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The Relationship between Working Capital Management and Profitability: Evidence from Saudi Cement Companies

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Author's contribution

This work was carried out by the author AAA himself. The author AAA designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. The author AAA read and approved the final manuscript.

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ABSTRACT

Aims: This paper investigated the relationship between the working capital management (WCM) and the firms' profitability for the Saudi cement manufacturing companies.

Methodology: There are 13 Saudi cement manufacturing companies operating in the market. Only eight companies were included which are listed in the Saudi stock exchange market (Tadawul) and were established before the year 2005, and the rest were excluded for the period of 5 years from 2008-2012.

Results: The study results showed that, Saudi cement industry current ratio is the most important liquidity measure which effected profitability, therefore, the cement firms must set a trade-off between these two objectives so that, neither the liquidity nor profitability suffers. It was also found, as the size of a firm increases, profitability increased. Besides, when the debt financing increased, profitability declined. Linear regression tests confirmed a high degree of association between the working capital management and profitability.

Conclusion: The Saudi cement firms could strengthened their working capital in more efficient ways by adopting more advanced financial devices which will help them to manage cash, accounts receivables and inventories, and will ultimately increase their profitability. There is much to be done about working capital in Saudi Arabia in future.

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1. INTRODUCTION

Working Capital Management has its direct impact on liquidity and profitability of the business organization. Firms are trying to have an optimal level of working capital that maximizes their value. The main objective of all firms is to be profitable and solvent. Solvency is classified into short-term and long-term solvency; or what is referred to as liquidity. Liquidity is important to ensure that firms are able to meet their short term debts and obligations when they come due, or it can be defined as the average time period required to convert non-cash current assets into cash; the shorter the period required the stronger the liquidity position of the business organization. The relationship between current asset items and current liability items is called the working capital of the business organization. Working capital can be looked at as the excess of total current assets over total current liabilities. Thus, the larger the amount of working capital the stronger the liquidity position of the business organization. Related literature has identified other measures of the liquidity position of business organizations such as the current ratio, the acid-ratio, the current cash debt coverage ratio, the Receivables Conversion Period (RCP), the Inventories Conversion Period (ICP), and the Cash Conversion Cycle (CCC) [1].

Working capital management (WCM) takes into consideration the trade-off between risk and return. Working capital management deals with assets and current debts. Current assets form large part of total properties of a firm. Current asset items can be classified into cash and other asset items which can be converted into cash quickly. The nearer the asset to cash, the lower its riskiness and expected return. Therefore, it is logical to expect a negative relationship between profitability and the length of period over which resources of business organizations are held in non-cash current assets.

The Saudi cement sector has attracted the attention of the author, as a matter of fact it is fuelled by strong domestic fundamentals represented by government's high expenditure on physical and social infrastructure, driven by positive oil price movements, relatively low fuel and raw material costs created competitive advantage and new market entrants which increased demand.

Over the past decade, the Saudi economy has become more than doubled, as measured by the current size of GDP. By the end of 2011, nominal GDP reached SAR 2,163 billion, a 206% increase from the SAR 707 billion in 2000. Both the construction and building materials sectors follow the growth trajectory of the country's GDP. In 2005, there were only eight cement producers in the Kingdom. High profit margins attracted increased competition within the sector, and as a result, these eight primary players have lost market share to new entrants in which there are presently 13 manufacturers operating in the market as listed in the Saudi stock market.

Given the importance of such aforementioned concepts to business success, this study aims at examining the relationship between working capital management and profitability in operating cement companies in Saudi Arabia. More specifically, it seeks to dwell upon mainly the following issues: To assess the impact of liquidity on profitability, to measure the impact of size (measured by sales) on profitability, to investigate the relationship between debt financing and profitability and to find out the relationship between working capital management and profitability. Previous studies used the cash conversion cycle as a

measure of working capital management and most of the studies aimed at finding out the positive or negative effects on corporate profitability, while this study used more than one measure of working capital management. This study enriches the finance literature on the relationship between working capital management and profitability.

The rest of the study is organized as follows; section 2 reviewing the related previous literature on the relationship between profitability and working capital management (WCM) measures. Then, section 3 defines the data and explains the study methodology including the study sample and period, the variables under examination, and models of the study. Section 4 discusses the empirical results of the relationship between profitability and working capital management of the Saudi cement firms. The final part of the study reports the conclusions and recommendations of the study.

2. LITERATURE REVIEW

There have been a number of studies and academic researches to find out the relationship between working capital management and profitability. The management of working capital is defined as the "management of current assets and current liabilities, and financing these current assets" Olufemi and Olubanjo [1]. Working capital management is important for creating shareholders value, and it was found in so many studies in different countries that it has a significant impact on both profitability and liquidity.

Al-Debi'e [2] examined the relationship between profitability and working capital management measures for industrial companies listed on Amman Stock Exchange in Jordan during the period 2001-2010. Industrial companies in Jordan invest significantly in working capital. Therefore, efficient working capital management is expected to enhance the profitability of these companies. The results show that less profitable companies wait longer to sell their products, to collect credit sales, and to pay their supplies of goods. Moreover, the results show that regardless of the level of profitability industrial companies in Jordan gain, but they pay their suppliers before collecting credit sales. The control variables (Size, Leverage, and GDP growth) included in all regression models were significant and have the expected signs. Profitability increases with Size and GDP growth and decreases with leverage.

Eljelly [3] empirically examined the relationship between profitability and liquidity, as measured by current ratio and cash gap (cash conversion cycle) on a sample of 929 joint stock companies in Saudi Arabia. Using correlation and regression analysis, he found significant negative relationship between the firm's profitability and its liquidity level, as measured by current ratio. This relationship is more pronounced for firms with high current ratios and long cash conversion cycles. At the industry level, however, he found that the cash conversion cycle or the cash gap is of more importance as a measure of liquidity than current ratio that affects profitability. The firm size variable was also found to have significant effect on profitability at the industry level.

Dănulețiu [4] analyzed the efficiency of working capital management of companies from Alba County. The relation between the efficiency of the working capital management and profitability is examined using Pearson correlation analyses and using a sample of 20 annual financial statements of companies covering period 2004-2008. The conclusion of his study was that, there is a weak negative linear correlation between working capital management indicators and profitability rates.

To test the relationship between working capital management and corporate profitability, Deloof [5] used a sample of 1,009 large Belgian non-financial firms for a period of 1992-1996. By using correlation and regression tests, he found significant negative relationship between gross operating income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms. Based on the study results, he suggests that managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories.

Usama [6] paper aimed to extend the Rehman and Nasr [7] finding regarding working capital management and its affect on profitability and liquidity of Pakistani firms. For the purpose of analyses, food sector was selected for 18 companies listed on Karachi Stock Exchange for the period of 2006-2010. The study examined the effect of different variables of working capital management like average collection period, average payment period, inventory turnover in days, cash conversion cycle, debt ratio, financial asset to total asset ratio, current ratio and net operating profitability. The least square regression and common effect model was used and it was found that there is significant positive affect of working capital management on profitability and liquidity of the firms. Size of the firm and financial asset to total asset ratio have significant positive effect on firm's profitability, while average collection period has significant negative effect on firm's profitability. Size of firm and cash conversion cycle has significant positive effect on firm's liquidity.

Karaduman et al. [8] argues that working capital management is one of the essential determinants of firms' market value because it directly affects profitability. And, working capital management is also extremely crucial from the point of firms' sustainability. Hence, firms should establish a fine balance between profitability and risk when it comes to managing working capital. This paper studied the effects of working capital management on the profitability of some selected companies in the Istanbul Stock Exchange for the period of 2005-2008. The panel data methods are employed in order to analyze the mentioned effects.

Amarjit et al. [9] seeks to extend Lazaridis and Tryfonidis's [10] findings regarding the relationship between working capital management and profitability. A sample of 88 American firms listed on New York Stock Exchange was selected to achieve the study purpose for 3 years period from 2005 to 2007. They found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit. It follows that managers can create profits for their companies by handling correctly the cash conversion cycle and by keeping accounts receivables at an optimal level. The study contributes to the literature on the relationship between the working capital management and the firm's profitability.

Bhunia and Das [11] examined the relationship between the working capital management and profitability of Indian private sector small-medium steel companies obtained from CMIE data base. Working capital management indicators and profitability indicators over the period from 2003 to 2010 are molded as a linear regression system in multiple correlation and regression analysis. The study shows a small relationship between WCM and profitability. Multiple regression tests confirm a lower degree of association between the working capital management and profitability.

Lazaridis and Tryfonidis [10] examined the relationship between working capital management and profitability of 131 firms listed on the Athens Stock Exchange for the period from 2001 to 2004 through cross sectional study with correlation and regression

analysis and found statistically significant relationship between profitability (gross operating profit) and cash conversion cycle and its components. They advocate that managers can create profits for their companies through appropriate treatment of the optimum level of cash conversion cycle.

Garcia-Terualand and Martínez-Solano [12] examined the impact of working capital management on SME profitability based on 8872 SMEs of Spain using the panel data methodology for the period from 1996 to 2002. The empirical results that are vigorous to the existence of endogeneity, confirmed that managers could create value by reducing their inventories and the number of days for which their accounts are outstanding. In addition, restricting the cash conversion cycle moreover perk ups the firm's profitability.

Napompech [13] argued that working capital is needed for day-to-day operations of a firm. This research examined the effects of working capital management on profitability. The regression analysis was based on a panel sample of 255 companies listed on the Stock Exchange of Thailand from 2007 through 2009. The results revealed a negative relationship between the gross operating profits and inventory conversion period and the receivables collection period. Therefore, managers can increase the profitability of their firms by shortening the cash conversion cycle, inventory conversion period, and receivables collection period. However, they cannot increase profitability by lengthening the payables deferral period. The findings also demonstrated that industry characteristics have an impact on gross operating profits.

In summary, the literature review indicates that working capital management has direct impact on the profitability of the firm but there is still ambiguity in selecting the proper variables that might work as proxies for working capital management. The present study investigates the relationship between working capital management as independent variable and the profitability as dependent variable of a sample of Saudi cement firms.

3. RESEARCH METHODOLOGY

The present research is testing the relationship between the working capital management and profitability of the Saudi Cement Industry. The relationship between the working capital management and profitability is tested by employing the following hypothesis and model. The proposed model of this paper addressed four hypothesizes as follows:

Thus, four hypotheses were addressed:

- H 1:** Liquidity position has a significant impact on profitability.
- H 2:** Size has a significant impact on profitability.
- H 3:** There exist a relationship between debt financing and profitability.
- H 4:** Working capital management has a significant impact on profitability.

3.1 Study Model

$$GROSS = a + \beta_1 (CCC) + \beta_2 (INV) + \beta_3 (DSO) + \beta_4 (PAY) + \beta_5 (LnSales) + \beta_6 (FIXEDFA) + \beta_7 (Debt) + \epsilon$$

Where:

- GROSS** =Gross Operating Profits
- CCC**=Cash Conversion Cycle
- INV**= Inventory Conversion Period
- DSO**= Receivables Collection Period
- PAY**= Payables deferral Period
- LnSales**= Firm Size
- FIXEDFA**= Fixed Financial Asset Ratio
- Debt**= Financial debt ratio
- ϵ = Error term.

This study carries out the issue of recognizing key variables that influence working capital management. Table 1 stated below shows all the variables that have been used to test the hypotheses of the study.

Table 1. Measurement of variables and abbreviation

Dependent Variable	Measurement	Abbreviation
Gross Operating Profits	(Sales – Cost of goods Sold) /(Total Assets-Financial Assets)	GROSS
Independent variables	Measurement	Abbreviation
Cash Conversion Cycle	Inventory Conversion Period + Receivables Collection Period -Payables deferral Period	CCC
Inventory Conversion Period	Inventory divided by cost of goods sold and multiplied by 365 days	INV
Receivables Collection Period	Accounts receivables divided by sales and multiplied by 365 days	DSO
Payables deferral Period	Accounts payables divided by cost of goods sold and multiplied by 365 days	PAY
Firm Size	Natural logarithm of firm's sales, lagged one year period	LnSales
Fixed Financial Asset Ratio	Fixed financial assets divided by the total assets	FIXEDFA
Financial debt ratio	Short-term loans plus long-term loans divided by the total assets	Debt

Source: Napompech [13]

This study presents an analysis of eight cement companies operating in Saudi Arabia during the period (2008–2012). Only Saudi cement companies which were established before the year 2005 and listed in the Saudi stock exchange market (Tadawul) were included in the study. Table 2 presents the listed cement companies in Tadawul during 2012. There are thirteen cement companies operating in Saudi Arabia, five of them were excluded in this

study, due to the fact that they are newly established after 2005. Thus, total observation number is 40. In addition to that, in order to achieve the main purpose of this study, the data were collected from the annual reports of these companies published on the corporate websites, related web pages of Saudi stock exchange (Tadawul) and Saudi Arabian Monetary Agency (SAMA). The author used the following set of data for the research requirements: balance sheets, short term asset, short term liabilities, total assets, long term liabilities, income statements, sales, and cost of goods sold. A Pearson correlation and linear regression were employed to examine the relationships between the variables used in this research.

Table 2. Saudi Cement Manufacturing Companies Listed on the Saudi Arabia Stock Exchange 2012

Year of Establishment	Trading Name
1955	Arabian Cement Co
1955	Saudi Cement Company.
1961	Yamamah Saudi Cement Co.
1976	The Qassim Cement Co
1976	Yanbu Cement Co.
1978	Southern Province Cement Co.
1983	Eastern Province Cement Co.
1994	Tabuk Cement Co.
2005	City Cement Co
2005	Najran Cement Company
2006	AL Jouf Cement Company
2006	Northern Region Cement Company
2010	Hail Cement Company

4. RESULTS AND DISCUSSION

4.1 General Overview

Before testing the hypothesis of this study it is worth mentioning that Saudi based cement companies enjoy amongst the strongest profitability globally. The cement industry has clocked exceptional growth, recording a remarkable Company Annual Growth Rate (CAGR) of 20% during the 2005-2011 along with a healthy net profit margin, averaging 49%. In addition to that, Saudi Arabia is the cheapest cement producer in the Gulf Cooperation Council (GCC) region, owing to the cheap availability of natural gas allocated by Aramco and presence of natural resources at its disposal. The cost of producing cement in Saudi Arabia stands at US\$30/ton as against US\$44/ton in the GCC region [14]

4.2 Working Capital Management and Profitability

Table 3 shows the main descriptive statistics of the variables which was used in the regression to explain the relationship between the working capital management and profitability of the Saudi Cement Industry. The mean of gross operating profit as dependent variable is 10.07%, while the mean of cash conversion cycle is -41.03 days showing low negative result as one of the independent variables. Other independent variables like inventory conversion period takes on average 200.73 days, while firms paid their creditors in 241.08 days on average, both show a higher level average, receivables collection period is

46 days, firm size is 6.09%, fixed financial asset ratio is 0.08% and financial debt ratio is 0.26% showing low level average. Also, the standard deviation of these data is rather on a higher level or lower level compared to gross operating profit.

Table 3. Descriptive statistics of independent and dependent variables

	Minimum	Maximum	Mean	Std. Deviation
GROSS	0.08	350.63	10.07	55.66
CCC	-532.91	303.57	-41.03	159.68
INV	36.46	389.35	200.73	95.04
DSO	0.08	175.56	46.12	34.36
PAY	0.17	711.62	241.08	157.78
LnSales	5.44	9.07	6.09	0.52
FIXEDFA	0.00	0.24	0.08	0.07
Debt	0.08	1.00	0.26	0.24

Table 4 shows the results of test of Pearson Bivariate Correlation coefficients for all study variables. According to the test there is a significant negative correlation relationship between GROSS as dependent variable, and five independent variables namely; PAY, CCC, INV, Dept, and DSO. At the same time, there is a positive correlation relationship between GROSS and LnSales, FIXEDFA, respectively. These findings correspond to the study made previously by the author (Deloof 2003) when he used a sample of 1,009 large Belgian non-financial firms for a period of 1992-1996. By using correlation and regression tests, he found significant negative relationship between gross operating income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms. Based on the study results, he suggests that managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories. It is well known that the nearer the asset to the cash, the lower its riskiness and the lower its expected return. Therefore, it is logical to expect a negative relationship between profitability and the length of period over which resources of business organizations are held in non-cash current assets. These negative correlations are consistent with the view that the longer the time required to sell inventories and collect from customers on account, the lower is the profitability of the company.

Table 4. Pearson Bivariate Correlation Analysis

GROSS	1	-0.014	0.934**	-0.109	-0.219	0.037	-0.214	-0.059
PAY	-0.014	1	-0.088	-0.349*	0.304	-0.369*	-0.002	0.455**
LnSales	0.934**	-0.088	1	-0.172	-0.409**	-0.014	-0.274	-0.021
CCC	-0.109	-0.349*	-0.172	1	0.215	0.611**	0.148	-0.438**
INV	-0.219	0.304	-0.409**	0.215	1	0.065	0.075	0.053
FIXEDFA	0.037	-0.369*	-0.014	0.611**	0.065	1	0.090	-0.476**
DSO	-0.214	-0.002	-0.274	0.148	0.075	0.090	1	0.216
Debt	-0.059	0.455**	-0.021	-0.438**	0.053	-0.476**	0.216	1

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

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

The negative correlation between GROSS and PAY can be interpreted that less profitable companies wait longer to pay their credit purchases. The correlation coefficients between GROSS and the control variables have the expected signs. The key findings of related previous research which was made by Mathuva [15] indicates that: i) there exists a highly

significant negative relationship between the time it takes for firms to collect cash from their customers (accounts collection period) and profitability, ii) there exists a highly significant positive relationship between the period taken to convert inventories into sales (the inventory conversion period) and profitability, and iii) there exists a highly significant positive relationship between the time it takes the firm to pay its creditors (average payment period) and profitability. GROSS is positively correlated with LnSales and FIXEDFA meaning that the larger the company and the better the economic conditions of the country, the more profitable is the company. However, the correlation between GROSS and FIXEDFA is positively significant. Finally, the correlation coefficient between GROSS and Debt is negatively significant indicating that less profitable companies rely on borrowed funds to finance their operations.

Table 5 reveals that INV is negatively correlated with GROSS, which means that as INV increases firm's profitability will raise, therefore, firm's should increase their INV. Firm LnSales is also accurately significant and positively affecting firm's profit which means that, firms with greater sales volume are more profitable in this sector. Whereas, average collection period is also negatively correlated, this means that as the firm's collection period increase, firm will bear loss so firms in this sector are advised to try to reduce their collection period. These arguments were supported by Filbeck and Krueger [16] as pointed out that, the ability of financial managers to effectively manage receivables, inventories, and payables has a significant impact on the success of the business. If capital invested in cash, trade receivables, or inventories is not sufficient, the firm may have difficulty in carrying out its daily business operations. This may result in declining sales and, in the end, a reduction in profitability. Other variables such as PAY, CCC and Debt show a negative correlation with GROSS. At the same time, there is a positive correlation relationship between GROSS and FIXEDFA.

Common regression F-statistic shows that overall model is significant and Adjusted R Square is 89.5%. According to the F-test, the regression overall is good as F-test value is high. Coefficient of determination (R square) is rather on the high level, showing that 91.4% of the variations of the gross operating profit (GROSS) were explained in conjunct by the independent variables.

Table 5. Model summary

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-693.988	43.193		-16.067	0.000
PAY	0.023	0.023	0.066	1.015	0.318
LnSales	110.998	6.414	1.031	17.307	0.000
CCC	-0.004	0.025	-0.010	-0.142	0.888
INV	0.107	.037	0.183	2.909	0.007
FIXEDFA	15.532	52.243	0.021	0.297	0.768
DSO	0.120	0.094	0.074	1.284	0.208
Debt	-20.601	15.814	-0.088	-1.303	0.202
R	0.956 ^a				
R Square	0.914				
Adjusted R Square	0.895				
F Change	48.362				
Durbin-Watson	2.004				

From the above discussion it is clear that all hypotheses are proved and accepted as working capital management significantly affects profitability of Saudi cement firms.

In the same way, the first research hypothesis (H1) which indicated that Liquidity position has a significant impact on profitability of the firm was proved. It was found that, in Saudi cement industry current ratio is the most important liquidity measure which affects profitability, therefore, the cement firms must set a trade-off between these two objectives so that, neither the liquidity nor profitability suffers.

The second hypothesis of the research (H2) regarding the size and profitability was proved. As the size (measured in terms of natural logarithm of sales) increases, it will lead to an increase in profitability of the firm.

The third hypothesis (H3) concerning that, there exist a relationship between debt financing and profitability was proved. So that, when the debt financing increased, profitability declined. In fact, debt financing affects the financial cost which will lead to decreasing profitability.

Last research hypothesis (H4) indicating that working capital management significantly affects profitability of Saudi cement firms was proved and accepted. Working capital management has its effect on liquidity as well on profitability of the firm; therefore, Saudi cement companies should maintain a balance between both.

5. CONCLUSION

Working capital management is of crucial importance in corporate financial management decision. The optimal of working capital management could be achieved by companies that manage the tradeoff between profitability and working capital management. The purpose of this study was to investigate the working capital management efficiency and profitability relationship. Linear regression tests confirm a high degree of association between the working capital management and profitability. Thus, company managers should concern more on working capital management, especially unexplained variables in purpose of creation shareholder wealth.

It was found in the study that, there is a significant negative correlation relationship between GROSS as dependent variable, and five independent variables namely; PAY, CCC, INV, Dept, and DSO. At the same time, there is a significant positive correlation relationship between GROSS and LnSales, FIXEDFA, respectively. It was also found that; current ratio is the most important liquidity measure which affects profitability in Saudi cement industry. As the size (measured in terms of natural logarithm of sales) increases, profitability of the firm will increase. When the debt financing increased, profitability declined. Working Capital Management has its effect on liquidity and profitability of the firm; therefore, Saudi cement companies should maintain a balance between both.

Based on the above analysis one can say that, these results can be further strengthened if the Saudi cement firms manage their working capital in more efficient ways. Managing cash, accounts receivables and inventories will ultimately increase their profitability. There is much to be done about working capital in Saudi Arabia Cement Industry in future. The author suggests that more research could be conducted on the same topic and extending the years of the sample. The scope of further research may be extended to the working capital

components management including cash, marketable securities, receivables and inventory management.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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