



Working Capital and Financial Performance in the Energy Sector of Saudi Arabia: Moderating Role of Leverage

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ABSTRACT

The current study examines the effect of working capital (measured in terms of current ratio on firm performance in the listed firms of Saudi Arabian energy sector during the period starting from 2012 to 2019. A pooled and panel data model was used to analyze the extracted data. The findings indicate that working capital has a considerable beneficial impact on company performance and that leverage has a significant negative impact. Even after moderating by an interaction variable, working capital still has a substantial negative influence on corporate performance.

Keywords: Working Capital, Firm Performance, Leverage, Moderation, Energy Sector

JEL Classifications: L25, L71, M40

1. INTRODUCTION

Capital or fund is to be considered the lifeblood for the business organization to run the business activities smoothly. In all business organizations, capital or fund is managed from internal and external sources. There are two usages of the collected funds or capital for a business organization. Primarily, collected funds are to be invested in establishing a business organization or expanding the capacity of the existing business organization. Secondly, capital is necessary to run the operational activities of businesses. The investment in the establishment of the business organization is to be made once in a life of the business organization while the expansion requires fund according to need of enhancement of the capacity or application of advanced technology in the operational system of the business organization. The capital which is necessary in the business establishment is fixed capital. The working capital refers the fund which is invested in the operational activities of the business organization. In other words, working capital is the fund which utilizes the fixed investment or fixed assets of the business organization to operate the business activities smoothly.

The financial performance of the company organization takes into account the profit, profitability, and financial soundness in order to satisfy its responsibilities. Financial soundness is a measure of a company's ability to pay off its liabilities both in the short and long term. Working capital is the excess of the company organization's current assets over its current liabilities in numerical terms. The working capital defines and affects the operational level of the business organization. The excess availability of working capital assures the hindrance free operation of the business activity while negative for the profit and profitability of the business organization. Scarcity of working capital leads the obstacles in the path of smooth operation of the operational activity but does not affect the profit and profitability. Ultimately, discontinuation in operational activities leads lowering of the profit of the business for a specific period. So, the optimal amount of the working capital necessary to enhance the profit and profitability.

Saudi Arabia is the largest petroleum product exporter in the world (Investopedia, 2020) and constitutes 46% of Saudi Arabia GDP (Trading Economics, 2022). The prices of the oil products lowering in last two decades. But, oil revenue governs the Saudi economy

positively (Al Rasasi et al., 2019; Alharbi, 2020). The Saudi Arabian government's budget and gross domestic product are determined by the oil prices (OPs) of petroleum products (Abdel-Latif et al., 2018). The OP of petroleum products are governed by different factors that are uncontrollable and unavoidable. So, the different factors that affect the profit and profitability of the energy firms in Saudi Arabia should be studied. Working capital is one of the most ingredient that affects the profit, profitability and smooth operation of the operational activities of the energy firms, internally.

2. LITERATURE REVIEW

Shaik (2021) studied Saudi Arabian companies and found a positive and significant relationship between working capital and profitability. He analyzed that the growth of the Saudi companies is linked with the inventory ordering cost and revealed that the profitability of bigger firms is more than the smaller firms. Finally, he suggested that the working capital governs the profitability of the companies.

Ali and Alam (2021) discovered that Saudi Arabia's energy industry companies' profitability varies significantly from one another. They revealed that there are positive and perfect relationships between revenue and profitability while negativity between investment and profitability.

Zimon (2019) studied the working capital management of Polish energy companies and found that the companies finance their operational capital from external assets and suppliers.

Ali (2021) found considerable differences in the Saudi Arabian energy sector companies' long-term and short-term paying capacity. He noted that Saudi energy sector enterprises do not need external funding because it has a detrimental impact on their financial performance. Long-term and short-term correlations between Saudi energy industry businesses' equity share capital and gross profitability are strong.

Tanveer et al. (2016) studied the impact of working capital on firms' performance listed on the Karachi stock exchange. They found a positive and significant relationship between the average collection period (ACP) and return on assets (ROA) while a negative and significant relationship between the average payment period, cash conversion cycle (CCC), and inventory turnover and ROA. Further, they found a negative significant impact on earning per share while a positive and significant impact on the ACP. Finally, they found that financial performance is governed by the working capital.

Aljaaidi and Hassan (2020) studied and found that the size of the board is positively associated with firm performance. Further, they demonstrated that, in the context of Saudi Arabia, board meetings, firm size, and firm leverage are inversely correlated with firm performance.

Hamdan et al. (2017) revealed that corporate governance positively influences the relationship between intellectual capital components and operational performance. The capital structural efficiency and capital employed efficiency positively govern the operational performance of a business entity. they also observed that the bigger

firms own the efficient human capital while smaller firms have the structural capital efficiency.

Alsharif and Tong (2020) focus on the feasible role of natural resources in the financial sector of Saudi Arabia's economy. Also, He affirms various favorable natural resource and technological shocks that improved the financial performance of Saudi Arabia's energy companies.

According to Almomani et al. (2021), the financial performance of manufacturing firms is influenced by inventory turnover, receivables turnover, current asset turnover, and working capital turnover.

Khondaker et al. (2015) found that Saudi Arabia's energy industry is the largest source of greenhouse gas (GHG) emissions. Due to the massive increase in GHG emissions, the monarchy confronts difficulties meeting both its targets for reduction and mitigating the resulting climatic consequences. They also disclosed the rise in energy demand brought on the population growth.

Wang et al. (2020) showed a negative correlation between working capital and firm performance. Nevertheless, this relationship changes as a corporation progresses through its life cycle. At each step of the firm's life cycle, they recommended adopting tailored working capital management practices to achieve sustainable financial performance.

Kiptoo (2017) examined how a company's working capital management methods affected its financial performance. He concluded that in order to improve financial performance, businesses should delay payments to creditors and lengthen the cash conversion period.

Akinwale (2018) studied that there is a link between Saudi Arabia's economic growth, technology innovation, and energy consumption in both the long and short runs. Energy consumption is negatively impacted by long-term technological advancement while positively impacted by long-term economic growth, and the short-term relationship has similar consequences.

Ali and Abu Theeb (2018) discovered that the financial results of petrochemical businesses before and after GER were not significantly different (Global Economic Recession). Additionally, they discovered that the petrochemical industry's negative effects were solely attributable to the increased cost of sales, despite the fact that sales prices had been rising globally since the GER.

Ali (2020) studied that the gross profitability of petrochemical companies is notably different and also governs the other measures of financial performance. Further, he observed a decrease in the financial performance of petrochemical companies in Saudi Arabia due to the operational performance of companies. Similarly, another study by Ali and Faisal (2020) examined the capital structure and financial performance of Saudi Arabian Petrochemical industry. They found a significant relationship between the two.

Barakat (2014) Revealed that in Saudi industrial enterprises, the return on equity capital and capital structure have a considerable

positive association. Additionally, he discovered an unfavorable and weak correlation between financial leverage and stock valuation. In the end, the company’s financial structure governs how much money the company has.

Sheikh et al. (2016) found that in all sectors, market-based and book-based metrics of performance are positively correlated with the current asset ratio and CCC. The average age of inventory and net working capital are positively linked to performance in all sectors except textile weaving.

Khan et al. (2021) noticed that if the country’s domestic energy need is not met, Saudi Arabia would see rapid expansion. Therefore, the monarchy might be less able to keep oil exports at their current levels. Additionally, they discovered that because oil appears to be the country’s financial and energy security safety valve, the nation may be in danger or at high risk in the future.

Alsulayhim (2019) it was noted that working capital management is a significant idea with a variety of potential influences on businesses. Working capital management and profitability have a good link since each business has different tactics for doing so.

Ali (2021) found large differences in long- and short-term liquidity, as well as their beneficial effects on the profitability of Saudi energy sector enterprises, were shown through a study of liquidity variations and their impact on profitability.

Hajisaaid (2020) studied that how Saudi Arabian basic materials companies’ profitability was affected by their financial structure. He found that the profitability of Saudi Arabia’s basic commodities industry and the proportion of short-term debt to total assets were negatively correlated.

Lele (2016) studied the impact of OPs on revenue growth and profitability of Non-Financial Saudi Arabian listed companies. He found a strong positive relationship between the global OPs, net margin, revenue growth, and return on net worth.

Rehman et al. (2015) found a positive relationship between the ROA and current ratio (CR) while a weaker but negative relationship between the ROA and quick ratio of the companies listed on the stock exchange of Saudi Arabia.

3. RESEARCH METHODOLOGY

In the Saudi Arabian energy companies listed on the Tadawul Stock Exchange, the research investigates the impact of financing working capital on enterprises’ financial performance. The study uses secondary data of four energy firms extracted from the firm’s financial reports from 2012 to 2019. To measure firm growth, the study employs, ROA which is a dependent variable, while the current assets ratio (CR) is used to measure working capital and debt-equity ratio are independent variables. Moreover, to further measure the impact of working capital, an interactive variable (CRDE) an interaction between CR and debt-equity ratio. Further, firm size is used as a control variable.

3.1. Dependent, Independent and Control Variables

The ROA is firm performance ratio described as Net Income before tax scaled by total assets, while current assets ratio is described as current assets scaled by current liabilities and debt-equity ratio is described as total debt scaled by total equity. The interaction variable is the interaction between CR and debt-equity ratio, while the control variable is firm size measured as log of total assets.

To examine the impact of working capital on the growth of Saudi Arabian energy firms, the study estimates pooled and panel regression models. The estimated models are described as under.

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 FS_{i,t} + \epsilon_{i,t} \tag{1}$$

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 FS_{i,t} + \epsilon_{i,t} \tag{2}$$

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 CR * DE_{i,t} + \beta_4 FS_{i,t} + \epsilon_{i,t} \tag{3}$$

Panel Regression (FE)

$$ROA_{i,t} = \alpha_i + \beta_1 CR_{i,t} + \beta_2 FS_{i,t} + \epsilon_{i,t} \tag{4}$$

$$ROA_{i,t} = \alpha_i + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 FS_{i,t} + \epsilon_{i,t} \tag{5}$$

$$ROA_{i,t} = \alpha_i + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 CR * DE_{i,t} + \beta_4 FS_{i,t} + \epsilon_{i,t} \tag{6}$$

Panel Regression (RE)

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 FS_{i,t} + \mu_i + \epsilon_{i,t} \tag{7}$$

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 FS_{i,t} + \mu_i + \epsilon_{i,t} \tag{8}$$

$$ROA_{i,t} = \alpha + \beta_1 CR_{i,t} + \beta_2 DE_{i,t} + \beta_3 CR * DE_{i,t} + \beta_4 FS_{i,t} + \mu_i + \epsilon_{i,t} \tag{9}$$

Where α is the constant, $\beta_1 - \beta_4$ are the coefficients of different study variables, and μ is a residual term for random effects model. Further, the Adjusted R² and F-test explains the model fitness.

4. DATA ANALYSIS AND RESULTS

The effect of working capital on the company’s financial performance is studied in the current study. This section presents the findings from panel regression models, descriptive statistics, and correlation. Results of descriptive statistics are shown in Table 1.

The descriptive statistics show that the determinant of firm performance ROA has a mean of 3.33 with a standard deviation of 3.72, while the determinant of working capital, i.e., the CR has

Table 1: Descriptive statistics

Variables	Observation	Mean	SD	Minimum	Maximum
ROA	32	3.33	3.72	-1.48	11.44
CR	32	0.30	0.14	0.14	0.52
DE	32	1.18	1.20	0.05	4.49
CR*DE	32	0.27	0.19	0.02	0.67
Size	32	7.43	0.87	5.97	8.67

ROA: Return on assets, CR: Current ratio, SD: Standard deviation

an average of 0.30 with a standard deviation of 0.14. The debt-equity ratio which is a determinant of leverage has an average of 1.18 with a standard deviation of 1.20. The interaction variable (CR*DE) has an average of 0.27 with a standard deviation of 0.19. The firm size has a mean of 7.43 with a standard deviation of 0.87. The reported results show that ROA has a greater variation, while the variation in the other dependent and control variables is low.

Table 2 reports the results of correlation between various study variables. The results of correlation show that the determinant of working capital (CR) is positively correlated with the firm performance determinant (ROA). Further, the leverage variable (DE) and the interaction variable (CR*DE) are negatively correlated with ROA. Moreover, the firm size is correlated negative with ROA.

Table 3 reports the results of the pooled regression. Model 1 shows that the determinant of working capital is positive insignificant, leverage is negative insignificant and the firm size is negative significant at 1% significance level. The model is assumed to be fit with an adjusted R² of 64% and F-statistic significant at <1% significance level. Model 2 has a different result with an interaction variable. Leverage is positively insignificant, working capital is positively significant at the 1% significance level, and the interaction variable (CR*DE) is negatively significant at the 5% significance level. The independent variables have a variance of 67% and explain the firm performance variable with an F-statistic significant at <1% significance level, indicating that the model has good fit.

Table 4 reports the panel regression results with fixed and random effects. Model 1 with fixed effects shows a positive

Table 2: Results of correlation

Variables	ROA	CR	DE	CR*DE	Size
ROA	1.000				
CR	0.738	1.000			
DE	-0.536	-0.541	1.000		
CR*DE	-0.398	-0.160	0.858	1.000	
Size	-0.750	-0.726	0.362	0.233	1.000

ROA: Return on assets, CR: Current ratio

Table 3: Pooled regression results

Variables/Statistics	α	β	t-statistic	P
Model-1: ROA (dependent variable)				
CR		7.09	1.62	0.115
DE		-0.66	-1.67	0.107
SZ		-1.99	-2.97	0.006
Constant	16.71		2.77	0.010
Adjusted-R ²	0.64			
F-statistic	19.33			0.000
Model-2: ROA (dependent variable)				
CR		19.04	2.62	0.014
DE		1.77	1.39	0.175
CR*DE		-13.71	-2.01	0.055
SZ		-1.01	-1.27	0.214
Constant	6.65		0.87	0.390
Adjusted-R ²	0.67			
F-statistic	17.07			0.000

ROA: Return on assets, CR: Current ratio

significant impact of working capital on firm performance at <1% significance level, leverage positive insignificant, and firm size is positive significant, while the results of panel random effects are different with a positive insignificant effect of working capital on firm performance, leverage negative insignificant, and firm size is negative significant. Further, model 2 results with fixed effects shows a positive significant effect of working capital on firm performance at <1% significance level, leverage negative insignificant, interaction variable (CR*DE) is positive insignificant, and firm size is positive significant, while the results of panel random effects reports a positive significant impact of working capital on firm performance at 1% significance level, leverage positive insignificant, interaction variable (CR*DE) is negative significant at <5% significance level, and firm size is negative insignificant. The results of hausman test shows that panel random effects is preferred over the fixed effects for both the models.

5. DISCUSSION

The current study examines the impact of working capital on firm profitability by moderating leverage. According to the data, working capital has a positive, considerable influence on the performance of the business. It is considered that a company’s working capital is essential to attaining its financial goals of profit and wealth maximization. An efficient management of working capital brings in good profits to a firm, because the practice of efficient working capital management increases the firm performance in the long-run. Working capital financing utilize the internal funds and short-term loans, hence avoids capital market operations. Therefore, the association between working capital and profitability is positive.

The results of current study are in accordance with the previous studies of Rehman et al. (2015), Sheikh et al. (2016), Tanveer et al. (2016), Shaik (2021) and Alsulayhim (2019). Further, the results of current study show at most negative insignificant effect of leverage on firm profitability. The past studies report different results on the association of leverage and profitability. The positive association was related to flow of cash due to higher and long-term debt, hence increasing the profitability of firms, but the other side of the coin is that the long-term debt also brings in high cost of debt, hence decreasing the firm’s profitability. The current results are in accordance with the past studies of Ahmad et al. (2015), Mukras (2015), Javed (2015), Ilyukhin (2015), Singh and Bansal (2016), Dalci (2018) and Daryanto et al. (2018). Moreover, the result of moderation of debt finance between working capital and profitability is interesting. The result show negative significant effect. The negative effect might be due to the higher impact of debt on working capital.

As discussed earlier that the negative impact of debt on profitability might be due to approach towards long-term funds that carry high cost of debt or due to frequent borrowing of short-term debt. The Saudi Arabian energy sector is strong with having Saudi Aramco as a global giant in the field of energy. The contrast results might be due to the approach towards short-term debt frequently by the other energy firms. The moderation results are in accordance with the previous research works of Baños-Caballero et al. (2014) and Mahmood et al. (2019) where they have reported U-shaped association between working capital financing and profitability.

Table 4: Panel regression results with fixed and random effects

Variables/Statistics	Fixed effects				Random effects			
	α	β	t-statistic	P	α	β	Z-statistic	P
Model-1: ROA (dependent variable)								
CR		50.78	4.92	0.000		7.09	1.62	0.104
DE		0.045	0.07	0.948		-0.66	-1.67	0.095
SZ		15.63	3.34	0.003		-1.98	-2.97	0.003
Constant	-128.34		-3.41	0.002	16.72		2.77	0.006
R ²	0.24							
F-statistic	9.58			0.000				
Wald χ^2					57.98			0.000
Hausman				25.61 (0.000)				
Model-2: ROA (dependent variable)								
CR		50.56	4.74	0.000		19.04	2.62	0.009
DE		-0.12	-0.09	0.930		1.77	1.39	0.164
CR*DE		1.36	0.14	0.891		-13.71	-2.01	0.045
SZ		15.67	3.27	0.003		-1.02	-1.27	0.203
Constant	-128.77		-3.34	0.000	6.65		0.87	0.383
R ²	0.24							
F-statistic	6.90			0.000				
Wald χ^2					68.28			0.000
Hausman				14.80 (0.005)				

ROA: Return on assets, CR: Current ratio

6. CONCLUSION

The current study examined the impact of working capital on firm's financial performance by moderating with leverage. The data has been collected from the energy firms listed on Tadawul for a period of 7 years starting in 2012 and ending in 2019. To analyze the data, the study has employed pooled and panel regression models by using ROA as dependent variable, working capital (CR) and leverage (debt-equity) as an independent variables and firm size as a control variable. Further, the study introduced an interaction variable (CR*DE) to further examine the effect of working capital on firm performance.

The results show that there is a positive significant impact of working capital on firm performance. Further, there is at most negative insignificant effect of leverage on firm profitability. The moderation results of leverage between working capital and profitability are interesting. The result shows a negative significant effect. The negative effect might be due to the higher impact of debt on working capital. The results of current study might be useful to the companies in the energy sector, policy makers and academicians. The future research can be focused on examining the effect of working capital on firm performance by moderating with other macroeconomic variables.

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