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Effect of Capital Structure on Corporate Performance: Evidence from Agricultural Firms Quoted on the Nigeria Stock Exchange (2007 – 2018)

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ABSTRACT

This study presented an analysis of the effect of capital structure on the corporate performance of agricultural firms quoted on the Nigeria Stock Exchange (NSE). There is no consensus on the effect of capital structure on corporate performance. Specifically, the effect of total debt to total assets, total debt to total equity, short-term debt to total assets respectively on return on assets, return on equity and net profit margin were ascertained. Secondary data for the period 2007 to 2018 were sourced from the annual reports of all the firms quoted on the Nigerian Stock Exchange (NSE). The Panel Ordinary Least Square (POLS) and the Granger Causality test were the techniques employed in estimating the models. The result of the analysis revealed that total debt to total assets, total debt to total equity, short-term debt to total assets have a significant effect on return on assets, return on equity, and net profit margin of agricultural firms in Nigeria. Firms in the agricultural sector are encouraged to fund their operations with more equity capital as debt financing negatively influences shareholder wealth. Management of agricultural firms should consider the use of more short-term debt relative to equity capital in preference to long-term debt in their financing mix.

Keywords: Capital structure; corporate performance, quoted agricultural firms, NSE

1. INTRODUCTION

The nexus between capital structure and corporate performance remains a topic of debate in corporate finance owing to the obligation of firms to their owners. To finance business operations, managers combine different sources of finance, all geared towards sustainability in corporate performance. The model of the capital structure adopted by firms in developing and developed economies is one in which debt, equity, and retained earnings show a structure of firm ownership in such a way that retained earnings and equity show ownership mainly by shareholders whereas, debt instrument as ownership by debt holders (La-Porta, Lopez, & Shleifer as cited in Ryoonhee, 2011). The use of all debt to finance the operations of a firm will be an advantage on one side as a debt interest will be tax and on the other side, the firm will be under the control of creditors to control their stake. The use of debt capital increases agency cost between shareholders and debt holders. A firm may decide to go for equity financing or may decide on a certain ratio between equity and debt financing. The survival of a firm may be threatened following a wrong combination of financing sources.

The optimal combination of financing mix only does not guarantee improvement in firms' value as some macroeconomic fundamentals have the capability of affecting corporate performance, hence the ability of firms to access both internal and external funds may be deterred. Echekoba (2017) reported that the devaluation of the

Nigerian Naira in 2015 by the Central Bank of Nigeria, inflation, and persistently high-interest rate charged by banks mounted huge pressure on both domestic and foreign companies. The financing decision is one of the most important roles played by a modern financial manager as they determine the value of a firm. Managers strive to maintain a capital structure that maximizes the shareholders' wealth while minimizing financial and business risks of the firm.

The orthodox assumption in corporate finance is that firms strive to maintain an optimal capital structure that balances the cost and value associated with varying equilibrium, this view argues that companies respond by rebalancing their level of the optimal level (Njagi, 2013). Except for macroeconomic uncertainty in the country affecting all firms operating in the economy, the number of agricultural firms quoted on the Nigerian Stock Exchange is very few. As of 31st December 2019, there are five (5) agricultural firms quoted on the exchange. These are FTN Cocoa Processors, Okomu Oil, Presco, Ellah Lakes, and Livestocks. The NSE has pledged to address and significantly mitigate the impact of a couple of production, financial, and operational risk that may face the companies to improve corporate performance. Despite the benefits agricultural firms would have by patronizing organized commodities through improved market access for their outputs, it is ideal to examine how the corporate performance of these firms has been influenced by their capital structure.

2. LITERATURE

Capital structure is the combination of debt and equity employed by companies in financing their business operations. According to Ravindra and Rao (2014), capital structure refers to the mix of long-term sources of funds, such as debentures, long term debt, preference share capital, and equity share capital including reserves and surpluses (i.e. retained earnings). Shalini and Mohua (2017) see capital structure as the mix of different securities known as debt-equity ratio in a corporate firm, and capital structure decisions are considered to be one of the most crucial decisions of a company as it has a direct bearing on the success or failure of the company. Capital structure implies propositional bearing on firm's financial performance of decision-making units including debt as a major part, magnify financial performance while equity enhances solvency although it is comparatively costly (Liaqat, Saddique, Bagh, Khan, Naseer, & Khan, 2017). The term corporate performance cannot be put into a tight framework of definition. It is an indistinct phenomenon and it can be interpreted and measured in different ways. Different users from their points of view can evaluate from various angles and performance. In a broader sense, corporate performance refers to the degree to which financial objectives being or has been accomplished. It is the process of measuring the results of a firm's policies and operations in monetary terms. It is used to measure a firm's overall financial health over a given period time and can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation.

Many theories have been developed in the debate of the effect of capital structure on the corporate performance of firms. These theories include pecking order theory, trade-off theory, agency cost theory, signalling theory among others. However, this study is anchored on the pecking order theory due to its predominance in empirical findings, especially in developing economies. Myers in (1984) introduced the Pecking Order Theory to challenge the Trade-off Theory, by inputting that a company first, prefers internal to external financing, secondly prefers debt over equity if it issues securities. This hypothesis is consistent with previous studies done with aggregated data on corporate financing. So, the pecking order theory ranks the different types of financing according to how prone they are to information asymmetry.

The empirical studies reviewed were arranged from most recent to fairly contemporary studies. Oleka, Echekoba, Ananwude, and Nwakobi (2019), Ngwoke and Udeh (2019), Garba, Abubakar, and Sulaiman (2019), Sahari, Rahim, and Tinggi (2019), Otekunrin, Nwanji, and Obasaju (2018), Ofoegbu, Mlanga, and Igwe (2018), Shibanda and Miroga (2018), Uremadu and Onyekachi (2018), Onuora and Obia (2018), Masavi, Kiweu, and Kinyili (2017), Igwe, Ogar, and Ogbuu (2017), Kenya, Kinyua

and Muriu (2017), Echekoba and Ananwude (2016), Stekla and Grycova (2016), Pahlevi, Hartoyo, and Maulana (2015), Suardi and Noor (2015), Mugera and Nyambane (2014), Njagi (2013) and Bassey, Arene, and Akpaeti (2012). These studies reviewed has mixed results however, most of them supported the pecking order theory on the negative relationship between capital structure and corporate performance of firms.

3. METHODOLOGY

The data used in the analysis were secondary and extracted from the annual reports of the five (5) agricultural firms quoted on the Nigerian Stock Exchange Nigerian from 2007 to 2018, and which have operated on the exchange for the least period of ten (10) years. The dependent variables are Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM). Total Debt to Total Assets (TDTA), Total Debt to Total Equity (TDTE), and Short-Term Debt to Total Assets (STDTA) serve as the independent variables. However, owing to how the size of the firm would affect its corporate performance, Firm Size (FMS) measured by the natural logarithm of the firm's total assets was included as a control variable.

Following the economic assumption that data must be free from stationarity defect, the first task we performed was the determination of the unit root test of the data through the Levin, Lin, and Chu (LLC) test. In the second step, we progressed to examine the long-run relationship between capital structure and corporate performance variables vide the Kao Residual Co-integration Test. Thirdly, the relationship in the short-run between the variables of interest was resolved following the panel data timeline incorporated by pooled, fixed, and random effect estimations Finally, we utilized the Granger Causality framework to determine the effect of capital structure on the corporate performance of agricultural firms.

A linear and multivariate modified regression model of Echekoba and Ananwude (2016) was adapted and modified. The original model is stated as:

$$Y_{i,t} = a_i + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots 3.1$$

Where:

$Y_{i,t}$: Firm performance/dependent variable for firm i in year t,

a_i: Coefficient constant for firm i,

β_i: Slope coefficient of the independent variables of firm i,

$X_{i,t}$: Financial structure of firm i in year t

$\varepsilon_{i,t}$: Error term of firm i in year t.

Following the model of Echekoba and Ananwude (2016), the modified models for this study is stated as:

$$ROA = f(TDTA, FMS) \quad \ldots\ldots 3.2$$
$$ROE = f(TDTE, FMS) \quad \ldots\ldots 3.3$$
$$NPM = f(STDTA, FMS) \quad \ldots\ldots 3.4$$

Econometrically transforming equ. 3.2 – 3.4 thus becomes:

$$ROA_t = \beta_0 + \beta_1 TDTA_t + \beta_2 FMS_t + \varepsilon_t \quad \ldots\ldots 3.5$$
$$ROE_t = \beta_0 + \beta_1 TDTE_t + \beta_2 FMS_t + \varepsilon_t \quad \ldots\ldots 3.6$$
$$NPM_t = \beta_0 + \beta_1 STDTA_t + \beta_2 FMS_t + \varepsilon_t \quad \ldots\ldots 3.7$$

Where:

ROA = Return on Assets

ROE = Return on Equity

NPM = Net Profit Margin

$TDTA$ = Total Debt to Total Assets

$TDTE$ = Total Debt to Total Equity

$STDTA$ = Short Term Debt to Total Assets

e = Stochastic or disturbance term.

t = Time dimension of the variables

β_0 = Constant or intercept

β_{1-2} = Coefficients to be estimated or the coefficients of slope parameters

4. RESULTS AND DISCUSSION OF FINDINGS

LLC unit root results in Tables 1 and 2 at individual intercept and individual intercept and trend of first difference show that the p-values of LLC test statistic for all the variables are significant at a 5% level of significance. This discloses that all the variables are stationary at the first difference and free from stationarity defect associated with most time-series data, hence permitting for the testing of the long-run co-integration relationship between the variables.

Table 1: LLC Test Result at First Difference: Individual Intercept

Variables	LLC Test Statistic	Pooled Coefficient	Pooled t-Stat.	Remark
ROA	-7.26810 (0.00)*	-1.95301	-11.180	Stationary
ROE	-22.3455 (0.00)*	-1.01211	-35.057	Stationary
NPM	-2.50535 (0.01)*	-2.11135	-6.7230	Stationary
TDTA	-2.34491 (0.00)*	-1.24207	-4.6520	Stationary
TDTE	-1.89744 (0.04)**	-2.05992	-8.0710	Stationary
STDTA	-2.00285 (0.02)**	-1.20462	-6.3510	Stationary
FMS	-2.68414 (0.00)*	-1.27329	-5.3110	Stationary

Source: Output Data using E-view 10.0.

Note: The optimal lag for the LLC test is selected based on the Schwarz Info Criteria (SIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

Table 2: LLC Test Result at First Difference: Individual Intercept and Trend

Variables	LLC Test Statistic	Pooled Coefficient	Pooled t-Stat.	Remark
ROA	-12.3282 (0.00)*	-1.90377	-15.839	Stationary
ROE	-5.85519 (0.00)*	-1.00460	-25.180	Stationary
NPM	-2.05688 (0.02)**	-2.27839	-7.3980	Stationary
TDTA	-3.33619 (0.02)**	-0.98082	-3.4500	Stationary
TDTE	-2.84061 (0.00)*	-0.81122	-2.9390	Stationary
STDTA	-2.51612 (0.01)*	-1.42700	-8.0120	Stationary
FMS	-2.60668 (0.00)*	-1.62342	-6.4020	Stationary

Source: Output Data using E-view 10.0.

Note: The optimal lag for the LLC test is selected based on the Schwarz Info Criteria (SIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

The structural criteria for estimation of the Kao panel Co-integration test are based on Engle-Granger. Table 3 depicts Kao's co-integration test result. The p-value of the t-statistics is significant at a 5% level of significance for all the variables in the three models. This suggests the rejection of the three null hypotheses of no co-integration. Put differently, return on assets, return on equity and net profit margin are related in long-run measurement/variables of capital structure. In summary, it is concluded that there is long-run relationship between capital structure and corporate performance of agricultural firms quoted on the Nigerian Stock Exchange over the period studied.

Table 3: Kao Residual Co-integration Test

Models Estimated	Argumented Dickey-Fuller	
	t-Statistic	Prob.
ROA →TDTA + FMS	-6.789989	0.0000
ROE → TDTE + FMS	-2.895270	0.0019
NPM → STDTA + FMS	-2.099181	0.0029

Source: Output Data using E-view 10.0.

Notes: The ADF is the residual-based ADF statistic. The null hypothesis is no co-integration. (*) and (**) indicate that the estimated parameters are significant at the 1% and 5% level respectively.

The result of the panel OLS estimations for the models is detailed in Tables 4 – 6. From the Hausman test in Table 4, the random effect estimation is preferred to fixed-effect due to the insignificant p-value of the Chi-square. The result reveals that there is a negative but insignificant relationship between total debt to total assets and return on assets of agricultural firms. The size of the firm was positively related to return on assets. When the total debt to total assets controlled by firm size is held constant, return on assets would depreciate by 0.066 units. A percentage increase in total debt to total assets leas to 0.000298-factor depreciation in return on assets, while return on assets would rise by a factor of 2.58 consequent a unit increase in firm size. The adjusted R-square value of -0.034718 shows that the explanatory variables negatively and jointly accounted for -3.48% variations in return on assets of agricultural firms within the period studied. The F-statistic which determines the overall significance joint effect of the independent variables shows that total debt to total assets moderated by firm size did not significantly explain the variations in return on assets as the p-value (0.99) is insignificant at 5% level. The Durbin Watson statistic (1.6) which is the traditional test of autocorrelation in a model is within the acceptable range of that the variables in the model are not serially correlated.

Table 4: Panel OLS of Return on Assets and Total Debt to Total Assets

Variables	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	-0.066145	0.7430	-0.065186	0.7509	-0.066018	0.7584
TDTA	-0.000298	0.9959	-0.008373	0.8963	-0.001074	0.9855
FMS	2.58E-10	0.9037	4.03E-10	0.8676	2.71E-10	0.9007
R-squared	0.000361		0.182551		0.000358	
Adjusted R-squared	-0.034714		-0.048467		-0.034718	
S.E. of regression	1.480503		1.490309		1.465218	
Sum squared resid	124.9376		102.1669		122.3712	
Log likelihood	-107.1404		-101.1042			
F-statistic	0.010287		0.790204		0.010196	
Prob(F-statistic)	0.989768		0.666329		0.989858	
Durbin-Watson stat	1.644534		1.604374		1.640829	
Hausman Specification Test						
	Chi-Sq. Statistic		0.096828			
	P-value		0.952700			

Source: Output Data using E-view 10.0.
Note: Periods included: 12, Cross-sections included: 5, Total Number of Observations: 60

The Hausman test in Table 5 favours the random effect estimation as the p-value of the Chi-square is insignificant at a 5% level. The result discloses that total debt to total equity has a negative but a significant relationship with the return on equity of agricultural firms quoted on the Nigerian Stock Exchange. According to the constant coefficient of -0.004858, keeping total debt to total equity and firm size constant, return on shareholders wealth would be up by a factor of 0.079%. Increasing total debt to total equity and firm size by a unit respectively leads to 0.89% and 0.86% factor depreciation in shareholders wealth. The F-statistic values of 0.017802 with a p-value of 0.92 show that total debt to total equity and firm size jointly did not insignificantly explain the changes in return on equity of quoted agricultural firms. Going by the adjusted R-squared of -0.034442, it is crystal clear that the explanatory variables accounted for -3.44% changes in return on equity. It adduces that total debt to total equity

and firm size have in no way contributed to the growth of shareholders' wealth. It is also observed from the Durbin Watson statistic that the variables in the model are free from autocorrelation problem and inference deduced is reliable in statistical terms.

Table 5: Panel OLS of Return on Equity and Total Debt to Total Equity

Variables	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	0.079615	0.5120	0.063155	0.6157	0.079615	0.5175
TDTE	-0.004858	0.8859	-0.003037	0.9359	-0.004858	0.8874
FMS	-2.27E-10	0.8557	2.30E-10	0.8718	-2.27E-10	0.8576
R-squared	0.000624		0.171886		0.000624	
Adjusted R-squared	-0.034442		-0.062146		-0.034442	
S.E. of regression	0.854402		0.865768		0.854402	
Sum squared resid	41.61016		34.47946		41.61016	
Log likelihood	-74.15631		-68.51689			
F-statistic	0.017802		0.734456		0.017802	
Prob(F-statistic)	0.982361		0.720543		0.982361	
Durbin-Watson stat	2.165937		2.151302		2.165937	
Hausman Specification Test						
	Chi-Sq. Statistic		0.778317			
	P-value		0.677600			

Source: Output Data using E-view 10.0.

Note: Periods included: 12, Cross-sections included: 5, Total Number of Observations: 60

Relying on the Hausman test Table 6, the acceptability of the random effect estimation is affirmed as a result of the insignificant p-value of the Chi-square. The result discloses that short-term debt to total assets and firm size have a negative but insignificant relationship with the net profit margin of agricultural firms quoted on the Nigeria Stock Exchange. The coefficient of the constant 2.151596 means that if short-term debt to total assets and firm size is held constant, quoted agricultural firms' net profit margin would rise by a factor of 2.15%. A unit increase in short-term debt to total assets and firm size would result in a corresponding decrease in the net profit margin by a factor of 0.067 and 0.1820 respectively. The adjusted R-square value of 0.043270 shows that the explanatory variables jointly accounted for only 4.32% variations in net profit margin of quoted agricultural firms within the period studied. The F-statistic which determines the overall significance joint effect of the independent variables shows that short-term debt to total assets and firm size did not significantly explain the variations in net profit margin as the p-value of F-statistic is insignificant at 5% level. It could be deduced from the Durbin Watson statistic of 2.09 that the model is free from autocorrelation.

Table 6: Panel OLS of Net Profit Margin and Short-Term Debt to Total Assets

Variables	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	2.034951	0.7125	2.871786	0.6057	2.151596	0.7086
STDTA	-14.59100	0.0718	-16.29170	0.0534	-14.82782	0.0674
FMS	-5.15E-08	0.1847	-5.61E-08	0.1842	-5.22E-08	0.1820
R-squared	0.072120		0.259101		0.075701	
Adjusted R-squared	0.039562		0.049716		0.043270	
S.E. of regression	31.85933		31.69047		31.39130	
Sum squared resid	57855.98		46197.16		56168.60	

Log likelihood	-291.2773	-284.5262	
F-statistic	2.215162	1.237440	2.334194
Prob(F-statistic)	0.118447	0.285241	0.106084
Durbin-Watson stat	2.104404	2.044525	2.097424
Hausman Specification Test			
	Chi-Sq. Statistic	0.928876	
	P-value	0.628500	

Source: Output Data using E-view 10.0.

Note: Periods included: 12, Cross-sections included: 5, Total Number of Observations: 60

In the Granger Causality timeline, the lag length selected was one (1). This is hinged on the fact that the data applied were gotten from the financial statement of firms that are on a yearly/annual basis. The result in Table 7 reveals that total debt to total assets and firm size has no significant effect on the return on assets of agricultural firms quoted on the Nigerian Stock Exchange. This is on the argument that causality does not flow from total debt to total assets and firm size to return on assets at a 5% level of significance.

Table 7: Return on Assets and Total Debt to Total Assets

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
TDTA does not Granger Cause ROA	55	0.29259	0.5909	No Causality
ROA does not Granger Cause TDTA		9.6E-06	0.9975	No Causality
FMS does not Granger Cause ROA	55	0.11083	0.7405	No Causality
ROA does not Granger Cause FMS		0.00701	0.9336	No Causality

Source: Output Data using E-views 10.0

From the output in Table 8, at a 5% level of significance, causality does not run from total debt to total equity and firm size to return on equity. This is an indication that total debt to total equity and firm size has no significant effect on the return on equity of agricultural firms quoted on the Nigerian Stock Exchange.

Table 8: Return on Equity and Total Debt to Total Equity

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
TDTE does not Granger Cause ROE	55	0.32987	0.5682	No Causality
ROE does not Granger Cause TDTE		0.06421	0.8010	No Causality
FMS does not Granger Cause ROE	55	0.06497	0.7998	No Causality
ROE does not Granger Cause FMS		0.01321	0.9089	No Causality

Source: Output Data using E-views 10.0

It is evident in Table 9 there is a unidirectional causal relationship between net profit margin and short-term debt to total assets. Causality flows from net profit margin to short-term debt to total assets at a 5% significance level. This implies that net profit margin has a significant effect on short-term debt to total assets of agricultural firms quoted on the Nigeria Stock Exchange. The size of the firm has no significant effect on net profit margin as there is causality flow firm size to net profit margin.

Table 9: Net Profit Margin and Short-Term Debt to Total Assets

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
STDTA does not Granger Cause NPM	55	1.87613	0.1767	No Causality
NPM does not Granger Cause STDTA		4.22152	0.0450	Causality
FMS does not Granger Cause NPM	55	1.64803	0.2049	No Causality
NPM does not Granger Cause FMS		0.02538	0.8740	No Causality

Source: Output Data using E-views 10.0

The Kao co-integration in Table 3 reveals the presence of a long-run relationship only between total debt to total assets, total debt to total equity, short term debt to total assets, and return on assets, return on equity and met profit margin of agricultural firms quoted on the Nigeria Stock Exchange. The panel OLS results in Tables 4, 5, and 6 show that total debt to total assets, total debt to total equity, short term debt to total assets and return on assets, return on equity and met profit margin of agricultural firms quoted on the Nigeria Stock Exchange respectively. This is in line with Onuora and Obia (2018), Uremadu and Onuegbu (2018), and Suardi and Noor (2015) that capital structure has a negative relationship with corporate performance by the assumption of the Pecking Order Theory. On the contrary, it disagrees with the works of Ofoegbu, Mlanga, and Igwe (2018), Igwe, Ogar, and Ogbuu (2017), Shibanda and Miroga (2018), Ngwoke and Udeh (2019), and Oriaku (2018) on the positive linkage between capital structure and financial performance of agricultural firms. From the granger causality test in Tables 7 – 9, there was evidence that proxies for capital structure: total debt to total assets, total debt to total equity, short term debt to total assets have no significant effect on the measurement of corporate performance: return on assets, return on equity, and met profit margin of agricultural firms quoted on the Nigeria Stock Exchange. The is a further affirmation of the Echekoba and Ananwude (2016) that capital structure has no significant effect on the return on assets, return on equity, and profit before tax of firms quoted on the agricultural sector of the Nigeria Stock Exchange. It as agrees with Oleka, Echekoba, Ananwude, and Nwakobi (2019) on the no significant effect of capital structure on the financial performance of non-financial service firms in Nigeria.

5. CONCLUSION AND POLICY IMPLICATIONS

This study presented an analysis of the effect of capital structure on the corporate performance of agricultural firms quoted on the Nigeria Stock Exchange (NSE) from 2007 to 2018. Specifically, the effect of total debt to total assets, total debt to total equity, short-term debt to total assets respectively on return on assets, return on equity and net profit margin was ascertained. The overall findings of this study suggested that capital structure has no significant effect on corporate performance of agricultural firms quoted on the Nigeria Stock Exchange. Furthermore, quoted firms are more aligned to Pecking Order Theory compared to Trade-off Theory suggesting that majority of the firms prefer internal financing to external financing. However, if they require external financing, they will issue the safest security first. Firms in the agricultural sector are encouraged to fund their operations with more equity capital as debt financing negatively influences shareholder wealth. Management of agricultural firms should consider the use of more short-term debt relative to equity capital in preference to long-term debt in their financial structure mix to increase net profit margin as this will reduce the overall cost of capital as a result of its tax advantage.

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APPENDIX

Return on Assets (ROA), Return on Equity (ROE), Net Profit Margin (NPM), Total Debt to Total Assets (TDTA), Total Debt to Total Equity (TDTE), Short Term Debt to Total Assets (TDTA) and Firm Size (FMS) of Agricultural Firms Quoted on the Nigerian Stock Exchange (NSE) from 2007 to 2018

FIRMS	YEAR	ROA (%)	ROE (%)	NPM (%)	TDTA (%)	TDTE (%)	STDTA (%)	FMS
Presco	2007	0.06144	0.12259	0.01643	0.49885	0.99542	0.26307	3,904,957
	2008	0.23618	0.33649	0.17002	0.32606	0.56755	0.18393	4,223,150
	2009	0.07113	0.12891	0.05979	0.62815	1.13836	0.28649	4,753,772
	2010	0.22555	0.37906	0.20331	0.56282	0.94615	0.28016	5,914,343
	2011	0.34174	0.55004	0.19826	0.44982	0.72400	0.15812	7,550,528
	2012	0.14981	0.22154	0.31001	0.31423	0.47571	0.00000	25,869,597
	2013	0.08125	0.13427	0.15759	0.37214	0.61496	0.00000	28,723,962
	2014	0.97876	0.17136	0.28512	0.42884	0.75083	0.21527	34,945,172
	2015	0.08521	0.13866	0.22363	0.37402	0.61379	0.61379	49,877,895
	2016	1.23026	1.23026	1.38483	0.02424	0.97576	0.65312	17,690,776
	2017	0.25983	0.25983	0.25413	0.09492	0.90508	0.49622	21,874,536
	2018	0.17787	0.17787	0.20145	0.11233	0.88767	0.41491	24,174,342
Livestock Feeds	2007	0.13479	0.01520	0.01520	1.94049	1.71584	0.00000	281,336
	2008	0.21043	0.02711	0.02711	0.11689	0.10122	0.00000	315,121
	2009	0.10895	0.01375	0.01375	0.13718	0.12388	0.00000	355,679
	2010	0.13503	0.01415	0.01415	0.09756	0.09856	0.00000	391,344
	2011	0.31166	0.02700	0.02700	0.07129	0.07129	0.00000	489,208
	2012	0.34166	0.15659	0.02559	0.09217	0.09217	2.18184	632,807
	2013	0.07704	0.14886	0.03447	0.01121	0.02378	0.51755	3,670,604
	2014	0.06991	0.20271	0.03211	0.65514	1.89974	1.85699	5,752,787
	2015	0.06568	0.15400	0.02097	0.57352	1.34478	1.28333	4,569,513
	2016	0.02070	0.07302	0.01376	0.29867	0.70133	0.54861	7,357,534
	2017	-0.13797	-0.34596	-0.07124	-1.93119	2.93119	-0.03851	5,260,724
	2018	-0.15726	-0.42393	-0.07918	-4.61086	5.61086	-0.02628	3,944,419
FTN Cocoa	2007	0.05491	0.06178	0.29511	0.22338	0.12521	1.00000	2,681,603
	2008	0.08837	0.11379	0.16740	0.31371	0.28763	0.17711	3,195,045
	2009	0.07459	0.10869	0.19072	0.47729	0.45711	0.21070	3,481,419
	2010	0.01472	0.02816	0.05318	0.43229	0.91315	0.28566	4,324,083
	2011	0.05328	0.10219	-0.21310	0.47729	0.82918	0.42920	4,575,933
	2012	-0.09217	-0.20427	-1.45440	0.54877	1.21616	0.54050	4,389,414
	2013	-0.06283	-0.16882	-0.58160	0.62784	1.68699	0.72928	4,553,277
	2014	-0.13055	-0.22553	-2.23330	0.45360	1.00013	1.00013	4,421,423
	2015	-0.04246	-0.07861	-0.14700	0.57891	0.83984	0.83984	4,738,510
	2016	-0.73568	-0.73568	-0.99046	-0.18845	1.18845	-0.18709	5,276,690
	2017	-1.95889	-1.95889	-9.31782	0.20120	0.79880	0.01980	4,815,357
	2018	-0.04397	-0.44827	-0.87701	1.26501	-0.26501	0.00302	4,813,698
Okomu Oil	2007	0.02843	0.04729	0.04979	0.48158	0.80139	0.00000	5,304,771
	2008	0.19497	0.28953	0.25505	0.32659	0.48497	0.00000	6,360,127
	2009	0.09608	0.15200	0.11590	0.36793	0.58210	0.12497	6,887,651
	2010	0.25155	0.33603	0.26766	0.25140	0.33583	0.06629	7,836,525
	2011	0.19937	0.24505	0.94584	0.18640	0.22911	0.06464	23,365,336
	2012	0.13997	0.17025	0.88253	0.17788	0.21636	0.08595	31,054,673
	2013	0.08963	0.1190	0.04798	0.24737	0.32867	0.00000	30,050,647
	2014	0.09159	0.06472	0.18140	0.29342	0.41527	0.19754	32,881,478
	2015	0.14455	0.24028	0.27516	0.39842	0.66229	0.20869	20,053,186
	2016	0.20247	0.29168	0.34543	0.10006	0.89994	0.33718	24,507,665
	2017	0.29073	0.39289	0.44873	0.02876	0.93343	0.43205	31,273,705
	2018	0.21448	0.28898	0.40675	0.08053	0.91947	0.33827	38,417,953
Ellah Lake	2007	4.95245	4.72762	0.18850	0.20372	0.16947	1.57519	1,123,033
	2008	-3.42412	-3.37325	-0.09990	0.20469	0.20069	1.40908	1,176,446
	2009	-8.99480	-0.00937	-0.58560	0.12211	0.21329	1.22928	1,194,185
	2010	-0.01769	-0.01768	-1.08060	0.21746	0.40582	1.28469	1,146,052
	2011	-0.02195	-0.02196	-240.830	0.21976	0.41365	1.40161	1,155,935
	2012	-0.02763	-0.02764	-3.16340	0.12248	0.41177	0.00477	1,129,956
	2013	-0.02111	-0.02111	-1.17910	0.49649	0.98940	0.00854	1,177,844
	2014	-0.01166	-0.02412	-0.14780	0.51640	1.0678	0.00493	1,195,441
	2015	-0.02941	-0.06403	-0.48090	0.54069	1.17717	0.00710	1,180,871
	2016	-0.05391	-0.05391	-0.46731	1.37801	-0.37801	0.01564	514,643,528
	2017	-0.01117	-0.01117	-0.28693	0.04080	0.08042	0.04080	508,682,725
	2018	-0.02195	-0.02195	-78.0598	30.8481	-29.8481	0.02645	497,894,356

Source: Annual Reports of Agricultural Firms from 2007 to 2018