.983907	-3.562882	Stationary
INFR	-2.478835	-3.552973	Non-Stationary	-9.795515	-3.580623	Stationary
UNEMP	-3.386848	-3.568379	Non-Stationary	-5.484113	-3.562882	Stationary
COIL	-5.366350	-1.951332	Stationary	-9.658510	-1.951687	Stationary

Source: Author's Computation (2025)

The results from the unit root tests as presented in Table 4.2 reveal a mixed order of integration among the variables under consideration. At level, only four variables—Market Capitalization (MCAP), Gross Domestic Product (GDP), Interest Rate (INTR), and Crude Oil Price (COIL)—exhibit stationarity, as their Augmented Dickey-Fuller (ADF) test statistics exceed the respective 95% critical values in absolute terms. Conversely, Exchange Rate (EXR), Inflation Rate (INFR), and Unemployment Rate (UNEMP) are non-stationary at level, as their test statistics fall short of the critical values. However, after first differencing, all variables become stationary, indicating that the non-stationary variables are integrated of order one, I(1), while the others are either I(0) or I(1), based on their stationarity at levels and first differences. This result suggests a combination of I(0) and I(1) series within the dataset.

Given the presence of variables with different orders of integration (I(0) and I(1)) but none integrated of order two or higher (I(2)), the use of Fully Modified Ordinary Least Squares (FMOLS) is justified. FMOLS is particularly appropriate in this context because it is designed to provide consistent and unbiased estimates in the presence of a mix of I(0) and I(1) variables, and when there is potential for endogeneity and serial correlation among regressors (Phillips & Hansen, 1990). Moreover, FMOLS adjusts for both short-run dynamics and long-run equilibrium relationships, making it suitable for panel data where cointegration among variables is suspected or established. Therefore, the results of the unit root tests provide a strong econometric rationale for adopting FMOLS in the subsequent analysis.

Table 4.3: Correlation Matrix

	MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL	VIF
MCAP	1.000000							
GDP	-0.219081	1.000000						1.565780
EXR	-0.040137	-0.108109	1.000000					1.424966
INTR	0.280084	0.191359	-0.541595*	1.000000				1.760601
INFR	0.484268*	-0.371934**	-0.121630	0.267346	1.000000			1.513696
UNEMP	-0.124548	-0.425397**	0.250743	-0.419572**	-0.046278	1.000000		1.455592
COIL	0.082672	-0.246737	-0.089677	0.080335	0.398563	-0.018301	1.000000	1.215884

* Sig @ 1%; ** Sig @ 5%

Source: Researcher's compilation (2025)

The correlation matrix reveals a mix of weak and moderate relationships among the macroeconomic variables. Stock market performance (MCAP) are moderately and significantly correlated with inflation (INFR) at 0.484, suggesting that rising inflation may be associated with higher returns. In contrast, MCAP shows weak correlations with GDP (–0.219) and exchange rate (EXR, –0.040). Notably, interest rates (INTR) exhibit a strong negative relationship with EXR (–0.542, significant at 1%), indicating that as the exchange rate depreciates, interest rates tend to decline. Additionally, GDP is moderately and significantly negatively correlated with inflation (–0.372) and unemployment (UNEMP, –0.425), while INTR also has a significant negative correlation with UNEMP (–0.420), highlighting the interconnected dynamics between these economic indicators.

Overall, the observed correlations are generally low to moderate, and the accompanying Variance Inflation Factor (VIF) values—ranging from 1.22 to 1.76—confirm that multicollinearity is not a major concern in the dataset. This diversity in relationships, alongside the minimal multicollinearity, supports a robust econometric analysis.

Table 4.4: Johansen Multivariate Cointegration Tests Results

Trace Test				***Maximum Eigenvalue Test***			
Null Hypothesis	Test Statistic	Critical Value	Prob.	Null Hypothesis	Test Statistic	Critical Value	Prob.
r = 0*	202.8525	125.6154	0.0000*	r = 0*	61.09663	46.23142	0.0007*
r ≤ 1	141.7559	95.75366	0.0000*	r ≤ 1	51.29514	40.07757	0.0019*
r ≤ 2	90.46071	69.81889	0.0005*	r ≤ 2	37.53087	33.87687	0.0175*
r ≤ 3	52.92984	47.85613	0.0155*	r ≤ 3	27.37107	27.58434	0.0532*
r ≤ 4	25.55877	29.79707	0.1424	r ≤ 4	13.19897	21.13162	0.4341
r ≤ 5	12.35980	15.49471	0.1405	r ≤ 5	9.808199	14.26460	0.2248
r ≤ 6	2.551599	3.841466	0.1102	r ≤ 6	2.551599	3.841466	0.1102

Source: Author's Compilation (2025)

The Johansen multivariate cointegration test results presented in Table 4.4 provide robust statistical evidence for the existence of long-run equilibrium relationships among the variables under investigation. Both the Trace and Maximum Eigenvalue test statistics significantly exceed their respective 5% critical values at the first four rank hypotheses ($r = 0$ to $r \leq 3$), with corresponding p-values well below the conventional threshold of 0.05. For instance, under the Trace test, the null hypothesis of no cointegrating vectors ($r = 0$) is strongly rejected, with a test statistic of 202.85 against a critical value of 125.62 ($p = 0.0000$), and similarly, the Maximum Eigenvalue test statistic of 61.10 surpasses its critical value of 46.23 ($p = 0.0007$). These results consistently support the rejection of the null hypotheses up to $r \leq 3$, suggesting the presence of at least four cointegrating relationships among the variables in the system.

Beyond $r \leq 3$, both test statistics fall below the critical values and have p-values above 0.05, indicating that additional cointegrating vectors beyond the fourth are not statistically significant. The convergence of both the Trace and Maximum Eigenvalue tests on the same conclusion reinforces the robustness of the finding. The existence of multiple cointegrating relationships implies a stable, long-run association among the macroeconomic and financial variables, such that short-term deviations from equilibrium are likely to self-correct over time. In this context, the confirmation of cointegration further justifies the application of the Fully Modified Ordinary Least Squares (FMOLS) estimation technique. FMOLS is particularly suited for cointegrated systems as it corrects for serial correlation and endogeneity, thereby ensuring consistent and efficient parameter estimates in the presence of long-run equilibrium relationships (Phillips & Hansen, 1990).

Table 4.5: Diagnostics Test: Serial, Heteroskedasticity, and Specification Tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	4.018235	Prob. F(2,25)	0.0307
Obs*R-squared	8.270860	Prob. Chi-Square(2)	0.0160
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.369842	Prob. F(6,27)	0.8916
Obs*R-squared	2.582145	Prob. Chi-Square(6)	0.8592
Ramsey RESET Test: Specification: MCAP GDP EXR INTR INFR UNEMP COIL C			
t-statistic	1.190828	26	0.2445
F-statistic	1.418071	(1, 26)	0.2445
Likelihood ratio	1.805596	1	0.1790

Source: Researcher's compilation (2025)

The diagnostic tests reported in Table 4.5 assess the robustness and reliability of the estimated regression model by evaluating the presence of serial correlation, heteroskedasticity, and model misspecification. The Breusch-Godfrey Serial Correlation LM test yields an F-statistic of 4.018 ($p = 0.0307$) and an Obs*R-squared value of 8.271 ($p = 0.0160$), both of which are statistically significant at the 5% level. This indicates the presence of serial correlation in the residuals, suggesting that the error terms are not independent across time. Serial correlation can bias standard errors and thus lead to misleading inferences if not addressed. Hence, robust standard errors or dynamic modeling techniques may be necessary to correct for this issue.

Conversely, the Breusch-Pagan-Godfrey test for heteroskedasticity reports an F-statistic of 0.370 ($p = 0.8916$) and an Obs*R-squared value of 2.582 ($p = 0.8592$), both of which are highly insignificant. This implies that the variance of the residuals is constant across observations, satisfying the homoskedasticity assumption. Additionally, the Ramsey RESET test for model

specification shows an F-statistic of 1.418 (p = 0.2445) and a likelihood ratio statistic of 1.806 (p = 0.1790), neither of which is statistically significant. This indicates that the functional form of the model is correctly specified and that no important variable has been omitted. Therefore, despite the presence of serial correlation, the absence of heteroskedasticity and model misspecification provides partial validation of the model's reliability. Nevertheless, the detection of autocorrelation further reinforces the appropriateness of using estimation techniques such as the Fully Modified Ordinary Least Squares (FMOLS), which adjusts for both serial correlation and endogeneity, thereby ensuring consistent and efficient estimators in the presence of long-run cointegration (Phillips & Hansen, 1990).

4.2.1 Multivariate Analysis

The multivariate analysis is carried out using the FMOLS. The result is present in Table 4.6

Table 4.6: FMOLS Output

Dependent Variable: MCAP
Method: Fully Modified Least Squares (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-26517.40	13550.98	-1.956861	0.0612
EXR	-4.180978	9.137878	-0.457544	0.6511
INTR	-215.1763	116.2828	-1.850456	0.0756
INFR	119.6867	10.63623	11.25273	0.0000
UNEMP	-386779.8	90848.19	-4.257430	0.0002
COIL	-0.223941	1.351764	-0.165666	0.8697
C	16358.46	4748.664	3.444856	0.0020
R-squared	0.980939			
Adjusted R-squared	0.976540			

Source: Author's Computation (2025) ***Using E-views 10***

The FMOLS estimation results in Table 4.6 reveal insightful long-run relationships between market capitalization (MCAP) and a set of macroeconomic variables: GDP growth, exchange rate (EXR), interest rate (INTR), inflation rate (INFR), unemployment rate (UNEMP), and crude oil price (COIL). The model demonstrates a very high explanatory power, with an R-squared of 0.981 and an adjusted R-squared of 0.977, suggesting that approximately 98% of the variations in MCAP are explained by the included regressors. Among the explanatory variables, inflation (INFR) and unemployment (UNEMP) emerge as statistically significant determinants of market capitalization. Specifically, the coefficient of INFR is positive and highly significant ($\beta = 119.69$, $p < 0.001$), indicating that higher inflation is associated with an increase in market capitalization in the long run—possibly reflecting inflationary gains in nominal stock prices or expansionary monetary conditions boosting asset valuations. Conversely, UNEMP exerts a strong and statistically significant negative effect on MCAP ($\beta = -386{,}779.8$, $p < 0.001$), implying that rising unemployment weakens market confidence and reduces stock market activity and investment flows.

Other variables exhibit expected directional effects but lack statistical significance at the 5% level. GDP growth has a negative coefficient ($\beta = -26{,}517.40$, $p = 0.0612$), marginally significant at the 10% level, which may appear counterintuitive. However, in emerging or volatile economies, stock market performance may be more responsive to short-term capital flows or speculative behavior than to real economic growth (see Levine & Zervos, 1998). Similarly, the interest rate (INTR) shows a negative impact ($\beta = -215.18$, $p = 0.0756$), aligning with the theoretical expectation that higher interest rates discourage equity investment by increasing the

opportunity cost of capital. Meanwhile, the effects of exchange rate (EXR) and crude oil price (COIL) are statistically insignificant, with p-values of 0.6511 and 0.8697 respectively, suggesting that these variables may not play a substantial role in explaining market capitalization dynamics in the long run within the context of the studied economy. The constant term is positive and significant, indicating a strong base level of MCAP when other factors are held constant. Overall, the strength of the model fit and the presence of statistically significant relationships—particularly with inflation and unemployment—validate the FMOLS technique's capability in addressing potential endogeneity and serial correlation issues, ensuring efficient and robust long-run estimates.

4.3 Hypotheses Testing

In this study, the hypotheses were evaluated at a 5% level of significance, meaning that a p-value less than or equal to 0.05 indicates rejection of the null hypothesis, while a p-value greater than 0.05 leads to acceptance of the null hypothesis. Table 4.6 presents the results of the analysis, which are used to assess each hypothesis. Below is an extensive discussion of the hypotheses, their respective tests, and the decisions based on the results:

Ho_1: The inflation rate has no significant effect on stock market performance in Nigeria. Based on the FMOLS output in Table 4.6, the p-value for inflation rate (INFR) is 0.0000, which is less than the 0.05 significance threshold. Therefore, we reject the null hypothesis (H_{01}) and accept the alternative that the inflation rate has a significant effect on stock market performance in Nigeria. The positive coefficient also suggests that inflation is associated with an increase in market capitalization in the long run.

Ho_2: There is no significant relationship between unemployment rate and stock market performance in Nigeria.

The p-value associated with the unemployment rate (UNEMP) is 0.0002, which is well below the 0.05 level of significance. Consequently, we reject the null hypothesis (H_{02}) and conclude that there is a statistically significant relationship between the unemployment rate and stock market performance in Nigeria. The relationship is negative, implying that higher unemployment adversely affects market capitalization.

Ho_3: GDP growth has no significant influence on stock market performance in Nigeria.

The p-value for GDP growth is 0.0612, which is greater than 0.05. Thus, we accept the null hypothesis (H_{03}), indicating that GDP growth does not have a statistically significant influence on stock market performance in Nigeria at the 5% level, though it is marginally significant at the 10% level.

Ho_4: Crude oil prices have no significant impact on stock market performance in Nigeria.

The crude oil price (COIL) has a p-value of 0.8697, which is far above the 0.05 significance level. Accordingly, we accept the null hypothesis (H_{04}) and conclude that crude oil prices do not have a statistically significant impact on stock market performance in Nigeria.

Ho_5: Interest rates have no significant effect on stock market performance in Nigeria.

Interest rate (INTR) shows a p-value of 0.0756, which is above the 0.05 threshold. Therefore, we accept the null hypothesis (H_{05}), concluding that interest rates do not have a significant effect on stock market performance in Nigeria at the 5% level, although the result suggests a weak significance at the 10% level.

Ho_6: Exchange rate has no significant effect on stock market performance in Nigeria. The exchange rate (EXR) returns a p-value of 0.6511, which is substantially greater than 0.05. Thus, we accept the null hypothesis (H_{06}) and infer that the exchange rate has no statistically significant effect on stock market performance in Nigeria.

4.4 Discussion of Findings

Based on the FMOLS output in Table 4.6, six macroeconomic variables were tested for their long-run influence on stock market performance in Nigeria (proxied by market capitalization). The findings are as follows: inflation and unemployment have statistically significant effects, while GDP growth, interest rate, exchange rate, and crude oil price are statistically insignificant at the 5% level. Below is a detailed discussion of each finding, evaluated against the backdrop of academic literature:

4.4.1. Inflation Rate and Stock Market Performance

The analysis shows that inflation has a positive and statistically significant effect on stock market performance in Nigeria, with a p-value of 0.0000. This aligns with the Fisher hypothesis, which posits that nominal stock returns should adjust to reflect inflation, making stocks a hedge against inflation. Studies such as Ogbebor et al. (2021) support this result, showing a long-term positive relationship between inflation and stock prices in Nigeria. Similarly, Abdullahi (2020) found that inflation positively affects stock prices in Nigeria's banking sector, reinforcing the notion that nominal asset prices rise with general price levels. However, the finding contradicts others like Pole and Cavusoglu (2021) and Mwangi and Mutuku (2022), who found a negative effect of inflation on stock returns in Nigeria and Kenya, respectively, highlighting regional and temporal

differences in inflationary dynamics and investor sentiment. Additionally, Jelilov et al. (2020) noted that during times of crisis, such as the COVID-19 pandemic, inflation's impact may be destabilizing due to investor uncertainty. Thus, the result of this study is more consistent with periods of relative economic stability where inflation expectations are priced into the market.

4.4.2. Unemployment Rate and Stock Market Performance

The unemployment rate exerts a significantly negative impact on stock market performance, with a p-value of 0.0002, suggesting that higher unemployment diminishes market capitalization. This result is consistent with the theoretical expectation that unemployment reflects lower economic productivity and reduced household income, which diminishes consumption, corporate earnings, and ultimately stock values. While unemployment has not been the primary focus in many African stock market studies, related macroeconomic analyses such as Ali et al. (2020) and Bhuiyan and Chowdhury (2020) indicate that economic distress indicators like joblessness can indirectly depress market confidence and returns. Furthermore, the negative association aligns with the findings of Baranidharan and Dhivya (2020), who argued that real sector disruptions adversely affect stock performance in India, even if not directly measurable in the short run. Therefore, this study contributes novel evidence confirming the long-run structural link between unemployment and stock market performance in Nigeria, highlighting the stock market's sensitivity to labor market conditions.

4.4.3. GDP Growth and Stock Market Performance

Interestingly, GDP growth exhibits a negative but statistically insignificant effect on stock market performance ($p = 0.0612$), a finding that runs counter to conventional economic theory and much of the existing literature. For instance, Usman and Ibrahim (2022) and Rahman and Li (2021) found that GDP growth significantly and positively affects stock markets in Nigeria and China, respectively, suggesting that economic expansion leads to improved corporate earnings and investor optimism. Similarly, Babar et al. (2024) observed a strong positive link between GDP and stock returns in emerging Asian economies. The insignificant and negative coefficient in this study may be due to structural issues in Nigeria's economy, such as the decoupling of real economic growth from stock market dynamics, weak investor confidence, or the dominance of speculative trading over fundamentals. Ordue et al. (2024) also found GDP to be insignificant in the short run, supporting the idea that in Nigeria's context, GDP growth may not immediately translate into stock market gains. This divergence suggests that the Nigerian stock market may be influenced more by external flows and sectoral dynamics than macroeconomic fundamentals.

4.4.4. Crude Oil Prices and Stock Market Performance

Crude oil price has an insignificant and negative effect on stock market performance ($p = 0.8697$), which contradicts the expected positive relationship, particularly given Nigeria's status as a major oil-exporting country. This finding stands in contrast to Okafor and Hassan (2024), who reported that fluctuations in global oil prices significantly influence Nigeria's stock market returns, often increasing market volatility. Similarly, Bello and Adeyemi (2022) found that rising oil prices tend to boost stock market performance due to increased government revenue and

foreign exchange inflows. However, the current result supports the findings of Ali et al. (2020), who noted that macroeconomic variables like oil prices may not significantly influence stock return volatility in Sub-Saharan Africa due to structural inefficiencies or weak transmission mechanisms. The insignificance here may also reflect declining oil-sector dominance in the Nigerian capital market or investors' growing disillusionment with oil revenue management and its translation into economic growth. This underlines the need for further diversification of the economy to reduce reliance on oil for market performance.

4.4.5. Interest Rate and Stock Market Performance

The interest rate has a negative but statistically insignificant impact on market capitalization ($p = 0.0756$), consistent with theoretical expectations but not strong enough to reject the null hypothesis at the 5% level. Typically, higher interest rates reduce stock market investment by increasing the cost of capital and making fixed-income instruments more attractive. This view is supported by Abdullahi (2020) and Adebisi and Yusuf (2024), who both found significant negative effects of interest rates on stock returns in Nigeria. However, the insignificance observed in this study is in line with Singh and Patel (2023), who reported that interest rates do not significantly influence stock returns in India. The weak statistical power could stem from interest rate pass-through inefficiencies in Nigeria or a low sensitivity of the market to monetary policy changes. Nevertheless, the consistent negative sign across multiple studies suggests that even if not statistically strong, interest rates are a relevant factor investors consider, especially over longer horizons or during policy tightening cycles.

4.4.6. Exchange Rate and Stock Market Performance

Finally, the exchange rate has a negative and statistically insignificant relationship with stock market performance ($p = 0.6511$). This result aligns with several studies, including Okonkwo and Eze (2023) and Olawale and Adebayo (2023), which found that exchange rate fluctuations have no significant long-run effect on stock market returns in Nigeria. However, it contrasts with findings from Okere, Muoneke, and Onuoha (2021) and Chen and Zhang (2021), who established a negative and significant relationship between currency depreciation and stock market performance, particularly in export-sensitive or import-dependent economies. The insignificance in this context may be explained by Nigeria's heavily segmented foreign exchange market, inconsistent forex policies, or capital controls, which dampen the impact of exchange rate changes on investor behavior. Moreover, stock market participants may factor in exchange rate risks in their pricing strategies, thereby diluting its observable effect in econometric models. This finding supports the argument of Ali et al. (2020) that structural and institutional weaknesses in Sub-Saharan African markets limit the responsiveness of stock returns to macroeconomic shifts.

4.5 Policy Implication- 1 paragraph

The findings of this study bear important policy implications for macroeconomic and financial governance in Nigeria. The significant impact of inflation and unemployment on stock market performance underscores the critical need for coordinated fiscal and monetary policies aimed at maintaining price stability and promoting employment. Policymakers, particularly the Central Bank of Nigeria, should prioritize inflation-targeting strategies that do not crowd out private

investment while ensuring that inflation expectations are well-anchored to sustain investor confidence. Additionally, labor market reforms and active job creation policies are essential to reducing unemployment, thereby fostering a more stable and responsive capital market. The insignificance of GDP, exchange rate, interest rate, and crude oil price in affecting market capitalization suggests a structural disconnect between macroeconomic fundamentals and financial market behavior, highlighting the necessity for deeper financial sector reforms, improved transmission mechanisms, and stronger institutional frameworks to enhance the sensitivity of the stock market to economic fundamentals and increase its role in capital formation.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

As the study draws to a close, this concluding chapter presents a comprehensive summary of the key findings, the overall conclusions derived from the analysis, and practical recommendations aimed at addressing the issues explored in the research.

5.2 Summary of Findings

This research investigated the impact of macroeconomic variables on Stock market performance in Nigeria over the period 1990 to 2023, utilizing data availability as the basis for the time frame. To achieve the study's objectives, six hypotheses were formulated and analyzed through the application of the fully modified ordinary least squares (FMOLS) technique, a robust method suited for exploring long-run relationships. Based on the analysis conducted, the following findings were made:

1. The analysis shows that inflation has a positive and statistically significant effect on stock market performance in Nigeria, with a p-value of 0.0000.
2. The unemployment rate exerts a significantly negative impact on stock market performance, with a p-value of 0.0002, suggesting that higher unemployment diminishes market capitalization.

3. Interestingly, GDP growth exhibits a negative but statistically insignificant effect on stock market performance (p = 0.0612), a finding that runs counter to conventional economic theory and much of the existing literature.
4. Crude oil price has an insignificant and negative effect on stock market performance (p = 0.8697), which contradicts the expected positive relationship, particularly given Nigeria's status as a major oil-exporting country.
5. The interest rate has a negative but statistically insignificant impact on market capitalization (p = 0.0756), consistent with theoretical expectations but not strong enough to reject the null hypothesis at the 5% level.
6. Finally, the exchange rate has a negative and statistically insignificant relationship with stock market performance (p = 0.6511).

5.3 Conclusion

This study examined the long-run impact of selected macroeconomic variables namely inflation, unemployment, GDP growth, interest rate, exchange rate, and crude oil price on stock market performance in Nigeria from 1990 to 2023, using the Fully Modified Ordinary Least Squares (FMOLS) technique. The findings revealed that inflation positively and significantly influences stock market performance, while unemployment has a significant negative effect, highlighting the sensitivity of the Nigerian stock market to domestic price levels and labor market conditions. In contrast, GDP growth, interest rate, exchange rate, and crude oil price were found to have statistically insignificant effects, suggesting potential structural inefficiencies and weak transmission mechanisms within the economy. These results underscore the need for targeted

macroeconomic policies that address inflation control and unemployment reduction, as well as reforms to strengthen the link between economic fundamentals and financial market outcomes.

5.4 Recommendations

Based on the findings of the study, the following recommendations were made;

1. Inflation Control Measures: Given the significant and positive effect of inflation on stock market performance, policymakers—particularly the Central Bank of Nigeria—should strengthen inflation-targeting frameworks. This includes enhancing monetary policy transparency, adjusting interest rates in response to inflation trends, and managing money supply effectively to stabilize price levels and maintain investor confidence in the equity market.
2. Employment Generation Strategies: Although unemployment was not found to significantly influence stock market performance in this study, its negative and substantial effect highlights its broader macroeconomic implications. Government authorities should implement inclusive job creation programs, invest in skills development, and support labor-intensive industries. Improving labor market outcomes may enhance household income, consumer spending, and business growth, thereby creating a more supportive environment for capital market development.
3. Promoting Quality Economic Growth: The statistically insignificant influence of GDP growth on the stock market suggests that aggregate growth alone is insufficient to drive market performance. Policymakers should focus on promoting inclusive and sustainable growth by encouraging innovation, improving infrastructure, and supporting sectors with

strong linkages to the financial markets. Structural transformation and productivity-led growth may yield more meaningful impacts on investor activity and market capitalization.

4. Economic Diversification: Despite crude oil prices showing no significant effect on the stock market, Nigeria's high dependence on oil revenue remains a structural vulnerability. The government should intensify efforts to diversify the economy by investing in agriculture, manufacturing, ICT, and other non-oil sectors. Reducing reliance on volatile oil markets would not only enhance economic resilience but also foster a more stable and predictable environment for capital market investments.
5. Broader Monetary and Fiscal Coordination: The insignificance of interest rates in the model implies that interest rate policies alone may be insufficient to stimulate stock market growth. It is recommended that monetary authorities work alongside fiscal policymakers to implement comprehensive economic strategies, including tax reforms, capital market incentives, and infrastructure financing, which together could have a more substantial effect on market development and investor behavior.
6. Exchange Rate Stability and Foreign Investment: Although exchange rate fluctuations were statistically insignificant, stable exchange rates are crucial for investor certainty and cross-border capital flows. Policymakers should maintain a transparent and market-driven exchange rate regime, supported by adequate foreign reserves and sound fiscal management. Stability in the foreign exchange market enhances the attractiveness of

Nigerian assets to both domestic and foreign investors, indirectly supporting stock market growth over the long term.

5.5 Suggestions for Further Studies

Given the scope and methodological approach of this study, future research could extend the analysis by incorporating additional macroeconomic variables that may offer deeper insights into stock market dynamics in Nigeria. Variables such as money supply, foreign direct investment, fiscal deficits, and industrial production could be included to examine their long-run and short-run impacts using advanced econometric models such as the Dynamic ARDL, Structural VAR, or Quantile Regression models. Furthermore, disaggregating the stock market by sectors (e.g., banking, manufacturing, telecommunications) could help identify industry-specific sensitivities to macroeconomic fluctuations, providing more targeted insights for investors and policymakers.

Moreover, future studies could adopt a comparative regional or cross-country framework, examining how macroeconomic variables influence stock market performance across multiple Sub-Saharan African or emerging market economies. Such comparative analyses would offer valuable insights into the structural similarities or differences across markets, enhancing the generalizability of findings. Additionally, researchers may explore the role of external shocks such as global financial crises, pandemics, or commodity price collapses on the macroeconomic-stock market nexus, potentially employing high-frequency data and non-linear models to capture asymmetries and volatility effects more accurately.

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Appendices

Appendix 1: Data for Analysis

YEAR	STOCK MARKET PERFORMANCE (MCAP) (₦' Billion)	GDP IN BILLION	GDP GROWTH	EXCHANGE RATE (DOLLAR TO NAIRA)	INTEREST RATE (MPR)	INFLATION RATE	UNEMPLOYME. RATE	CRUDEOILPRICE BONNY LIGHT US$
1990	16.3	21680.2	0.00454	10.7	18.5	15.51	0.0374	31.65
1991	23.1	21757.9	0.00358	9.3	15.5	16.6	0.0374	20.4
1992	31.2	22765.6	0.04631	9.91	17.5	17.69	0.0371	19.35
1993	47.5	22302.2	-0.0204	21.9	26	18.78	0.0392	17.24
1994	66.3	21897.5	-0.0182	56.8	13.5	19.87	0.0394	1833
1995	180.4	21881.6	-0.0007	84.58	13.5	20.96	0.0404	19.35
1996	285.8	22799.7	0.04196	79.6	13.5	23.97	0.0394	23.82
1997	281.9	23231.1	0.01892	74.63	13.5	26.41	0.0374	21.06
1998	262.6	24075.2	0.03633	84.37	13.5	29.56	0.0384	11.03
1999	300	24215.8	0.00584	92.53	18	29.63	0.039	22.35
2000	472.3	25430.4	0.05016	109.55	14	33.93	0.0387	33.36
2001	662.5	26935.3	0.05918	113.45	20.5	39.53	0.0383	29.92
2002	764.9	31064.3	0.15329	126.9	16.5	44.34	0.0362	29.82
2003	1359.3	33346.6	0.07347	137	15	54.89	0.0359	32.67
2004	2112.5	36431.4	0.09251	132.85	15	60.39	0.0356	44.72
2005	2900.06	38777	0.06439	129	13	67.37	0.0369	61.8
2006	5120.9	41126.7	0.06059	127	10	73.13	0.0372	64.7
2007	13181.7	43837.4	0.06591	116.8	9.5	77.93	0.0377	93.4
2008	9562.97	46802.8	0.06765	131.25	9.75	89.66	0.0377	45.87
2009	7030.84	50564.3	0.08037	148.1	6	102.15	0.0375	75.11
2010	9918.21	55469.4	0.09701	148.81	6.25	114.22	0.0374	92.79
2011	10275.3	58180.4	0.04887	156.7	12	125.97	0.0377	111.46
2012	14800.9	60670.1	0.04279	155.76	12	141.06	0.0376	114.49
2013	19077.4	63942.9	0.05394	155.74	12	152.29	0.0371	112.75
2014	16875.1	67977.5	0.0631	168	13	164.44	0.039	63.28
2015	17003.4	69780.7	0.02653	197	11	180.15	0.0414	37.8
2016	16185.7	68652.4	-0.0162	305	14	213.56	0.045	53.48

YEAR	STOCK MARKET PERFORMANCE (MCAP) (₦' Billion)	GDP IN BILLION	GDP GROWTH	EXCHANGE RATE (DOLLAR TO NAIRA)	INTEREST RATE (MPR)	INFLATION RATE	UNEMPLOYME. RATE	CRUDEOILPRICE BONNY LIGHT US$
2017	21128.9	69205.7	0.00806	306	14	246.38	0.0483	65.11
2018	21904	70536.4	0.01923	307	14	274.57	0.0507	62
2019	25890.2	72094.1	0.02208	307	13.5	307.47	0.0521	68.56
2020	38589.6	70800.5	-0.0179	381	11.5	355.91	0.0571	50.33
2021	42054.5	73382.8	0.03647	435	11.5	411.52	0.0539	65.41
2022	51188.9	75769	0.03252	460	16.5	499.36	0.038	82.5
2023	75202.9	77936.1	0.0286	899.89	18.75	643.78	0.0307	79.12

Appendix 2: Eviews Output

	MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
Mean	12492.88	0.039141	181.7388	13.88971	138.0288	0.040082	105.5794
Median	6075.870	0.039215	132.0500	13.50000	75.53000	0.037850	51.90500
Maximum	75202.90	0.153290	899.8900	26.00000	643.7800	0.057100	1833.000
Minimum	16.30000	-0.020400	9.300000	6.000000	15.51000	0.030700	11.03000
Std. Dev.	17235.98	0.037705	171.6162	3.849533	152.8137	0.005729	306.6552
Skewness	1.950792	0.598960	2.408737	0.653449	1.687996	1.610029	5.488691
Kurtosis	6.832550	3.819462	10.17664	4.739458	5.378394	4.883226	31.43949
Jarque-Bera	42.37362	2.984253	105.8423	6.706071	24.15995	19.71335	1316.519
Probability	0.000000	0.224894	0.000000	0.034978	0.000006	0.000052	0.000000
Sum	424758.1	1.330800	6179.120	472.2500	4692.980	1.362800	3589.700
Sum Sq. Dev.	9.80E+09	0.046915	971920.4	489.0239	770616.8	0.001083	3103234.
Observations	34	34	34	34	34	34	34

Covariance Analysis: Ordinary
Date: 18/09/25 Time: 08:06
Sample: 1990 2023
Included observations: 34

Covariance
Correlation
t-Statistic
Probability

	MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
MCAP	0.132842 1.000000 ----- -----						
GDP	-0.002966	0.001380					

	-0.219081	1.000000					
	-1.270163	-----					
	0.2132	-----					
EXR	-2.473371	-0.678902	28585.89				
	-0.040137	-0.108109	1.000000				
	-0.227232	-0.615160	-----				
	0.8217	0.5428	-----				
INTR	0.004051	0.000282	-3.633807	0.001575			
	0.280084	0.191359	-0.541595	1.000000			
	1.650455	1.102873	-3.644516	-----			
	0.1086	0.2783	0.0009	-----			
INFR	0.027666	-0.002165	-3.223384	0.001663	0.024569		
	0.484268	-0.371934	-0.121630	0.267346	1.000000		
	3.131067	-2.266582	-0.693189	1.569468	-----		
	0.0037	0.0303	0.4932	0.1264	-----		
UNEMP	-0.000256	-8.92E-05	0.239275	-9.40E-05	-4.09E-05	3.19E-05	
	-0.124548	-0.425397	0.250743	-0.419572	-0.046278	1.000000	
	-0.710078	-2.658994	1.465222	-2.614744	-0.262066	-----	
	0.4828	0.0121	0.1526	0.0135	0.7950	-----	
COIL	9.103234	-2.768679	-4580.610	0.963122	18.87386	-0.031205	91271.60
	0.082672	-0.246737	-0.089677	0.080335	0.398563	-0.018301	1.000000
	0.469271	-1.440283	-0.509340	0.455914	2.458306	-0.103541	-----
	0.6421	0.1595	0.6140	0.6515	0.0196	0.9182	-----

Null Hypothesis: MCAP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.750557	0.0005
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MCAP)
Method: Least Squares
Date: 18/09/25 Time: 08:07
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP(-1)	-0.842895	0.177431	-4.750557	0.0000
C	0.186050	0.075624	2.460195	0.0197

R-squared	0.421294	Mean dependent var	0.000113
Adjusted R-squared	0.402626	S.D. dependent var	0.480938
S.E. of regression	0.371717	Akaike info criterion	0.917325
Sum squared resid	4.283384	Schwarz criterion	1.008022
Log likelihood	-13.13586	Hannan-Quinn criter.	0.947842
F-statistic	22.56779	Durbin-Watson stat	1.930493
Prob(F-statistic)	0.000044		

Null Hypothesis: D(MCAP) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.486033	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MCAP,2)
Method: Least Squares
Date: 18/09/25 Time: 09:28

Sample (adjusted): 1993 2023
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAP(-1))	-1.992910	0.266217	-7.486033	0.0000
D(MCAP(-1),2)	0.523723	0.164448	3.184726	0.0035
C	-0.008653	0.075420	-0.114732	0.9095

R-squared	0.740859	Mean dependent var	0.017605
Adjusted R-squared	0.722349	S.D. dependent var	0.795928
S.E. of regression	0.419395	Akaike info criterion	1.191761
Sum squared resid	4.924992	Schwarz criterion	1.330534
Log likelihood	-15.47229	Hannan-Quinn criter.	1.236997
F-statistic	40.02457	Durbin-Watson stat	2.123334
Prob(F-statistic)	0.000000		

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.011587	0.0441
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 18/09/25 Time: 09:28
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

GDP(-1)	-0.440403	0.146236	-3.011587	0.0051
C	0.018109	0.007977	2.270234	0.0303

R-squared	0.226347	Mean dependent var	0.000729
Adjusted R-squared	0.201391	S.D. dependent var	0.035397
S.E. of regression	0.031633	Akaike info criterion	-4.010567
Sum squared resid	0.031019	Schwarz criterion	-3.919870
Log likelihood	68.17436	Hannan-Quinn criter.	-3.980050
F-statistic	9.069657	Durbin-Watson stat	2.274484
Prob(F-statistic)	0.005136		

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.357632	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 18/09/25 Time: 09:28
Sample (adjusted): 1992 2023
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.399340	0.167433	-8.357632	0.0000
C	0.001131	0.005927	0.190816	0.8500

R-squared	0.699549	Mean dependent var	-9.24E-05
Adjusted R-squared	0.689534	S.D. dependent var	0.060153

S.E. of regression	0.033517	Akaike info criterion	-3.893082
Sum squared resid	0.033701	Schwarz criterion	-3.801474
Log likelihood	64.28932	Hannan-Quinn criter.	-3.862717
F-statistic	69.85001	Durbin-Watson stat	1.994899
Prob(F-statistic)	0.000000		

Null Hypothesis: EXR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 7 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.579374	0.9990
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXR)
Method: Least Squares
Date: 18/09/25 Time: 09:30
Sample (adjusted): 1998 2023
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR(-1)	0.391062	0.674974	0.579374	0.5704
D(EXR(-1))	-0.396560	0.734156	-0.540158	0.5965
D(EXR(-2))	-0.585441	0.743997	-0.786887	0.4428
D(EXR(-3))	-0.278412	0.732349	-0.380163	0.7088
D(EXR(-4))	0.106395	0.665794	0.159803	0.8750
D(EXR(-5))	0.085184	0.652624	0.130525	0.8978
D(EXR(-6))	-1.062477	0.636353	-1.669635	0.1144
D(EXR(-7))	3.005511	0.751674	3.998423	0.0010
C	-49.38495	31.56522	-1.564537	0.1373
@TREND("1990")	-0.051076	5.070143	-0.010074	0.9921

R-squared	0.855164	Mean dependent var	31.74077
Adjusted R-squared	0.773693	S.D. dependent var	87.27631
S.E. of regression	41.51883	Akaike info criterion	10.57389
Sum squared resid	27581.01	Schwarz criterion	11.05778
Log likelihood	-127.4606	Hannan-Quinn criter.	10.71324
F-statistic	10.49661	Durbin-Watson stat	1.849738
Prob(F-statistic)	0.000035		

Null Hypothesis: INTR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.066024	0.0013
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTR)
Method: Least Squares
Date: 18/09/25 Time: 09:31
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR(-1)	-0.906939	0.179024	-5.066024	0.0000
C	0.201828	0.042563	4.741889	0.0000
@TREND("1990")	-0.002320	0.000746	-3.112118	0.0041

R-squared	0.462183	Mean dependent var	-0.003433
Adjusted R-squared	0.426329	S.D. dependent var	0.040233
S.E. of regression	0.030473	Akaike info criterion	-4.057464
Sum squared resid	0.027858	Schwarz criterion	-3.921418

Log likelihood	69.94815	Hannan-Quinn criter.	-4.011688
F-statistic	12.89055	Durbin-Watson stat	1.935824
Prob(F-statistic)	0.000091		

Null Hypothesis: D(INTR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.983907	0.0001
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTR,2)
Method: Least Squares
Date: 18/09/25 Time: 09:32
Sample (adjusted): 1993 2023
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTR(-1))	-1.716817	0.286906	-5.983907	0.0000
D(INTR(-1),2)	0.233704	0.165339	1.413482	0.1689
C	-0.015417	0.013302	-1.158973	0.2566
@TREND("1990")	0.000465	0.000661	0.703602	0.4877

R-squared	0.765135	Mean dependent var	-0.003055
Adjusted R-squared	0.739038	S.D. dependent var	0.064413
S.E. of regression	0.032905	Akaike info criterion	-3.870475
Sum squared resid	0.029234	Schwarz criterion	-3.685445
Log likelihood	63.99237	Hannan-Quinn criter.	-3.810160
F-statistic	29.31981	Durbin-Watson stat	1.589961
Prob(F-statistic)	0.000000		

Null Hypothesis: INFR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.478835	0.3357
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFR)
Method: Least Squares
Date: 18/09/25 Time: 09:32
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFR(-1)	-0.325438	0.131287	-2.478835	0.0190
C	0.107444	0.055227	1.945519	0.0611
@TREND("1990")	-0.002554	0.002188	-1.167012	0.2524

R-squared	0.170383	Mean dependent var	0.005242
Adjusted R-squared	0.115075	S.D. dependent var	0.115251
S.E. of regression	0.108417	Akaike info criterion	-1.519161
Sum squared resid	0.352626	Schwarz criterion	-1.383115
Log likelihood	28.06615	Hannan-Quinn criter.	-1.473385
F-statistic	3.080624	Durbin-Watson stat	1.478591
Prob(F-statistic)	0.060697		

Null Hypothesis: D(INFR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 4 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.795515	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFR,2)
Method: Least Squares
Date: 18/09/25 Time: 09:33
Sample (adjusted): 1996 2023
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFR(-1))	-2.601148	0.265545	-9.795515	0.0000
D(INFR(-1),2)	1.246221	0.195187	6.384760	0.0000
D(INFR(-2),2)	0.931594	0.161664	5.762527	0.0000
D(INFR(-3),2)	0.720271	0.122010	5.903393	0.0000
D(INFR(-4),2)	0.376874	0.104426	3.609012	0.0016
C	-0.164584	0.031247	-5.267256	0.0000
@TREND("1990")	0.006979	0.001446	4.827306	0.0001

R-squared	0.879979	Mean dependent var	-0.003571
Adjusted R-squared	0.845688	S.D. dependent var	0.144091
S.E. of regression	0.056603	Akaike info criterion	-2.693209
Sum squared resid	0.067281	Schwarz criterion	-2.360158
Log likelihood	44.70492	Hannan-Quinn criter.	-2.591392
F-statistic	25.66164	Durbin-Watson stat	1.079819
Prob(F-statistic)	0.000000		

Null Hypothesis: UNEMP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.386848	0.0722
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMP)
Method: Least Squares
Date: 18/09/25 Time: 09:33
Sample (adjusted): 1994 2023
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNEMP(-1)	-0.575304	0.169864	-3.386848	0.0024
D(UNEMP(-1))	1.080671	0.184254	5.865107	0.0000
D(UNEMP(-2))	-0.200207	0.427204	-0.468644	0.6436
D(UNEMP(-3))	1.236175	0.469962	2.630373	0.0147
C	0.020862	0.006274	3.325294	0.0028
@TREND("1990")	8.22E-05	7.09E-05	1.159843	0.2575

R-squared	0.618969	Mean dependent var	-0.000283
Adjusted R-squared	0.539587	S.D. dependent var	0.003688
S.E. of regression	0.002503	Akaike info criterion	-8.965979
Sum squared resid	0.000150	Schwarz criterion	-8.685740
Log likelihood	140.4897	Hannan-Quinn criter.	-8.876328
F-statistic	7.797384	Durbin-Watson stat	2.144470
Prob(F-statistic)	0.000177		

Null Hypothesis: D(UNEMP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.484113	0.0188
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UNEMP,2)
Method: Least Squares
Date: 18/09/25 Time: 09:34
Sample (adjusted): 1993 2023
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UNEMP(-1))	-1.177808	0.338051	-3.484113	0.0017
D(UNEMP(-1),2)	0.953978	0.395500	2.412077	0.0229
C	0.000109	0.001232	0.088833	0.9299
@TREND("1990")	9.82E-06	6.63E-05	0.148251	0.8832

R-squared	0.354409	Mean dependent var	-0.000226
Adjusted R-squared	0.282676	S.D. dependent var	0.003458
S.E. of regression	0.002929	Akaike info criterion	-8.708604
Sum squared resid	0.000232	Schwarz criterion	-8.523574
Log likelihood	138.9834	Hannan-Quinn criter.	-8.648289
F-statistic	4.940704	Durbin-Watson stat	1.842635
Prob(F-statistic)	0.007307		

Null Hypothesis: COIL has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-5.366350	0.0000
Test critical values:	1% level	-2.636901	
	5% level	-1.951332	
	10% level	-1.610747	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(COIL)
Method: Least Squares
Date: 18/09/25 Time: 09:35
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COIL(-1)	-0.948085	0.176672	-5.366350	0.0000

R-squared	0.473659	Mean dependent var	1.438485
Adjusted R-squared	0.473659	S.D. dependent var	454.0176
S.E. of regression	329.3869	Akaike info criterion	14.46218
Sum squared resid	3471863.	Schwarz criterion	14.50753
Log likelihood	-237.6259	Hannan-Quinn criter.	14.47744
Durbin-Watson stat	2.003874		

Null Hypothesis: D(COIL) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.658510	0.0000
Test critical values:	1% level	-2.639210	
	5% level	-1.951687	
	10% level	-1.610579	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(COIL,2)

Method: Least Squares
Date: 18/09/25 Time: 09:35
Sample (adjusted): 1992 2023
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(COIL(-1))	-1.501145	0.155422	-9.658510	0.0000

R-squared	0.750577	Mean dependent var	0.245937
Adjusted R-squared	0.750577	S.D. dependent var	799.2704
S.E. of regression	399.1738	Akaike info criterion	14.84742
Sum squared resid	4939532.	Schwarz criterion	14.89323
Log likelihood	-236.5588	Hannan-Quinn criter.	14.86261
Durbin-Watson stat	2.333224		

Date: 18/09/25 Time: 08:17
Sample (adjusted): 1992 2023
Included observations: 32 after adjustments
Trend assumption: Linear deterministic trend
Series: MCAP GDP EXR INTR INFR UNEMP COIL
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.851811	202.8525	125.6154	0.0000
At most 1 *	0.798703	141.7559	95.75366	0.0000
At most 2 *	0.690513	90.46071	69.81889	0.0005
At most 3 *	0.574864	52.92984	47.85613	0.0155
At most 4	0.337986	25.55877	29.79707	0.1424
At most 5	0.263986	12.35980	15.49471	0.1405
At most 6	0.076641	2.551599	3.841466	0.1102

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.851811	61.09663	46.23142	0.0007
At most 1 *	0.798703	51.29514	40.07757	0.0019
At most 2 *	0.690513	37.53087	33.87687	0.0175
At most 3	0.574864	27.37107	27.58434	0.0532
At most 4	0.337986	13.19897	21.13162	0.4341
At most 5	0.263986	9.808199	14.26460	0.2248
At most 6	0.076641	2.551599	3.841466	0.1102

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.589946	-10.08991	-0.008575	9.087582	-13.33480	121.0081	0.005637
-0.143769	6.537289	0.006443	-10.77071	2.228065	-81.23853	0.004400
4.101029	6.749632	-0.000703	-26.31408	1.559881	97.56368	-0.002692
-3.102595	-4.654320	-0.004960	9.652600	-1.837887	255.3530	0.001803
-0.097008	25.78975	-0.015325	-45.27251	2.317898	132.6160	-0.001820
0.163001	42.82332	-0.015178	15.02260	-1.746685	446.0595	0.002500
0.375977	7.314456	0.016181	8.411081	-2.169048	-201.2096	0.000970

Unrestricted Adjustment Coefficients (alpha):

D(MCAP)	-0.049625	0.002957	-0.224582	0.157649	0.035236	0.016661	-0.024426
D(GDP)	0.014487	0.002564	0.008153	-0.002190	-0.000986	-0.003520	-0.006511
D(EXR)	-7.778389	3.343747	7.740663	18.17261	-3.687929	-12.45239	5.210348
D(INTR)	0.014106	-8.97E-05	-0.002609	6.47E-05	0.014287	-0.006797	-

							0.001204
D(INFR)	0.037885	-0.052740	-0.005332	0.013380	-0.000393	0.000958	0.007268
D(UNEMP)	-4.34E-05	9.00E-05	-0.001454	-0.000147	-0.000588	-0.000732	0.000254
D(COIL)	-206.8363	-203.1508	18.79953	4.243973	39.36530	-15.36549	-5.870028

1 Cointegrating Equation(s): Log likelihood -53.41535

Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.000000	-6.346070	-0.005393	5.715655	-8.386953	76.10831	0.003545
	(2.85716)	(0.00161)	(2.94633)	(0.76924)	(32.4342)	(0.00046)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-0.078901
	(0.11918)
D(GDP)	0.023034
	(0.00909)
D(EXR)	-12.36722
	(13.5384)
D(INTR)	0.022427
	(0.00962)
D(INFR)	0.060234
	(0.02292)
D(UNEMP)	-6.90E-05
	(0.00088)
D(COIL)	-328.8585
	(84.9033)

2 Cointegrating Equation(s): Log likelihood -27.76778

Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.000000	0.000000	0.001001	-5.508843	-7.233612	-3.200642	0.009084
		(0.00340)	(6.98155)	(1.84681)	(62.8158)	(0.00112)

0.000000	1.000000	0.001008	-1.768732	0.181741	-12.49733	0.000873
		(0.00047)	(0.97144)	(0.25697)	(8.74041)	(0.00016)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-0.079326	0.520044
	(0.11966)	(0.90114)
D(GDP)	0.022665	-0.129414
	(0.00909)	(0.06846)
D(EXR)	-12.84795	100.3423
	(13.5480)	(102.028)
D(INTR)	0.022440	-0.142912
	(0.00966)	(0.07276)
D(INFR)	0.067817	-0.727027
	(0.01487)	(0.11201)
D(UNEMP)	-8.20E-05	0.001026
	(0.00088)	(0.00663)
D(COIL)	-299.6516	758.9031
	(51.9078)	(390.912)

3 Cointegrating Equation(s):	Log likelihood	-9.002346

Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.000000	0.000000	0.000000	-4.800504	-4.647351	13.61455	0.005132
			(3.99036)	(0.98634)	(21.9285)	(0.00065)
0.000000	1.000000	0.000000	-1.055607	2.785476	4.431464	-0.003106
			(2.18179)	(0.53930)	(11.9897)	(0.00036)
0.000000	0.000000	1.000000	-707.7960	-2584.279	-16802.30	3.948690
			(3009.67)	(743.930)	(16539.2)	(0.49048)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-1.000344	-0.995802	0.000603
	(0.25756)	(0.80693)	(0.00063)
D(GDP)	0.056101	-0.074385	-0.000113
	(0.02392)	(0.07493)	(5.8E-05)
D(EXR)	18.89674	152.5889	0.082795
	(36.6652)	(114.872)	(0.08955)

D(INTR)	0.011740	-0.160524	-0.000120
	(0.02652)	(0.08310)	(6.5E-05)
D(INFR)	0.045950	-0.763017	-0.000661
	(0.04071)	(0.12754)	(9.9E-05)
D(UNEMP)	-0.006044	-0.008785	1.97E-06
	(0.00203)	(0.00635)	(5.0E-06)
D(COIL)	-222.5542	885.7929	0.451511
	(142.048)	(445.034)	(0.34693)

4 Cointegrating Equation(s):	Log likelihood	4.683191

Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.000000	0.000000	0.000000	0.000000	1.011864	-68.90063	-0.002897
				(0.75193)	(17.2371)	(0.00056)
0.000000	1.000000	0.000000	0.000000	4.029910	-13.71322	-0.004871
				(0.67993)	(15.5866)	(0.00050)
0.000000	0.000000	1.000000	0.000000	-1749.873	-28968.51	2.764821
				(431.524)	(9892.18)	(0.31996)
0.000000	0.000000	0.000000	1.000000	1.178880	-17.18886	-0.001673
				(0.27633)	(6.33447)	(0.00020)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-1.489466	-1.729552	-0.000179	6.948574
	(0.26073)	(0.70463)	(0.00057)	(1.51907)
D(GDP)	0.062894	-0.064193	-0.000103	-0.131635
	(0.02916)	(0.07881)	(6.4E-05)	(0.16989)
D(EXR)	-37.48552	68.00773	-0.007335	-134.9767
	(39.9528)	(107.975)	(0.08783)	(232.777)
D(INTR)	0.011539	-0.160825	-0.000120	0.198438
	(0.03245)	(0.08771)	(7.1E-05)	(0.18909)
D(INFR)	0.004438	-0.825290	-0.000727	1.181782
	(0.04749)	(0.12834)	(0.00010)	(0.27669)
D(UNEMP)	-0.005588	-0.008102	2.70E-06	0.035471
	(0.00248)	(0.00669)	(5.4E-06)	(0.01442)
D(COIL)	-235.7215	866.0401	0.430462	-145.2896
	(173.735)	(469.530)	(0.38194)	(1012.23)

5 Cointegrating Equation(s):		Log likelihood	11.28268			

Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL
1.000000	0.000000	0.000000	0.000000	0.000000	-78.92390	-0.001680
					(16.8119)	(0.00037)
0.000000	1.000000	0.000000	0.000000	0.000000	-53.63247	-2.34E-05
					(9.88853)	(0.00022)
0.000000	0.000000	1.000000	0.000000	0.000000	-11634.72	0.659758
					(3241.33)	(0.07195)
0.000000	0.000000	0.000000	1.000000	0.000000	-28.86653	-0.000254
					(5.35265)	(0.00012)
0.000000	0.000000	0.000000	0.000000	1.000000	9.905741	-0.001203
					(4.34072)	(9.6E-05)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-1.492884	-0.820819	-0.000719	5.353342	0.109940
	(0.25775)	(1.41725)	(0.00093)	(2.63616)	(0.66656)
D(GDP)	0.062990	-0.089631	-8.75E-05	-0.086980	-0.173017
	(0.02914)	(0.16025)	(0.00010)	(0.29807)	(0.07537)
D(EXR)	-37.12776	-27.10303	0.049184	31.98508	81.30041
	(39.7441)	(218.536)	(0.14291)	(406.488)	(102.782)
D(INTR)	0.010153	0.207633	-0.000339	-0.448370	-0.159371
	(0.02822)	(0.15515)	(0.00010)	(0.28860)	(0.07297)
D(INFR)	0.004476	-0.835414	-0.000721	1.199554	-0.656509
	(0.04750)	(0.26116)	(0.00017)	(0.48576)	(0.12283)
D(UNEMP)	-0.005531	-0.023270	1.17E-05	0.062097	-0.002581
	(0.00239)	(0.01312)	(8.6E-06)	(0.02441)	(0.00617)
D(COIL)	-239.5403	1881.261	-0.172826	-1927.456	2418.257
	(168.046)	(924.015)	(0.60426)	(1718.71)	(434.582)

6 Cointegrating Equation(s):		Log likelihood	16.18678			

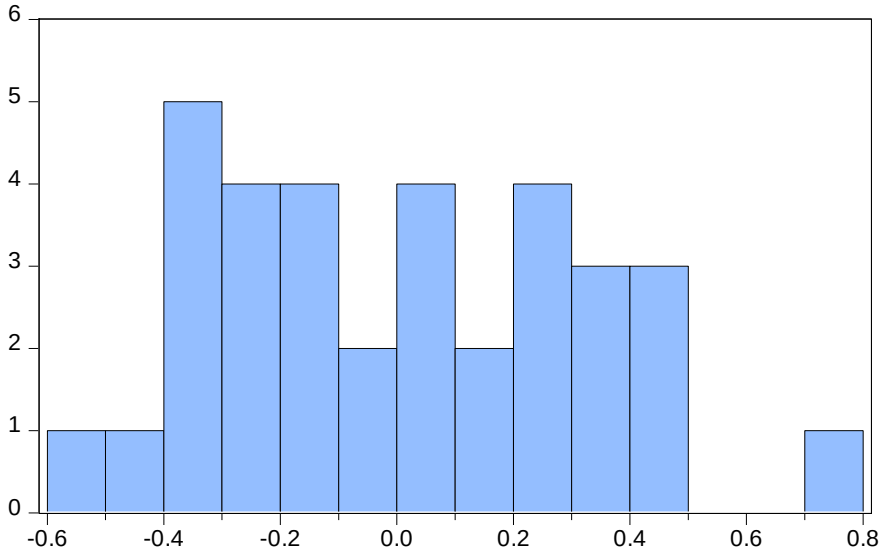
Normalized cointegrating coefficients (standard error in parentheses)

MCAP	GDP	EXR	INTR	INFR	UNEMP	COIL

1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.001276
						(0.00020)
0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000251
						(4.1E-05)
0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.719315
						(0.09327)
0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	-0.000107
						(3.0E-05)
0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	-0.001254
						(8.8E-05)
0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	5.12E-06
						(3.8E-06)

Adjustment coefficients (standard error in parentheses)

D(MCAP)	-1.490168	-0.107322	-0.000972	5.603640	0.080838	24.20472
	(0.25719)	(2.48527)	(0.00117)	(2.72524)	(0.67001)	(26.6853)
D(GDP)	0.062416	-0.240364	-3.40E-05	-0.139857	-0.166869	0.080206
	(0.02889)	(0.27914)	(0.00013)	(0.30610)	(0.07526)	(2.99729)
D(EXR)	-39.15752	-560.3559	0.238189	-155.0823	103.0508	-1860.839
	(37.2201)	(359.668)	(0.16997)	(394.398)	(96.9641)	(3861.90)
D(INTR)	0.009045	-0.083449	-0.000236	-0.550483	-0.147498	0.338848
	(0.02718)	(0.26263)	(0.00012)	(0.28798)	(0.07080)	(2.81992)
D(INFR)	0.004633	-0.794397	-0.000736	1.213943	-0.658182	12.14031
	(0.04750)	(0.45905)	(0.00022)	(0.50338)	(0.12376)	(4.92902)
D(UNEMP)	-0.005650	-0.054630	2.28E-05	0.051096	-0.001302	-0.596527
	(0.00224)	(0.02166)	(1.0E-05)	(0.02375)	(0.00584)	(0.23253)
D(COIL)	-242.0449	1223.260	0.060394	-2158.285	2445.096	-7240.779
	(167.235)	(1616.03)	(0.76369)	(1772.08)	(435.672)	(17352.0)



Series: Residuals	
Sample 1990 2023	
Observations 34	
Mean	-2.12e-17
Median	-0.004533
Maximum	0.724183
Minimum	-0.523649
Std. Dev.	0.307968
Skewness	0.274909
Kurtosis	2.233388
Jarque-Bera	1.260825
Probability	0.532372

Variance Inflation Factors
Date: 18/09/25 Time: 10:05
Sample: 1990 2023
Included observations: 34

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
GDP	3.869638	3.304785	1.565780
EXR	1.70E-07	3.071415	1.424966
INTR	3.811710	38.63750	1.760601
INFR	0.210053	3.567724	1.513696
UNEMP	155.7886	74.86650	1.455592
COIL	4.54E-08	1.364380	1.215884
C	0.536690	157.4134	NA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.018235	Prob. F(2,25)	0.0307

Obs*R-squared	8.270860	Prob. Chi-Square(2)	0.0160

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 18/09/25 Time: 10:05
Sample: 1990 2023
Included observations: 34
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.844369	1.852420	0.455820	0.6525
EXR	7.31E-06	0.000375	0.019505	0.9846
INTR	0.199447	1.773586	0.112454	0.9114
INFR	0.044453	0.416911	0.106625	0.9159
UNEMP	-5.786281	11.47221	-0.504374	0.6184
COIL	-0.000107	0.000198	-0.540770	0.5935
C	0.164973	0.664840	0.248140	0.8061
RESID(-1)	-0.095997	0.185481	-0.517560	0.6093
RESID(-2)	-0.535677	0.189289	-2.829947	0.0090

R-squared	0.243261	Mean dependent var	-2.12E-17
Adjusted R-squared	0.001104	S.D. dependent var	0.307968
S.E. of regression	0.307798	Akaike info criterion	0.703179
Sum squared resid	2.368484	Schwarz criterion	1.107215
Log likelihood	-2.954036	Hannan-Quinn criter.	0.840967
F-statistic	1.004559	Durbin-Watson stat	1.955994
Prob(F-statistic)	0.457234		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.369842	Prob. F(6,27)	0.8916
Obs*R-squared	2.582145	Prob. Chi-Square(6)	0.8592
Scaled explained SS	1.004199	Prob. Chi-Square(6)	0.9855

Test Equation:
Dependent Variable: RESID^2

Method: Least Squares
Date: 18/09/25 Time: 10:06
Sample: 1990 2023
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.185629	0.237292	0.782281	0.4409
GDP	-0.101587	0.637172	-0.159434	0.8745
EXR	-0.000162	0.000134	-1.215590	0.2347
INTR	-0.398110	0.632384	-0.629539	0.5343
INFR	-0.024740	0.148452	-0.166651	0.8689
UNEMP	0.549925	4.042863	0.136024	0.8928
COIL	-5.04E-05	6.90E-05	-0.729813	0.4718

R-squared	0.075945	Mean dependent var	0.092055
Adjusted R-squared	-0.129400	S.D. dependent var	0.103771
S.E. of regression	0.110281	Akaike info criterion	-1.390326
Sum squared resid	0.328372	Schwarz criterion	-1.076075
Log likelihood	30.63554	Hannan-Quinn criter.	-1.283157
F-statistic	0.369842	Durbin-Watson stat	1.552186
Prob(F-statistic)	0.891621		

Ramsey RESET Test
Equation: UNTITLED
Specification: MCAP GDP EXR INTR INFR UNEMP COIL C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.190828	26	0.2445
F-statistic	1.418071	(1, 26)	0.2445
Likelihood ratio	1.805596	1	0.1790

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.161877	1	0.161877
Restricted SSR	3.129855	27	0.115921
Unrestricted SSR	2.967978	26	0.114153

LR test summary:

	Value
Restricted LogL	-7.692553
Unrestricted LogL	-6.789755

Unrestricted Test Equation:
Dependent Variable: MCAP
Method: Least Squares
Date: 18/09/25 Time: 10:06
Sample: 1990 2023
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.062503	2.406501	-0.025973	0.9795
EXR	6.51E-05	0.000453	0.143617	0.8869
INTR	0.171540	2.570652	0.066730	0.9473
INFR	-1.047533	1.761524	-0.594675	0.5572
UNEMP	0.442293	14.10946	0.031347	0.9752
COIL	0.000225	0.000390	0.575173	0.5701
C	0.142651	0.737863	0.193329	0.8482
FITTED^2	2.099445	1.763013	1.190828	0.2445

R-squared	0.342879	Mean dependent var	0.231259
Adjusted R-squared	0.165961	S.D. dependent var	0.369956
S.E. of regression	0.337865	Akaike info criterion	0.869986
Sum squared resid	2.967978	Schwarz criterion	1.229129
Log likelihood	-6.789755	Hannan-Quinn criter.	0.992464
F-statistic	1.938073	Durbin-Watson stat	1.982542
Prob(F-statistic)	0.103813		

Dependent Variable: MCAP
Method: Fully Modified Least Squares (FMOLS)
Date: 09/01/25 Time: 23:42
Sample (adjusted): 1991 2023
Included observations: 33 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth
= 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-26517.40	13550.98	-1.956861	0.0612
EXR	-4.180978	9.137878	-0.457544	0.6511
INTR	-215.1763	116.2828	-1.850456	0.0756
INFR	119.6867	10.63623	11.25273	0.0000
UNEMP	-386779.8	90848.19	-4.257430	0.0002
COIL	-0.223941	1.351764	-0.165666	0.8697
C	16358.46	4748.664	3.444856	0.0020

R-squared	0.980939	Mean dependent var	12870.96
Adjusted R-squared	0.976540	S.D. dependent var	17359.45
S.E. of regression	2658.870	Sum squared resid	1.84E+08
Long-run variance	4867754.		