

Accounting Ratios and False Financial Statements Detection: Evidence from Nigerian Quoted Companies

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Abstract

The broad objective of the study was to investigate accounting ratios and false financial statements detection. The study was a descriptive survey in design. This study employed pooled data from firms listed in the Nigerian Exchange Group PLC, covering a period of 5 years (2017-2021). A total of 239 firms quoted on the Nigerian Exchange constituted the population of the study. The study relied on secondary data. Historical data were obtained from the annual financial reports of accounts of 10 purposively sampled service sector firms. Data obtained were analysed using descriptive statistics, Pearson correlation and Pooled Data Binary logit regression analysis. The findings of the study revealed that profitability has a positive relationship with false Financial Statement detection. However, profitability and leverage ratios do not significantly relate to the probability of Financial Statement fraud occurrence. Based on the findings, it was recommended that the firm's financial managers should note with caution, the negative relationship between financial ratios and the firm's profitability. Hence, if the purpose of financial management is to improve fraudulent detection, then such efforts must be improved in using financial ratios to detect fraudulent financial reporting.

Keywords: Leverage, Profitability ratio, financial fraud, financial fraud detection, fraudulent financial fraud statement

Introduction

Financial reporting is the standard practice of giving stakeholders an accurate depiction of a company's finances, including revenues, expenses, profits, capital and cash flow. The difference between fraud and error is very clear. Error is considered to be an unintentional act while fraud is an intentional act. Financial statement fraud is defined as the deliberate misrepresentation of the financial condition of a corporate entity by intentionally misstating or omitting amounts or disclosures in the financial statement reports to deceive their users. In the view of the Association of Certified Fund Examiners in Sunday (2014), financial statement fraud is usually a means to an

end rather than an end itself. Financial statement fraud is a deliberate misstatement of material facts by management in the books of accounts of a company to deceive investors and creditors. This illegitimate task performed by management has a severe impact on the economy because it significantly dampens the confidence of investors. Alade and Emmanuel (2014) averred that the type of company notwithstanding, the frequency and percentage of financial statements that contain false information is quite high. Evidence abounds in reports that when people manipulate accounting books, they do so intending to fix problems that could prevent the company from meeting its expected earnings, complying with loan requirements, or even obtaining or renewing financing agreements that would not be granted or would be smaller if genuine and transparent financial statements were provided.

Although the number of fraudulent financial statements is small concerning the number of audits performed, cost-effective methods are needed to improve their detection and deterrence. Fraudulent financial statements can be detected and measured using financial ratios. Financial ratios consist of several types of financial ratios such as liquidity, profitability, capital turnover, and leverage as well as asset composition. Ratio analysis can identify and explain a company's financial strengths and weaknesses as well as changes in its long-term trends of financial position, results of operations and cash flows. The primary function of ratios is to act as indicators or red flags to point to areas of acceptable or unacceptable results or conditions. While these analytical procedures are well-known and widely used, there is a general lack of understanding of how they are properly applied and how much reliance should be placed on them. Research on detecting fraud in the fraudulent company's financial statements through a variety of methods has already been studied but the results obtained have not been entirely consistent. To obtain more consistent results, this study has the objective to test the methods that can be used in detecting false financial statements.

Statement of the Problem

There is evidence that the financial statement of some companies is fraudulent (Sunday, 2014). From downplaying losses to overinflating gains, the practice of overstating/understating financial reports covertly is becoming not just embarrassing, and misleading but also, is responsible for most company collapse. The question arises as to whether any accounting ratios can be used to identify which financial statements are fraudulent and which are not. Financial ratios are effective indicators of the Strengths, Weaknesses, Opportunities and Threats (SWOT) in a financial statement. Financial statements are prone to all sorts of manipulations and every manipulation which is out of tune with the standards of accounting amounts to fraud (Razae, 2002). Techniques of manipulation as identified by Green (2003) include abuse of the materiality principle, round-tripping, back-to-back and swaps, timing of adopting mandatory accounting standards and voluntary accounting changes. All of these manifest in fictitious or overstated revenue and assets reduction of expenses and liabilities and premature revenue recognition (Green, 2003). Magrath & Weld (2002) and Smith (2004) also identified misclassified revenue and assets, overvalued assets and undervalued expenses and liabilities, omitted liabilities and omitted or improper disclosures. In each of these cases, corporate governance is called to question. However, where certain ratios do not add up, financial statement fraud could be detected. Thus, this research seeks to fill this gap by using financial ratios to determine financial statement fraud.

Objectives of the study

The broad objective of the study is to investigate accounting ratios and false financial statements detection, while the specific objectives are to:

- 1) ascertain the extent to which leverage ratios relate to the probability of false financial statement

detection

2) determine the extent to which profitability ratios relate to the probability of false financial statement detection

Research questions

The following research questions were stated to guide the study:

1) What is the extent to which leverage ratios relate to the probability of false financial statement detection?

2) What is the extent to which profitability ratios relate to the probability of false financial statement detection?

Research Hypotheses

The following hypotheses guided the study:

Ho1: leverage ratios do not significantly relate to the probability of false financial statement detection

Ho2; profitability ratios do not significantly relate to the probability of financial statement fraud occurrence

Scope of the Study

This study is delimited to listed manufacturing companies on the Nigeria exchange group, with data obtained from the period of 2018-2021. The financial ratios studied were profitability and leverage ratios.

Literature Review

Fraudulent Financial Reporting

Fraudulent financial reporting (FFR) is a deliberate fraud committed by management that injures investors and creditors through misleading financial statements. In addition, FFR is described as a scheme designed to deceive, accomplished with fictitious documents and representations. We can conclude that such reports (Financial Statement reports prepared with the intention to deceive the users) are designed with the intention of fraud. Spathis (2002) defined FFR as a financial statement that contains falsifications of figures which do not represent the true scenario. The Association of Certified Fraud Examiners (ACFE) Defines FFR as “The intentional, deliberate, misstatement or omission of material facts, or accounting data to mislead and, when considered with the information made available and would cause the reader to alter his or her judgments in making a decision, usually concerning investments. This definition is important because it emphasizes the investor decision-making process which relies on the financial statements provided. In practice, a financial statement which includes manipulating elements which as overstating assets, sales and profit or understating liabilities, expenses, or losses, are often done to conceal a greater challenge faced by the firm. False Financial statements are offences which include materially misstated information reported in the financial statement.

Financial Ratios

A ratio is simply a mathematical expression of an amount or amounts in terms of others. A ratio may be expressed as a percentage, a fraction, or a stated comparison between two amounts. The computation of a ratio does not add any information not already existing in the amount or amounts under study. A useful ratio may be computed only when a significant relationship exists between two amounts. A ratio of two unrelated amounts is meaningless. It should be re-emphasized that a ratio by itself is useless, unless compared with the same ratio over some time and or a similar ratio for a different company and industry. Ratios focus attention on significant relationships, but the full interpretation of a ratio usually requires further investigation of the underlying data. Thus ratios are aids to analysis and interpretation and do not substitute for sound thinking. Financial ratios may be grouped into four basic categories: liquidity ratios, debt ratios, activity ratios, profitability ratios, and investment ratios (International Conference on Financial Criminology 2013).

Kaminski (1997) identified two principal uses of financial ratios. There is the traditional normative use of comparing a firm's ratio with a standard. There is also a positive use in estimating empirical relationships. Such relationships are then used for predictive purposes e.g. forecasting future financial variables and predicting corporate failure.

One group of studies focuses on the development of empirically-based classifications or taxonomies of financial ratios. Such studies are also concerned with removing ratio redundancy by identifying a small critical set of independent financial ratios which contain most of the information in a more extensive set of ratios. Another group of empirical studies utilizes ratios derived from the financial statements of failed and non-failed firms. The purposes of these studies are to obtain discriminant functions with the smallest classification error or logit functions with the best possible fit and to utilize such functions in the prediction of corporate failures. A third research direction is the behavioural aspects of decision-making using financial ratios (Kaminski, 1997).

As financial ratios are constructed from two accounting variables, the joint distribution will depend on the behaviour of both the numerator and the denominator and the relationship between these two coordinates. An implicit assumption of ratio analysis is that of proportionality. It is expected that a proportionate relationship exists between the two variables used in the calculation of the ratio.

Leverage Ratios and Probability of Financial Statement Fraud

Leverage indicates the percentage of funds used by creditors to finance company assets (Dewa, et al., 2020). Companies that have a high degree of leverage will be more careful in taking actions relating to these expenditures, including preventive measures and also carbon reduction. This happens because of the limited allocation of funds owned, companies are required to choose to use these funds to pay off all obligations or to make voluntary disclosures. In stakeholder theory, high leverage indicates the company's indebtedness to large creditors. Making a voluntary report means that it will add more costs it can add to the company's burden (Choi, et al., 2013).

The higher the financial leverage ratio, the higher the possibility that the company may commit fraudulent financial statements (Spathis, 2002). According to Dechow et al., (1996), companies with high debt tend to manipulate the income statement. Furthermore, companies with a high financial leverage ratio have a high risk of bankruptcy, because the company may be unable to pay

the interest on the loan (Zainudin & Hashim, 2016). Based on Zainudin & Hashim (2016) the formula for calculating financial leverage variables is as follows:

$$\text{Leverage (Debt ratio)} = \text{Total liabilities} / \text{Total Assets}$$

Profitability Ratios and Probability of Financial Statement Fraud

Profitability is a measure of the firm's ability to generate returns. The profitability ratio measures the efficiency of companies using their assets to generate net income as well as return on equity which focuses on return to the shareholders of a company. In a broader sense, profitability refers to the degree to which financial objectives as stated in the organizational vision and mission statements are being accomplished (Souha & Anis, 2016). It is the process of measuring the results of a firm's policies and operations in monetary terms. It is also a measure of a firm's financial status compared to similar firms across the same industry or to compare industries or sectors in aggregation (Mgeni & Nayak, 2016). The most common proxies for firm profitability are Return on Asset, Return on Equity, and Net Profit Margin.

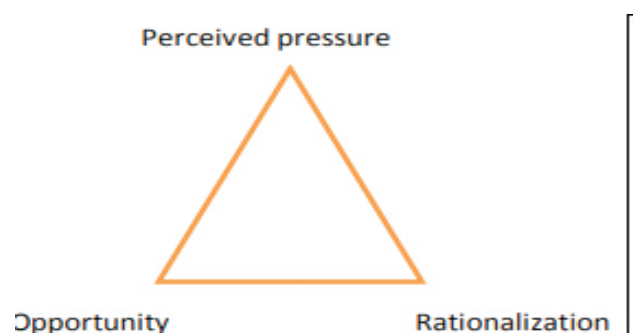
The profitability ratio is defined as the ratio usually used by the entity to compare the net income with the income of the company. According to Nia (2015), the profitability ratio is usually used to measure the capability of a company to generate profit. Substantiating further, Ilaboya, (2008) stated that profitability ratios measure a company's returns on its total investment. Lower profits may give management an incentive to overstate revenue or understate expenses. Kreutzfeldt & Wallace (1986), in Sunday (2014) discovered that firms with profitability problems are more likely to report more errors in their financial statement than firms without profitability problems. If this expectation is not met by actual performance, then it motivates financial statement falsification. According to the research conducted by Skousen & Wright (2008) using the financial stability variable with a proxy of sales to total asset ratio and sales to accounting receivable ratio, the profitability ratio has a positive relation in detecting fraud in companies.

Theoretical framework

Fraud Triangle Theory (FTT)

Cressey (1953) pioneered the development of the fraud triangle theory while studying the behaviour of inmates incarcerated as a result of alleged financial trust violations. The fraud triangle theory hypothesizes fraud as a function of pressure, opportunity and rationalization. People tend to engage in fraud when faced with the pressure of some sort when they feel that they can commit fraud without getting caught and when there is a way to justify their actions. These 3 pillars of FTT can also act as fraud drivers (Cressey, 1953)

Figure 1: Fraud drivers



Source (Cressey, 1953)

Pressure is a factor that sometimes makes managers engage in unethical actions. Types of pressures are financial and non-financial pressures. This pressure could be detected from the value of financial ratios such as profitability, leverage, and liquidity. Opportunity, the second pillar of fraud serves as the conduit between pressure and fraud. The opportunity to commit fraud might arise from a lack of internal control, inability to measure performance, lack of punishment against the fraudster, ignorance, lack of audit trail and lack of information. Opportunities can also be minimized with good-quality auditors.

Rationalization forms the last piece of the fraud triangle puzzle where the perpetrator tries to hang on to reasons that justify his/her actions. Cressey (1953) posits that the main reason individuals may try to rationalize fraud is when they believe that their actions are non-criminal or that the impact of their actions is minimal in comparison to the global financial position of their organization. This theory is related to the present study in that managers as agents of the company may, as a result of opportunity, pressure or rationalization engage in financial statement falsification.

Empirical Studies

Tomy & Bambang (2019) examined the relationship between financial ratio and financial statement fraud risk moderated by auditor quality. The population of the study consisted of manufacturing companies with published financial statements on the Indonesian Stock Exchange between 2016-2017. This study used purposive sampling and the study sample was 275 firms. The dependent variable used the financial statements fraud risk with the proxy Dechow F-score. The independent variable consisted of profitability with ROA ratio, leverage using the calculation of the ratio of total liabilities to total assets, and liquidity using the calculation of the ratio of total current assets to current liabilities. The moderating variable in the study was auditor quality as moderating variable with a dummy variable. The Hypothesis test conducted was the moderated regression analysis (MRA) and the results indicated that a financial statement's fraud risk is influenced by financial liquidity ratios, while financial ratios of profitability and leverage have not been proven to affect financial report fraud.

Serl (2020) examined the effect of financial ratios in detecting fraudulent companies listed on the Indonesia stock exchange. This study was meant to examine the effect of financial ratios in detecting fraudulent financial statements. The independent variable consisted of 5 variables: leverage, profitability, asset composition, liquidity and capital turnover. This study used the financial statements listed on the Indonesia Stock Exchange (IDX) as samples. The sampling technique used was purposive sampling, while the period range of the financial statements was 2014-2018 or the range of 5 years. The findings of the study showed that the variable of leverage, profitability and liquidity have a positive correlation effect to a fraudulent company. So the conclusion is that the higher the financial ratios, the higher the likelihood of indication that the management of a company will commit fraud.

Alade and Emmanuel (2014) investigated accounting ratios and false financial statements detection among firms quoted in the Nigerian Exchange Group plc. Accounting data were obtained from the reported financial statements of 30 sampled firms in the financial and non-financial sectors covering a time frame of five (5) years (2007-2011). The statistical instrument employed was Pooled Data Binary Logit regression. Data collected were run with E-Views 7 and SPSS 20. The findings revealed that investment and liquidity ratios were significantly related to financial statements fraud.

Methodology

The study was a descriptive survey in design. The study employed pooled data from firms listed in the Nigerian Exchange Group PLC, covering a period of 5 years (2017-2021). The firms investigated are those in the service sector companies listed in the Nigerian Exchange Group (NGX). A total of two hundred and nine (239) quoted firms constituted the population of the study (Fact book, 2021). The study relied on secondary sources for data collection. Historical data were obtained from the annual financial reports of accounts of 10 sampled firms.e

Model Specification and Method of Data Analysis

The model includes the following parameters:

$$Pr(FSA= 1, 0) = X_0 + X_1LEV; + X_2PROF; + E.$$

Where,

Pr (FSA) = Probability of Financial Statement fraud.

LEV; = Leverage ratio.

PROF; = Profitability ratio.

E; = Error term.

Variables	Proxy	Operation	Sign
Probability of false financial statement	FFS	Dichotomous variable	
Leverage ratio	LEV	Operationalized by Debt ratio $\frac{\text{liabilities}}{\text{assets}}$	+
Profitability ratio	PROF	Operationalized by Return on assets (ROA)	+

Data obtained were analyzed using the descriptive statistics, Pearson correlation and Pooled Data Binary logit regression analysis.

Analysis and Results

Table 1: Summary of descriptive statistics for variables in the study

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis	Std. Error
FFS	50	.00	1.00	.76	.43142	-1.256	-.443	.337
ROA	50	1.17	735.48	72.73	129.42	3.554	14.656	.337
LEV	50	.05	1.91	.652	.407	1.486	3.778	.337
Valid N (listwise)	50							

Table 1 shows the summary of the descriptive analysis of the variables. The result indicates that a false financial statement has dichotomous values of 0 and 1, with “1” representing companies with no case of fraud and 0 representing companies with cases of fraud. Return on asset (ROA) has minimum and maximum mean values of 1.17 and 735.48 respectively with a mean value of 72.73. The standard deviation is 129.42, indicating that the values are quite dispersed, confirming that different companies have different rates of ROA. Leverage (LEV) has minimum and maximum mean values of .05 and 1.91 respectively with a mean value of .652. The standard deviation is .407, indicating that the values are quite dispersed from the mean.

Table 2: Summary of correlation coefficients among variables

		FFS	ROA	LEV
FFS	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	50		
ROA	Pearson Correlation	.023	1	
	Sig. (2-tailed)	.872		
	N	50	50	
LEV	Pearson Correlation	-.156	-.060	1
	Sig. (2-tailed)	.280	.678	
	N	50	50	50

Table 2 gives the summary of the correlation matrix for the variables of false financial statement (FFS), leverage and profitability proxied by return on asset (ROA). The result shows that FFS is positively related to ROA, but not significant, while FFS is negatively related to LEV and not significant.

Table 3: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	53.950a	.023	.034

Table 4: ANOVA test

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	ROA	.002	.003	.017	1	.896	1.000
	LEV	-.832	.778	1.145	1	.285	.435
	Constant	1.696	.678	6.252	1	.012	5.452

a. Variable(s) entered on step 1: ROA, LEV.

Ho1: leverage ratios do not significantly relate to the probability of financial statement fraud occurrence.

Table 4 shows the summary of the logistics regression test for a significant relationship between leverage (LEV) and false financial statement (FFS). The result shows that leverage has a negative relationship with FFS and was not significant $p=0.285$ ($\beta=-.832$, $p>0.05.285$).

Ho2: profitability ratios do not significantly relate to the probability of Financial Statement fraud occurrence

Table 4 shows the summary of the logistics Regression test for a significant relationship between profitability (ROA) and false financial statement (FFS). The result shows that ROA has a positive relationship with FFS. Return on asset (ROA) on the other hand, has a Beta value of .002 and was not significant $p=0.896$ ($\beta=-.000$, $p>0.05.896$). The result is not significant ($\beta=0.00$, $p>0.05.896$).

For the overall model, the result also gives the Nagelkerke R Square of 0.034, indicating that 3.4% of changes in false financial statements are a result of the financial ratios. The overall model is statistically not significant, $\chi^2(2)=1.158$, $p>0.05.561$. Hence, there is no significant relationship between financial ratios and the probability of a false financial statement

Discussion of Findings

The result of the analysis shows that leverage has a negative relationship with FFS and was not significant. These results showed that leverage does not have a positive effect on the risk of financial statement fraud. This is in agreement with Tomy & Bambang (2019) who found that leverage using the calculation of the ratio of total liabilities to total assets has no significant effect on financial statement fraud detection. This finding is, however, in variance with Serl (2020) who established that leverage, profitability and liquidity have a positive correlation effect to a fraudulent company.

A further result of the analysis shows that ROA has a positive relationship with FFS. This implies that as ROA rises, it is easier to detect FFS. However, the result is not significant. This finding is consistent with that of Tomy & Bambang (2019) who found that profitability does not significantly influence financial statement fraud detection. This finding is further supported by Alade & Emmanuel (2014) who established that profitability influences account manipulation but was not significant.

Summary, Conclusion and Recommendations

Summary

The broad objective of the study was to investigate accounting ratios and false financial statements detection. The study was a descriptive survey in design. The study employed pooled data from firms listed in the Nigeria Exchange Group, covering a period of 4 years (2018-2021). The firms investigated were those in service the sector companies listed in NGX.

A total of two hundred and nine (239) firms quoted in the Nigerian Exchange Group Plc. constituted the population of the study. The study employed a secondary source of data collection. Historical data were obtained from the annual financial reports of accounts of 10 sampled firms. Data obtained were analyzed using descriptive statistics, Pearson correlation and Pooled data Binary logit regression analysis.

The findings are summarized as follows:

1. Leverage ratios do not significantly relate to the probability of financial statement fraud occurrence.
2. Profitability ratios do not significantly relate to the probability of financial statement fraud occurrence.
3. There is no significant relationship between financial ratios and the probability of false financial statements.

Conclusion

The research which was conducted on manufacturing companies in Nigeria for the period 2018-2021 showed that the financial statements' fraud probability is influenced by profitability ratios, while the financial ratio of leverage has not been proven to affect financial report fraud.

Recommendations

Based on the findings of the study, it is recommended that

1. The Firm's financial managers should note with caution the negative relationship between financial ratios and the firm's profitability. Hence, if the purpose of financial management is to improve fraudulent detection, then such efforts must be improved in using financial ratios to detect fraudulent financial reporting.
2. Auditors are expected to consider whether the information presented in the financial statements is relevant, reliable, comparable and understandable when forming an opinion on whether financial statements fairly present the financial position, results of operations and cash flows of an entity and are required to discuss their judgment about the quality of an entity's financial statements with the audit committee.

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Appendix
Summary of Data for Analysis

FFS	ROA	LEV
1	97.15	0.69
1	61.43	1.91
1	11.53	0.05
1	8.9	0.58
1	52.55	0.66
1	10.33	0.28
1	37.34	0.65
1	7.75	0.93
0	323.88	0.79
0	38.42	0.48
1	35.64	0.59
1	15.91	0.95
0	1.17	0.06
1	22.61	0.61
1	38.15	0.62
1	16.45	0.29
0	59.06	0.7
1	6.28	0.88
1	39.08	0.74
1	22.53	0.34
0	26.9	0.69
0	251.02	1.91
1	436.8	0.05
1	73.8	0.58
1	251.27	0.66
1	4.08	0.28
0	23.77	0.65
1	5.79	0.93
1	46.34	0.79
1	1.82	0.48
1	33.44	0.59
1	46.48	0.95
0	43.21	0.06
1	127.33	0.61
1	25.42	0.62
1	49.68	0.29
0	19.97	0.7
0	3.77	0.88

1	192.74	0.74
0	13.84	0.34
1	94.74	0.69
0	3.79	1.91
1	17.97	0.05
1	16.45	0.58
1	54.47	0.66
1	735.48	0.28
1	20.04	0.65
1	4.35	0.93
1	6.74	0.79
1	98.62	0.48

Efficiency in Public Service Delivery in Nigeria: Lessons for Theory and Practice in the Electric Power Sector

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Abstract

The recent concern on improving public service delivery in Nigeria provides an important lesson to advance efficiency in the power sector. The objective of this paper is to examine efficiency in power service delivery in Nigeria, Africa's largest economy. The methodology is based on an appraisal of efficiency indicator models (EIMs) which seeks to understand the current challenge of efficiency in power supply in Nigeria between 1999 to 2017. The model builds on the data envelopment analysis and qualitative data retrieved from national energy agencies by the International Energy Agency (IEA). The study examined three key indicators namely accountability, corruption and equitability in power distribution. Each indicator was specifically disaggregated to provide robust evidence. A direct field survey from a five-point Likert scale was also conducted. Findings suggest evidence of inefficiency in the power sector. In the alternative, the paper argues that reframing dominant practices on power delivery service is critical and made some recommendations.

Keywords; Public Service Delivery, Efficiency, Accountability, Power Sector,

Introduction

At the turn of the century, the question of improving public service delivery becomes a growing concern in public administration (Denhardt, 1999; Lorde, Waithe, Francis 2010). This centres largely on efficiency in public service delivery particularly in most developing societies (Lee, 2008; Grandy, 2009; Bulecaa & Murab, 2014). Public service delivery in the power sector is important in Nigeria as Nigeria's Power Baseline Report (2015) reveals, Nigeria is the biggest economy in Africa, with a GDP of USD569 billion (2014). However, its power sector performs poorly. More than half of the population (55%) has no access to grid-connected electricity those connected to the grid experience extensive power outages (PBR, 2015). The sector accounts for over 78% of total economic activities in the country (NBS, 2017).

Electric power emerged as a public service sector in Nigeria in 1898 under the colonial administration which set up the foremost generating plant with the Public Works Department (PWD) (Okoro & Chikuni, 2007; Awosope, 2014). In 1950 a colonial ordinance established the Electricity Corporation of Nigeria (ECN) responsible for generating, distributing and transmission of electricity. At independence in 1960 much emphasis was laid on improving the Dams in Nigeria for enhanced power provision. This resulted in the setting up of Niger Dam Authority through an act of parliament in 1962. The Act provided for the construction and maintenance of dams and the generation of electricity through water power.