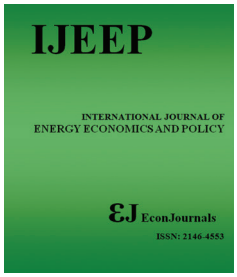

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Effect of Debt Financing on Firm Performance: A Study on Energy Sector of Saudi Arabia

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ABSTRACT

The current research seeks to investigate the influence of debt financing (as assessed by the debt-equity ratio) on financial performance as evaluated by ROA and ROE. The information was taken from yearly reports issued by Saudi Arabian oil companies between 2012 and 2019. The current ratio (CR) was also incorporated as an interaction variable in the research. The findings indicate that debt financing has a detrimental influence on business financial performance. Furthermore, even after accounting for the interaction variable, the effect remains negative. Moreover, the business size has a negative link with the ROA and ROE.

Keywords: Debt Financing, Financial Performance, Energy Companies, Return on Assets, Debt-equity, Current ratio
JEL Classifications: L25, L71, M40

1. INTRODUCTION

Financing is the acquisition of funds to meet a corporate organization's short-term and long-term demands. Nowadays, businesses manage their cash from both internal and external sources. Debt finance is an external source of money acquisition for a corporate entity. The top-level management defines the corporate organization's finance choices and strategy. The aims of the business organization also dictate the choice of a debt financing strategy to foster or satisfy the fund demand of the business organization. Profitability, net worth enhancement, ownership dispersion, cost of dent capital, and other considerations all influence the use of debt financing. The top management favors debt financing because the cost of borrowed capital is cheaper than what the true owner of the company organization or shareholders anticipates. The reduced cost of borrowed capital reduces financial expenditures while increasing the profit and profitability of the firm. Saudi Arabia's economy is based on oil earnings, and Saudi Arabia's petroleum reserves account for 17% of global reserves and 70% of total Saudi export revenue (Organization of the Petroleum Exporting Countries, 2020). The oil income is determined by the OP (oil prices) and demand for oil/petroleum products.

The external variables of the business environment determine oil pricing and demand. International demand for petroleum products is governed by political-legal, economic, and technical reasons. The demand for petroleum products directly regulates Saudi Arabia's pricing and overall OSR (oil source revenue). Externally, the demand for petroleum products is uncontrolled and determines the OSR. As a result, overall costs may be managed to improve Saudi Arabia's OSR. A company's total expenditures include production, administrative, and financial costs. A decrease in manufacturing and administrative expenditures reflects the company organization's operational and administrative efficiency, whilst a decrease in financial expenses demonstrates the use of less expensive external sources of funding to execute the business operations. Internal funds or owned funds increase the absolute amount of profit for the owners. Furthermore, external sources of money are recommended to meet the business's monetary needs and requirements while increasing overall absolute profit since the

cost of external capital is lower than the cost of owned capital. As a result, there is a need to investigate debt financing in Saudi energy enterprises and its influence on financial performance.

2. LITERATURE REVIEW

Aljaaidi and Bagais (2020) examined the connections between inventory management, loan finance, and the economic value of the Saudi Arabian oil sector. They observed that there is an inverse association between the utilization of debt financing and a company's economic worth. In addition, there is a positive relationship between effective inventory management and the economic value of a business. Bagais et al. (2021) analyzed the impact of several loan kinds, including long-term and short-term loans, on the economic value of Saudi Arabia's oil industry. To get a better understanding of why a company's capital structure may have a negative influence on its long-term survival, the researchers also examined the many policy implications this discovery has for financial managers, banks, investors, auditors, and stock market regulators. According to Shaik and Sharma (2021), the Debt to Equity Ratio is positively correlated with several profitability indicators. Similarly, the Total Debt Ratio exhibits favorable relationships with ROA and ROE, as well as a minor but negative link with EPS (EPS). According to the findings of Konak and Güner (2016), the relationship between Net Margin, Short Term Debt Turnover Days, and Cash Conversion Cycle is a negative one (2016). It has been proposed that excellent management of a company's working capital, including a reduction in the number of days it takes to turn over its short-term loan, may have a positive impact on the business's performance. Zeitun and Haq (2015) examined the effect of the financial crisis on company performance and the relevance of both short-term and long-term debt financing. In addition, they analyzed the significance of debt financing. Additionally, they observed that the economic relevance of short-term debt is a reliable determinant of the profitability of firms. Yazdanfar and Öhman (2015) discovered that the amount of debt a small or medium-sized firm held was connected to the company's overall performance. According to the investigation's findings, both short-term and long-term debt had a negative impact on the company's operations. Pham and Nguyen (2020) found that debt financing has a considerable negative influence on board independence, which mitigates the negative impact of debt financing on accounting profitability.

Cole and Sokolyk (2018) showed that taking on debt in the name of a company was related to a longer duration of existence and higher revenues, but taking on debt in the name of the firm's owner had no effect on the firm's capacity to survive and resulted in lower revenues. Zhang et al. (2021) demonstrated that the debt-to-equity ratio of a company's financing mix affects both the short- and long-term performance of the economy and the environment. In addition, the usage of debt enhances a company's economic performance in the long run while hindering it in the short run. Nazir et al. (2021) performed a study examining the association between the amount of debt carried by publicly listed corporations and the performance of those companies on the Pakistan Stock Exchange over a 5-year period. In addition, they discovered that both short- and long-term debt had a negative impact on a company's profitability. As a result of agency-related issues, a policy of substantial debt has been implemented, resulting in poor performance. However, expanding a company's size and scope may improve its profitability. According to Khasawneh and Dasouqi (2017), the usage of debt financing has a huge and negative effect on the performance of a company, but a significant and positive impact on the systemic risk of the business. They noted that the use of debt financing had no effect on the systemic risk presented by domestic services and enterprises in terms of revenue. The authors of the research by Tauseef et al. (2015) determined that the relationship between return on equity and debt-to-asset ratio was not linear. They continued by arguing that the ROE would grow with the debt-to-asset ratio until the optimal debt level was reached, at which time it would begin to drop. If debt levels were ideal, this would be the case. According to Cole et al. (2015), the connection between profit margin and capital structure differs by industry. According to their results, capital structure has a favorable effect on the profit margin in the industrial sector but a negative effect on the profit margin in the energy sector. Debt should be used to support the activities of organizations in the industrial and healthcare sectors. Their study demonstrates indisputably that increasing a company's financial leverage in the industrial, healthcare, or energy sectors may have a negative impact on the organization's performance. If the capital structure would have a negative impact on a company's performance, enterprises should not seek debt financing. According to Zhang et al. (2018), in the energy business, leverage correlates positively with profitability, scale, and tangibility. Both profitability and the capacity to service debt are negatively impacted by tax rates. When taxes are increased, the available funds for debt financing are diminished.

According to De Marco and Mangano (2017), a variety of risk characteristics, as measured by certain indicators, have a significant impact on loan leverage. These risk indicators included the nation's stability index, construction duration, and average partner size. Cariola et al. (2020) examined if borrowing hinders the success of small and medium-sized energy companies in Europe. Their results imply that the cost of borrowing exceeds the benefits that are directly related to it. Second, they saw a quick improvement in these effects, which went from unfavorable to positive. Countries that fulfill environmental quality requirements set limitations on the expansion of the production systems of small and medium-sized companies (SMEs) while promoting the financial efficiency of SMEs via the effective use of capital. According to the findings of Aziz and Abbas (2019), both short-term and long-term debt has a negative impact on the performance of organizations. Both short-term and long-term debt has a significant, and negative, effect on a corporation's financial performance. Short-term debt may have a positive impact on a company's overall performance, despite the fact that the cost of debt is substantial and it reduces profitability. Scannella (2012) found a number of pervasive serious flaws in the market for project bonds. The project bond is an innovative kind of financial instrument that may be used to effectively combine public and private funds to finance large-scale projects of public interest. Project bonds will be used by energy sector firms to increase expertise, financing, and private placement opportunities, while simultaneously reducing the company's ownership percentage.

Two impacts of debt financing on a company's performance were discovered by Pandey and Sahu (2019). In the first step of the process, ROE is used to assess the effect of debt on the profitability of the firm. The second step is including agency cost into the rationale for why this impact happens. They reached the conclusion that the usage of debt financing has a significant, although negative, effect on the performance of enterprises. ROA is impacted by Short-Term Debt (STD), Long-Term Debt (LTD), and Total Debt (TD), according to the results of Twairesh (2014) (ROA). Only LTD significantly contributes to the total ROE. Moreover, a company's degree of success may be affected by its size. In addition, he established a link between the debt maturity structure of a business and the decisions made by that organization as well as its performance.

Akhtar et al. (2016) discovered a link between the use of leverage and an increase in a company's total value. Tax advantages associated with carrying debt may have a positive effect on the value and performance of a firm. Additionally, they discovered that countries with no income tax, such as Saudi Arabia, had little effect on the value of a company. Desai (2021) discovered that the presence of either long-term or short-term debt adversely affects the market value of a firm. Regardless of the kind of debt, this was the case. Moreover, he demonstrated that the relationship between debt financing and the value of a firm is affected by the size of the business. According to Altaf (2020), there is a U-shaped relationship between working capital finance and a company's performance (2020). When a company is supported by short-term debt, its performance worsens. According to Campello (2006), debt financing may have both beneficial and negative implications on the operation of a business. The implications of debt financing on the banking sector were explored in Harelimana (2017). He observed a substantial and positive relationship between the quantity of bank debt and a company's profitability. In conclusion, low-cost debt financing benefits both the performance and profitability of businesses. According to Rahman et al. (2020), total debt, short-term debt, and long-term debt had no meaningful impact on a company's financial performance. There is a link between the short-term and long-term debt levels of a corporation and its degree of success. Long-term debt and the financial performance of an organization's corporation have not been demonstrated to have a meaningful association. Lastly, they argued that the capital structure of Bangladeshi firms, often known as their debt-equity ratio, is harmful to the profitability of these firms. According to Detthamrong et al. (2017), who analyzed the corporate governance, capital structure, and company performance of 493 Thai enterprises between 2001 and 2014, there is no association between corporate governance and firm performance. In contrast, leverage has a beneficial effect on the success of a company.

Rouf and Abdur (2015) observed a substantial and negative relationship between the debt-to-equity ratio, the ratio of proprietary debt to total debt, and the ratio of return on assets to return on assets (return on sales). Tifow and Sayilir (2015) analyzed 130 Turkish manufacturing businesses between 2008 and 2013 and discovered a negative correlation between short-term loans to total assets (STDTA), return on assets (ROA), earnings per share (EPS), and the Tobin Q ratio. Examining the short-term loan to total asset ratios of the companies, they discovered this association. In addition, they observed that the ratio of long-term loans to total assets (LTDTA) had a significant negative correlation with ROE, earnings per share (EPS), and Tobin's Q ratio, but a positive correlation with ROA. Fareed et al. (2016) evaluated the profitability factors of 16 enterprises operating in Pakistan's energy and electricity industry between 2001 and 2012. They concluded that the firm's age and development, in addition to Pakistan's electricity issue, positively affect the profitability and financial performance of power and energy enterprises. They observed that the profitability of Pakistani power and energy firms was highly impacted by both the productivity of the organization and the size of the organization.

3. RESEARCH METHODOLOGY

The current research investigates the influence of debt financing on business development in Saudi Arabian energy enterprises listed on Tadawul (the stock exchange of Saudi Arabia). The data for the empirical study was gathered from the firm's annual financial reports from 2012 to 2019. The research sample comprises four Saudi Arabian energy companies. The research presents fundamental findings using descriptive statistics and correlation analysis, as well as empirical findings using panel regression.

3.1. Study Variables

The current research uses ROA and ROE as performance assessment variables that are utilized alternately as dependent variables; debt to equity and company size are used as independent and control factors. Previous research has shown that several components such as cash flow, leverage, business growth, and so on impact a firm's working capital. As a result, the current ratio (used to gauge businesses' working capital) is included as an interaction variable in the research. Table 1 depicts many sorts of variables.

3.2. Model Estimation

The current work estimates panel data models to investigate the impact of debt financing on company growth. Furthermore, Adjusted R2 and F-statistic are used to explain the fitness of these estimated models. The following is the model estimation:

Pooled Regression:

$$ROA_{i,t} = \alpha + \beta_1 DE_{i,t} + \beta_2 SZ_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROA_{i,t} = \alpha + \beta_1 DE_{i,t} + \beta_2 CR_{i,t} + \beta_3 SZ_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$ROE_{i,t} = \alpha + \beta_1 DE_{i,t} + \beta_2 SZ_{i,t} + \varepsilon_{i,t} \quad (3)$$

Table 1: Description of study variables

Variables	Description	Sign
ROA	Net Income before Tax/Total Assets	--
ROE	Net Income before Tax and Preference Dividend/Total Shareholders' Equity	--
DE	Total Debt/Total Equity	(-)
CR	Current Assets/Current Liabilities	
Firm Size	Log of Total Assets	(+) or (-)

$$ROE_{i,t} = \alpha + \beta_1 DE_{i,t} + \beta_2 CR_{i,t} + \beta_3 SZ_{i,t} + \varepsilon_{i,t} \quad (4)$$

Panel Regression:

$$ROA_{i,t} = \alpha_i + \beta_1 DE_{i,t} + \beta_2 SZ_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$ROA_{i,t} = \alpha_i + \beta_1 DE_{i,t} + \beta_2 CR_{i,t} + \beta_3 SZ_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$ROE_{i,t} = \alpha_i + \beta_1 DE_{i,t} + \beta_2 SZ_{i,t} + \varepsilon_{i,t} \quad (7)$$

$$ROE_{i,t} = \alpha_i + \beta_1 DE_{i,t} + \beta_2 CR_{i,t} + \beta_3 SZ_{i,t} + \varepsilon_{i,t} \quad (8)$$

where ROA and ROE are the performance measurement variables alternatively, $\alpha$is the constant, β_1 and β_2 are Debt to equity and current ratio, while β_3 is the control variable and $\varepsilon_{i,t}$ is the error term.

4. DATA ANALYSIS AND RESULTS

In the current research, the fundamental findings are reported using descriptive statistics and correlation analysis, whilst the empirical findings are reported using panel data analysis. The findings of the descriptive statistics are shown in Table 2.

According to the descriptive statistics, the performance measurement variables such as ROA and ROE have a mean value of 3.33 and 8.87 respectively, with a standard deviation of 3.72 and 8.74 respectively. The fact that these factors are trending in a favorable direction indicates that Saudi Arabia's energy companies are seeing healthy revenue growth. The debt-equity ratio is positive, which indicates that the energy companies are leaning more toward debt, as seen by the fact that the ratio is positive. The ratio in question currently has a positive value. In addition, the average size of the company is favorable, coming in at 7.43.

The findings from the correlation study are shown in Table 3. There is an inverse relationship between the debt-equity ratio and the indicators that are used to gauge performance. There is not a positive connection between the two variables that are independent. There is an inverse correlation between the size of the company and performance assessment factors.

The results of pooled regression are shown in Table 4. The pooled regression findings show that debt financing is negative and significant at the 1% level of significance in all models except model 2, which includes the current ratio (CR) as an interaction variable. Following the introduction of the interaction variable, the debt financing variable becomes negative. At the 1% threshold of significance, the firm size is negative and significant. All of the models' modified R2s range from 0.46 to 0.64, and the F-statistic is significant at the 1% level of significance. This demonstrates that the models provided are adequate for understanding the connection between dependent and independent variables.

Table 5 displays the panel regression findings. The panel regression results using fixed effects and random effects show that the debt financing variable is negative and not significant in the fixed effects model, but negative and significant in the random effects model at the 1% level of significance in all models except model 3, where it is negative and significant at the 10% level of significance. The debt financing variable stays negative and inconsequential in the fixed assets model even with the addition of the interaction variable, however, it becomes negative and significant in the random-effects model. The firm size is negative and significant at the 1% level of significance in the random-effects model, but

Table 2: Descriptive statistics

Variables	Obs	Mean	SD	Min	Max
ROA	32	3.329	3.717	-1.48	11.44
ROE	32	8.875	8.735	-9.08	33.35
Debt Equity (DE)	32	1.178	1.198	0.05	4.49
Current Ratio (CR)	32	0.304	0.148	0.140	0.520
Firm Size (FS)	32	7.433	0.874	5.97	8.67

Source: Own calculations based on the data contained in the financial statements of the energy sector companies of Saudi Arabia from 2012 to 2019

Table 3: Result of correlation analysis

Variables	ROA	ROE	DE	CR	FS
ROA	1.000				
ROE	0.894	1.000			
Debt Equity (DE)	−0.536	−0.529	1.000		
Current Ratio (CR)	0.738	0.503	−0.542	1.000	
Firm Size (FS)	−0.750	−0.634	0.362	−0.726	1.000

Source: Own calculations based on the data contained in the financial statements of the energy sector companies of Saudi Arabia from 2012 to 2019

Table 4: Empirical results of pooled regression

Model-1: ROA (Dependent Variable)				
	α	β	t-statistic	P-value
DE		−0.945	−2.57	0.016
SZ		−2.720	−5.38	0.000
Constant	24.67		6.76	0.000
Adjusted-R^2	0.619			
F-statistic	26.19			0.000
Model-2: ROA (Dependent Variable)				
	α	β	t-statistic	P-value
DE		−0.664	−1.67	0.107
CR		7.093	1.62	0.115
SZ		−1.985	−2.97	0.006
Constant		16.72	2.77	0.010
Adjusted-R^2	0.639			
F-statistic	19.33			0.000
Model-3: ROE (Dependent Variable)				
	α	β	t-statistic	P-value
DE		−2.516	−2.47	0.020
SZ		−5.087	−3.64	0.001
Constant		49.65	4.92	0.000
Adjusted-R^2	0.472			
F-statistic	14.85			0.000
Model-4: ROE (Dependent Variable)				
	α	β	t-statistic	P-value
DE		−2.841	−2.48	0.019
CR		−8.174	−0.65	0.520
SZ		−5.934	−3.09	0.004
Constant		58.82	3.39	0.002
Adjusted-R^2	0.461			
F-statistic	9.84			0.000

Source: Own calculations based on the data contained in the financial statements of the energy sector companies of Saudi Arabia from 2012 to 2019

Table 5: Empirical results of panel regression

Model-1: ROA (Dependent Variable)								
	Fixed Effects				Random Effects			
	α	β	t-statistic	P-value	α	β	z-statistic	P-value
DE		−0.382	−0.41	0.689		−0.945	−2.57	0.010
SZ		−4.515	−1.45	0.160		−2.721	−5.38	0.000
Constant	37.34		1.62	0.118	24.67		6.76	0.000
R^2	0.601				0.643			
F-statistic	0.24			0.871				
Wald chi2					52.38			0.000
Hausman	0.70 (0.705)							
Model-2: ROA (Dependent Variable)								
	Fixed Effects				Random Effects			
	α	β	t-statistic	P-value	α	β	z-statistic	P-value
DE		0.045	0.07	0.948		−0.664	−1.67	0.095
CR		50.78	4.92	0.000		7.093	1.62	0.104
SZ		15.63	3.34	0.003		−1.985	−2.97	0.003
Constant	−128.3		−3.41	0.002	16.71		2.77	0.006
R^2	0.237				0.674			
F-statistic	9.58			0.000				
Wald chi2					57.98			0.000
Hausman	25.61 (0.000)							
Model-3: ROE (Dependent Variable)								
	Fixed Effects				Random Effects			
	α	β	t-statistic	P-value	α	β	z-statistic	P-value
DE		−2.386	−0.94	0.355		−2.516	−2.47	0.014
SZ		4.354	0.52	0.608		−5.087	−3.64	0.000
Constant	−20.68		−0.33	0.742	49.65		4.92	0.000
R^2	0.05				0.501			
F-statistic	0.53			0.594				
Wald chi2					29.70			0.000
Hausman	1.33 (0.5145)							
Model-4: ROE (Dependent Variable)								
	Fixed Effects				Random Effects			
	α	β	t-statistic	P-value	α	β	z-statistic	P-value
DE		−1.782	−0.74	0.469		−2.841	−2.48	0.013
CR		71.81	1.98	0.059		−8.17	−0.65	0.514
SZ		32.84	2.00	0.057		−5.93	−3.09	0.002
Constant	−254.99		−1.93	0.065	58.82		3.39	0.001
R^2	0.287				0.513			
F-statistic	1.70			0.192				
Wald chi2					29.53			0.000
Hausman	5.97 (0.113)							

Source: Own calculations based on the data contained in the financial statements of the energy sector companies of Saudi Arabia from 2012 to 2019

positive and significant in models 2 and 4 and inconsequential in models 1 and 3. For fixed effects in model 2, the F-statistic is significant at the 1% level of significance, but the Wald chi2 is significant at the 1% level of significance for random effects. The R2 for all models ranges from 0.05 to 0.60 for fixed effects and from 0.50 to 0.67 for random effects. The significance of the Hausman test suggests that the random effects model is preferred over the fixed effects model for revealing linkages. As a result, the panel random effects are included in the current study for interpreting the data.

5. DISCUSSION AND CONCLUSION

The present study looked at the impact of debt financing on the profitability of Saudi energy companies. According to the data, debt financing has a negative relationship with company profitability. In the study, the current ratio, also known as the working capital ratio, was employed as an interaction variable. The post-interaction data show that debt financing has a negative and significant relationship with a firm's profitability. This shows that Saudi Arabian oil businesses are struggling with agency issues, which result in increasing debt and poorer profitability. Furthermore, a higher debt proportion in a company's capital structure leads to a higher cost of capital, which leads to lesser profitability. Firm size demonstrates a negative and significant association, indicating that the businesses included in the research are tiny in size. The current study's findings corroborate those of prior research investigations by Aziz and Abbas (2019), Aljaaidi and Bagais (2020), Nazir et al. (2021), Desai (2021), and disagree with those of Akhtar et al. (2016), Shaik and Sharma (2021), Zhang et al (2018).

Debt finance is an external source of money acquisition for a corporate entity. The aims of the business organization also dictate the choice of a debt financing strategy to foster or satisfy the fund demand of the business organization. The purpose of this study was to investigate the impact that using debt financing has on the overall financial performance of Saudi Arabian energy enterprises. The research sample comprises four energy businesses. The information was gleaned from the company's annual reports between 2012 and 2019. The panel regression method was used in the research, with ROA and ROE as financial performance measurement variables and debt-equity ratio (DE) as debt financing variables. The current ratio (CR) was also incorporated as an interaction variable in the research. The research found a negative relationship between both performances measuring factors. Furthermore, the post-interaction findings reveal that the link with the performance measurement factors remains unchanged. Furthermore, company size has a negative connection with ROA and ROE, indicating that the sample businesses are modest in size. The current study's findings may help energy company finance managers decide how to employ debt in the firm's capital structure. Furthermore, the findings are beneficial to academics, investors, and policymakers. The current analysis may be expanded by comparing Saudi Arabian energy firms to GCC energy companies as well as other growing nations internationally.

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