

*Full Length Research*

## Measuring Corporate Performance: A Statistical Approach

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Accepted 5 August 2015

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The study investigated the financial performance of some listed Oil and Gas entities in Nigerian Stock Exchange. Data was collected from their Annual Financial Report and was analyzed with Analysis of Variance, regression and correlation. The study established a negative trend in the performance of the tested Oil and Gas sectors in Nigeria. The developed (fitted) model for the trend of performance is  $Y = 13.504 + 0.002x_1 - 2.522x_2 - 0.001x_3$

**Keyword:** Conventional Performance, Measuring Corporate, Indicator, Financial Reports

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**Cite This Article As:** Iwuagwu CE, Nwosu MO (2015). Measuring Corporate Performance: A Statistical Approach. *Inter. J. Econ. Bus. Manage.* 3(3): 18-22.

### INTRODUCTION

Management and shareholders can be misled as a result of short coming in method being used to measure corporate performance.

An optimal measure of corporate performance that lead to maximization of profit should indicate the degree of effective success in allocating a firm limited resources and also related to the market value of the firm's capital because management decision and performance can be properly evaluated by stakeholders and prospective investors, through this means.

The conventional performance indicators being used by management and many investment analysts may be showing results that appear satisfactory, they merely camouflage interior performance.

The remedy is the adoption of a statistical indicator which avoids the shortcomings of the conventional ones. Due to the recent economic meltdown, a sharp fall on the price of crude oil and frequent devaluation of Nigeria currency (Naira), there is need to check the performance of the oil and gas companies in Nigeria. In Nigeria today, we have a large number of oil and gas companies but this study will select randomly five companies and compare and contrast their performance from 2009 to 2013 using data extracted from their Annual Financial Reports. The comparative work will enable us to see if these companies are still performing very well in Nigeria amid the above and other challenges facing oil and gas companies globally.

These selected companies have experienced amazing increases in its operational activities like exploration and exploitation and refining and marketing of the products. The exploration business has continued in resulting into environmental destruction due to neglect and limited concern by the multinational companies. This neglect has caused frequent destruction of the companies' pipelines, properties and kidnapping of its expatriates within and outside the host working areas.

## OBJECTIVES

This paper is aimed at the following:

1. To determine if there is any significant difference in the Return on Revenue, Return on Asset and working capital for the selected companies.
2. To determine the rate of increase in Return on Revenue, Return on Asset and working capital over the years.
3. To develop or fit a model for the future determination of Return on Revenue, Return on Asset and working capital

## METHODOLOGY

The data used in this research work was collected from the Annual Financial Report of five selected Oil and Gas companies in Nigeria. The data is a secondary data from 2009 to 2013, hence covering a period of five years.

## METHOD OF DATA ANALYSIS

This work uses Regression Analysis, Correlation Analysis, and Test of Homogeneity of Variances. The data were analyzed using SPSS-20.

### Return on Revenue

This is used measuring corporation's profitability that compares net income to revenue. Return on revenue is calculated by dividing net income by revenue.

$$\text{Return on Revenue} = \frac{\text{Net Income}}{\text{Revenue}}$$

A corporation's return on revenue is useful in comparing profitability from year to year and evaluating its profitability performance, by comparing the net income and the revenue. When ROR decreases, it may indicate that expenses are rising. Conversely, when ROR

increases, it may provide an indication that expenses are being handled efficiently. By reviewing ROR and changes to ROR values over time, a company's management can implement expense control measures where necessary. Since return on revenue does not take into consideration a company's assets and liabilities, it should be used in conjunction with other metrics when evaluating a company's financial performance and position.

### Return on Assets

An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. Sometimes this is referred to as "return on investment".

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

Some investors add interest expense back into net income when performing this calculation because they like to use operating returns before cost of borrowing.

### Working Capital

Working Capital is a measure of both company's efficiency and its short-term financial health. The working capital is calculated as:

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

If a company's current assets do not exceed its current liabilities, then it may run into trouble paying back creditors in the short term. The worst-case scenario is bankruptcy. A declining working capital ratio over a longer time period could also be a red flag that warrants further analysis.

### Current Ratio

Current Ratio also known as "liquidity ratio", "cash asset ratio" and "cash ratio".

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The current ratio is a liquidity and efficiency ratio that measures a firm's ability to pay off its short-term liabilities with its current assets. The current ratio is an important

measure of liquidity because short-term liabilities are due within the next year. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. While this shows the company is not in good financial health, it does not necessarily mean that it will go bankrupt - as there are many ways to access financing - but it is definitely not a good sign. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This means that a company has a limited amount of time in order to raise the funds to pay for these liabilities. Current assets like cash, cash equivalents, and marketable securities can easily be converted into cash in the short term. This means that companies with larger amounts of current assets will more easily be able to pay off current liabilities when they become due without having to sell off long-term, revenue generating assets.

### REGRESSION ANALYSIS

Regression analysis involves identifying the relationship between a dependent variable and one or more independent variables. A model of the relationship is hypothesized, and estimates of the parameter values are used to develop an estimated regression equation.

Regression parameters that give minimum error variance

$$\text{are: } y = b_0 + b_1x \quad , \quad b_0 = \bar{y} - b_1\bar{x} \quad ,$$

$$b_1 = \frac{n \cdot \sum XY - \sum X \cdot \sum Y}{n \cdot \sum X^2 - (\sum X)^2}$$

### CORRELATION ANALYSIS

Correlation is another way to determine how two variables are related. In addition of knowing whether variables are positively or inversely related, correlation also tells you the degree to which the variables tend to move together.

The correlation measurement, called a correlation coefficient, will always take on a value between 1 and - 1.

The quantity  $r$ , called the linear correlation coefficient, measures the strength and the direction of a linear relationship between two variables. The linear correlation coefficient is sometimes referred to as the Pearson product moment correlation coefficient. The mathematical formula for computing  $r$  is:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2 \cdot n(\sum y^2) - (\sum y)^2}}$$

Where  $n$  is the number of pairs of data. The value of  $r$  is such that  $-1 < r < +1$ . The + and - signs are used for positive linear correlations and negative linear correlations, respectively.

### ANALYSIS

**To test if there is any significance difference on the Return on Revenue among the selected oil and gas companies.**

#### Hypothesis

Ho: There is no significant difference in the Return on Revenue

H<sub>1</sub>: There is significant difference in the Return on Revenue

#### Test Statistic

From the data analysis with SPSS, the  $F_{\text{cal}} = 0.920$  and the P-value = 0.472

#### Critical Value

From the table, the tabulated value at 5% level of significance is 2.87

### CONCLUSION

Since the P-value of 0.472 is greater than 0.05, we do not reject the null hypothesis and conclude that there is no significance difference on the Return of Revenue among the selected Oil and Gas companies.

**To test if there is any significance difference in working capital among the selected Oil and Gas companies**

#### Hypothesis

Ho: There is no significant difference in the Working Capital

H<sub>1</sub>: There is significant difference in the Working Capital

#### Test Statistic

From the data analysis with SPSS, the  $F_{\text{cal}} = 0.238$  and the P-value = 0.914

### Critical Value

From the table, the tabulated value at 5% level of significance is 2.87

### Conclusion

Since the P-value of 0.914 is greater than 0.05, we do not reject the null hypothesis and conclude that there is no significance difference on the Working Capital among the selected Oil and Gas companies.

### To test if there is any significance difference on the Return on Asset among the selected oil and gas companies.

#### Hypothesis

Ho: There is no significant difference in the Return on Asset

H<sub>1</sub>: There is significant difference in the Return on Asset

#### Test Statistic

From the data analysis with SPSS, the  $F_{-cal} = 0.984$  and the P-value = 0.439

#### Critical Value

From the table, the tabulated value at 5% level of significance is 2.87

### Conclusion

Since the P-value of 0.439 is greater than 0.05, we do not reject the null hypothesis and conclude that there is no significance difference on the Return of Asset among the selected Oil and Gas companies.

### Model for the growth of Return on Revenue, Working Capital and Return on Asset

The estimated linear model is

$$Y = 13.504 + 0.002x_1 - 2.522x_2 - 0.001x_3$$

Where,

X<sub>1</sub> represent rate of growth on Return on Revenue

X<sub>2</sub> represent rate of growth on Working Capital

X<sub>3</sub> represent rate of growth on Return on Asset

### To test if there is any significance increase in the growth of Return on Revenue, Working Capital and Return on Asset

#### Hypothesis

Ho: There is no significant increase in the rate of growth of the three variables

H<sub>1</sub>: There is significant increase in the rate of growth of the three variables

#### Test Statistic

From the data analysis with SPSS, the  $F_{-cal} = 2.878$  and the P-value = 0.403

#### Critical Value

From the table, the tabulated value at 5% level of significance is 18.5

### Conclusion

Since the P-value of 0.403 is greater than 0.05, we do not reject the null hypothesis and conclude that there is no significance increase in the growth of the three variables, that is, the Return of Revenue, Working Capital and Return of Asset.

## DISCUSSION OF RESULTS

From the analysis, we observed that Return on Revenue increases by 0.002 and a decrease of -2.522 and -0.001 for Working Capital and Return on Asset respectively. If this position is not checked, it will put the Oil and Gas companies in the wrong direction.

The correlation coefficient ( $r$ ) = 0.947 and coefficient of determination ( $r^2$ ) = 0.896, therefore the correlation among the companies over the year is significant.

## FINDINGS

1. From the analysis with Analysis of Variance (ANOVA), it shows that there is no significant difference in the Return of Revenue, Working Capital and Return of Asset. The Oil and Gas companies are operating at almost the same level.
2. From the F-test, it indicated that there is no significant increase in the rate of growth of these companies in respect to the three variables tested.
3. It shows that Return on Revenue increased by 0.002, which is of no significant and the Working

Capital and Return on Asset decreases by 2.522 and 0.001 respectively.

4. The coefficient of determination ( $r^2$ ) is 0.896 indicating percentage of total variation explained.

## CONCLUSION

The analysis shows that these Oil and Gas companies are not in good position (financially), many of them are living on past glories and in long term, it may be unable to pay off its obligations and this may lead to bankrupting because the fitted model shows that, the companies are performing negatively as the year passes on.

## REFERENCES

- Ball, R. et al (2003). Incentives versus Standards: Properties of Accounting Income in Four East Asian Countries." *Journal of Accounting and Economics* 36: 235-270.
- Barth, M. E. (2007). Cost of Capital and Financial Statement Transparency. Working paper, Stanford University and University of North Carolina.
- Barth, M.E., et al (2008). International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, forthcoming.
- Benzacar, K. (2008), IFRS: the next accounting revolution, A publishing of CMA management June 2008
- Blanchette M. et al (2011). The Effects of IFRS on Financial Ratics, Early Evidence from Canada. A publication of Research and Standards, Certified General Accountants Association of Canada.
- Chen H. et al, (2010). The Role of International Financial Reporting Standards in Accounting Quality: Evidence from the European Union. *Journal of International Financial Management and Accounting* 21(3), 220-278
- EIA (2013). Overview of Nigerian Economy. U.S Energy Information Administration Report, October 16, 2012
- Garuba, O. A. (2011), The Challenges of Adopting International Financial Reporting System in Nigeria, *JORIND* 9(1), 313-319.
- Garuba A. O. & Donwa P. (2011). The Challenges Of Adopting International Financial Reporting System In Nigeria, *Jorind* (9)1 June, 2011. Issn 1596-8303
- KPMG (2012), Impact of IFRS: Mining, Energy and Natural Resources. KPMG international 2012
- Kunle, O. A. et al, (2011). Impact of International Reporting Standards on Insurance Management in Nigeria, *Middle Eastern Finances and Economics*. Euro Journal Publishing 2, 128 -142
- Lantto, A. M. and Sahlström, P. (2009). Impact of International Financial Reporting Standard Adoption on Key Financial Ratios. *Accounting and Finance* 49: 341-361.
- Omenikolo, I. A. and Amadi, R. O. (2010). Challenges Facing Nigerian Local Content In Oil And Gas Industry, Published by Wilolud Journals Continental J. Renewable Energy 1: 15 - 20, 2010
- PWC (2011), Similarities and Differences between IFRS and Nigerian GAAP. PricewaterhouseCoopers, February 2011.
- Singh R. & Newberry S. (2008). Corporate Government and International Financial Reporting Standards (IFRS), the Case of Developing Countries. *Research in Accounting in Emerging Economies*, 8, 483-518
- Tanko M. (2012). The Effects of IFRS adoption on the performance of firms in Nigeria. *Journal of administration and economic science* Qassim University, vol5, No 2, pp 133 – 157