Gross Domestic Product and Financial Performance of Energy and Petroleum Companies Listed at the Nairobi Securities Exchange in Kenya

Gitati, J. K, Kimani E. M and Tirimba, I.

Gross Domestic Product and Financial Performance of Energy and Petroleum Companies Listed at the Nairobi Securities Exchange in Kenya

[1]Gitati, J. K

Master of Science, Finance, Jomo Kenyatta University of Agriculture and Technology

[2]Kimani E. M

Jomo Kenyatta University of Agriculture and Technology

[3]Tirimba, I.

Jomo Kenyatta University of Agriculture and Technology

Abstract

Purpose: Potential investors in any sector seek to establish the financial performance of the sector before investment. The key factors that would affect the variability of the expected returns ought to be taken into consideration, and appropriate measures taken to mitigate any inappropriate conditions. This study sought to investigate the effect of gross domestic product on the financial performance of energy and petroleum firms listed at the NSE in Kenya.

Methodology: The study employed a descriptive research design. All four energy and petroleum firms are listed on the NSE. Secondary data covering a period of seven years from 2017 to 2023 was sourced from published annual reports and financial statements of all four listed energy and petroleum firms at the NSE in Kenya, National Bureau of Statistics periodic reports, using a data collection sheet. Data was analyzed with the aid of STATA18 software using descriptive and inferential statistical tools. Descriptive tools included frequencies, percentages, means, variances, and standard deviations. Inferential statistics tools included Pearson's Product correlation and panel regression analysis, which were used in examining how macroeconomic variables affect the financial performance of listed energy and petroleum firms at the NSE Kenya.

Findings: The study revealed that the R2 value of 56% of the variations in the perceived financial performance can be explained by the variations in the gross domestic product, while factors not studied in this research contributed 44% of the variance in the dependent variable. Panel regression results concluded that gross domestic product significantly affects the financial performance of energy and petroleum firms listed at the NSE, Kenya.

Unique Contribution to Theory, Practice and Policy: The study recommended that firms and policymakers should establish a Macroeconomic Risk Monitoring Unit within the Energy and Petroleum Regulatory Authority (EPRA) to track GDP in real time and guide strategic pricing, investment, and hedging decisions. Additionally, the NSE and CMA could jointly develop a Macroeconomic-Adjusted Energy Performance Index (MEPI), a specialized benchmark that tracks how listed energy firms respond to Kenya's GDP cycles. This would promote transparency, attract investors, and facilitate evidence-based policymaking for energy-sector resilience.

Keywords: *Gross Domestic Product, Financial Performance, Energy and Petroleum Firms, Nairobi Securities Exchange*

INTRODUCTION

All stakeholders are interested in the financial performance of firms since they are concerned about their organization's ability to yield returns (Javadi, Alimoradi & Ashtiani, 2017). Financial performance measures a company's capacity to maximize the use of its assets to boost revenues and generate profits. According to Tarigan et al. (2019), a firm's financial performance determines the amount of profit it makes over time. Nzalu (2015) underscores the importance of statements of financial performance and reports and the role they play in indicating the financial performance of a firm. Financial performance continues to be broadly defined by financial indicators. According to Altmeppen et al. (2017), key financial performance metrics, including return on equity, return on assets, and net profit margin, are crucial in proving a company's economic resilience. Kibara (2021) defines macroeconomic variables as characteristics of a macroeconomy that affect the performance of the firms operating within it and cannot be directly controlled by individual shareholders, managerial decisions, and activities. One important indicator in macroeconomics is the GDP. It calculates a nation's total value of finished goods and services during a specific time frame, typically a year (Armstrong, 2017). In the context of energy and petroleum companies listed at the NSE and their financial results, GDP is not a reliable indicator of financial performance or profitability; rather, GDP's reflection of the overall state of the economy is closely tied to the success of energy and petroleum companies. Interest rates have been defined by multiple scholars in a variety of ways to help users of financial or accounting data understand them.

Energy and petroleum firms' optimal performance is impacted by changes in macroeconomic conditions, and this must be considered when assessing the importance of disclosing information to the government and investors (Epaphra & Salema, 2018). To help them make wise investment decisions and forecast future market trends, analysts and investors thus must keep a close eye on macroeconomic variables (Tola, 2018). Management can evaluate a company's financial performance and gather data on the investment and passage of funds within and outside the organization by evaluating macroeconomic variables (Kalyani & Mathur, 2017). It was therefore crucial to undertake a study and establish the effect of macroeconomic (external) variables and how they impact the financial performance of energy and petroleum firms listed at the NSE, Kenya.

Statement of the Problem

The Kenyan Energy and Petroleum industry is of great interest since it is one of the key drivers of the economy (Kikanga, Njoroge & Mathuva, 2024). Like many other companies, energy and petroleum companies are expected to generate profit through effective and efficient utilization of resources to create a sound asset portfolio and ensure the maximization of shareholders' wealth. Despite the growth, these firms still face poor financial performance (EPRA 2022). For instance, during the period between 2015 and 2024, KPLC posted mixed results of ROE with figures fluctuating from 14.7% in 2015, 11.5% in 2016, 9.34% in 2017, 14.7% in 2018, 12.5% in 2019, 9.3% in 2020, 8.4% in 2021, 13.7% in 2022, and 13.0% in 2023, and closing at 11.12% in 2024. (NSE 2020, EPRA 2020; NSE, 2021; EPRA 2024). During the same period, Kengen reported similar fluctuations in ROEs with figures of 3.9%, 4.2%, 5.0 %, 4.15%, 4.04%, 3.15%, 2.17%, 8.10%, 6.05%, and 5.14% respectively. (NSE 2020, EPRA 2020; NSE, 2021; EPRA 2024). Umeme Ltd posted ROE figures of 19.15%, 21.18%, 22.24%, 24%, 20.15%, 18.75%, 17.62%, 15.5%, 12.3%, and 9.36% respectively during the same period under review (NSE 2020, EPRA 2020; NSE, 2021; EPRA 2024). Lastly, the reports show fluctuations for Total Kenya for the same period with ROE figures of 11.54%, 12.80%,

and 13.23%, 11.65%, 12.15%, 9.34%, 7.5%, 5.15%, 7.14%, and 6.75% respectively. Some of the reasons attributed to the mixed performance included stringent tax systems, stagnating demand, migrating to other sources, e.g., Devki Group set up its coal generation plant, corruption in the sector, and the global COVID-19 pandemic that occurred during the period under review, which affected the energy consumption globally. (NSE 2019; EPRA, 2022). The current study seeks to examine the effects of GDP growth and how they affect ROE as a measure of the financial performance of Energy and petroleum firms listed at the NSE in Kenya. Empirical evidence links financial performance to GDP growth, with conflicting results from studies being done on other sectors, and not the energy and petroleum sector, which is greatly affected by the GDP growth. For instance, Sainz- Fernandez et al. (2015) concluded that GDP growth has a significant positive impact on MFIs. Alhassan, Anokye, and Gakpetor (2018) studied GDP growth and profitability in Ghana commercial banks, Rutto & Ondiek (2014) studied Kenya Tea export companies, and Kengere (2022) investigated the effect of GDP growth and utilized stock market volatility at the NSE 20 share index as the dependent variable. Other studies were conducted in other economies different from the Kenyan perspective (Kim and Lee, 2021) in China; Mkhize (2022) in South Africa, and Ghurstskaia (2018) in Georgia. Based on conflicting empirical gaps and statistical evidence of the decline in the performance of energy and petroleum firms listed at the NSE, the current study aims to add knowledge to the study area to explain the question: What are the effects of GDP growth on the financial performance of energy and petroleum firms listed at the NSE?

Objectives of the Study

The objective of the study was to establish the effect of GDP growth on the financial performance of Energy and Petroleum companies listed at the Nairobi Securities Exchange, Kenya

Theoretical Review

This section provides a comprehensive review of the relevant literature that guided the study.

Neo-Classical Growth Theory

Neo-Classical Growth Theory was developed by Solow and Swan in 1956. The theory postulates that economic growth is influenced by population growth, capital accumulation, and technological advancements, with an emphasis on the long-term equilibrium of a competitive economy. Solow and Swan (1956) assert that population increase (labor force), capital accumulation (investment), and technical advancement all have an impact on GDP growth, which in turn determines the long-term standard of living. In Solow's model, since technological change is caused by external factors, it is reasonable to assume that the growth rate will converge across nations at the same pace of technical advancement. Developing nations can increase the rate of capital accumulation and investment returns by opening up their national markets to attract more foreign and domestic investment.

Additionally, the theory emphasizes the idea of diminishing returns to labor and capital, which states that although capital creation increases GDP at first, this benefit eventually fades (Popa 2014). Neoclassical growth theory demonstrates that ongoing economic growth can only be attributed to technological advancement and the change in the functional connection between the inputs and productive outputs as technological knowledge increases. As a result, the same amount of inputs might yield more and better output (Herrera 2011). According to the theory by Solow and Swan (1956), economic growth is boosted by technical knowledge since it causes the rate of return on capital to increase more than the rate of return on capital to decrease.

Neo-Classical Growth Theory assumes declining returns to labor and capital, meaning that although more labor and investment boost GDP, the marginal impact of each extra unit declines. Additionally, the theory asserts that sustained long-term growth is primarily driven by technical advancement, which is fueled by exogenous forces (Popa 2014). The theory presupposes that GDP growth will ultimately converge towards a steady-state level that is influenced by population increase, savings, and technological innovation (Rumanzi 2021). Additionally, the theory presupposes a closed economy, which excludes capital flows and foreign trade. Punzo and Wiston (2011) highlight that the main shortcoming of the theory is its disregard for the business cycle and its consequences for combining short- and long-term macroeconomics.

According to Punzo and Wiston (2011), the theory mostly overlooks the cyclical variations that take place in the economy over shorter time periods and instead concentrates on long- term growth tendencies. The theory has been challenged for its irrational assumptions on perfect competition, perfect information, and the symmetry between capital and labor. One example is the neoclassical production function, which makes the unrealistic assumption that all inputs (capital and labor) are completely interchangeable (Meyer 2023). Another critique of neoclassical growth theory by Herrera (2011) is that the theory finds it difficult to account for the steady, long-term growth seen in some economies, especially those that have seen substantial institutional changes or quick technical advancements. Despite the criticisms, neoclassical growth theory continues to be a useful paradigm for comprehending the GDP and economic growth of nations.

While analyzing the effect of total productivity and economic growth in Kenya, Ndegwa (2019) utilized neoclassical growth theory to conclude that total factor productivity (TFP) is a key determinant of economic growth and that TFP has a favorable impact on GDP growth when combined with labor, capital, and human capital. Ocharo (2013), on the other hand, utilized the theory in establishing the relationship between private capital flows, private remittances, and economic growth to conclude that GDP has a positive and statistically significant effect on economic growth in Kenya. Popa (2014) admitted that neoclassical growth theory plays an important role in accounting literature in demonstrating the positive correlation between total factor productivity and output.

Neoclassical growth theory, while being primarily a macroeconomic theory, provides insights into how the performance of energy and petroleum companies might affect Kenya's GDP. It implies that GDP growth is influenced by energy use, a crucial production input. For example, more petroleum consumption has been associated with both immediate and long-term benefits to Kenya's real GDP. The theory also emphasizes how technological advancement and capital accumulation propel economic growth, both of which are impacted by energy sector investments. Therefore, the study employed the neoclassical growth theory to establish the effect of GDP growth and its impact on the financial performance of energy and petroleum firms listed at the NSE, Kenya.

Empirical Review

AlSharif (2021) sought to study the effect of GDP on the performance of Islamic Banks (return to assets, return to equity, and return on share) in Islamic banks in Jordan. The study was carried out over 15 years, from 2005 to 2019, using a descriptive research design. The study used Pearson correlation to establish the relation between GDP and Islamic banks in Jordan. The study used annual panel data from Jordanian Islamic Banks and multivariate linear regression

to thoroughly examine the association between variables. The study's findings demonstrated that Islamic banks' performance had a negative relationship with GDP. The study's inverse relationship can be explained by the fact that rising real exchange rates will lead to lower exports and higher imports, which in turn will result in lower domestic investment, fewer deposits and facilities in Islamic banks, and ultimately lower returns on equity, return on assets, and return on shares.

Ally (2022) carried out a study to establish the effect of GDP growth and the financial performance of banks in Tanzania. Secondary sources were used to gather data. In order to understand the relationship between GDP growth and the financial performance of commercial banks, the study used both descriptive and explanatory research designs to describe the trajectory of GDP growth during the ten years from 2010 to 2019. After entering the data gathered for this study into an Excel spreadsheet, a descriptive and correlational analysis was carried out. According to the study, there is a high positive association between GDP growth and return on assets, as determined by correlation analysis. Accordingly, a rise in GDP leads to a rise in return on assets. The study came to the conclusion that commercial banks' financial performance is positively impacted by GDP growth.

Onyancha and Muturi (2023) undertook a study to establish the effects of GDP growth on the financial performance of commercial banks in Kenya. The study conducted a census of all 35 commercial banks that were fully functioning from 2011 to 2019 and used a causal research methodology. The Central Bank of Kenya, the Kenya National Bureau of Statistics, and the audited financial accounts of banks provided the secondary data used in the study. The data was analyzed using both descriptive and inferential statistics. The impact of macroeconomic conditions on the financial performance of Kenyan commercial banks was determined using a panel regression model. The study's conclusions demonstrated that the GDP growth rate had no discernible impact on Kenyan commercial banks' financial performance.

Mwikamba, Rosana, and Aluvale (2025) studied the effect of GDP growth on the financial performance of Microfinance institutions in Kenya. The study employed a descriptive research design. The target group consisted of microfinance organizations under the Central Bank of Kenya regulation. There was a census of the target population. It was decided to use secondary data. A data collection sheet, which was based on secondary data sources, served as the primary instrument for gathering data over the 11 years from 2015 to 2023. Descriptive and inferential statistics were used to analyze the collected data. The data was analyzed using measures of central tendency and dispersion, correlation, and a linear multiple regression model. The findings demonstrated that the financial performance of microfinance institutions was positively impacted by GDP growth. The Central Bank of Kenya, the regulator, is advised by the report to implement monetary policies that improve microfinance firms' financial performance.

Conceptual Framework

This study will be predicated on GDP growth, interest rate, inflation rates, and exchange rates, and how they will impact the financial performance of energy and petroleum companies listed at the NSE, Kenya. Consequently, the dependent variable, that is, financial performance, has been measured by Return on Equity (ROE).
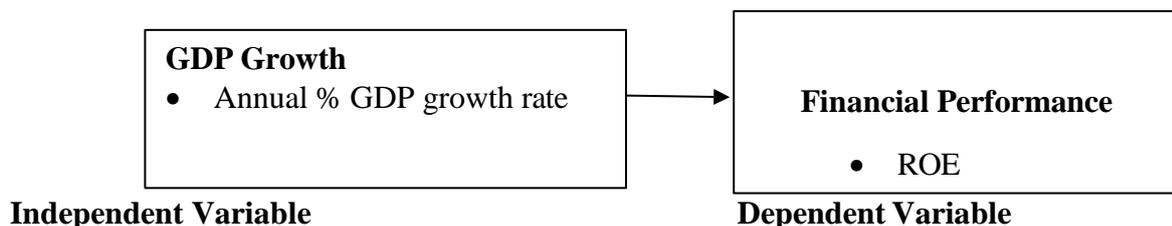
GDP Growth	**Financial Performance**
• Annual % GDP growth rate	• ROE

Independent Variable   **Dependent Variable**

Figure 1: Conceptual Framework

METHODOLOGY

This chapter presents the techniques and approaches that were applied in the research study.

Research Design

The study employed a descriptive research design to gather specific information. Descriptive research is a research strategy in which an existing phenomenon is described as accurately as possible; as a result, this plan details each stage of the study process.

Population of the Study

The target population for this study was 4 energy and petroleum companies listed at the NSE, Kenya, as of December 2025.

Census Study

The study employed the census technique, including all energy and petroleum corporations.

Data Collection Instruments

Secondary data was sourced from NSE and the energy and petroleum firms' financial statements for the ten years between 2015 and 2024.

Data Collection Procedure

To gather information from reports published by the NSE and ERC, the study gathered secondary data using the data collection sheet. This included Kenya's yearly economic evaluation report, the KNBS annual reports, the Energy and Regulatory Commission Supervision yearly Reports, and the corresponding NSE reports.

Data Processing and Analysis

The data were coded and then imported into STATA 18 software for analysis. The study used descriptive and inferential statistics. The panel regression model was used in the study. The overall significance of the model was evaluated using the analysis of variance using the F-statistic at the 95% confidence level. To show how independent variables affect dependent variables, the coefficient of determination (R-squared) was employed.

The panel regression model that was applied is shown in equation 1.

$$Y_{it} = \beta_0 + \beta_1 \, GDP_{it} + \varepsilon_{it} \quad \text{...} \textbf{Equation 1}$$

FINDINGS AND DISCUSSIONS

The chapter presents the results and discussion. The results are based on descriptive, diagnostic, and inferential analysis.

Descriptive Statistics

Table 1: Descriptive Statistics Results

Statistics	Obs	Min	Max	Mean	SD	Skewness	Kurtosis
GDP Growth	40	-1.965	6.5419	4.3701	2.2564	0.969539	3.807969
ROE	40	-4.004	10.007	7.046	3.3350	0.862013	2.603409

Table 1 presents the descriptive tests for GDP growth rate. The findings reveal a low value of -1.965 and a high of 6.5419, and an average growth rate of 4.3701. With a range of -1.965 to 6.5419 and an average of 4.3701, the GDP growth rate indicates a mixed but generally optimistic outlook for the financial performance of the energy and petroleum firms listed at the NSE, Kenya. The high growth of 6.5419 suggests the possibility of substantial demand and revenue, while the low of -1.965 and average of 4.3701 may imply considerable demand variability and the possibility of reduced earnings during times of slower GDP growth. The standard deviation of 2.2564 also supports notable variations in economic growth over the years.

GDP growth had a skewness of 0.969539, indicating moderately skewed data with the distribution having longer tails on the right side, with more values lying on the asymmetric right tail of the distribution. According to Hitti (2022) and Brown (1997), a skewness value between -1 and +1 is generally considered acceptable, while values outside of this range (specifically, beyond -2 and +2) suggest substantial non-normality. The Kurtosis coefficient of 3.807969 indicates a slightly leptokurtic distribution, meaning it has a higher peak and heavier tails than a normal distribution. The kurtosis value of 3.807969 is close to the kurtosis of a normal distribution (which is 3), therefore considered to be acceptable since it lies between -4 and +4, which is the acceptable normal univariate distribution (Arnau, 2014)

Regarding financial performance, descriptive results yielded a minimum value of -4.004 and a maximum of 10.007. The minimum of -4.004 suggests that during the period under review, energy and petroleum firms listed at the NSE were experiencing net losses at some point, meaning that the firms were not effectively utilizing the shareholders' funds to generate profits to cover their net worth. The maximum value of 10.007 indicates a period where energy and petroleum firms listed at the NSE were earning a profit of Shs 0.10 for every Sh 1.00 of equity held by shareholders. Descriptive results gave an average of 7.046, suggesting that generally, the energy and petroleum firms are generating a moderate amount of profit in relation to their shareholders' funds. The accompanying standard deviation of 3.3350, which is lower than the mean, reflects a significant level of fluctuation in the financial results of the listed petroleum and energy sector, implying that while some had a good financial performance, others were underperforming.

Trend Analysis

This section provides a graphical representation of the movement and changes of the variable under study over the years 2015 to 2024
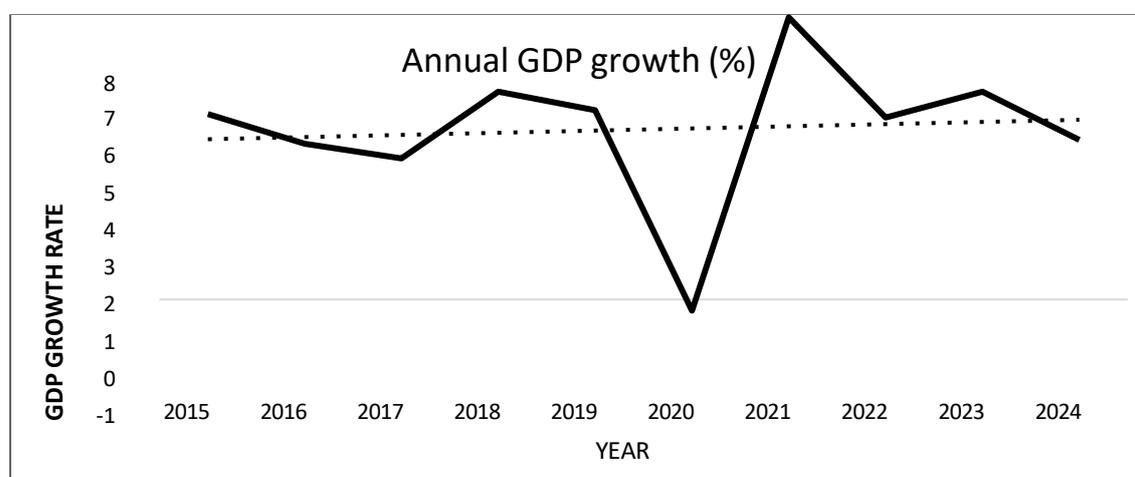
Figure 2: Trend Analysis for GDP Growth Rate

The trend results in Figure 4.1 show evidence that GDP growth had no specific pattern to predict. The year 2015 began on a strong note with relatively robust growth, reflecting stability and moderate energy sector performance. A slight dip was witnessed in 2016 from 2015, possibly due to tightening monetary conditions and lower investment levels in the sector. During the period, KPLC operational inefficiencies began surfacing in its financial statements. In 2017, the downward trend continued, indicating subdued economic activity possibly due to drought and political uncertainty or reduced agricultural performance in Kenya. The year saw reduced hydropower generation that hit KenGen's revenues. Political instability also led to delayed infrastructure projects, impacting KPLC, and fuel consumption dropped due to reduced economic activity.

2018 marked a significant recovery, likely due to improvements in agriculture, services, and favorable weather conditions. The year saw KenGen benefiting from geothermal energy growth. KPLC saw rising electricity demand, but profit margins remained squeezed, and Total Energies posted better volumes. This did not last as 2019 witnessed a modest decline from 2018, but still higher than the mid-decade lows. The economy remained relatively stable. In 2020, the GDP growth rate saw a sharp contraction, entering negative growth territory. This was largely due to the COVID-19 pandemic, which halted economic activity, disrupted supply chains, and increased unemployment. There was a massive hit to electricity demand, especially from industries and institutions. KPLC faced a revenue drop and mounting unpaid bills. KenGen maintained supply but with reduced power off-take. Total Energies experienced a sharp drop in fuel and lubricants sales, and stock prices declined sharply.

2021 saw the strongest GDP growth rate in the decade. This sharp rebound could have been attributed to post-pandemic recovery, reopening of key sectors, and low base effects from the 2020 recession. In 2021, KenGen focused on carbon trading and green energy transition. KPLC launched prepaid metering and system upgrades, and Total Energies diversified into clean energy segments. In 2022, the growth normalized after the sharp spike in 2021. The energy sector performance began stabilizing, although not as rapidly growing as in the rebound year. This continued in 2023 as seen in the slight rise of GDP growth rate from 2022, suggesting renewed investor and demand for energy, and perhaps a recovery in exports and infrastructure.2024 saw a notable decline from 2023, indicating stabilization rather than

acceleration. The economy appeared to be settling into a sustainable medium-term growth path.

In 2024, KenGen expanded into regional energy sales, KPLC underwent restructuring with regulatory support, Total Energies pushed ESG compliance and e-mobility, and the entire energy sector aligned with green economic goals. The dotted trend line indicates a slightly positive slope, suggesting that despite annual fluctuations, the overall GDP growth is gradually increasing over the decade. The trend shows energy sector resilience, especially in the aftermath of the 2020 downturn. In summary, the trend analysis highlights both short-term shocks and long-term energy sector recovery, offering a clear picture of the sector's GDP growth rate, which is an indicator of the listed energy firms' trajectory from 2015 through 2024.

Trend Analysis for Return on Equity (ROE)

The results of ROE movements, which were the measure of financial performance for the period, are shown in Figure 3
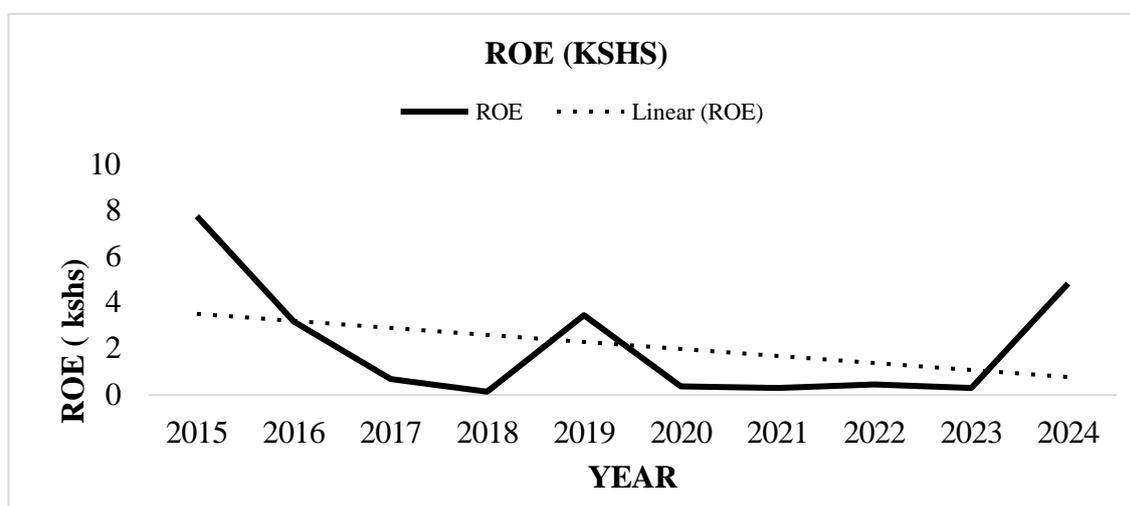

Figure 3: Trend Analysis for ROE

The study finding in Figure 3 shows the 10-year annual trend analysis for ROE for the period. 2015 posted ROE of 7.5%. This was a strong year for the energy sector, driven by aggressive geothermal expansions (KenGen) and relatively stable macroeconomic conditions. Energy firms listed at the NSE utilized their assets efficiently amid a supportive regulatory and funding environment. In 2016 and 2017, the decline in ROE began with figures of around 3.5% in 2016 and the sharpest drop to 1% in 2017.KPLC reported rising operational inefficiencies and technical losses. Cost pressures and weak power distribution margins began affecting profitability. Transition in government and delayed tariff reviews in 2017 hurt Kenya Power's revenue; asset returns weakened. In 2018, the surge in ROE persisted to around 0.4%. This resulted in KPLC declaring profits but with significant impairment provisions. 2019 showed a rebound of ROE to around 3.5%. The rise was short-lived, as witnessed by a drop in the ROE of around 0.6%. The cause was due to the impact of COVID-19, which saw the demand for electricity plunge, and schools, industries, and transport were shut down.

Energy firms faced reduced consumption and operational disruptions; return on assets deteriorated in 2021, and 2022 posted a modest recovery of ROE to around 0.7% and 0.8%, respectively. The recovery went past 2023, posting a 1% ROE. The slight increase saw Total Energies posting better results amid stable petroleum margins. In 2024, there was a sharp

upsurge of ROE with figures around 4.7%. This was likely due to tariff reviews, improved power factor management, and regulatory reforms in the energy sector. The ROE trend mirrors the operational challenges and macroeconomic shocks that the Kenyan energy sector has faced. While early years showed robust returns, the cumulative effect of poor regulatory alignment, currency volatility, and operational inefficiencies reduced asset efficiency. The 2024 rebound offers hope, but long-term recovery will depend on regulatory stability, modernization of grid infrastructure, and diversification into decentralized energy systems.

Inferential Statistics

Inferential analysis was undertaken to examine the statistical relationships between GDP and the financial performance of energy and petroleum firms listed at the NSE.

Correlation Analysis

Correlation analysis was carried out to examine the strength and direction of association between GDP growth rate and the financial performance of energy and petroleum firms listed at the NSE. Table 2 shows the correlation analysis results

Table 2: Correlations Coefficient

Correlation		ROE	GDP Growth
ROE	Pearson Correlation	1.000	
	Sig.(2-tailed)		
GDP Growth	Pearson Correlation	0.412**	1.000
	Sig.(2-tailed)	0.019	
N		40	40

The correlation analysis results presented in Table 4.11 indicate that GDP growth rate has a positive and significant relationship with the financial performance of energy and petroleum firms listed at the Nairobi Securities Exchange ($r = 0.412$, $p = 0.019$). This suggests that periods of higher economic growth are associated with improved firm profitability, as economic expansion tends to increase demand for energy and petroleum products, thereby enhancing firm returns.

Regression Analysis

The model summary presents the overall goodness of fit of the regression model used to determine the effect of GDP growth on the financial performance of energy and petroleum firms listed at the NSE. The model is presented in Table 3

Table 3: Model Summary

Model 1	Multiple R	R Squared	Adjusted R Squared	S.E. Regression	Durbin-Watson	Obs
ROA	0.748[a]	0.560	0.519	2.164	1.982	40

The results in Table 3 show that the correlation coefficient (R) is 0.748, indicating a strong positive relationship between GDP growth and the financial performance (ROE) of energy and petroleum firms listed at the NSE. The coefficient of determination (R^2) is 0.560, suggesting that approximately 56.0% of the variations in financial performance are explained by changes in GDP growth rate. The remaining 44.0% of the variation is attributed to other firm-specific and external factors not included in the model, such as management efficiency, operational costs, and regulatory policies. The Adjusted R^2 value of 0.519 indicates that even after adjusting for the number of predictors, the model remains robust and provides a good fit for the data.

www.iprjb.org

Analysis of Variance (ANOVA)

The Analysis of Variance (ANOVA) was conducted to assess the overall significance of the regression model and to determine whether GDP growth has a statistically significant effect on the financial performance of energy and petroleum firms listed at the NSE. Table 4 portrays the results.

Table 4: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	164.287	2	41.072	7.958	0.000**
Residual	103.326	37	2.952		
Total	**267.613**	**39**			

Dependent Variable: Return on Equity (ROE) Predictors: GDP Growth Rate,

Significance Level: $p < 0.05$ (**)

The ANOVA results presented in Table 4.4 reveal that the regression model is statistically significant (F = 7.958, p = 0.000). This indicates that the combined effect of GDP growth rate significantly explains variations in the financial performance (ROE) of the four energy and petroleum firms listed at the NSE. The p-value of 0.000, which is less than the 0.05 significance threshold, confirms a significant predictive influence on the financial performance of these firms.

Regression Coefficients (With Robust Standard Errors)

To address potential heteroscedasticity identified in the residuals, the study estimated the regression model using robust standard errors under the fixed effects framework. The results are presented in Table 5

Table 5: Regression Coefficients (Robust Standard Errors)

Variable	Unstandardized Coefficients(B)	Robust Std. Errors	Standardized Coefficients(Beta)	t-Statistic	Sig. (p-Value)
(Constant)	4.287	0.974	-	4.402	0.000***
GDP Growth Rate	0.526	0.165	0.342	3.188	0.004**

Dependent Variable: Return on Equity (ROE) Significance Levels: $p < 0.05$ (), $p < 0.01$ (*)

Estimation Method: Fixed Effects Regression with Robust Standard Errors The output generated in Table 5 is summarized in the equation

$$Y = 4.287 + 0.526 GDP_{it}$$

Interpretation of Regression Results

The panel regression results with robust standard errors revealed the coefficient value for GDP growth rate ($\beta = 0.526$, $p = 0.005$ which is positive and statistically significant at the 1% level, confirming that economic expansion enhances firm financial performance. The results imply that a one-unit increase in GDP growth rate increases ROE by approximately

0.526 units, holding other variables constant. Based on the significance level ($p < 0.05$), the null hypothesis that GDP growth rate has no significant effect on the financial performance of energy and petroleum firms listed at the NSE is rejected. This finding underscores the role of economic activity in stimulating energy consumption and business performance.

This outcome is consistent with prior empirical studies such as Egbunike and Okerekeoti

(2018), Kamau and Kariuki (2022), and Mugambi and Okoth (2021), who similarly reported that GDP growth positively influences firm performance through improved business activity, higher energy consumption, and increased investment confidence. The results affirm that during periods of robust economic growth, energy and petroleum firms experience enhanced demand for fuel, electricity, and related products, which translates into higher revenues and profitability. However, the findings contrast with studies such as Okoth (2019) and Nyangoro (2020), which found that GDP growth had an insignificant relationship with financial performance in some sectors of the Kenyan economy.

Additionally, studies of Agyapong and Boakye (2020) found no conclusive evidence linking GDP growth to firm profitability, suggesting that the strength of this relationship may vary depending on firm size, economic structure, and time horizon. The results are theoretically supported by the Neo-Classical Growth Theory, which posits that as GDP growth accelerates, it signals greater economic efficiency and higher aggregate demand, thereby boosting firm-level returns such as ROE. In the context of the Kenyan energy and petroleum sector, this relationship reflects the interdependence between macroeconomic expansion and energy consumption, as economic activity intensifies, energy demand rises, leading to improved financial outcomes for these firms.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents a summary of the study findings, conclusions, and recommendations derived from the analysis of the effect of GDP growth on the financial performance of energy and petroleum firms listed at the NSE, Kenya.

Summary

The study found that GDP growth rate has a positive and statistically significant effect on the financial performance of energy and petroleum firms. This implies that periods of economic expansion enhance firm profitability by stimulating energy demand, industrial output, and investment activity. The results support the Neo-Classical Growth Theory, which emphasizes that macroeconomic expansion promotes productivity and capital accumulation, thereby improving firm returns.

Conclusion

In line with the first hypothesis, the study concludes that the GDP growth rate positively and significantly influences the financial performance of energy and petroleum firms listed at the NSE. A high GDP growth rate signals increased national output, higher household income, and expanded industrial activity, which collectively drive energy demand and boost firm revenues. During periods of economic expansion, energy consumption rises as businesses intensify production and consumers spend more, improving firms' ROE.

Therefore, Kenya's sustained GDP growth under the "Big Four Agenda" and infrastructure expansion provide a conducive environment for profitability in the energy and petroleum sector.

Recommendations

The study recommends that energy and petroleum firms align their strategic investments with Kenya's economic growth agenda by integrating into national development frameworks such as the Bottom-Up Economic Transformation Agenda (BETA) and Vision 2030. Firms should adopt adaptive investment models that expand during high-growth cycles, for example, scaling production and distribution networks when GDP growth accelerates and optimizing efficiency

during downturns. Additionally, firms can leverage infrastructure-led growth by forming partnerships in renewable energy projects, industrial parks, and rural electrification programs, which directly benefit from GDP expansion.

REFERENCES

Abel, A. B., Bernanke, B. S., & Croushore, D. (2017). *Macroeconomics* (9th Ed.) New York: Pearson.

Aguiar, M., & Broner, F. A. (2016). Determining Underlying Macroeconomic Fundamentals during Emerging Market Crises: Are Conditions as Bad as they Seem? *Journal of Monetary Economics*, *53*(4), 699-724.

Alam, Q. N. (2020). Impacts of Macroeconomic Variables on the Stock Market Returns of South Asian Region. *Canada Journal of Business Information & Studies*, *2*(2), 24–34.

Ali, M., & Bohara, A. K. (2017). How Does FDI Respond to the Size of Shadow Economy: An Empirical Analysis under a Gravity Model Setting? *International Economic Journal*, *31*(2), 159-178.

Aringo, C. E. (2023). Relationship between Increased Taxation and Financial Performance of Kenyan Firms. *African Journal of Commercial Studies*, *3*(3), 150-163.

Arnold, N., Osanloo, A. F., & Sherman Newcomb, W. (2021). Paying Professional Taxes for Promotion and Tenure: The Costs of Justice Work for Black Faculty. *Journal of Research on Leadership Education*, *16*(2), 122-139.

Aslam, A. M. (2015). A Case Study of Cointegration Relationship between Tax Revenue and Foreign Direct Investment: Evidence from Sri Lanka. In *2nd International Symposium, FIA, South Eastern University of Sri Lanka* 241 (4) 251- 266.

Asravor, R. K., & Fonu, P. D. (2021). Dynamic Relation between Macroeconomic Variable, Stock Market Returns and Stock Market Development in Ghana. *International Journal of Finance & Economics*, *26*(2), 2637–2646.

Atawodi, O. W., & Ojeka, S. A. (2012). Factors that affect Tax Compliance among Small and Medium Enterprises (SMES) In North Central Nigeria. *International Journal of Business and Management*, *7*(12), 87- 98.

Avgerinopoulou, S. (2018). The Impact of Macroeconomic Factors on Stock Market Prices in United Kingdom. *International Journal of Economics and Financial Issues*, *8*(2), 267-273.

Badullahewage, S. U., & Jayewardenepura, C. (2018). The Effects of Macroeconomic Factors on the Performance of Stock Market in Sri Lanka. *International Journal of Innovation and Economic Development*, *3*(6), 33–41.

Bernardelli, L. V., & De Castro, G. H. L. (2020). Stock Market and Macroeconomic Variables: Evidence for Brazil. *Journal of Economics and Business Research, 4(2), 101-113.*

Buckley, P. J., & Casson, M. C. (2015). The Internalization Theory of the Multinational Enterprise: a Review of the Progress of a Research Agenda after 30 Years. *International Business Strategy*, *135* (8) 85-107.

Chigbu, E. E., & Eze, L. (2012). An Empirical Study on the Causality between Economic Growth and Taxation in Nigeria. *Current Research Journal of Economic Theory*, *4*(2), 29-38.

Chioma, D. O., Adanma, S. E., & Clementina, N. O. (2014). Empirical study of the Impact of Inflation on Bank Performance: Implication for Investment Decision Making in Banking Industry in Nigeria. *Humanity & Social Sciences Journal*, *9*(2), 61-71.

Chorn, S., & Siek, D. (2017). The impact of Foreign Capital Inflow on Economic Growth in Developing Countries. *Journal of Finance and Economics*, *5*(3), 128-135.

Daoui, D. (2017). Analysis of the Exchange Rate Volatility Influence on the Share Price: Morocco. *International Journal of Economics, Commerce and Management, 5(4), 95-105.*

Elbadawi, I., & Zaki, C. (2021). Exchange Rate Undervaluation, Economic Institutions and Exports Performance: Evidence from Firm-Level Data. *International Journal of Trade and Global Markets*, *14*(1), 62-93.

Epaphra, M. (2018). The Impact of Macroeconomic Variables on Stock Prices in Tanzania. *Journal of Economics Library*, *5*(1), 12–41.

Farsio, F., & Fazel, S. (2013). The Stock Market/Unemployment Relationship in USA, China and Japan. *International Journal of Economics and Finance*, *5*(3), 24–29.

Fredrick, W. O. (2021). Macroeconomic Variables and Performance of Stock Prices of Companies Listed at Nairobi Securities Exchange, Kenya. *Journal of Finance and Investment Analysis*, *10*(3), 87-101.

Fronczek, M. (2018). Restrictions Applied By WTO Countries in International Trade in the Context of the COVID-19 Pandemic. *International Journal of Management and Economics*. *4*(1), 62-93.

Indangasi, J. (2017). The Relationship Between Economic Growth and Stock Market Performance in Kenya. *Journal of Finance and Accounting*, *1*(1), 27–41.

Innocent, G., Shukla, J., & Mulyungi, P. (2018). Effects of Macroeconomic Variables on Stock Market Performance in Rwanda. Case study of Rwanda Stock Exchange. *Journal of African Business, 19(3), 361-382.*

Irungu, S. M., & Muturi, W. (2015). Impact of Macroeconomic Variables on Performance of Firms Quoted in The Energy and Allied Sector in The Nairobi Securities Exchange. *International Journal of Education and Research*, *3*(10), 321-336.

Istiak, K., & Serletis, A. (2016). A Note on Leverage and the Macroeconomy. *Macroeconomic Dynamics*, *20*(1), 429-445.

Jareño Cebrián, F., & Negrut, L. (2016). US Stock Market and Macroeconomic Factors. *Emerging Markets Finance and Trade*, *52*(10), 2348-2362.

Javangwe, K. Z., & Takawira, O. (2022). Exchange Rate Movement and Stock Market Performance: An Application of the ARDL Model. *Journal of International Business and Economics, 20(1), 57-72.*

Jayasundara, J., Rathnayake, R., & Fernando, P. J. S. (2019). Impact of Macroeconomic Variables on Stock Market Performances. *International Journal of Business and Economics Research*, *8*(3), 89-102.

John, F. M., & Kisava, Z. S. (2018). The Relationship between Stock Prices and Exchange Rates: the Focus on Dar es Salaam Stock Exchange (DSE). *Journal of Economics and Finance*, *42*(4), 769-784.

Jorion, P. (2021). Hedge Funds vs. Alternative Risk Premia. *Financial Analysts Journal*, *77*(4), 65-81.

Kibara, J. W. (2021). The Effect of Selected Macroeconomic Variables on Stock Returns of Companies Listed in the Nairobi Securities Exchange. *International Journal of Economics and Financial Issues*, *11*(3), 344-356.

Kim & Lee (2021). The Relationship between GDP Growth and Stock Prices in Korea. *Journal of Korean Economic Studies*, *43*(2), 135-152.

Msabaha, A. (2020). Relationship Between Macroeconomic Factors and Stock Price Index: The Case of Dar Es Salaam Stock Exchange Market in Tanzania. *International Journal of Economics, Commerce and Management*, *8*(6), 124-141.

Muigai, R. G., & Cherono, I. (2019). Effect of Foreign Exchange Rates Volatility on Share Prices of Listed Firms in Kenya. *International Journal of Business and Management,14(5), 75- 89.*

Muktadir, A. L. M. D. (2013). The Effects of Interest Rates Volatility on Stock Returns: Evidence from Bangladesh. *International Journal of Economics, Commerce and Management*, *1*(5), 1-9.

Muli, D. M. (2019). *Determinants Of Financial Performance Of Processing Small And Medium Enterprises in Kitui County* . *International Journal of Economics, Commerce and Management*, *3*(8), 12-14.

Mutheu, E. (2016). The Relationship Between Interest Rates and Share Prices of Commercial Banks Listed at the Nairobi Securities Exchange. *International Journal of Finance and Banking Research*, *2*(5), 97-110.

Muthui, F. K. (2018). Effect of Selected Macroeconomic Variables on Share Prices of Listed Firms on the Nairobi Securities Exchange. *International Journal of Economics and Financial Research*, *4*(1), 15-28.

Mutuku, P. W., Waweru, F. W., & Kosgei, M. (2024). Multiple Taxation and Financial Performance of Manufacturing Firms Listed at the Nairobi Securities Exchange, Kenya. *Journal of Finance and Accounting*, *8*(7), 85-102.

Mwaore, M. W. (2017). Macroeconomic Variables on Share Prices of Firms Listed on the Nairobi Securities Exchange. *International Journal of Business and Management*, *12*(5), 115-128.

Mwenda, B., Ngollo, M., & Mwasota, A. (2023). Effects of Macroeconomic Variables on Performance of Listed Firms at Dar es Salaam Stock Exchange, Tanzania. *International Journal of Economics, Commerce and Management*, *12*(1), 2-8.

Namikoye, P., Macheru, J., & Nyiva, M. (2023). Foreign Direct Investment Outflow and Securities Market Volatility in Nairobi Securities Exchange, Kenya. *Journal of Finance and Accounting*, *7*(6), 21-33.

Ndlovu, B., Faisa, F., Resatoglu, N. G., & Türsoy, T. (2018). The Impact Macroeconomic Variables on Stock Returns: A Case of the Johannesburg Stock Exchange. *Journal of Economics and Behavioral Studies, 10(2), 41-51.*

Ntshangase, K., Mingiri, K. F., & Palesa, M. M. (2016). The Interaction Between the Stock Market and Macroeconomic Policy Variables in South Africa. *Journal of Economics*, *7*(1), 1–20.

Rutto, R., & Ondiek, A. (2014). Impact of Exchange Rate Volatility on Kenya's Tea Exports. *International Journal of Economics, Commerce and Management*, 2(12), 1-18.

Park, Y. (2011). A Pedagogical Framework for Mobile Learning: Categorizing Educational Applications of Mobile Technologies into Four Types. *International Review of Research in Open and Distributed Learning*, 12(2), 78-102.

Phiri, A. (2017). The Unemployment-Stock Market Relationship in South Africa: Evidence from Symmetric and Asymmetric Cointegration Models. *Managing Global Transitions: International Research Journal*, 15(3) 67-77.

Pramod Kumar, N., & Puja, P. (2012). The Impact of Macroeconomic Fundamentals on Stock Prices: An Evidence from Indian Data. *International Journal of Economics, Commerce and Management*, 1(9), 1-12.

Rompotis, G. G. (2024). The Impact of Taxation on Firm Performance and Risk: Evidence from Greece. *Quantitative Finance and Economics*, 8(1), 29-51.

Siddiqui, T. A., Ahmed, H., Naushad, M., & Khan, U. (2023). The Relationship between Oil Prices and Exchange Rate: A Systematic Literature Review. *International Journal of Energy Economics and Policy*, 13(3), 566-578.

Šimáková, J., Stavárek, D., Pražák, T., & Ligocká, M. (2019). Macroeconomic Factors and Stock Prices in the Food and Drink Industry. *International Journal of Financial Studies*, 7(1), 11.

Sirucek, M. (2012). Macroeconomic Variables and Stock Market. *Journal of Business Economics and Management*, 13(4), 723-737.

Suriani, S., Kumar, M. D., Jamil, F., & Muneer, S. (2015). Impact of Exchange Rate on Stock Market. *International Journal of Economics and Financial Issues*, 5(1), 385–388.

Taubah, I. D., Roslina, N. Y., Damayanti, I., & Tansar, I. A. (2024). The Influence of Earning Per Share (EPS) and Price Earnings Ratio (PER) on Stock Prices in the Food and Beverage Sector on the Indonesian Stock Exchange (BEI) for the 2015-2019 Period. *Journal of Economics, Management, and Entrepreneurship*, 2(1), 49-63.

Terborgh, G. W. (1926). The Purchasing-Power Parity Theory. *Journal of Political Economy*, 34(2), 197-208.

Thuo, A. N. (2012). The Effects of Interest Rates Volatility on Stock Returns: Evidence from the Nairobi Securities Exchange. *International Journal of Economics, Commerce and Management*, 1(9), 13-23.

Tola, Y. H. (2018). Effect of Selected Macroeconomic Variables on Capital Market Development in Kenya. *International Journal of Economics, Commerce and Management*, 6(5), 18-31.

Umar, B., & Nayan, S. (2018). Unemployment and Stock Market Development: Empirical Evidence from Africa. *Management and Economic Journal. 24 (12),351–360*.

Varpio, L., Paradis, E., Uijtdehaage, S., & Young, M. (2020). The Distinctions between Theory, Theoretical Framework, and Conceptual Framework. *Academic Medicine*, 95(7), 989-994.

Viphindrartin, S., Wilantari, R. N., & Bawono, S. (2022). The Comparison of the Islamic and Conventional Bank Performance before and During Covid-19 Pandemic in Indonesia. *Manajemen Dan Bisnis*, *21*(1), 76-84.

Waluyo, W. (2018). Do Efficiency Of Taxes, Profitability And Size of Companies Affect Debt? A Study of Companies Listed in the Indonesian Stock Exchange. *International Journal of Economics, Commerce and Management*, *2*(9), 33-43.

Willy, O. C. O. (2018). Macroeconomic Fluctuations Effects on the Financial Performance of Listed Manufacturing Firms in Kenya. *International Journal of Social Sciences*, *21*(1), 26- 40.

Worlu, C. N., & Omodero, C. O. (2017). A Comparative Analysis of Macroeconomic Variables and Stock Market Performances in Africa (2000-2015). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *7*(4), 95–102.

Zhang, K. H. (2021). How does South-South FDI affect Host economies? Evidence from China- Africa in 2003–2018. *International Review of Economics & Finance*, *75*, (7), 69-73.