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FACTORS AFFECTING CORPORATE CASH HOLDINGS: EVIDENCE FROM THE ENERGY SECTOR OF SAUDI ARABIA

Abstract

This study investigates the impact of firm-specific components of cash holdings on the cash reserves of energy firms. Decisions related to cash management are significant and treated as confident made by financial managers to increase the value of a firm. Therefore, financial managers are obligated to hold an optimum level of cash to enhance the firm value. The study depends on secondary data from seven energy firms listed on the Saudi Arabian Stock Exchange over the period between 2014 and 2023. The study considers cash holdings as a dependent variable, leverage, networking capital, and profitability as explanatory variables, and firm size as a control variable. The study employed a linear regression model and a generalized linear regression (GLM) model with Gaussian and Gamma distributions to analyze the data. The results show that Saudi Arabian energy firms reserve approximately 7% of cash, while external financing is 51%. The pooled regression results show that the association between leverage and firms' cash reserves was negative (-0.064) and significant at less than a 1% significance level. Further, the networking capital and profitability were positively related (0.063 and 0.113) and significant at 5% and 1% significance levels. Moreover, the firm size was positive but insignificant. The generalized linear regression model results with Gaussian and Gamma distributions were similar to the simple linear regression with minor variation.

Keywords

cash reserves, leverage, networking capital, profitability,
pecking order theory, trade-off theory

JEL Classification

L71, L95, M40, M41

INTRODUCTION

Profit and wealth maximization are the significant objectives of firms' financial management. Therefore, managers need to take utmost care in achieving these objectives. Further, the firm's cash management is connected mainly to profit maximization. A firm needs cash for several reasons, such as daily operating activities, financing expansion, payment of debts and taxes, preventive measures, etc. Cash management can increase the value of a firm. Besides, holding cash in a firm is not significant because a firm can lever up funds to invest in long-term projects at nominal transaction costs, hence leaving shareholders' wealth untouched. However, recent studies have reported the significance of investment in quick assets by holding cash reserves. There has been evidence of firms holding more cash reserves. The point of discussion is how much cash a firm should maintain as a reserve. Generally, a firm's strategy in determining the cash ratio plays a significant part in obtaining sound financial health by constituting a balance between cash reserve and current cash obligations. This brings in benefits such as a reduction in the cost of external financing, opportunities for investment, or staying away from financial failures. Therefore, the transaction costs and cash preventive measures are the primary justifications for the firm's cash reserves.

The decision to use firms' cash reserves is a fundamental issue among financial managers and shareholders, which is termed agency conflict, and narrow-minded managers hesitate to disburse excess cash to shareholders (Jensen, 1986). A firm's cash reserves increase during the phase of internal expansion, and the financial managers make crucial decisions related to using existing cash reserves. Further, financial managers should compromise on cash spending and build up excess cash reserves. Different elements influence a firm's cash reserves, such as cash ratio, opportunities for growth, level of debt, company size, capital spending, volatility of cash flow, change in current assets and current liabilities, etc. These elements are derived from two fundamental financial theories: pecking order and trade-off. Both theories are in contrast with each other.

The pecking order theory derives from the flagship of Myers (1984), which states that firms abide by a specific system in using available funds. The firms have internal resources, retained profits, and external resources. This theory says that, initially, the firms meet their investment needs; after that, the excess cash is used to repay debts, pay dividends, and retain the remaining cash. The trade-off theory debates that firms reserve target cash for nominal benefits. It is the trade-off between nominal benefits and transaction costs. According to Ferreira and Vilela (2004), firms holding cash enjoy three types of benefits: protection from financial turbulence, meeting the investment needs with positive net present value, and reducing the cost of raising funds.

The Kingdom of Saudi Arabia is the world's largest exporter of fossil fuels (Investopedia, 2022). The energy sector of Saudi Arabia contributes 46% to the Kingdom's GDP (Trading Economics, 2022). Nevertheless, the Kingdom's primary source is the export of fossil fuels; it intends to invest in the research and development of new energy-producing technologies. Further, even though oil prices fluctuated in the past decade, the government's revenue from oil was positive. The pecking order theory and trade-off theory influence the revenues generated by Saudi Arabian energy firms, specifically regarding cash holdings. Therefore, examining the impact of firm-specific components on the cash holdings of Saudi Arabian energy firms becomes significant.

1. LITERATURE REVIEW

Jamil et al. (2016) studied the factors influencing firms' cash holdings among non-financial companies. They applied multiple regression methods to estimate the data. They found that factors such as working capital, investment, leverage, firm size, etc., have different impacts on firms' cash holdings. Uyar and Kuzey (2014) examined the factors affecting the firm's cash holdings in an emerging market like Turkey and found that Turkish firms have a targeted level of cash. This targeted level of cash is influenced by cash flow and growth opportunities. Wasiuzzaman (2014) investigated firms' cash holdings using the OLS regression technique and found important differences in the level of firms' cash holdings. The importance of firms' features and their association with firms' cash holdings shows that different theories can explain firms' cash holdings. Similarly, Al-Najjar (2013) investigated the financial factors that affect the firm's cash holdings in selected emerging mar-

kets and found similarities in results between developed and emerging nations. The study found that capital structure and dividend policy affected firms' cash holdings. Further, the nations with low stockholder protection have more cash.

However, Sun et al. (2012) reported that poor earnings quality increases asymmetric information between different firms' stakeholders. Further, poor-quality earnings negatively affect the firm's cash holdings and positively affect the cash level. Al-Najjar and Belghitar (2011) studied the association of dividend payments with the holding of cash by the firms. By controlling the simultaneous association between the two, the study found no significant impact between the two variables. Further, Martínez-Sola et al. (2013) studied the firm value's association with the firm's cash holdings in the US industrial sector. The study results reported a concave association linking it to the existence of cash holdings in an optimum manner. Moreover, a decrease or increase above or below the optimum lev-

el deteriorates the firm's value. Subramaniam et al. (2011) examined the structure of firm and corporate cash holdings using time series and cross-sectional data to analyze the results. They found that diversified companies generate more cash by selling assets effectively, and an increase in agency costs for these firms tends to lower the firm's cash holdings.

Similarly, García-Teruel et al. (2009) examined the firms' cash holdings and accrual accounting quality and found that the firms' good accrual quality of accounting reduces the negative effects, which reduces the firm's cash level. Further, the firms' use of more debt also reduces the cash level. Moreover, Tayem (2017) examined the justifications of firms among GCC nations that hold cash subject to firms' characteristics and associated with political acquiring threats and found a positive association between political corruption and firms' cash holdings. Ekadjaja et al. (2022) found that firms' debt is negatively associated with their capital expenditures. Further, they observed that firms' profitability is positively associated with their cash holdings. Further, Malik and Muazzam (2022) found that the KSE-listed firms have the feature of holding moderate cash with them. They revealed that firms' debt, net income, and dividend have no evidence of association with firms' cash holdings. In contrast, net working capital and firms' ownership are positively associated with firms' cash holdings.

Alghadi et al. (2021) studied the influence of firms' ownership structure on firms' cash holdings in Saudi Arabia. They found a positive association between firms' ownership at managerial capacity and cash holdings, while ownership in terms of family and foreign ownership negatively influences the firms' cash holdings. Saleem et al. (2021) found that the GDP positively influences the firm's cash holdings, while the other variables, such as firms' long-term debt, growth, and dividend payment, have a negative influence. Alnori (2020) studied the influence of firms' cash holdings on their financial performance. The results revealed that the company's cash holdings significantly influence its financial development. Besides, Jebran et al. (2019) attempted to examine the factors affecting firms' cash reserves during manageable and unmanageable periods and revealed that firm size and leverage influence cash reserves during turbulent time periods.

Thu and Khuong (2018) examined the determinants that influence firms' cash holdings in Vietnam's energy sector. They found a negative influence of firms' cash reserves on their growth and leverage, while other components such as operating cash flow, firm size, and tangible assets have a positive association. Akben-Selcuk and Altiok-Yilmaz (2017) examined the factors influencing firms' cash reserves in some selected developing nations and found that companies that are giving more weight to financial debt in their capital structure are assumed to have more cash holdings and vice versa. Further, the firms' cash reserves increased with an increase in their revenues. Chireka and Fakoya (2017) attempted to examine the factors that influence the levels of cash reserves in South African firms. They found that capital spending, proxy quick assets, dividend payout, and changes in cash flows influence the firms' cash reserves. Further, in an interesting way, Guizani (2017) investigated different components influencing cash reserve levels in Saudi Arabian companies and revealed that capital spending, company size, debt, change in current assets and current liabilities, and change in cash flows influence the firms' cash reserves. Chen et al. (2012) studied how sensible firms' cash reserves are to the corporate governance of firms listed on the Chinese stock exchange. They found that firms with weak corporate governance have lower cash reserves, while the companies with stable corporate governance enjoy more enormous cash reserves. Similarly, Gill and Shah (2012) studied various factors that influence firms' cash holdings and found that some variables, such as market to book value, firm size, flow of cash, working capital, leverage, etc., significantly influence firms' cash reserves.

Similarly, Diaw (2021) reported a negative interconnection between growth opportunities and firms' cash reserves. El-Halaby et al. (2021) reported that firms' cash holding increases, positiveness and gender identity decrease, while this situation increases distance to efficacy, established situation, and individualism. Chi and Dzung (2021) concluded that cash conversion cycle, flow of cash, opportunities for growth, level of debt, and firm revenue influence the firms' cash reserves significantly. Tahir and Alifiah (2015) focused on firms' financial climate and their level of cash reserves and revealed that past research mostly focused on

developed nations in studying firms' level of cash reserves, while this is meager in the case of developing countries. Similarly, Mesfin (2016) reported that opportunity for firm growth, flow of cash, and company size positively influence firms' cash reserves, while capital spending, changes in current assets and current liabilities, and price escalation negatively influence the firms' level of cash reserves. Harford et al. (2008) reported that companies with a weak corporate governance hold lower cash. Moreover, they also noted that companies with intense corporate governance consume their cash reserves quickly. A. Ozkan and N. Ozkan (2004) found that firms with growth opportunities, cash flow, quick assets, and firm and bank debt are the significant elements influencing firms' cash reserve levels.

Corporate cash holdings have gained importance for their significant role in a company's future investments. Different internal and external factors influence these cash holdings. Therefore, examining the impact of firm-specific factors on firms' cash holdings becomes significant. Hence, the literature review focused on the factors influencing the firms' cash holdings in a global scenario. The varied results of international firms holding cash reserves provide a basis for conducting the current study. Therefore, the core objective of the current study is to examine the influence of different financial components on the cash reserves of Saudi Arabian energy firms. In this regard, the present research establishes the following hypothesis:

H_1 : *There is no association between firm-specific financial factors and firms' cash holdings in Saudi Arabian energy firms.*

2. METHOD

The study examines the influence of different cash holding factors on Saudi Arabian energy firms' cash reserves. The study takes advantage of secondary data extracted from the Koyfin financial database for the seven Saudi Arabian energy sector firms from 2014 to 2022. As discussed, the Kingdom of Saudi Arabia intends to invest in developing new energy-producing technologies. Further, even though oil prices fluctuated in the past decade, the government's revenue from oil was positive. Further, Saudi Arabia shares 11% of total oil production, which is the highest in the world. Table 1 shows the Saudi Arabian oil firms with their market capitalization.

Due to the small sample size, the study adopted a bootstrapping technique. To analyze the data, the study employs a pooled regression model and generalized linear regression with Gaussian and Gamma distributions. Further, to examine the association of different cash holding factors on the firms' cash reserves, the study follows the methodology of Guizani (2017), and the following dependent, independent, and control variables are used.

To examine the influence of different factors of cash holdings on the cash reserves of Saudi

Table 1. Saudi Arabian oil firms and their market capitalization

S. No.	Company	Market Capitalization (Million \$)
1	Saudi Arabian Oil Company (2222)	1,900,507
2	Saudi Arabia Refineries Co. (2030)	329
3	Rabigh Refining and Petrochemical Company (2380)	3,083
4	Arabian Drilling Co. (2381)	3,228
5	ADES Holding Co. (2382)	5,401
6	National Shipping Company of Saudi Arabia (4030)	5,079
7	Aldrees Petroleum and Transport Services Co. (4200)	2,987

Table 2. Measurement of dependent, independent, and control variables

Variables	Type	Measurement
Cash holdings (CASH)	Dependent	Total Cash and Equivalents/(Total Assets-Total Cash)
Leverage (LEV)	Independent	Total Debt/Total Assets
Net Working Capital (NWC)	Independent	Current Assets – Current Liabilities/Total Assets
Profitability (PROF)	Independent	Net Income/Total Assets
Firm Size (FS)	Control	Log (Total Assets)

Arabian energy firms, the current paper estimates pooled regression model and generalized linear regression with Gaussian and Gamma distributions. The following is the estimated model:

$$CASH_{i,t} = \alpha_i + \beta_1 LEV_{i,t} + \beta_2 PROF_{i,t} + \beta_3 NWC_{i,t} + \beta_4 FS_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where α is the constant, β_1 to β_4 are the coefficients of explanatory variables, and ε is the error term. Moreover, the fitness of the pooled regression model is tested using R^2 , F -statistic, and generalized linear regression with Gaussian and Gamma distributions shall be tested using the AIC and BIC criterion.

3. RESULTS

The paper examined the influence of firm-specific factors on the cash reserves of Saudi Arabian energy firms. Table 3 reports the descriptive statistics results.

The descriptive statistics results report that the mean of the dependent variable, i.e., cash holdings, is positive (0.067) with a standard deviation of 0.053. Further, the results of explanatory variables show that leverage is positive (0.506) with a standard deviation of 0.268, net working capital is negative (-0.038) with a standard deviation of 0.089, and profitability is positive (0.095) with a standard

deviation of 0.133. The descriptive results of the control variable, firm size, show a positive mean of 8.876 with a standard deviation of 3.402.

Table 4 reports the results of the correlation. Among the explanatory variables, leverage is negatively correlated with cash holdings, which is expected because the pecking order theory says that leverage decreases the firms' cash reserves (Guizani, 2017), while the other variables, such as net working capital and profitability, are positively correlated. The relation of net working capital contrasts the previous studies, where a negative relation with cash holdings was reported. The control variable firm size positively correlates with cash holdings.

Table 5. Pooled regression

Variables	α	β	t-statistic	p-value
CASH – Dependent Variable				
LEV		-0.064	-7.48	0.000
NWC		0.063	2.38	0.018
PROF		0.113	6.37	0.000
FS		0.00002	0.04	0.970
CONSTANT	0.090		15.47	0.000
Adj R ²	0.30			
F-statistic	67.89			0.000

Note: CASH = Cash holdings; LEV =Leverage; NWC = Net Working Capital; PROF = Profitability; FS = Firm size.

Table 5 reports the results of pooled regression. The results show that leverage is negative and significant at a less than 1% significance level. The net working capital is positive and significant at

Table 3. Descriptive statistics

Variables	Observations	Mean	SD	Minimum	Maximum
CASH	630	0.067	0.053	0.004	0.304
LEV	630	0.506	0.268	0.007	0.912
NWC	630	-0.038	0.089	-0.271	0.126
PROF	630	0.095	0.133	0.050	0.593
FS	630	8.876	3.402	0.001	14.73

Note: CASH = Cash holdings; LEV =Leverage; NWC = Net Working Capital; PROF = Profitability; FS = Firm size.

Table 4. Correlations

Variables	CASH	LEV	NWC	PROF	FS
CASH	1.000				
LEV	-0.457	1.000			
NWC	0.401	-0.593	1.000		
PROF	0.409	-0.271	0.385	1.000	
FS	0.092	0.147	-0.028	0.500	1.000

Note: CASH = Cash holdings; LEV =Leverage; NWC = Net Working Capital; PROF = Profitability; FS = Firm size.

less than 5% significance level. Further, profitability is positive and significant at less than 1% significance level. The control variable firm size is positive but insignificant. The results of leverage and profitability are similar to those reported by past studies, while the result of net working capital is in contrast to the results of past studies. The adjusted R^2 shows that the explanatory variables can explain 30% of the variation. Further, the F -statistic is significant at less than 1 percent level of significance.

Table 6. Generalized linear models (Gaussian)

Variables	α	β	t-statistic	p-value
CASH – Dependent Variable				
LEV		-0.064	-7.48	0.000
NWC		0.063	2.38	0.017
PROF		0.113	6.37	0.000
FS		0.00002	0.04	0.970
CONSTANT	0.090		15.47	0.000
AIC	-3.362			
BIC	-4027.32			
Log-likelihood	1064.05			

Note: CASH = Cash holdings; LEV =Leverage; NWC = Net Working Capital; PROF = Profitability; FS = Firm size.

Table 7. Generalized linear models (Gamma)

Variables	α	β	t-statistic	p-value
CASH – Dependent Variable				
LEV		-0.094	-9.28	0.000
NWC		0.0100	0.60	0.547
PROF		0.138	6.35	0.000
FS		0.001	1.80	0.072
CONSTANT	0.093		12.47	0.000
AIC	-3.657			
BIC	-3744.43			
Log-likelihood	1157.21			

Note: CASH = Cash holdings; LEV =Leverage; NWC = Net Working Capital; PROF = Profitability; FS = Firm size.

The generalized linear models (GLM) restrict the distribution power to model the available data. The current analysis employs GLM with Gaussian and Gamma distributions to model the errors in simple linear regression. The results of GLM with both distributions are reported in Tables 6 and 7. The results of GLM with Gaussian distribution show that leverage is negative and significant at less than 1% significance level. In comparison, the networking capital and profitability are positive and significant at less than 5% and 1% significance levels.

Further, the firm size is positive but insignificant. The results of GLM with Gamma distribution show that leverage is negative and significant, and profitability is positive and significant. At the same time, the net working capital and firm size are positive but insignificant. The results of GLM with Gaussian are similar to that of the simple linear regression model. The AIC and BIC criteria show that both the GLM (Gaussian) and GLM (Gamma) models have a better fit.

4. DISCUSSION

The study examines the firm-specific factors that influence the firms' cash reserves of Saudi Arabian energy firms. The descriptive results show that energy firms hold 6.7% of cash, less than the average of 14% of Saudi Arabian firms (Guizani, 2017). The Saudi Arabian energy firms are more considerate in holding the cash reserves than their internal companion. Further, the explanatory variables report that the energy firms have a leverage of 51% while networking capital and profitability hold 4% and 10% each. The result of leverage shows that the energy firms are more leveraged, and these firms depend more on external debt. The correlation results show no multicollinearity among the study variables since the calculated variance inflation factor (VIF) was less than 5. Studenmund (2006) and Guizani (2017) suggest that a VIF of more than 5 shows greater multicollinearity among the study variables.

The generalized linear regression (GLM) with Gaussian and Gamma distributions shows that the leverage negatively influences the firms' cash reserves. It was evidenced in the descriptive results that the Saudi Arabian energy firms hold 51% of leverage, which shows that these firms have easy accessibility to external financing and hence preserve less cash with them. This result is consistent with the pecking order theory and some past studies (Ferreira & Vilela, 2004; Guizani, 2017; Mesfin, 2016; A. Ozkan & N. Ozkan, 2004) and in contrast to Aldoseri et al. (2022) and El-Halaby et al. (2021). The result of net working capital shows a positive relationship between cash reserves in pooled and generalized linear regression and Gaussian distribution regressions. This contrasts the trade-off theory that firms with significant quick as-

sets tend to have less cash. This reveals that energy firms have less quick assets and, hence, hold large amounts of cash. This result is inconsistent with Al-Najjar (2013), Ferreira and Vilela (2004), Guizani (2017), and Bates et al. (2009).

The results of generalized linear regression (GLM) with Gaussian and Gamma distributions show that the positive association between profitability and firms' cash reserves is in line with the past studies of Opler et al. (1999), Ferreira and Vilela (2004), and Guizani (2017) and in contrast to Thu and Khuong

(2018). This confirms that the energy firms of Saudi Arabia are more profitable; hence, they reserve cash to a large extent. This confirms the pecking order theory. Finally, the control variable, firm size, does not impact the firms' cash holdings. Guizani (2017) argued that firm size is a significant component of firms' cash reserves; hence, there is no indication of any influence on cash reserves. Nevertheless, the result is insignificant. The current study assumes that the energy firms of Saudi Arabia are large and more profitable, and hence are able to accumulate large amounts of cash.

CONCLUSION

The present study examined the influence of firm-specific factors, such as leverage, networking capital, and profitability, on the firm's cash holdings of listed Saudi Arabian energy firms. There has been evidence of firms holding more cash reserves. The point of discussion is how much cash a firm should maintain as a reserve. Specific theories explain the elements that influence firms' cash reserves. Therefore, the study collected data from seven energy firms over the time from 2014 to 2023. Cash reserves were considered the dependent variable, while leverage, networking capital profitability, and firm size were considered explanatory and control variables. The data were analyzed using pooled regression and generalized linear regression with Gaussian and Gamma distributions. The descriptive results show that energy firms hold less cash than their counterparts.

The study found that energy firms hold more debt. The generalized linear regression (GLM) with Gaussian and Gamma distributions shows that leverage negatively influences firms' cash reserves, which shows that energy firms have easy access to acquiring external funds. The results of leverage are in accordance with the pecking order theory. Further, the negative association of networking capital with the firms' cash reserves shows that energy firms have fewer quick assets, hence holding large amounts of cash, which is the opposite of the trade-off theory. Moreover, the positive influence of profitability on firms' cash holdings confirms that the energy firms of Saudi Arabia are more profitable. The association between firm size and the firm's cash reserves is insignificant. Nevertheless, the present study assumes that the energy firms of Saudi Arabia are large firms that are more profitable and, hence, are able to accumulate large amounts of cash.

The results are helpful to the financial managers of firms in the Saudi Arabian energy sector in planning optimum cash holdings. They are also useful to academicians and policymakers in drafting the financial policies of energy firms. Moreover, in terms of future scope, further research may consider growth, inflation, and cash flow volatility as control variables.

AUTHOR CONTRIBUTIONS

Conceptualization: Nadeem Fatima.

Data curation: Nadeem Fatima.

Formal analysis: Nadeem Fatima.

Investigation: Nadeem Fatima.

Methodology: Nadeem Fatima.

Project administration: Nadeem Fatima.

Supervision: Nadeem Fatima.

Validation: Nadeem Fatima.

Visualization: Nadeem Fatima.

Writing – original draft: Nadeem Fatima.

Writing – review & editing: Nadeem Fatima.

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