

Full Length Research Paper

Operational efficiency and financial sustainability of listed manufacturing companies in Nigeria

Imhanzenobe Japhet Osazefua

Department of Accounting, School of Management and Social Sciences, Pan-Atlantic University, Lagos, Nigeria.

Received 4 December, 2018; Accepted 14 January, 2019

This study investigates the impact of operational efficiency on the financial sustainability of listed manufacturing companies in Nigeria. The recent economic crisis in Nigeria has caused an alarming decline in financial sustainability indicators of manufacturing companies. Managers are forced to make efficient use of resources to maximize profitability so as to cope with and compete in the harsh economic condition. Several measures of efficiency were analysed in relation to financial sustainability. There is a dearth of studies on effect of operational efficiency on long-term profitability in Nigerian manufacturing sector. Also, stock market performance has been ignored by studies in Nigeria. This study helps to fill these gaps by evaluating the impact of operational efficiency on long-term profitability (return on asset) and stock market performance (Tobin's Q). The efficiency variables considered include; employee growth, operating expenses, account receivables turnover, inventory turnover and asset turnover. A secondary panel dataset ranging from 2009 to 2016 for 16 listed manufacturing companies was obtained from the Bloomberg portal. The Ordinary Least Square method was used to test the 5 formulated hypotheses. The findings revealed that in relation to ROA, operating expenses and asset turnover had negative and positive significant relationship respectively. Employees' growth, account receivable turnover and inventory turnover were found to be insignificant. In relation to Tobin's q, both inventory and asset turnover had a positive significant relationship. Operating expense had a negative significant relationship. Again, employees' growth and account receivables turnover were found to be insignificant. Based on the findings, the study suggests that the common notion of employee retrenchment and keeping a thin workforce may not necessarily promote financial sustainability. The study recommends that firms should strive to reduce their operating expenses and implement efficient strategies that address asset and inventory turnover.

Key words: Financial sustainability, long-term profitability, stock market performance, efficiency, listed manufacturing companies.

INTRODUCTION

Financial sustainability has been a cause for concern among academics and industry players. The Nigerian

manufacturing industry has gone through several troughs. The Nigerian economy is known to be heavily

E-mail: jimhanzenobe@pau.edu.ng. Tel: +2348138331182.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

dependent on oil revenues, and this shows its priorities in terms of managing sustainable revenue sources. This dependence on the oil sector tends to have a significant negative effect on the other sectors (Ku et al., 2010). Crude oil revenues have been the major contributor to the country's national income and gross domestic product. On the other hand, the manufacturing industry in Nigeria accounted for as low as 3.91% of GDP in 2006, 4.02% in 2007, 3.6% in 2008 and 4.2% in 2009. While sectors like Agriculture contribute 39.5%, telecom 5.6%, crude oil and natural gas 13.6%, the manufacturing sector contributes a mere 4.5% to GDP (Alli, 2012). To address this, the Nigerian government seeks to place more emphasis on the development of the manufacturing sector in order to promote sustainable growth and development. It is believed that an improved manufacturing sector is a prerequisite for economic development (Asaley et al., 2018). The sectors' contribution to GDP has not changed substantially over the course of the decade. The contribution of the manufacturing sector remains below its potential, well below other African peers such as South Africa (13%) and Mauritius (16%). According to African Business Magazine, the plunge in oil prices in 2014 induced fiscal pressures and foreign currency shortages which spilled over to non-oil sectors, tipping the economy into recession in 2016. Within the periods between 2000 and 2010, more than 850 manufacturing companies have either been shut down or forced to cease production activities due to financial sustainability issues (Atoyebi et al., 2014).

Financial sustainability has been defined and measured in several ways over the years. It has been defined from the perspective of asset sustainability (Playford, 2016; Department of Infrastructure Local Government and Planning DILGP, 2013), financial independence (Wallstedt et al., 2014; Price water house Coopers PwC, 2006) and solvency (Hur-Yagba et al., 2015; Wang et al., 2007; Carmeli, 2001; Lorig, 1941). However, profit plays a crucial role in the going concern of any firm. Its continuous survival depends to a large extent on its periodic profitability (Umobong, 2015).

Several studies have equated financial sustainability with profitability in current and future periods and measured it with long-term profitability ratios like return on asset (Okoye et al., 2017; Umobong, 2015; Chari et al., 2012; Karaca and Ekşi 2012). Also, since the study focuses on listed companies, stock market performance is also a component of financial performance and survival (Alakeci and Al-khatib, 2006). Stock market performance has been measured in several studies using the Tobin's Q ratio (Wahla et al., 2017; Karaca and Ekşi, 2012; Omowunmi, 2012; Heenetigala and Armstrong, 2011). There is a dearth of studies on the effect of operational efficiency on long-term profitability in the Nigerian manufacturing sector (Falope and Ajilore, 2009). Also, stock market performance has been ignored by studies in

Nigeria (Abubakar, 2017) and these constitute the gaps that this study fills by evaluating the impact of operational efficiency on long-term profitability (return on assets) and stock market performance (Tobin's Q). The harsh economic condition that has characterized the Nigerian business environment has caused an alarming decline in the financial performance and sustainability of listed manufacturing companies in Nigeria.

Return on assets

Figure 1 hints that the year 2009 indicates when the effect of the financial crisis began to greatly affect the financial performance of companies. The industry average of return on asset between 2009 and 2016 was 8.63% with some companies having as low as -37.9%. The industrial average of return on asset has been on a consistent decline since 2010. The Central Bank of Nigeria left its benchmark interest rate at 14% since July 2016. Some commercial banks charge interest on loans as high as 25% since interest rates were deregulated (Okoye and Eze, 2013). This implies that manufacturing companies will find it difficult to repay debt and interest payable (comparing 8% with 14%-25%).

Tobin's Q index

The average Tobin's q ratio was relatively better with an industrial average value of about 1.97 which is at least greater than 1. However, the industrial average has been on a consistent decline since 2013 (Figure 2). Companies have found it wise not to depend on government policies and interventions but instead to manage profitability by tweaking internal variables within their control. Profitability (and financial sustainability in the long run) can be achieved by either maximizing revenue or minimizing costs. Cost minimization strategies require managers to be prudent and efficient in managing items that reduce profits. Efficiency in simple terms refers to an organization's ability to achieve a certain level of output with the minimum level of input (without compromising quality). Efficiency is the effort put in by management to reduce costs while the additional profit is the reward for doing so. Thus, managers can improve profitability both in short and long-term and thus become financially sustainable.

The question that this study addresses is; what are some of the key efficiency variables that management must control to optimize profit and financial sustainability in the long run so as to hedge itself as much as possible from harsh financial conditions and policies that characterize the recent Nigerian business environment? This study addresses some gaps in existing literature in that it is one of the few studies that look at financial sustainability in Nigeria, even fewer to look at financial

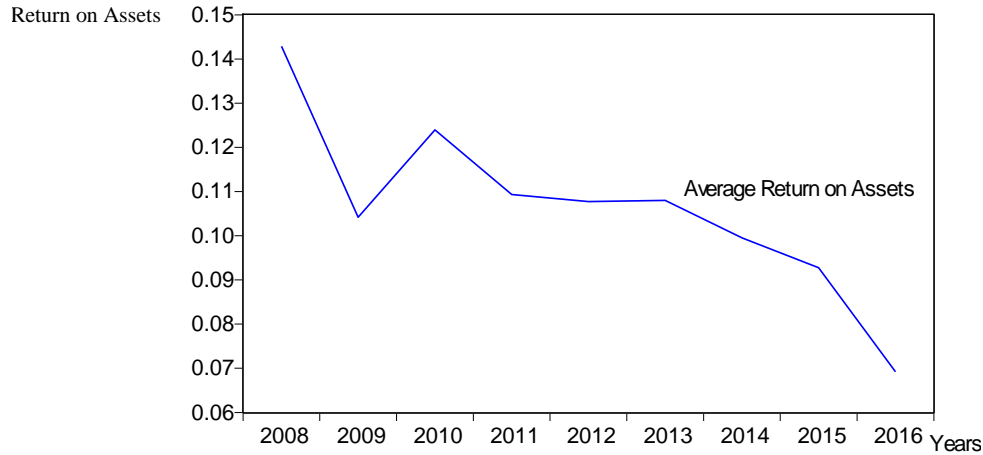


Figure 1. Graph of Industrial average return on assets of listed manufacturing companies. Source: (Author's Computation and EViews 9 Output).

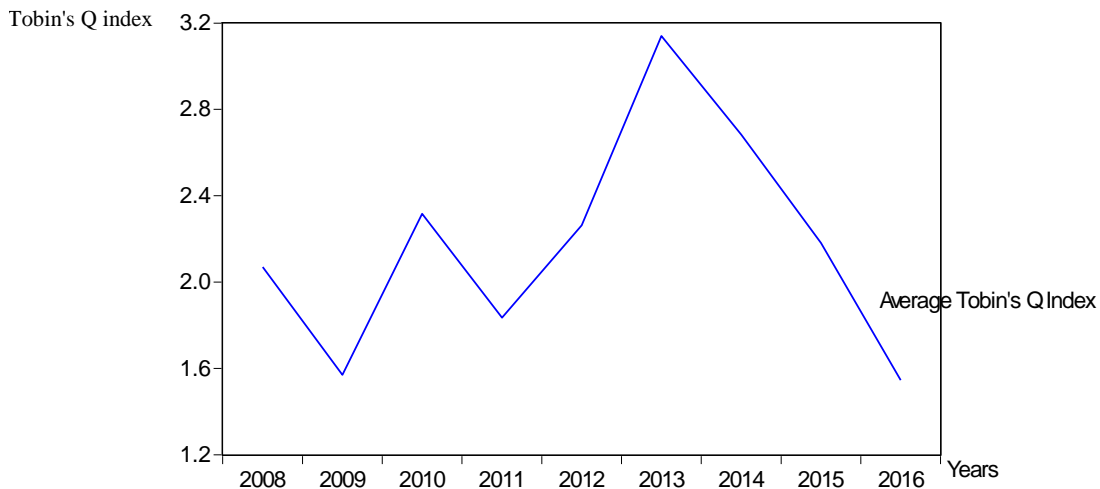


Figure 2. Graph of Industrial average Tobin's Q Index of listed manufacturing companies Source: (Author's Computation and EViews 9 Output).

sustainability in the manufacturing sector and the first to look at sustainability in Nigerian manufacturing sector from a stock market perspective.

LITERATURE REVIEW

Operational efficiency in the manufacturing sector continues to be a prominent issue among academics and industry players. An efficient manufacturing sector is an important solution to resolving the problems of unemployment and sustainable economic growth (Asaleye et al., 2018). The Rent Theory of Profit is one of the few theories that explain the impact of efficiency on profits (Bloom et al., 2018; Teece, 2017; Syversson, 2011; Walker, 1887).

Rent theory of profit

The rent theory of profit was propounded by Francis Amasa Walker (an American Economist) and so is sometimes called Walker's Theory of Profit. He saw profit (pure profit) as the additional income that results from the difference in ability that one entrepreneur may possess over others (Teece, 2017; Walker, 1887). He related this to business profit which he described as the difference between the rent of the least and that of the most efficient entrepreneurs. Walker assumed a perfect situation where all managers' abilities were equal and received their normal wage (which he equates with normal profit and doesn't constitute pure profit). In such situation, there will be no super profit (above normal profit) and thus extra profit (in addition to normal profit) will be due to



Figure 3. Relationship map of operational efficiency and financial sustainability.

managers' efficiency level. He suggests that the least efficient workers try to cover only the cost of production while the more efficient workers try to earn extra for their differential abilities. According to Walker, the pure profit (additional profit) depends on managers' ability to produce in the simplest and shortest ways; by saving all unnecessary waste of materials and machinery while meeting customer demand and retaining product quality (Syversson, 2011; Walker, 1887). Lean manufacturing and improved quality are based on this theory (Drew et al., 2016; Sutton, 2007).

The theory was criticised because it focused more on explaining the reason for differences in profit more than describing the nature of profit itself (Macvane, 1887). However, in this study, we are looking at the relationship between operational efficiency and changes in profitability as well as controlling for other factors that can cause changes in profitability. Thus, this criticism doesn't limit the application of this theory for this study.

On a firm level, the theory views efficiency as a form of competitive advantage and thus, like other competitive-advantage-based theories of profit, it suggests that manufacturing firms often differ systematically in the extent to which their processes for transforming inputs into outputs can create economic value (Makadok, 2011; Brandenburger and Stuart, 1996). Economic value is described as the difference between what customers are willing to pay for the company's product and the cost incurred by the company to produce and deliver that product to those customers. This is closely related to operational efficiency. This economic value often takes

the form of working capital savings. Producing more output from unchanged input, consuming less input for unchanged output, reducing operating costs without damaging the corporation, reducing the days in the cash conversion cycle, improving operating cash flows, increasing total asset turnover, and effecting reductions in operating risk are all signs of relative operational efficiency (Gill et al., 2014; Owolabi and Obida, 2012).

Operating in an efficient manner can help to minimize working capital spending and thus enhance financial performance of companies (Owolabi and Obida, 2012). When the operational efficiency of companies increases, it tends to reduce working capital spending and thus increase financial sustainability of the company (Figure 3). This theory views profit as the reward of a firm for being relatively more efficient than others. More efficient companies earn additional profit and are therefore more financially sustainable than others. There are several ratios that measure different aspects of efficiency of companies (efficiency ratios). This study attempts to test the accuracy of this theory with regards to listed manufacturing firms in Nigeria by relating efficiency ratios to financial sustainability measures and evaluating which of the efficiency measures have strong relationship with financial sustainability.

Financial sustainability

Emmanuel (2015) defined financial sustainability as the ability of a project, a program or an organization to maintain broader sources of funding in order to provide

standard services to its clients over time and can be evaluated through profitability, liquidity, solvency, efficiency, and effectiveness. Sa-Dhan Microfinance Resource Centre (2005) defines financial sustainability as the ability of a company to cover all its present costs and the cost incurred in its growth if it expands its operations. These costs include operational and financial costs. Some of these costs are inherent and so may not be easily spotted out. However, efficiency ratios help to evaluate how well the manager has been able to manage those costs.

In this study, we are interested in the impact of management's efficiency on financial sustainability. We look at the financial sustainability of quoted manufacturing companies from 2 perspectives; long-term profitability and stock market performance.

Return on asset

Several studies have measured financial sustainability with return on asset (Okoye et al., 2017; Yameen and Pervez, 2016; Khidmat and Rehman, 2014; Oyewale and Adewale, 2014; Al Manaseer et al., 2012; Uwalomwa and Olamide, 2012; Hartanka 2004). Return on asset has been preferred because it gives an all-encompassing view of profitability. It measures a firm's financial self-sufficiency. The return on asset has been suggested to give a broader and more long-term view of profitability as it relates profit (in form of earnings before interest and tax) to the total asset of the firm. Many other measures (e.g. Return on Equity and Net Profit Margin) relate profit to revenue which is periodic (short-term) or equity which is myopic i.e. only from shareholders' perspective (Aliabadi et al., 2013; Hagel et al., 2010). From data collected, Dangote cement plc, Nestle Nigeria plc, Nigerian Breweries Plc, Dangote Sugar Plc, GlaxoSmithKline Consumer Nigeria Plc, Guinness Nigeria Plc and Unilever Plc were found to have high return on asset (ROA>10%).

Tobin's Q

Some studies have measured financial sustainability with the Tobin's Q ratio (Banerjee, 2018; Karaca and Ekşi, 2012; Wahla et al., 2012; Heenetigala and Armstrong, 2011; Herly and Sisnuhadi, 2011; Ibrahim and Samad, 2011; Kang and Kim, 2011). However, there is still a lack of studies that measure stock market performance in Nigeria with Tobin's Q. The Tobin's Q index measures the investors' perception of the firm. It compares the market value of the total asset (i.e. market value of equity + market value of debt) to the book value of the firm's total assets (Al-Matari et al., 2014). It shares some of the characteristics of return on assets in that it is based on the total asset of the firm (and not just net profit or

equity).

The number of quoted companies on the Nigerian stock exchange fluctuates periodically thus indicating that some companies are listed and delisted from time to time. Some of these delisted companies leave voluntarily out of inability to compete for share prices, thus indicating financial sustainability issues from a stock market perspective. Most companies that were found to have favourable return on assets were also found to have favourable Tobin's Q ratio (TBQ>1). They include Nestle Nigeria plc, Nigerian Breweries Plc, Unilever Plc, Dangote cement plc, Guinness Nigeria Plc, Champion Breweries Plc, PZ Cussons, GlaxoSmithKline Consumer Nigeria Plc, Larfarge Plc and Dangote Sugar Plc.

Operational efficiency

Peter Drucker refers to efficiency as "doing things right". (Drucker, 1963). Several studies have emphasized the importance of efficiency as a factor that affects profitability and sustainability. Eskandari (2007) opined that a company's overall efficiency and performance are closely related. Efficiency in an organisation's operations relates to the optimum utilization of its resources. To survive and prosper, firms must produce their output from input efficiently.

According to Michael Porter, cost and product differentiation are the key elements of successful competitive strategies (Tanwar, 2013; Porter, 1989). Operational efficiency is the basis for cost leadership strategies. The cost leader in any industry is the one who is capable of producing goods and services similar to those of competitors but at the least cost. This requires him to produce a certain level of output using minimal input. The cost leader has strong competitive advantage as he can simply decide to reduce his price to the minimum amount required to remain profitable so as to capture larger portion of the market share, thus forcing competitors to either reduce their prices. Some competitors can only bear a certain level of reduction in profit to justify remaining in business and so may be forced to quit. It is a case of "give in or give up" (i.e. reduce prices or quit).

Several measures have been used to measure operational efficiency in different studies e.g. employee growth (Pantea et al., 2013; Sathye, 2001; Zhu, 2000), operating expenses (Ghebregeorgis and Atewebrhan, 2016; Al-Jafari and Alchami, 2014), account receivables turnover (Yameen and Pervez, 2016), inventory turnover (Yameen and Pervez, 2016; Enekwe et al., 2013) and asset turnover (Yameen and Pervez, 2016; Jamali and Asadi, 2012; Fairfield and Yohn, 2001). In the periods under consideration in this study, companies like Nestle Nigeria plc, Nigerian Breweries Plc, Flour Mills Nigeria Plc, Dangote Sugar Plc, GlaxoSmithKline Consumer Nigeria Plc, PZ Cussons Plc, Guinness Nigeria Plc,

Unilever Plc and Vitafoam Plc were seen to possess relatively high operational efficiency ratios with average turnovers (Account receivable, Inventory and Asset) greater than 100% and some having average operating expenses below ten billion naira.

Employees' growth

Employees' growth was measured as the percentage change in the number of employees. The porter's generic strategy of cost leadership has been applied in different ways by several companies. A congestion study of manufacturing firms in the fortune 500 companies by Zhu (2000) suggested that a reduction in current levels of employees may actually increase revenue and profit levels. Many firms are growing content with having as low as 2 or 3 employees while expecting to improve financial performance by reducing staff cost (Sathye, 2001). Some companies that are content with current profit levels and do not want to rock the boat keep a thin work force that enables them to merely stay afloat.

Several small companies have also resolved to remain small by keeping a thin workforce and retrenching employees, if need be, in order to keep personnel costs within a certain range. These companies then compensate for lack of employees by overburdening the available ones. Thus, you have employees getting used to doing unpaid overtime and slammed with unrealistic targets. From time to time, they compensate these employees with a salary increase and performance bonuses which are usually less than the amount that would have been paid to an extra employee. There may be a need for a trade-off in number of employees and profitability prospects. And so, this leads us to the inevitable question: Is there a relationship between change in number of employees and financial sustainability?

H₁: There is no relationship between change in number of employees and financial sustainability

Operating expenses

Operating expense has been used to measure efficiency in some studies either alone or in relation to revenue or total assets (Ghebregiorgis and Atewebhran, 2016; Al-Jafari and Alchami, 2014; Gill et al., 2014) The rising costs of imports and private generation of electricity and other vital infrastructures to sustain production processes result in high cost of production, increase in product prices, and consequently reduction in consumer demand (Adegbeie and Adeniji, 2013). The high fuel import bill (16% of total imports) highlights the need for investment in oil refineries (African Business Magazine, 2017). Fuel and energy expenses constitute between 30-40% of total

expenses for most manufacturers. Energy spending in Nigeria's manufacturing sector has continued to rise rapidly, owing to incessant power outages experienced not just in industrial clusters but also across the country (Anudu, 2018). Also, the unfavourable foreign exchange rates make import of raw materials and other items of inventory more expensive. Companies that require raw materials that are not produced locally suffer from fluctuations in the exchange rate, thus, making operating expenses less predictable and controllable. This is a crucial factor for most industrial goods producers. Industrial assets require larger expenses to keep them running compared to those of consumer goods producers. This leads us to ask: Is there a relationship between operating expenses and financial sustainability?

H₂: There is no relationship between operating expenses and financial sustainability

Account receivables turnover

The account receivables turnover ratio relates credit sales to average debtors. It evaluates the rate at which debtors redeem their debt to the firm and how efficient the organization's credit policy and debt collection system are. A high account receivables turnover ratio indicates a high level of efficiency in debt collection and a high level of liquid revenue available to the firm.

During periods of inflation, debtors benefit as they get to pay the same nominal amount at a later date when the purchasing power of money may have reduced, thus paying a lower real amount. Debtors are tempted to prolong payment of their debt to the company and this can reduce the company's liquidity. This can also affect the efficiency of the company since it will reduce the account receivables turnover and may cause the company to incur some extra cost on debt collection e.g. bad debt forgone, cost of hiring a debt factor and cost of administering and negotiating credit terms. These costs may affect liquidity and profitability. Efficient credit policy and debt collection system may reduce liquidity and credit risk and thus improve financial sustainability, which leads us to ask: Is there a relationship between account receivables turnover and financial sustainability?

H₃: There is no relationship between account receivables turnover and financial sustainability

Inventory turnover

Inventory turnover compares the cost of goods sold to the cost of inventory. A high inventory turnover indicates that the firm sold most of the good produced with few inventories left. Inventory turnover can be used to

evaluate a firm's marketing power. Although having high inventory may not be a good idea. However, in periods of inflation, firms whose products are relatively or perfectly inelastic tend to hoard inventory so as to sell inventory in later periods at a higher price. But in an economy where prices are fairly stable, keeping inventory could be harmful because keeping inventory has its costs (holding cost and time value of money). Keeping inventory postpones profit on goods sold without any compensation.

With harsh inflation rates and highly competitive business environment, managers have been forced to take actions that compromise quality in a bid to save cost. Several consumer goods manufacturers, in a bid to compete efficiently, have reduced their product content, quantity and/or quality and sell them at the same price thus leaving profit unchanged. This has a negative effect in the long-run; like loss of customer patronage, goodwill and brand identity. Even in the short-term, if this strategy is not matched with aggressive marketing, it could lead to excess inventory (low inventory turnover) which may also affect the firm's profitability.

This brings us to another research question and hypothesis of this study: Is there a relationship between inventory turnover and financial sustainability?

H₄: There is no relationship between inventory turnover and financial sustainability

Asset turnover

Asset turnover relates the revenue generated for the period to the company's expenditure on all its assets. It measures the extent to which the company has put its assets to use in generating revenue (Bodie and Alan, 2004). The asset turnover gives a hint on the capacity actualization of the company. Among the fortune 500 companies, only about 3% of manufacturing companies were operating on the best-practice frontier (Zhu, 2000). In Nigeria, this problem has been said to be caused by power outages resulting in the use of alternative power generating system (which attracts high cost), lack of funds to produce inputs, fallen demand for locally manufactured goods and industrial unrest (Adegbe and Adeniji, 2013).

Companies, with the aim of avoiding huge capital expenditure, result to making use of over-depreciated assets in production process. Walking into the average Nigerian company, one would probably identify an asset that obviously needs to be changed. Making use of such assets can lead to frequent machine breakdown which will reduce operational efficiency and could even lead to employee idle time which management will nevertheless still have to pay for. Frequent machine breakdown would lead to poor asset turnover which could also affect financial performance of the firm.

Poor choices of asset specification can also lead to

poor asset turnover. This is also worsened by the fact that capital projects are most times irreversible. In situations where managers purchase sub-standard or wrong specification of assets, those assets may not operate to the full capacity of the firm and thus may reduce revenue generated for the period and continue to do so for several future years, hence reducing financial sustainability. This leads us to the big question: Is there a relationship between asset turnover and financial sustainability?

H₅: There is no relationship between asset turnover and financial sustainability

Empirical framework

Some existing studies have tried to evaluate the nature of the impact of efficiency measures on financial performance and sustainability. Some have identified positive relationship between both variables while some have identified negative relationship. A few others have also identified no relationship (i.e. no significant correlation).

Banerjee (2018) did a study on the ability of financial ratios to predict the Financial Performance of UAE Banks. His paper, like this one, examined the financial performance as it relates to accounting-based performance (measured by Return on Assets) and Market-based performance (measured by Tobin's Q). These measures were regressed against some financial ratios from the audited financial statements of the sampled banks for the period of 2014 till 2017. The regressors included; individual size of the bank, the credit risk, operational efficiency and asset management. The result reported that operational efficiency and asset management had a positive significant relationship with financial performance and sustainability. These results were similar with those of Tarawneh (2006) and Khizer et al. (2011). Tian et al. (2018) also did a study on the Combination of efficiency and innovation to enhance financial performance in emerging economies. They buttressed that firms in these economies have to enhance their efficiency and innovative capabilities synthetically in order to combat competitors. The paper analysed data for more than 20,000 firms from 36 emerging economies and found strong evidence to prove the arguments. Efficiency was found to be positively related to productivity and, through it, financial performance. Yameen and Pervez (2016) carried out a study on the impact of liquidity, solvency and efficiency on profitability of steel authority of India limited. Financial sustainability was measured using return on equity, return on assets and return on capital employed. Efficiency ratios (asset turnover, inventory turnover and account receivables turnover) were found to have positive significant relationship with return on assets.

Ndolo (2015), using correlation matrix in his study, found asset turnover to be a major determinant of financial performance. Al-Jafari and Alchami (2014) also found that management efficiency, as a function of operating expenses and asset management, had significant impact on profitability of banks in Syria. Jamali and Asadi (2012) also did a study on management efficiency (which was measured with asset turnover) and profitability (measured with Gross profit ratio) in the Indian automobile industry. The study was conducted using Pearson Coefficient correlation test on the variables. The central conclusion of the study was that profitability and management efficiency are highly positively correlated with each other. Agiomirgianakis et al. (2006) also revealed that efficiency in management of assets, as well as age, size, fixed assets growth, exports, reliance on debt and sales growth all impacted significantly on firm performance. Fairfield and Yohn (2001), in an analysis on 9,147 U.S. firms for the periods 1977–1996 concluded that change in return on assets is strongly dependent on changes in asset turnover. They concluded that asset turnover ratios are useful for predicting future profitability changes. Zhu (2000), in his study, found number of employees to be negatively associated with firm performance

On the other hand, some authors also found negative relationship between operational efficiency and financial performance indices. Sohail (2018) carried out a research to determine how profitability of Pakistani banks was affected by operational efficiency and several risk types (liquidity risk, credit risk and capital risk). Simple regression analysis was used for analysis of data and the Hausman test was used to select between random and fixed effects model. The results revealed that banks' profitability was negatively affected by operational efficiency. Aremu et al. (2013), in their study, applied cointegration and error correction techniques and revealed that cost efficiency, along with credit risk and capital adequacy, were inversely related to financial performance of Nigerian firms while money supply and labour efficiency were directly associated. Pantea et al. (2013), in their study, found number of employees to be positively associated with firm performance in Romania, thus, suggesting that efficiency strategies involving decrease in number of employees could lead to reduced firm performance. This result supports that of Sathye (2001).

Some studies also found too little or no relationship between operational efficiency measures and firm performance. Evans (2018) carried out a research to discover whether the changes in profitability in Nigerian companies where as a result of changes in operational efficiency. To answer the question, the study conducted four different panel unit root tests to establish the stationarity of financial performance (profit after tax) and operational efficiency variables in Nigeria. Asset turnover ratio was one of the efficiency variables. With a cross section of 20 quoted companies on the Nigerian Stock

Exchange, the analyses showed that profit after tax was non-stationary while efficiency variables were stationary. In other words, while financial performance was changing, asset turnover and other efficiency variables remained stagnant thus, signifying a lack of correlation between operating efficiency and financial performance of quoted companies in Nigeria. This result was a bit similar to that of Enekwe et al. (2013), who found that while inventory turnover proved to be a significant determinant of firm performance, asset turnover ratio was insignificant.

The above summary suggests that there are doubts as to whether there is a consistent relationship between efficiency measures and financial performance. This disparity may be due to the fact that there are other country specific factors that affect this relationship (the relationship between efficiency and financial performance is contextual to the business environment). Given the mixed results in existing literature, this study attempts to fill the gap by clarifying the relationship between operational efficiency and financial sustainability measures using the Nigerian manufacturing sector as a case study.

MATERIALS AND METHODS

This section explains the skeletal framework for the data collection, presentation and analysis from which relevant conclusions can then be drawn. It includes a model specification and explanation of variables used and population, sampling and data collection.

Model specification

The study aims at testing the functional dependence of Financial Sustainability on the following efficiency variables; employee growth rate, operating expenses, account receivables turnover, inventory turnover and asset turnover.

Employees' growth rate, operating expenses, account receivables turnover, inventory turnover and asset turnover were the major/vocal independent variables. Firm size has been used in some studies to control for firm specific characteristics (Dang et al., 2018) and was used in this study, represented with market capitalization. Following the suggestions of Keele and Kelly (2006), the lagged values of return on asset and Tobin's Q were also included as control variables because current year's financial performance is largely dependent on previous year's performance (Van et al., 2010), thus, capturing a theory of dynamics with dynamic specification. This is partly what justifies using previous year's results as a benchmark for the current year. The lagged variables were also included to control for autocorrelation as financial ratios tend to auto-correlate since they all come from a similar set of financial statement information. Financial sustainability is the dependent variable in the regression and will be measured across Return on Asset and Tobin's Q. The three non-vocal variables (market capitalization, return on asset for previous period and Tobin's Q for previous period) were included because they have been found to be significant determinants of financial performance and sustainability in previous studies and thus will increase the explanatory coefficient (R^2) (Table 1). Therefore, the functions can be represented in two functional forms. We have:

$$ROA = f (EGR, OPX, ART, IVT, AST, MKC, lagROA, lagTBQ) \quad (1)$$

$$TBQ = f (EGR, OPX, ART, IVT, AST, MKC, lagROA, lagTBQ) \quad (2)$$

The empirical analysis for this study employs the econometric model specified as follows:

$$ROA_{it} = \beta_0 + \beta_1 EGR_{it} + \beta_2 OPX_{it} + \beta_3 ART_{it} + \beta_4 IVT_{it} + \beta_5 AST_{it} + \beta_6 MKC_{it} + \beta_7 ROA_{i(t-1)} + \beta_8 TBQ_{i(t-1)} + \mu_{it} \quad (3)$$

$$TBQ_{it} = \beta_0 + \beta_1 EGR_{it} + \beta_2 OPX_{it} + \beta_3 ART_{it} + \beta_4 IVT_{it} + \beta_5 AST_{it} + \beta_6 MKC_{it} + \beta_7 ROA_{i(t-1)} + \beta_8 TBQ_{i(t-1)} + \mu_{it} \quad (4)$$

Where,

ROA: was calculated as earnings before interest and tax / total assets

TBQ: was calculated as (Market value of equity + total debt) / total assets

EGR: was calculated as the percentage change in the number of employees between current and previous period

OPX: is a line item on the financial statement;

ART: was calculated as Total revenue / accounts receivable

IVT: was calculated as cost of goods sold / average inventory

AST: was calculated as total revenue / total asset

MKC: was measured Market price per share x number of outstanding shares

β_0 = is the constant term representing the value of financial sustainability (which is measured across return on asset and Tobin's q) when the hypothesized efficiency variables and control variables are zero in the given models;

β_{1-8} = slope coefficients measuring the impact of the hypothesized efficiency variables and control variables on Financial sustainability which is measured across return on asset and Tobin's q;

μ = is the random error term of the model capturing other factors not captured by the hypothesized efficiency variables and control variables.

Apriori expectations

The study expects all hypothesized efficiency variables except employee growth and operating expense to have positive impact on financial sustainability. The control variables are all expected to have positive correlation since increase in market capitalization ought to attract more investors and investment opportunities thus increasing profitability and firms tend to want to improve by setting previous years target as the minimum benchmark of performance. Therefore:

$$\beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8 > 0.$$

$$\beta_1, \beta_2 < 0$$

Population, sampling and data collection

The research work was carried out using secondary data obtained from the Nigerian Stock Exchange as well as the Bloomberg portal for annual reports and account of the relevant companies. Data for Tobin's Q were author computed from component variables (market value of equity, book value of debt and book value of total assets).

The population of this study includes the thirty-five quoted manufacturing companies (producing industrial and/or consumer goods) on the Nigerian Stock Exchange. The sample was taken on

the basis of availability of financial statement for the different financial period that the study focuses on. Only sixteen of the thirty-five quoted manufacturing companies had readily available financial statements information as at the date of the research.

The empirical model was regressed on a panel data set for 16 companies and spanning 8 years period (2009-2016).

RESULTS OF ANALYSIS

OLS regression technique was employed as the primary test of the hypotheses using E-Views (version 9). This method is preferred as it will allow for testing relationships in dynamic environments and controlling for the effects of other independent variables. Two least squares regression models were generated for the two measures of financial sustainability and are reported in tables 1 (ROA) and 2 (Tobin's Q).

In Table 1, the findings, at 5% level of significance, reveal that there is a positive and significant relationship between asset turnover and return on asset as a measure of financial sustainability with p-value of 0.0017. The findings also reveal a negative and significant relationship between operating expenses and return on asset as a measure of financial sustainability with p-value of 0.0227. Employee growth, account receivable turnover and inventory turnover were insignificant. The R^2 and adjusted R^2 reported explanatory coefficients of 0.824327 and 0.811314 respectively. This indicates that 82.4327% of ROA can be explained by the combination of the variables in Table 1. The F-statistic of the overall model was also significant with p-value of 0.000000. At 5% level of significance, Table 2 reveals that there is a positive and significant relationship between Inventory and asset turnover and Tobin's Q as a measure of financial sustainability with p-values of 0.0172 and 0.0265 respectively. The findings also reveal a negative and significant relationship between operating expenses and Tobin's Q as a measure of financial sustainability with p-value of 0.0261. Employee growth and account receivable turnover were insignificant. The R^2 and adjusted R^2 reported explanatory coefficients of 0.760377 and 0.742627 respectively. This indicates that 76.0377% of Tobin's Q can be explained by the combination of the variables in table 2. The F-statistic of

Table 1. Variables measurement and representation.

Variable	Measurement	Notation
Dependent variable		
Financial sustainability	Return on Asset	ROA
	Tobin's Q	TBQ
Independent variable		
Operational efficiency	Employee Growth Rate	EGR
	Operating Expenses	OPX
	Account Receivables Turnover	ART
	Inventory Turnover	IVT
	Asset Turnover	AST
Control variable		
Stock Market Index	Market Capitalization	MKC
Previous year's financial performance	Previous year's Return on Asset	ROA _{t-1}
	Previous Year's Tobin's Q	TBQ _{t-1}

Table 2. OLS regression model for return on asset.

Dependent Variable: ROA				
Panel least squares regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022322	0.014517	-1.537667	0.1271
EGR	-0.015406	0.019100	-0.806584	0.4217
OPX	-5.77E-13	2.50E-13	-2.312006	0.0227**
ART	2.35E-05	2.65E-05	0.885024	0.3781
IVT	0.001363	0.001692	0.805642	0.4222
AST	0.040523	0.012561	3.226104	0.0017***
MKC	3.61E-14	9.51E-15	3.790946	0.0002***
ROA _(t-1)	0.611620	0.049112	12.45347	0.0000***
TBQ _(t-1)	0.002110	0.002697	0.782380	0.4357
R ²	0.824327	Mean dependent var		0.094547
Adjusted R ²	0.811314	S.D. dependent var		0.087187
F-statistic	63.34741	Durbin-Watson stat		1.662324
Prob(F-stat)	0.000000			

* Significant at 10%, ** Significant at 5%, *** Significant at 1%.

the overall model was also significant with p-value of 0.000000.

The control variables were also regressed against the dependent variables. The lagged variables of return on asset and tobin's q (ROA_(t-1) and TBQ_(t-1)) were control variables but also acted as auto-regressors thus correcting for autocorrelation so as to avoid spurious regression results (Tables 1 and 2). Market capitalization had a positive significant relationship in both models with p-values of 0.0002 and 0.0022 for ROA and TBQ respectively. ROA_(t-1) was significantly related with return on asset for the period but insignificantly related to

Tobin's Q with p-values of 0.0000 and 0.3256 respectively. TBQ_(t-1) was significantly related to Tobin's Q for the period but insignificantly related to return on assets with p-values of 0.0000 and 0.4357 respectively.

The Durbin Watson statistic of 1.662324 and 1.902192 in Tables 1 and 2 respectively tends towards 2 and thus signifies an absence of autocorrelation. Residual diagnostic tests for the violations of heteroscedasticity and cross-sectional dependence were also carried out on the return on asset model to ensure that the regression results are meaningful, and that the analysis generates the best linear unbiased equation. Cross-sectional

Table 3. OLS Regression Model for Tobin's Q.

Dependent Variable: TBQ				
Panel least squares regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.673721	0.337694	-1.995066	0.0486
EGR	-0.095683	0.444310	-0.215351	0.8299
OPX	-1.31E-11	5.81E-12	-2.255151	0.0261**
ART	0.000575	0.000617	0.932624	0.3531
IVT	0.095200	0.039357	2.418887	0.0172**
AST	0.657489	0.292194	2.250177	0.0265**
MKC	6.94E-13	2.21E-13	3.134258	0.0022***
ROA _(t-1)	1.128261	1.142453	0.987578	0.3256
TBQ _(t-1)	0.718039	0.062748	11.44329	0.0000***
R ²	0.760377	Mean dependent var		2.052967
Adjusted R ²	0.742627	S.D. dependent var		1.736544
F-statistic	42.83846	Durbin-Watson stat		1.902192
Prob(F-stat)	0.000000			

* Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 4. Residual cross-section dependence test.

Residual cross-section dependence test			
Null hypothesis: No cross-section dependence (correlation) in residuals			
Equation: ROA			
Test employs centered correlations computed from pairwise samples			
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	140.1388	120	0.1010
Pesaran scaled LM	0.267155		0.7893
Pesaran CD	0.217101		0.8281

dependence can lead to bias in tests results (also called contemporaneous correlation). The Breusch-Pagan Lagrange Multiplier tests for heteroskedasticity and cross-sectional dependence was carried out on the OLS model on ROA in Table 1 (as it is Durbin Watson statistic of 1.662324 does not fall within 1.8 and 2.2). The null hypothesis in the LM test is that there is cross sectional independence. The Breusch-Pagan LM showed a p-value of 0.1010 (Table 3). This proves that there is neither heteroskedasticity nor cross-sectional dependence since p-values are not significant at 5%. The Pesaran Scaled LM and CD test, like the Breusch-Pagan test, are also used to test whether the residuals are correlated across entities. The null hypothesis is that residuals are not correlated. The p-values of 0.7893 and 0.8281 (Table 4) lead us to accept the null hypothesis that there is no contemporaneous correlation.

DISCUSSION

Existing literature has suggested that managers should

minimize cost as much as possible. The capitalist philosophy of business encourages managers to reduce costs as much as possible in order to maximize profits. Efficiency is the degree to which firms actually achieve this. Efficiency ratios act as measurement basis of manager's efficiency. The Rent theory of profit suggests profit as a reward for good efficiency ratios. However, inferring from the results of this study, not all the efficiency ratios are essentially rewarded with Profit. Operating expense and asset turnover had a significant relationship with both return on asset and Tobin's Q and thus are essential determinants of financial sustainability. This result is consistent with those of Banerjee (2018), Tian et al. (2018), Yameen and Pervez (2016), Ndolo (2015), Al-Jafari and Alchami (2014), Jamali and Asadi (2012), Khizer et al. (2011), Agiomirgianakis et al. (2006), Tarawneh (2006) and Fairfield and Yohn (2001). The result also goes against those of Sohail (2018), Enekwe et al. (2013) and Aremu et al. (2013). Also, Inventory turnover was found to be a significant determinant of ROA. This result is similar to that of Enekwe et al. (2013). Managers' effort to minimize operating expenses and

increase asset and inventory turnover is rewarded by an increase in financial performance and sustainability, thus, verifying the Rent theory of profit. However, employee growth rate and account receivables turnover nullified the generalization of this theory in the Nigerian manufacturing sector, as those variables were insignificant with regards to profitability. This is contrary to the findings of Pantea et al. (2013) and Zhu (2000) both of which suggested a significant relationship between number of employees and financial performance.

Operating expense was significant and thus, is a key factor to be managed. Data collected revealed that listed manufacturing companies in Nigeria incur average operating expense as high as eighteen billion naira annually. The operating costs of the business should be reduced as much as it can with production quality remaining the same. When production quality is reduced while reducing operating expenses, companies tend to lose their competitive advantage in form of product uniqueness. Then, cost saving becomes geared toward short-term profits instead of long-term financial sustainability.

Operating expense optimization is even more important for industrial goods producers as they tend to incur larger operating expenses. Industrial assets require larger expenses to keep them running compared with those of consumer goods producers, and so, measures have to be put in place to keep those operating expenses in check.

Asset turnover was also significant. The capacity utilization rate in the manufacturing sector (currently between 40 - 45%) may need to increase. This can be done via proper asset management decision. Assets should have a proper maintenance schedule and proper usage. Operating manuals should be respected, especially for first time assets users. Companies should also avoid making use of over-depreciated assets in production process. Rickety machines disrupt the learning curve process of employees (due to frequent breakdowns and irregularities), causing them to take longer to familiarize themselves with how the machine works. Managers should document specifications and brand of assets that work well with the organization's production and administration process and consider them when purchasing new assets. Purchase of sub-standard or wrong specification of assets could reduce operational efficiency and cause the organization a lot of harm, both financial and non-financial.

Conclusion

The operating costs of the business should be reduced as much as it can with production quality remaining the same. Given that energy spending in Nigeria's manufacturing sector has continued to rise rapidly, managers should endeavour to try out other cheaper

energy sources or import foreign energy creating technologies e.g. solar panels, biofuel engines (since Nigeria generates a lot of wastes due to large population), high capacity inverters (to prevent idle times during power outages) etc. Although, these may involve huge cost outlays, but it has its long-term advantages (in form of cost savings) and so can be a good investment.

In the case of fixed asset (for asset turnover), managers need to make sure that its machines and equipment are always in good working condition and avoid any breakdown or bottlenecks that could prevent the machine from producing at maximum capacity. Also, managers should ensure that working hours are respected and productive. Idle time should be minimized as much as possible so that value-in-use of assets is realized. Managers should ensure that they make appropriate and suitable choice of asset expenditure. Purchase of substandard assets or assets that do not meet the production specification should be avoided as this will render assets inactive or unfit (like asking a carpenter to do a plumber's work).

The role of local SMEs in financial sustainability

Employees' growth rate had a negative coefficient but insignificant probability with both measures of financial sustainability (profitability and stock market performance). This indicates that changes in the number of employees do not necessarily lead to any change in profits. This is a unique discovery as many SME managers often tend to minimize cost by avoiding unnecessary extra hands. Most Nigerian SMEs have very thin work force. They argue that 'there is no need to increase capacity when you haven't exhausted the existing capacity'. Managers should avoid hiring unnecessarily as this can create excess capacity and lead time which could reduce the ratio of profit to cost. However, managers need not deliberately retrench employees with the aim of improving profits significantly since change in number of employees was found to be insignificant.

SME managers are often associated with cost cutting strategies so as to merely survive the current financial period without incurring loss. Many SME managers often consider expansion strategies as over-ambitious while the others, who are ambitious, view expansion more from an asset-based perspective (total asset). Growth strategies often depend on product uniqueness to positively influence financial performance (Alkasim et al., 2018). Operational efficiency does not necessarily oppose expansion as long as there is always 'value for money'. Large Companies (with large asset base, sales turnover and market capitalization) can still operate efficiently and tend to be more financially sustainable as long as their operations yield good revenue turnover (Olawale et al., 2017). In this study, market capitalization, which has been suggested as a measure for firm size

(Dang et al., 2018), was found to have a significant positive relationship with financial sustainability as can be seen from the analysis (Tables 2 and 3).

Role of the central government in financial sustainability

Lack of infrastructural facilities is one of the primary causes of high operating expense of businesses and thus there is a lot that the government can do to help companies lower their operating expense, and thus, improve financial sustainability. Transportation costs and energy costs are two major costs that comprise the operating expenses of manufacturing companies. The government can help reduce companies' expenses by providing good road network and adequate power. The Nigerian waterways (using boats and ships to transport goods within and between states) have not been exploited to its full potential and this might reduce transportation time and cost substantially and even help existing road structures last longer. Imagine if companies did all their intra-state and inter-state freight by water!

Government can also help by subsidizing the import of power generation technologies and/or encourage local ones by granting them pioneer status and other business and tax incentives.

Also, government can improve the educational system and curriculum with the aim of producing quality and efficient graduate management students, who can take on managerial roles and implement efficient strategies that will improve financial sustainability in the Nigerian manufacturing sector.

Internationalization of local production and attraction of foreign investors

Manufacturing companies need not limit their operational activities or market base to Nigeria only. They need to launch into foreign markets with huge prospects so as to profit from more favourable business environments and expand revenue from market share which will lead to higher turnover ratios. Market development has been found to improve competitive advantage and financial performance in recent studies (Alkasim et al., 2018). This may involve some huge investment (in terms of market research and development cost), but if carried out properly, companies can increase the revenue generated per cost of asset by taking advantage of the internationally liberalized market. If done efficiently, this can improve financial sustainability. Also, the recent unfavourable foreign exchange rates make import of raw materials and other items of inventory more expensive. Companies that require raw materials, which are not produced locally, may need to hedge foreign exchange risk by entering into forward and future contracts with foreign suppliers to stabilize costs of those raw materials.

Such partnership with foreign companies can help to eliminate or at least postpone foreign exchange risk and improve operational efficiency, and thus, increase profits. The country is in need of foreign investments as the foreign exchange reserve is fast depleting. The government should create a friendlier business environment for foreign investors in Nigerian manufacturing sector so as to attract more foreign currency.

Limitations of the study

This study used secondary data from the Bloomberg financial information portal. Unlike primary data, secondary data may not be totally free from error and thus may be inaccurate. Also, the small sample size may make generalization of results of the study statistically incorrect.

Suggestions for further studies

This study looks at financial sustainability from profitability and stock market perspective. However, bankruptcy and financial distress are also important measures of how financially sustainable a company is. Further study could be done on the determinants of financial sustainability measured across financial distress. The ability of financial ratios to predict financial distress and bankruptcy could be a possible study that will be relevant for manufacturing companies as it will help them identify key factors that predict financial distress and its possible causes.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

REFERENCES

- Abubakar A (2017). Financial Leverage and Firms' Performance: A Study of Quoted Companies in the Nigerian Stock Exchange.
- Adegbe FF, Adeniji NA (2013). The Challenges and Prospects of the Manufacturing Sector of Nigerian Economy. *International Journal of Innovations in Management Science* 4(2):3.
- African Business Magazine (2017). Is it a good time to invest in Nigeria?. Available at: <https://africanbusinessmagazine.com/region/west-africa/good-time-invest-nigeria/>
- Agiomirgianakis G, Voulgaris F, Papadogonas T (2006). Financial Factors Affecting Profitability and Employment Growth: The Case of Greek Manufacturing. *International Journal of Financial Services Management* 1(2):232-242.
- Alakeci V, Al-Khatib H (2006). 'The concept of corporate governance and the applicability to the ground in the listed companies in the financial market. *Journal of Irbid for Scientific Research* 10(1):54-68.
- Alkasim SB, Hilman H, Bin Bohari AM (2018). The mediating effect of competitive strategy on the relationship between market development, product development and performance of manufacturing based SMEs in Nigeria. *Journal of Business and*

- Retail Management Research 12(2):133-143.
- Alli F (2012). How to achieve 10% real sector contribution to GDP by 2015 – Stakeholders. Available at: <https://webcache.googleusercontent.com/search?q=cache:c7AKgk6TptgJ:https://www.vanguardngr.com/2012/07/how-to-achieve-10-real-sector-contribution-to-gdp-by-2015-stakeholders/+&cd=1&hl=en&ct=clnk&gl=ng>
- Aliabadi S, Alireza D, Balsara, N (2013). The Most Value Relevant Accounting Performance Measure by Industry. *Journal of Accounting and Finance* 13(1):22-35.
- Al-Jafari MK, Alchami M (2014). Determinants of Bank Profitability: Evidence from Syria. *Journal of Applied Finance and Banking* 4(1):17-45.
- Al Manaseer MF, Al-Hindawi RM, Al-Dahiyat MA, Sartawi II (2012). The impact of corporate governance on the performance of Jordanian banks. *European Journal of Scientific Research* 67(3):349-359.
- Al-Matari EM, Al-Swidi AK, Fadzil FH (2014). The measurements of firm performance's dimensions. *Asian Journal of Finance and Accounting* 6(1):24-49.
- Anudu O (2018). Solving energy jigsaw in Nigeria's manufacturing sector. Available at: <https://businessday.ng/real-sector/article/solving-energy-jigsaw-nigerias-manufacturing-sector/>
- Aremu MA, Ekpo IC, Mustapha AM (2013). Determinants of Banks' Profitability in a Developing Economy: Evidence from Nigerian Banking Industry. *Interdisciplinary Journal of Contemporary Research in Business* 4(9):155-181.
- Atoyebi KO, Okafor BO, Falana AO (2014). The Global Financial Meltdown and Its Effects on Manufacturing Sector: the Nigerian Perspective. *Journal of Economics and Sustainable Development* 5(6):78-90.
- Asaley AJ, Adama JI, Ogunjobi JO (2018). Financial sector and manufacturing sector performance: evidence from Nigeria. *Investment Management and Financial Innovations* 15(3):35-48.
- Banerjee A (2018). Can Ratios Predict the Financial Performance in Banks: A Case of National Banks in United Arab Emirates (UAE). *International Journal of Accounting and Financial Reporting* 8(4):2162-3082.
- Bodie AK, Alan JM (2004). *Essentials of Investments*, 5thed. McGraw-Hill Irwin. Asset turnover ratio. P 459.
- Bloom N, Brynjolfsson E, Foster L, Jarmin R, Patnaik M, Saporta-Eksten I, Van Reenen J (2018). What Drives Differences in Management Practices?. *American Economic Review* 2018:1-27.
- Brandenburger AM, Stuart HW (1996). Value-based business strategy. *Journal of Economics and Management Strategy* 5:5-24.
- Carmeli A (2008). The fiscal distress of local governments in Israel. *Administration and Society* 39(8):984-1007.
- Chari A, Chen W, Dominguez KM (2012). Foreign ownership and firm performance: emerging market acquisitions in the United States. *IMF Economic Review* 60(1):1-42.
- Dang CD, Li FZ, Yang C (2018). Measuring firm size in empirical corporate finance. *Journal of Banking and Finance* 86:159-176.
- Department of Infrastructure Local and Government and Planning (DILGP) (2013). *Financial Management (Sustainability) Guideline 2013*. Department of Infrastructure Local and Government and Planning. State of Queensland, Australia. Available at: <http://www.dilgp.qld.gov.au/resources/guideline/sustainability/financial-management-guide-2013.pdf>
- Drew J, McCallum B, Roggenhofer S (2016). *Journey to Lean: Making Operational Change Stick*. Springer.
- Drucker PF (1963). Managing for business effectiveness. *Harvard Business Review* 41:53-60.
- Emmanuel JF (2015). *Financial sustainability for non-profit organizations*. New York: Springer publishing company.
- Enekwe CI, Okwo IM, Ordu MM (2013). Financial Ratio Analysis as a Determinant of Profitability in Nigerian Pharmaceutical industry. *International Journal of Business and Management* 8(8):107-117.
- Eskandari J (2007). *Accounting principles*. Tehran Sazeman Publishers.
- Evans O (2018). Improved Financial Performance without improved Operational Efficiency: The Case of Nigerian Firms. *Forum Scientiae Oeconomia* 6(3):25-39.
- Fairfield PM, Yohn TL (2001). Using asset turnover and profit margin to forecast changes in profitability. *Review of Accounting Studies* 6(4):371-385.
- Falope OI, Ajilore OT (2009). Working capital management and corporate profitability: Evidence from panel data analysis of selected quoted companies in Nigeria. *Research Journal of Business Management* 3(3):73-84.
- Ghebregiorgis F, Atewebhran A (2016). Measurement of bank profitability, risk and efficiency: The case of the Commercial Bank of Eritrea and Housing and Commerce Bank of Eritrea. *African Journal of Business Management* 10(22):554-562.
- Gill A, Singh M, Mathur N, Mand HS (2014). The Impact of Operational Efficiency on the Future Performance of Indian Manufacturing Firms. *International Journal of Economics and Finance* 6(10):259-269.
- Hagel J, Brown JS, Davison L (2010). The Best Way to Measure Company Performance. Available at: <https://hbr.org/2010/03/the-best-way-to-measure-compan.html>
- Heenetigala K, Armstrong A (2011). The impact of corporate governance on firm performance in an unstable economic and political environment: Evidence from Sri Lanka. *Conference on Financial Markets and Corporate Governance* pp. 1-17.
- Hur-Yagba AA, Okeji IF, Ayuba B (2015). Analyzing Financial Health of Manufacturing Companies in Nigeria using multiple discriminate analysis. *International Journal of Managerial Studies and Research* 3(7):72-81.
- Ibrahim H, Samad FA (2011). Corporate governance mechanisms and performance of public-listed family-ownership in Malaysia. *International Journal of Economics and Finance* 3(1):105-115.
- Jamali AH, Asadi A (2012). Management efficiency and profitability in Indian automobile industry: from theory to practice. *Indian Journal of Science and Technology* 5(5):2779-2781.
- Kang S, Kim Y (2011). Does earnings management amplify the association between corporate governance and firm performance?: Evidence from Korea. *International Business and Economics Research Journal* 10(2):53-67.
- Karaca SS, Ekşi İH (2012). The relationship between ownership structure and firm performance: An empirical analysis over İstanbul Stock Exchange (ISE) Listed Companies. *International Business Research* 5(1):172-181.
- Keele L, Kelly NJ (2006). Dynamic models for dynamic theories: The ins and outs of lagged dependent variables. *Political Analysis* 14(2):186-205.
- Khidmat WB, Rehman MU (2014). Impact of liquidity and solvency on profitability chemical sector of Pakistan. *Economics Management Innovation* 6(3):34-67.
- Khizer A, Muhammad FA, Sharma S (2011). Financial and non-financial business risk perspectives: empirical evidence from commercial banks. *Middle Eastern Finance and Economics* 11:151-159.
- Ku HS, Mustapha U, Goh S (2010). Literature review of past and present performance of the Nigerian manufacturing sector. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture* 224(12):1894-1904.
- Lorig AN (1941). Determining the current financial position of a city. *The Accounting Review* 16(1):41-49.
- Macvane SM (1887). *The Theory of Business Profits*. *The Quarterly Journal of Economics* 2(1):1-36.
- Makadok R (2011). The four theories of profit and their joint effects. *Journal of Management* 37(5):1316-1334.
- Ndolo PS (2015). *The Relationship Between Operational Efficiency and Financial Performance of Firms Listed at The Nairobi Securities Exchange*. Thesis: Nairobi: Master Degree of Science Finance, School of Business, University of Nairobi.
- Okoye V, Eze OR (2013). Effect of Bank Lending Rate on the Performance of Nigerian Deposit Money Banks. *International Journal of Business and Management Review* 1(1):34-43.
- Okoye LU, Erin OA, Ado A, Isibor AA (2017). Corporate Governance and Financial Sustainability of Microfinance Institutions in Nigeria. In: 29th IBIMA conference Sustainable Economic Growth, Education Excellence, and Innovation Management through Vision 2020, 3-4 May 2017, Vienna, Austria.
- Olawale LS, Ilo BM, Lawal FK (2017). The effect of firm size on performance of firms in Nigeria. *Aestimatio* (15):2.
- Omwunmi OF (2012). *Capital Structure and Corporate Performance of Nigerian Quoted Firms: A Panel Data Approach* (Unpublished

- Doctoral Thesis), School of Business, College of Development Studies, Covenant University, Ota, Ogun State, Nigeria.
- Owolabi SA, Obida SS (2012). Liquidity Management and Corporate Profitability: Case Study of Selected Manufacturing Companies Listed on the Nigerian Stock Exchange. *Business Management Dynamics* 2(2):10-25.
- Oyewale B, Adewale B (2014). Sustainability of microfinance institutions: A comparative case study of Kwara State, Nigeria. *Journal of Business and Organizational Development* 6(2):11- 25.
- Pantea M, Gligor D, Anis C (2013). Economic Determinants of Romanian Firms' Financial Performance. *Procedia - Social and Behavioural Sciences* 124:272-281.
- Playford (2016). Financial Sustainability Ratios and Targets Policy. City of Plaford, Southern Australia.
- Porter ME (1989). How competitive forces shape strategy. In *Readings in strategic management*. Palgrave, London. pp. 133-143.
- Price water house Coopers (2006). National Financial Study of Local Government Sustainability. Commissioned by the Australian Local Government. Sydney, NSW: PwC.
- Sa-Dhan Microfinance Resource Centre (2005). Sustainability of Microfinance Interventions, Perspective Paper.. pp. 1-20.
- Sathye M (2001). X-efficiency in Australian banking: An empirical investigation. *Journal of Banking and Finance* 25(3):613-630.
- Sohail M (2018). Impact of efficiency and risk on profitability of Pakistani banks (Doctoral dissertation, Bahria University Islamabad Campus).
- Sutton J (2007). Quality, trade and the moving window: The globalisation process. *The Economic Journal* 117(524):469-498.
- Syverson C (2011). "What Determines Productivity?". *Journal of Economic Literature* 49(2):326-365.
- Tanwar R (2013). Porter's generic competitive strategies. *Journal of business and management* 15(1):11-17.
- Tarawneh M (2006). A Comparison of Financial Performance in the Banking Sector: Some Evidence from Omani Commercial Banks. *International Research Journal of Finance and Economics* 3:101-112.
- Tian X, Lo VL, Zhai X (2018). Combining efficiency and innovation to enhance performance: Evidence from firms in emerging economies. *Journal of Management and Organization* 2018:1-17.
- Trading Economics (2018). Nigeria Holds Interest Rate at 14%. Retrieved on 4 September 2018 from <https://tradingeconomics.com/nigeria/interest-rate>
- Teece DJ (2017). A capability theory of the firm: an economics and (strategic) management perspective. *New Zealand Economic Papers* 2017:1-43.
- Umobong AA (2015). Assessing the impact of liquidity and profitability on growth of profits in pharmaceutical firms in Nigeria. *European Journal of Accounting, Auditing and Finance Research* 3(10):97-114.
- Van Ness RK, Miesing P, Kang J (2010). Board of Director Composition and Financial Performance in a Sarbanes-Oxley World. *Academy of Business and Economics Journal* 10(5):56-74.
- Wahla KU, Shah SZ, Hussain Z (2012). Impact of ownership structure on firm performance evidence from non-financial listed companies at Karachi Stock Exchange. *International Research Journal of Finance and Economics* 84:6-13.
- Walker FA (1887). The source of business profits. *The Quarterly Journal of Economics* 1(3):265-288. Available at <https://www.jstor.org/stable/pdf/1882759.pdf>
- Wallstedt N, Grossi G, Almqvist R (2014). Organizational solutions for financial sustainability: A comparative case study from the Swedish municipalities. *Journal of Public Budgeting, Accounting and Financial Management* 26(1):181-218.
- Wang X, Dennis L, Tu YS (2007). Measuring financial condition: A study of U.S. states. *Public Budgeting and Finance* 27(2):1-21.
- Yameen M, Pervez A (2016). Impact of Liquidity, Solvency and Efficiency on Profitability of Steel Authority of India Limited. *International Journal of Research in Management, Economics and Commerce* 6(9):25-31.
- Zhu J (2000). Multi-factor performance measure model with an application to Fortune 500 companies. *European Journal of Operational Research* 123(1):105-124.