EFFECT OF FINANCIAL LEVERAGE ON THE PROFITABILITY OF PETROLEUM COMPANIES IN KENYA

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Abstract
This study explored the relationship between financial leverage and profitability among Kenyan petroleum companies, using financial data from selected firms over a defined period. The research employed statistical analysis to assess how different measures of financial leverage specifically debt ratio, debt-to-equity ratio, and long-term debt affect profitability. The theoretical framework guiding the study included the Modigliani and Miller hypothesis, trade-off theory, pecking order theory, and agency cost theory. The research design was descriptive, targeting a population of thirty-five oil marketers registered in Kenya. The study relied exclusively on secondary data, which was sourced from the financial statements of these companies covering the years 2010 to 2020. Data analysis was conducted using SPSS (Version 23), with both descriptive and inferential statistics applied. Inferential statistics helped identify relationships between variables, and Pearson correlation analysis assessed the strength of these relationships. The results indicated that the debt-to-total assets ratio had the most significant impact on Return on Assets (ROA), with a standardized beta coefficient of 0.944. The debt-to-equity ratio also positively influenced profitability, though to a lesser extent, with a beta coefficient of 0.79. Conversely, the long-term debt-to-assets ratio had a minimal and statistically insignificant effect on ROA. The study concluded that optimizing the total debt-to-total assets ratio is crucial for enhancing profitability. Recommendations include achieving a balance between debt and equity financing and adopting effective financial strategies. Future research should investigate additional macroeconomic factors and consider other segments within the petroleum sector for a more comprehensive analysis.
Keywords: *Financial Leverage, Profitability, Debt, Equity*

INTRODUCTION

Firms tend to use distinctive gearing levels, and thus, their financial performances differ from one another. Leverage holds a critical position within organizations as it dictates the balance between internal and external funding, exerting a considerable amount of influence on the company's expenditure. The financial health of a firm is gauged by its profitability, a metric dependent on the contrast between revenues and expenditures. When all else remains constant, leverage emerges as a vital factor in elucidating a firm's financial performance, given that the costs associated with leverage are integrated into the overall expenses (Zarebski & Dimovski, 2012).

A firm can finance its investments using various sources of finance. Three forms of financing exist for a firm, which include equity, debt, and retained earnings. The choice of each form of financing is dependent on the management's view of maximizing the shareholder's wealth

and, at the same time, reducing the risk associated with any choice. When a firm chooses equity or retained earnings, for example, it foregoes the tax shield that is associated with the interest, which is deducted before arriving at the taxable income. On the other hand, too much reliance on debt will result in raising the risk level associated with the repayments of both the interest and the installments when they fall due. Berger and Patti (2002) indicate that a financial manager's aim is to ensure there is a balance between equity and debt so as to maximize returns and reduce debt financing risks.

Cash flows are not certain. Thus, a firm faces risk from the intended investments that it may undertake. One of the risks is the sales risk, which is the extent to which it is uncertain to determine the quantity of units likely to be sold, the best prices for goods or services, and operating risk, which is the uncertainty levels of operational cashflows caused by the mix of fixed and operational costs of a company (McGuigan, Moyer, and Harris, 2007). The sources of debt financing can be classified into either the long-term debt or the short-term debt. Short-term debts are debts to be repaid within one year, while long-term debts are debts whose repayment periods are more than one year. The choice is highly dependent on the management as all forms of debt have different advantages and disadvantages. One essential function of a financial manager is to formulate policies aiming at the maximization of a firm's profitability, which are influenced by leverage decisions (Mueni & Muturi, 2013). The decisions, they argue, affect the retained earnings of the company, consequently impacting its future growth, working capital, and potential to invest. Therefore, organizations in developing countries must determine their capital structure's optimum levels, which should be based on their debt-to-equity ratios of funding activities and promote its ground to the extent that it generates income and employment opportunities (Kipngetich et al., 2016). However, since many companies face resource availability challenges, it is the responsibility of financial managers to ensure working capitals are appropriately managed to prevent the need to forge resources being held in current assets whose costs tend to lower their firms' returns (Mueni & Muturi, 2013).

Leverage is defined by Chadha and Sharma (2015) as the ratio between debt and equity, representing the existing dynamics within the capital structures of organizations caused by borrowed funds and owners' capital. Unleveraged firms, according to their definition, solely rely on owner's capital for financing, while leveraged firms combine both debt and owner's equity. In essence, financial leverage quantifies the extent to which a firm's assets are funded through the interplay of debt and equity (Ali, 2014). Alternatively, financial leverage can refer to the extent of utilization of fixed-income securities such as debt and preferred shares, as articulated by Tshehla (2014). He further posits that the adoption of debt results in higher interest payments, consequently leading to lower earnings per share.

Statement of the Problem

Over the period from 2010, Africa as a whole and Kenya in particular has had a sharp increase in demand for affordable energy, especially petroleum (Takase & Essandoh, 2021). Despite this, the industry is overwhelmed by the demand, worsened by the sky-rocketing prices since 2007 (ERC, 2017). The profitability of petroleum firms has been at stake as giant firms close, merge, or are taken over by new firms entering into the market (ERC, 2017). It is of great concern that with many firms entering the market, others are also exiting majorly because of debt in their financial leverage, putting the spotlight on whether the industry is really profitable. Although using debt and equity is a viable option, it also has its costs. However, relying on obligations will lead to cost savings because taxes can be deducted in the debt interest. Therefore, relying on obligation ultimately reduces a capital's overall cost (Mueni & Muturi, 2013). Consequently, using financial leverage can either enhance a firm's profit or losses, making it a "double-edged sword" (Tahir et al., 2012); Pandey, (2006).

Various scholars ' available literature on financial leverage has yielded mixed results. The studies focused on firms' financial performances. Studies by (Mueni & Muturi, 2013; Mule & Mukras, 2015) analyzed sampled NSE firms, and their findings revealed that financial leverage and performance have a significant negative relationship. Maniangi et al.(2013) reported that short term debt ratio had a positive correlation with ROE, dividend Pay Out, and Price to Book Ratio while negative with ROA and Earnings Per Share. Mule and Mukras (2015) carried out a study on financial leverage, which revealed that firms listed on the NSE employ an average of 0.258 Kenyan Shilling of long-term debt for every shilling of total capital employed, demonstrating a high preference for equity capital. This is in contrast to Mule and Mukras (2015), who found a negative relationship between financial leverage and ROE and ROA. This study sought to get findings in the petroleum industry to fill the gap by examining the financial leverage variables that influence profitability, including debt ratio, debt-to-equity ratio, long-term debt, and combined effect of financial leverage. The same effect can either enhance or hinder the stable financial performance of the petroleum industry in Kenya, which will affect its overall profitability. Based on the reviewed literature, the study has identified that few studies have been found to focus on financial leverage on NSE-listed firms' profitability. This is the gap this study is leveraged on.

Hypotheses of the Study

The study sought to test the following hypotheses;

H_01: Debt ratio has no significant effect on the profitability of Kenya's petroleum companies.

H_02: Debt to equity ratio has no significant effect on the profitability of Kenya's petroleum companies.

H_03: Long-term debt has no significant effect on the profitability of Kenya's petroleum companies.

H_04: Combined financial Leverage (Debt Ratio, debt to equity, and long-term debt) has no significant effect on Kenya's petroleum companies' profitability.

LITERATURE REVIEW

Theoretical Literature

Trade-Off Theory

The emergence of the static trade-off theory was largely driven by the Modigliani-Miller theory debate. According to the static trade-off theory, corporations can optimize their capital structure by evaluating the trade-offs between the benefits of debt, such as tax shields, and the costs associated with financial distress (Modigliani & Miller, 1958). The theory suggests that firms with substantial taxable income and tangible assets should leverage high levels of debt to maximize tax benefits. However, it also notes that firms within the same industry can exhibit different debt ratios and profitability levels, which the theory does not fully explain. Kraus and Litzenberger (1973) introduced the classical hypothesis, emphasizing the need to balance bankruptcy costs against tax savings from debt, highlighting the advantages and disadvantages of debt reliance.

Oino and Ukaegbu (2013) and Mule and Mukras (2015) discuss how the trade-off theory focuses on achieving an optimal capital structure by balancing bankruptcy costs with the tax benefits of borrowing. When there is a management-ownership divide, agency costs can increase, complicating the assessment of debt versus equity benefits. The theory underscores that companies must evaluate and adjust their capital structures to balance debt and equity effectively, aiming to achieve optimal leverage ratios. If discrepancies between actual and optimal leverage ratios arise, firms must adjust their funding strategies to align with their desired capital composition, ensuring effective debt and equity management.

Agency Costs Theory

The theory of agency costs, proposed by Stephen Ross and Barry Mitnick in 1975, addresses the costs that arise due to conflicts of interest between shareholders (principals) and managers (agents). Ross laid the groundwork for the economic theory of agency, while Mitnick developed the institutional aspects. The theory explores how discrepancies between ownership and management interests, especially regarding free cash flows, lead to agency costs (Mitnick, 1975). Berger and Patti (2002) suggest that managers in profitable firms might misuse excess cash for personal benefit. To counteract this, companies often increase their debt levels to reduce cash availability, thereby forcing more responsible cash management and lowering agency costs. This approach implies that higher debt ratios can potentially enhance earnings by mitigating misuse of funds.

However, the theory also highlights challenges associated with high debt levels, such as reduced investment opportunities compared to firms with short-term debts (Brigham & Houston, 2012). When managers hold a low share in the company, inefficiencies and agency problems are more likely. Conversely, higher managerial shareholding typically reduces such issues. The principal aspect of agency cost theory in this context is that leveraging can help business owners monitor and appraise managers more effectively. In the petroleum industry, for instance, managers are accountable to shareholders and must make prudent decisions regarding debt levels and profitability to enhance shareholder value (Akintoye, 2008).

Pecking Order Theory

The pecking order theory, initially proposed by Donaldson and later refined by Myers and Majluf in 1984, outlines a hierarchical approach to financing decisions within firms. According to this theory, management prefers internal financing using retained earnings over external sources. If internal funds are insufficient, the next step is to seek external debt before resorting to equity issuance. This sequence is based on the premise that debt is typically cheaper than equity due to lower associated costs and the avoidance of flotation costs. Consequently, firms prioritize internal funding to minimize costs and only opt for external equity as a last resort when other options are not viable.

This theory is particularly relevant for firms in the financial sector, such as petroleum companies. These companies should adhere to the pecking order when selecting external funding sources, preferring convertible securities, followed by debt, preferred stock, and common stock. Myers and Majluf (1984) emphasized that firms should focus on maintaining an optimal debt-to-equity ratio and current ratio while navigating external funding options. This approach helps ensure that the cost of capital remains minimized and that the firm's financial structure supports its operational and strategic goals effectively.

Modigliani and Miller Hypothesis

The irrelevance theory of capital structure, introduced by Modigliani and Miller in 1958, posits that a firm's value is unaffected by its capital structure under ideal market conditions, which sparked significant debate among financial economists (Hasan, 2014). Initially, Modigliani and Miller assumed a perfect market with no taxes or transaction costs, suggesting that the firm's value is determined solely by its risk profile and not by its mix of debt and equity. Their seminal paper argued that capital structure does not influence the total cost of capital or the firm's value in such a theoretical framework.

However, Modigliani and Miller revised their theory in 1963 to incorporate the impact of corporate taxes, introducing the concept of the tax shield. This revised theory highlighted that interest payments on debt are tax-deductible, which creates a tax shield and increases a firm's value through higher leverage. The more a company utilizes debt, the greater its tax benefits and overall value, as the value of a leveraged firm equals the value of an unleveraged firm plus the tax shield from debt. This study aims to empirically test the relevance of these

theories by examining the relationship between profitability and leverage in petroleum firms in Kenya.

Empirical Studies

Debt Ratio and Profitability of Petroleum Firms

Sammanasu and Pappurajan (2017) carried out a study to determine how leverage impacts Indian steel companies listed on the Bombay Stock Exchange (BSE). Its objective was to analyze the leverage effects of the select steel companies traded in BSE. The second was to find out the different types of leverages, such as operating, financial, and composite. The third was to study leverage's impact on Earning Per Share (EPS), and the fourth was to make suggestions to the investors to make appropriate investment decisions. The two theories used to guide the study were the agency theory and the MM theory, and the two research designs used were analytical and descriptive. Its scope was a finite sample size of three companies listed on the BSE. Also, the study adopted the convenient sampling technique. The companies were selected based on market capitalization. Tools used for analysis were mean standard deviation, correlation, test of significance, and Analysis of Variance (ANOVA). The findings revealed that the mean standard deviation of the degree of operating leverages of JSW are highest among the other companies, and they are exposed to more risk of paying operating expenses.

Abubakar (2017) carried out research to explore how financial leverage impacts a firm's performance. The study used 66 non-financial firms from Nigeria's sector listed on the Nigerian Stock Exchange (NSE) between 2005 and 2014. The major underlying theory of this study was the Modigliani and Miller theory. This research also used descriptive and regression analysis to analyze data. One of the key findings of the study was that a firm's financial performance measured by ROE is significantly positively impacted by the increased equity portion of the total debt-equity ratio (TDER). The findings of the study further indicated that the financial leverage that is surrogated by TDER is also a vital indicator of financial performance. The recommendation emphasized in the study is that increasing the equity portion of the debt-equity mix in the capital structure is an excellent way for NSE-quoted firms to enhance their financial performance.

Debt to Equity Ratio and Profitability

Yinusa and Rodnonova (2019) carried out a study to assess how capital structure impacts Nigerian companies' performance. The researchers further carried out tests to determine whether there is non-monotonic relationship between capital structure and firm performance. The agency cost theory predicts whether this relationship exists, especially when firms are using financing debts excessively. 115 non-financial from Nigeria were involved in the study, and the dynamic panel was also used. The researcher further used the two-step generalized method of moment (GMM) to assess the dependent variable's persistence levels. This process also involved using its lag value as the explanatory variable in the regression model. One key finding from this study is capital structure, and a firm's performance has a statistically significant relationship, especially if there is moderate use of debt financing. Another important finding from this study is that capital structure and firm performance have a non-monotonic relationship when there is excessive use of debt financing. This relationship had a negative impact on the performance of Nigerian companies.

Butsili and Miroga (2018) iinvestigated whether leverage had any influence on the profitability of micro finance banks located in Kakamega County, Kenya. Its main objective was to examine whether debt equity had any effect on Micro-Finance Banks' profitability. The study's underlying theory was the trade-off theory, and its research design was descriptive. Its sample was comprised of fifty top and middle managers working in four large microfinance banks in Kakamega County. Its results indicated that the microfinance banks' profitability is positively influenced by debt equity. Based on the results, debt equity

enhanced the profitability of microfinance banks in Kakamega by 88.6%. One recommendation proposed in the study is for managers to take the initiative of accompanying the improved loan averages of their firms with expanded services and effective follow-ups. This is supported by this study's findings indicating that financial leverage and profitability have a relationship.
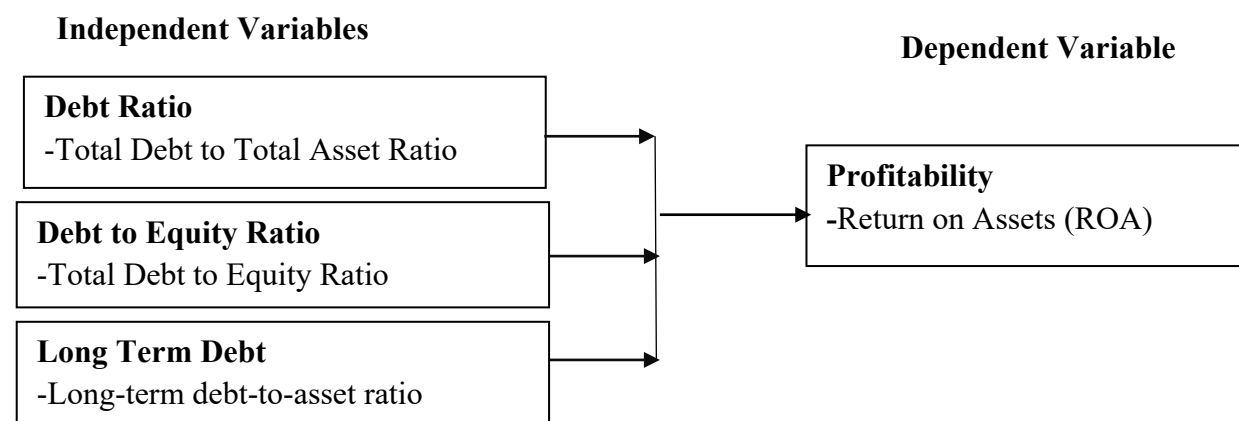
Long-Term Debt and Profitability

Ebaid (2009) investigated Egypt's emerging economy, and findings revealed that long-term debt negatively impacts a firm's ROA. The researcher argued that when profitability is measured by ROA, then long-term debt harms its growth. Ebaid, in his study, further explained that long-term debts can become short-term debts if the borrowing firm exceeds the repayment. In such situations, the borrowing company is required to pay it back in less than one year. However, long-term debts still remain popular debts for financing operations as they are associated with various benefits. For example, unlike short-term debts, long-term debts are less prone to short-term financial shocks, making them more stable than the latter. Also, various studies have linked long-term debts with the growth of a firm's operating capacity.

Kaumbuthu (2011) carried out a study to explore financial leverage's effect on profitability of corporations listed on NSE from the agricultural sector. Objectives the study sought to achieve were debt to equity ratio's effect on profitability, how long-term debts affect capital employed on NSE, the current ratio's effect on profitability, and how the size of a firm impacts its profitability. The theories that guided the study are the pecking order theory, agency theory, trade-off theory, and Net Income theory. The target groups were 66 firms listed in NSE and seven listed agricultural firms. This study further used the time series secondary data retrieved from the publications on the NSE, Capital Markets Authority (CMA), Statistical Bulletins, and Annual Reports and Statement Accounts of the participating firms. The study discovered that the profitability of agricultural enterprises is not significantly impacted by the ratio of long-term debt to total capital.

Conceptual Framework

A conceptual framework is a basic structure made up of specific abstract relations that represent the analytical, experiential, and observational facets of a process or system being conceptualized. Figure 1 represents the relationship between debt ratio, debt to equity ratio, long term debt and profitability of petroleum firms listed on the NSE.

Independent Variables   **Dependent Variable**

| Debt Ratio |
| -Total Debt to Total Asset Ratio |

| Debt to Equity Ratio |
| -Total Debt to Equity Ratio |

| Long Term Debt |
| -Long-term debt-to-asset ratio |

| Profitability |
| -Return on Assets (ROA) |

Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

The study used descriptive research design. The study was carried out on the petroleum firms that are registered in Kenya. The study population concentrated on the downstream and specifically the oil marketers. According to Energy Regulation Commission (ERC, 2018), Kenya has a total of 35 registered Petroleum firms as indicated in appendix I. This formed the

unit of analysis. The companies must have been actively trading in the petroleum industry. The study collected the data for a period of 11 years. The financial statement for the period from 2010 to 2020 was used for the collection of data. Since the population was small the study employed census survey. There are 35 firms that met these criteria, and therefore the researcher used their data to conduct the analysis. These criteria helped the researcher obtain unbiased and consistent estimators. A census survey is ideal for collecting data from a small, diverse population. In this study, the target population consisted of 35 firms, making a census survey the appropriate method for data collection.

Kothari (2010) noted that the quality of research findings heavily depends on the selection and design of data collection instruments. In this study, secondary data was utilized for analysis, primarily sourced from audited financial statements on leverage and financial performance. This choice was driven by the need for accurate and reliable data, as all petroleum firms are legally required to publish comprehensive, audited financial statements. The secondary data was gathered from these audited statements covering the period from 2010 to 2020. This timeframe was selected to ensure the data was recent and available, and the collection was carried out using a data collection sheet.

For data analysis, inferential statistics including Pearson correlation and linear regression were used. The Statistical Package for the Social Sciences (SPSS, version 23) facilitated the analysis.

The researcher narrowed down the use of both simple (one independent variable) and multiple (more than one predictor variable) regression techniques.

The study then ran a multiple linear regression analysis to determine the relationship between the dependent and independent variables. The multiple regression equation is as indicated:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Profitability of petroleum companies in Kenya; β_0= intercept coefficient7; ε – error term (extraneous variables); X_1 – Debt ratio; X_2 – Debt to equity ratio; X_3 – Long term Debt; X_4 – Combined Effect; β1, β2, β3 and β4 =regression coefficients

RESULTS AND DISCUSSIONS

Relationship between Total Debt to Total Asset Ratio and Profitability

The relationship between the total debt ratio to total assets as the independent variable and the dependent variable which was the profitability measured by the returns on Assets was sought.

Correlation Analysis

The simple correlation between profitability analysis and total debt analysis indicated that a correlation value of 0.944 existed between the two variables. This translated to 94.4% if the relation between the total debt and total asset ratio to the profitability or return on asset. This was measured using the Pearson correlation coefficient. It meant that a strong correlation existed between the total debt ratio and the eventual profitability or ROA.

Table 1: Simple Correlation – Total Debt to Total Asset Ratio and Profitability (ROA)

		Total Debt to Total Assets Ratio	Profitability or Return on Assets (ROA)
Total Debt to Total Assets Ratio	Pearson Correlation	1	.944[**]
	Sig. (2-tailed)		.000
	N	35	35
Profitability or Return on Assets (ROA)	Pearson Correlation	.944[**]	1
	Sig. (2-tailed)	.000	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

A higher total debt to total asset ratio indicates a company having greater financial risk. At the same time, leverage is an important tool that companies use to grow, and many businesses find sustainable uses for debt. Debt ratio highly affects the performance of firms as it creates a level of risk associated with the repayment of debt and costs thereof. The cost perspective of debt which is interest also affects to great extent the level of profits reported by firms in their financial statements and ultimately the returns that is attributable to the assets that have been invested in firms.

Regression Analysis

The first variable which was the debt ratio showed the r of 94.4% while the R-Squared was 89.1% while the adjusted R square was 88.8%. The standard error of the estimate was 0.0177449. The adjusted R-squared value of 0.888 meant that the debt ratio explained 88.8% of the variations in the profitability (ROA). This was when the variable was considered independently without consideration of the other variables that may affect the ROA or the profitability.

Table 2: Simple Regression – Total Debt to Total Asset Ratio and Profitability (ROA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.944[a]	.891	.888	.1077449

a. Predictors: (Constant), Total Debt to Total Assets Ratio
b. Dependent Variable: Profitability or Return on Assets (ROA)

With a degree of freedom at 5% the sum of squares on the regression was 3.136 with a degree of freedom of 1. The significant ratio of $p > 0.05$' meant that the F statistics were significant. The F statistics were recorded as $F(1,34) = 270.17$, $p > 0.05$'.

Table 3: Total Debt to Total Asset Ratio and Profitability (ROA) ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.136	1	3.136	270.166	.000[b]
	Residual	.383	33	.012		
	Total	3.519	34			

a. Dependent Variable: Profitability or Return on Assets (ROA)
b. Predictors: (Constant), Total Debt to Total Assets Ratio

The resulting simple regression equation was represented as shown below.

ROA/Profitability (Petroleum Companies in Kenya) = 0.103 + 0.944 total debt to total asset ratio + 0.006

The simple regression analysis indicated that there was a $\beta 0$ value of 0.103. This small (albeit positive value) value of $\beta 0$ indicated that only a small portion of the Kenyan petroleum firms' profitability was determined by leveraging ratios other than total debt to total asset ratio. The standardized coefficient beta from the analysis was 0.944.

Table 4: Total Debt to Total Asset Ratio and Profitability (ROA) Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.005	.027		.169	.867
	Total Debt to Total Assets Ratio	.103	.006	.944	16.437	.000

a. Dependent Variable: Profitability or Return on Assets (ROA)

Relationship between Total Debt to Equity ratio and Profitability (ROA)

The relationship between the total debt ratio to equity ratio as the independent variable and the dependent variable which was the profitability measured by the returns on Assets was sought.

Correlation analysis

The second correlation analysis was done by the use of Pearson correlation coefficient. This was done considering the data from all the 35 companies in the data set. The Pearson

Correlation Coefficient was 0.790. The *p-value* of 0.000 showed there is a statistical significance of the results, further strengthening the ratio in determine the eventual profitability measure was the use of Return on Assets of these energy firms in Kenya.

Table 5: Simple Correlation – Debt to Equity Ratio and Profitability (ROA)

		Profitability or Return on Assets (ROA)	Total Debt to Total Equity Ratio
Profitability or Return on Assets (ROA)	Pearson Correlation	1	.790[**]
	Sig. (2-tailed)		.000
	N	35	35
Total Debt to Total Equity Ratio	Pearson Correlation	.790[**]	1
	Sig. (2-tailed)	.000	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

The relationship between debt to equity ratio and the return on assets showed the r of 79.0% while the R-Squared was 62.4% while the adjusted R square was 61.20%. The standard error of the estimate was 0.2003137.

Table 6: Simple Regression – Debt to Equity Ratio and Profitability (ROA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.790[a]	.624	.612	.2003137

a. Predictors: (Constant), Total Debt to Total Equity Ratio
b. Dependent Variable: Profitability or Return on Assets (ROA)

With a degree of freedom at 5% the sum of squares on the regression was 2.195 with a degree of freedom of 1. The significant ratio of $p > 0.05$' meant that the F statistics were significant. The F statistics were recorded as $F(1,34) = 54.711$, $p > 0.05$'.

Table 7: Debt to Equity Ratio and Profitability (ROA) ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.195	1	2.195	54.711	.000[b]
	Residual	1.324	33	.040		
	Total	3.519	34			

a. Dependent Variable: Profitability or Return on Assets (ROA)
b. Predictors: (Constant), Total Debt to Total Equity Ratio

The relationship between the variables can be expressed in a simple regression model as below:

ROA/Profitability (Petroleum Companies in Kenya) = 0.133 + 0.79 Debt to Equity Ratio + 0.018

The simple regression analysis indicated that there was a β_0 value of 0.133. The value of $\beta 0$ indicated that only a small portion of the Kenyan petroleum firms' profitability was determined by leveraging ratios other than total debt to equity ratio. The beta from the analysis was 0.790.

Table 8: Debt to Equity Ratio and Profitability (ROA) Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.736	.065		11.348	.000
	Total Debt to Total Equity Ratio	.133	.018	.790	7.397	.000

a. Dependent Variable: Profitability or Return on Assets (ROA)

Relationship between Long-term debt to total asset ratio and Profitability (ROA)

The third simple analysis was conducted between the long-term debt to total asset ratio and ROA of petroleum companies in Kenya. The relationship between the long term debt to total assets ratio as the independent variable and the dependent variable which was the profitability measured by the returns on Assets was sought.

Correlation analysis

The simple correlation between profitability analysis and long term debt analysis indicated that a correlation value of 0.172 existed between the two variables. This translated to 17.2% if the relation between the long term debt and total asset ratio to the profitability or return on asset. This was measured using the Pearson correlation coefficient. It meant that a weak correlation existed between the long term debt ratio and the eventual profitability or ROA. The large *p-value* of 0.323 undermined the statistical significance of the results, further portraying the complexity of the ratio in trying to determine the eventual profitability of these energy firms in Kenya.

Table 9: Simple Correlation – Long-Term Debt to Asset Ratio and Profitability (ROA)

		Profitability or Return on Assets (ROA)	Long Term Debt to Total Asset Ratio
Profitability or Return on Assets (ROA)	Pearson Correlation	1	.172
	Sig. (2-tailed)		.323
	N	35	35
Long Term Debt to Total Asset Ratio	Pearson Correlation	.172	1
	Sig. (2-tailed)	.323	
	N	35	35

Regression Analysis

The third variable which was the long term debt ratio to total asset showed the r of 17.2% while the R-Squared was 3.0% while the adjusted R square was 0.00%. The standard error of the estimate was 0.3217085.

Table 10: Simple Regression – Long Term Debt to Asset Ratio and Profitability (ROA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.172[a]	.030	.000	.3217085

a. Predictors: (Constant), Long Term Debt to Total Asset Ratio
b. Dependent Variable: Profitability or Return on Assets (ROA)

With a degree of freedom at 5% the sum of squares on the regression was 0.104 with a degree of freedom of 1. The ANOVA test revealed a *p-value* of 0.323, larger than the significant value of 0.05. This meant that the F statistics were insignificant. The *F* statistics were recorded as $F(1,34) = 1.00$, $p = 0.32$'.

Table 11: Long-Term Debt to Asset Ratio and Profitability (ROA) ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.104	1	.104	1.005	.323[b]
	Residual	3.415	33	.103		
	Total	3.519	34			

a. Dependent Variable: Profitability or Return on Assets (ROA)
b. Predictors: (Constant), Long Term Debt to Total Asset Ratio

The resulting regression equation results were as expressed below;

ROA/Profitability (Petroleum Companies in Kenya) = 0.062 + 0.172 Debt to Equity Ratio + 0.062

The third simple regression recorded a constant beta value (β0) of 0.062. The value of β0 indicated that only a small portion of the Kenyan petroleum firms' profitability was

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determined by leveraging ratios other than long term debt to asset ratio. The beta from the analysis was 0.790.

Table 12: Long-Term Debt to Asset Ratio and Profitability (ROA) Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.305	.059		5.213	.000
	Long Term Debt to Total Asset Ratio	to.062	.062	.172	1.003	.323

a. Dependent Variable: Profitability or Return on Assets (ROA)

Combined Effect of the Total Debt Ratio, Debt to Equity and Long-Term Debt to Asset ratio and Profitability (ROA)

The combined regression analysis was conducted between the all the variables as independent variables and ROA of petroleum companies in Kenya. The relationship between the total debt ratio, debt to equity ratio and the long-term debt to total assets ratio as the independent variable and the dependent variable which was the profitability measured by the returns on Assets was sought.

Correlation analysis

The multiple linear regression helped to carry out a comparative analysis of the most influential leveraging ratio. It was observed that the total debt to total asset ratio was the most influential (0.944) in determining the profitability (ROA) of petroleum companies in Kenya. This was closely followed by the total debt to total equity ratio (0.790), as this was also determined to have an influential role in determining the profitability of the petroleum firms in Kenya. The long-term debt to total asset ratio (0.172), was determined to have minimal influential role in determining the profitability of the petroleum firms in Kenya.

Table 13: Multiple Correlation Analysis – Combined Total Debt Ratio, Debt to Equity and Long-Term Debt and Profitability (ROA)

		Total Debt to Total Assets Ratio	Total Debt to Total Equity Ratio	Long Term Debt to Total Asset Ratio	Profitability or Return on Assets (ROA)
Total Debt to Total Assets Ratio	Pearson Correlation	1	.654**	.426*	.944**
	Sig. (2-tailed)		.000	.011	.000
	N	35	35	35	35
Total Debt to Total Equity Ratio	Pearson Correlation	.654**	1	.087	.790**
	Sig. (2-tailed)	.000		.619	.000
	N	35	35	35	35
Long Term Debt to Total Asset Ratio	Pearson Correlation	.426*	.087	1	.172
	Sig. (2-tailed)	.011	.619		.323
	N	35	35	35	35
Profitability or Return on Assets (ROA)	Pearson Correlation	.944**	.790**	.172	1
	Sig. (2-tailed)	.000	.000	.323	
	N	35	35	35	35

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Multiple Analysis

The combined effect of the variables (predictor) showed an r of 0.984 while the r square was 0.968 while the adjusted R square was 0.965. The standard error of the estimate was

0.0604350. The adjusted R-squared value of 0.965 meant that the three independent variables explained 96.5% of the variations in the profitability (ROA). This was the combined effect that showed that the combined ratios have a significant effect on the profitability measured by Return on Assets.

Table 14: Multiple Regression Analysis – Combined Total Debt Ratio, Debt to Equity and Long-Term Debt and Profitability (ROA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.984[a]	.968	.965	.0604350

a. Predictors: (Constant), Long Term Debt to Total Asset Ratio, Total Debt to Total Equity Ratio, Total Debt to Total Assets Ratio
b. Dependent Variable: Profitability or Return on Assets (ROA)

A P value of >0.05' observed in the ANOVA test (F statistics) underscored the significance of the results. The statistical outcomes were recorded as $F(1,34) = 310.87$, $p > 0.05$'.

Table 15: Multiple Regression Analysis ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.406	3	1.135	310.867	.000[b]
	Residual	.113	31	.004		
	Total	3.519	34			

a. Dependent Variable: Profitability or Return on Assets (ROA)
b. Predictors: (Constant), Long Term Debt to Total Asset Ratio, Total Debt to Total Equity Ratio, Total Debt to Total Assets Ratio

The resulting statistical outputs were used to develop the fourth regression equation as indicated below:

ROA/Profitability (Petroleum Companies in Kenya) = 0.118 + 0.92 Debt Ratio + 0.171 Debt to Equity Ratio + 0.205 Long-Term Debt to Asset + 0.041

It was observed that the constant beta value (β_0) for the debt ratio was 0.1 while that of the debt-to-equity ratio was 0.029, and that of the long-term debt-to-asset ratio was 0.74. This led to a combined constant beta value of 0.118, which was significantly smaller.

Table 16: Multiple Regression Analysis Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.118	.041		2.879	.007
	Total Debt to Total Assets Ratio	.100	.006	.920	16.593	.000
	Total Debt to Total Equity Ratio	.029	.008	.171	3.393	.002
	Long Term Debt to Total Asset Ratio	.074	.015	.205	4.868	.000

a. Dependent Variable: Profitability or Return on Assets (ROA)

Conclusions

The findings revealed that the total debt-to-total assets ratio had the most significant influence on ROA. Specifically, for each unit increase in this ratio, ROA increased by 0.92. This substantial impact highlights the importance of managing total debt relative to assets effectively. A higher total debt-to-total assets ratio generally indicates a higher level of financial leverage, which, when managed well, can lead to increased profitability. Therefore, petroleum companies should prioritize optimizing this ratio to maximize their returns.

In contrast, the debt-to-equity ratio showed an insignificant influence on ROA. A unit increase in the debt-to-equity ratio resulted in only a 0.171 increase in ROA. This minimal effect suggests that the debt-to-equity ratio does not play a crucial role in determining profitability compared to the total debt-to-total assets ratio. It implies that while the debt-to-

equity ratio is a relevant financial metric, it does not have a strong direct impact on ROA in this context.

Similarly, the long-term debt-to-asset ratio had a relatively insignificant effect on ROA. A unit increase in this ratio led to a 0.205 increase in ROA. Although this shows some level of impact, it is less significant compared to the total debt-to-total assets ratio. This finding suggests that while long-term debt is a factor in profitability, its influence is not as pronounced as that of the total debt-to-total assets ratio.

The overall conclusion from the research is that the total debt-to-total assets ratio is the most critical factor influencing ROA for petroleum companies in Kenya. It has a more significant effect on profitability compared to the long-term debt-to-asset ratio and the debt-to-equity ratio. Therefore, financial managers should focus on optimizing the total debt-to-total assets ratio to enhance profitability. By creating a competitive and balanced financial strategy that prioritizes this ratio, petroleum firms can improve their returns on invested assets and strengthen their market position.

Recommendation of the Study

Based on the research findings, several strategic recommendations are offered to petroleum companies to enhance their profitability and optimize their return on assets (ROA). Improving profitability is central, as it directly influences ROA, reflecting the effectiveness of the investments made by the company.

To achieve this, petroleum companies should focus on structuring their debt portfolios in a way that balances debt and equity financing. A well-balanced mix of debt and equity is essential for optimizing the financing of assets. This involves carefully assessing the proportion of debt versus equity to ensure that the cost of capital is minimized while maximizing the potential returns. Financial managers must prioritize this balance, as the cost of both debt and equity plays a crucial role in determining overall profitability. By managing these costs effectively, companies can enhance their ROA and, subsequently, the returns on their investments.

In addition to managing the debt-equity balance, petroleum firms should place significant emphasis on financial leverage when making strategic decisions. Financial leverage, which refers to the use of debt to amplify potential returns, has a substantial impact on ROA. Effective utilization of financial leverage can lead to higher profitability by allowing companies to invest more significantly in growth opportunities without requiring an equivalent increase in equity. However, it is essential to manage leverage carefully, as excessive debt can increase financial risk and potentially erode profitability.

Therefore, petroleum companies should adopt a comprehensive approach to financial management that includes optimizing their debt-equity ratio and leveraging financial strategies to boost profitability. This involves not only finding the right balance between debt and equity but also making strategic decisions that enhance the overall financial leverage. By doing so, they can improve their ROA, thereby maximizing the return on investments and ensuring long-term financial stability and growth.

Areas for Further Research

Future research should address the limitations of this study and explore additional macroeconomic factors influencing petroleum firms' profitability. While this study focused on debt ratios, variables like inflation, global interest rates, tax regimes, and exchange rates could offer further insights, especially for companies involved in international trade. Additionally, expanding the research beyond oil marketers to include retailers and importers could provide a more comprehensive view, as each segment faces unique financial challenges. Lastly, extending the study to cover a longer time frame would allow for analysis of trends, policy changes, and economic cycles, offering a deeper understanding of how

macroeconomic factors impact profitability over time. This would lead to more informed decision-making in the petroleum sector.

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