



MITIGATING THE EFFECT OF PIPELINE VANDALISM AND PRODUCTION DECLINE IN NIGERIA'S OIL AND GAS SECTOR: A CASH FLOW PLANNING APPROACH TO SUSTAINABLE FIRM SURVIVAL.

Agbo, Emmaculeta Obianujunwa¹; Onyeka, V.² and Emmanuel Cynthia Ononuju³

¹Bursary Department, Enugu State University of Medical and Applied Sciences, Igbo-Eno

²Enugu State University of Science and Technology, Enugu

³Federal University, Otuoke.

Abstract:

The study considered mitigating the effect of pipeline vandalism and production decline in Nigeria's oil and gas sector using a cash flow planning approach to sustainable survival. Net cash flow from operating activities (NCFOA), Net cash flow from investing activities (NCFIA), and Net cash flow from financing activities (NCFFA) were the independent variables, while sustainable survival was the dependent variable. Six (6) of the eleven (11) oil and gas firms listed on the Nigerian Exchange Group (NGX) using a simple random sampling technique. The ex-Post facto research design was adopted. Three hypotheses guided the study. Regression models were used. The results revealed that NCFOA, NCFIA and NCFFA have significant positive effect on sustainable survival. Implications of the findings include that an increase in NCFOA will enhance firm survival, just investing decisions will significantly affect survival. The study recommends that managers of oil and gas firms in Nigeria should expand activities such as improved marketing and promotions, carefully evaluate investment choices to include building refineries to guarantee optimal value creation and increased survival. While considering the limits of the risk appetite of the management.

Keywords: Cash flow activities, Firm survival. Oil and gas sector. Cash flow planning and Sustainability

Introduction

The Nigeria oil and gas sector (the petroleum industry) has been the backbone of the country's economy. Foreign exchanges depend on this sector, accounting for approximately 90% of its export earnings and 80% of government revenue (Ugwu, and Inyiama, 2021; Ugwu and Nwachukwu, 2024). However, the sector has been plagued by persistent challenges, including pipeline vandalism and production decline, which have significant implications for the country's economic stability and the survival of firms operating in the sector. The question remains, how can firms survive without a sustainable economy?

Ugwu et al (2021) and Ezeh, et al (2022) opine that pipeline vandalism, in particular, has become a recurring decimal, with the Nigerian National Petroleum Corporation (NNPC) reporting an average of 200 pipeline breaches per year, resulting in substantial losses in revenue and production capacity. Furthermore, the decline in oil production has been exacerbated by aging infrastructure, lack of investment in new projects. The consequences of pipeline vandalism and production decline are far-reaching, with firms in the sector facing significant cash flow challenges, reduced profitability and increased risk of insolvency, thereby threatening the sustainable of firms in the sector.

The ability of these firms to survive and thrive in the face of these challenges is critical to the long-term sustainability of the sector and the Nigerian economy as a whole (Ugwu, and Inyiama, 2021; Ugwu and Nwachukwu, 2024). Effective cash flow planning is essential for firms to navigate these challenges, as it enables them to prioritize investments, manage risk, maintain liquidity and sustain survival. However, Ekechukwu, *et al* (2017); Aghaei and Shakiri (2019); Ezeh, *et al* (2022), and Okorie, *et al* (2024) in their separate studies opine that sustainable survival is threatened when an organization is unable to generate positive cash flows enable it to sustain operations effectively. Indications of cash flow problems include the organization's inability to pay or settle creditors and other suppliers, pay salaries, and meet other future obligations.

It is expected that there should be a mutual understanding between the people of the oil rich areas in Nigeria, the oil firms and the government, and other stakeholders. Having a strong unambiguous legal frame work to guide operations and relationships. Maintaining open communications, exploring the options of dialogue to resolve issues. Where it seems difficult, legal approach will be adopted. Creating environment of peaceful coexistence and smote operations for oil firms. In turn, helping the companies to thrive, meet their obligations and sustain survival, the prevailing economic challenges notwithstanding.

However, what obtains is a situation where there is a widening gap of effective communication between the stakeholders, resulting is several unresolved issues, hence the increase in crises within the sector. This has degenerated to persistent pipeline vandalism and production decline, resulting in significant economic losses and threatening the sustainability of the survival of firms operating in the sector. The frequent attacks on pipelines have not only led to a decline in oil production but also resulted in environmental degradation, loss of revenue, and increased operational costs for oil-producing companies, lack of cash flow. Despite efforts by the government and oil companies to curb pipeline vandalism, the problem persists.

Consequently, the industry continues to face significant challenges in maintaining stable production levels. The lack of a robust cash flow planning framework has exacerbated the problem, as firms struggle to manage their finances effectively in the face of declining production and increasing operational costs. This situations have resulted to the exit of many oil companies from the sector and from Nigerian economy. The survival of firms in the Nigerian oil and gas industry is under threat due to the combined effects of pipeline vandalism and production decline. The industry's inability to maintain a stable cash flow has led to a decline in investment, and an increase in the cost of production. If left unaddressed, the problem of pipeline vandalism and production decline could lead to the collapse of the industry, with severe consequences. The broad objective of the study was to investigate cash flow models that can enhance sustainable survival of oil and gas firms in Nigeria. Whereas the specific objectives were to:

1. examine the effect of net cash flow from operating activities on firm survival;
2. ascertain the effect of net cash flow from investing activities on firm survival;
3. investigate the effect of net cash flow from financing activities on firm survival.

The following hypotheses guided the study:

- H₀₁: Net cash flow from operating activities does not have significant effect on firm survival
H₀₂: Net cash flow from investing activities does not have significant effect on firm survival
H₀₃: Net cash flow from financing activities does not have significant effect on firm survival

This work will be significant to research institutions and scholars who may find this work a reference material during subsequent researches and learning endeavours. It will also benefit business owners and managers of the oil and gas firms who will be assisted with more knowledge of the relationship that exist between cash flow models and firm survival. They will understand why they should engage more activities that will improve cash flow.

The scope of this work covered cash flow models and firm survival of oil and gas firms in Nigeria. The independent variables included net cash flow generated from operating activities, net cash flow generated from investing activities and net cash flow generated from financing activities, while profit for the year was proxy for sustainable survival. Six firms were studied for a period of 10 years from 2014 to 2023.

Review Of Related Literature

Conceptual Review

Cash Flow Planning Approach

While cash flow is the movement of cash into and out of, the treasury of an organization which involves receipts and payments of cash by an organization in its core business operations (Rahman and Nasr, 2007; and Akinyomi, 2014; Aghaei and Shakiri, 2019; Ezech, *et al* 2022), and Okorie, et al 2024). Cash flow planning approach is the modelling procedure of forecasting and management of cash inflow and cash outflow within an entity. Effective cash flow planning is crucial for the smooth operation of a business, as it enables the forecasting and management of cash inflows and outflows (Rahman and Nasr, 2007; Akinyomi, 2014; Efobi, 2018 and Odo and Ohazuluike, 2021). This process involves analyzing historical cash flow patterns to project future cash flows and make informed decisions that ensure the entity can meet its obligations in a timely manner. By implementing effective cash flow planning strategies, organizations can control their cash inflows and outflows, ensuring they can meet short-term and long-term obligations as they fall due. Furthermore, cash flow planning serves as a guide for comparing actual cash flows with the projections (Rahman & Nasr, 2007; Akinyomi, 2014; Ezech, *et al* 2022). This document is also critical for investors, lenders, and other stakeholders, as it provides a comprehensive overview of an organization's cash flow situation, including the sources of cash and their ability to meet forecast objectives.

Operating Cash Flow Activities

This refers to the main activities of a business operation. Cash flow from operating activities is the amount of inflow which a company makes from its daily, primary business activities, which could be manufacturing of goods, sales of products or rendering of services. In their opinion, Ugwu and Inyama (2021), and Ugwu, et al (2021) state that operating activities are all the things a company does to bring its products and services to market on an ongoing basis. Operating activities might include receipts from sales of goods and services, interest payments, income tax payments, payments made to suppliers of goods and services used in production, and any other type of operating expenses. Athanase, (2015); Amah, et al (2016); Khalil et al (2017); Ugwu, et al (2021) and Odume, Nwabuisi, and Ugwu (2024) have a convergent opinion that cash flow from operating activities is important because it shows stakeholders of the organization the success or failure of the organization's core business activities. Cash flow can be derived using the following important cash flow formula:

- i. Operating Cash Flow = Operating Income + Depreciation – Taxes paid + Change in Working Capital.
- ii. Cash Flow Forecast = Opening Cash + Projected Inflows – Projected Outflows = Net Cash Flow.

Investing Cash Flow Activities

Investing cash flow includes all sources and application of cash from an organization's investments. This section of the cash flow statement provides information about the business's purchases or sale of assets such as property, buildings, vehicles, furniture or equipment. In the opinion of Bodie et al (2014), Ambreen et al (2016), and Ugwu, et al (2021), investing cash flow activities section provides further details about a company's assets, the use and its benefits to the organization as well as inter-corporate investments of the entity. Ashtiani, (2015); Aliakbari, et al (2015); and Adam, et al (2020) posit that cash flow from investing activities can also be described as cash generated or spent relating to investments in securities, or the sale of securities.

Financing Cash Flow Activities

As the name suggests, financing activities relate to long term funds or capital of an enter price. For instance, cash

proceeds from issue of equity shares, debentures, raising long-term bank loans, and repayment of bank loan. As posits by Accounting Standards (3), financing activities are activities that result in changes in the size and composition of the owners' capital (including preference share capital in case of a company) and borrowings of the enterprise. Separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowings) to the enterprise, Aliakbari, et al (2015); Amah, et al (2016), Dickinson, (2017), Adam, et al (2020).

Sustainable Firm Survival

Sustainable firm survival refers to the ability of a company to maintain its operations and achieve its goals over the long term while minimizing its negative impact on the environment, society, and the economy (Ugwu, 2024). Sustainable firm survival can be conceptualized as a multidimensional construct that encompasses three key dimensions: economic, social, and environmental sustainability. These dimensions refer to a firm's ability to generate sufficient financial returns to sustain its operations and invest in its future. It involves managing costs, optimizing production, and generating cash flows to invest in new projects, technologies and CSR. It maintains positive relationships with its stakeholders, which involves managing the social impacts of operations, such as displacement of communities, human rights abuses, and labour practices. While minimizing its negative impact on the environment, including reducing greenhouse gas emissions, managing waste, and conserving natural resources. Ensuring that there's no oil spills, gas flaring, and habitat destruction. Sustainable firm survival was measured using profit for the year.

Theoretical Framework

This study is anchored on the theoretical framework that cash flow activities affect firm's survival and that the extent of such effect depends on operating, financing, and investing policies adopted by the organization. Two outstanding theories emerge and present a clear direction, and firm behaviour about cash flows (Net-cash flows generated from operating, investing and financing activities). The theories are free cash flow theory and Agency theory; both were propounded by Jensen (1986) and (1976), respectively. While free cash flow theory posits that firm managers tend to engage in unprofitable investment, agency theory posits that firm managers act in a manner that conflicts with the primary purpose of their engagement (profit maximization). The researcher therefore chose the above two theories for the purpose of the research work.

Empirical Review

Operating Cash Flow and Sustainable Firm Survival

Sharifi and Asadi (2016) analyzed the relationship between the cash flow and stock value of 102 companies listed on the Tehran Stock Exchange, 2003 - 2014. The data were analyzed using regression technique. The results of the study showed an inverse relationship between cash flow and stock prices.

Haitam, and Jaya, (2017) conducted a study on the impact of free cash flow, equity concentration and agency costs on firm's profitability firms listed on the Saudi Stock Market. A two-steps robust generalized method of moments (GMM) system estimation as applied to dynamic panel data was employed. The results indicated that equity concentration has no significant impact on agency costs, free cash flow has no significant impact on agency costs and agency costs have no significant impact on firm's profitability.

Liman and Sani (2019) studied operating cash flow and corporate financial performance of listed conglomerate companies in Nigeria. Result showed a positive and significant impact between Cash Flow from Operating activities (CFO) and financial performance proxied by ROA while the impact is positive and significant when financial performance was proxied by ROE of the listed conglomerate companies in Nigeria

Jiang-Chuan et al (2022) investigated the effect of operating cash flow (OCF) on the likelihood and the duration

of distressed firms returning to a profitable position for survival. Population was the 309 marginally distressed firms that are Taiwan listed firms. The sample size was the 218 firms that survived from financial distress. The logistic regression model was adopted. The result found consistent and robust evidence that OCF is a reliable instrument to predict the likelihood and duration of survival for financially distressed firms.

Investing Cash Flow and Firm Survival

Bingilar and Oyadongham (2014) did a study on cash flow and corporate performance. In a study of selected food; and beverage companies in Nigeria, the data for the study involved 6 food and beverage companies. The data were subjected to multiple regression techniques. The result of the study revealed that operating and financing cash flow has a significant positive relationship with corporate performance in the food and beverage sector of Nigeria.

[Khalil, et al (2020) investigated whether cash flow has an impact on profit quality from 2014 to 2018. The study was based on panel data as the data collected were one-time and cross-sectional data for a while; extracted from the annual reports of 9 Jordanian hotels. The results of the hypothesis test indicated a strong inverse relationship between the index of operational activity and index of return on assets, from operating cash flow, respectively, and profit quality. At the same time, the study found an inverse relationship that is not statistically significant between the index of operating cash flow and profit quality.

Soboleva, et al (2020) evaluated the monitoring of business operations with cash flow analysis. The population and sample of the study were Russian-registered small and medium-sized businesses. The following research methods were used: retrospective analysis, statistical observation method, factor analysis, principles and methods of system analysis; computational procedures involving the apparatus of financial mathematics and financial management; and optimization methods and models (Excel nonlinear optimization technology). The study found that a cash flow element enables the assessment of the sufficiency of the cash flow and to adjustment of its value depending on the influence of factor indicators.

Ugwu and Inyama (2021) evaluate the relevance of cash flow activities to the profitability of manufacturing firms in Nigeria. The study adopted *ex-post facto* research design. The population was the 37 manufacturing firms on the Nigeria Stock Exchange. The study made use of a systematic sampling technique and the sample size was 18. Correlation model was employed for data analysis using E-views 9.0 Software. The result revealed that net cash flow from investing activities has a significant and negative correlation with profit for the year. It was concluded that net cash flow from investing activities negatively and significantly relates to profit for the year.

Emeka, et al (2023) empirically investigated the moderating effect of the corporate governance mechanism on the relationship between cash flow management and the performance of listed manufacturing firms in the era of disruption in Nigeria. Panel least squares regression model operated with E-View 12 was utilized to perform the statistical test of parameter estimates, and six hypotheses were formulated to direct the investigation. Ex Post Facto design was used to study consumer goods companies listed on the Nigerian Exchange Group (NGX). The results of the study show that operating activities (OA) significantly affect firm performance (NAPS) at a 5% significant level. Furthermore, it was discovered that, at a 1% significant level, financing activities (FA) have a positive and significant effect on firm performance, whereas investing activities (FA) have the same effect on firm performance in Nigeria.

Financing Cash Flow and Firm Survival

Nwakaego, et al (2015) observationally determined the effect of cash flow on a firm's performance of a Nigerian nourishment and refreshment organization. The outcome uncovered investing cash flow had a critical negative relationship with corporate performance. Further, the nexus existing between firm size and performance has

additionally gotten significant consideration in both theoretical and observational research.

Yazan (2017) studied the effect of cash flows on the share price of the Amman stock exchange. The specific objective of the study was to investigate the effects of cash flows on the share prices of Jordanian companies. The study employed multiple regression technic for analysis. It was found that cash flows have a statistically-significant effect on the share prices of the Jordanian companies listed on the ASE. It specifically observed that operating cash flows (OCFs), financing cash flows (FCFs), and investment cash flows (ICFs) collectively explain 13.27% of the variations in share prices.

Nwarogu, and Iormbagah, (2017) studies cash management and performance of listed firms in Nigeria. The study utilized *ex-post factor* research design and pool ordinary least square regression. The result shows that Cash flow and firm size has a negative association with the arrival on assets. In the model of Return on Equity, cash flow indicated a negative association with the variable of firm performance. The examination suggested that administration firms ought to embrace approaches that empower them offer inventories and gather receivables rapidly for enhanced proficiency and corporate dissolvability.

Ugwu, et al (2021) examined the effective management of cash flow activities on the profitability of manufacturing firms in Nigeria. *Ex-Post facto* research design was adopted. Net cash flow from investing and financing activities were the independent variables while profit for the year was the dependent variable. Eighteen (18) firms were selected from the thirty-seven (37) manufacturing firms listed on the Nigerian Stock Exchange (NSE) using a systematic sampling technique. Data were analyzed using a correlation model. The findings revealed that negative and significant relationships exist between net cash flow from financing activities and profit for the year.

Within the scope of the reviews above, a geographical gap was observed as it was established that none of the reviewed studies was carried out in the oil and gas sector in Nigeria. More so, the works of Bingilar and Oyadongham (2014); Nwakaego, et al (2015); Yazan (2017); Jiana-Chuan et al (2022) and Ugwu and Inyama (2021) found a positive effect of cash flow on corporate performance and survival in contradiction to the findings of Sharifi and Asadi (2016); Haitham, and Jaya, (2017); Nwarogu, and Iormbagah, (2017); [[Khalil, et al (2020); Ugwu, et al (2021) and Emeka, et al (2023) which revealed significant negative correlation and negative and significant effect of cash flow on performance and firm survival. It could be seen from the reviews that there are contradictory reports from the respective groups of scholars which the researcher sought to review in this current work. Consequently, this study focused on mitigating the effect of pipeline vandalism and declining production in the Nigeria's oil and gas using the cash flow model approach to sustainable firm survival, to close the knowledge gap established above.

Methodology

This research adopted the *ex-post facto* research design. Area of the study is the Nigerian oil and gas sector. The study made use of secondary data that covered a period of 10 years from 2014. Population of the study comprised of the 11 oil and gas firms that are listed on the Nigeria Exchange Group. The sample size consisted of Forte Oil Nigeria Plc., MRS Oil Nigeria Plc, Oando Nigeria Plc, Mobil Oil Nigeria (11) Plc., Eterna Oil Nigeria Plc and Total Nigeria Plc. The sample size was determined using simple random sampling technique. The model is specified in line with previous related literature in the area of the study. The composite panel multiple regression (prediction) models were statistically formulated as;

$$PFTY_{it} = \beta_0 + \beta_1 NCFOA_{it} + \beta_2 NCFIA_{it} + \beta_3 NCFFA_{it} + \varepsilon_t \quad \text{---} \quad \text{[Equation (1)]}$$

Where, PFTY = Profit for the year; NCFOA = Net Cash Flow from Operating Activities; NCFIA = Net Cash

Flow from Investing Activities; NCFFA = Net Cash Flow from Financing Activities; ε = Error Term; β_0 = Coefficient (constant) to be estimated; $\beta_1 - \beta_6$ = Parameters of the independent variables to be estimated; $t =$

Current period. A regression equation was estimated to evaluate the effect of cash flow on sustainable survival of firms in the oil and gas sector in Nigeria. And the decision was to reject H_0 if the t-statistics is > 2.0 and the P-value is < 0.05 , otherwise accept H_0 .

Data Presentation and Analysis

Data Analysis

Table 2: Descriptive Statistics for the industry level data

	PFTY	NCFOA	NCFIA	NCFFA
Mean	-3732288.	-5234525.	479802.7	3608842.
Median	746404.0	56170.00	-25601.00	-17888.00
Maximum	7168642.	9547751.	14767263	1.07E+08
Minimum	-1.02E+08	-1.04E+08	-13540130	-22132965
Std. Dev.	18078111	20287034	4562009.	20090362
Skewness	-4.093620	-3.311778	0.995467	3.327136
Kurtosis	20.71435	14.40743	6.927775	16.29261
Jarque-Bera Probability	777.5260 0.000000	355.2521 0.000000	39.59045 0.000000	451.1531 0.000000
Sum	-1.83E+08	-2.56E+08	23510330	1.77E+08
Sum Sq. Dev.	1.57E+16	1.98E+16	9.99E+14	1.94E+16
Observations	60	60	60	60

The descriptive statistics in table 1 present the statistical characteristics of all the observations. These include measures of central tendency, the mean, and the median. Dispersions in the series are also indicated using the standard deviation. The results show the mean to stand at ~~₦~~373228, ~~₦~~5234525, ~~₦~~479802, and ~~₦~~3608842 with a standard deviation of ~~₦~~18078111, ~~₦~~20287034, ~~₦~~4562009, and ~~₦~~20090362 for sustainable firm survival, net cash flow from operating activities, net cash flow from investing activities and net cash flow from financing activities respectively.

In addition to the statistical description of the panel above, the descriptive statistics also test or check for the normality of the observed variables. To reject the null hypothesis that the data are not normally distributed, the JB (Jarque-Bera) statistics must be significant at a critical value of 0.05 (Gujarati and Porter, 2009).

The normality test results reveal that there is strong evidence that the panel variables and dataset are normally distributed as the probability of JB-statistic for each of the variables is $>$ the critical value of 0.05. Hence, the null hypothesis (H_0) is rejected in favor of the alternative (H_1) that the residuals of the distribution of the model are normally distributed

TABLE 2: Panel Regression Results

Dependent Variable: PFTY
 Method: Panel Least Squares
 Date: 02/18/25 Time: 10:20
 Sample: 2014 2023
 Periods included: 10
 Cross-sections included: 6
 Total panel (unbalanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NCFOA	0.565856	0.100414	5.635258	0.0000
NCFIA	0.536447	0.105380	5.090569	0.0000
NCFFA	0.766455	6.731063	4.258547	0.0001
C	-770300.0	2083586.	-0.369699	0.7133
R-squared	0.803221	Mean dependent var	-3732288.	
Adjusted R-squared	0.792324	S.D. dependent var	18078111	
S.E. of regression	14113394	Akaike info criterion	35.80311	
Sum squared resid	9.36E+15	Schwarz criterion	35.88032	
Log likelihood	-875.1761	Hannan-Quinn criter.	35.83240	
F-statistic	31.75613	Durbin-Watson stat	0.793173	
Prob(F-statistic)	0.000001			

Source: Author's Eviews 9.0 Output, 2025

Test of Hypotheses

Ho₁: Net cash flow from operating activities does not have significant effect on firm survival

From the model above, R² of 0.803221 shows that 80% variation on firm survival (PFTY) was explained by changes in net cash flow from operating activities. The adjusted R² of 0.792324 which considers more number of repressors explains that 79% variations in the dependent variable (PFTY) are caused by net cash flow from operating activities. The results further indicate that the overall regression is significant as explained by the prob(F-statistics) of 31.75613 which is significant at 0.05 or 5%. This implies that the entire model is significant. The Durbin Watson statistics (DW) of above 2 shows no trace of autocorrelation in the model. Te coefficient of 0.56585 is positive, the t-statistics of 5.635258 > 2 and the probability value of 0.0000 < 0.05 and significant at 5% critical value. Thus, the study rejects the null hypothesis and accepts the alternate that, net cash flow from operating activities has significant effect on firm survival

Ho₂: Net cash flow from investing activities does not have significant effect on firm survival

Results indicate that the overall regression is significant as explained by the prob(F-statistics) of 31.75613 which is significant at 0.05 or 5%. The Durbin Watson statistics (DW) of 0.963445 shows no trace of autocorrelation in the model. The coefficient of 0.536447 is positive, the t-statistics of 5.090569 > 2 and the probability value of 0.0000 < 0.05 and significant at 5% critical value. Thus, the study rejects the null hypothesis and accepts the alternate that, net cash flow from investing activities has significant effect on firm survival.

Ho₃: Net cash flow from financing activities does not have significant effect on firm survival

Result of the panel regression shows that the overall regression is significant as explained by prob(F-statistics) of 31.75613 which is significant at 0.05 or 5%. This implies that the entire model is significant. The Durbin Watson statistics (DW) of above 2 shows no trace of autocorrelation in the model. The coefficient of 0.766455 is positive,

the t-statistics of $4.258547 > 2$ and the probability value of $0.0001 < 0.05$ and significant at 5% critical value. Thus, the study rejects the null hypothesis and accepts the alternate that, Net cash flow from financing activities does not have significant effect on firm survival

Discussion of Result

Result of hypothesis one shows that net cash flow from operating activities has significant and positive effect on survival of oil and gas firms in Nigeria. This is in line with the finding of Liman and Sani (2019) and Ugwu et al, (2021) who found that cash flow has positive and significant effect on firm performance. However, the finding disagrees with the findings of Sharifi and Asadi (2016) and Haitham, and Jaya, (2017) who found that cash flow has inverse and no non-significant effect on firm performance. The observed variance could be as a result of industry peculiarities, economic depression, successive government policy summersault and insecurity within the period under review.

Result of hypothesis two reveals that net cash flow from investing activities has significant effect on sustainable survival of oil and gas firms. Firm will survive and thrive better if investing decisions are carefully appraised before it is embarked upon. The above finding failed to validate both the free cash flow theory by Jensen (1986) and the Agency theory by Jensen (1976). While free cash flow theory posits that firm managers tend to engage in unprofitable investment, provided it suites their private interests, agency theory posits that firm managers act in a manner that conflicts with the primary purpose of their engagement which is to maximize profit. The finding is in agreement with the report of Bingilar and Oyadongham (2014) and Emeka, et al (2023) who found that cash flow positively affect corporate performance of Beverages Companies and manufacturing firms. The finding disagrees with the studies of Nwakaego, et al (2015); Khalil, et al (2020) and Ugwu and Inyama (2021) who found that cash flow from investing activities has significant negative correlation, inverse relationship and non-significant effect on firm profitability and performance of Jordanian Hotels and manufacturing firms Nigeria. The disagreement could be attributed to difference in data sources and quality, industry peculiarities, and time period, etc.

The result of hypothesis three shows that net cash flow from financing activities has significant and positive effect on firm survival. This finding aligns with one of the contributions of agency theory propounded by Jensen and Meckling (1976) which posits that leverage helps to lower agency costs and reduce inefficiency. When there are obligations to be settled, there will be no free funds for frivolities, and managers are forced to be strategic in actions. The finding is in line with the studies of Yazan (2017) and Jaradat (2017) whose studies revealed that cash flow has a positive effect on the share price of jodanian companies and the performance of Jordanian commercial banks. However, the result is at variance with the results of the studies by Nwarogu, and Iormbagah, (2017) and Ugwu, Ugwu, and Uzoma (2021) who found that cash flow has a negative association with performance and a negative and significant effect on the performance of refreshment companies and manufacturing firms respectively. The observed variance could be a result of economic conditions, government policy summersault, and differences in analytical technique.

Summary of Findings, Conclusion and Recommendation

1. Net cash flow from operating activities has a significant and positive effect on firm survival
2. Net cash flow from investing activities has a significant and positive effect on firm survival
3. Net cash flow from financing activities has a significant and positive effect on firm survival

The study considered mitigating the effect of pipeline vandalism and production decline in Nigeria's oil and gas sector using a cash flow planning approach to sustainable firm survival. After analyzing the results obtained, the study concluded that net cash flow from operating, net cash flow from investing and net cash flow from financing, activities has positive and significant effects on the survival of oil and gas firms in Nigeria. The finding implies

that an increase in operating cash flow will result in to increase in the survival chances of oil and gas firms in Nigeria and vice versa. It further suggests that investments decisions result to increased returns provided that it is well appraised.

The study recommends that players in the oil and gas sector in Nigeria should expand activities to generate more net cash inflow from operating activities. This is to sustain survival of oil and gas sector. This could be achieved through intensified CSR to create peace in the area. Improve marketing and promotions to generate more sales hence, enhancing survival. It is further recommended that the management of the firms should carefully evaluate investment choices to include building refineries to guarantee optimal value creation and increased survival. This is should be done within the limits of the risk appetite of the management. Lastly, it also recommends that financing cash flow activities should be properly planned to boost firm survival by seeking cheaper sources of funding to reduce the risk of bankruptcy associated with debt.

To the extent of the reviews and analysis carried out by the researcher, it was observed that there were contradictory reports from the respective groups of scholars whose works were reviewed. Consequently, the findings of this study has enriched the literature base on firm survival and cash flow planning approach to mitigating the effect of pipe line vandalism and low production.

This work is limited to the oil and gas sector using profit the year as a measure of sustainable survival. Other measures such as the non-financial aspects were not considered. Further studies could be carried out in this area as well.

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