



“Corporate cash holdings, working capital, and profitability: Evidence from Saudi Arabia”

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CORPORATE CASH HOLDINGS, WORKING CAPITAL, AND PROFITABILITY: EVIDENCE FROM SAUDI ARABIA

Abstract

This article examines the influence of networking capital, leverage, and profitability on a firm's cash holdings. A firm's level of cash reserves is a trade-off between financing, investment, and market climate. To achieve this trade-off, firms maintain cash reserves as a preservative motive. A firm with optimized working capital will have low working capital requirements, which will result in an increase in the firm's cash reserves. In this context, the present study acquires data from 51 firms in the manufacturing sector registered on the TASI (Tadawul All Share Index) from 2014 to 2022. The study considers cash as a regressand, net working capital, profitability, and leverage as predictor variables, and firm size as a control variable. The study observed that the manufacturing firms in Saudi Arabia invest excess cash in profitable projects. The study wrapped up the results by using pooled regression and panel regression with fixed and random effects. Panel regression results report a negative and significant influence of net working capital on firms' cash reserves with a coefficient of -0.09 . Leverage positively influences the firms' cash reserves with a coefficient of 0.05 and is significant, and profitability is positive and significant with a coefficient of 0.04 . Further, firm size is positive and significant with a coefficient of 0.004 .

Keywords

cash, net working capital, firm profitability, trade-off theory, pecking order theory, leverage, liquid assets

JEL Classification

M40, M41, L61

INTRODUCTION

The main objective of a business firm is either profit maximization or wealth maximization, or both, and cash flow performs a crucial function in both contexts. Moreover, the method of yielding cash and utilizing it in an optimum way is an important feature of managerial decision making. The decisions related to firms' cash flows carry much significance in terms of financial sustainability. Moreover, firms' cash holdings affect their strategic decisions associated with external capital acquisition and related external investments. Besides, since the global capital markets are perfect, the concept of holding liquid assets by the firms is immaterial because firms are now in a position to finance their investments with a minimum cost of transactions (Guizani, 2017). Nevertheless, firms globally manage liquid assets on an average scale ranging from 9 percent to 19 percent of their total assets in terms of cash and cash equivalents (Al-Najjar, 2013). Firms across the world prefer cash as a line of credit since it provides assured liquidity at any moment. Further, the firms with more cash try to use other credit lines. Firms that maintain larger cash holdings are at risk because if the excess cash is not used for internal operational activities, it becomes a private benefit for internal financial managers. Further, firms' liquidity position and growth in profitability highlight the relevance of working capital during times of hardship. Further, firms with



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greater investment possibilities reserve cash to protect themselves from cash inadequacy and invest in prospective projects that generate future cash flows. Moreover, a firm with larger cash reserves can promote greater investment efficiency to enhance the firm value, and a firm with better cash reserves can better manage the risks that are required to surpass firm values. The decision with regard to firms' cash reserves is one of the significant decisions taken by the corporation. The cash reserves of a firm are significant in terms of maintaining working capital, meeting daily requirements, and facing unforeseen circumstances (Li et al., 2021). The costs and benefits related to holding cash reserves, such as a decrease in transaction costs, the lesser possibility of a financial crash, and the likelihood of investing in future prospects, etc. Financial managers have an opportunity to reserve cash to make optimum investments. Firms reserve cash for upcoming uncertainties but might not invest in future prospects due to agency costs and opportunity costs (Al-Najjar, 2013). The level of excess cash reserves of a firm remains over time, while firms with lower cash levels pile up cash reserves at an accelerated rate. Further, holding larger cash reserves by a firm is an indication that the firm has efficient cash management.

The manufacturing industry in the Kingdom of Saudi Arabia is growing at a rapid speed, contributing a lot (approximately 15 percent) to the GDP and investing a significant amount in the research and development of industrial production. The investment made in research and development might affect the cash reserves, debt, and equity of manufacturing firms. Therefore, given the above relevance of holding cash reserves and its applicability to the Kingdom's manufacturing industry, it becomes a matter of interest to examine the influence of profitability and firms' working capital on the cash reserves maintained by these manufacturing firms.

1. LITERATURE REVIEW

A firm's cash flows determine its ability to finance its internal operations and invest in external long-term activities. Cash, being a liquid asset, plays a prominent role in managing internal capital, operating activities, contingent situations, etc. Moreover, firms' liquidity position and growth in profitability highlight the relevance of working capital in meeting daily requirements and facing unforeseen circumstances. In this context, the current study focuses on the past global literature targeting firms' cash management, working capital, and profitability.

Lins et al. (2010) examined the effect of credit lines and excess cash on the liquidity of corporate firms using the survey method. They found interesting results, such as corporate firms using excess cash as a savior for low cash flow activities, while lines of credit are used when firm managers predict a higher need for external financing. Mioduchowska-Jaroszewicza (2022) observed cash flows from the firms listed on the Polish Stock Exchange. They reported a huge financial resilience through excess cash reserves, making the firms rely less on external financing. Further, Fresard and Salva (2010) examined the effect of cross-listing on the

firms' cash holdings converting the latter into financial benefits. They found that the foreign firms that are listed on the US stock exchange hold excess cash beneficial to investors compared to their domestic firms. Ukaegbu (2014) examined the efficiency of firms' working capital on the firm's profitability in firms located in developed African nations. An adverse effect was detected between profitability and cash cycle, which is part of firms' working capital requirements. Similarly, Enqvist et al. (2014) found interesting results, such as the impact of business cycles found during financial downturns compared to financial booms. Further, the efficiency in inventory management and receivables increased during the financial downturn. Batuman et al. (2022) examined the effect of financial downturn on the factors of firm cash reserves in Eastern European companies. They found that there is a substantial difference in firm-level specific factors of cash holdings during pre and post-financial downturns. Pan et al. (2020) found that supply chain finance helps in increasing corporate cash holdings. Further, strong ties with the banks and political institutions increase firms' cash holdings. Li et al. (2021) examined air pollution's influence on the firms' holding excess cash reserves in the firms listed on the Shanghai and Shenzhen stock exchanges. They found a sig-

nificant association between air pollution and firm cash holdings, where the former increases the level of holding cash by firms.

Guzani (2017) investigated different elements that affect cash holding reserves in Saudi Arabian firms. He found that total debt, working capital, capital expenditure and firm size are the factors that significantly determine the firms' cash holdings. Similarly, Al-Najjar (2013) examined the factors that influence firms' cash reserves by conducting a comparative study between firms in BRIC nations and firms in the UK and the US. He disclosed that firms' capital structure, firm size, and dividend policy are the significant factors that affect firms' cash reserves. Li et al. (2024) suggested that the more banking market concentration, the more the firms' cash reserves through equity issues. Further, the concentration of the banking market and firms' cash value were positive since some firms have good access to the debt market and can demand more cash to protect themselves from high risk. Lopez-Gracia and Sogorb-Mira (2014) reported that financially unrestrained firms depend more on internal funds and invest the excess cash in financially rewarding projects, while restrained firms reduce their debt when there is an excess cash flow. Both firms react negatively to external financing. Venkiteshwaram (2011) estimated a dynamic model with a trade-off type of movement to customize firms' cash reserves. He found that firms with excess cash have enduring cash reserves compared to firms with deficit cash. Chen et al. (2015) examined the association between a nation's cultural extent and firms' cash holdings in the US and the world. They found an unfavorable effect of individualism on firms' cash holdings and a privilege of suspicion-elimination and firms' cash holdings among international firms. At the same time, the two attributes motivate firms to hold cash. Aktas et al. (2015) studied the influence of firms' cash cycle requirements in enhancing the value of a firm among firms in the US. They found that US firms have an optimum working capital policy, and the firms that converged with this policy exhibited better performance. Afrifa (2016) found a curved association between working capital and firm performance without firms' cash flows. However, the association turns U-shaped when firms' cash flows are included. Further, firms with more cash flows have

more investment in working capital and vice-versa. Akhtar et al. (2018) examined the influence of CG on firms' cash reserves through a conceptual framework analysis. They reported that the analysis related to the impact of CG on cash reserves in terms of the combined impact of firm-level and national-level governance is missing.

Wasiuzzaman (2020) studied the effect of regional changes on firms' liquidity in terms of the cash cycle and its reserves in Malaysian firms. She found that regional changes have a beneficial effect on firms' cash holdings, while they are negative in terms of working capital. The latter effect on working capital is noticed at high levels compared to low levels. Choi et al. (2020) examined the influence of audit committee and chief executive officer presence on the firms' cash holdings in Korean firms. They found that the presence of experts such as CEOs and audit committee members mitigates the firms' cash holdings and has an adverse effect. Mehrabanpour et al. (2020) explored the effect of financial statement comparability on the firms' cash holdings in Iranian firms. They found some undesirable consequences between the financial statement comparability and firms' cash holdings. In another study, Wasiuzzaman (2014) explored the significance of holding excess cash by the firms listed on Bursa Malaysia. She reported that there are different factors and firm characteristics that help firms hold cash. Moreover, different cash flow theories aid in holding different cash levels by Malaysian firms. Prasad et al. (2019) examined the impact of inconsistency in working capital policy on firm performance of BSE-listed non-financial firms. They found that Indian firms tend to maintain target working capital and try to concentrate in terms of inconsistencies. Salehi et al. (2019) investigated the effect of financial resources such as cash and working capital on excess stock returns in the firms listed on the Tehran stock exchange. They found an unfavorable effect of cash on excess stock returns, while no impact was found for the working capital. Azmat (2014) investigated the effect of firm efficiency on cash reserves in Pakistani firms. They found a curved association between the two confirming an optimum level of cash maintained by these firms that increases firm value. Further, any deviation from the optimum level decreases the firm value. Laghari and Chengang (2019) examined the as-

sociation of working capital on firm performance with financial difficulties in Chinese firms. They found a non-linear association between working capital and firm performance. Soda et al. (2022) examined the association of firms' working capital and profitability of firms listed on the Amman stock exchange. They found an unfavorable effect between the two. They reported that prospective financiers and shareholders are encouraged to purchase a large number of shares in those firms that have a swift cash conversion mechanism. Maheshwari and Rao (2017) examined the factors determining firms' cash holdings in S&P CNX 500 companies. Their results report a useful impact of firms' cash holdings with dividend payment, debt, equity issuance, and cash flows. Moreover, other factors such as working capital, R&D expenditure, and leverage are negatively associated with firms' cash holdings. Habib et al. (2022) analyzed the effect of working capital on firms' profitability in the Chinese manufacturing sector. They revealed that the working capital in firms with low financial restraints has a negative influence on firms' profitability, while it is vice versa in terms of financially restrained firms. Abushammala and Sulaiman (2014) examined the influence of firms' cash reserves on the profitability of the firms listed on the Amman stock exchange. They found a beneficial effect of firms' cash holdings on their profitability. Further, this positive influence of cash holdings shall lead to increased financial performance.

A firm's cash is the value that its shareholders locate on liquid assets. It is observed that firms tend to have large cash reserves due to confined external financing opportunities. Moreover, firms with higher investment in working capital shall lose short-term projects, which are profitable. Hence, a firm with an efficient cash cycle can attain a balance between efficiency and risk and increase firm value. In this context, the study finds it significant to examine the influence of different financial components, such as net working capital, leverage, profitability, etc., on cash reserves. The current literature focuses on global studies, and the results reported by these studies were established as a base to examine the influence of different financial factors, such as net working capital and profitability on cash holdings of Saudi Arabian manufacturing firms. In light of this, the following hypothesis is proposed:

H0: There is a significant influence of profitability, net working capital and leverage on the cash reserves maintained by the Saudi Arabian manufacturing firms.

2. DATA AND METHODOLOGY

The current study obtains data from the manufacturing firms listed on the Tadawul, the main market of Saudi Arabia. The Tadawul has two markets, one is the main market (TASI – Tadawul All Share Index), and the other is the parallel market (NOMU). The TASI is the leading market consisting of listed firms that are established. The financial data used in this study are secondary in nature and were obtained from the database of Koyfin. The reason behind choosing the Saudi Arabian manufacturing sector is that the Kingdom is at the frontage of the transformation process within the manufacturing industry under the Saudi Arabia Vision 2030. The data were collected for the period 2014 to 2022.

As mentioned earlier, information required for data analysis was obtained from the Koyfin database for the listed firms on TASI. The actual study sample consists of 51 firms in the manufacturing sector, resulting in a balanced panel with 459 observations in total. However, for better results, the study has adopted the bootstrapping technique for panel data analysis.

2.1. Variable measurement and model specification

The model estimating the influence of working capital and profitability on firms' cash holdings is given in the equation below:

$$CASH_{it} = \alpha_0 + \beta_1 NWC_{it} + \beta_2 PROF_{it} + \beta_3 LEV_{it} + \beta_4 FS_{it} + \varepsilon_{it}, \quad (1)$$

where *CASH* is the predicted variable as shown in equation (1).

CASH is calculated as Cash and its Equivalentents divided by Total Assets Less Cash and its Equivalentents. *NWC*, *PROF* and *LEV* are the explanatory variables. Net Working Capital (*NWC*) is measured as Working Capital (current assets minus cash

minus current liabilities) scaled by Total Assets. Profitability represented by *PROF* is measured as Operating Profit scaled by Total Assets, Leverage represented by *LEV* is measured as Total Debt scaled by Total Assets. Firm Size represented by *FS* is a control variable measured as log normal of Total Assets. The predicted and predictor variables deployed in the study are chosen from the past studies.

Table 1 shows the descriptive statistics for the predicted and predictor variables.

Table 1. Descriptive statistics

Variables	Observations	Mean	SD	Min	Max
CASH	459	0.06	0.05	0.00	0.60
NWC	459	0.07	0.15	-0.55	0.67
PROF	459	0.14	0.21	-1.83	0.67
LEV	459	0.21	0.15	0.00	0.69
FS	459	6.99	2.26	0.00	10.77

The mean value of cash reserves (CASH) is 0.06 with a minimum value of 0.00 and a maximum value of 0.60. On average, the working capital (NWC) is 0.07 with a maximum value of 0.67 and a minimum value of -0.55. The average profitability seems to be 14 percent with a maximum value of 0.67 and a minimum value of -1.83. This shows that some firms are experiencing losses based on the given minimum value. The mean of leverage is 0.21, which implies that 21 percent of the total assets of sample firms are financed through debt. On average, firm size is 6.99.

The mean of CASH shows that manufacturing firms hold 6 percent of cash of total assets, which is too low, but some firms hold 60 percent of cash of total assets as the maximum value is 0.60. This shows that firms utilize the excess cash in future investments, hence holding less cash. The average working capital is 7 percent, which shows that manufacturing firms invest excess cash in profitable projects, and this also coincides with the dependent variable CASH. The average profitability of manufacturing firms shows that the operating profit is less due to some firms experiencing losses. This might be due to huge competition in the market. The average of leverage shows that 21 percent of the firms financing their capital through debt. This reveals that production firms are consistent with a good revenue stream.

3. RESULTS

In anticipation of further analysis, the correlation between variables is calculated to eliminate the effects of multicollinearity. Table 2 shows the result of the correlation between different variables. The study found no multicollinearity between the dependent and independent variables and in parallel between the independent variables. Further, the independent variables are positively correlated with *CASH*, while the control variable of firm size is negatively correlated.

Table 2. Results of correlation

Variables	CASH	NWC	PROF	LEV	FS
CASH	1.000	-	-	-	-
NWC	0.02	1.000	-	-	-
PROF	0.14	0.25	1.000	-	-
LEV	0.10	0.04	0.08	1.000	-
FS	-0.02	0.01	0.20	0.11	1.000

At the outset, equation (1) is estimated by employing pooled regression. Given the advantages of panel regression, such as increased estimation accuracy over pooled regression, this study also employs panel regression with fixed and random effects. Table 3 displays the results of pooled regression.

Table 3. Results of pooled regression analysis

Variable	Constant (α)	β	t	p-value
CASH (DV)	0.06	-	9.18	0.000
NWC	-	-0.01	-0.77	0.44
PROF	-	0.04	4.35	0.000
LEV	-	0.03	2.88	0.004
FS	-	-0.002	-1.93	0.05
No. of Obs.	918	-	-	-
R ²	0.03			
F-statistic	7.33 (0.000)			

The results of pooled regression show that Net Working Capital (NWC) is insignificant. The other independent variables, such as profitability (PROF) and leverage (LEV) are significant. Moreover, the control variable firm size (FS) is also significant. The R² of the regression model is 3 percent, and the F-statistic is significant, which shows the suitability of the model.

Nevertheless, the fitness of the pooled regression model is good, but the R² is very low, which shows that the explanatory variables can explain only 3

percent of the variation. Therefore, the study took advantage of panel regression. Tables 4 and 5 display the panel regression results.

Table 4. Results of panel fixed effects

Variable	Constant (α)	β	t	p-value
CASH (DV)	0.02	–	1.76	0.08
NWC	–	–0.09	–4.97	0.000
PROF	–	0.04	3.34	0.001
LEV	–	0.05	3.02	0.003
FS	–	0.004	2.53	0.012
No. of Obs.	918	–	–	–
R ²		0.03		
F-statistic		16.52 (0.000)		

Table 5. Results of panel random effects

Variable	Constant (α)	β	t	p-value
CASH (DV)	0.04	–	5.00	0.000
NWC	–	–0.05	–3.44	0.001
PROF	–	0.04	3.96	0.000
LEV	–	0.05	3.66	0.000
FS	–	0.001	0.43	0.665
No. of Obs.	918	–	–	–
R ²		0.02		
Wald Chi ²		45.67 (0.000)		
Hausman Test (Chi ²)		28.71 (0.000)		

Tables 4 and 5 report the results of panel regression. They show that Net Working Capital (NWC) is significant. The other independent variables, such as profitability (PROF) and leverage (LEV), are also significant. Firm size (FS), which is a control variable, is also significant. The R² of the panel regression model with fixed effects is 3 percent, and the F-statistic is 16.52 and significant.

The results of panel regression with random effects are similar to that of fixed effects, except for firm size (FS). The R² of the panel regression model with random effects is 2 percent, and the Wald Chi²-statistic is 45.67 and significant. Further, the study selects the panel fixed effects model upon the random effects model since the Hausman test results show that the Chi² is 28.71 and significant.

4. DISCUSSION

A firm's cash is the value that its shareholders locate on liquid assets. It is observed that firms tend to have large cash reserves due to confined external financing opportunities. In this regard, the

study investigated the influence of firm working capital and profitability on the cash holdings of Saudi Arabian manufacturing firms. The statistical description shows that manufacturing firms hold 6 percent of cash of total assets, which is too meager, while some firms hold 60 percent of cash of total assets. This shows that the firms use the excess cash in future investments, hence holding less cash. Moreover, the average working capital is 7 percent, which shows that manufacturing firms invest excess cash in profitable projects, which also coincides with the results of dependent variable CASH.

The pooled regression reported a negative influence of working capital on firms' cash, while profitability and leverage were reported to have a positive influence. Moreover, panel regression results report a negative influence of working capital and a value proposition of profitability and leverage on firms' cash holdings. This result of working capital is in accordance with the trade-off theory, which assumes an adverse effect of working capital on firms' cash holdings. The reason is that firms with high liquid ratios tend to hold minimal cash to surrogate other current assets (Kalcheva & Lins, 2007; Batuman et al., 2022). This result confirms historical research, where these studies reported an adverse effect between firms' net working capital and their cash holdings (Opler et al., 1999; Chen, 2008; D'Mello et al., 2008; Guizani, 2017; Batuman et al., 2022).

The result of leverage shows a beneficial effect on firms' cash holdings. This shows that Saudi Arabian manufacturing firms are motivated to hold cash for the costs of bankruptcy related to higher debt to protect themselves from financial toxicity, hence a privilege is found between the leverage and firms' cash holdings (Yildiz & Karan, 2020; Batuman et al. 2022). The result of leverage is commensurable with some previous studies (Minh et al., 2022; Jumah et al., 2023) and different from the studies by A. Ozkan and N. Ozkan (2004), Al-Najjar and Belghitar (2011), Enqvist et al. (2014), and Ali and Shaik (2022). Furthermore, the result of profitability shows a beneficial effect on the firms' cash holdings. As per the pecking order theory, firms with better profitability positions tend to have higher liquidity levels, hence accumulate larger cash amounts. The result of

profitability is in line with historical studies by Al-Najjar and Clark (2017) and Guizani (2017), and in contrast to the study by Batuman et al. (2022), where they reported that profits can be treated as an alternative to cash accumulation, hence a detrimental effect between the profitability and firms' cash holdings. The result of firm size is negative

in pooled regression, while it is positive in panel fixed effects. Guizani (2017) argues that a significant component of firms' cash holdings does not anticipate negative or positive signs, while some studies argue that the association depends on whether the firms are larger or smaller (Al-Najjar & Belghitar, 2011; Batuman et al., 2022).

CONCLUSION

The current study investigated the impact of net working capital, leverage, and profitability on firms' cash holdings compiling data from 51 Saudi Arabian manufacturing firms registered on Tadawul All Share Index from 2014 to 2022. The study supposed cash as an outcome variable, while profitability, leverage, net working capital, and firm size were considered as covariates. To figure out the results, the study used pooled regression and panel regression.

The statistical description shows that that the firms utilize the excess cash in future investments, hence holding less cash. Moreover, the average working capital is 7 percent. The study found an unfavorable effect of net working capital on cash reserves in Saudi Arabian manufacturing firms, assuming that these firms are liquid, hence holding minimal cash to surrogate other current assets. Further, there is a useful effect of leverage on the firms' cash reserves, presuming the Saudi Arabian manufacturing firms maintain higher debt to protect themselves from financial decline. Moreover, the result of profitability is in accordance with the pecking order theory, where Saudi Arabian manufacturing firms are in better profitability position and liquid, hence accumulate huge amount of cash. Firm size is significant with the firms' cash holdings.

Since the Saudi Arabian economy is going through the transition phase, the reported results might be pragmatically useful in financial decision making for the managers of Saudi Arabian manufacturing firms. Moreover, policy makers might find the results of this study productive in projecting financial policies. Improvements can be made to this current study by acknowledging other variables, such as dividend payment, firm growth, cash flow volatility, etc.

AUTHOR CONTRIBUTIONS

Conceptualization: Turki Ibrahim Albarak.

Data curation: Turki Ibrahim Albarak.

Formal analysis: Turki Ibrahim Albarak.

Funding acquisition: Turki Ibrahim Albarak.

Investigation: Turki Ibrahim Albarak.

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