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Capital Adequacy A Moderating Effect of Asset Growth on Performance of Nigerian Agricultural Firms

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Abstract

This study examines capital adequacy and the moderating impact of asset growth on the performance of firms in the agricultural sector. 4 listed agricultural firms were examined over a period of 10 years and data were extracted from their financial statements which were analyzed through a STATA 13 tool of analysis. Regression, correlation matrix and descriptive methods of analysis were employed to present and analyze results. Other post estimation tests like skewness and kurtosis test, Variance Inflation Factor test, specification test, heteroskedasticity tests and hausman test to select between fixed effect and random effect regression model were conducted to ensure robustness of results. The fixed effect stochastic longitudinal regression analysis model was adopted as guided by the hausman test. From the findings posited by the study, liquidity structure, liquidity structure moderated by asset growth and the combined effect of firm size moderated by asset growth were found to be significantly impacting on return on asset of firms at 1% level of significance. Firm size was found not to have any significant impact on return on assets. It was therefore recommended that the management should ensure considerable excess of current assets over current liabilities at all times so that there will always be positive liquidity structure; management should ensure consistent and prudent capital acquisition to ensure larger firm size; management should ensure steady asset growth by asset revaluation and new acquisition over time; the regulatory authority in the agricultural sector should establish a firm size benchmark below which no firm should operate.

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Introduction

Capital adequacy is seen as the level of capital necessary for a firm as determined by the regulatory and supervisory authorities to assume the firm's financial health and soundness. Capital adequacy, the measure of the solvency of a firm, tells whether a firm has enough capital to support the risks in its balance sheet. Adequate capitalization is an important variable in business, and is more so in the business of using other peoples' money such as agricultural firms. According to Onoh (2002), a firm capital fund is considered adequate if it is enough to cover the banks operational expenses and satisfy customers with dual needs and protect depositors against total or partial loss of deposits in the event of liquidation or loss sustained by the firm. Wall (1989) posited that firms faced with tougher capital standards may take on more risk in other aspect of their operations in order to keep from earning lower returns. Graham (1985) emphasizes that, if depositors are going to grow, capital must grow alongside. He affirmed that management disciplines have an effect on capital. In this view, capital constraint helps to avoid over-trading and curbs malpractice by management. Gardener (1989) is of the opinion that prudential guidelines of capital adequacy system have an important effect on firm capital profitability and efficiency. As suggested by Ebhodaghe (1996), capital inadequacy is a strong indicator of distress situation in any business. It is a contending issue that has affected Nigerian manufacturing firms and the banking system in the past years before recapitalization policy in December, 1996. Ndifon & Ubana (2014) suggested that the issue of capital adequacy is of more interest in the banking industry because the banking industry is considered the back bone of every economy owing to the fact that it forms the financial threshold of every economy. They went further to opine that on the aspect of manufacturing firms, there is liberty of operation with regards to capital adequacy based on the financial strength of individual manufacturing firms and its ability to withstand competition in the sector. This is considered the reason why the listed agricultural firms are very few in that the small capital based firms find it difficult to strive and withstand competition because right from the inception of a firm there is no regulated and standardized capital base required and as such, sustainability becomes difficult for companies that starts afresh. Satryo, Rokhmania, and Diptyana, (2016) study demonstrated the efficacy and the influence of capital structure on the LQ45 index of the Indonesian stock exchange of listed firms with regards to their profitability ratio, market ratio, and solvency ratio. Ogodor & Mukolu (2015) posited that capital adequacy performs many functions in a firm: it determines and affects the level of performance of firms, for example, capital serves as a cushion for operational loss absorption; it creates shareholders' confidence in the firm, it exposes the firm's ability to finance its long term projects and capital expenditure. To crown it all, the existence of adequate capital also helps to minimize investors' risk and improve performance. Hence, this study intends to evaluate capital adequacy and its resultant impact on banks performance considering the impact of asset growth as a moderating variable on all the independent variables on firms' performance. In another related perspective Akingunola, Olawale, & Olaniyan, (2018) performed their study in Nigeria with a focus on of 22 listed non-banks firms on the Nigerian stock exchange and shade light on its negative effect on debt owners. Musah (2018) provided evidence in Ghana how 17 listed banks apply capital structuring as a necessary tool in their bid to steer through their businesses given the turbulence operative environment. [1-10]

This research paper examines the determinants of capital adequacy in relation to performance of agricultural firms in Nigeria and also considering the moderating impact of asset growth on capital adequacy as it affects the performance of firms in the Nigerian agricultural sector. Although studies have been conducted on the subject matter, very few or no studies, to the best of the researcher's knowledge, have taken into consideration the moderating impact of asset growth as it relates to capital adequacy in influencing the performance of agricultural firms in Nigeria. This study will also dwell on period gap in extracting data of most recent times in order to make the results and analysis most current. As noticed by the researcher from the review of literatures, most studies conducted in Nigeria often neglect the agricultural sector and this has become a domain gap as one of the gaps that this study intends to address. The inclusion of asset growth as a moderating variable was considered appropriate due to

the fact that a firm could possible attain adequacy in terms of its capital within a particular accounting period but there is a likelihood that if the adequacy is not maintained and sustained over time, then there will be a problem with the capital. Thus, the sustainability and maintenance of firms' capital is measured in growth of asset and this is why the researcher considered using asset growth to moderate the impact of capital adequacy on performance of agricultural firms.

The major objective of this study is to examine the impact of capital adequacy and the moderating effect of asset growth on the performance of firms in the Nigerian agricultural firms. Specifically, the study set to achieve the following objectives:

To determine the effect of liquidity structure on ROA of listed agricultural firms in Nigeria.

To evaluate the impact of firm size on ROA of listed agricultural firms in Nigeria.

To examine the combined effect of liquidity structure and asset growth on ROA of listed agricultural firms in Nigeria.

To determine the combined impact of firm size and asset growth on ROA of listed agricultural firms in Nigeria.

In line with the objectives of this study, the hypotheses of the study are stated in null form;

H_{O1} Liquidity structure has no significant impact on ROA of listed agricultural firms in Nigeria.

H_{O2} Firm size has no significant impact on ROA of listed agricultural firms in Nigeria.

H_{O3} The combined result of liquidity structure and asset growth has no significant impact on ROA of listed agricultural firms in Nigeria.

H_{O4} The combined result of firm size and asset growth has no significant impact on ROA of listed agricultural firms in Nigeria.

This case study opens practical and theoretical rooms for information that will help the government, public, foreign investors and private/corporate business owners in the agricultural sector and other sectors in Nigeria and abroad, in taking decisions that are reliable by implementing the results of this study with reference to the variables as highlighted in the objectives and hypothesis statements. This study is also expected to add to knowledge in terms of reference material for future research, theoretical and practical implementation of result findings by various but relevant stakeholders. This article is structured into five sections. Section one is the introduction, section two examines the conceptual framework and literature review, section three centers on the research methods, section four is the results and discussion while section five comprise of conclusion and recommendations.

Review of Empirical Previous Studies

This section critically reviewed previous results of studies on capital adequacy and performance of firms in the manufacturing sector alongside the banking sector. This review is expected to provide us with a blue print on what has been studied, how the studies were conducted and where those studies were conducted as well as what need to be complemented that is, where need be for further studies of presupposition of variant results if such studies were carried out differently.

Research has been carried out in recent years on the issues of whether the private market place or government regulatory agencies exert influence on firms risk taken and on firms' capital decisions. However, government regulation appears to have become important with the strengthening of capital regulations and the imposition of minimum capital requirements, especially in the banking sector. The financial markets do seem to react to the differential risk positions of firms by downgrading the debt and equity securities offered by the riskier banking sector in contrast to the agricultural sector of the Nigerian economy. However, as Eisenbeis & Gilbert (1985) stated, 'we are not at all sure whether markets discipline works well for small and medium - sized firms, whose securities are not as actively traded in open market nor is it clear that the risk premium imposed by the market on lower-quality firms securities (in the form of lower price and higher interest rates) are really large enough to discipline firms' business activities'. Also, while the market may make efficient use of all the information it possesses, some of the most vital information needed to assess a firm's true level of risk exposure is hidden from the market and is known only to firm examiners. Is a firm's capital-to-assets ratio significantly related to its probability of failure? Most research studies find little connection between capital ratios and the incidence of

firm failure. For example, Santemero & Vinso (1977) found that increased capital does not materially lower a firm's failure risk. [11, 12]

A study conducted by Onaolapo, Obasan & Soyebo (2012) on a qualitative analysis of the impact of capital adequacy on managerial effectiveness: a case study of selected insurance firms in Nigeria, employed the use of descriptive analysis, regression and the Pearson correlation coefficient to run the data extracted from 100 staff of selected insurance companies in Nigeria. The study revealed that capital is an essential tool in business formation and continuity which prompts the realization of business objectives while its insufficiency could preempt organizational goal realization in the insurance industry with a correlation value of 0.584 indicating the existence of a positive relationship between capital adequacy and managerial effectiveness. It was therefore recommended that in order to attract and enjoy the potential opportunities offered by the provision of adequate capital in the insurance industry, operators must come to terms on the overall size of capital requirement as a basis for creating a supportive and enabling business support system that fosters management culture, performance and practice. The study was conducted in the insurance industry which is quite different from the agricultural sector in many aspects and also, the variables employed are different from the intended variables to be used for the purpose of this study therefore, obtaining a different result should not be far from expectation. Also, this study set to include a moderating variable which is quite unusual from previous studies and this is also expected to produce a result which could be similar or dissimilar. The study also, was conducted in 2012 where as this study will extend the period to 2016 and this is expected to cover some period gaps which are expected to have been overtaken by technological, managerial and operational advancements or structural changes. [13, 14, 15]

Olarewaju (2015) evaluated capital base and operational efficiency in Nigerian deposit money banks (evidence from a two-way fixed effect approach) using debt to total equity, core capital ratio, equity to total assets and bank risk to represent capital base on operational efficiency. His findings showed that core capital ratio significantly impact on banks operational efficiency, debt to total equity and bank risk had negative significance on banks operational efficiency, whereas equity to total assets had no significance on the operational efficiency of banks in Nigeria. The study was conducted on a number of five banks within 2004 to 2013. However, it is possible that the result obtained would have varied if it was conducted on the manufacturing sector employing more variables. Again, the study was conducted in the year 2013 therefore, the period gap between 2013 and 2016 which might have been overtaken by changes in technology, changes in managerial structure, government policies and environmental factors surrounding the banking industry are likely to alter the results and particularly that this study set to address the agricultural sector. [16, 17]

Sharma, Raina & Singh (2012) made use of panel data through stochastic frontier analysis model to measure the source of technical efficiency of Indian banking sector. The major determinant of technical efficiency as revealed by the study are fixed asset, deposit and deposit to total liabilities while the cash deposit ratio was significant. More also, the study was conducted in India, which has varying features compared to Nigeria in terms of population, operational system and level of development. [18]

A study on the determinants of operating efficiency conducted in Egypt banking sector, Armar, Mustapha & Eldomiaty (2011) found asset quality, capital adequacy, credit risk and liquidity as the main determinants of efficiency in the highly competitive banks. Presumably, the operational system, size, location, culture and managerial attitudes might likely not be the major determinants of operating efficiency in Nigeria due to dissimilarities in the aforementioned. [19]

Djahlilor & Piesse (2006) employed non parametric approach of measuring efficiency by focusing on total factor productivity in the measurement of the determinant of efficiency in the central Asian banks between 2003 to 2006. Their study revealed that the majority of the banking organizations are efficient and that the inefficiency observed in some of the central Asian banks are traceable to low capital adequacy, poor asset quality and low profitability. It is however expected that a different result would be obtained if same study was conducted on the agricultural sector

and if a moderating variable was introduced to moderate the impact of such relationship. [20]

In the study of Agbeja, Adelakun & Olufemi (2015), capital adequacy ratio and bank profitability in Nigeria using a linear approach was examined. Secondary data extracted from five commercial banks within a period of five years were analyzed using regression analysis and the result obtained revealed that there is a positive and significant relationship between capital adequacy and bank's profitability which suggested that banks with more equity capital are perceived to have more safety and such advantage can be translated into higher profitability. The recommendations proffered were that there should be a constant review of minimum capital requirement of deposit, money banks in Nigeria to the optimal level and Nigeria banks should be capitalized to enable them get access to cheaper sources of funds with subsequent improvements in profit levels. The study failed to break down the concept of capital adequacy into various proportions which would have given a better and specific understanding of variables. Arguably, a linear approach may be considered less robust and ineffective in capturing the complex nature of capital adequacy in explicit terms. Also, if the study was conducted in a developed country, using a different method/technique of analysis and a larger sample size, there is the likelihood of obtaining a different result. [21]

The studies of Olarewaju (2015) and Agbeja, Adelakun & Olufemi (2015) were conducted in Nigeria and both studies revealed positive significance between capital adequacy and operational efficiency of banks. The latter study used linear approach and analyzed capital adequacy in its lonesome without extracting variables from the concept while the former study used different variables to represent the concept of capital adequacy out of which some were found to be positively significant, others were found to be negatively significant and the rest of the variables were found to be insignificant. Both studies also employed the use of various techniques and this could be one of the reasons for the variation in their results regardless of the fact that both studies were conducted in the same banking industry. Considering the difference existing different sectors of the economy, it should the banking industry has very dissimilar features as compared to the agricultural sector which this study intends to address. [22]

Studies carried out in India, Egypt and Central Asia by Sharma, Raina & Singh (2012); Armar, Mustapha & Eldomiaty (2011); Djahlilor & Piesse (2006) respectively, revealed mixed findings with respect to capital adequacy and operational efficiency as a performance measure in the banking industry. The mixed findings can be attributed to the fact that all studies were conducted in different countries with different government policies, managerial structure and operational methods. From the literatures sourced, obtained and reviewed, it was found out that very little studies were carried out in the manufacturing sector, especially the agricultural sector and this is the reason why there are very few literatures on the manufacturing sector. This study, therefore, will provide empirical literatures on the agricultural sector for future and further studies. [23]

The Modigliani-Miller irrelevance theorem (M & M theory, 1958) is known to be the basis for all other theories on capital. The theory opines that a firm's financing decision has no significant effect on its value, that it is irrelevant. This could mean that the value of the firm is determined by the income generated by its assets' composition, and not by how the assets are being financed or how the income from the asset utilization is derived. This theory could only be applied in the perfect world, that is, where there is asymmetric information, no taxation, no bankruptcy costs, no transaction costs, there is equivalence in borrowing cost for companies and investors, presence of perfect competition, no agency costs and no effect of debt on firms' earnings and lots more. Owing to these assumptions, the theory is considered not viable, but because it links to other numerous theories and the theory adopted for the purpose of this study is the reason why it was captured in this study.

For the purpose of this study and in line with reality, the Regulatory and Efficient Market-Monitoring Theory was adopted. This was introduced by Fama (1965) but got more elaboration by same Fama in 1970. It states that regulators encourage firms and banks to increase their capital to measure up with the amount of risk taken by such groups of firms. This may be achieved through efficient market monitoring mechanisms that will call for an increase in capital when capital positions

are deemed inadequate. Thus, an important factor contributing to a positive relationship between capital adequacy and banks efficiency relates to the behaviors of regulators and supervisors. The thrust behind adopting this theory revolves round the fact that the dependent and independent variables representing capital adequacy and performance are explicit in this theory.

Methodology and Model Specification

The Study used correlational research design. The population for the study consists of the entire firms in the agricultural sector in Nigeria, and the arrival at the sample size circumscribed round the fact all firms that have their annual reports published and available/ accessible for use during the period under review and also are listed on the Nigerian Stock Exchange Market for the complete period are selected and sampled for use. With this, 4 firms producing agricultural products were arrived at as the sample size. The study will cover a period of ten years starting from 2007 till 2016. Secondary data were extracted from annual report of concerned firms. The techniques for data analysis were longitudinal balanced panel regression analysis, descriptive statistics and correlation matrix and a number of reliability and validity test such as heteroskedasticity test, multi-collinearity test and normality test are expected to be carried out so that an appropriate regression method will be employed.

The model 1 for the study which captured all the four independent and one dependent variable is specified thus:

$$ROA_{it} = \beta0 + \beta1\ LS_{it} + \beta2\ FS_{it} + \beta3\ AG_{it} + \beta4\ LS \times AG\ it + \beta5\ FS \times AG_{it} + e \ldots\ldots\ldots (1)$$

Where: ROA = Return on Assets

β0 = Constant

β1 and β2 = Coefficients of Independent variables 1 and 2

β3 = Coefficient of moderating variable 3

β4 and β5 = Coefficient of moderated variables 4 and 5

LS = Liquidity structure

FS = Firm Size

AG = Moderating variable as Asset Growth

LS x AG = The moderation of Liquidity Structure by Asset Growth

FS x AG = The moderation of Firm Size by Asset Growth

it = Represents panel data (a combination of time series and cross sectional data)

e = error term

The variables of the study were measured in accordance to variable measurement by previous researchers who employed same variables for their studies. Thus, the variables for this study are measured as follows:

Result and Discussions

This section presents, interprets and discuss the results obtained from the data generated from annual report and accounts of listed agricultural firms in Nigeria for the period of the study. The data was analyzed using descriptive statistics, correlation matrix and regression analysis after a series of reliability and validity tests of the dependent and independent variables. The descriptive statistics explains the various statistics such as minimum, maximum, mean, standard deviation, kurtosis and skewness of variables in this study. The correlation matrix showed us the relationship between all independent variables and the dependent variable and also the relationship existing among independent variables themselves. The regression analysis presents the result of the study.

Table 1 above revealed a return on asset-ROA mean value of 0.1142, standard deviation value of 0.1264, minimum value of -0.11 and a maximum value of 0.44. This suggest that on the performance measure of the dependent variable, some firms in the agricultural sector incurred losses which was represented by a negative minimum value and also, the standard deviation value is not farther away from the average mean value of the performance statistics. Therefore, we can conclude statistically from the above data that the performance data of return on assets are normal and statistically in order.

Observing the independent variables from same table 1 above, it could be lucidly noticed that the combined result of liquidity structure and assets growth-LSAG posited the least minimum value of -6.97 while the combined result of firm size and assets growth-FSAG revealed the highest maximum value of

Table 1.

	Variable Name	**Measurement Parameter**	**Sources**
1	Return on Assets (ROA)	ROA= Profit before interest and tax / Total Assets	Onaolapo & Kajola, 2010; Chuke, Idam & Sergius (2016)
2	Liquidity Structure (LS)	LS= Current Assets – Current Liabilities / Current Assets	Mbizi, R. (2012); Djalilov. K. & Piesse, J. (2006).
3	Firm Size (FS)	FS= Log of Total Assets	Fama, E. F. (1965); Kleff, V.,& Weber, M. (2008).
4	Asset Growth (AG: Moderating Variable)	AG = Current year TA – Prev. year's TA / Prev.(Previous) year's TA	Sharma, Raina & Singh (2012)
5	Liquidity Structure Asset Growth (LSAG)	LSAG = LS * Current year TA – Prev. year's TA / Prev.(Previous) year's TA	
6	Firm Size Asset Growth (FSAG)	FSAG = FS * Current year's TA – Prev. year's TA / Prev. year's TA	

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
roa	40	11425	264077	-.11	44
ls	40	5.17275	1.808503	0	6.97
fs	40	6.78275	4789999	6.01	7.89
lsag	40	52275	2.390332	-6.97	7.15
fsag	40	1.0865	3.519686	-7.89	14.91

14.91 and this could be attributed to the availability of extreme values in the data distribution within the same period of study. Observably also, firm size-FS was seen to have the maximum mean value of 6.782 and the standard deviation of all the independent variables were seen not to be very farther from the mean values. Therefore, it could be concluded that the statistical distribution of data for the study is normal and in order.

Table 2 above depicts a positive relationship between three independent variables (LS, FS and FSAG) with firm size having the highest positive relationship of 0.351 amongst the three. This connotes that the three aforementioned variables are positively influencing performance of agricultural firms within the period under review. However, the combined result of liquidity structure and asset growth-LSAG showed a negative influence on performance. It would be too quick to conclude whether the negative relationship mean a negative impact as that could only be discovered with the help of the regression result which determines the degree of impact between all independent variables and dependent variable.

As observed from the same table 2 above, the collective relationships amongst all independent variables themselves is seen to be at a moderate level which is neither too weak nor too strong. It also revealed a mixture of negative and positive relationship amongst independent variables themselves within the period under review. From the exposition of relationships amongst all independent variables which is neither too weak nor too strong, it could therefore be concluded that there is absence of multi-collinearity which means that the data is free from error and all independent variables could be specified and studied together under the same model.

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 7.90

Prob>chi2 = 0.0954

(V_b-V_B is not positive definite)

Source: STATA 13 Output, 2017

Table 1.3 above is the presentation of hausman test which is the yardstick or basis for selection of the appropriate technique for analysis. Considering the null hypothesis of hausman test which state that difference in coefficients not systematic, the standard for selection according to Guajarati is that when the result for hausman test is significant, then we report and analyze fixed effect whereas when the hausman test result is insignificant, we therefore report random effect result for analysis. Considering the hausman prob value of 0.0954 from table 1.3 above, we therefore conclude that the test is significant which imply that we report fixed effect regression model for analysis.

In determining the authenticity and correctness of the model, table 4 above revealed an F value of 4.63 and an F probability value of 0.0046 with a corresponding R squared value of 0.3666. A model is considered fit when it has an F value of 2 and above and from the available result, we could conclude by saying that the model is fit and significant at 1% level of significance. The adjusted R squared value of 0.3666 suggest that all the four independent variables are collectively impacting on performance at 36.6% which means that the remaining 63.4% is influenced by other variables not captured in this study.

Table 4 reveals a liquidity structure coefficient value of 0.037, a t value of 3.95 and a corresponding p value 0.000. This implies that liquidity structure has positive significant impact on the performance of agricultural firms in Nigeria. This also opines that any ₦1 increase in liquidity structure will bring about a corresponding significant increase on the performance of firms in the Nigerian agricultural sector by ₦ 3. The result is not surprising as it coincides or aligns with the priori expectation of the researcher. The result also is in line with the Regulatory and Efficient Market theory which was used to anchor the relationship between capital adequacy and the performance of agricultural firms in Nigeria. This is obtainable in the real world as it is expected that firms with solid liquidity structure will do well by judiciously utilizing available excess of liquid funds for investment out of which good returns are expected to boost the performance of such firms. The findings of this study is in line with the findings of Eisenbeis and Gilbert (1985), Sharma, Raina & Singh (2012) and Agbeja, Adelakun & Olufemi (2015) but contradicts the findings of Djahlilor & Piesse (2006),

Table 2. Correlation Matrix

	roa	ls	fs	lsag	fsag
roa	1.0000				
ls	0.0579	1.0000			
fs	0.3510	-0.0598	1.0000		
lsag	-0.0488	-0.0231	-0.2677	1.0000	
fsag	0.1309	-0.3826	-0.1393	0.7429	1.0000

Table 3. Hausman Test

	Coefficients		(b-B)	sqrt(diag(V_b-V_B))S.E.	
	(b) fe	(B) re	Difference		
ls	.0379419	.0198469	.018095		
fs	-.000114	.0919309	-.0920448	.0051933	
lsag	-.0290258	-.0192341	-.0097917		
fsag	.0252421	.0200487	.0051933		

Table 4. Fixed Effect Regression Analysis

roa	Coef	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ls	.0379419	.0096132	3.95	0.000	.0183603	.0575234
fs	-.000114	.049367	-0.00	0.998	-.1006712	.1004433
lsag	-.0290258	.0095081	-3.05	0.005	-.0483931	-.0096585
fsag	.0252421	.0071478	3.53	0.001	.0106825	.0398016
cons	-.0934932	.3308498	-0.28	0.779	-.7674121	.5804258

Sharma, Raina & Singh (2012) and Agbeja, Adelakun & Olufemi (2015). This result provides us with the basis of rejecting the null hypothesis which states that liquidity structure has no significant impact on the performance of firms in the Nigerian agricultural sector.

Firm size as revealed by table 4 above had a coefficient value of -0.0001, a t value of -0.00 and a corresponding p value of 0.998. This connotes that firm size no significant impact on return on asset of firms in the agricultural. This also implies that any increase or decrease in firm size will result to no change on the performance of agricultural firms in Nigeria. The result of this study contradicts the priori expectation of the researcher. The result also deviates from the Regulatory and Efficient market theory which underpinned the relationship between the capital adequacy and the performance of agricultural firms in Nigeria. This is also a deviation from reality as it is expected that increase in firm size which is measured as increase in asset value will mean availability of more current and non-current assets which is logically expected to boost the performance of firms in the Nigerian agricultural sector. The findings of this study agrees with the findings of Djahlilor & Piesse (2006), Sharma, Raina & Singh (2012) and Agbeja, Adelakun & Olufemi (2015), and contrary to the findings of Armar, Mustapha & Eldomiaty (2011), Sharma, Raina & Singh (2012) and Olarewaju (2015). The findings of this study provides us with the basis of failing to reject the null hypothesis which states that firm size has no significant impact on the performance of agricultural firms in Nigeria.

The combined result of liquidity structure and asset growth as seen from table 4 above has a coefficient value of -0.029, a t value of -3.05 and a p value of 0.005. This implies that liquidity structure moderated by asset growth has negative significant impact on the performance of firms in the Nigerian agricultural sector. The result also suggests that any increase on liquidity structure combined with asset growth will result to a decrease on the performance of firms in the agricultural sector. For us to increase or impact positively on performance, we therefore reduce liquidity structure as moderated by asset growth. The result of this study agrees with the priori expectation of the researcher. However, the result of the study is in line with the Regulatory and Efficient market theory which anchored the relationship between capital adequacy and the performance of firms in the agricultural sector. In reality, this result seems to be a confirmation of what is obtainable in the real world as growth in assets is expected to add up to capital formation which will in turn impact positively and significantly on performance of firms even though it is a negative impact, the positive impact of liquidity structure without moderation of asset growth has been established. The findings of this study provides us with the basis of rejecting the null hypothesis which states that liquidity structure moderated by asset growth has no significant impact on the performance of firms in the agricultural sector.

Firm size asset growth collectively posited a coefficient value of 0.0252, t value of 3.52 and a p value of 0.001. This implies that firm size asset growth has a significant positive impact on the performance of firms in the agricultural sector at 1% level of significance. This suggests that for every increase on firm size as moderated by asset growth, there will be a corresponding significant increase on the performance of agricultural firms in Nigeria. The result of this study is not surprising as it conforms to the priori expectation of the researcher. The finding is in line with the Regulatory and Efficient market theory which underpinned the relationship between capital adequacy and the performance of listed agricultural firms in Nigeria. The findings of this variable agrees to reality as the size of a firm when moderated with the considerable growth of such firm has a big role to play in impacting on the performance of such a firm. Even though the findings of firm size without moderation by asset growth suggested a non-significant impact, this could be as a result of other factors such as agricultural sector regulatory policies of capital base. The findings of this study provides us with the basis of rejecting the null hypothesis which states that firm size moderated by asset growth has no significant impact on the performance of agricultural firms in Nigeria. Consequently, this means that firms that grow in terms of capital base enjoy the benefits of increasing its return on asset especially with good managerial involvement.

Conclusion and Recommendations

This article examined the impact of capital adequacy and the moderating impact of asset growth on

the performance of listed agricultural firms in Nigeria. Data was collected from a sample of four firms for a period of ten years and run through Ordinary Least Square (OLS) regression analysis using STATA 13 tool for analysis. The four variables studied are therefore concluded as follows:

Liquidity structure has significant impact on the performance of agricultural firms and as such, increase in liquidity structure will mean significant increase on performance.

Firm size has no significant impact on the performance of agricultural firms in Nigeria and as such, any increase or decrease will mean no impact on performance.

Liquidity structure and the moderating result of asset growth had negative significant impact on the performance of agricultural firms in Nigeria.

Firm size as moderated by asset growth was found to have positive significant impact on the performance of firms in the agricultural sector at 1% level of significance.

Owing to the findings posited by this study, it was recommended as follows:

In order to sustain a positive significant impact of liquidity structure on performance, management of agricultural firms should endeavor to always have current assets at least twice the size of current liabilities or have short term debts to be very minimum as it was noticed from the data extracted by the researcher that there were too much short term debt some of which were even more than current liabilities and this will undoubtedly drain the liquidity structure of firms which will result to non-impact on performance.

The regulatory agencies of agricultural firms and their respective board of directors should always ensure that larger firm sizes are maintained by capital acquisition and proper investment of funds in order to maintain significant and positive impact because the firm size or asset base of most of the agricultural firms is not encouraging as seen from their financial statements.

There should be policies enacted by the management and board of directors to ensure regular purchase of assets as this will lead to steady growth in assets which when combined to moderate the result of firm size, the impact will be visible. This recommendation is based on the fact that most of the periods under study were seen to have a negative asset growth but if the firms have positive asset growth, it will have significant impact on the performance of such firms.

Despite some of the negative asset growth observed within the period under study, the positive firm size impact on firms' performance resulted to a combined positive significant impact on performance. As such, the regulatory agency and management involved should strive to improve and maintain favorable firm size by establishing a benchmark below which no firm should operate just as is the case in the banking sector.

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