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Capital Structure and Dividend Payout of Quoted Agriculture Firms in Nigeria: Moderating Effect of Financial Performance

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ABSTRACT

Despite the previous effort to analyze the capital structure and dividend payout interface with mixed results, it appears the moderating effect of financial performance on the nexus was yet to be empirically examined. This study examined the moderating effect of financial performance on the relationship between the capital structure and dividend payout ratio of quoted agriculture firms in Nigeria. Debt-equity ratio and debt-assets ratio were the proxies of capital structure, while dividend payout ratio measured dividend payout. Return on asset was the proxy for financial performance. Adopting an ex-post facto research design, the panel data sourced from the annual published accounts of the firms were subjected to multiple regression analysis using STATA 13. The results showed that the debt-equity ratio has a negative and significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria. The debt-assets ratio has a positive and insignificant effect on the dividend payout ratio of agriculture firms in Nigeria. Return on assets has a positive and significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria. Furthermore, return on assets has a negative and significant moderating effect on the relationship between debt-equity ratio and dividend payout ratio, while return on assets also has a negative and insignificant moderating effect on the relationship between debt-assets ratio and dividend payout ratio of quoted agriculture firms in Nigeria. The firms should use debt-financed assets more productively to generate an optimum return on assets to reverse the negative effect of the debt-equity ratio on the dividend payout ratio if they are to consistently pay competitive dividends and attract investment.

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KEYWORDS: capital structure, return on assets, financial performance, debt-equity ratio, debt-asset ratio

1.0 INTRODUCTION

The quest to analyze the effect of capital structure on dividend payout to determine the effect, magnitude, and significance has informed the many recent empirical investigations carried out by scholars with mixed results in corporate finance literature (see Akmalia, 2023; Adesola et al., 2021; Ishaku et al., 2020). Simanullang et al. (2021) evaluated the effect of return on assets (ROA) on company value with capital structure as a moderating variable in banking companies listed on the Indonesia Stock Exchange. Adeiza et al. (2020) examined the dividend payout ratio and return on assets interface of quoted oil and gas companies. This was followed by Akinboade et al. (2021), who analyzed the relationship between return on assets and dividend payout of listed insurance companies in Nigeria. Adding his voice to the discourse, Abdulrahman (2021) examined the moderating effect of liquidity on the relationship between capital structure and profitability with emphasis on listed deposit money banks in Nigeria, while Igben et al. (2021) assessed the impact of ROA on the dividend payout policy of listed consumer goods companies in Nigeria. Aside from liquidity, a firm's dividend payment is affected by financial performance, as affirmed by Nurhikmawaty et al. (2020). By extension, capital structure and dividend payout nexus may be moderated by financial performance. From the existing literature, it is evident that the previous scholars assessed either the relationship or effect of capital structure on dividend payout ratio with mixed results. Also, the link between financial performance and dividend payout has also been assessed with mixed results. Meanwhile, to the best of my knowledge, the moderating effect of financial performance on the relationship between capital structure and dividend payout was yet to receive empirical attention to contribute to the ongoing discourse on capital structure and dividend payout interface. Also, adequate empirical effort was yet to be given to the quoted agriculture firms in Nigeria

as the government mainstreams the agribusiness ecosystem to reflate the economy, grow the gross domestic product, and ensure food security. To the best of my knowledge, the inability to examine the moderating effect of financial performance on the link of discourse would make the apparent gap in literature linger. Therefore, this study attempted to bridge the observed gaps by analyzing the moderating effect of financial performance on the relationship between capital structure and dividend payout nexus of quoted agriculture firms in Nigeria using secondary data spanning 2012–2022. Maintaining that thrust, all the quoted agriculture firms in Nigeria were recruited in the survey. Agriculture holds an important key to unlocking the huge potential in the economy and food security, which should attract an inflow of equity and debt capital. To attract equity funding, dividend considerations and appreciation in the market value of shares are key to the investing public.

In the study, the proxies of capital structure are debt-equity ratio and debt-asset ratio. The proxy of the dependent variable is the dividend payout ratio. The measure of financial performance is return on assets, which ascertains the profitability of the firm in relation to using its total assets. The proportion of earnings paid to the shareholders as dividends is influenced by the mix of capital (debt and equity) employed by the firm. If dividend ratio is impacted by financial performance, the relationship between capital structure and dividend payout ratio may be moderated by return on assets. The overriding question in the study is, does financial performance moderate the relationship between capital structure and dividend payout of quoted agriculture firms in Nigeria?

The general objective of this study is to examine the moderating effect of financial performance on the relationship between capital structure and dividend payout of quoted agricultural firms in Nigeria. The specific objectives are to: analyze the effect of debt-equity ratio on dividend payout ratio of quoted agriculture firms in Nigeria, examine the effect of debt-assets ratio on dividend payout ratio of quoted agriculture firms in Nigeria, ascertain the effect of return on assets on dividend payout ratio of quoted agriculture firms in Nigeria, and assess the moderating effect of return on assets on the relationship between capital structure and dividend payout ratio of quoted agriculture firms in Nigeria.

2.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Conceptual Framework

A conceptual framework depicts the subsisting relationships among variables of interest and the statement of the variables, which explains why or how the relationships exist (Edokpa et al., 2024; Mathooko & Mathooko, 2011). Figure 1 shows the conceptual framework that was formulated to address the main issues in the empirical survey. The model proposes that the link between capital structure and dividend payout is moderated by return on assets.

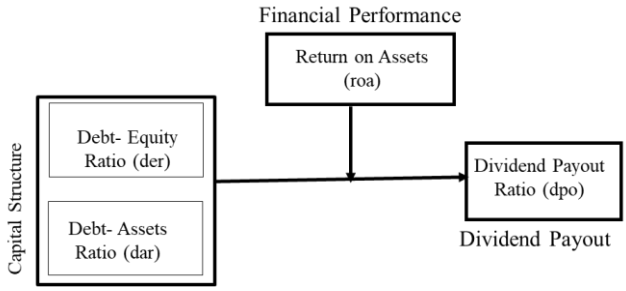

Figure 1. Conceptual framework

2.1.1 Dividend Payout Ratio

A firm may distribute its profit after tax among shareholders in the ratio of shares held. When a firm distributes its such profit (in part or full) to shareholders, it is called a dividend (Heba & Rabab, 2021). The portion of the distributable profit (earnings after tax) that is given to the shareholders in the form of cash dividends is referred to as the dividend payout ratio in this study. It is the amount of money that a company pays out to its shareholders on a per-share basis (Edokpa et al., 2024). Dividend payout decisions are made by the board of directors. The determination of the threshold may be influenced by various factors, such as the company's financial performance, growth strategy, and cash reserves. The range of a healthy dividend payout ratio is a topic of ongoing debate among scholars and practitioners. Therefore, there is no generally acceptable range since it depends on various factors. However, the traditional view presented by Akre Capital (2018), shows the range of 20–40% considered healthy and can create the leverage for companies to retain some earnings for future growth and expansion while providing a competitive return to shareholders. A higher dividend payout can attract more investors, enhance a company's market reputation, and reward shareholders for their investment in the company (Ishaku, 2015; Andiema & Atieno, 2016). Bossman et al. (2022) opined that where there are insufficient funds after cash dividend payment, profitable investment opportunities may be ignored with their negative consequences for the firm. However, where firms consistently refuse to pay a dividend, it sends a bad signal to existing and prospective investors such that the price of the firm's securities would react negatively to the signal (Ali, 2022; Hasan et al., 2021; Thompson & Adasi Manu, 2020). A firm's dividend payout ratio may have some prediction power as it signals what stage of business the firm is in. It is more expedient for the firm to keep the profits and reinvest them into the business for the future benefits of the shareholders. This may be typical of some of the quoted agriculture firms in Nigeria, whereby the need to grow and expand operations drives continuous reinvestment of profits that should have been given to shareholders as cash dividends

(Edokpa et al., 2024). The dividend payout was operationalized in the study as total dividends / net income.

2.1.2 Capital Structure

The capital structure of a firm combines the debt and equity that it uses to finance its operations and investments. Debt pertains to borrowed money, while equity is a combination of funds provided by shareholders (Edokpa et al., 2024). Furthermore, it is the mix of debt and equity finance in its long-term funding plan. It also comprises of debt, equity, or hybrid securities issued by the firm (Andiema & Atieno, 2016). A firm's capital structure should take cognizance of factors such as company size, risk, industry, and current market conditions. It affects its creditworthiness and attractiveness to lenders and investors. Debt financing offers some advantages, such as low cost of capital and tax benefits, but also increases financial risk. Equity financing provides flexibility, but it may also dilute ownership and reduce earnings per share. Increased leverage may be inversely correlated with dividend payments. The capital structure of the firm has been influenced by some major schools of thought or theories (Edokpa et al., 2024, Kiprono, 2012; Prace, 2004). Kumar et al. (2018) opine that agriculture firms with a higher equity ratio in their capital structure have better performance likelihood and lower risk of financial distress because equity provides greater flexibility and enables firms to adjust to market dynamics. Furthermore, Chen et al. (2020), having analyzed the capital structure decisions of listed Chinese agriculture firms, concluded that those with a higher debt ratio tend to have higher returns on assets and higher share prices, even though excessive leverage can exacerbate the risk of financial distress.

2.1.2.1 Debt-equity Ratio

The debt-equity ratio is a measure of the fraction of debt and equity financing in the capital structure of companies. It could also be viewed as a financial index that compares a company's total debt to its total equity. Edokpa et al. (2024) see the ratio as a measure of the proportion of funding that comes from debt in comparison with equity. Furthermore, they hold that debts include all the financial obligations of the firm, such as loans, bonds, and other borrowings. Equity includes ordinary shares, preference shares, and retained earnings. The debt-equity ratio can be operationalized as total debt divided by equity (Salim & Widoatmojo, 2023; Marpaung et al., 2023). The ratio is commonly used by the investing public, analysts, and credit rating agencies to evaluate a company's financial health and risk profile. A higher debt-equity ratio signals more debt than equity, which can make it riskier and more vulnerable to financial distress. The doubtful characteristic of cash flows among firms operating in high risk industries may result in a higher debt-equity ratio. A lower debt-equity ratio paints the picture that a company has more equity than debt, which can make it more financially stable and less risky. A negative debt-to-equity ratio indicates the firm has more liabilities than assets, which generally signals imminent bankruptcy (Graham & Harvey, 2001). Thus, Edokpa et al. (2024) hold that the debt-equity ratio can be a useful tool in the financial analysis of a company's capital structure and financial health as it provides insights into a company's degree of leverage and the risks associated with its financing methods. Investors and lenders of capital can use the ratio in the evaluation of a company's financial strength and probability of its ability to meet its negotiated maturing reciprocal financial obligations.

2.1.2.2 Debt-asset Ratio

The debt-asset ratio is a financial index showing the proportion of debt that a firm uses to finance its assets. It measures the level of a firm's leverage by comparing the total debt to the total assets. It also evaluates the firm's ability to meet its negotiated reciprocal debt obligations (Edokpa et al., 2024). This ratio is an important tool for investors and creditors to ascertain a firm's financial health and creditworthiness (Romero, 2021). The debt-assets ratio of a firm is obtained by dividing the total debt by its total assets (Edokpa et al., 2024; Salim & Widoatmojo, 2023; Aman et al., 2022). A low debt-assets ratio suggests that a company has a lower level of debt relative to its assets, thereby indicating the company is less risky and more financially stable, which could be attractive to the investing and lending public. A high debt-asset ratio indicates a high level of financial risk, which may lead to financial distress or even bankruptcy. The range of a healthy debt-to-asset ratio may vary across firms and industries over time. Ross et al. (2013) believe a debt-asset ratio between 0.2 and 0.5 is considered to be a healthy range, signaling the firm has a moderate level of debt and a strong ability to finance its debt obligations. A debt-asset ratio above 1.0 can be sticky, suggesting that the firm is heavily dependent on short-term funding and may be exposed to potential losses. Scholars have also reported a negative debt-asset ratio (Chen & Wang, 2016; Shleifer & Vishny, 2011; La Porta et al., 1997), indicating the firm is in financial distress or bankruptcy. Therefore, it is essential for firms to maintain an optimal debt-asset ratio to ensure financial stability and long-term growth (Edokpa et al., 2024; Global Banking and Finance Review, 2021).

2.1.3 Financial Performance

Performance is a multidimensional concept that could be defined in different ways depending on the context and perspective. Financial performance may be viewed as the ability of a firm to use its assets to generate revenue, typically measured against specific goals or key performance indicators (KPIs). It assesses how well a firm is performing in terms of profitability, liquidity, and efficiency. It provides insights into the overall health and success of a firm and helps identify areas that require improvement or further investment (Edokpa et al. 2023). The information used in assessing the financial performance of a company is generally sourced

from the published annual accounts or financial statements. Good or high financial performance implies that a company is meeting or exceeding expected goals, whereas poor or low financial performance suggests the opposite. Financial performance is critical for a company's survival, as it can affect its market reputation, financial stability, investor confidence, and ability to sustain competitive advantage. In finance, accounting and market-based ratios are often employed as measures of financial performance (Edokpa et al., 2023). Key performance indicators such as revenue, net income, gross margin, return on investment, and return on assets are often used to measure financial performance. The proxy of financial performance in this study is return on assets, which was also used by prior scholars in their reviews (e.g., Heba & Rabab, 2021; Salim & Widoatmojo, 2023; Aman et al., 2022). ROA can provide an overview of management's effectiveness in using assets to generate income (Akmalia, 2023).

2.1.3.1 Return on Assets

Return on assets measures how well the firm managed total available resources to generate revenue. It focuses on the earning power of assets without prejudice to how the assets were financed by the firm. In their contribution to the discourse on return on assets, Abu and Okpe (2020) submitted that it is an accounting ratio that measures how much the firm is earning after tax for each Naira invested in the assets employed. Adeiza et al. (2020) corroborated the view when they opined that the ratio indicates management performance in using the company's total assets to generate return but differed in its measurement by using profit before tax instead of profit after tax. In his contribution to the discourse, Akmalia (2023) submitted that return on assets can provide an overview of management's effectiveness in using assets to generate income. Stressed further, the ratio measures the efficiency of the firm in generating earnings with the total available assets. Thus, the higher the ratio, the better it is for the firm. Scholars reported that a negative return on assets ratio can signal that a company is grappling with financial challenges orchestrated by low profitability, high costs, poor asset utilization, high levels of debts, or industry-specific besetting factors (O'Hearne & Griffin, 2016; Deegan & Gordon, 1998).

2.2.1 Debt-Equity Ratio and Dividend Payout Ratio

Oguoma and Ezentu (2020) analyzed the relationship between debt-equity ratio and dividend policy of listed Nigerian banks. The study used panel data analysis, employing a sample of 11 listed banks in Nigeria from 2010 to 2018. The findings of the study indicated a significant negative relationship between debt-equity ratio and dividend payout, suggesting that banks with high debt-equity ratios tend to have lower dividend payouts. Additionally, Ishaku et al. (2020) evaluated the relationship between capital structure and dividend policy of listed companies in Nigeria. It adopted an ex post facto research design. The measure of dividend policy was the dividend payout ratio, while the debt-equity ratio was one of the independent variables. Robust GLS regression analysis was used to analyze the data. It was reported that the debt-equity ratio has a significant negative relationship with the dividend payout ratio. However, Oludare et al. (2020) examined the relationship between debt-equity ratio and dividend payout in Nigeria within the oil and gas industry. The authors collected data from annual reports and financial statements of eleven (11) firms for the period 2010-2018, which were analyzed using multiple regression analysis. The results showed a significant positive relationship between debt-equity ratio and dividend payout.

Nwankwo and Ogbonna (2021) examined the relationship between debt-equity ratio and dividend payout of Nigerian manufacturing firms. The study employed a panel data analysis using secondary data obtained from annual reports and accounts of 15 manufacturing firms listed on the Nigeria Exchange from 2010 to 2019. They also carried out regression analysis through the use of STATA. It was reported that there is a significant negative relationship between debt-equity ratio and dividend payout in the firms of study. Also, Akinlo and Adebiyi (2021) assessed the effect of the debt-equity ratio on the dividend payout policy of Nigerian banks. The study adopted panel regression analysis to explore the relationship between debt-equity ratio and dividend payout ratio. The results revealed there exists a significant negative relationship between the debt-equity ratio and the dividend payout ratio of Nigerian banks. However, Adeoye et al. (2021) analyzed the relationship between leverage and dividend payout of quoted companies in Nigeria. Secondary data were collected from annual reports and accounts of 50 selected companies listed on the Nigerian Exchange for a period of 5 years (2015-2019). The findings revealed a weak negative relationship between leverage and dividend payout, implying that as leverage increases, dividend payout decreases, but the relationship is not significant. Based on the empirical evidence obtained, the study, therefore, hypothesized that:

H01: Debt-equity ratio has no significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria.

2.2.2 Debt-Asset Ratio and Dividend Payout Ratio

Agwu et al. (2019) assessed the relationship between leverage and dividend payout of selected listed manufacturing firms in Nigeria. The study employed a quantitative research design and a sample of 10 manufacturing firms in the Nigerian Exchange for the period 2013 to 2017. It used multiple regression analysis to run the secondary data sourced from annual published accounts. The outcome revealed that there is an insignificant positive relationship between leverage and dividend payout.

Ishaku et al. (2020) evaluated the relationship between capital structure and dividend policy of listed companies in Nigeria.

It adopted an ex post facto research design. Secondary data extracted from the annual audited accounts (2012–2019) of six conglomerate companies listed on the Nigerian Exchange were used in the analysis. Robust GLS regression analysis was used to analyze the data. It was reported that the debt-asset ratio has a significant negative effect on the dividend payout ratio of listed companies in Nigeria. Also, Anyaeji (2020) explored the effect of debt-asset ratio on dividend payout of listed manufacturing firms in Nigeria. The research design adopted was ex post facto, and the population was comprised of all 11 listed manufacturing firms in Nigeria. The data was analyzed using panel data regression analysis. The result of the analysis revealed a significant negative relationship between debt-asset ratio and dividend payout.

Oluwatoyin and Koyenikan (2021) inquired into the effect of the debt-asset ratio on the dividend payout of banks listed on the Nigerian Exchange. The study used data from twelve (12) listed banks from 2011 to 2019. The study utilized a panel regression analysis to test the relationship between debt-asset ratio and dividend payout ratio. The results of the study revealed that the debt-asset ratio has a significant negative effect on the dividend payout ratio of banks listed on the Nigerian Exchange. Furthermore, Adesola et al. (2021) examined the relationship between debt-asset ratio and dividend payout policy in Nigerian agricultural firms. The research employed a quantitative research method, using secondary data obtained from audited financial statements of agricultural firms listed on the Nigeria Exchange between 2015 and 2019. The study used descriptive statistics, correlation analysis, and multiple regression analysis to analyze the data. The findings revealed that debt-asset ratio has a significant negative relationship with dividend payout policy. Having reviewed the submissions of the previous researchers and obtained empirical evidence, the study hypothesized that:

H02: Debt-assets ratio has no significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria.

2.2.3 Return on Assets and Dividend Payout Ratio

Ighomereho et al. (2021) studied the relationship between return on assets and dividend payout of listed companies in Nigeria. The study used data from a sample of 30 quoted firms in Nigeria for the period from 2011 to 2019 and performed panel regression analysis. It was reported that ROA has a significant positive effect on dividend payout. The study concludes that firms with high ROA tend to pay higher dividends compared to firms with low ROA. This result implies that the profitability of a firm is a critical determinant of dividend payout in Nigerian listed companies. Furthermore, Isinguzo et al. (2021) inquired into the relationship between return on assets and dividend policy in Nigerian deposit money banks using panel data analysis for a period of 10 years (2010–2019). The study employed fixed effects, random effects, and pooled ordinary least squares regression models in analyzing the data. The results revealed a significant positive relationship between return on assets and dividend policy of Nigerian deposit money banks. In the same vein, Oluwole and Oyeleye (2021) analyzed the effect of return on assets (ROA) on dividend payout in Nigerian manufacturing firms. Data were collected from 10 selected firms listed on the Nigerian Exchange for the period of 10 years (2010-2019). The study employed panel data analysis through the fixed effect and random effect regression models. The results revealed that ROA has a significant positive relationship with dividend payout both in the short and long-run. In their contribution, Akinboade et al. (2021) evaluated the relationship between return on assets and dividend payout of listed insurance companies in Nigeria. The sample comprised of insurance firms listed on the Nigerian Exchange for the period 2010-2019. Panel data analysis was used to investigate the relationship between the variables of interest. The results indicated a significant positive relationship between the return on asset ratio and dividend payout ratio of listed insurance companies in Nigeria. In addition, Igben et al. (2021) examined the impact of return on assets on the dividend payout policy of listed consumer goods companies in Nigeria. Secondary data were generated from the annual published accounts of the companies under review. The study adopts a panel data regression analysis on a sample of 21 firms from 2010 to 2019. The findings revealed that ROA has a significant positive impact on dividend payout policy, indicating that firms with higher ROA pay higher dividends. In line with the empirical evidence obtained, the study hypothesized that:

H03: Return on assets has no significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria.

H04a: Return on assets has no significant moderating effect on the relationship between debt-equity ratio and dividend payout ratio of quoted agriculture firms in Nigeria.

H04b: Return on assets has no significant moderating effect on the relationship between debt-asset ratio and dividend payout ratio of quoted agriculture firms in Nigeria.

2.3 Theoretical Review

This study was anchored by the Pecking Order Theory, and Bird in Hand Theory found to be relevant to the study. The Pecking Order Theory was first proposed by Stewart Myers in 1984. In his article, "The Capital Structure Puzzle," Myers argues that firms prefer internal financing to external financing, considering its cheap and less risky nature. Furthermore, he posits that firms issue debt only when they have exhausted their internal financing options, while fresh external equity is the last resort (Myers, 1984). The theory has been criticized for its thin focus on taxes, ignoring agency costs and market conditions, limited generalizability, and overlooking the signaling effect, among others (Hovakimyan, & Ozkan, 2010; Baker & Wurgler, 2002; Graham & Harvey, 2001; Ross, 1977; Jensen & Meckling, 1976). Critiques

notwithstanding, some studies have empirically validated the theory by providing evidence that firms actually follow a pecking order in their capital structure decisions (Fama & French, 2002; Graham & Harvey, 2001). Thus, the Perking Order Theory remains one of the most influential theories in the field of finance. Bird-in-Hand Theory was proposed by Myron J. Gordon and John Lintner in their seminal paper "Dividend Policy, Growth, and the Valuation of Shares." The theory holds that because shareholders are risk-averse, they prefer dividend payments to future capital gains. Shareholders consider dividend payments to be more certain than future indeterminable capital gains. The fundamental implication of the theory is that because of the less risky nature of dividends, shareholders will discount the firm's dividend stream at a lower rate of return. This would increase the value of the firm's shares.

3.0 METHODOLOGY

A descriptive research design of *ex-post facto* research was adopted in the study in line with the specific research objectives and panel data for review. Previous scholars had also used *ex-post facto* design in their related study (e.g., Ishaku et al., 2020; Anyaeji, 2020). This study adopted positivism research philosophy in examining the moderating effect of financial performance on capital structure and dividend payout of quoted agriculture firms in Nigeria.

The population comprises of the five (5) agriculture firms quoted on the Nigerian Exchange (NGX). These are Ellah Lakes Plc, FTN Cocoa Processors Plc, Livestock Plc, Okomu Plc, and Presco Plc. The census sampling technique was adopted in the study. Eleven years of data were sourced from published audited financial statements of the firms analyzed. This study adopted descriptive and inferential statistics in the analysis of data. Furthermore, it made use of the multiple regression analysis technique with the aid of STATA 13 statistical software to diagnose the data and evaluate the hypotheses developed in the study.

3.1 Variables and Measurements

The variables of interest in the study were operationalized as shown in Table 1.

Variables	Type	Measurement	Sources
Debt-equity ratio (der)	Independent	Total debt / equity	Salim and Widoatmojo (2023); Marpaung et al. (2023).
Debt-assets ratio (dar)	Independent	Total debt / Total assets	Salim and Widoatmojo (2023); Aman et al. (2022)
Return on Assets (roa)	Moderator	EBIT / Total Assets	Heba and Rabab (2021); Salim and Widoatmojo (2023); Aman et al. (2022).
Dividend Payout Ratio (dpo)	Dependent	Dividend paid/earnings	Dewasiri et al. (2021); Heba and Rabab (2021); Marpaung et al. (2023).

From the conceptual framework (Figure 1) developed for the study, capital structure (proxied by debt-equity ratio, and debt-assets ratio) and dividend payout ratio link is moderated by return on assets—the proxy of financial performance. Consequently, the research models are specified, thus:

$dpo = \beta_0 + \beta_1 der_{it} + \beta_2 dar_{it} + \varepsilon_{it}$ ---------- (1)

$dpo = \beta_0 + \beta_1 der_{it} + \beta_2 dar_{it} + \beta_3 roa_{it+} + \varepsilon_{it}$ ---------- (2)

$dpo = \beta_0 + \beta_1 der_{it} + \beta_2 dar_{it} + \beta_3 roa_{it+} + \beta_4 der.roa_{it} + \beta_5 dar.roa_{it} + \varepsilon_{it}$ ------ (3)

Where:

'dpo' is dividend payout ratio; 'der' is debt-equity ratio; 'dar' is debt-asset ratio, and 'roa' is return on assets ratio.

β_0 is a constant.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the coefficients of der, dar, roa, der.roa, and dar.roa, respectively.

ε = is the error term.

i = firms, and

t = periods

A-priori expectations: $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4 \beta_5 > 0$

4.1 RESULTS AND DISCUSSION

The descriptive statistics and correlation matrix are presented in this section of the study. Furthermore, robustness tests, analysis, interpretation, and discussion of findings were also presented.

The descriptive statistics display the minimum, maximum, mean, and standard deviation of the variables used in the study, as highlighted in Table 2.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
dpo	55	1.33	1.67	0.00	4.82
der	55	4.40	1.66	0.00	9.48
dar	55	3.90	0.57	1.61	4.87
Roa	55	1.67	5.34	-6.38	18.76
der.roa	55	0.02	0.25	-1.55	0.70
dr.roa	55	0.15	0.53	-0.6	3.09

Output of STATA 13

From Table 2, the minimum value of the natural log of dpo is 0, while the maximum value is 4.82 with a standard deviation of 1.67 and a mean of 1.33. The minimum value of the natural log of der is 0, while the maximum value is 9.48 with a standard deviation of 1.66 and a mean of 4.40. The minimum value of the natural log of dar is 1.61, while the maximum value is 4.87 with a standard deviation of 0.57 and a mean of 3.90. The minimum value of roa is -6.38, while the maximum value is 18.76 with a standard deviation of 5.34 and a mean of 1.67. Some firms were more profitable than the others by making profits of 18.76% return on assets above the mean of 1.68%, while others recorded losses amounting to -6.38%. The minimum value of der.roa is -1.55 with a maximum value of 0.70, while the standard deviation and mean values are 0.25 and 0.02, respectively. In the same vein, the minimum and maximum values of dar.roa are -0.6 and 3.09, respectively, while the standard deviation value is 0.53 with the mean value of 0.15.

A collinearity matrix shows the degree of correlation between the independent variables in a regression analysis. It helps identify whether the independent variables are linearly related to each other, which can cause problems such as multicollinearity in the regression model.

Table 3. Correlation Matrix

	Der	dar	Roa	der.roa	dr.roa
der	1				
dar	0.0690	1			
Roa	-0.0399	0.1358	1		
der.roa	-0.8539	-0.0275	0.4174	1	
dr.roa	-0.0463	0.4859	0.3998	0.2634	1

Output of STATA 13

From the table, the Pearson correlation matrix for the data set shows there are no problems of multicollinearity in the regression model. The relationship among some of the variables is negative, while the positive relationship among the variables does not pose multicollinearity problems.

4.2 Robustness Tests

Robustness tests were conducted to validate the statistical inferences to be drawn from the study; the tests included tests for normality, multicollinearity, heteroscedasticity, and Hausman specification.

The Shapiro-Wilk test is used to test the null hypothesis that a set of data comes from a normal distribution.

Table 4: Shapiro-Wilk Normality Test

Variable	Obs	W	V	Z	Prob>z
dpo	55	0.7512	12.617	5.437	0.00000
der	55	0.21752	39.681	7.894	0.00000
Dr	55	0.61873	19.335	6.352	0.00000
Roa	55	0.9346	3.317	2.571	0.00507
derroa	55	0.53163	23.752	6.793	0.00000
drroa	55	0.68129	16.162	5.968	0.00000

Output of STATA 13

From Table 4, each variable of the study, except roa, has a probability value less than 0.05 ($p < 0.5$), which signifies that the residual is not normally distributed around their mean. This implies that one of the basic assumptions of the linear regression technique of normally distributed residual has been violated, which necessitated the use of the robust regression technique in the analysis.

From Table 5, the values of variance inflation factor (VIF) and tolerance (1/VIF) obtained were below 10 and 1, respectively, being proof that there was no multicollinearity problem (Farouk & Bashir, 2017; Gujarati, 2003). The mean VIF is 4.72.

The result obtained from the heteroscedasticity test shows a chi-square value of 28.94 and a p-value of 0.0000, indicating heteroscedasticity was present necessitating further testing. Where the value is significant, i.e., less than 5%, it implies the analysis must continue by running for fixed and random effects because OLS regression will be biased if the analysis were terminated.

A Hausman fixed and random effect test reveals a chi-square value of 34.26, and a p-value of 0.0000, which is lower than 0.05 and indicative of statistical significance. This result implies that the fixed effect estimation technique is the more appropriate model for this study.

The model tested in the study is:

$dpo_{it} = \beta_0 + \beta_1 der_{it} + \beta_2 dar_{it} + \beta_3 roa_{it} + \beta_4 der.roa_{it} + \beta_5 dar.roa_{it} + \varepsilon_{it}$ ---------- (3)

4.3 Regression Results

The results of the fixed effect regression in the study are hereby presented.

Table 5: Regression Results

Variables	β Coefficient	t-Stat.	t-Sig.	Cumulative Result	Tolerance	VIF
Constant	1.133	3.310	0.002			
der	-0.079	-1.910	0.063		0.120	8.36
dar	0.012	0.250	0.805		0.144	6.94
roa	0.304	2.590	0.013		0.256	3.90
der.roa	-6.164	-1.970	0.055		0.342	2.92
dar.roa	-0.079	-0.090	0.928		0.673	1.49
R^2				0.166		
F-Stat.				1.790		
F-Sig.				0.135		
Mean VIF				4.720		

Output of STATA 13

The combined results revealed an overall coefficient of determination (R^2) of 16.56%. The outcome shows the combined effect of der and dar moderated by roa will result in 16.56% change in dpo. The F-statistic value of 1.79 with a significant value of 0.135 shows that the cumulative effect of the regressors on dividend payout ratio was insignificant among the quoted agriculture firms in Nigeria.

Hypothesis One states the debt-equity ratio has no significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria. From Table 5, $\beta = -0.079$, $t = -0.91$, and $p = 0.063$. This shows that at the 10% significant level, the debt-equity ratio has a significant negative effect on the dividend payout ratio of quoted agriculture firms in Nigeria. It implies that a unit increase in debt-equity ratio will result in a 7.9% decrease in the dividend payout ratio of quoted agriculture firms in Nigeria. Thus, the study rejects the null hypothesis, which states the debt-equity ratio has no significant effect on the dividend payout of quoted agricultural sector firms in Nigeria. The analysis carried out shows the debt-equity ratio has a negative and significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria at the 10% level of significance. The accumulation of debts increases the exposure of the firm to interest payments and general debt servicing obligations. Meanwhile, with increasing interest obligations, the residual earnings from which dividends can be considered for payment to shareholders dwindle. The outcome of the analysis aligns with the report of most of the recent scholars, who indicated that the link between debt-equity ratio and dividend payout ratio is negative and significant (Akinlo & Adebiyi, 2021; Nwankwo & Ogbonna, 2021; Ishaku et al., 2020; Oguoma & Ezentu, 2020). According to those scholars, the implication is that debt-equity ratio has a significant inverse effect on dividend payout ratio, such that an increase in debt-equity ratio would lead to a decrease in dividend payout ratio and vice versa. Adesola et al. (2021), differed slightly when they concluded

that the relationship is insignificantly negative. Nevertheless, Oludare et al. (2020) concluded that the relationship between debt-equity ratio and dividend payout ratio is positive and significant among the firms of study, but the position was yet to be largely supported by scholars, to the best of my knowledge.

Hypothesis Two states the debt-assets ratio has no significant effect on the dividend payout ratio of quoted agriculture firms in Nigeria. From Table 5, $\beta = 0.012$, $t = 0.25$, and $p = 0.805$. This shows the debt-assets ratio has an insignificant positive effect on the dividend payout ratio of quoted agriculture firms in Nigeria. It implies that a unit increase in debt-asset ratio brings about a 1.15% increase in the dividend payout ratio of quoted agriculture firms in Nigeria. Thus, the study fails to reject the null hypothesis, which states the debt-asset ratio has no significant effect on the dividend payout of quoted agricultural sector firms in Nigeria. The study also shows the debt-assets ratio has an insignificant positive effect on the dividend payout ratio of quoted agriculture firms in Nigeria. Debts are acquired to finance the assets employed by the firm. The more long-term debts are acquired to finance productive assets, the greater the likelihood of an increase in the revenue generation capacity that could place the firms on a better pedestal to pay competitive dividend rates to shareholders after meeting all debt obligations to investors. The outcome corroborates the findings of Agwu et al. (2019), who stated debt-asset ratio has an insignificant positive effect on dividend payout. In the meantime, the results failed to align with the conclusions of Oluwatoyin & Koyenikan (2021), Adesola et al. (2021), Ishaku et al. (2020), and Anyaeji (2020). They reported that debt-assets ratio has a significant negative effect on dividend payout ratio, which means with the inverse relationship, an increase in debt-asset ratio induces a decrease in dividend payout ratio and conversely.

Hypothesis Three states return on assets ratio has no significant effect on dividend payout of quoted agriculture firms in Nigeria. From Table 5, $\beta = 0.304$, $t = 2.59$, and $p = 0.013$. This shows return on assets has a significant positive effect on the dividend payout ratio of quoted agriculture firms in Nigeria at the 5% significance level. It indicates an increase in return on assets would result in a 30.4% increase in the dividend payout ratio of quoted agriculture firms in Nigeria. Consequently, the study declines to accept the null hypothesis, which states that return on asset has no significant effect on the dividend payout ratio of quoted agricultural sector firms in Nigeria. The study shows that return on assets has a significant positive effect on the dividend payout ratio of quoted agriculture firms in Nigeria at the 5% level of significance. A dividend is paid out of net income generated from the productive utilization of the total assets employed in operations by the firm. The increase in return on assets, triggers the likelihood of an increase in dividend payout, and conversely, all things being equal. This outcome aligns with the unequivocal conclusion of previous scholars that return on assets is positively and significantly correlated with dividend payout in quoted agriculture firms of study (Akinboade et al., 2021; Oluwole & Oyeleye, 2021; Isinguzo et al., 2021; Ighomereho et al., 2021; Igben et al., 2021). Stressed further, the conclusion of scholars is indicative of a headwind effect on dividend payout ratio triggered by return on assets as determined by the direction of movement, southward or northward.

Hypothesis 4a states that return on assets has no significant moderating effect on the relationship between debt-equity ratio and dividend payout ratio of quoted agriculture firms in Nigeria. From Table 5, $\beta = -6.164$, $t = -1.97$, and $p = 0.055$. This shows return on assets has a significant negative moderating effect on the relationship between debt-equity ratio and dividend payout ratio of quoted agriculture firms in Nigeria at the 10% level of significance. It indicates an increase in return on assets significantly and negatively moderates the relationship between debt-equity ratio and dividend payout of quoted agriculture firms in Nigeria. Consequently, the study declines to accept the null hypothesis, which states that return on asset has no significant moderating effect on the relationship between debt-equity ratio and dividend payout ratio of quoted agriculture firms in Nigeria.

Hypothesis 4b states return on assets has no significant moderating effect on the relationship between debt-assets ratio and dividend payout ratio of quoted agriculture firms in Nigeria. From Tables 7 and 8, $\beta = -0.079$, $t = -0.09$, and $p = 0.928$. This shows return on assets has a negative and insignificant moderating effect on the debt-assets ratio and dividend payout ratio relationship of quoted agriculture firms in Nigeria. It portrays an increase in return on assets that negatively moderates the debt-asset ratio and dividend payout of quoted agriculture firms in Nigeria, and conversely. Nonetheless, the probability value of 92.8% is far greater than the 10% level of significance, implying the moderating effect is not significant. On that basis, the study failed to reject the null hypothesis, which states return on asset has no significant moderating effect on the relationship between debt-asset ratio and dividend payout of quoted agricultural sector firms in Nigeria. The study further shows return on assets has a negative and significant moderating effect on the relationship between debt-equity ratio and dividend payout ratio of agriculture firms in Nigeria at 10% significance. In the same vein, the study also revealed return on assets has a negative and insignificant moderating effect on the relationship between debt-assets ratio and dividend payout ratio of quoted agriculture firms in Nigeria.

These two relationships have not been examined by prior scholars, to the best of my knowledge and understanding. It underscores the novelty or originality of this empirical survey

as it distinguishes the study from previous discourse on capital structure and dividend payout. However, scholars reviewed the linear relationship between financial performance and dividend payout ratio. In their unequivocal position, it was reported that return on assets (a proxy of financial performance) has a positive and significant effect on dividend payout ratio (see Ighomereho et al., 2021; Isinguzo et al., 2021; Oluwole & Oyeleye, 2021; Akinboade et al., 2021; Igben et al.).

5.0 CONCLUSION AND RECOMMENDATIONS

Against the backdrop of the analyses carried out, findings, and discussions, the following conclusions were made in the study:

i. Debt-equity ratio is a major determinant in the dividend payout ratio of quoted agriculture firms in Nigeria. Increase in debt capital impairs dividend payout ratio.
ii. Return on assets is a major determinant in the dividend payout ratio of quoted agriculture firms in Nigeria. An uptick in return on assets impels a significant movement in the same direction in the dividend payout ratio of the quoted agriculture firms.
iii. Return on assets has a major reversing effect on the relationship between debt-equity ratio and dividend payout ratio of quoted agriculture firms in Nigeria. Return on assets can significantly reverse a negative effect on the relationship between debt-equity ratio and dividend payout ratio of the firms of interest.

Therefore, it is recommended that the quoted agriculture firms in Nigeria should use debt-financed assets to generate more return on assets to create a large pool of earnings from which to pay regular competitive dividends that attract more investments to the sector. Return on assets can reverse the negative effect of the debt-equity ratio on the dividend payout ratio of quoted agriculture firms in Nigeria. It is worthy of note that agriculture is a growing industry in Nigeria, and the temptation to reinvest distributable profits is rife among the management of the firms.

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