Innovations

Financial Structure and Performance of Quoted Agricultural Firms in Nigeria

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Abstract: *This study examined the effect of financial structure on the performance of agricultural firms quoted on the Nigerian Stock Exchange (NSE). The motivation stemmed from conflicting theoretical and empirical perspectives. While Modigliani and Miller argue that firm value is independent of capital structure, the static trade-off theory suggests an optimal financial structure balancing tax advantages and leverage-related costs. In contrast, the pecking order theory rejects the notion of an optimal structure, favoring internal financing over debt. Empirical findings on this relationship remain inconsistent. Using secondary data from 2009 to 2021, the study applied Panel Ordinary Least Squares (POLS) and Granger Causality tests. Results showed that total debt to total assets, total debt to equity, and short-term debt to total assets significantly affect return on assets, return on equity, and net profit margin. However, financial structure had no significant effect on overall performance. The study recommends a debt-equity mix that enhances returns, with a preference for equity financing to avoid negative impacts on shareholder wealth.*

Key Words: *Financial Structure, Quoted Agricultural Firms, Nigeria*

Introduction

The relationship between financial structure and corporate performance remains a debated topic in corporate finance due to firms' obligations to various stakeholders. To fund business operations, managers use a mix of financing sources aimed at sustaining corporate performance. In both developing and developed economies, firms adopt capital structures comprising debt, equity, and retained earnings, with shareholders primarily owning equity and debt holders controlling debt instruments (La-Porta, Lopez, & Shleifer as cited in Ryoonhee, 2011). While financing a firm

entirely with debt offers the advantage of tax-deductible interest, it also places the firm under creditors' control to protect their interests. The use of debt financing raises agency costs due to potential conflicts between shareholders and debt holders. Companies may choose equity financing or a balanced combination of debt and equity. However, an improper mix of these financing sources can threaten a firm's survival.

Achieving an optimal financing mix alone does not ensure improved corporate performance, as macroeconomic factors can significantly impact a firm's ability to access internal and external funding. According to Echekoba (2017), the 2015 devaluation of the Nigerian Naira by the Central Bank of Nigeria, coupled with inflation and persistently high-interest rates, placed significant financial pressure on both domestic and foreign businesses. Modigliani and Miller's pioneering 1958 study suggested that under perfect market conditions, a firm's capital structure does not influence its value. However, in 1963, they revised their stance, acknowledging that the tax shield on debt could enhance firm value.

The static trade-off theory proposes that firms seek an optimal financial structure by balancing the benefits and costs of debt and equity while accounting for market imperfections such as taxes, bankruptcy costs, and agency costs (Kraus and Litzenberger as cited in Oleka, Echekoba, Nwakobi & Ananwude, 2019). Conversely, the pecking order theory suggests that firms prioritize internal financing over external debt and only resort to borrowing when internal funds are exhausted. Nevertheless, as Ryoonhee (2011) points out, capital structure can significantly influence firm value when constraints are present, with elements like taxes, bankruptcy costs, and agency conflicts being crucial to capital structure analysis. The risk of bankruptcy negatively affects a firm's value, not because of the risk itself but due to the associated costs. As firms increase their debt levels, the probability of bankruptcy rises, leading to higher required returns for debt holders due to increased financial leverage.

Financing decisions play a crucial role in corporate finance, as they directly impact firm value. Financial managers aim to establish a capital structure that maximizes shareholder wealth while minimizing financial and business risks. Traditional corporate finance theory assumes that firms strive to maintain an optimal capital structure that balances costs and value at an equilibrium (Mbah & Obiezekwem, 2019; Otaokpukpu, Ogbu, & Okonkwo, 2017). Apart from macroeconomic uncertainties that affect all businesses, the number of agricultural firms listed on the Nigerian Stock Exchange remains small. As of December 31, 2019, only five agricultural firms were listed: FTN Cocoa Processors, Okomu Oil, Presco, Ellah

Lakes, and Livestock. To enhance corporate performance, the NSE has committed to mitigating production, financial, and operational risks for these companies. Although agricultural firms can benefit from organized commodity markets through improved market access, it is essential to assess how their financial structures influence corporate performance (Ugwa & Okonkwo, 2019).

Statement of the Problem

The various financing options available to firms and their obligations to shareholders have drawn scholarly attention to the potential relationship between financial structure and corporate performance. This study is driven by two key conflicting issues in both theoretical and empirical literature. Firstly, from a theoretical perspective, there is no clear consensus on how financial structure influences corporate performance. According to Modigliani and Miller's 1958 proposition, a firm's value is independent of its capital structure. The static trade-off theory, however, suggests that an optimal financial structure is achieved when the net tax benefits of debt financing offset the associated costs, such as financial distress and bankruptcy, assuming the firm's assets and investment decisions remain constant. In contrast, the pecking order theory asserts that firms do not have an optimal financial structure, as they tend to prioritize internal financing over debt.

Secondly, empirical findings on the link between financial structure and corporate performance remain inconsistent and contradictory. Some studies, including those by Ofoegbu, Mlanga, and Igwe (2018), Igwe, Ogar, and Ogbuu (2017), Shibanda and Miroga (2018), Ngwoke and Udeh (2019), Oriaku (2018) and Pahlevi, Hartoyo, and Maulana (2016), report a positive impact of capital structure on corporate performance measures in agricultural firms. Conversely, research by Onuora and Obia (2018), and Uremadu and Onuegbu (2018) suggests that financial structure negatively affects the corporate performance of agricultural firms. Echekoba and Ananwude (2016) found no significant impact of capital structure on return on assets, return on equity, or profit before tax for firms listed in the agricultural sector of the Nigerian Stock Exchange (NSE). Further complicating the debate, Mugera and Nyambane (2014) discovered that farm technical efficiency positively correlates with short-term debt, tax liabilities, and capital investments but negatively with off-farm income-generating activities. They also found that long-term debt has no impact on production efficiency or return on assets.

Additionally, existing studies on corporate performance in Nigeria's agricultural sector predominantly focus on return on assets, return on investment, profit before and after tax, earnings per share, and return on equity. This study aims to expand the scope by incorporating net profit margin and gross revenue as additional

measures of corporate performance. Given the conflicting views and inconsistencies in the literature on the financial structure–corporate performance relationship, as well as the gaps identified in previous studies, this research seeks to examine the impact of capital structure on the corporate performance of agricultural firms listed on the NSE. The need for updated findings based on recent data further underscores the relevance of this study.

Conceptual Review
Financial Structure

Financial structure refers to the blend of debt and equity that companies utilize to finance their business operations. Ravindra and Rao (2014) define financial structure as the combination of long-term funding sources, including debentures, long-term debt, preference share capital, equity share capital, and retained earnings. Similarly, Shalini and Mohua (2017) describe financial structure as the composition of various securities, commonly expressed as the debt-to-equity ratio in corporate firms. They emphasize that decisions regarding financial structure are among the most critical for a company, as they significantly influence its success or failure.

According to Liaqat, Saddique, Bagh, Khan, Naseer, and Khan (2017) and Ugwa & Okonkwo, (2019), financial structure plays a crucial role in shaping a firm's financial performance. A capital structure heavily reliant on debt can amplify financial returns, whereas equity financing enhances solvency, albeit at a higher cost. The choice of financial structure is vital to a firm's survival, as poor financial decisions can hinder an organization's ability to achieve its profit-making objectives and meet stakeholder expectations. Therefore, financial managers must carefully determine the appropriate proportion of equity and debt to achieve an optimal capital structure that ensures financial stability and growth (David & Olorunfemi, 2010; Mbah & Obiezekwem, 2019; Okeke et al., 2020).Gerhardinger, as cited in Echekoba (2017), identified four key proxies for financial structure, which are discussed below:

Total Liabilities to Total Assets: This solvency ratio measures the proportion of a firm's assets that are funded by liabilities. A liabilities-to-assets ratio of 20% implies that 20% of the firm's assets are financed through liabilities. A high ratio may indicate potential solvency concerns due to low shareholder equity. Firms experiencing rapid expansion often exhibit higher liabilities-to-assets ratios due to increased debt financing. Conversely, companies in financial distress may also display high ratios, particularly if declining revenues and poor growth prospects impact retained equity (Gerhardinger, 2015). A low liabilities-to-assets ratio generally signifies strong financial health, as it indicates minimal reliance on liabilities.

Total Debt to Total Assets: This leverage ratio assesses the extent to which a firm's total assets are financed through debt, including both long-term and current liabilities. A debt-to-assets ratio of 60% suggests that 60% of the firm's assets are backed by debt. Most companies carry some level of debt, but higher debt-to-assets ratios pose greater risks for equity investors since debt holders have priority claims in the event of bankruptcy (Well, 2007). A ratio of 1 would indicate that the company is entirely financed by debt, whereas a ratio of 0 means it has no debt. Companies with high debt-to-assets ratios must allocate more resources toward interest payments before calculating net earnings.

Total Assets to Total Equity: This financial leverage metric compares a firm's total assets to the amount of shareholder equity, reflecting the level of debt financing relative to equity financing. A ratio above 2 suggests that the firm relies more on debt than equity to finance its assets, which could indicate a riskier investment. Conversely, a lower ratio may reflect a more conservative financial approach (Pushner, 1995;Ezeokafor, Jacobs, & Ekwere, 2021). This ratio often moves in tandem with the debt-to-equity ratio.

Total Debt to Total Equity: This leverage ratio represents the proportion of debt financing relative to shareholders' equity. A low debt-to-equity ratio indicates reduced financial risk, as debt holders have fewer claims on the company's assets. A debt-to-equity ratio of 5 implies that debt holders have five times the claims on assets compared to equity holders. Firms with high debt-to-equity ratios are typically aggressive in financing growth through debt, which can lead to more volatile earnings (Ojo, 2012; Mbah & Obiezekwem, 2019).

Corporate Performance

The term corporate performance cannot be put into a tight framework of definition. It is indistinct phenomenon and it can be interpreted and measured in different ways. Different stakeholders assess corporate performance based on their individual perspectives and priorities. A financial analyst evaluates performance through profitability and growth, while an economic planner focuses on equitable wealth distribution and efficient resource utilization. Similarly, a welfare economist prioritizes fair distribution of gains alongside economic efficiency. From a national perspective, corporate performance can be measured through indicators such as employment generation, research and development, health, education, and overall economic progress. Different parties perceive corporate performance differently. Shareholders are primarily interested in profitability, whereas management focuses on company growth (Anetoh et al., 2020; Obiezekwem et al., 2021; Okonkwo, Ifechukwu-Jacobs, & Obiezekwem, 2024). Therefore, both profitability and growth

are essential dimensions in corporate performance analysis. Some researchers use these factors as key measures of performance. Broadly, corporate performance refers to the extent to which a firm achieves its financial objectives. It involves evaluating the outcomes of a firm's policies and operations in monetary terms, providing insights into financial health over a specific period. This metric also enables comparisons between firms within the same industry or across different industries. The key measures of corporate performance for agricultural firms, as considered in this study, are discussed below:

Return on Assets (ROA): This metric, calculated as net income divided by total assets, reflects how effectively a company utilizes its assets to generate earnings. A company with a consistently high ROA is perceived as financially stable and liquid. A higher ROA indicates efficient asset utilization, which is favorable for investors and stakeholders.

Return on Equity (ROE): Defined as net income divided by total equity capital, ROE measures a company's ability to allocate funds toward profit-generating activities. It essentially represents the return on investment for shareholders. A higher ROE signifies that the company effectively transforms shareholder funds into profitable ventures, enhancing shareholder wealth.

Net Profit Margin: This forward-looking, accounting-based performance measure is determined by dividing profit after tax by turnover or net sales. It provides insight into the percentage of profit generated from sales, reflecting the firm's efficiency in converting revenue into actual profit. A higher net profit margin signifies stronger financial performance and operational efficiency (Okafor, Okonkwo, & Chinenye, 2023; Ugwa, Okonkwo, & Madu, 2020; Mbah & Obiezekwem, 2019).

Theoretical Framework
Pecking Order Theory
Myers and Majluf (1984) based their research on Akerlof's "Market for Lemons" model, which illustrates how markets can deteriorate when potential buyers cannot accurately assess the quality of the products they are offered. Akerlof's work highlights the issue of information asymmetry, where sellers possess more knowledge about a product than buyers, potentially leading to adverse selection when firms raise capital (Myers & Majluf, 1984; Drobetz, Gounopulos, Merikas & Schröder, 2013; Myers, 1984).

To challenge the Trade-off Theory, Myers (1984) introduced the Pecking Order Theory, which suggests that companies prioritize their sources of financing in a specific order: first, internal financing, then debt, and lastly, equity issuance. This ranking is based on how each financing type is affected by information asymmetry.

Retained earnings have no adverse selection issues, making them the preferred financing source.

Debt financing has minor adverse selection concerns.

Equity financing faces significant adverse selection risks, as issuing new shares can signal to investors that a firm's stock is overvalued, leading to a drop in valuation.

Companies generally prefer internal financing (retained earnings) over issuing new securities. If retained earnings are insufficient, firms opt for debt rather than issuing external equity, as debt financing discloses less information about the firm's valuation. Unlike the trade-off theory, which assumes firms maintain a leverage-ratio equilibrium, the pecking order theory suggests no such balance exists.

From a macroeconomic perspective, factors like high oil prices and increased corporate earnings should lead to a decline in leverage ratios if the pecking order theory holds. This is because firms with rising profits would rely more on retained earnings rather than seeking external funding. In such a scenario, the agency problem between shareholders and managers should diminish, resulting in fewer firms issuing debt (Frank & Goyal, 2009).

Empirical Studies

Ibekwe, Ogini, & Ibekwe (2022), explored the impact of ownership structure on agricultural output in Nigeria, defining agriculture as the cultivation of crops and livestock for food, human needs, and economic gain. It examines the effects of ordinary shares, retained earnings, short-term debt ratio, and long-term debt ratio on agricultural firms. Using an ex post facto research design and secondary data from annual reports, the findings reveal that all four factors positively and significantly influence agricultural output.

The study concludes that ownership structure enhances agricultural firm performance and recommends that management optimize ownership structures to boost output and investment. It advises firms to be cautious about excessive debt, as high leverage can shift control from internal to external stakeholders. Investors are encouraged to assess firms' financing structures before making investment decisions, as capital structure impacts returns.

Ofoegbu, Mlanga, and Igwe (2018) examined the effect of capital structure on the performance of agricultural and agro-allied companies in Nigeria. Covering a period from 2005 to 2015, the study analyzed financial statements of one agricultural and nine agro-allied companies quoted on the Nigerian Stock Exchange Market. Using an ex-post facto research design and ordinary least squares regression analysis via SPSS, the study found that capital structure significantly affects returns on investments, concluding that it is a key determinant of firm performance.

Garba, Abubakar, and Sulaiman (2019) assessed the impact of financial leverage on the financial performance of three quoted agricultural firms in Nigeria from 2005 to 2017. The study employed ex-post facto and longitudinal research designs and used Pooled Ordinary Least Squares for estimation. The findings showed that while the short-term debt ratio negatively impacted financial performance, the total debt-to-equity ratio had a significant positive impact on return on equity, whereas the long-term debt ratio had no significant effect.

Ngwoke and Udeh (2019) investigated how capital structure affects the financial performance of listed food and beverage companies in Nigeria. Using data from 2007 to 2016, the study employed an ex-post facto research design and multiple regression analysis via E-View statistical software. The results indicated that short-term debt had a significant and positive effect on return on equity as a measure of corporate performance.

Sahari, Rahim, and Tinggi (2019) conducted an empirical study on the relationship between capital structure and firm performance among food-producing firms in Malaysia from 2007 to 2016. Their panel data analysis revealed that all variables studied had a significant impact on firm performance.

Onuora and Obia (2018) examined the effect of financial leverage on the financial performance of listed agricultural firms in Nigeria over five years (2011-2015). Employing ex-post facto research design and regression analysis, the study found that debt ratio and interest coverage ratio negatively influenced earnings per share, while debt-equity ratio and asset tangibility were statistically insignificant in explaining financial performance.

Uremadu and Onyekachi (2018) analyzed the impact of capital structure on corporate performance in Nigeria's consumer goods sector. Using multiple regression analysis, the study found a negative and insignificant relationship between capital structure and corporate performance, with long-term debt and total debt ratios showing no significant impact on returns on assets.

Otekunrin, Nwanji, and Obasaju (2018) studied the relationship between capital structure and profitability in 18 agriculture and agro-allied firms listed on the Nigerian Stock Exchange from 2007 to 2012. Applying the Ordinary Least Squares method, the study found that profitability was positively correlated with shareholder equity but negatively correlated with long-term debt.

Igwe, Ogar, and Ogbuu (2017) examined the effect of capital structure on the profitability of agro-allied companies listed in Nigeria. Covering a period from 2005 to 2015, the study found that capital structure serves as a major determinant of profitability in the Nigerian agro-allied sector.

Shibanda and Miroga (2018) assessed how capital structure influences the growth of agricultural firms in Kenya listed on the NSE from 2012 to 2017. Using regression and correlation analysis, the study found that capital structure significantly affects

growth, with a positive relationship between profitability and current liabilities to capital employed.

Kinyua and Muriu (2017) evaluated the determinants of capital structure for agricultural firms in Kenya from 2010 to 2015. Using fixed and random effects estimation techniques, the study found that profitability, liquidity, age, and firm size significantly influenced capital structure, with profitability showing a negative relationship with long-term debt.

Echekoba and Ananwude (2016) examined the impact of financial structure on the performance of agricultural and healthcare firms listed on the Nigerian Stock Exchange from 1993 to 2013. Using pooled OLS and fixed/random effect models, the study found that financial structure significantly impacted earnings per share but did not affect return on equity, return on assets, or profit before tax.

Gap in Knowledge

Previous research on corporate performance measures of agricultural firms in Nigeria has primarily focused on return on assets, return on investment, profit before and after tax, earnings per share, and return on equity. This study takes a novel approach by incorporating net profit margin as an additional indicator of corporate performance. Given the inconsistencies in existing literature regarding the relationship between capital structure and corporate performance, as well as the identified research gap, this study aims to analyze the impact of capital structure on the corporate performance of agricultural firms listed on the Nigerian Stock Exchange (NSE).

Methodology

Research Design

This research adopted an ex-post facto longitudinal/panel research design. The data used in the analysis were secondary in nature and extracted from the annual reports of the five (5) agricultural firms quoted on the Nigerian Stock Exchange Nigerian from 2009 to 2021, and which have operated on the exchange for a least period of ten years. All the data are on annual basis as contained in the sources mentioned.

Model Specification and Description of Variables

To test the hypotheses developed, a linear and multivariate modified regression model of Echekoba and Ananwude (2016) was adapted and modified. The original model is state as:

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

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

$Z_{i,t}$ reflects the control variables which include tangibility, firm size, growth opportunities, risk and tax.

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

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

$ROA = f(TDTA, FMS)$ ……………………..……………………………………………..……3.2

$ROE = f(TDTE, FMS)$ …………..…………..……………………………………………..……3.3

$NPM = f(STDTA, FMS)$ …..……………..…..………………………………………………..……3.4

$GRV = f(TDTA, FMS)$ ……………..……..……………………………………..……3.5

Econometrically transforming equ. $3.2 - 3.4$ thus becomes:

$ROA_t = a_0 + a_1 TDTA_t + a_2 FMS_t + u_t$ ………………..…………………………………..……3.6

$ROE_t = a_0 + a_1 TDTE_t + a_2 FMS_t + u_t$ ……………………………………………..……3.7

$NPM_t = a_0 + a_1 STDTA_t + a_2 FMS_t + u_t$ ………………………………………..……3.8

$GRV_t = a_0 + a_1 TDTA_t + a_2 FMS_t + u_t$ ……………..…..……………………………..……3.9

Where:

ROA = Return on Assets

ROE = Return on Equity

NPM = Net Profit Margin

GRV = Net Profit Margin

TDTA = Total Debt to Total Assets

TDTE = Total Debt to Total Equity

STDTA = Short Term Debt to Total Assets

u = Stochastic or disturbance term.

t = Time dimension of the variables

a_0 = Constant or intercept

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

Data Analysis

Panel OLS Analysis of Capital Structure and Corporate Performance

The pooled OLS, fixed and random effect were the estimation approaches used. The result ofthe panel OLS estimations for the models are detailed in Tables $10 - 12$. The global and relative utility of the models were adopted in interpreting the output of the regression estimates.

Findings
Return on Assets and Total Debt to Total Assets
Table 1: Panel OLS of Return on Assets and Total Debt to Total Assets

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
C	-0.067807	0.7430	-0.066838	0.7509	-0.067678	0.7584
TDTA	-0.000301	0.9959	-0.008457	0.8963	-0.001085	0.9855
FMS	2.61E-10	0.9037	4.07E-10	0.8676	2.74E-10	0.9007
R-squared	0.000365		0.184376		0.000362	
Adjusted R-squared	-0.034371		-0.048112		-0.034375	
S.E. of regression	1.495308		1.505212		1.480870	
Sum squared resid	126.1869		103.1886		123.5949	
Log likelihood	-108.2118		-102.1153			
F-statistic	0.010390		0.798106		0.010298	
Prob(F-statistic)	0.989867		0.666998		0.989957	
Durbin-Watson stat	1.644534		1.604374		1.640829	
Hausman Specification Test						
		Statistic	Value			
		Chi-Sq. Statistic	0.097796			
		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 1 suggests that the random effect estimation is preferred to the fixed effect due to the insignificant p-value of the Chi-square. The findings indicate a negative but insignificant relationship between total debt to total assets and return on assets in agricultural firms. Firm size, however, exhibits a positive correlation with return on assets. When controlling for firm size, a constant total debt

to total assets ratio would result in a 0.067-unit decline in return on assets. Additionally, a one-percent increase in total debt to total assets leads to a 0.000301-factor decrease in return on assets, whereas a unit increase in firm size would contribute to a 2.61-factor increase in return on assets.

The adjusted R-square value of -0.034371 indicates that the explanatory variables collectively accounted for a negative 3.47% variation in the return on assets of agricultural firms during the study period. The F-statistic, which assesses the overall significance of the independent variables, suggests that total debt to total assets, when moderated by firm size, did not significantly explain the variations in return on assets, as evidenced by the p-value (0.99), which is not significant at the 5% level. The Durbin-Watson statistic (1.6), a traditional test for autocorrelation, falls within the acceptable range, indicating that the model's variables are not serially correlated.

Return on Equity and Total Debt to Total Equity
Table 2: Panel OLS of Return on Equity and Total Debt to Total Equity

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
C	0.080411	0.5120	0.063787	0.6157	0.080411	0.5175
TDTE	-0.004907	0.8859	-0.003067	0.9359	-0.004907	0.8874
FMS	-2.30E-10	0.8557	2.32E-10	0.8718	-2.30E-10	0.8576
R-squared	0.000630		0.173605		0.000630	
Adjusted R-squared	-0.034098		-0.061525		-0.034098	
S.E. of regression	0.862946		0.874426		0.862946	
Sum squared resid	42.02626		34.82425		42.02626	
Log likelihood	-74.89787		-69.20206			
F-statistic	0.017980		0.741801		0.017980	
Prob(F-statistic)	0.982185		0.721263		0.982185	
Durbin-Watson stat	2.165937		2.151302		2.165937	
Hausman Specification Test						
	Statistic		Value			
	Chi-Sq.		0.786100			

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
	Statistic					
	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

The Hausman test results in Table 2 indicate that the random effect model is preferred, as the Chi-square p-value is not significant at the 5% level. The findings reveal a negative but insignificant relationship between total debt to total equity and return on equity for agricultural firms listed on the Nigerian Stock Exchange. Based on the constant coefficient of 0.080411, if total debt to total equity and firm size remain unchanged, shareholder wealth would increase by 0.080%. However, a one-unit increase in total debt to total equity and firm size would result in a depreciation of shareholder wealth by 0.91% and 0.87%, respectively.

The F-statistic value of 0.017980, with a p-value of 0.98, indicates that total debt to total equity and firm size did not significantly explain the variations in return on equity for listed agricultural firms. The adjusted R-squared value of -0.034098 clearly shows that the explanatory variables accounted for a -3.41% change in return on equity. This suggests that total debt to total equity and firm size have not contributed to the growth of shareholders' wealth. Additionally, the Durbin-Watson statistic confirms that the variables in the model are free from autocorrelation issues, making the statistical inferences reliable.

Net Profit Margin and Short Term Debt to Total Assets
Table 3: Panel OLS of Net Profit Margin and Short Term Debt to Total Assets

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
C	2.055301	0.7125	2.900504	0.6057	2.173112	0.7086
STDTA	-14.73691	0.0718	-16.45462	0.0534	-14.97610	0.0674
FMS	-5.20E-08	0.1847	-5.66E-08	0.184	-5.27E-08	0.1820

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
				2		
R-squared	0.072841		0.261692		0.076458	
Adjusted R-squared	0.039958		0.050213		0.043703	
S.E. of regression	32.17792		31.99637		31.70521	
Sum squared resid	58434.54		46659.13		56730.29	
Log likelihood	-294.1901		-287.3715			
F-statistic	2.237314		1.249814		2.357536	
Prob(F-statistic)	0.119631		0.288093		0.107145	
Durbin-Watson stat	2.104404		2.044525		2.097424	
Hausman Specification Test						
	Statistic		Value			
	Chi-Sq. Statistic		0.938165			
	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

The Hausman test in Table 3 supports the use of the random effect estimation due to the Chi-square p-value being insignificant. The findings indicate that short-term debt to total assets and firm size have a negative but insignificant relationship with the net profit margin of agricultural firms listed on the Nigerian Stock Exchange. The constant coefficient of 2.173112 suggests that if short-term debt to total assets and firm size remain unchanged, the net profit margin of these firms would increase by 2.17%. However, a unit increase in short-term debt to total assets and firm size would lead to a decline in net profit margin by factors of 0.0674 and 0.1820, respectively.

The adjusted R-square value of 0.043703 indicates that the explanatory variables collectively accounted for only 4.37% of the variations in the net profit margin of

listed agricultural firms during the study period. The F-statistic, which assesses the overall significance of the independent variables, reveals that short-term debt to total assets and firm size did not significantly explain changes in net profit margin, as the p-value of the F-statistic is insignificant at the 5% level. Additionally, the Durbin-Watson statistic of 2.10 suggests that the model is free from autocorrelation.

Gross Revenue and Total Debt to Total Assets
Table 4: Panel OLS Regression Result Gross Revenue and Total Debt to Total Assets

Variables	Pooled OLS Coefficient	Prob.	Fixed Effect Coefficient	Prob.	Random Effect Coefficient	Prob.
C	12871983.38	0.0005	15148299.16	0.0003	12871983.38	0.0007
TDTA	-1932166.36	0.7792	-7130558.59	0.3657	-1932166.36	0.7850
FMS	-171700.20	0.4948	-159012.18	0.5774	-171700.20	0.5065
R-squared	0.011311		0.159597		0.011311	
Adjusted R-squared	-0.018134		-0.075108		-0.018134	
S.E. of regression	16437847		16895951		16437847	
Sum squared resid	1.79E+16		1.53E+16		1.79E+16	
Log likelihood	-1272.7545		-1267.0723			
F-statistic	0.383221		0.682378		0.383221	
Prob(F-statistic)	0.678857		0.788313		0.678857	
Durbin-Watson stat	0.559290		0.552766		0.559290	
Hausman Specification Test						
	Statistic		Value			
	Chi-Sq. Statistic		2.472774			
	P-value		0.294000			

Source: Computer output data using E-views 10.0
Note: Periods included: 12, Cross-sections included: 5, Total Number of Observations: 60

The Hausman test in Table 4 supports the random effect model, as the p-value of the Chi-square is insignificant at the 5% level. The findings indicate that the total debt-to-total assets ratio has a negative but insignificant relationship with gross revenue. The constant coefficient of 12,871,983.38 suggests that if the total debt-to-total assets ratio remains unchanged, the gross revenue of agricultural firms would amount to ₦12,871,983.38. A unit increase in the total debt-to-total assets ratio and firm size would result in a depreciation of gross revenue by ₦1,932,166.36 and ₦171,700.20, respectively.

The F-statistic value of 0.383221, with a p-value of 0.678857, indicates that the total debt-to-total assets ratio and firm size did not jointly and significantly explain variations in gross revenue. Based on the adjusted R-squared value of -0.018134, it is evident that the explanatory variables negatively contributed to 1.81% of the variations in gross revenue. Additionally, the Durbin-Watson statistic of 0.56 falls outside the acceptable range; however, this issue was mitigated through the application of an autocorrelation test.

Conclusion

The overall results of this study indicate that financial structure does not have a significant impact on the performance of agricultural firms listed on the Nigerian Stock Exchange. Additionally, the findings suggest that these firms align more closely with the Pecking Order Theory than the Trade-off Theory, implying a preference for internal financing over external funding. However, when external financing is necessary, firms tend to issue the least risky securities first.

Recommendations

In view of the findings of this study, the following recommendations are put forward for consideration by stakeholders:

1.   Agricultural firms should establish a debt-equity mix capable of improving return on assets. This is based on the non-significant effect of total debt to total assets on return on assets.

2.   Agricultural firms should fund their operations with more of equity capital as debt financing negatively influence shareholder wealth.

3.   Agricultural firms' management 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 of leverage.

4.   Agricultural firms should increase their investment in their assets such production/manufacturing assets to improve gross revenue, under investment in

fixed assets should be discontinued and effective and efficient utilization of fixed assets vehemently upheld.

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