

BUSINESS PROCESS REENGINEERING AND FINANCIAL STABILITY OF LISTED OIL AND GAS COMPANIES IN NIGERIA***Olajide ARISE, Babcock University and Dr. Festus FolajimiAdegbie**

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Abstract

Financial stability is fundamental to the accomplishment of every organization. However, the issues of unaccountable barrel of crude per day, oil price volatility, complexity of drilling and production process, Niger-Delta crisis, endemic corruption, illiquidity, and high cost of production have adversely affected liquidity, profitability, capital adequacy, asset quality and tangibility and firm size. There seems to be paucity of studies on the effect of business process reengineering on financial stability in the oil and gas sector in Nigeria. This study examined the effect of business process reengineering on financial stability of selected listed oil and gas companies in Nigeria. The research design employed was ex-post facto research design and thirteen selected listed oil and gas companies in Nigeria were considered and purposive sampling technique was employed. The study secondary data were subjected to pre-diagnostic tests which showed that the study variables were normally distributed, no heteroskedascity problem and stationarity at different levels and analysed the secondary data using descriptive and pooled, random and fixed panel regression method of analyses. Findings revealed that Post- Business Process Re-engineering measures significantly affect liquidity of quoted oil and gas companies in Nigeria (Wald chi2 = 18.92, R²= 0.32, P< 0.05); Post-Business Process Re-engineering measures significantly affect gross profit margin and net profit margin of quoted oil and gas companies in Nigeria (Wald chi2 = 14.32, R²= 0.22, P< 0.05; Wald chi2 = 9.35, R²= 0.19, P< 0.05) while Pre--Business Process Re-engineering measures significantly affect return on assets of quoted oil and gas companies in Nigeria (Wald chi2 = 10.77, R²= 0.15, P< 0.05). The study concluded that Post-Business Process Re-engineering measures significantly affect financial stability components in terms of liquidity, profitability, capital adequacy and asset quality and tangibility of quoted oil and gas companies in Nigeria. Therefore, the study recommended that quoted oil and gas companies in Nigeria should embraced business process re-engineering measures in order to achieve sound financial stability and aggregate financial performance in the oil and gas industry.

Keywords: Assets, Business Process Re-engineering, Capital, Financial stability, Oil and gas industry, Liquidity, Profitability.

INTRODUCTION

The world is changing rapidly and the stability of every institution depends on the success in today's business environment, guaranteed by sustained profit and future plans. According to Organization of Petroleum Exporting Countries (OPEC) (2018), Nigeria has almost 40 billion barrels of proven oil reserve and accounts for 65% of total revenue to the government. With a maximum crude oil production capacity of 2.5 million barrels per day, Nigeria has been facing significant challenges in managing the sector such as the unaccountable use of revenues, corruption, among other issues. It is not business as usual as the competition in global market place intensifies due to obsolete ways of doing business and adjustment to changes in their environment (Eke & Achilike, 2014). The Nigerian oil and gas industry need to encourage multi-stakeholder groups by exploring innovative approaches towards financial stability. Essentially, financial stability is exemplified when an organization displays an ability to successfully maintain its functions, efficiently manage its expenses, and withstand external shocks all while exhibiting growth (Bertrand, 2016). Tadesse (2017) opines that financial stability of every organization should be preserved for it to continue operation in the foreseeable future. Financial stability differs in respect to the initial startup methods of fostering funds in that it is a long-term goal and represents an ability to demonstrate endurance for the organization as a whole, in ensuring that the organization maintains good market value for

the interest of not only its shareholders but stakeholders at large (Kassa, 2015). Financial stability is difficult to define and even more difficult to measure. Strictly speaking, a financial system can be characterised as stable in the absence of excessive volatility, stress or crises. This narrow definition is relatively simple to formulate but fails to capture the positive contribution of a well-functioning financial system to overall economic performance. Indeed, broader definitions of financial stability encompass the smooth functioning of a complex nexus of relationships among financial markets, infrastructures and institutions operating within the given legal, fiscal and accounting frameworks. Such definitions are more abstract but are more inclusive of the macro-economic dimension of financial stability and interactions between the financial and real sectors. From this perspective, financial stability can be defined as "a condition in which the financial system – comprising financial intermediaries, markets and market infrastructure – is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities" (ECB, 2007). The process of BPR envisages that firms must revamp their process, by engaging in radical redesign of core business processes to achieve dramatic improvements in productivity, cycle times and quality (Rigby, 2015). This means that to reengineer a business process implies starting with a blank sheet of paper and rethinking on an existing process to deliver more value to the customer. Business Process Reengineering (BPR) serves as a veritable tool for

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costs and cycle times reduction, by eliminating unproductive activities and the employees who perform them (Ozcelik, 2010). In addition, BPR has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction, but it often requires a fundamental organizational change. As a result, the implementation process is complex, and needs to be checked against several success or failure factors to ensure successful implementation (Ozcelik, 2010; Siha and Saad, 2008; Singh and Kant, 2008; Vergidis, Tiwari and Majeed, 2008; Bhatt, 2000). However, despite the significant growth of the BPR concept, not all organisations embarking on BPR projects achieve their intended result. Hammer and Champy (1993), Abdolvand *et al.* (2008), Adeyemi and Aremu (2008), and Ozcelik (2010) estimate that as many as 50-70 percent do not achieve the dramatic results they seek. This is attributed to poor implementation of BPR rather than a problem with the concept itself (Siha and Saad, 2008; Singh and Kant, 2008; Vergidis *et al.*, 2008; Jarrar and Aspinwall, 1999). Such contradictory outcomes raise concerns among companies evaluating BPR as a crucial strategic initiative (Ringim, 2011). Most significantly, the mixture of results makes the issue of BPR implementation very important (Bhatt, 2000; Abdolvand *et al.*, 2008; Shin and Jemella, 2002; Siha and Saad, 2008; Singh and Kant, 2008). Al-Mashari and Zairi (1999) sustained these contradictory findings, offer a unique opportunity for conducting studies oriented to identify critical factors that can influence the success of BPR implementations.

With the increasing volatility of oil prices, the discovery of oil in other parts of the world, oil imports from Nigeria to major economies such as the United States has steadily decreased, the inability to sustain peace in the Niger/delta region, endemic corruption among other problems have caused production to decline. The production capacity of Crude oil and natural gas has not been steadily progressed in what Nigeria Government desires for the country over the last two decades. This consequently affects Government institutions, operators and other stakeholders in the industry to meet their financial obligations and accomplish their mission (Hassan and Faruok, 2014). Hence, the need to improve current production level to attain optimum level of liquidity. This is why the economy was thrown into turmoil in 2016 when it posted a negative GDP growth in the four quarters of 2016 as follows: -0.36%, -2.06%, -2.24% and -1.3% for the four quarters of 2016 respectively (NBS, 2016). This is why oil and gas companies must find ways to protect its huge investments from the global shocks of reduced capacity and liquidity challenges controllable by the global markets. This reflects negatively on the financial performance as a result of its inability to implement operational plans, considering that the financial performance is specific scale for the success of the companies. The increasing emphasis on reduction of cost of producing a barrel implores the question of new cost initiatives to deliver a sustainable and competitive cost base thereby improving the profitability of the oil and gas companies. According to Osetoba, Barinyima and Amadi (2019), the major problem associated with crude oil production is the cost of production; starting from method of production to transportation. The cost of crude oil production in Nigeria is very high - eroding profits, indicating that Nigeria still remains one of highest cost producers of crude oil in the world (Ofogebu, 2016). Crude oil production cost can be minimized if oil firms renegotiate and manage service costs of ongoing projects to increase the profitability in the industry (Latif, 2015). Since market is

competitive, the survival of companies is based on costs reduction and how to reduce costs is paramount to them all (Nandon, 2010).

LITERATURE REVIEW

Business Process Reengineering

Neill (2017) stated that business process is a collection of related structured activities in order to solve a specific problem or to produce service or product. It consists of a series of logically related entities that makes use of organizational resources. Hammer and Champy (2015) defined that "Reengineering is the fundamental rethinking & radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures performance, such as cost, quality, service and speed. Davenport and Short (2016) explained business process reengineering analysis and design of effective work process & flows in organization. Petrozzo and Stepper (2014) described that Business process reengineering involves redesign of organizations and processes to achieve desired improvement in organizational operations and processes. Process is a measured and structured bundle of activities planned with a view to specified outcome for a particular market or customer. It involves a strong and effective emphasis on how work is carried on within the organization (Davenport, 2009). Maleki and Beikkhakhian (2011) summed up that due to globalization and intensive competitive environment organizations are now trying to exchange their old-fashioned processes with new processes with a view to achieve success. The key words in the definition are; fundamental, radical, dramatic, and process and we shall have to examine them more closely:

1. **Fundamental:** Reengineering goes to the very basic: what is the company supposed to be doing, and how is it supposed to do it. This means going to the root of the things the organization does.
2. **Radical:** This implies disregarding all existing structures and procedures and inventing completely new ways of doing work
3. **Dramatic:** Reengineering is not about making marginal improvements to your business. It is not about making things five percent or ten percent better, it is about making quantum leaps in performance, achieving break through.
4. **Process:** By a process, we mean a group of related tasks that together create value for customers. A business process is also defined as a collection of activities that takes one or more kinds of input and creates an output that is of value to the customers, it cuts across jobs, people and structures. (Michael and Steven, 2015)

The concept reengineering encourages businesses to shift focus from functions to processes in order to achieve dramatic improvements in their performance. It requires organizations to find new methods of carrying out their businesses so as to increase customer satisfaction and enhance competitiveness. This should lead to improvements in quantum leaps as oppose to small incremental changes. Reengineering is not restructuring or downsizing (Aslam, 2015). These are terms used to explain capacity reduction to meet current (lower) demand. Restructuring or downsizing means doing less with less. By contrast, Reengineering means doing more with less (Nehring & Plummer 2014). Reengineering also is not the same as reorganizing, or flattening an organization, although

reengineering may, in fact, produce a flatter organization. The problems facing companies does not stem from their organizational structures but rather from their process structures. Overlaying a new organization on top of an old process is like patching an old cloth with a new piece of cloth. Gathari and Shamsi (2014) insist that the objective of BPR is not only to improve cost and performance, but also to meld organisational cultures and impose parental controls on the acquired business. Mergers offer a tremendous opportunity to improve efficiency and reduce operating costs through consolidation of activities, streamlining of operations, and integration of business processes.

Production Capacity: According to Bates and Parkinson (2014) production is the organized activity of transforming resources into finished products in the form of goods and services; the objective of production is to satisfy the demand for such transformed resources. Production is any activity directed to the satisfaction of other peoples' wants through exchange". This definition makes it clear that, in economics, we do not treat the mere making of things as production. What is made must be designed to satisfy want (Arnold, 2010). For general purposes, it is necessary to classify production into three main groups:

1. **Primary Production:** Primary production is carried out by 'extractive' industries like agriculture, forestry, fishing, mining and oil extraction. These industries are engaged in such activities as extracting the gifts of Nature from the earth's surface, from beneath the earth's surface and from the oceans.
2. **Secondary Production:** This includes production in manufacturing industry, viz., turning out semi-finished and finished goods from raw materials and intermediate goods— conversion of flour into bread or iron ore into finished steel. They are generally described as manufacturing and construction industries, such as the manufacture of cars, furnishing, clothing and chemicals, as also engineering and building.
3. **Tertiary Production:** Industries in the tertiary sector produce all those services which enable the finished goods to be put in the hands of consumers. In fact, these services are supplied to the firms in all types of industry and directly to consumers. Examples cover distributive traders, banking, insurance, transport and communications. Government services, such as law, administration, education, health and defense, are also included.

Production of a commodity or service requires the use of certain resources or factors of production. Since most of the resources necessary to carry on production are scarce relative to demand for them, they are called economic resources. Resources, which we shall call factors of production, are combined in various ways, by firms or enterprises, to produce an annual flow of goods and services.

Classification of Factors of Production: Suman (2010) classified factors of production as depicted in the table below:

Name	Nature	Reward
Land	Any natural resources	Rent
Labour	Toil and/or skills	Wage
Capital	Man-made resource	Interest
Enterprise	Risk taking and organising	Profit

(Suman, 2010)

The first three factors namely land; labour and capital do not work independently or in isolation. There is need to combine these factors and co-ordinate their activities. This two-fold function is performed by the organizer or the entrepreneur. But this is not the only function of the entrepreneur. In fact, production can never take place without some risk being involved; the decision to produce something has to be taken in anticipation of demand and there must be some element of uncertainty about that demand materializing.

Cost of Production: Operating an efficient and cost-effective manufacturing process with strict control of material and production costs is the goal of every successful company (Nnanna&Chimezie, 2016). This is because competition nowadays is very rapid in the industrial sector, demanding every company engaged in manufacturing to improve business strategy (Siregar, 2018). Companies have reduced their dependency on traditional accounting systems by developing activity-based cost management systems. Traditional costing systems have a tendency to assign indirect costs based on something easy to identify (such as direct labor hours). This method of assigning costs can be very inaccurate because there is no actual relationship between the cost pool and the cost driver. This can make indirect costs allocation inaccurate. According to NnannaandChimezie(2016), the cost of a manufactured item has the components from: Labour, Direct materials, Equipment used and Overhead expenses from indirect labour and materials and tools.

Generally: Cost of article = Material + Labour + general Overhead costs (Martand, 2011).

1. **Direct Material Cost:** All the material that form part of the article after manufacture are referred to as "direct material". The cost of the material is evaluated before the material is processed using the proper equipment to shape it according to its final design of the article. Therefore, the complete material cost is the final processed material plus the scrap allowance: Materials cost = Cost of final material + cost of scrap allowed or removed (Khanna, 2019).
2. **Direct Labour Costs:** All work that is directly applied to manufacture the article and its components are included in direct labour. All salaries or wages of workshop staff who are directly involved in making the article using their hands or equipment constitute direct labour. The wage rate of the operator of equipment or manual worker on the manufacturing line is multiplied by the time the operator has been working to find the cost of his labour
3. **Analysis of Overhead Costs:** In the manufacture of an article like the wheel nut the overhead cost element include the following; cost of rent, lighting, heating, power, general suppliers, wages of maintenance staff, typist, draughtmen, cleaners, salaries of departmental heads, managers, directors, consumable or indirect materials, communication, etc Overheads are made up of two parts namely; Fixed Overheads and Variable Overheads. The fixed overhead costs remain constant no matter the quantity of articles produced while the variable overhead cost vary with the quantity of articles produced, e.g. cutting tools (Jenkins and Harberger, 2015). Variable overheads are further subdivided into semi-variable and fully variable Overheads. For example, telephone charges are constant for the first three minutes in Nigeria and then a different rate (higher) is charged per subsequent minute. It is not advisable to keep semi-variable overhead facilities in the

control of shop floor staff in order to avoid possible excessive overhead costs in the company. This is equally true of administrative establishments where such facilities should be located in the management offices. The initial cost of the equipment used in production is recovered through depreciation charges. Since depreciation is usually fixed with respect to time periods it falls within the category of fixed overheads. However, in machine-intensive production, the machine cost is usually isolated from overheads and calculated separately within depreciation of assets.

According to Windmark (2018), production cost is calculated by aggregation of costs occurring in each activity the product interacts with throughout the value chain. Calculating the cost of products or services remains a difficult exercise, especially in highly competitive environments where in order to guarantee long-term profitability, companies must ensure that their product and service costs should not exceed market prices (Hoozée, Vermeire and Bruggeman, 2019). According to Ciaian, Paloma and Delincé (2018), Cost of Production is an economic indicator assessing the economic performance of production. Cost is defined as the value of a factor of production (input) employed in the production of final outputs. Nipun (2018) opined that a firm can produce at low cost when it produces with the new and improved techniques of production. Production with the old and out-dated technique involves higher cost. The profit maximisation requires the use of the particular technique of production which would allow the optimum combination of factors. In the short period the optimum combination for any given level of output is the least-cost combination possible with the fixed factor units. But this may not be the absolute optimum combination if all the factors could be adjusted. Over the longer period, all factors can be varied, and so the firm is free to select the production technique of factors. Naiqi (2015) suggested that the variety of manufacturing flexibility measures are needed for engineers and managers to understand production costs behavior in order to implement the flexibility. The selling price of the product is the sum of the elements of cost below (Meghabber, 2015):

1. Direct material cost.
2. Direct labour cost
3. Direct expenses (Machinery and tools)
4. Factory overhead cost (power, lube oil, rent, etc)
5. Selling costs (Adverts, distribution, discounts etc)
6. General administration/management cost (salaries of staff in management)
7. Profit

Financial Stability: Schinasi (2014) defined financial stability in terms of its ability to facilitate and enhance economic processes, manage risks, and absorb shocks. Moreover, financial stability is considered a continuum: changeable over time and consistent with multiple combinations of the constituent elements of finance. Financial stability has become a term we have come to adopt as the basis of measuring the likelihood of failure or continued survival of corporate entities. This term can also often be referred to, as the attribute of going concern of an organization (Enyi, 2018). According to World Bank, there are numerous definitions of financial stability. Most of them have in common that financial stability is about the absence of system-wide episodes in which the financial system fails to function (crises). It is also about resilience of financial systems to stress. A stable financial

system is capable of efficiently allocating resources, assessing and managing financial risks, maintaining employment levels close to the economy's natural rate, and eliminating relative price movements of real or financial assets that will affect monetary stability or employment levels. A financial system is in a range of stability when it dissipates financial imbalances that arise endogenously or as a result of significant adverse and unforeseen events. In stability, the system will absorb the shocks primarily via self-corrective mechanisms, preventing adverse events from having a disruptive effect on the real economy or on other financial systems. Financial stability is paramount for economic growth, as most transactions in the real economy are made through the financial system (World Bank, 2012).

Liquidity: Liquidity refers to the speed in the transfer of assets into cash, liquidity ratios primarily focus on the cash flows. It is an indicator to measure a company's ability to meet its short-term liabilities. Liquidity management is achieved through the effective use of assets (Robinson, 2015). Liquidity ratios according to Omar, Abdul Aziz, Syed and Nour (2016) include the following:

1. **Current ratio:** Measure the company's ability to pay short-term liabilities such as payable accounts and short-term loans, which represents the ratio of current assets to current liabilities. The magnitude of this ratio expresses high liquidity of the company, thus a greater capacity to meet the short-term liabilities. In contrast, decrease in the ratio under (1) Expresses the deficit of liquidity and the part of the fixed assets financed by short-term debt. Although liquidity deficit could lead to a decline in the company's energy, thus can affect profitability. If the ratio (1) means that current assets equal to current liabilities (Robinson *et al.*, 2015).
2. **Quick ratio:** This ratio only includes the most liquid of current assets to current liabilities. The rise in the value of this ratio expresses high liquidity of the company. This ratio excludes prepaid expenses and inventory from current assets being difficult conversion into cash (Sinha, 2012).
3. **Cash ratio:** This ratio of current assets depends only on short-term marketable investments plus its cash attributed to current liabilities (Gibson, 2016).

Profitability: Profitability refers to the company's ability to generate profits as return on their money invested; profitability ratios reflect the competitive situation of the company in addition to the quality management. It is reflecting the success or failure of the company (Robinson *et al.*, 2015). Profitability ratios include the following:

1. **Gross profit margin:** This ratio refers to the sales' ability to generate gross profit. The high ratio refers to high of selling prices and low production costs. The high selling prices refer to the company's products having a competitive advantage. If a product has a competitive advantage either from cost or quality, then this will help the company to increase profitability (Robinson *et al.*, 2015).
2. **Operating profit margin:** Operating profit can be obtained through operating costs deducted from gross profit. This is a very important ratio because it reflects the company's ability to generate profit from ordinary operations related to a company. The decline in this ratio refers to a weak control over operating costs (Gibson, 2016).

3. **Net profit margin:** This ratio includes the operating profit plus extraordinary revenue (non-recurring) and minus extraordinary expenses (Robinson *et al.*, 2015).
4. **Operating cash flow margin:** The ratio measures the cash generated by the regular company's operations per unit in cash from sales. Cash flows can be found from the statement of cash flows, while revenue from the income statement. The rise in this ratio could refer that the company takes effective policies to turn sales into cash and may also refer to a high quality of profits (Sinha, 2012).
5. **Return on Assets:** It refers to a relation between net profit and assets. The rise in the ratio refers to an effectiveness of the employment of assets by the company (Robinson *et al.*, 2015). ROA is a fiscal proportion showing fraction of company receives relating to its general resources. Net pay is the revenue after levies. Companies acquired a grouping called "good will" representative of further money remunerated over and beyond its genuine book worth at time of procurement. Because assets fluctuate over while, an ordinary asset above the era to be measured is used. Consequently, the return for a section should be built on net revenue for the quarter divided by normal assets in that quarter. It is a proportion but frequently presented as a fraction (Ironkwe and Wokoma, 2017). Total resources are used relatively than remaining assets. Consequently, for illustration, the currency holdings of a firm have been hired and are accordingly balanced by a responsibility. Likewise, the firm's receivables are unquestionably an advantage but are well-adjusted by its payables, a responsibility (Ironkwe *et al.*, 2017). Higher ROA value indicates better company performance, because of higher return on investment rate. This value reflects the company's return on all assets (or funding) provided to the company" (Wild, 2015).

Theoretical Consideration

The theoretical review section consisted of the theories and theoretical framework. This theoretical review provided the basic theoretical assumptions for this study. It focused on the relevant theories that can be applied to the variables and concepts in order to come up with a logical linkage between the variables.

Resource Based View (RBV)

This study was anchored on the resource-based view theory. Resource Based View (RBV) was articulated into a coherent theory by Jay B. Barney in 1995. The theory states that the organizational resources and capabilities that are rare, valuable, non-substitutable, and imperfectly imitable form the basis for a firm's sustained competitive advantage. RBV suggests that the firm can secure a sustained competitive advantage through facilitating the development of competencies that are firm specific, produce complex social relationship; are embedded in a firm's history and culture, and generate tacit organizational knowledge (Lee, 2016). The resource-based view of the firm has long provided a core theoretical rationale for business process reengineering potential role as a strategic asset in the firm (Wood, 2018). The basic argument of the RBV, as explained by Barth (2018) is that the firm's human resource confers enduring competitive advantage to a firm to the extent that they remain scarce or hard to duplicate, have no direct substitutes and enable companies to pursue opportunities. This view of the firm infers that firms create competitive advantage by implementing

unique combinations of resources and business practices that are difficult for competitors to imitate. Human resource practices may provide significant competitive advantage when they are used to create a unique or difficult to imitate organizational culture that institutionalizes organizational competencies throughout the organization (Burns, 2016)). The firm's core competencies are created when human resource programs improve a company's human capital through influencing the creation, transfer, and integration of knowledge (Bullock, 2017). Resource based theory holds that the choice of resources is guided by the motives of efficiency, effectiveness and profitability which enable firms to generate competitive advantage (Chekrezi, 2015). This study considers knowledge as a resource bundle and learning as the strategy to obtain the positive returns of organizational learning and ultimately improved employee performance. The study added precision to resource-based theory by exploring the contribution of organizational learning to employee performance.

Statement of Hypotheses

H₀₁: Business Process Reengineering (BPR) does not significantly affect liquidity of listed oil and gas companies in Nigeria

H₀₂: Business Process Reengineering (BPR) does not significantly affect profitability of listed oil and gas companies in Nigeria

METHODOLOGY

The ex-post facto research design was used in the study to examine the impact of the independent variable on the dependent variable of the subject of study. The independent variable (business process reengineering) had already occurred as observed by the researcher over time in relation to its effects on financial stability of listed oil and gas companies in Nigeria. The population of interest for this study comprised of the total number of listed oil & gas companies on the Nigeria Stock Exchange as at 31st December 2018. The total population used were 13 oil and gas companies listed on the NSE except 2 oil and gas companies that were not listed during the pre-period considered. The period of the study was for 15 years from 2004 to 2018. Seven years prior to the reengineering project (2004-2010) and seven years after (2012-2018). So, the year 2011 constituted the pre-reengineering period while 2012-2018 was the post reengineering period in order to test the extent of the relationship amongst the dependent and the independent variables. Data used were secondary data from financial statements of the selected listed oil and gas companies

Research Model

The models below were used to establish the effect of Business Process Reengineering and financial stability of listed oil and gas companies in Nigeria. The essence was to establish whether there was a linear relationship among the variables of the study for the samples selected as well as the sample period of study. Thus, the models were developed as follows:

Model One

Mathematical model 1 based on Hypothesis

$$FS_{it} = \alpha + \beta_1 PC_{it} + \epsilon_{it}$$

Model Two**Mathematical model 2 based on Hypothesis 2**

$$FS_{it} = \alpha + \beta_2 COP_{it} + \varepsilon_{it}$$

Data Presentation and Analysis: The study consisted of thirteen listed firms on the Nigerian Stock Exchange for the period of 2004 – 2018. The descriptive statistics presented in Table 4.1 were the mean, maximum, minimum and standard deviations and the numbers of observations for each of the dependent and independent variables.

HYPOTHESIS TESTING FOR STRUCTURAL ESTIMATES**Regression Results of Hypothesis 1**

Research hypothesis one: Business Process Reengineering (BPR) does not significantly affect liquidity of listed oil and gas companies in Nigeria

Aprior expectation: It was expected that business process reengineering would have a positive impact on the liquidity of listed oil and gas companies in Nigeria.

$$\text{Model one: } LQ_t = \beta_0 + \beta_1 PC_t + \beta_2 CoP_t + \varepsilon_{it}$$

Regression Results of Hypothesis II

Research hypothesis two: Business Process Reengineering (BPR) does not significantly affect profitability of listed oil and gas companies in Nigeria.

Aprior expectation: It was expected that business process reengineering (BPR) would have a positive impact on profitability of listed oil and gas companies in Nigeria.

$$\text{Model two: } PF_t = \beta_0 + \beta_1 PC_t + \beta_2 CoP_t + \varepsilon_{it}$$

Table 1. Effect of Business Process Reengineering on Liquidity

Panel A: Pre- Business Re-engineering process				
Variables	Coef.	Std. Err.	z	P>z
COC	-2.108488	2.320537	0.91	0.364
PC	2.181525	1.612649	1.35	0.176
COP	1.398447	1.066108	1.31	0.190
RD	-.7998642	.8085768	0.99	0.323
CONS	-15.80587	11.15514	1.42	0.157
R-Square	0.0325			
Wald chi2(4)	4.95			
Prob> chi2	0.2923			
Panel B: Post- Business Process Re-engineering				
Variables	Coef.	Std. Err.	z	P>z
COC	.0181135	.0582949	0.31	0.756
PC	.9098435	1.702514	0.53	0.593
COP	-2.248561	.7837098	-2.87	0.004
RD	1.667728	.4935926	3.38	0.001
CONS	12.42042	11.37573	1.09	0.275
R-square	0.3234			
Wald chi2(4)	18.92			
Prob> chi2	0.0008			

Source: Author's Computation (2020).

Table 2. Effect of Business Process Reengineering on Profitability (Gross Profit Margin)

Panel A: Pre- Business Process Re-engineering				
Variables	Coef.	Std. Err.	z	P>z
COC	-.0225315	.1477144	-0.15	0.879
PC	.1025998	.1015849	1.01	0.312
COP	.0963808	.0690006	1.40	0.162
RD	.1149802	.059794	1.92	0.054
CONS	-1.477855	.6963903	-2.12	0.034
R-Square	0.2555			
Wald chi2(4)	17.80			
Prob> chi2	0.0014			
Panel B: Post- Business Process Re-engineering				
Variables	Coef.	Std. Err.	z	P>z
COC	-.0121338	.0127702	-0.95	0.342
PC	.1109592	.3626774	0.31	0.760
COP	-.2938807	.1707783	-1.72	0.085
RD	.3077908	.0915656	3.36	0.001
CONS	.8039121	2.483593	0.32	0.746
R-Square	0.2195			
Wald chi2(4)	14.32			
Prob> chi2	0.0063			

Source: Author's Computation (2020).

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Findings

The empirical findings of this study were in two folds; for hypothesis one, the result showed that for pre-business process re-engineering the cost of capital and the research and development have negative and insignificant effect on liquidity, while production capacity and cost of production have positive but insignificant effect on liquidity. The coefficient of determination of this model shows that 3.25 per cent change in the in the liquidity of oil and gas companies can be explained cost of capital, production capacity, cost of production and research and development. This is confirmed by the Wald statistics which is 4.95 and the associated probability value of 0.2923 which is greater than 0.005. While for post- business process re-engineering, the finding showed that cost of production has negative but significant effect on liquidity and research and development has positive and significant effect on liquidity of the oil and gas companies. This implies that the post business process reengineering has effect on the liquidity of the oil and gas companies in Nigeria, all at 5% level of significance

Conclusion

In this sub-section summary of both the descriptive and empirical findings were presented. The preliminary statistics show that selected quoted oil and gas in Nigeria have periods of positive mean value for Business Process Reengineering (BPR) measures such as production capacity, cost of production, likewise financial stability components such as liquidity, profitability. All the study variables such as standard deviation within the periods covered was highly trending, it means that all the study variables were widely spread around the mean value of 0.0201893 and 8.399497

Recommendations

Many organizations in Nigeria need to reengineer their processes to improve their efficiency. This need does not go unnoticed by the employees and other stakeholders, but due to many innate and extraneous factors, they tend to resist change. Based on the findings, a number of recommendations were offered to address issues of Business Process Reengineering (BPR) on the financial stability of listed oil and gas companies in Nigeria.

- i. The study recommended that oil and gas companies should be more efficient by increasing production capacity for domestic needs. The refineries are performing less than expected capacity, although the federal Government has been rallying round to secure funding for the rehabilitation of these refineries. The new Dangote refinery coming on board later in 2020 will receive crude from Nigeria which also is expect to limit refined products importation in the nearest future. Hence, the need to increase production capacity cannot be overemphasized so as to cater for the new refinery vis-à-vis revenue generation from our crude oil exportation. Through reduced cost of production and capital and increase in investment on research and development, oil and gas companies' liquidity positions will be enhanced.
- ii. Managements of listed oil and gas companies in Nigeria need to focus on business re-engineering process to

improve their capital base. They may choose to go for more debt financing when the interest rate is considerably low, which will increase their liquidity assets. This is important because oil and gas companies have had serious problem with unstable financial performance in the past which led to collapse of many oil and gas companies in Nigeria.

- iii. Nigerian oil and gas companies' managers should tactically combine application of business re-engineering process in terms of production capacity, cost of production, cost of capital and research and development in order to enhance capital adequacy within oil and gas companies in Nigeria. Also, precautionary measures should be taken over firm size, proportion of shares held by institutions, and also pursuance of higher profit at the expense of the quality of reported earnings mission (Hassan and Faruok, 2014).

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