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Cash Flow Management and Performance of Listed Nigerian Oil and Gas Companies

[1]Ibrahim, Kamaludeen Funsho Adisa and [*2]Akintola, Abdulwaheed

[1, *2]Department of Accounting, University of Abuja, FCT, Abuja Nigeria.

Abstract

This study examined cash flow management and performance of listed Nigerian oil and gas companies. Ex post facto research design was adopted. Population of this study was the nine (9) oil and gas companies listed on the Nigerian Exchange Group (NGX) as at 31st December, 2023. The sample size for this study was five (5) listed oil and gas companies. This study covered a period of fifteen (15) years from 2009-2023. Data collected were analyzed using both descriptive and inferential statistics. Inferentially, robust multiple regression was employed. The finding showed that net cash flow activities have positive significant impact on performance. Operating cash flow activities have negative significant impact on performance. Investing cash flow activities have positive significant impact on performance. Financing cash flow activities have negative significant impact on performance. Leverage has negative significant impact on performance. Firm size has negative significant impact on performance. Age of the firms have positive significant impact on the performance of listed Nigerian oil and gas companies. This study recommended that Nigerian oil and gas companies' management should improve their management approaches to sustain positive net cash flow and performance. Management of Nigerian oil and gas companies should employ adequate strategies in order to generate enough cash for daily operating needs, thereby improve performance. The management of Nigerian oil and gas companies should be more committed to investment needs to enhance annual performance. Lastly, the management of listed Nigerian oil and gas companies should increase their financing cash flow activities to improve performance.

Keywords: Cash Flow Management, Liquidity, Performance, Net Cash Flow Activities, Operating Cash Flow Activities, Investing Cash Flow Activities and Financing Cash Flow Activities.

Introduction

It is a known fact that agriculture sector have continue to play vital roles in the economic growth and development of different countries globally. Hence, there is no gain saying that agriculture sector contributes significantly to the Gross Domestic Products (GDP) of many African countries. In the case of Nigeria as developing country, it was regarded as one of the biggest agricultural commodity vaults in the world after attaining independence in 1960. This implies that Nigeria's principal source of income prior to the discovery of crude oil was the country's agricultural sector. Currently in Nigeria, the oil and gas sector is a significant contributor to the GDP, a fact that is widely acknowledged (Umoren *et al*, 2018). According to Nwoji (2021), the oil and gas sector remains the leading contributor to the Gross Domestic Product (GDP) in Nigeria. No wonder, the Nigeria generates over 90% of its export earnings from this sector. Hence, issues bothering on cash flow management are expected to be given adequate attention among listed Nigerian oil and gas companies.

Shash and Qarra (2018) assert that exercising proper management of cash flow is vital to the persistence of businesses. In the words of Laghari *et al* (2023), firms manage efficiently their cash flows through adequate working capital by balancing liquidity and profitability. Without doubt, working capital management, which is the main source of firm cash flow, and it, has significant importance in the context of the Nigerian oil and gas companies. Nasimiyu (2024) opined that firms' efficient cash flow management is a significant tool to enhance financial performance. Within the framework of this study, an enterprise's performance is an overall economic metric that signifies the extent to which production process inputs are utilized. According to Damagum and Abubakar (2014) financial performance measurement has been a much easier task; nevertheless, it also has its complications. Consequently, it is critical to employ suitable accounting tools to evaluate the operational and financial performance of companies, notably the oil and gas companies.

Statement of the Problem

Cash flow management is a critical aspect of business operations, yet many organizations struggle to effectively manage their cash flow, leading to financial instability and hindering performance. This implies that many businesses lack reliable methods for predicting cash inflows and outflows, resulting in unexpected cash shortages or surpluses.

***Corresponding Author:** Akintola, Abdulwaheed

This may be as a result of the global financial crises of the 2008 economic meltdown which affected all sectors of the world, including the oil and gas companies particularly in Nigeria. The Nigerian oil and gas industry in 2008 was significantly affected by the global financial crisis. The crisis led to a sharp decline in oil prices, which had a major impact on the sector's revenue. Also, the collapse of Lehman Brothers and the subsequent global financial crisis led to a sharp decline in oil prices. This had a major impact on the Nigerian oil and gas industry, as the sector's revenue is heavily dependent on oil exports. These challenges collectively contribute to cash flow volatility, reduced profitability, and increased financial risk, ultimately hindering business growth and success. Despite the significant roles of the oil and gas industry in Nigeria's economy, many companies within the oil and gas sector are facing significant problems, leading to suboptimal performance and financial instability which may be as a result of challenges in managing cash flow.

The researchers observed that there are previous researches on cash flow management both from developed countries, and African countries including Nigeria. Among these studies are the research carried out by Nasimiyu (2024), Laghari *et al* (2023), Emeka *et al* (2023), Stom and Wepukhulu (2022), Chibuike and Celestine (2022) but the findings of these studies are not the same which may be due to many factors such location of the study, companies used as a focus, data used for the study, number of years covered, variables used, method of data analysis among others. The question is; is there any effect of cash flow management on performance of listed Nigerian oil and gas companies? Furthermore; what is the effect of cash flow management variables such as net cash flow, operating cash flow, investing cash flow, and financing cash flow on oil and gas companies in Nigeria? The researchers were motivated to provide answers to these questions raised on cash flow management and performance. Consequently, it was also observed that the effects of cash flow management variables such as net cash flow, operating cash flow, investing cash flow and financing cash flow on performance of listed oil and gas companies in Nigeria need be thoroughly studied. Thus, this study filled knowledge gap by assessing the extent to which cash flow management affect the performance listed oil and gas companies in Nigeria.

Research Questions

The following research questions are raised to guide this study.

i). What is the effect of net cash flow activities on performance of listed Nigerian oil and gas companies?
ii). To what extent has operating cash flow activities affected the performance of listed Nigerian oil and gas companies?
iii). What is the effect of investing cash flow activities on performance of listed Nigerian oil and gas companies?
iv). What is the extent to which financing cash flow activities affect the performance of listed Nigerian oil and gas companies?

Objectives of the Study

The main objective of this study is to investigate cash flow management and performance of listed Nigerian oil and gas companies. Specifically, the objectives are to:

i). Examine the effect of net cash flow activities on the performance of listed Nigerian oil and gas companies.
ii). Ascertain the effect of operating cash flow activities on the performance of listed Nigerian oil and gas companies.
iii). Identify the effect of investing cash flow activities on the performance of listed Nigerian oil and gas companies.
iv). Investigate the effect of financing cash flow activities on the performance of listed Nigerian oil and gas companies.

Research Hypotheses

The following hypotheses are formulated and tested for the purpose of this study.

H_{01}: Net cash flow activities have no significant relationship with the performance of listed Nigerian oil and gas companies.

H_{02}: There is no significant relationship between operating cash flow activities and the performance of listed Nigerian oil and gas companies.

H_{03}: There is no significant relationship between investing cash flow activities and the performance of listed Nigerian oil and gas companies.

H_{04}: Financing cash flow activities has no significant relationship with the performance of listed Nigerian oil and gas companies.

Significance of the Study

The findings of this study would benefit stakeholders such as financial analysts, management of listed oil and gas companies, potential and existing investors, shareholders, and future researchers.

Scope of the Study

This study covered cash flow management and performance of listed Nigerian oil and gas companies. This study is limited to a period of fifteen (15) years from 2009 to 2023. Further, the variables used in this study are limited to cash flow management variables such as net cash flow activities, operating cash flow activities, investing cash flow activities, and financing cash flow activities and performance indicator, that is liquidity.

Literature Review

Conceptual Review

Cash Flow Management

Cash flow management involves the systematic handling, regulation, and investment of an organization's liquid assets to optimize their utilization. It is considered crucial for the sustainability and operational vitality of a business like the oil and gas companies. Nasimiyu (2024) defined cash management as a strategic process aimed at maximizing the value of cash flow. Emeka *et al*. (2023) assert that it is important have the right amount of cash available at the appropriate time and place to meet the entity's obligations cost-effectiveness. Laghari *et al*. (2023) described cash management as encompassing tasks such as fund collection, forecasting, allocation, investment, and strategic planning of financial resources necessary for the organization's efficient functioning. Thus, in this context, cash flow management components are net cash flow, operating cash flow, investing cash flow and financing cash flow.

Concept of Performance

The term "performance" in this study refers to financial performance. Thus, every business is expected to aim for the maximum financial performance because it is a vital issue in economic units. A business's financial performance is influenced by a wide range of factors. According to Joecks, *et*

al (2023), these factors could be internal or external. This demonstrates how the overall economic indicator of an enterprise's performance reflects the extent to which factors of the production process are put to use. Financial performance serves as a comprehensive X-ray of a company's financial well-being over a specific timeframe, allowing for comparisons not only within industries but also across broader sectors (Debie, 2022). In this study, performance is measured as liquidity of oil and gas companies, that is, Current Ratio as used by Chibuike and Celestine (2022).

Theoretical Review

Free Cash Flow Theory

The Free Cash Flow (FCF) theory was introduced by Jensen in 1986. The theory emphasized that companies with substantial FCF often engage in suboptimal projects, exacerbating the agency conflict between management and shareholders and reducing firm value. Jensen argues that when FCF exceeds the amount needed for positive Net Present Value (NPV) projects, managers frequently misuse it on investments that yield returns below the cost of capital. To address this issue, the FCF theory suggests using debt as a tool to reduce the agency costs linked to FCF. It is suggested that debt is a more effective tool than dividends in restricting managers' access to resources. Managers are obligated by debt commitments, unlike dividends, which allow them to influence the firm's future FCF and potentially reduce dividends to the detriment of shareholders. Several empirical studies consistently support the Free Cash Flow (FCF) theory.
This study used the Free Cash Flow (FCF) theory as the underpinning theory because it is related and relevant to this study. Thus, this theory was adopted as the most appropriate underpinning theory for this study because the theory primarily focuses on the potential misuse of excess cash by company management. It posits that companies with abundant free cash flow are susceptible to managerial inefficiency and self-serving decisions which can lead to decline in shareholder value and performance.

Empirical Review

Nasimiyu (2024) examined cash management and its impact on the financial performance of Small and Medium Enterprises (SMEs). Empirical evidence revealed that effective cash management is crucial for SMEs as it enables growth, optimizes investments, enhances profitability, and ensures financial stability. Laghari *et al*. (2023) investigated the impact of changes in cash flow measures and metrics on firm financial performance. The study used generalized estimating equations (GEEs) methodology to analyze longitudinal data for sample of 2,028 listed Chinese non-financial firms from the period 2018-2020. The findings of the study showed that the decline in cash flow measures and metrics has significant positive improvements on the financial performance of firms. Similarly, Emeka *et al*. (2023) examined the moderating effect of corporate governance mechanism on the relationship between cash flow management and performance of listed manufacturing firms in Nigeria. Ex post facto design was used. The results of the study showed that operating activities (OA) significantly affect firm performance (NAPS). Financing activities (FA) has a positive and significant effect on firm performance, whereas investing activities (FA) has the same effect on firm performance in Nigeria. Also, it was noted that corporate governance mechanism (board independence) moderated the effect of cash flow management on firm performance in Nigeria. The study recommended that businesses should review their approaches to managing cash flow so that they can produce enough cash to cover both their operating and investing needs.
Stom and Wepukhulu (2022) determined the effect of cash flow management on financial performance of listed companies on the Nairobi Securities Exchange. The study covered year 2013 to 2017. The study used multiple linear regression for data analysis. The findings revealed a positive significant relationship between cash flow from operating activities and the financial performance of listed companies; a negative significant relationship between cash flow from investing activities and financial performance and a positive significant relationship between cash flow from financing activities and financial performance of listed companies at the Nairobi Securities Exchange. Chibuike and Celestine (2022) also examined the effect of cash flow management on financial performance: Evidence from the pharmaceutical industry in Nigeria (2011 to 2020). Multiple regression analysis and the Pairwise Granger Causality tests were used to analyze the data gathered with the aid of E-Views 10 statistical software. The study revealed a positive and insignificant effect of operating activities on liquidity. Also, it revealed a positive and insignificant effect of investing activities on liquidity. And finally, it revealed a negative but significant effect of financing activities on the liquidity of listed pharmaceutical companies in Nigeria. Therefore, it was recommended that listed pharmaceutical companies in Nigeria should be encouraged to build a reasonable cash flow control strategy that will bring efficiency to the firm, thereby enhancing the firm financial performance. Also, pharmaceutical companies should re-evaluate their cash flow management strategies in order to enable them to generate enough cash sufficient to meet their investing activities.

Methodology

This study adopted *ex-post facto* research design and the population for this study comprises of all the nine (9) listed oil and gas companies in Nigeria as at 31st December, 2023. The sampling technique adopted was the systematic filtration technique. This study employed secondary data.

Table 1: Definitions and Measurement of Variables.

S/No.	Variables	Measurements	Author(s)
	Dependent Variable		
1.	**LIQ** = Liquidity.	Measured as Current Ratio, that is, current assets divided by current liabilities.	Chibuike & Celestine (2022)
	Independent Variables		
2.	**NCF** = Net Cash Flow Activities.	Measured as a natural logarithm of the net value of the cash flow activities in a cash flow statement in the annual report.	Odo & Ohazuluike (2021)
3.	**OPA** = Operating Cash Flow Activities	Measured as a natural logarithm of the total value of the operating activities in a cash flow statement in the annual report.	Chibuike & Celestine (2022)

4.	**INVA** = Investing Cash Flow Activities	Measured as a natural logarithm of the total value of the investing activities in a cash flow statement in the annual report.	Emeka *et al*. (2023)
5.	**FINA** = Financing Cash Flow Activities	Measured as a natural logarithm of the total value of the financing activities in a cash flow statement in the annual report.	Chibuike & Celestine (2022)
Control Variables			
6.	**FMZ** = Firm Size	Measured as logarithm of total assets of each firm.	Ibrahim & Ademu, (2021)
7.	**LER** = Leverage	Measured as total debt divided by total assets.	Salawudeen & Ibrahim (2021)
8.	**AGE** = Age of Firms	Measured as natural logarithm of the number of years since the firms are listed.	Coad *et al*. (2018)

Source: *Researchers' Review*

Model Specification

The model specification used for this study was adapted from the study of Chibuike & Celestine (2022) which was used to examine the effect of Cash Flow Management on Financial Performance of Pharmaceutical Industry with little modification.

The model used by Chibuike & Celestine (2022) is stated as follows:

$$LIQ_{it} = \alpha_0 + \alpha_1 OPA_{it} + \alpha_2 INVA_{it} + \alpha_3 FINA_{it} + \alpha_4 FMZ_{it} + \varepsilon_{it}$$

Where:
LIQ = Liquidity
OPA = Operating Cash Flow Activities
INVA = Investing Cash Flow Activities
FINA = Financing Cash Flow Activities
FMZ = Firm Size

The model for this study is specified below:

$$LIQ_{it} = f(NCF_{it}, OPA_{it}, INVA_{it}, FINA_{it}, FMZ_{it}, LER_{it}, AGE_{it}) \quad \ldots (1)$$

$$LIQ_{it} = \alpha_0 + \alpha_1 NCF_{it} + \alpha_2 OPA_{it} + \alpha_3 INVA_{it} + \alpha_4 FINA_{it} + \alpha_5 FMZ_{it} + \alpha_6 LER_{it} + \alpha_7 AGE_{it} + \varepsilon_{it} \quad \ldots (2)$$

The modification made in the adapted model was the introduction of Net Cash Flow as independent variable which was not used by Chibuike & Celestine (2022). Further, this study introduced Leverage and Age of the firms as additional control variable.

Where:
LIQ = Liquidity
NCF = Net Cash Flow Activities
OPA = Operating Cash Flow Activities
INVA = Investing Cash Flow Activities
FINA = Financing Cash Flow Activities
LER = Leverage
FMZ = Firm Size
AGE = Age of the Firms
α_0 = Constant or Intercept;
$\alpha_1 - \alpha_4$ = Coefficient of the explanatory variables;
$\alpha_5 - \alpha_7$ = Control variables
α_8 = Dependent variable
ε = error term

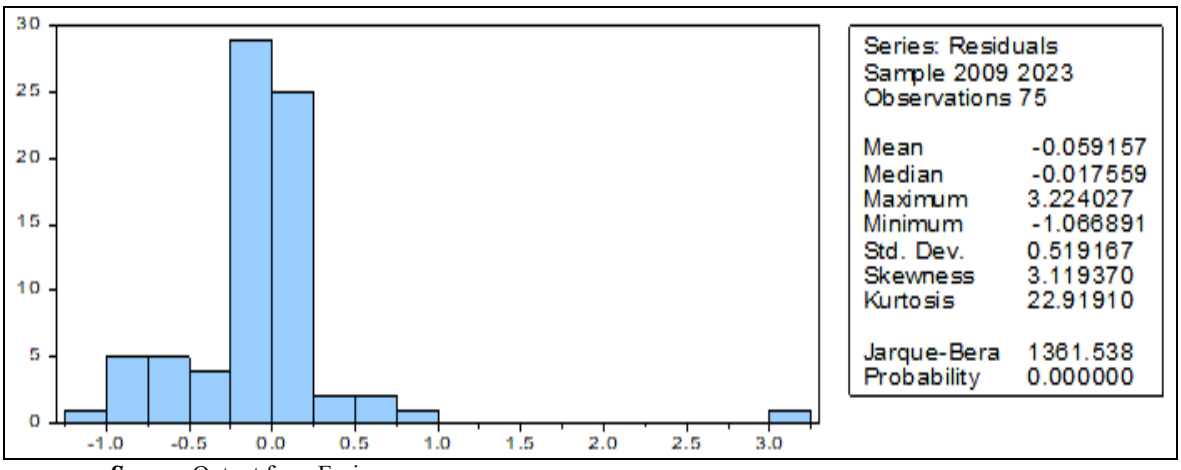
The data obtained for the purpose of this study was analyzed through the use of both descriptive and inferential statistics. The descriptive statistics analysis describes the data obtained. The correlation analysis was used to assess the relationship between variables. Inferentially, robust multiple regression was used to test the hypotheses formulated earlier.

Data Presentation and Analysis

Data Analysis

Normality Test

The data used for this study was subjected to normality test. The researchers decided to use histogram test for the normality test as shown below.



***Source*:** Output from E-views

The histogram above is the result of the abnormality correction using log transformation values of the data used for this study. Based on the shape of the histogram, the distribution is said to be normally distributed as can be observed from the graph above. According to Ghasemi and Zahediasl (2012), when an histogram normality result show a bell shaped with the middle having the pick of the distribution and both left and right hand sides representing the tail, the distribution is considered normal.

Table 2: Residual Cross-Section Dependence Test.

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	10.91053	10	0.3645
Pesaran scaled LM	-0.914433		0.3605
Pesaran CD	-0.471779		0.6371

***Source*:** Output from E-views

The residual cross-section dependence test revealed that the p-value for Breusch-Pagan test is 0.3645. This revealed that there is no evidence of heteroscedasticity in the model. The error terms appear to have constant variance. This suggests that the model assumptions are met, and the standard errors of the parameter estimates are reliable. Similarly, the p-value for Pesaran scaled LM test is 0.3605. This shows that there is no evidence of cross-sectional dependence in the panel data. This suggests that the observations across different cross-sectional firms are independent. Also, the p-value for Pesaran CD test is 0.6371. This suggests that the observations across different cross-sectional firms are independent. Thus, it is evidence that cross-sectional dependence test has significant implications for this analysis, according to Haining (2003).

Summary of descriptive statistics of dependent, independent, control variables.

Table 3: Descriptive Statistics Results

	LIQ	NCF	OPA	INVA	FINA	LER	FMZ	AGE
Mean	0.995013	3.797747	3.595573	-5.214413	-0.204173	0.706213	10.90337	1.279880
Median	0.978000	8.930000	9.217000	-9.098000	-8.324000	0.737000	10.78400	1.322000
Maximum	4.475000	10.91800	11.19000	10.74600	11.32700	0.951000	12.49700	1.531000
Minimum	0.190000	-10.68800	-10.65800	-11.26700	-10.93900	0.116000	9.959000	0.602000
Std. Dev.	0.564511	8.862096	9.071477	7.710846	9.704198	0.162654	0.576164	0.192321
Skewness	3.012095	-0.888502	-0.763669	1.326666	0.085491	-1.526072	0.779008	-1.406568
Kurtosis	20.34659	1.832554	1.618624	2.853742	1.030703	6.607295	2.960644	5.037507

***Source*:** Output from E-views

The descriptive statistics reveals that Liquidity (LIQ) has an average value of 1.00% and a 0.56% standard deviation value. This implies that data distribution clustered around the mean data points in sampled listed oil and gas companies LIQ across the total observations. The distribution shows positive skewness value of 3.012 and kurtosis value of 20.35. This result depicts that the data are normally distributed. Net Cash Flow (NCF) shows a mean of 3.80% with a standard deviation value of 8.86%. This implies that NCF that is data are more spread out (there is a high dispersion) data are above the mean of NCF, that is, higher dispersion value. The distribution shows a negative skewness value of -0.889 and kurtosis distribution of 1.832. This result depicts the data are normally distributed.

Statistical observation from Operating Cash Flow Activities (OPA) shows that it has a mean of 3.60% with a standard deviation value of 9.07% which indicates data are more spread out (there is a high dispersion) data are above the mean in OPA. The distribution shows a negative skewness value of -0.764 and kurtosis distribution value of 1.619. This result depicts the data are normally distributed. Also, Investing Cash Flow Activities (INVA) has an average value of -5.21% with a standard deviation value of 7.711%, this implies that data are more spread out (there is a high dispersion) data are above the mean in INVA (higher dispersion value or higher than the mean). The distribution shows a positive skewness value of 1.327 and kurtosis distribution value of 2.854. This result depicts the data are normally distributed.

However, Financing Cash Flow Activities (FINA) has an average value of -0.20% and a 9.70% standard deviation value. This implies that data are more spread out (there is a high dispersion) data are above the mean in FINA across the total observations. The distribution shows a positive skewness value of 0.085 and kurtosis distribution value of 1.031. This result depicts the data are normally distributed. Leverage (LER) has an average value of 0.71% and a 0.16% standard deviation value. This implies that data distribution clustered around the mean data points in sampled listed oil and gas companies LER across the total observations. The distribution shows a negative skewness value of -1.526 and kurtosis distribution value of 6.607. This result depicts the data are normally distributed. Firm size (FMZ) shows a mean of 10.90% with a standard deviation value of 0.58%. The implication of this is that FMZ distribution shows that data points are below the mean, that is, data clustered around the mean (there is, a lower dispersion) in sampled listed oil and gas companies in Nigeria. The distribution shows a positive skewness value of 0.799 and kurtosis distribution value of 2.961. This result shows normally distributed data. Lastly, age of the firms has an average value of 1.28% and a 0.19% standard deviation value. This implies that data points are below the mean, that is, data clustered around the mean (there is, a lower dispersion) in the sampled listed oil and gas companies in Nigeria. The distribution shows a negative skewness value of -1.407 and kurtosis distribution value of 5.038. This result depicts the data are normally distributed.

Table 4: Correlations Matrix.

	LIQ	NCF	OPA	INVA	FINA	LER	FMZ	AGE
LIQ	1.000000							
NCF	0.039383	1.000000						
OPA	-0.067212	0.318483	1.000000					
INVA	0.073298	-0.016301	0.054407	1.000000				
FINA	-0.241489	0.199204	0.024981	0.118463	1.000000			
LER	-0.524588	-0.219221	-0.016047	-0.140304	0.075577	1.000000		
FMZ	-0.359849	-0.046939	-0.097802	-0.191487	0.273700	0.467579	1.000000	
AGE	-0.292817	-0.171935	-0.104274	-0.160966	0.043759	0.587357	0.522968	1.000000

***Source*:** Output from E-views

The above correlation matrix results indicates that Net Cash Flow Activities (NCF) and Investing Cash Flow Activities (INVA) are positively correlated with Liquidity (LIQ) respectively; this indicates that net cash flow activities and investing cash flow activities has positive impacts on the liquidity of listed oil and gas companies in Nigeria. On the other hand, the relationship between Operating Cash Flow Activities (OPA), Financing Cash Flow Activities (FINA), Leverage (LER), Firms Size (FMZ), Age of the firms (AGE), and Liquidity (LIQ) is negative. This suggested that operating cash flow activities, financing cash flow activities, leverage, firms size and age of the firms decreases liquidity and have negative impact on liquidity of listed oil and gas companies in Nigeria.

Table 5: Robust Regression Estimation

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	4.764468	0.343963	13.85167	0.0000
NCF	0.003720	0.002061	1.805043	0.0711
OPA	-0.006766	0.001926	-3.513629	0.0004
INVA	0.006807	0.002209	3.082316	0.0021
FINA	-0.004263	0.001834	-2.324281	0.0201
LER	-1.058280	0.130598	-8.103337	0.0000
FMZ	-0.417707	0.036312	-11.50336	0.0000
AGE	1.278488	0.112999	11.31412	0.0000

***Source*:** Output from E-views

The above table shows the results of the Robust Multiple Regression statistical analysis as specified by econometric model. This result shows that Net Cash Flow Activities (NCF) has a positive coefficient value of 0.003720 and an insignificant impact on performance measured by Liquidity (LIQ) of listed oil and gas companies in Nigeria at 5%. However, the finding is significant at 10%. It means that an increase in net cash flow activities has the potential on the average, 0.37 percent impact on the liquidity of listed oil and gas companies in Nigeria, while holding other variables constant. With the p-value of 0.0711, it is evident that the result is significant at 0.10 significant level.

Also, the finding shows that Operating Cash Flow Activities (OPA) has negative coefficient value of -0.006766 and a significant impact on performance, that is, liquidity (LIQ) of listed oil and gas companies in Nigeria. It means a decrease in operating cash flow activities has the potential on the average to decrease the liquidity of listed oil and gas companies in Nigeria by 0.68 percent, while holding other variables constant. This impact is positive and statistically significant considering the p-value of 0.0004.

In addition, Investing Cash Flow Activities (INVA) has positive coefficient value of 0.006807 and a significant impact on performance, that is, Liquidity (LIQ) of listed oil and gas companies in Nigeria. It means an increase in investing cash flow activities has the potential on the average to increase the liquidity of listed oil and gas companies in Nigeria by 0.68 percent, while holding other variables constant. This impact is positive and statistically significant considering the p-value of 0.0021.

Furthermore, Financing Cash Flow Activities (FINA) has negative coefficient value of -0.00426 with p-value of 0.0201 implying that a decrease in the financing cash flow activities of listed oil and gas companies in Nigeria has the potential on the average to decrease performance, that is, Liquidity (LIQ), while holding other variables constant, financing cash flow activities will have -0.43 percent decrease in liquidity of listed oil and gas companies in Nigeria; however, this result has negative coefficient value but statistically significant considering the p-value of 0.0201

Leverage (LER) has negative coefficient value of -1.058280 with p-value of 0.0000 implying that a decrease in the leverage of listed oil and gas companies in Nigeria has the potential on the average to decrease performance, that is, Liquidity (LIQ), while holding other variables constant, leverage will have -1.06 percent decrease in liquidity of listed oil and gas companies in Nigeria; however, this result has negative coefficient value but statistically significant considering the p-value of 0.0000.

Firm Size (FMZ) has negative coefficient value of -0.417707 with p-value of 0.0000 implying that a decrease in the firm size of listed oil and gas companies in Nigeria has the potential on the average to decrease performance, that is, Liquidity (LIQ), while holding other variables constant, leverage will have -0.42 percent decrease in liquidity of listed oil and gas companies in Nigeria; however, this result has negative coefficient value but statistically significant considering the p-value of 0.0000

Lastly, Age of the firms (AGE) has positive coefficient value of 1.278488 and a significant impact on performance, that is, Liquidity (LIQ) of listed oil and gas companies in Nigeria. It means an increase in the age of listed oil and gas companies has the potential on the average to increase the liquidity by 1.28 percent, while holding other variables constant. This impact is positive and statistically significant considering the p-value of 0.0000.

The coefficient of determination, $R^2 = 0.605744$ shows that 60.57 percent of variation in Liquidity (LIQ) and adjusted $R^2 = 0.564553$ shows that 56.46 percent of variation in Liquidity (LIQ) which is explained by the independent variables and control variables; that is, Net Cash Flow Activities (NCF), Operating Cash Flow Activities (OPA), Investing Cash Flow Activities (INVA), Financing Cash Flow Activities (FINA), and Control Variables which are; Leverage (LER), Firm Size (FMZ) and Age of the firms (AGE). Further, significant value of $F = 0.0000 < 0.05$, it can be said that the model was fit, or the independent variables could be used to predict the dependent variable.

Test of Hypotheses

H_{01}: Net cash flow activities have no significant relationship with the performance of listed Nigerian oil and gas companies.

From the robust multiple regression statistical analysis result based on LIQ, it shows that Net Cash Flow Activities indicated by NCF, has a positive coefficient value of 0.003720 with p-value of 0.0711. Based on this result, this study rejects the null hypothesis (H_0) which states that net cash flow activities has no significant relationship with the performance of listed Nigerian oil and gas companies; thereby accepting the alternate hypothesis (H_1) which states that net cash flow activities has significant relationship with the performance of listed Nigerian oil and gas companies.

H_{02}: There is no significant relationship between operating cash flow activities and the performance of listed Nigerian oil and gas companies.

Further, the robust multiple regression statistical analysis result based on LIQ, it shows that Operating Cash Flow Activities indicated by OPA has negative coefficient value of -0.006766 with p-value of 0.0004. Based on this result the p-value is statistically significant, the study thereby reject the

null hypothesis (H_0) which states that there is no significant relationship between operating cash flow activities and the performance of listed Nigerian oil and gas companies and accept the alternate hypothesis (H_1) which states that there is no significant relationship between operating cash flow activities and the performance of listed Nigerian oil and gas companies.

H_{03}: There is no significant relationship between investing cash flow activities and the performance of listed Nigerian oil and gas companies.

Also, the robust multiple regression statistical analysis result based on LIQ shows that Investing Cash Flow indicated by INVA, has a positive coefficient value of 0.006807 with p-value of 0.0021. Based on this result, the null hypothesis (H_0) which states that there is no significant relationship between investing cash flow activities and the performance of listed Nigerian oil and gas companies is rejected and alternate hypothesis (H_1) which states that there is a significant relationship between investing cash flow activities and the performance of listed Nigerian oil and gas companies is accepted.

H_{04}: Financing cash flow activities has no significant relationship with the performance of listed Nigerian oil and gas companies.

Lastly, the robust multiple regression statistical analysis result based on LIQ shows that Financing Cash Flow Activities indicated by FINA, has a negative coefficient value of -0.004263 with p-value of 0.0201. Based on this result, the alternate hypothesis (H_1) which states that financing cash flow activities has a significant relationship with the performance of listed Nigerian oil and gas companies is accepted and null hypothesis (H_0) which states that financing cash flow activities has no significant relationship with the performance of listed Nigerian oil and gas companies is therefore rejected.

Discussion of Findings

This study used robust multiple regression statistical analysis to determine the relationship between the dependent, independent and control variables.

From the findings of this study, a positive but significant relationship at 10% was observed between Net Cash Flow Activities (NCF) and Liquidity (LIQ). This finding suggests that an increase in net cash flow activities will create a situation of an increase in the liquidity of listed oil and gas companies in Nigeria. This finding is in line with the finding of Laghari *et al* (2023).

The relationship between Operating Cash Flow Activities (OPA) and Liquidity (LIQ) was observed to be negative and statistically significant. This finding suggests that a decrease in operating cash flow activities will create a situation of a decrease in the liquidity of listed oil and gas companies in Nigeria. The finding of this study is not in line with the finding of Emeka *et al* (2023), Stom & Wepukhulu (2022), and Chibuike & Celestine (2022).

A positive association was noticed between Investing Cash Flow Activities (INVA) and Liquidity (LIQ). This finding indicated that investing cash flow activities have positive significant impact on liquidity of listed oil and gas companies in Nigeria. This finding is in line with the finding of Emeka *et al* (2023). However, this study disagrees with the findings of Stom & Wepukhulu (2022), and Chibuike & Celestine (2022).

The relationship between Financing Cash Flow Activities (FINA) and Liquidity (LIQ) was observed to be negative but statistically significant. This finding suggests that decrease in financing cash flow activities will create a situation of decrease in the liquidity of listed oil and gas companies in Nigeria. This finding is in line with the finding of Chibuike & Celestine (2022). However, the finding of this study disagreed with the findings of Emeka *et al* (2023), and Stom & Wepukhulu (2022).

Further, from the findings of this study, a negative significant relationship was also observed between Leverage (LER) and Liquidity (LIQ). This finding suggests that a decrease in leverage will create a situation of a decrease in the liquidity of listed oil and gas companies in Nigeria. This finding is in line with the finding of Ibrahim & Ademu, (2021).

A negative association was noticed between Firm Size (FMZ) and Liquidity (LIQ). This finding indicated that firm size have negative significant impact on liquidity of listed oil and gas companies in Nigeria. This finding is in line with the finding of Salawudeen & Ibrahim (2021).

Lastly, the relationship between Age of the firms (AGE) used as a control variable for this study and Liquidity (LIQ) was observed to be positive and statistically significant at 1% significant level. This finding suggests that age of the firms have positive significant impact on the liquidity of listed oil and gas companies in Nigeria. This finding is in line with the findings of Coad *et al* (2018).

Conclusion

For the purpose of this study and based on the findings, it was concluded that net cash flow activities has a positive insignificant impact at 5% but statistically significant at 10% on performance. This finding suggests that an increase in net cash flow activities will create a situation of an increase in the liquidity of listed oil and gas companies in Nigeria. Further, operating cash flow activities has negative but significant impact on performance. This suggests that a decrease in operating cash flow activities will decrease the liquidity of listed oil and gas companies in Nigeria. Investing cash flow activities has positive significant impact on performance. That is, increase in the investing cash flow activities will increase liquidity of oil and gas companies in Nigeria.

On the other hand, financing cash flow activities has negative but significant impact on performance. This finding suggests that financing cash flow activities is negatively affecting the liquidity of listed oil and gas companies in Nigeria. Leverage has negative but significant impact on performance. This finding suggests that leverage is negatively affecting the liquidity of listed oil and gas companies in Nigeria. Firm size has negative but significant impact on performance. This finding suggests that firm size is negatively affecting the liquidity of listed oil and gas companies in Nigeria. Lastly, age of the firms has positive significant impact on performance. It is concluded that age of the firms is capable of increasing the liquidity of listed Nigerian oil and gas companies.

Recommendations

This study made the following recommendations based on the findings.

i). The management of oil and gas companies in Nigeria should improve and maintain their management approaches to cash flow management in order to sustain positive net cash flow, this will enhance their performance.

ii). It is also recommended that management of Nigerian oil and gas companies should employ more strategies to cash flow management so that they can have enough cash for

operating needs for more significant impact on their performance.

iii). The management of oil and gas companies in Nigeria should be more committed to cash flow management so that they can produce enough cash to cover investing needs of their companies and also enhance annual performance.

iv). Lastly, the management of listed oil and gas companies in Nigeria should improve and maintain their management approaches to cash flow management in order to sustain positive financing cash flow activities and enhance performance.

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