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LIQUIDITY MANAGEMENT AND CORPORATE SUSTAINABILITY OF LISTED OIL AND GAS COMPANIES: EMPIRICAL EVIDENCE FROM NIGERIA

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ABSTRACT*: Investors had watched the fragile state of corporate sustainability of the oil and gas companies, as huge capital investments had been lost due to the unpredictable nature of prices occasioned by the unstable foreign exchange rate. Studies have shown that profitability, assets growth and economic value added expectations of investors rely on skillful and efficient management of the companies' resources especially, liquidity management, which were considered inadequate. Consequently, the study investigated the effect of liquidity management on corporate sustainability of the oil and gas companies in Nigeria.The study explored ex-post facto research design. The population consisted of 13 listed oil and gas companies listed on the Nigerian Stock Exchange as at 31st December 2017. Ten oil and gas companies were selected using purposive sampling technique. Data were extracted from published financial statements of the sampled companies, while the validity and reliability of the data were premised on the scrutiny and certification by the external auditors. Descriptive statistics and inferential statistics were used for the data analysis.The study revealed that corporate sustainability of quoted oil and gas companies in Nigerian was significantly affected by liquidity management. Results showed that liquidity management had a positive significant effect on profitability, F-Statistics $_{(4, 95)}$ = 3.493; AdjR^2 = 0.092; P-value = 0.010; while liquidity management also exhibited a positive significant effect on assets growth, F-Statistics $_{(4, 95)}$ = 0.3.030; AdjR^2 = 0.076; P-value= 0.021. Also, liquidity management exhibited a positive significant impact on economic value added. F-Statistics $_{(4, 95)}$ = 2.598; AdjR^2 = 0.054; P-value = 0.035. When the control variable was introduced, the results revealed that liquidity management had a positive significant effect on profitability, F-Statistics (5, 94) = 3.020; AdjR^2 = 0.093; P-value = 0.014; while liquidity management also exhibited a positive significant effect on assets growth, F-Statistics $_{(5, 94)}$ = 2.488; AdjR^2 = 0.070; P-value= 0.037. Also, liquidity management exhibited a positive significant impact on economic value added. F-Statistics $_{(5, 94)}$ = 4.683; AdjR^2 = 0.159; P-value = 0.001.The study concluded that liquidity management affected corporate sustainability of quoted oil and gas companies in Nigerian. The study recommended that shareholders, managers, policy makers, financial regulators and market participants should be mindful of companies' liquidity management and time lag between credit sales and collection of receivables as critical to the corporate sustainability companies. Managers should revisit cash conversion cycle policy time-lag, and ensure effective resource management because of their importance to corporate sustainability.*

KEYWORDS: assets growth, cash conversion, corporate sustainability, economic value added, liquidity management, quick ratio

INTRODUCTION

All over the world, especially among the developing nations, corporate sustainability has been the major challenges Oil and Gas companies face, leading to strategic tragedy and sudden corporate collapse. The corporate sustainability and operational capacity of Oil and Gas companies are quite huge and quite challenging, requiring expertise and pragmatic management, the capital intensive and operational risks, had led multinational Oil and Gas companies' suspend their operations in some locations (Amin, Maran, Rohail & Mehreen, 2019; Dahiru, 2016). Waswa, Mukras and Oima (2018) further opined that corporate sustainability largely depend on the ability of companies' operating in whatever industry to have an adequate and working mechanism to ensure cost reduction across board, at all levels of the operations of the company and equally put and maintain a sustainable machinery in place, meeting its profitability requirements and corporate objective set by the company. More studies from developed economies had written on sustainability performance of companies. For example the studies of Luther (2010) wrote from United Kingdom; Rivera (2017) studied United States economy; Busse (2016) from Spain; Truant, Corazza and Scagnelli (2017); Martinez-Ferrero and Frias-Aceituno (2015). Others are the studies of Alshehhi, Nobanee and Khare (2018), Hahn and Figge (2015) and (Albertini, 2013).Companies in business operations vary in size, profitability wise and level of liquidity management. While some organizations enjoy corporate stability, others allow their years of corporate performances go down the drain as a result of instability and incompetence of the management. The issue of corporate sustainability has over the years been one of the problems facing companies to sustain their corporate performances (Gjorgji & Goran, 2019; Sandra, Diego, Aldo & Marly, 2018). The Oil and Gas sector in Nigeria had been dominated by multinational corporations until the early 1990s when Nigerian companies began to make a foray into the industry. Local participation was boosted with the indigenization decree of 1972, which declared many sectors of the Nigerian economy off-limits to all foreign investment, while ruling out more than minority participation by foreigners in several other areas, provided windfall gains to several well-connected Nigerians, but proved highly detrimental to non-oil investment in the Nigerian economy. Most experts and economist believe that the majority of the problems confronting the oil sector in Nigeria today have its root in the Indigenization decree of 1972 and implementation of the Nigerian Content Directives (NCD) issued by the Nigerian National Petroleum Corporation (NNPC) about a decade ago, and eventually, by the promulgation of the Nigerian Oil and Gas Industry Content Development (NOGIC) Act (the Act) in 2010. The Act seeks to promote the use of Nigerian companies/resources in the award of oil licensees, contracts and projects, unfortunately, the problems of the sector is chronicling to liquidity management and corporate sustainability problems, now raving the growth and underlying economic performance of the sector (Enekwe, 2015).

In the advanced economies, studies had shown that one of the challenges of corporations is that of corporate sustainability performance and its evaluation and these have been the essence of overall assessment of financial liquidity management situation of companies for some time periods, hence firm value and results of operations must take rational decision to preserve nature and good atmosphere. Herbohn, Walter and Loo (2014) affirmed that United States had over a decade

ensured a strict sustainability policy on smoke emission and going green policy, and many of the problems has had no problems adhering to its compliance. Maherani, Ranjbar & Fathi, 2014; Bolis *et al*. (2014) opined that apart from the corporate financial performance challenges, the oil and gas companies currently face the greatest environmental, health and safety, as well as vendor environment due diligence assessment (EDDA) of a refinery and crude oil extraction site challenges that require pragmatic and strategic liquidity management to contend. Mojarad, Vahid & Adrian (2018) stated that for a period the oil and gas companies had faced complex challenges in view of the more competitive activities in the sector. Simultaneously adhering to environmental laws of host communities and responsiveness of managers to social responsibilities and regulatory guidelines adherence in financial and liquidity management could be a panaceas to the growing problems of the oil and gas companies (Neill, 2017). Earlier researchers have rarely looked upon the corporate sustainability and social sustainability and its influence on the firm corporate performance in the emerging economies. In order to improve corporate performance through quality improvement, organizations include sustainability measurements in their quality management programs. The Baldridge National Quality program (2009) has 15 percent social sustainability measures that improve quality and hence result in financial performance (Pullman, Maloni & Carter, 2009; Hutchins & Sutherland, 2008). Also, the Deming's 14 point program also focuses on quality improvement through social sustainability practices (Wicks, 2001). Countries around the world recognize and appreciate companies with high focus on sustainability performance. The decision criteria to evaluate sustainability performance may vary between countries. For example, in Canada the top 100 socially sustainable businesses are recognized by a competition evaluated by a distinguished academic advisory board, drawn from universities across Canada. Each panel member has either edited or written a major human resources textbook in Canada (Jermyn, 2014). Corporate organizations are evaluated for their corporate sustainability performance based on eight basic key areas of i) physical workplace; ii) vacation and time off; iii) employee communications focused on how employers capture employee feedback; iv) work and social atmosphere; v) health, financial, and family benefits; vi) performance management; vii) training and skills development; and viii) community involvement (Jermyn, 2014).

Looking at the contextual perspective of the oil and gas sector in Nigeria, Enekwe (2015) revealed that the Nigerian oil and gas industry has been vibrant since the discovery of crude oil at Olobiri in 1956 by the Shell Group. Though, the sector was largely dominated by multinational corporations until the early 1990s when Nigerian companies began to make a foray into the industry. Local participation was boosted with the indigenization decree of 1972, which declared many sectors of the Nigerian economy off-limits to all foreign investment, while ruling out more than minority participation by foreigners in several other areas, provided windfall gains to several well-connected Nigerians, but proved highly detrimental to non-oil investment in the Nigerian economy. Most experts and economist believe that the majority of the problems confronting the oil sector in Nigeria today have its root in the Indigenization decree of 1972 and implementation of the Nigerian Content Directives (NCD) issued by the Nigerian National Petroleum Corporation (NNPC) about a decade ago, and eventually, by the promulgation of the Nigerian Oil and Gas Industry Content Development (NOGIC) Act (the Act) in 2010. The Act seeks to promote the use of Nigerian companies/resources in the award of oil licensees, contracts and projects, unfortunately, the problems of the sector is chronicling to liquidity management and corporate

sustainability problems, now raving the growth and underlying economic performance of the sector (Enekwe, 2015).

There are systematic challenges in the liquidity management and corporate sustainability in Nigeria. For instance Ajayi and Oke (2017) stated that a recurring problem in the upstream sector of the Oil and Gas companies' liquidity management problem and corporate sustenance is characterized by the inability of the Nigerian National Petroleum Company (NNPC) to meet funding obligation to joint venture (JV) operations, resulting to illiquidity problem. That the process of contract award in the Nigerian Oil and Gas upstream sector is tedious and greatly lengthy, as the period, of contract award between initiation and concluding for execution take as much as 36 months in some cases, thereby compounding the liquidity management problem of the companies. That it is quite worrisome see gas flared with lack of sufficient infrastructure to convert huge losses through gas flared daily, while the companies go through the pain of liquidity problem in Nigeria (Ajayi & Oke, 2017).

Onuegbu (2016) documented that corporate sustainability in the Oil and Gas companies in Nigeria calls for a concern, that there is a sudden fall in Crude Oil Price, the price of crude oil which accounted for an average of 90% exports and 70% of the Nigeria's consolidated budgetary revenues has fallen by some 70 % since the second half of 2014 and dragged the Nigerian Economy into avoidable recession, exchange rate crises & stagflation. The author commented on the problem of corporate sustainability, that Nigeria's offshore wells and rigs account had declined due to liquidity problem to maintain them, and Wood Mackenzie equally estimated that global upstream investment for 2015 to 2020 has been slashed by US$1 trillion. That Nigeria remained very vulnerable to shocks in Oil and Gas market due to huge financial requirements. So, a fall in crude Oil and Gas price and quantity produced as we saw since the second half of 2014 led to a severe fall in foreign exchange receipts, large disproportionate pressure on the Naira, foreign exchange induced inflation, lower government revenues, and inability of governments at all levels to meet their obligations, Stagflation and severe economic crises (Onuegbu, 2016).

Other studies from Africa and other developing economies, the problem of corporate sustainability is under rated, and time has come for a holistic attempt to control the rate of companies folding up (Kakamba, 2012). The study of Badawi and Hidayah (2018) from Indonesia, Mucheru, Shukla and Kibachia (2017) from Sri Lanka; Amalendu and Sri (2011) from Nairobi; Ajanthan (2013) from Pakistain, also Sammy, Philemon and Juma (2013) from Kenya, Sambasivam and Biruk (2013) from Ethiopia; Kabamba (2012) from Uganda; Bhunia (2010) from India. These studies had found different results and have different opinions on liquidity management and its effect on corporate sustainability. The study of Mucheru, Shukla and Kibachia (2017) revealed that liquidity management could be one of the likely solution to maintain corporate going concern, that in the absence of liquidity management and firm performance, there could be a corporate mismatch between assets and liabilities, that when that happens, the company is exposed to financial illiquid and loss of focus (Mucheru, Shukla & Kibachia, 2017).

Furthermore, the nexus between liquidity management and corporate sustainability being surrogated with corporate sustainable performance has been investigated in theoretical and

empirical studies by researchers. However, the findings had been inconsistent. For instance, Weber (2008) on environmental performance, Koo, Chung and Ryoo (2014); Wagner & Schaltegger (2004); Wagner (2010) on sustainability performance revealed different results. Most of these previous studies confirmed that incorporating sustainability in business can yield economic benefits, others think otherwise. This means that the issue of liquidity management and corporate sustainability in literature is somewhat controversial and an ongoing debate among scholars. While some studies found a positive effect, other found negative effect, yet some found none. For example, for the dependent variable (Corporate sustainability), most studies used corporate performance sustainability to proxy corporate sustainability. Chen, Feldmann and Tang (2015) studied the relationship between disclosures of corporate social performance on corporate sustainability, an evidence from reports in manufacturing industry in Sweden. The study employed corporate performance as a surrogate of corporate sustainability. However, the study said the issue of corporate sustainability is complex, debatable and inconclusive in literature.

The problem of illiquid and cash management cut across beyond Oil and Gas companies. For example, the Manufacturers Association of Nigeria (MAN) revealed that the manufacturing sector contributes only six percent to the Nation's 2013 GDP; worse still, industrial capacity utilization also dropped to about 28 percent. The study maintained that the corporate performance and the underlying Oil and Gas companies declined relatively to the same period in 2009. It recorded a decline in growth rate from 7.03 percent in 2009 to 6.43 percent in 2013.

This development was traceable to the liquidity problem, occasioned by poor cash management, low manufacturing activities recorded in the first quarter after the festivities of the last quarter of the previous year, poor electric power supply and inability to access credit from banks arising from the credit crisis in the banking sector, Okereke (2015). Abioro (2013) stated that one of the problems faced by finance managers in managing cash is determination of appropriate source of fund for the company either to be used as the initial or working capital. Other challenges are identification of right investment opportunity for idle funds, non-cash planning, and determination of the optimal level of cash to be maintained by the company. Consequent to the above divergence thoughts and opinions, the issue of liquidity management as it affects corporate sustainability reveals inclusiveness in literature and there is need for further extension of the frontiers of knowledge and investigate further, hence this study. As a result, this study proposes to investigate the effect of liquidity management on corporate sustainability of quoted oil and gas companies in Nigeria. These studies made case for corporate sustainability problems in the Oil and Gas companies in Nigeria, among them includes illiquidity related issues, hence hopefully, proper liquidity management could resolve them.

Statement of the Problem

All over the world, especially among the developing nations, corporate sustainability has been the major challenges faced by companies leading into avoidable strategic tragedy of sudden collapse. The operational capacity of oil and gas companies is quite huge and quite challenging, they are capital intensive and operational risks, no wonder big oil and gas companies' suspend their operations in some locations (Amin, Maran, Rohail & Mehreen, 2019; Dahiru, 2006). Waswa *et*

al. (2018) further opined that corporate sustainability largely depend on the ability of companies' operating in whatever industry to have an adequate and working mechanism to ensure cost reduction across board, at all levels of the operations of the company and equally put and maintain a sustainable machinery in place, meeting its profitability requirements and corporate objective set by the company. More studies from developed economies had written on sustainability performance of companies. For example the studies of Luther (2010) wrote from United Kingdom; Rivera (2017) studied United States economy; Busse (2016) from Spain; Truant, Corazza and Scagnelli (2017); Martinez-Ferrero and Frias-Aceituno (2015). Others are the studies of Alshehhi, Nobanee and Khare (2018), Hahn and Figge (2015) and (Albertini, 2013).

Corporate sustainable performance provides a deductive measure of how well an oil and gas companies can grow its assets (Assets growth-ATG) from business operations, generate revenue and ensure economic value added (EVA) to the corporation (Dahiru, 2016). In other words, the provision of corporate sustainability performance of a firm offers the following benefits: One, assist the management and investors and other users to make decisions regarding the company and their individual investment. Two, provides information on the business economic value added and obligations solved and yet unsolved. Finally, help provide the management and other users the information to evaluate the company's the earnings potential of their investment (Profitability-PROF). Basically, when a corporate operations cannot guarantee some of these specific objectives of the company: Profitability (PROF), Assets growth (ATG) and Economic value added (EVA), then something is absolutely wrong (Dahiru, 2016).

Onuegbu (2016) stated that corporate sustainability in the oil and gas companies in Nigeria calls for a concern, that there is a sudden fall in Crude Oil Price, the price of crude oil which accounted for an average of 90% exports and 70% of the Nigeria's consolidated budgetary revenues has fallen by some 70 % since the second half of 2014 and dragged the Nigerian Economy into avoidable recession, exchange rate crises & stagflation. The author commented on the problem of corporate sustainability, that Nigeria's offshore wells and rigs account had declined due to liquidity problem to maintain them, and Wood Mackenzie equally estimated that global upstream investment for 2015 to 2020 has been slashed by US$1 trillion. That Nigeria remained very vulnerable to shocks in Oil and gas market due to huge financial requirements. So, a fall in crude oil and gas price and quantity produced as we saw since the second half of 2014 led to a severe fall in foreign exchange receipts, large disproportionate pressure on the Naira, foreign exchange induced inflation, lower government revenues, and inability of governments at all levels to meet their obligations, Stagflation and severe economic crises (Onuegbu, 2016). These studies made case for corporate sustainability problems in the oil and gas companies in Nigeria, among them includes illiquidity related issues, hence hopefully, proper liquidity management could resolve them.

Similarly, Oil and gas companies in Nigeria suffer from corporate sustainability resulting to Low refining capacity utilization, low investments in refinery & over dependence on imported refined petroleum products, due to lack of financial implications in procuring and acquisition of highly sophisticated technological it requires. Insufficient funding & unprecedented "*cash call arrears"* Government has been unable to fund its equity interest in the joint venture thereby stalling on-going oil and gas projects and operations. Previous huge revenue accrued from the industry from

many decades in Nigeria were either poorly managed or misappropriated. That payment of Cash calls has been a major challenge to the industry as the joint venture (JV) partners spent cash are tied up and help up for years. This together with underfunding of the JV approved programme budget has stifled the growth and development of the Nigerian oil and gas industry (Fawibe, 2017; Onuegbu, 2016).

While there are vast literature that had considered the effect of liquidity management on corporate sustainability, there are far few comparative studies addressing major recurring corporate failures and other underlying perennial problems in the Oil and Gas companies especially in the offshore operations. The downstream and upstream operations of the Oil and Gas companies had been that of operationally inconsistent and unstable performance owing to its alignment to unstable and volatility of the oil prices. The inability of the Nigerian national Petroleum Corporation (NNPC) to honuor its counterpart contractual agreement, meet its funding obligations to its joint venture (JV) operational partners creates huge deficit respecting funding obligations in the Joint Venture. Fawibe (2017) noted number of issues that must be considered in the funding of oil industry. Financial institutions have more access to fund and NNPC once encouraged indigenous oil firms to be involved in the sector, injecting funds into the banks assist the Oil and Gas companies have access to adequate funding. Zhattau (2013) opined that the price of crude oil came crashing down from over $100 to $35 in less than nine months in 2012/2013 fiscal year, creating doubts on the sustainability of the Oil and Gas companies in Nigeria. This drop in the value of oil has a corresponding negative influence in Nigeria's earnings and revenue that inadvertently exposes her to financial instability. This shows how weak Nigeria's economy will continually look like if it keep depending on oil revenue from the international market (Zhattau, 2013). Far less attention has been given to Oil and Gas quoted companies in Nigeria, which this studies intends to fill the gap. Furthermore, not much have been given to uncover the underlying dimension of corporate sustainability in the Oil and Gas sector in Nigeria. However, Fawibe (2017) opined that the quoted Oil and Gas companies in Nigeria lack proactive and strong regulatory framework for the industry known as Petroleum Industry Bill (PIB), for the past ten years the bill has not been passed into law which ought to address among others, how to manage revenue accruable from the Oil and Gas industry. This is one of the issues bedeviling the oil industry in Nigeria. Prior studies had make tremendous efforts examining the effects of liquidity management on corporate sustainability, there had been only few of these addressing the effects liquidity management on corporate sustainability of the Oil and Gas companies in Nigeria, and despite these efforts, the scholarly literature remain inconclusive when it comes to the question to what extent liquidity management affects assets growth of the Oil and Gas companies in Nigeria.. Addressing this gaps, considering the huge role the Oil and Gas industry plays as the funding base of the Nigerian annual budget. Undertaking an empirical investigation of the effect of liquidity management on assets growth as a surrogate of corporate sustainability is imperative at this time and period the Nigerian government is faced with funding budgets deficits. The remainder of the study proceeded as follows: Section 2 provided the extant literature from the perspective of conceptual, underpinning theory and empirical review, section 3 presented the methodology, 4 section outlined the results and discussion of findings and section 5 ended the study with conclusion and recommendations. This according Mojarad *et al*. (2018), the problems of corporate the oil and gas sector, as of yet, lacks transparency. Revenues don't get published and payments made to governments to exploit

resources remain secret. Therefore the politicians and the industry insiders too often reap unlawful benefits. Most of the oil and gas organizations are wholly or partially state owned. Emerging markets tend to be bureaucratic which results in many 'touch points' with the government where bribes can be demanded. The oil and gas companies also protect the identities of their subsidiaries and equity holders, which makes it very easy for corrupt leaders to hide stolen funds. Without any published information and evidences of hidden royalties and taxes, it becomes very difficult to hold the government accountable (Mojarad, Vahid & Adrian, 2018).As a result, this study on precise attempt in contributing to knowledge set the following study objectivesand hypotheses thus:

Research Objectives:

The main objective of this study was to evaluate the effect of liquidity management on corporate sustainability of quoted oil and gas companies in Nigeria.

The following specific objectives were stated:

i. to evaluate the effect of liquidity management on profitability (PROF) of the quoted Oil and Gas companies in Nigeria;
ii. to assess the effect of liquidity management on assets growth (ATG) of the quoted Oil and Gas companies in Nigeria;
iii. to ascertain the influence of liquidity management on economic value added (EVA) of the quoted Oil and Gas companies in Nigeria.
iv. to evaluate the effect of liquidity management with a control variable of firm size on profitability (PROF) of the quoted Oil and Gas companies in Nigeria;
v. to assess the effect of liquidity management with control variable of firm size on assets growth (ATG) of quoted Oil and Gas companies in Nigeria;
vi. to ascertain the influence of liquidity management with control variable of firm size on economic value added (EVA) of the quoted Oil and Gas companies in Nigeria.

Statement of Hypotheses

To enable the researcher test if there is any effect of liquidity management on corporate sustainable performance, the following hypotheses were tested in this study:

H_{01}: Liquidity management does not have any significant effect on profitability of quoted Oil and Gas companies in Nigeria.

H_{02}: There is no significant effect of liquidity management on assets growth of quoted Oil and Gas companies in Nigeria.

H_{03}: There is no significant influence of liquidity management on economic value added quoted Oil and Gas companies in Nigeria.

H_{04}: Liquidity management with control variable of firm size does not have any significant effect on profitability of quoted Oil and Gas companies in Nigeria.

H_{05}: There is no significant effect of liquidity management with control variable of firm size on assets growth of quoted Oil and Gas companies in Nigeria.

H_{06}: There is no significant influence of liquidity management with control variable on Corporate Sustainability in quoted oil and Gas companies in Nigeria.

LITERATURE REVIEW

Conceptual Review:

Corporate Sustainability

The concept of sustainable development was first discussed in the second half of the 20th century; it was defined in 1987 and gradually implemented at the macroeconomic level in response to global problems like the global warming, soil degradation and poverty that cannot be addressed at the local level (Brundtland, 1987). Nevertheless, during the implementation of sustainable development policies, there was a shift from the macro to the micro level because the actual power to enforce changes rests with economic entities, namely companies. The studies of Mohanty and Mehrotra (2018); Gijorji and Goran (2019) and that of Brundtland (1987) maintained that many studies assessed the then consumption and production patterns as unsustainable in the long term. As time progressed, the influence of various stakeholder groups began to grow and it is became obvious that the traditional attitude to evaluating and reporting the economic performance of a company is no longer sufficient (Kocmanova, Docekalova, Skapa, & Smolikava, 2016; Perini & Tencati, 2006; Zain & Shafii, 2018; Sharma & Henriques, 2005).

The concept of corporate sustainability could also viewed from the general performance that improves economic, protect and restore ecological systems and continuous enhancement of well-being of the people and resources management efficiency (Swarnapali, 2017). The concept of corporate sustainability was originally launched as an ecological idea, which focused on the conservation of resources and the environment. However, corporate sustainability has been developed into economic viability, environmental responsibility and social equity responsibility communities (Herbohn, Walker, & Loo, 2014; Nure, 2019; Tabash, 2018; Przychodzen & Przychodzen, 2013; Yu & Zhao, 2015).

More prior studies from advanced Economies had considered and defined the concept of corporate sustainability from different perspectives, for example, Wagner, Santos and Pacchini (2018) stated that corporate sustainability could be considered from the viewpoint of balanced scorecard from European Union; that Stakeholders influenced on sustainability in Canadian Sharma and Henriques (2005); Backstrom and Karlsson (2015) defined corporate sustainability and financial performance as the livewire of organizations; Rivera (2018) from United States of America defined corporate sustainability as the strategic corporate management that considers the future that its foundations extends and transients beyond the boundaries of a single organization and naturally addresses the performance of both the customers, stakeholders' perception and a reflection of value chain performance. Yet, Fauzi, Goran and Rahman (2015) said that corporate sustainability performance is multifaceted and an unresolved issue in literature. The study hypothesized that corporate sustainability should be considered from three perspectives: The financial performance perspective, the social responsibility perspective and the operational environment perspective and these three, are interrelated and interdependent. While the study of Schaltegger and Wangner (2006) opined that Sustainability performance can be seen as the performance of a company in all dimensions and for all drivers of corporate sustainability, hence no one single measure is enough to evaluate corporate sustainability accurately.

Profitability

Profitability is a major factor in the going concern of a business. Managers should strive to achieve a reasonable level of profitability in order to maximize their shareholders wealth. Liquidity requirement of a firm depends on the peculiar nature of the firm and there is no specific rule on determining the optimal level of liquidity that a firm can maintain as to ensure positive impact on its profitability (Sopn & Dutta, 2018; Thuraisingam, 2015). Generally, corporate sustainable performance is all about optimal utilization of the available resources, competence and profitability. Profitability in essence is the exercise of expertise in producing the result expected while profitability is the ability to make profit from all the business activities of and an organization, company, firm, or an enterprise Ezejiofor, Adigwe & John-Akamelu, 2015). It measures management efficiency in the use of organizational resources in adding value to the business venture of the company.

Profitability may be regarded as a relative term measurable in terms of profit and its relation with other elements that can directly influence the profit. Profitability is the relationship of income to some balance sheet measure which indicates the relative ability to earn income on assets. Irrespective of the fact that profitability is an important aspect of business, it may be faced with some weakness such window dressing of the financial transactions and the use of different accounting principles (Ejiofor *et al,* 2015). Company's long term survival in the oil and gas sector, being a huge capital intensive in nature, depends on its being able to earn satisfactory revenue from its operations. And such the investors will continue to remain in the business. In the words of Gee and Pegglers (1998), an evaluation of a firm's past earning power may give the investor a better basis for decision-making. A firm's ability to earn an income usually affects it liquidity. For this reason, evaluating profitability is important to both investors and creditors.

This study adopted Karjiati and Evawany (2017) model and followed common practice and computed the variables as follows:

$$\text{ROCE} = \frac{\text{Profit}}{\text{Capital Employed}} \times 100$$

Assets Growth: The concept of assets growth is the capital investment and subsequent quality returns (Titman, Wei & Xie, 2004). Assets growth is a reflection of the wealth creation and increase in value of a company's asset or investment over time. It could be evaluated by considering the difference between the current value or market value of assets or investment and possibly its purchase price, the value at the time such assets were acquired. Assets growth are expected to bring in returns because it is not idle. Assets in whatever forms are the basic economic resources of companies and they are definitely expected to bring in yields and future benefits. It could be in form of liquid, receivables and other monetary items at the usage of the companies. Maggina and Tsaklanganos (2012) and the study of Majard, Vahid and Adrian (2018) posited that assets are the integral part of Oil and Gas companies, as such they are expected to the major drivers of the growth and corporate sustainability strategic plans of the companies, Assets growth provides respite and additional capabilities, prospects, earnings and profits.

$$\text{Assets growth} = \frac{\text{Total Assets}_{it} - \text{Total Assets}_{it-1}}{\text{Total Assets}_{it-1}}$$

Liquidity Management

The concept of Liquidity management is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they fall due and increase profitability and shareholder's wealth (Thuraisingam, 2015). Aguguom, Dada, and Nwaobia (2019); Owolabi and Obida (2012) posited that liquidity management is strategic and corporate sustainability the essence of firms being in business, that every investor is corporate sustainability conscious, hence that no investor is interested when the sustainability and going concern of a firm is in doubt. Therefore liquidity requirements, and liquidity management largely depends on the nature of the establishment, and the pivotal role liquidity plays on its day to day operational activities. The Oil and Gas companies are huge capital intensive and concentrated funding operations that requires expertise and pragmatic liquidity management to ensure make and sustain positive impact on its profitability. Prior studies had shown that liquidity management is an essentially important for the assets growth (AG) and corporate sustainability (Rivera, 2017).

Economic Value Added

The concept of the variable is from the angle of what value that is being added to the value that needs to be sustainable. Panigrahi and Zainuddin (2015) posited that economic value added is a measuring tool that evaluates the economic value and growth of a company. Economic value added is defined as the value gap between corporate profit after considering taxes and its cost of capital as stated by Stewart, 1991). Many studies had used economic value added as a measure of corporate performance in terms of wealth creation and growth, In India Bhattacharyya and Phani (2000); economic value added employed in firm profitability performance in Egypt; while employed as a measure of future earnings in United Kingdom according to Ismail (2011), Hassan and Marimuthu (2018); Kyriazis and Anastassis (2007) used economic value added to measure profitability of Greek firms, while Issa 2012, measured profitability, growth and opportunity Malaysian firms. This study proposed economic value added appropriate for the measure of corporate sustainable performance from the viewpoint of performance.

Furthermore, studies had considered the concept of economic value added from different standpoints: Bhasin (2013) stated that economic value added is a value creation measure that differentiates the return on company's capital from the cost of that capital. Basically, economic value added evaluates the true economic profit generated by a firm and is calculated by comparing a firm's net operating profit after tax (NOPAT) to the total cost of all its forms of capital which includes debt as well.

Cash Conversion Cycle

Cash conversion cycle is the length of time a business paying for inventory and the customers paying for the goods sold from the inventory. Cash operating cycle reflects a firm's investment in working capital as it moves through the production process towards sales. It is concerned with the combination of average collection period, creditors' payment period and stock turnover period. According to Abdulazeez, Baba, Fatima and Abdulrahman (2018), Cash Conversion Cycle refers to the length of time in days between firm's payment for payables and collections from receivables.

Account receivables are affected by the credit collection policy of the firm vis-a-vis the frequency of conversion of receivables into cash. Where there is a policy within the organization to grant customers a more liberal period, profitability may increase but at the expense of liquidity (Erik, 2012). Scholars are at consensus on the fact that shorter conversion period in day's leads to better liquidity and profitability. According to Gitman (2009) and Deloof (2003), Cash Conversion Cycle is mathematically measured as: CCC =. ACP +ITID – APP. (that is: Average Collection period + Inventory Turnover in Days – Average Payment Period)

Receivables Collection Period

This is a financial ratio closely related to debtors' turnover. It shows the average length of time measured in days or months or year in which debts remain uncollected. In this study, average collection period is being measured in days. It is the average length of time between sale of an item and receipt of cash for the sale from customers. Basically, the ratio when computed should be compared with the credit period granted to customers because in practice, customers don't normally like to pay within the time allowed and also be compare with the ratio of similar businesses. If other companies have a lower average collection period, then there is need to see if there can be an improvement in the performance of the company, but if the result obtained is too high showing an upward trend, could mean poor management of debtors and might indicate any of the following: (a) a need to change credit policy especially seeking more sales from creditworthy customers. (b) Introducing or withdrawing a cash discount and (c) window dressing- a company may be allowing longer credit but has lower average collection period because sales invoices are dated before the year end (Olowe, 2011). In literature, debtors' Collection Period is measured by the Average accounts receivable divided by the net sales and then multiply the outcome by average number of days in a year which is usually taken as 365 days (Adamu, 2016).

Cash Ratio

Since cash is an important element of the current assets, it is considered important to measure it along with trade investment which are cash equivalents against current liabilities especially where the value of the former is significant. This ratio is used to determine the degree of responsiveness of cash and cash equivalents to take care of current liabilities and ascertain the ability of the company to hold enough cash and cash equivalent per time (Institute of Chartered Accountants of Nigeria, 2006). According to Irubis (2018) cash ratio is the ratio of a company's total cash and cash equivalents (CCE) to its current liabilities. The metric calculates a company's ability to repay its short-term debt; this information is useful to creditors when deciding how much debt, if any, they would be willing to extend to the asking party. Cash ratio is more useful when it is compared with industry averages and competitor averages, or when looking at changes in the same company's cash ratio over time. A cash ratio that is lower than 1 does sometimes indicate that a company is at risk of having financial difficulty. However, a low cash ratio may also be an indicator of a company's specific strategy to have low cash reserves (Irubis, 2018). Furthermore, following also the study of Salawu and Alao (2014), this study measures cash ratio as: Cash and cash equivalent divided by Current liabilities.

Firm Size

The concept of firm size is the dimension of the particular oil and Gas Company in terms of capital structure, capitalization, scope and location. Roy (2015) defined firm size as the natural log of the companies' total assets employed within the period under consideration**,** implying the totality of the assets deployed I the operational activities of a company for a period of time. According to Dwi-Lusi (2013), firm size is associated do have impact on earnings, liquidity size in terms of amount and liquidity management, that the lower the capital a company operatives with, the higher expertise required in its liquidity management. This study contributes to the debate and to the body of knowledge, states that larger companies with enough resources acquired over the years, gives the company a great advantage over the smaller companies, they can engage in higher risks and also effectively manage their resources with a higher expectation of results. Ahmad and Wardani (2014) argued that the company's size has a positive and significant effects on the company's dividend policy in the Indonesia Stock Exchange, while Roy (2015) study reveals that there is a positive relationship between firm size and company's dividend policy which in turn effects companies' market value in India.

THEORETICAL UNDERPINNING

The following theories were used in this study

Liquidity Asset Theory

Liquidity assets theory was developed by Alger and Alger as one of the pioneer literature on liquidity management in 1999 as stated by the study of **(**Delmas & Montes-Sancho, 2011). This theory focuses on the asset side of the balance sheet and argues that banks must hold large amount of liquid assets against possible demand or payment cushion of readily marketable short-term liquid asset against unforeseen circumstances. However this theory might put Oil and Gas companies in a position, in which it has excess liquid asset which might impair return on asset as cash lies idle in the account in anticipation of unforeseen circumstances. In lending credence to the theory; Bansa (2005) in of support liquidity assets theory posited that since liquidity is the soul and engine factory of every organization, it was only proper and reasonably enough that liquidity as an assets be given appropriate attention and suitable management. This theory gives focus to the research work, as it emphasis the fact that companies can be caught unawares by unforeseen circumstances, so it stresses that companies should hold large amount of liquid asset which are readily marketable in short-term so that they can always respond accordingly and reasonably to unforeseen circumstances. The theory of liquidity asset theory is relevant and good in relation to the independent variable of liquidity management of the study because the theory is fundamental for liquidity management for Oil and Gas companies to maintain adequate liquidity in the Oil and Gas company in Nigeria. The theory is associated with the independent variable in ability to significantly affect the corporate sustainability of the quoted Oil and Gas companies sin Nigeria.

Supporters of Liquidity Theory*:* In lending credence to the theory; Bansa (2005) in of support liquidity assets theory posited that since liquidity is the soul and engine factory of every organization, it was only proper and reasonably enough that liquidity as an assets be given appropriate attention and suitable management. This theory gives focus to the research work, as it emphasis the fact that companies can be caught unawares by unforeseen circumstances, so it

stresses that companies should hold large amount of liquid asset which are readily marketable in short-term so that they can always respond accordingly and reasonably to unforeseen circumstances.

Criticisms of the Liquidity Assets Theory: One of the critics of liquidity theory was Ibe (2013), who opined that this approach is very expensive in a current world of dynamic money market especially the oil and gas sector, that non-current assets investment and research development management should take more attention of the management rather than the liquid assets, this gives a pointer to bank to have adequate liquidity management; however, at a point companies should consider not to keep cash in excess of what is stipulated by the Central bank in their vaults, which would have been invested in form of loans and advances as it impairs the profit making ability of commercial establishments. Thus this theory gives a focus in term of adequate planning and structuring of the banks liquidity to ensure that the banks customers like the Oil and gas are adequately serviced and are not caught unawares by unforeseen events in the course of fulfilling their day to day obligations to their customers (Lartey, Antwi, & Boadi, 2013).

Institutional Theory of Corporate Sustainability

Institutional theory of corporate sustainability was pioneered and brought to literature domain by Meyer and Rowan in 1977. In accounting and finance, the theory of institutional theory have been employed in social surroundings context of institutionalization process surrounding extraction and drilling processes in the corporations like Oil and Gas companies with the environment where they operate.). Some of the proponents who supported institutional theory of corporate sustainability are (Chintrakarn, Jiraporn, Kim & Kim, 2016; Ivan & Javier, 2014). These scholars in support of the theory had considered institutional theory from different perspectives: Used as an entrenchment strategy by manager, that the theory has strong impact on the development and sustenance of formal structures in companies' existence. Chintrakarn *et al* (2016) also opined that innovative structure that improves technical efficiency in early-adopting companies are legitimized in the environment Also Etzion and Ferraro (2010) applied institutional entrepreneurship to study the institutionalization processes that drove the Global Reporting Initiative (GRI) to become a legitimate Corporate Sustainability reporting standard. Reinecke *et al*. (2012) explained the coexistence of multiple sustainability standards in the coffee industry as a product of two countervailing mechanisms of convergence and differentiation.

Signaling Theory

The Signaling theory was developed by a renowned scholar Spence (1973) in regards to capital market, in explaining the behavior of the market at the time of writing (Watts & Zimmerman, 1986; Eliwa, 2015). The ideas of this theory have been an issue of applicability to any market with information asymmetry (Morris, 1987) which has been used in literature (Abd-Elsalam & Weetman, 2003) to elucidate cross-sectional discrepancy in voluntary disclosure levels and this has also been associated with agency theory (Morris, 1987). In a study, Akerlof (1970) opines that voluntary disclosure is considered a form of signaling connecting to information asymmetry in the market and that it is possible for signaling theory to handle the likely problems of information asymmetry, thereby reduce disproportionateness by the other with more information signaling it to other parties (Morris, 1987; Eliwa, 2015).Basically, the signaling theory hypothesizes that in

situation of asymmetric distribution of information, one member attempts to realistically convey formation about itself to another member (Muttakin, Khan & Subramaniam, 2015). In support of signaling theory, some studies (Dainelli, Bini & Giunta, 2013; Loannou & Serafeim, 2015) had shown some interest and backing the great relevance of signaling theory. For example, Dainelli *et al.* (2013) posited that signaling theory is the firm's signal through accounting information, to influence investors with the aim of lowering the required rate of return. According to Dainelli, Bini, and Giunta (2013), the purpose of signaling can be used to appreciate why firms release signals to its investors compared to the conduct when two parties have access to different information, and the theory explains the information asymmetry between parties, which can be reduced through signaling, that is the part which has superior information signals it to others

Empirical Review

The study of Xuan and Hong (2016) conducted an evaluation of assets growth from a sectors outside the oil and gas companies, however, the study interest was on assets growth and cross section of stock returns. The study employed quite a sizeable data from the market and accounting variables of the sampled companies sampled listed on the Ho Chi Minh City Stock Exchange of Vietnam. The study used data sourced from the financial statements of the companies for the period of 4 years (2008-2012). The study found result different from the expectation of this study. It found that assets growth and liquidity management are negatively related and that it had a negative and not significant effect on profitability and stock returns of companies in Vietnam. However, on the contrary, the study of Iqbal and Wibowo (2015) examined the analysis of asset growth anomaly on cross-section stock returns from the Indonesian capital market. The study employed correlation and multiple regression analysis of panel data for the analysis of the specified models. The data were sourced from the listed companies on the Indonesian Stock Exchange. The study revealed that assets growth had a positive effect on the stock returns.

Abbas, Iqbal and Aziz (2019) explored the influence of bank capital, bank liquidity level and credit risk on the profitability of commercial banks in the post crisis period between 2011 and 2017 in Asian developed economies in comparison with the USA banking industry. The study used percentages analysis to evaluate the influence of capital and liquidity level of banks on profitability. At the end of the analysis, the study found that bank capital and credit risk positively influenced profitability of banks in Asian developed economies similar to in the USA commercial banks, and at the same time, the study found that liquidity had a positive impact on the profitability of the USA large commercial banks and negative and positive on Asian developed economies commercial banks in the post crisis era. The findings indicated that a 6% increase in capital leads to a 1% increase in profit, a 3.5% increase in liquidity leads to a 1% increase in profit. Specifically, larger banks generate 1% profit against a 1% increase in liquid assets. Medium size banks made 1% profit against a 3% increase in liquid assets, and small size banks produce 1% profit against a 7% increase in liquid assets. The findings showed that liquidity influences profitability more intensively than capital, whereas the sign of coefficients is similar for large, small and medium-size banks. The results of the paper equally indicated that liquidity and bank capital had positive impact on profitability, while credit risk had a negative influence on the profitability of banks. The findings of the simultaneous equations model indicated that bank capital had a positive impact on

profitability in large and medium banks, whereas the profitability of banks influenced the bank capital positively in case of large banks and negatively in case of medium banks

Li, Becker and Rosenfeld (2012) investigated the effect of assets growth on future stock return resulting sampled companies' ability in liquidity management. The study used data collected from 23 countries in different continents of United States of America, Europe and Asian continent. The study found that a high predictability of assets growth in respect to stock returns for a period of four (4) years after the initial measurements. Furthermore, the study found that different results emerged reflecting the size of the continents in terms of big companies, small companies and geographical locations of the companies. Similarly, Maggina and Tsaklanganos (2012) conducted a study of the effect of assets growth on the stock management and returns from the Greece capital market. The study seeks to investigate the effect of assets growth on the profitability and liquidity of the traded companies on the Greece Stock Exchange. The study found that assets growth was positively predictable at an 85.7% rate in large companies. Delkhoshi and Abdollah (2017) examined the effect of liquidity on assets growth from predictive ranking models. The results of study show that the 1-year asset growth to 2-year growth and investment growth cannot be good predictors for stock liquidity rank.

Mojarad, Vahid and Adrian (2018) conducted an investigation on the challenges for sustainable development strategies in oil and gas industries. The study adopted survey research design focusing on the oil and gas and also oil services companies within the Middle East region for a period of two years (2015-2016). The study found that there was a significant effect of environmental policies on financial and corporate sustainable performance of the companies sampled in the survey. The study also found that under severe economic unstable conditions, oil and gas companies were seen unexcited in implementing policies that could influence corporate sustainable performance. The study then recommended that companies in the oil and gas industry should consider a comprehensive review of evolving technologies in addressing existing and future challenges in liquidity management towards improving on corporate sustainable performance. Jan, and Marimuthu (2019) examined the moderating role of Islamic corporate governance on the link between sustainable business practices and the firm's financial performance. A post-crisis period sustainability data for a period of 10 years (2008–2017) was collected by the study. The study used the weighted content method. Also the Generalized Method of Moments (GMM) statistical test was explored for empirical testing. The study found that the link between sustainable business practices with the firm's financial performance measured from the shareholders' and the management's perspective was positive, while the subjected link measured from the market perspective was found to be insignificant. The finding of the study could imply that the market stakeholders of the Islamic banks are reluctant for their bank's spending on sustainable business practices. Interestingly, the insignificant link between sustainable business practices and market performance became significant with the moderating role of Shariah governance and managerial ownership. It shows that the moderating role of Shariah governance and managerial ownership is giving confidence to market stakeholders of Islamic banks for receiving a higher financial return through sustainable business practices initiatives.

Wagner, Santos and Pacchini (2018) studied measuring the sustainability of manufacturing process, from the angle of conceptual framework. The study sort to establish that that beside financial gains, there are other environmental and social sustainability requirement the manufacturing companies must fulfil. The study in evaluating this, developed a triple bottom lines as a criteria of the whether the manufacturing companies comply with them. The study found that the companies were not fully implementing the requirements, hence there was no appropriate triple bottom lines approach for the company as a whole, which made their application for a manufacturing process difficult; (b) they did not consider the measures for sustainability (economic, environmental and social) as separate variables with no integration among them, which could became a methodological difficulty in case indicators move in different directions; or (c) they are too complicated to be used as a practical tool on the factory floor. Qasim and Rehman (2011) examined the impact of liquidity ratio on profitability of some selected enterprises in Pakistan. The study selected 26 Oil and Gas companies listed under the Karachi Stock Exchange in Pakistan. The study measured profitability using return on assets (ROA), return on equity (ROE) and return on investment (ROI). The study revealed that there was a positive significant relationship liquidity ratio and return on assets (ROA). However, liquidity ratio exhibited a nonsignificant impact on return on equity (ROE) and return on investment (ROI). Furthermore, the study found that return on equity had no significant effect on three ratio of liquidity (current ratio, quick ratio and liquidity ratio. And lastly, return on investment was greatly affected by the ratios of current ratio, quick ratio and liquidity ratio.

Forcadell, Aracil and Ubeda (2019) examined the liquidity management innovation and corporate sustainability link using a large sample of worldwide banks for the period 14 years (2003–20160, using 168 banks in 14 countries giving rise to 938 observation. The study framework consisted of three underlying dimensions-the antecedents of innovation performance, the specific innovation performance initiatives, and how these initiatives are converted into improved corporate sustainability. The study found that the insights for academics and practitioners on the dynamics between service innovation performance and corporate sustainability in the banking sector were positively related. Further, due to the intermediation role of banks in the economy, and the evolution towards sustainable banking constitutes a lever for sustainability across other industries and overall sustainable development, positive effect was established between innovation and corporate links in the banks. That macroeconomic factors were specifically relevant to the banking sector due to the cyclical nature of its business. The study include that the natural logarithm of Gross Domestic Product (GDP) and the percentage evolution of GDP annually (Growth), both gathered from the World Bank had positive significant effect on the banks.

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Justification for the study

Liquidity management and corporate sustainability of quoted Oil and Gas companies in Nigeria deserve an investigation, considering the recent crises witnessed in the sector (Ajayi & Oke, 2017). Liquidity management as it were, determine to a large extent the quantity of profit that result as well as the value of shareholders wealth (Ben-Caleb, 2009; Madhuwanthi & Morawakage, 2019). This is because, a firm in order to survive must remain liquid as failure to meet its obligation in due time results in bad credit rating by the short term creditors, reduction in the value of goodwill in the market and may ultimately leads to liquidation (Gadzo,Kportorbgi, 2019; Bhavet, 2011).

Hence, a good and firm financial management policy seeks to maintain adequate liquidity in order to meet its short-term maturing obligations without impairing profitability. Liquidity management and corporate sustainability problem in Nigeria still persist and requires an investigation. For example National Bureau of Statistics (NBS-2018) indicated that as at the third quarter of the year the oil and companies sector remains the higher foreign exchange earner, contributing close to 87% in revenue but less than 9 % in gross domestic product (GDP).

By implication while the sector contributes the bulk of the country's revenues due to the export of the raw product, the domestic economy is not impacted that much because of its inability convert the commodity locally to finish goods by way of refining or transforming such to energy generating product to drive production in other sectors. Secondly, the failure in terms of local transformation of crude oil and natural gas to value adding products had serious negative impact on the downstream sector of the nation's petroleum industry during the period under review. In simple terms, this is basically why the sector was not able to contribute meaningfully to GDP during the year (Al-Homaidi, Tabash, Farhan & Almagtari, 2019; Brenner, 2018).The rationale behind this study also was to find a probable and better solutions for the long age problems and challenges of corporate sustainability in the oil and Gas companies in Nigeria. For instance studies from the National Bureau of Statistics review of Midstream & Downstream Nigerians reveal that the unpalatable experience of yuletide season of 2017 and early 2018 caused by the absence of petroleum products, Premium Motor Spirit (PMS), otherwise called petrol to be precise, occasioned by lack of policy direction (National Bureau of Statistics, 2018). The companies problem of liquidity management and corporate sustainability resulting to multiple challenges of non-functional refineries, government regulation of petrol pump prices as well as hike in exchange rate of Naira to the Dollar, by October 2017. Lack of corporate sustainability of past performance, led to the point that importation of the product became the sole responsibility of the Nigerian National Petroleum Corporation (NNPC). Not only was the corporation battling the importation of the product which services as a drive to the economic engine of the nation, the absence of distribution infrastructure occasioned by vandalism and outright sabotage in the form of product diversion on the part of some unprofessional attitude of oil marketers, led to the emergence of long queues in major cities across the country (National Bureau of Statistics, 2018).Additionally, to the best knowledge of the researcher, there are paucity of studies conducted in Nigeria on the Oil and Gas sector focusing on liquidity management and corporate sustainability in Nigeria, creating a gap in literature that needed to be filled by this study.

METHODOLOGY

To measure the effect of liquidity management on assets growth, this study adopted *expo facto* research design and the population of the study consisted of all the 13 listed Oil and Gas companies on the Nigeria Stock Exchange as at 31 December, 2018. A sample of 10 Oil and Gas companies were purposively selected, the selection was premised on the availability of required data. The data were extracted from the audited and published financial statements. Three variables were identified for the study, the dependent variable of assets growth as a surrogate of corporate sustainability, the independent variable of liquidity management proxied with Cash Conversion Cycle,

Receivables collection Period, Payables payment Period, Cash Ratio and Quick Ratio and lastly, control variable of firm size.

The sample size of the study was determined using the Krejcie and Morgan (1970) sample size formula. The number of listed oil and gas firms in for the study were thirteen (13), and the period covered for was ten years (2009-2018), as such the elements of the sampling unit is 130 (10 years*13companies).

Using the Krejcie and Morgan (1970) sample size formula:

$$\boldsymbol{S = \frac{X^2 * N * P(1-P)}{D^2(N-1) + X^2 * P(1-P)}}$$

Where S = Sample size;

X^2 = table value of chi-square @ d.f =1 for desired confidence level;

N = Population size;

P = Population proportion (assumed to be 0.50);

D = degree of accuracy (expressed as a proportion = 0.05).

$With\ N = 130; X^2(at\ \propto = 0.05) = 3.84; P = 0.50$

The sample size for this study will be:

$$S = \frac{3.84 * 130 * 0.25}{(0.05^2 * 129) + (3.84 \times 0.25)}$$

$$S = \frac{124.80}{(0.3225) + (0.96)}$$

$$S = \frac{124.80}{1.2825}$$

S = 97.30 approx. 97 observations

From the sample size calculation carried out, it revealed that the 97observations were approximately equivalent of 10companies that was arrived out by 97observations divided by 10years (97/10 = 9.7companies, which was approx. 10 companies). This number was representative enough for generalization of the study, and the target companies were as represented in Table 3.1. A purposive and random sampling technique were adopted for the study. The criteria was that companies who were not available for trading at the capital market for the period under consideration, 2009-2018 under consideration were not selected. As a result: Seplat Oil, Beco Petroleum and Anino International Plc were not selected because they did not meet the criteria for selection. The adequacy of the information content of the published annual report financial statements in each of the oil and gas companies was the major criteria for the qualification and final selection of oil and gas companies used for the study.

This study collected data from the secondary data. The second data were extracted published financial statement of the 10 quoted oil and gas companies selected for the study. Furthermore, the data were sourced from the audited annual report from the Nigerian Stock Exchange and Central Bank of Nigeria. The secondary data was considered valid owning to the fact that the published

accounts of the sampled units have been subjected to the review of external Auditors, and approved for general usage by government approved regulatory bodies like the Nigerian Stock Exchange, Central Bank of Nigeria Corporate affairs Commission and National Bureau of Statistics. This was intended to ensure that the data content validity and face validity of the data were not compromised. The researcher believed that since the data from the audited annual financial statements constituted the source of data for this study were prepared by the oil and gas companies as statutorily required with the applicable financial reporting framework, by the relevant company's statutory auditors in agreement with Companies and Allied Matters Act (CAMA). and also certified by the appropriate regulatory agencies such as Securities and Exchange Commission (SEC), Nigerian stock Exchange (NSE), Central Bank of Nigeria, Financial Reporting Council of Nigeria are considered to be appropriate and correct for public consumption and for the purpose of studies like this one. The data were analyzed using descriptive and quantitative inferential statistics

Model Specification

Two types of variables are being proposed in this study, namely: the predictor/explanatory and criterion variables. The predictor variable in this study is the liquidity management with the following dimension as surrogates – cash conversion cycle (CCC), receivables collection period (RCP), Cash ratio (CR) and Quick ratio (QR. The criterion variable is the corporate sustainability being proposed to be measured in this study by corporate governance (CG) indices, Employees and Suppliers (EM) indices, Economic and Society (ES) indices and Environmental (EN) indices. This translated to the following:

$Y = f(XZ)$
Where
Y= Dependent Variable: Corporate Sustainability (Corporate Sustainable Performance-CSP)
X= Independent Variable: Liquidity Management (LM)
Z = Controlling Variable
Where
$CSP = f(LM)$
And
$Y = y_1, y_2, y_3.$
y_1 = Profitability (PROF)
y_2 = Assets Growth (ATG)
y_3 = Economic Value Added (EVA)

$X = x_1, x_2, x_3, x_4$
x_1= Cash Conversion Cycle (CCC)
x_2= Receivables Collection Period (RCP)
x_3 = Cash Ratio (CR)
x_4 = Quick Ratio (QR)

$Z = z_1$
z_1 = Firm Size (FRMSIZ)

Functional Relationship

PROF = *f* (CCC, RCP, CR, QR)	Equation	1
ATG = *f* (CCC, RCP, CR, QR)	Equation	2
EVA = *f* (CCC, RCP, CR, QR)	Equation	3
PROF = *f* (CCC, RCP, CR, QR, FRMSIZ)	Equation	4
ATG = *f* (CCC, RCP, CR, QR, FRMSIZ)	Equation	5
EVA = *f* (CCC, RCP, CR, QR, FRMSIZ)	Equation	6

Models Specification

$PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}$ Model 1
$AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}$ Model 2
$EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_5 QR_{it} + \varepsilon it$ Model 3
$PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ Model 4
$AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ Model 5
$EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ Model 6

Where
PROF: Profitability
AGT: Assets Growth
EVA: Economic value Added
CCC: Cash Conversion Cycle
RCP: Receivables collection Period
PPP: Payables payment Period
CR: Cash Ratio
QR: Quick Ratio
FRMSIZ: Firm Size

DATA ANALYSIS, RESULTS AND DISCUSSION OF FINDINGS

Descriptive Statistics

Table 4.1: Summary Statistics

	Obsn	*Mean*	*Median*	*Maximum*	*Minimum*	*Std. Dev.*
Dependent Variable						
PROF	100	0.059	0.080	1.310	-1.680	0.355
ATG	100	0.160	0.070	2.550	-0.450	0.416
EVA	100	10.202	5.147	110.060	-122.166	23.316
Independent Variable						
CCC	100	804.763	582.552	11675.800	-2008.329	1340.308
RCP	100	945.441	672.255	11691.640	89.723	1251.912
CR	100	0.008	0.109	2.420	-4.550	0.979
QR	100	1.061	0.924	4.404	-0.056	0.801
FRMSIZ	100	17.203	17.708	20.796	12.704	1.957

Source*: Author's Computation (2019), underlying data from annual reports of firms listed on Nigerian Stock Exchange (NSE).* ***Note****: Profitability (PROF), Assets Growth (AGT), Economic Value Added (EVA), Cash Conversion Cycle (CCC), Receivables collection Period (RCP), Cash Ratio (CR), Quick Ratio (QR) and Firm Size (FRMSIZ)*

The average value of PROF is 0.059 while the median value was 0.080 suggesting that the selected firms' total profitability is 5.9% on average during the period and the ratios varies among the firm relatively. In addition, the minimum and maximum values of -1.680 and 1.310 with a standard deviation value of 0.355. These suggest that the Return on Capital employed of the oil and gas firms on average takes values between -168.0% and 131.0% between 2009 and 2018. Overall, the average value suggests that the selected firms performed well in terms of profitability during the year under review.

Assets Growth as presented in Table 4.1 has a minimum value of -0.450 and a maximum value of 2.550. These figures depicts that during the year the highest asset growth recorded was about 255.0% while the least was -45.0% with a standard deviation of 0.416. Additionally, the average value of Assets Growth was 0.160 suggesting that the firms' asset grew by about 16.0% on average during the period of this study. Generally, the average result shows that the selected firms recorded asset expansion that is capable of attracting investors who buy asset as investment.The Economic Value Added (EVA) as in Table 4.1 has a minimum value of -N122.17b and a maximum value of N110.06b. These figures depicts that the EVA that during the year the highest Economic Value Added (EVA) recorded was about N110.06b while the least was N-122.17b with a standard deviation of 23.316. Moreover, the average value of Economic Value Added (EVA) is N10.20b.

As a matter of fact the result shows that averagely; the industry performs well based on the residual wealth or economic profit.Again, in this study, we are using the following as proxies for Liquidity management: Cash Conversion Cycle (CCC), Receivables collection Period (RCP), Cash Ratio (CR) and Quick Ratio (QR).*)*The mean value of the variable is 804.76 while the median value is 582.55 suggesting that on average it take the firms about 805 days to change their investments in inventory and other resource to cash from sales Besides, the minimum and maximum values of -2008.33 and 1167580 with a standard deviation value of 1340.31 show that during period some firms required fewer days to change their investments in inventory and other resource to cash while for some it take longer days.Receivables collection Period as reported in Table 4.1 took values between 89.72 and 11691.640 with a Standard deviation of 1251.91. This shows that the average length of time between sale of an item and receipt of cash for the sale from customers varies relatively. Also, the average value of RCP is 945.44 and the median value is 672.26 suggesting that on average, the length of time between sale of an item and receipt of cash for the sale from customers is 945 days.As can be seen from the table, the average and median values of cash ratio are 0.008 and 0.109 respectively. This shows that the degree of responsiveness of cash and cash equivalents to take care of current liabilities varies significantly among the firms. The mean value of CR indicates that the selected firms' could cover about 8.0% of their short-term debt with cash and cash equivalent on average during the period. In addition, the minimum and maximum values of -4.550 and 2.420 with a standard deviation value of 0.979 shows that during the period, all the firms could settle their short term debts with the available current asset.

As can be seen from the table, the average and median values of quick ratio are 1.061 and 0.924 respectively. This show the ability of a firm to settle its short term debt with its assets that can be converted to cash within a year. The mean value of QR indicate that the selected firms' could able to utilize the available current asset to settle about 106.5% of their short-term debt on average during the period and as a matter of fact, these ratios among the firm are relatively close. In addition, the minimum and maximum values of -0.056 and 4.404 with a standard deviation value of 0.801 shows that during the period, all the firms could to settle their short term debts with the available current asset.The mean value of FRMSIZ is 17.20 while the median value was 17.71 indicating that the sizes of the firms in terms of total asset relatively close. The minimum and maximum values of 12.70 and 20.80 with a Standard deviation value of about 1.96.

Inferential Statistics

Test of hypothesis one and Four

Research Objectives One and Four: To evaluate the effect of liquidity management with and without control variable of firm size on profitability (PROF) of the quoted Oil and Gas companies in Nigeria;

Research Questions One and Four: How does liquidity management with and without control variable of firm size on affect profitability (PROF) of the quoted Oil and Gas companies in Nigeria?

Statement of Hypotheses: **$H_0$1** and **$H_0$4**: Liquidity management with and without control variable of firm size does not have any significant effect on profitability of quoted Oil and Gas companies in Nigeria.

Table 42.1: Effect of Liquidity Management on Profitability with and without Control Variables

VARIABLES		**Effect of Liquidity management on profitability** $PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}$ **RAMDOM (MODEL 1)**	**Effect of Liquidity management with control variable of Firm size on profitabilit** $PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ **RAMDOM (MODEL 4)**
C	*Coeff.* *(t-stat.)* *[p-value]*	8.6781 (1.5021) [0.1364]	-53.742 (-0.8712) [0.3859]
CCC	*Coeff.* *(t-stat.)* *[p-value]*	3.6591** (4.571) [0.0000]	3.4722** (4.4445) [0.0000]
RCP	*Coeff.* *(t-stat.)* *[p-value]*	-3.9889** (-4.9098) [0.0000]	-3.7577** (-4.7218) [0.0000]
CR	*Coeff.* *(t-stat.)* *[p-value]*	0.0574** (2.7143) [0.0079]	0.0390 (1.3598) [0.1771]
QR	*Coeff.* *(t-stat.)* *[p-value]*	0.0258 (0.539) [0.5911]	0.0522 (1.0664) [0.2890]
FRMSIZ	*Coeff.* *(t-stat.)* *[p-value]*		3.4348 (1.0239) [0.3085]
Observations		***100***	***100***
R^2		***0.128***	***0.138***
Adj. R^2		***0.092***	***0.093***
F-Statistic [P-value]		***3.493 [0.010]***	***3.020 [0.-14]***
Pesaran Cd test *[P-value]*		***-1.566 [0.571]***	***-0.625 [0.532]***
Heteroskedasticity Test *[P-value]*		***0.636 [0.639]***	***0.747 [0.590]***
Serial Auto-Correlation Test *[P-value]*		***0.813 [0.564]***	***0.813 [0.580]***

***Source**: Author's Computation (2019), underlying data from annual reports of firms listed on Nigerian Stock Exchange (NSE). Note: The dependent variable is **Profitability (PROF).** The Independent variables are Cash Conversion Cycle (CCC), Receivables collection Period (RCP), Cash Ratio (CR), Quick Ratio (QR) and Firm Size (FRMSIZ). ** p<0.05*

In Table 4.2.1, the significant F-statistics values [3.493; P - value = 0.010 and 3.020; P - value = 0.014] show that the chosen random effect models are statistically significant. The coefficient of determination (R – squared) values which are 0.128 and 0.138 for models (1) and (2) respectively imply that the explanatory variables account for about 12.8% and 13.8% of changes that occur in the dependent variable. Based on the coefficients of Cash Conversion Cycle (CCC), the results show that the coefficients are positive and statistically significant at 5% level of significance [coeff. = 3.659; P – value = 0.000 and coeff. = 3.472; P – value = 0.000]. These imply that Cash Conversion Cycle (CCC) has positive and significant effect on corporate sustainability performance in terms profitability (PROF).Based on the coefficient of Receivables collection Period (RCP), the coefficients and associated P-values [coeff. = -3.989; P – value = 0.000 and coeff. = -3.758; P – value = 0.000] appear to be positive and statistically significant at 5% level of significance. These mean that Receivables collection Period (RCP) effect on corporate sustainability performance in terms profitability (PROF) is inverse and this inverse effects are statistically significant. Alternatively, the significant result suggests that the effect of Receivables collection Period (RCP) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is significant.Similarly, the results reveal that there are positive relationship between Cash Ratio (CR) and corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) [coeff. = 0.057; P – value = 0.008 and coeff. = 0.039; P – value = 0.177]. However, the positive relationship is statistically significant at 5% levels of significance in the model (1) only This is confirmed by the P – value = 0.008. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is statistically significant.Besides, Quick Ratio (QR) has an insignificant P – values (0.539 and 0.289) though the associated coefficients appear to be positive. These suggest that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is insignificant. Alternatively, Quick Ratio (QR) has no significant effect on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF).For Firm size (FRMSIZ) in model (2), the coefficient is seen to be highly insignificant. This is confirmed by the P – value = 0.309 that is associated with the coefficient of the variable. As a result, the insignificant result suggests that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is insignificant during the period of this study.

Model with Control Variable

When the Firm Size is introduced into the model as a control variable, there are some levels of changes in the coefficients of the selected explanatory variables as stated earlier. Specifically, the result of the regression model as shown in Table 4.4.shows that Cash Conversion Cycle (CCC) coefficient changed from coeff. = 3.659 (P – value = 0.000) to coeff. = 3.472 (P – value = 0.000). This however indicates that the coefficient remains positive and statistically significant at 5% level of significance though, it witnesses a little reduction. The coefficient of Receivables collection Period (RCP), increase from coeff. = -3.989; P – value = 0.000 to coeff. = -3.758; P – value = 0.000 which appear to be positive and statistically significant at 5% level of significance due to the controlling effect of Firm Size. Also, the results reveal that the significant relationship between Cash Ratio (CR) becomes insignificant after controlling for Firm Size though positively signed. [coeff. = 0.057; P – value = 0.008 and coeff. = 0.039; P – value = 0.177]. Quick Ratio (QR) still

maintains an insignificant P – values (0.539) though the associated coefficients appear to be positive after Firm Size is added. Overall, the adjusted R^2 of 0.092 and 0.093 indicates that the joint explanatory power of the independent variables improved by 1.09% due to the controlling effect of Firm Size.

Heteroskedasticity Test, Serial Autocorrelation Test and Cross Sectional Dependence Test for Profitability. In this study, Pesaran CD test statistic in Table 4.2.1was employed to check whether the estimated models have cross sectional dependence problem or not when Profitability is regressed on Liquidity management indicators as well as control variable. As in the Table the PCD tests values of *-1.566 [P-value= 0.571]* and *-0.625 [P-value= 0.532]* are statistically insignificant. These strongly suggest the acceptance of the null hypothesis of no problem of cross sectional dependence in model two, thus concludes that the models are free form cross sectional dependence problems. For heteroskedasticity test, the tests' statistics values of *0.636 [P-value= 0.639]* and *0.747 [P-value= 0.590]* are statistically insignificant at 5% alpha levels. These mean that we strongly failed to reject the null hypothesis of homoscedasticity. Therefore, the study concludes that the residuals of the estimated regression models have constant variance (homoscedastic in nature). Alternatively, the study concludes that the residuals of the estimated regression models are free from heteroskedasticity problem. Furthermore, serial autocorrelation test carried out to determine whether the relationship between the residual of the models its lagged version over various time intervals correlate. From the result, the tests' statistics values of *0.813 [P-value= 0.564]* and *0.813 [P-value= 0.580]* are statistically insignificant at 5% alpha levels. This indicates the absence of first order autocorrelation among the series in both models.

$PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}$ Model 1

PROF = 8.6781 +3.6591CCC - 3.9889RCP + 0.0574CR + 0.0258QR

$PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ Model 4

PROF =-53.742 +3.4722CCC– 3.7577RCP+0.0390CR+0.0522QR+3.4348FRMSIZ

In model 1, $\boldsymbol{(PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it})}$ in Table 4.2.1 The coefficients of cash conversion cycle, cash ratio and quick ration are positively signed and are consistent with the study expectorations (β_1= 3.6591; β_3 = 0.0574; β_4 = 0.028) > 0. But, in contrary the coefficients of receivables collection period is negatively signed and not consistent with the expectation (β_2 = - 3.9889) < 0. This result implies that a unit change in cash conversion cycle, cash ratio and quick ratio will lead to an increase of 3.6591, 0.0574 and 0.028 in profitability respectively, whereas a unit change in receivables collection period will lead to a decrease of 3.9889 in profitability of quoted oil and gas companies in Nigeria respectively. In model 4, $\boldsymbol{(PROF_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it})}$, in Table 4.2.1, with the introduction of the control variable, the coefficients of cash conversion cycle, cash ratio, quick ratio and firm size, are positively signed and inconsonant with the expectation of the study (β_1 = 3.4722; β_3 = 0.039; β_4 = 0.0522; β_5 = 3.4348) > 0. This implies that a unit change in cash conversion cycle, cash ratio, quick ratio and firm size will lead to an increase of 3.4722, 0.039, 0.0522 and 3.4348 in profitability. However, receivables collection period is negatively signed and inconsistent with the expectation (β_2 = -3.7577) < 0. This implies that a unit change in receivables collection period will lead to a decrease of 3.7577 in profitability of the quoted oil and gas companies in Nigeria.

Decision

As in the regression result in Table 4.4, in model 1, at the significance level of 0.05, the F- statistics value is 3.493, while the P-value is 0.010 which is les that 0.05 level of significant. Therefore the study reject the null hypothesis and accept the alternative, which means that liquidity management has significant effect on profitability of the quoted oil and gas companies in Nigeria. Furthermore, when the control variable of firm size was introduced, at the significance level of 0.05, F-statistics value is 3.020, and P-value of 0.014 which is less than 0.05 level of significant. Consequently, the study reject the null hypothesis and accept the alternative in model 4, which means that liquidity management has significant effect on profitability with control variable of firm size.

Discussion of Findings

The results reveal that there are positive relationship between Cash Ratio (CR) and corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) [coeff. = 0.057; P – value = 0.008 and coeff. = 0.039; P – value = 0.177], the result is consistent with the study of (Bhunia & Bandyopadhay, 2015; Lee, Seo & Sharma, 2013). However, the positive relationship is statistically significant at 5% levels of significance in the model (1) only. This is confirmed by the P – value = 0.008. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is statistically significant this is in tandem with the result found by Almeida, Campello, Cunha & Weisbach, 2013; Amin, Maran, Rohail & Mehreen, 2019).Besides, Quick Ratio (QR) has an insignificant P – values (0.539 and 0.289) though the associated coefficients appear to be positive. These suggest that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is insignificant. Alternatively, Quick Ratio (QR) has no significant effect on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF). The study result here is consistent with the study of Uwuigbe, Uwalomwa and Egbide (2011) who found cash management had a negative effect on corporate profitability of selected companies in Nigeria.For Firm size (FRMSIZ) in model (2), the coefficient is seen to be highly insignificant. This is confirmed by the P – value = 0.309 that is associated with the coefficient of the variable. As a result, the insignificant result suggests that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms profitability (PROF) is insignificant during the period of this study, in the same manner, the study result in this area is consistent with the result of the study of (Jan & Marimuthu, 2019; Ben-Caleb, Egbide, Olubukunola, Uwuigbe & Uwalomwa, 2013).

Test of Hyphothesis 2 & 5

Research Objectives Two and Five: To assess the effect of liquidity management with and without control variable of firm size on assets growth (ATG) of the quoted Oil and Gas companies in Nigeria;

Research Questions Two and Five: In what way does liquidity management with and without control variable of firm size affect assets growth (ATG) of quoted Oil and Gas companies in Nigeria?

Statement of Hypotheses: **H_{02}** and **H_{05}:** There is no significant effect of liquidity management on assets growth of quoted Oil and Gas companies in Nigeria.

Table 4.2.2: Effect of Liquidity Management on Assets Growth with and without Control Variables

Variable		Effect of Liquidity Mgt. on Assets Growth AGTit = β0 +β1CCCit + β2RCPit+ β3CRit + β4QRit + εit **Panel-corrected Standard Errors (PCSE) Pooled Regression** **MODEL 2**	Effect of Liquidity Mgt. with control variable of Firm size on Assets Growth **[[** $AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ **Panel-corrected Standard Errors (PCSE) Pooled Regression** **MODEL 5**
C	*Coeff.* *(t-stat.)* *[p-value]*	12.7781** (2.0641) [0.0417]	2.8826 (0.145) [0.8851]
CCC	*Coeff.* *(t-stat.)* *[p-value]*	1.9273** (4.7493) [0.0000]	1.7462** (6.3464) [0.0000]
RCP	*Coeff.* *(t-stat.)* *[p-value]*	-0.9188** (-2.0855) [0.0397]	-0.8975** (-2.843) [0.0055]
CR	*Coeff.* *(t-stat.)* *[p-value]*	0.0347 (1.4635) [0.1466]	0.0491** (2.9511) [0.0040]
QR	*Coeff.* *(t-stat.)* *[p-value]*	-0.0481 (-0.8212) [0.4136]	-0.0416** (-2.1010) [0.0383]
FRMSIZ	*Coeff.* *(t-stat.)* *[p-value]*		0.4714 (0.4199) [0.6755]
Observations		***100***	***100***
R^2		***0.113***	***0.117***
Adj. R^2		***0.076***	***0.070***
F-Statistic [P-value]		***3.030 [0.021]***	***2.488 [0.037]***
Pesaran Cd test *[P-value]*		***0.585 [0.559]***	***0.444 [0.657]***
Heteroskedasticity Test *[P-value]*		***95.058 [0.000]***	***94.900 [0.000]***
Serial Auto-Correlation Test *[P-value]*		***0.179 [0.982]***	***0.375 [0.914]***

***Source**: Author's Computation (2019), underlying data from annual reports of firms listed on Nigerian Stock Exchange (NSE). Note: The dependent variable is **Assets Growth (AGT).** The Independent variables are Cash Conversion Cycle (CCC), Receivables collection Period (RCP), Cash Ratio (CR), Quick Ratio (QR) and Firm Size (FRMSIZ). ** p<0.05,*

In Table 4.2.2. the significant F-statistics values [3.030; P - value = 0.021 and 2.488; P - value = 0.037] show that the chosen Pooled regression models are statistically significant. The R – squared values of 0.113 and 0.117 for models (1) and (2) respectively indicate that the explanatory variables jointly account for about 11.3% and 11.7% of variation that occur in the Assets Growth (AGT).Going by the coefficients of Cash Conversion Cycle (CCC), the results show that the coefficients are positive and statistically significant at 5% level of significance [coeff. = 1.927; P – value = 0.000 and coeff. = 1.746; P – value = 0.000]. These relationships are similar to that of profitability (PROF) and Cash Conversion Cycle (CCC) in the preceding subsection. These imply that Cash Conversion Cycle (CCC) has positive and significant effect on corporate sustainability performance in terms Assets Growth (AGT).Based on the coefficient of Receivables collection Period (RCP), the coefficients and associated P-values [coeff. = -0.919; P – value = 0.0397 and coeff. = -0.898; P – value = 0.006] also appear to be positive and statistically significant at 5% conventional levels of significance. These mean that Receivables collection Period's (RCP) effect on corporate sustainability performance in terms Assets Growth (AGT) is inverse and this inverse effects are statistically significant. Alternatively, the significant result suggests that the effect of Receivables collection Period (RCP) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is highly significant.The results further reveal that there are positive relationship between Cash Ratio (CR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) [coeff. = 0.035; P – value = 0.147 and coeff. = 0.049; P – value = 0.004]. However, the positive relationship is statistically significant at 5% levels of significance in the model (2) only. This is confirmed by the P – value = 0.004. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is statistically significant when firm size is controlled for in the model.Besides, the results reveal that the coefficients of Quick Ratio (QR) are negative suggesting negative relationship between Quick Ratio (QR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) [coeff. = -0.048; P – value = 0.414 and coeff. = -0.042; P – value = 0.038]. However, the negative relationship is statistically significant at 5% levels of significance in the model (2) only. This is confirmed by the P – value = 0.038. The significant result suggests that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is statistically significant when firm size is controlled for in the model.For Firm size (FRMSIZ) in model (2), the coefficient is seen to be highly statistically insignificant. This is confirmed by the P – value = 0.676 that is associated with the coefficient of the variable (coefficient = 0.471). Correspondingly, the insignificant result suggests that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) during the period of this study is insignificant.

Model with Control Variable

When the Firm Size is introduced into the model as a control variable, there are some levels of changes in the coefficients of the selected explanatory variables as stated earlier. Specifically, the result of the regression model as shown in Table 4.shows that Cash Conversion Cycle (CCC) coefficient changed from coeff. = coeff. = 1.927; P – value = 0.000 to coeff. = 1.746; P – value = 0.000. This however indicates that the coefficient remains positive and statistically significant at 5% level of significance though, it witnesses slight reduction. The coefficient of Receivables

collection Period (RCP), increase from coeff. = -0.919; P – value = 0.0397 to coeff. = -0.898; P – value = 0.006 which appear to be negative and statistically significant at 5% level of significance due to the controlling effect of Firm Size. Also, the results reveal that the insignificant relationship between Cash Ratio (CR) becomes significant after controlling for Firm Size [coeff. = 0.035; P – value = 0.147 and coeff. = 0.049; P – value = 0.004]. Quick Ratio (QR) becomes insignificant [P – values (0.038)] though the associated coefficients remain the same after Firm Size is added. Overall, the adjusted R^2 of 0.076 and 0.070 indicates that the joint explanatory power of the independent variables reduce by 7.89% due to the controlling effect of Firm Size.

Heteroskedasticity Test, Serial Autocorrelation Test and Cross Sectional Dependence Test for Assets Growth

To check whether the estimated models have cross sectional dependence problem or not when Profitability is regressed on Liquidity management indicators as well as control variable in this study, Pesaran CD test statistic is employed. As in the Table 4.2.2, the PCD tests values of ***0.585 [****P-value= **0.559]*** and ***0.444 [****P-value= **0.657]*** are statistically insignificant. These strongly suggest the acceptance of the null hypothesis of no problem of cross sectional dependence in model two, thus concludes that the models are free form cross sectional dependence problems. For heteroskedasticity test, the tests' statistics values of ***95.058 [****P-value= **0.000]*** and ***94.900 [****P-value= **0.000]*** are statistically significant at 5% alpha levels. These mean that the null hypothesis of homoscedasticity cannot be accepted. Hence, the study concludes that the residuals of the estimated regression models do have constant variance (heteroscedastic in nature). Alternatively, the study concludes that the residuals of the estimated regression models are not free from heteroskedasticity problem. As a result of these, the study used panel-corrected standard errors (PCSE) that is robust to the possibility of heteroskedasticity problem. Additionally, serial autocorrelation test carried out to determine whether the relationship between the residual of the models it's lagged version over various time intervals correlate. From the result, the tests' statistics values of ***0.179 [****P-value= **0.982]*** and ***0.375 [****P-value= **0.914]*** are statistically insignificant at 5% alpha levels. This indicates the absence of first order autocorrelation among the series in both models.

$AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}$ Model 1

AGT = 12.7781 +1.9273CCC -0.9188RCP+0.0347CR-0.0481QR Model 2

$AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ *Model 5*

AGT=2.8826+1.7462CCC+0.8975RCP+0.0491CR-0.0416QR+0.4714FRMSIZ Model 5

In model 2, ($\boldsymbol{AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \varepsilon_{it}}$) in Table 4.2.2. the coefficients of cash conversion cycle and cash ratio are positively signed and are consistent with the study expectorations (β_1= 1.9273; β_3 = 0.0347) > 0. But, in contrary the coefficients of receivables collection period and quick ratio are negatively signed and not consistent with the expectation (β_2 = - 0.9188; β_4 = -0.0481) < 0. This result implies that a unit change in cash conversion cycle and cash ratio will lead to an increase of 1.973 and 0.0347 in assets growth respectively, whereas a unit change in receivables collection period and quick ratio will lead to a decrease of 0.9188 and 0.0481 in assets growth respectively of quoted oil and gas companies in Nigeria respectively. In model 5, ($\boldsymbol{AGT_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}}$) in Table 4.6, when the control variable was introduced, the coefficients of cash conversion cycle, receivables collection period and firm size, are positively signed and in tandem with the expectation of the

study (β_1 = 1.7462; β2 = 0.8975; β_3 = 0.0491; β5 = 0.4714) > 0. However, quick ratio is negatively signed and not in tandem with the expectation (β_4 = -0.0416) < 0. This implies that a unit change in receivables collection period will lead to a decrease of 3.7577 in assets growth of the quoted oil and gas companies in Nigeria.

Decision

As in the regression result in Table 4.2.2, in model 2, at the significance level of 0.05, the F-statistics value is 3.030, while the P-value is 0.021 which is les that 0.05 level of significant. Therefore the study reject the null hypothesis and accept the alternative, which means that liquidity management has significant effect on assets growth of the quoted oil and gas companies in Nigeria. In addition, when the control variable of firm size was introduced in model 5, at the significance level of 0.05, F-statistics value is 2.488, and P-value of 0.037 which is less than 0.05 level of significant. Consequently, the study reject the null hypothesis and accept the alternative in model 5, which means that liquidity management has significant effect on assets growth with control variables of the quoted oil and gas companies in Nigeria.

Discussion of Findings

Based on the coefficient of Receivables collection Period (RCP), the coefficients and associated P-values [coeff. = -0.919; P – value = 0.0397 and coeff. = -0.898; P – value = 0.006] also appear to be positive and statistically significant within 5% conventional levels of significance, this result is in in agreement with the study of Thuraisingam (2015). These mean that Receivables collection Period's (RCP) effect on corporate sustainability performance in terms Assets Growth (AGT) is inverse and this inverse effects are statistically significant. Alternatively, the significant result suggests that the effect of Receivables collection Period (RCP) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is highly significant in consistent with that found in the study of Shelikhdon & Kayale, 2016), however not consistent with the study of (Lartey, Antwi & Boadi, 2013).

The results further reveal that there are positive relationship between Cash Ratio (CR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) [coeff. = 0.035; P – value = 0.147 and coeff. = 0.049; P – value = 0.004]. However, the positive relationship is statistically significant at 5% levels of significance in the model (2) only. This is confirmed by the P – value = 0.004. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is statistically significant when firm size is controlled for in the model. This result is in consistent with the study of Lu, Chau, Wang and Pan (2014) as conducted in China.Besides, the results reveal that the coefficients of Quick Ratio (QR) are negative suggesting negative relationship between Quick Ratio (QR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) [coeff. = -0.048; P – value = 0.414 and coeff. = -0.042; P – value = 0.038]. However, the negative relationship is statistically significant at 5% levels of significance in the model (2) only. This is confirmed by the P – value = 0.038. The significant result suggests that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) is statistically significant when firm size is controlled for in the model. The finding here is in tandem with the

result of the study of Adegbie and Dada (2018), however on the contrary, not consistent with the study of Karjati and Evawany (2017) who no significant effect of factors affecting sustainability in Indonesia.For Firm size (FRMSIZ) in model (2), the coefficient is seen to be highly statistically insignificant. This is confirmed by the P – value = 0.676 that is associated with the coefficient of the variable (coefficient = 0.471). Correspondingly, the insignificant result suggests that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms Assets Growth (AGT) during the period of this study is insignificant. The result here is in consonant with the result obtained by (Xuan & Hong, 2016)

Test of Hypotheses Three and Six

Research Objectives Three and Six: To ascertain the influence of liquidity management with and without control variable of firm size influence economic value added (EVA) of the quoted Oil and Gas companies in Nigeria.

Research Questions Three and Six: To what extend does liquidity management with and without control variable of firm size influence economic value added (EVA) in Nigeria?

Statement of Hypotheses: **H_{03}** and **H_{06}**: There is no significant influence of liquidity management with and without control variable of firm size on economic value added quoted Oil and Gas companies in Nigeria.

Table 4.2.3.: Effect of Liquidity Management on Economic Value Added with and without Control Variables.

Variable		Effect of Liquidity Mgt. on Economic Value Added $EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_5 QR_{it} + \varepsilon it$ **Panel-corrected Standard Errors (PCSE) Pooled Regression** **MODEL 3**	Effect of Liquidity Mgt. with Control Variable of Firm size. $EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ **Panel-corrected Standard Errors (PCSE) Pooled Regression** **MODEL 6**
C	*Coeff.* *(t-stat.)* *[p-value]*	19.9511** (4.0405) [0.0001]	-73.3059** (-2.5121) [0.0137]
CCC	*Coeff.* *(t-stat.)* *[p-value]*	1.5225** (3.0999) [0.0025]	1.2034** (3.429) [0.0009]
RCP	*Coeff.* *(t-stat.)* *[p-value]*	-1.6348** (-3.2228) [0.0017]	-1.2232** (-3.4712) [0.0008]
CR	*Coeff.* *(t-stat.)* *[p-value]*	0.0239** (2.5454) [0.0125]	-0.0111 (-1.093) [0.2772]
QR	*Coeff.* *(t-stat.)*	-0.0726** (-2.5492)	-0.0082 (-0.8118)

	[p-value]	[0.0124]	[0.4189]
FRMSIZ	*Coeff.* *(t-stat.)* *[p-value]*		4.9622** (2.7929) [0.0063]
Observations		***100***	***100***
R^2		***0.092***	***0.200***
Adj. R^2		***0.054***	***0.157***
F-Statistic [P-value]		***2.598 [0.035]***	***4.683 [0.001]***
Pesaran Cd test *[P-value]*		***-0.751 [0.453]***	***-0.060 [0.952]***
Heteroskedasticity Test *[P-value]*		***270.032 [0.000]***	***313.272 [0.000]***
Serial Auto-Correlation Test *[P-value]*		***0.753 [0.609]***	***0.452 [0.724]***

Source*: Author's Computation (2019), underlying data from annual reports of firms listed on Nigerian Stock Exchange (NSE). Note: The dependent variable is* ***Economic Value Added (EVA).*** *The Independent variables are Cash Conversion Cycle (CCC), Receivables collection Period (RCP), Cash Ratio (CR), Quick Ratio (QR) and Firm Size (FRMSIZ). ** p<0.05,*

From the results in Table 4.2.3, the significant F-statistics values [2.598; P - value = 0.035 and 4.683; P - value = 0.001] show that the selected Pooled regression models are statistically significant in explaining changes in the dependent variable. The R – squared values of 0.092 and 0.200 for models (1) and (2) respectively indicates that the explanatory variables jointly account for about 9.2% and 20.0% of variation in the Economic Value Added (EVA).Focusing on the coefficients of Cash Conversion Cycle (CCC), the results show that the coefficients are positive and statistically significant within 5% and 5% level of significance [coeff. = 1.522; P – value = 0.003 and coeff. = 1.203; P – value = 0.001]. These relationships are similar to that of profitability (PROF), Asset Growth and Cash Conversion Cycle (CCC) in the preceding subsections. These imply that Cash Conversion Cycle (CCC) has positive and significant effect on corporate sustainability performance in terms Economic Value Added (EVA).Based on the coefficient of Receivables collection Period (RCP), the coefficients and associated P-values [coeff. = -1.635; P – value = 0.002 and coeff. = -1.223; P – value = 0.001] also is seen to be positive and statistically significant at 5% conventional levels of significance. These mean that Receivables collection Period's (RCP) effect on corporate sustainability performance in terms Economic Value Added (EVA) is inverse and this inverse effects are statistically significant. Alternatively, the significant result suggests that the effect of Receivables collection Period (RCP) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is highly significant.The results further reveal that there are positive relationship between Cash Ratio (CR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) for model (1) and negative for model (2) [coeff. = 0.024; P – value = 0.013 and coeff. = -0.011; P – value = 0.277]. However, the positive relationship is statistically significant at

5% level of significance in the model (1) only. This is confirmed by the P – value = 0.013. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is statistically significant without controlling for firm size in the model.In addition, the results reveal that the coefficients of Quick Ratio (QR) are negative suggesting negative relationship between Quick Ratio (QR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) [coeff. = -0. 073; P – value = 0.012 and coeff. = -0. 008; P – value = 0.419]. However, the negative relationship is statistically significant at 5% levels of significance in the model (1) only. This is confirmed by the P – value = 0.038. The significant result suggests that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is statistically significant without controlling for firm size in the model.

In the Tables, Firm size (FRMSIZ) in model (2), has a coefficient that is seen to be highly statistically significant. This is confirmed by the P – value = 0.006 that is associated with the coefficient of the variable (coefficient = 4.962). The significant and result is positive suggesting that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) during the period of this study is significant.

Model with Control Variable

When the Firm Size is introduced into the model as a control variable, there are some levels of changes in the coefficients of the selected explanatory variables as stated earlier. Specifically, the result of the regression model as shown in Table 4.8.shows that Cash Conversion Cycle (CCC) coefficient changed from coeff. = 1.522; P – value = 0.003 to coeff. = 1.203; P – value = 0.001. This however indicates that the coefficient remains positive and statistically significant at 5% level of significance though, it witnesses slight reduction. The coefficient of Receivables collection Period (RCP), increase from coeff. = -1.635; P – value = 0.002 and coeff. = -1.223; P – value = 0.001 which appear to be negative and statistically significant at 5% level of significance due to the controlling effect of Firm Size. Also, the results reveal that the significant relationship between Cash Ratio (CR) becomes insignificant after controlling for Firm Size [coeff. = 0.024; P – value = 0.013 and coeff. = -0.011; P – value = 0.277]. Quick Ratio (QR) becomes insignificant [P – values (0.013)] though the associated coefficients remain the same after Firm Size is added. Overall, the adjusted R^2 of 0.054 and 0.157 indicates that the joint explanatory power of the independent variables increase by 190.74% due to the controlling effect of Firm Size.

Heteroskedasticity Test, Serial Autocorrelation Test and Cross Sectional Dependence Test for Economic Value Added

Again, to check whether the estimated models have cross sectional dependence problem or not when Profitability is regressed on Liquidity management indicators as well as control variable in this study, Pesaran CD test statistic is employed. As in the Table 4.2.3, the PCD tests values of ***-0.751 [****P-value= **0.453]*** and ***-0.060 [****P-value= **0.952]*** are statistically insignificant. These strongly suggest the acceptance of the null hypothesis of no problem of cross sectional dependence in model two, thus concludes that the models are free form cross sectional dependence problems. For heteroskedasticity test, the tests' statistics values of ***270.032 [****P-value= **0.000]*** and ***313.272 [****P-*

*value= **0.000]*** are statistically significant at 5% alpha levels. These mean that the null hypothesis of homoscedasticity cannot be accepted. Therefore, the study concludes that the residuals of the estimated regression models do have constant variance (heteroscedastic in nature). Alternatively, the study concludes that the residuals of the estimated regression models are not free from heteroskedasticity problem. As a result of these, the study used panel-corrected standard errors (PCSE) that is robust to unit heteroskedasticity. In addition, serial autocorrelation test carried out to determine whether the relationship between the residual of the models it's lagged version over various time intervals correlate. From the result, the tests' statistics values of ***0.753 [****P-value= **0.609]*** and ***0.452 [****P-value= **0.724]*** are statistically insignificant at 5% alpha levels. This indicates the absence of first order autocorrelation among the series in both models.

$EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_5 QR_{it} + \varepsilon it$ Model 3

EVA =19.9511 +1.5225CCC-1.6348RCP+0.0239CR-0.0726QR

$EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}$ Model 6

EVA = -73.3059+1.2034CCC-1.2232RCP-0.0111CR-0.0082QR+4.9622FRMSIZ

In model 3, ($\boldsymbol{EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_5 QR_{it} + \varepsilon it}$) in Table 4.2.3 the coefficients of cash conversion cycle, and cash ratio are positively signed and are consistent with the study expectorations (β_1= 1.5225; β_3 = 0.0239) > 0. But, in contrary the coefficients of receivables collection period and quick ratio are negatively signed and not consistent with the expectation (β_2 = - 1.6348; β_4 = 0.0726) < 0. This result implies that a unit change in cash conversion cycle and cash ratio will lead to an increase of 1.5225 and 0.0239 in economic value added respectively, whereas a unit change in receivables collection period and quick ratio lead to a decrease of 1.6348 and 0.0726 in economic value added respectively of quoted oil and gas companies in Nigeria respectively. In model 6, ($\boldsymbol{EVA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 RCP_{it} + \beta_3 CR_{it} + \beta_4 QR_{it} + \beta_5 FRMSIZ_{it} + \varepsilon_{it}}$), in Table 4.2.3, the same way, with the introduction of the control variable, the coefficients of cash conversion cycle and firm size, are positively signed and in tandem with the expectation of the study (β_1 = 1.2034; β_5 = 4.9622) > 0. However, receivables collection period, cash ratio and quick ratio are negatively signed and inconsistent with the expectation (β_2 = -1.2232; β_3 = -0.0111; β_4 = -0.0082) < 0. This implies that a unit change in receivables collection period, cash ratio and quick ratio will lead to a decrease of 1.2232, 0.011 and 0.0082 in economic value added respectively of the quoted oil and gas companies in Nigeria.

Decision

In the regression result in Table 42.3, in model 3, at the significance level of 0.05, the F- statistics value is 2.598, while the P-value is 0.035 which is les that 0.05 level of significant. Therefore the study reject the null hypothesis and accept the alternative, which means that liquidity management has significant effect on economic value added of the quoted oil and gas companies in Nigeria. Also, when the control variable of firm size was introduced in to the mode, in model, at the significance level of 0.05, F-statistics value is 4.683, and P-value of 0.001 which is less than 0.05 level of significant. Consequently, the study reject the null hypothesis and accept the alternative in model 6, which means that liquidity management has significant effect on economic value added with control variable of firm size of the quoted oil and gas companies in Nigeria.

Discussion of Findings

Based on the coefficient of Receivables collection Period (RCP), the coefficients and associated P-values [coeff. = -1.635; P – value = 0.002 and coeff. = -1.223; P – value = 0.001] also is seen to be positive and statistically significant within 1% and 5% conventional levels of significance. These mean that Receivables collection Period's (RCP) effect on corporate sustainability performance in terms Economic Value Added (EVA) is inverse and this inverse effects are statistically significant. Alternatively, the significant result suggests that the effect of Receivables collection Period (RCP) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is highly significant.The results further reveal that there are positive relationship between Cash Ratio (CR), this is consistent with the result found by the study of aIqbal and Wibowo (2015), and corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) for model (1) and negative for model (2) [coeff. = 0.024; P – value = 0.013 and coeff. = -0.011; P – value = 0.277], this is also in consistent with the study Oyewo and Badejo (20140 conducted in Nigeria as well. However, the positive relationship is statistically significant at 5% level of significance in the model (1) only. This is confirmed by the P – value = 0.013. The significant result suggests that the effect of Cash Ratio (CR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is statistically significant without controlling for firm size in the model. The result here is line and consonant with the study of Ibe (2013), on the contrary not in tardem with the result found by the study of Bolek & Wolski, 2016).In addition, the results reveal that the coefficients of Quick Ratio (QR) are negative suggesting negative relationship between Quick Ratio (QR) and corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) [coeff. = -0. 073; P – value = 0.012 and coeff. = -0. 008; P – value = 0.419]. However, the negative relationship is statistically significant at 5% levels of significance in the model (1) only. This is confirmed by the P – value = 0.038. The significant result suggests that the effect of Quick Ratio (QR) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) is statistically significant without controlling for firm size in the model, conforming to the result found by the study of (Priya & Nimalathas, 2013). In the Tables 4.2.3, Firm size (FRMSIZ) in model (2), has a coefficient that is seen to be highly statistically significant, the study of Badawi and Hadaya (2018) equally found a similar significant effect. This is confirmed by the P-value = 0.006 that is associated with the coefficient of the variable (coefficient = 4.962). The significant and result is positive suggesting that the effect of Firm size (FRMSIZ) on corporate sustainability performance of oil and gas firms in Nigeria in terms Economic Value Added (EVA) during the period of this study is significant. The result of significant effect is in consistent with the study of (Alshehhi, Nobanee & Khare, 2018; Ezejiofor, Adigwe & John-Akamelu, 2015)

Implications of Findings

The results from the study had revealed mixed results, while each of the models had shown a positive significant effect on each of the proxies measuring corporate sustainability, while some variables within the models exhibited mixed of negative; others had positive effects on corporate sustainability. The findings have implications and the high co-efficient of determination implied that corporate sustainability of the oil and gas companies is greatly influenced by the liquidity management of oil and gas companies. The results further stressed the importance and essence of

adequate of each of the explanatory variables of liquidity management for a healthy corporate sustainability of the oil and gas industry in Nigeria.

Academia: Furthermore, this study would be useful to the academia and the general public as an addition to the existing literature on liquidity management and corporate sustainability. Also, this study will contribute to the body of knowledge and extend the frontier of the pool of data literature on liquidity management.

In addition, it will be beneficial to the following:

Shareholders and analysts: The findings of this study will assist shareholders and analysts more tools to evaluate liquidity and corporate sustainable performance of the quoted Oil and Gas companies in terms of profitability (PROF), assets growth (ATG), and economic value added (EVA) to the corporation for decision makers.

Economic policy makers: Economic policy makers could find valuable suggestions to policy makers on how to further develop the Oil and Gas companies sectors in Nigeria.

Managers: The findings showed an average value of cash collection period revealed 945.44 and the median value is 672.26 suggesting that on average, the length of time between sale of an item and receipt of cash for the sale from customers is 945 days**.** This study will afford managers in the Oil and Gas sector to decide a workable and good liquidity management towards achieving their profitability objectives, understand the implication of negative economic management decisions resulting from poor liquidity management and the effects productivity.

Other stakeholders: Other stakeholders (labour union, employees, creditors, government etc.) would be interested to know that the resources at the disposal of the management are properly managed and corporate sustainable performance of the organization is assured.Researchers and Analysts: Research students and other researchers could also benefit from this study; it could provide additional information and create a platform for further research work in the area of liquidity management and corporate sustainability.

Oil and Gas Industry

IPMAN & MMAN and Others: This study and the results reported herein would be useful and impactful to the industry related associations and stakeholders. For example, the Independent Petroleum Marketers Association of Nigeria (IPMAN) and Major Marketers Association of Nigeria (MMAN) and Depot and petroleum products marketers association (DAPPMA) NUPENG and PENGASSAN. These associations of down- stream operators that push for the interest and concerns of their members-to enable their associations negotiate with the government and regulatory bodies regarding pricing of petroleum products and financing assistance as well as windows to boast their trading capacity and profit margins.

Director of Petroleum Resources (DPR) & NNPC: The Directorate of Petroleum Resources (DPR), the regulatory body of the Oil and Gas industry-the result will assist DPR in its monitoring activity and proffering useful advice to the government and parent body Nigerian Petroleum

Corporation of Nigeria (NNPC) regarding marketers funding and pricing of products. Petroleum Product Pricing Regulation Agency (PPPRA)-which regulates the pricing structure for the Petroleum products that are yet to be deregulated-the outcome of the study will enable the agency in its pricing policy and review of the pricing template and its function of advising the government on appropriate pricing and subsidy where applicable. The Nigerian Petroleum Corporation of Nigeria (NNPC)-to aid the parent body in its regulatory policies formulation, investments in infrastructure and pricing of the products to help the traders' business growth and availability of the products for the consumers.

CONCLUSION, RECOMMENDATIONS AND CONTRIBUTION TO KNOWLEDGE

Conclusion

This study investigated the effect of liquidity management on corporate sustainability, specifically the study also established the effects of the explanatory variables of, cash conversion cycle, receivables collection period, cash ratio and quick ration on corporate sustainability attributes of profitability, assets growth and economic value added. In terms of scope perspective, Nigeria was chosen as the area of study, while a time period of 10 years (2009-2018) was explored, using 10 quoted oil and gas companies listed on the Nigerian. The unit of analysis is the sampled 10 quoted oil and gas companies financial statements. Also, this study tested six hypotheses: Liquidity management does not have any significant effect on profitability of quoted Oil and Gas companies in Nigeria; There is no significant effect of liquidity management on assets growth of quoted Oil and Gas companies in Nigeria; There is no significant influence of liquidity management on economic value added quoted Oil and Gas companies in Nigeria; Liquidity management with control variable of firm size does not have any significant effect on profitability of quoted Oil and Gas companies in Nigeria; There is no significant effect of liquidity management with control variable of firm size on assets growth of quoted Oil and Gas companies in Nigeria; There is no significant influence of liquidity management with control variable of firm size on economic value added of quoted oil and gas companies in Nigeria. The results obtained indicated that all the liquidity management proxies are jointly significant in affecting corporate sustainability. Individually, while some variables exhibited positive significant effect, others revealed negative effects on corporate sustainability of the sampled quoted oil and gas companies in Nigeria. Consequently, the study concluded by affirming that liquidity management positively affected corporate sustainability of the oil and gas companies in Nigeria.

Recommendations:

Based on the findings and conclusion of this study, the following recommendations are made which may be useful to the managers, management at all levels as a whole, investors, market analysts, and policy makers, therefore this study recommend as follows:

Managers: The managers in the Oil and Gas industry and related companies in Nigeria should pay particular attention and review their credit sales policies and their age analysis. The study heighted much of negative and insignificant effect of receivables collection periods on each of the proxies of corporate sustainability. This could imply that there are lapses on the receivables management by the sampled companies. When the control variable of firm size was introduced,

there was no much difference. Therefore, irrespective of the size of the quoted oil and gas companies, liquidity management is very important and time lag between credit sales and the receivables are actually collected is critical to the corporate sustainability of the companies. This position was reinforced in model 4, the result exhibited negative and insignificant effect of cash conversion cycle with profitability of the companies. The managers should revisit the conversion cycle of between sales and fund committed to operations to the time lag of realizing and collections of some credit sales to liquidity assets.

Policy makers: Nigerian government and those saddled with policy making and regulations should tailor same to ensure corporate sustenance of oil and gas companies, in particular the unstable of foreign exchange rates these companies face in course of importing equipment and refined petroleum products. Therefore, policies like unhealthy multiplicity of taxes, ensuring tax incentives and at the same time remove double taxation. These should be directed towards making friendly and attainable policies that could positively affect the companies' operations and ensure that they maximize their resources economically and efficiently in other to report earnings and good turnover to enable them comply with their tax obligations and thereby increase government tax revenue

Investors: The investors are advised to mindful of credit policies and corporate sustainability profile in terms of profitability, assets growth trend of the quoted oil and c=gas companies in Nigeria over the years to ascertain their corporate sustainability as a guide in making investment and portfolio diversification decisions. Efficient and effective resource management will reveal optimal lots of investment guide

Contribution to Knowledge:
The results of this study is considered useful to investors, market analysts, economic regulators, policy maker and managers and the entire management of companies, who are desirous of a manufacturing companies who performs excellently, where the managers are efficient and effectively in cash management that translate to effective performance.

Policy Markers: Capital market stakeholders and potential investors in the capital market in particular who are concerned about the uninterrupted quality performance of companies in the Nigerian capital market, desire to invest in companies meeting their profitability objective and positively influenced by liquidity management towards corporate sustainability. The performance pf companies in an economy in most cases is a reflection of the economic policies in place, therefore, the results obtained in this study would give a lending guide in subsequent policy directives in Nigeria.

Theoretical Contribution: From the theoretical perspective, this study contributes to the theoretical body of knowledge having reviewed by five theories of liquid assets theory, institutional theory of corporate sustainability, signaling theory, resource-based theory and pecking order theory. The study also made the following theoretical and practical contributions by explaining the relevance of each of the reviewed five theories, by stating the proponents of the theories, the opponents and allies supporting the ideology of each of the theories. The study equally

posited the relevance of each of them as they relates to the hypothesized variables of the study. The study theorized that liquidity management can make significant effect on corporate sustainability if liquidity management positive effects profitability, assets growth and economic value added of the quoted oil and gas companies in Nigeria.

Conceptual Contribution: From the viewpoint of conceptual contribution, each of the various dependent and independent variable concepts related to the study was carefully explained in details. This study were carried out from different angle peculiar from prior study in Nigerian studies, by using different variable s different from the ones used as no two conceptual literature could be the same, otherwise, the essence is defeated. Therefore, this current study is unique as it concentrated on liquidity management and its proxies of cash conversion cycle, receivables collection period, cash ratio and quick ratio and its joint effect on each of profitability, assets growth and economic value added.

Empirical Contribution: The study with the help of regression analysis, using descriptive and inferential analyzed 6 models exhibiting different results. From the empirical findings from models formulated as shown in models 1 to 6, various results were obtained, making each model unique and distinct from each other judging from the different results found from the regression analysis carried out. While some models results exhibited significant effect, others revealed negative effects. The introduction of the controlling variable of firm size brought some robustness to the study. The empirical results contributes the mixed results that could be obtained using different measuring variables different from what had been used before now. The empirical results obtained were analyzed with detailed syntheses with prior studies, while some of the study results were found to be consistent with some prior studies, other were found inconsistent, thereby making new contributions to the body literature.

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