

## **THE RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND PROFITABILITY: EVIDENCE FROM SAUDI CEMENT COMPANIES**

### **ABSTRACT**

**Aims:** This paper tends to investigate the relationship between the working capital management 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 which are listed in the Saudi stock exchange market (Tadawul) and were established before the year 2000 were included and the rest were excluded for the period of 5 years from 2008-2012.

**Results:** The study results shows that, 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. It was also found, as the size of a firm increases, profitability increase. Besides, when the debt financing increases, profitability declines. Linear regression tests confirm a high degree of association between the working capital management and profitability.

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

**Keywords:** working capital, Gross Operating Profits, Cash Conversion Cycle, Payables deferral Period

### **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 cash equivalent items. 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 SAR2,163 billion, a 206% increase from the SAR707 billion in 2000. Both the construction and building materials sectors follow the growth trajectory of the country's GDP. In 2006, 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 working capital management efficiency; To observe the liquidity position and areas of weakness, if any; To investigate the relationships between liquidity and profitability; To assess the association between debt financing and profitability; To measure the association between working capital cycle and profitability; To explore the association 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.” Working capital management is important for creating shareholders value, and it was found in so many studies in different countries that it have a significant impact on both profitability and liquidity.

Al-Debi'e [1] 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 [2] 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 [3] 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 [4] 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 [5] extended in his paper the Rehman and Nasr [6] findings regarding working capital management and its affect on profitability and liquidity of Pakistani firms. For the purpose of analyses we have been selected the other food sector and selected the data from 2006-2010 of 18 companies of this sector listed on Karachi Stock Exchange. For this purpose we examine 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. We have used pooled least square regression and common effect model. We 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. [7] 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 mainly aims to provide some empirical evidence on the effects of working capital management on the profitability of 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. [8] seeks to extend Lazaridis and Tryfonidis's [9] findings regarding the relationship between working capital management and profitability. A sample of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007 was selected. We 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 [10] 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 including working capital cycle and profitability. Multiple regression tests confirm a lower degree of association between the working capital management and profitability.

Lazaridis and Tryfonidis [9] 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-Teruel and Martínez-Solano [11] 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 [12] argued that working capital is needed for day-to-day operations of a firm. The primary purpose of this research was to examine 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 still is ambiguity in selecting the proper variables that might work as proxies for working capital management. The present study investigates the relationship between a set of such variables and the profitability 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 hypothesis 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.

#### 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

182 **CCC**=Cash Conversion Cycle

183 **INV**= Inventory Conversion Period

184 **DSO**= Receivables Collection Period

185 **PAY**= Payables deferral Period

186 **LnSales**= Firm Size

187 **FIXEDFA**= Fixed Financial Asset Ratio

188 **Debt**= Financial debt ratio

189  $\varepsilon$  = Error term.

190 This study carries out the issue of recognizing key variables that influence working capital management. All the  
191 variables stated below have been used to test the hypotheses of the study.

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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

193 **Source:** Napompech [12]

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195 This study presents an analysis of eight cement companies operating in Saudi Arabia during the period (2008–2012).  
196 Only Saudi cement companies which are listed in the Saudi stock exchange market (Tadawul) and were established  
197 before the year 2000 were selected and the rest were excluded. Table 1 presents the listed cement companies in  
198 Tadawul during 2012. There are thirteen cement companies operating in Saudi Arabia, five of them were excluded  
199 in this study, due to the fact that they are newly established after 2000. Thus, total observation number are 40. In  
200 addition to that, in order to achieve the main purpose of this study, the data were collected from the annual reports of  
201 these companies published on the corporate websites, related web pages of Saudi stock exchange (Tadawul) and  
202 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 statement, sales, cost of goods sold.

**Table1: Saudi Cement Manufacturing Companies Listed on the Saudi Arabia Stock Exchange**

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 JoufCement 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 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 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 againstUS\$44/ton in the GCC region.[13]

### 4.2. Working capital management and profitability

Table 2 shows the main characteristics of the variables 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 showing low negative result as one of the independent variables. Other independent variables like inventory conversion period is 200.71% and payables deferral period is 241% both show a higher level average, receivables collection period is 46%,firm size is 6%,fixed financial asset ratio is 0.078% 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.

226 **Table 2: Descriptive Statistics of Independent and Dependent Variables**

	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
GROSS	0.08175	350.63075	10.0665923	55.66069104
CCC	-532.91226	303.56592	-41.0281857	159.68148576
INV	36.46294	389.35248	200.7317556	95.04149205
DSO	0.07922	175.56419	46.1179247	34.35699143
PAY	0.16751	711.62144	241.0753666	157.77657310
LnSales	5.43871	9.06558	6.0852860	0.51724626
FIXEDFA	0.00000	0.23669	0.0778595	0.07444793
Debt	0.07952	1.00000	0.2610308	0.23827834

227 Table 3 reports the test of Pearson Bivariate Correlation coefficients for all study variables. According to the test  
228 there is a significant negative correlation relationship between GROSS as dependent variable, and five independent  
229 variables namely; PAY, CCC, INV, Dept, and DSO. At the same time, there is a positive correlation relationship  
230 between GROSS and LnSales, FIXEDFA, respectively. These findings corresponds to the study made previously by  
231 the author (Deloof 2003) when he used a sample of 1,009 large Belgian non-financial firms for a period of 1992-  
232 1996. By using correlation and regression tests, he found significant negative relationship between gross operating  
233 income and the number of days accounts receivable, inventories, and accounts payable of Belgian firms. Based on  
234 the study results, he suggests that managers can increase corporate profitability by reducing the number of day's  
235 accounts receivable and inventories. It is well known that the nearer the asset to the cash, the lower its riskiness and  
236 the lower its expected return. Therefore, it is logical to expect a negative relationship between profitability and the  
237 length of period over which resources of business organizations are held in non-cash current assets. These negative  
238 correlations are consistent with the view that the longer the time required to sell inventories and collect from  
239 customers on account, the lower is the profitability of the company.

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241 The negative correlation between GROSS and PAY can be interpreted that less profitable companies wait longer to  
242 pay their credit purchases. The correlation coefficients between GROSS and the control variables have the expected  
243 signs. The key findings of related previous research which was made by Mathuva [14] indicates that: i) there exists a  
244 highly significant negative relationship between the time it takes for firms to collect cash from their customers  
245 (accounts collection period) and profitability, ii) there exists a highly significant positive relationship between the  
246 period taken to convert inventories into sales (the inventory conversion period) and profitability, and iii) there exists  
247 a highly significant positive relationship between the time it takes the firm to pay its creditors (average payment  
248 period) and profitability. GROSS is positively correlated with LnSales and FIXEDFA meaning that the larger the  
249 company and the better the economic conditions of the country, the more profitable is the company. However, the  
250 correlation between GROSS and FIXEDFA is insignificant. Finally, the correlation coefficient between GROSS and  
251 Dept is negatively significant indicating that less profitable companies rely on borrowed funds to finance their  
252 operations.

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254 **Table 3: Pearson Bivariate Correlation Analysis.**

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

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256 **\*\* Correlation is significant at the 0.01 level (2-tailed).**257 **\* Correlation is significant at the 0.05 level (2-tailed).**

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259 Table 4 reveals that INV is positively correlated and accurately significant, which means that as INV increase firm's  
 260 profitability will raise, therefore, firm's should increase their INV. Firm LnSales is also accurately significant and  
 261 positively affecting firm's profit which means that, firms with greater sales volume are more profitable in this sector.  
 262 Whereas, average collection period is also significant but negatively correlated which means that, as the firm's  
 263 collection period increase, firm will bear loss so firms in this sector are advised to try to reduce their collection  
 264 period. These arguments were supported by Filbeck and Krueger [15] as pointed out that, the ability of financial  
 265 managers to effectively manage receivables, inventories, and payables has a significant impact on the success of the  
 266 business. If capital invested in cash, trade receivables, or inventories is not sufficient, the firm may have difficulty in  
 267 carrying out its daily business operations. This may result in declining sales and, in the end, a reduction in  
 268 profitability.

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

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282 **Table 4: Model Summary**

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(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
<b>R</b>	0.956 <sup>a</sup>				
R Square	0.914				
Adjusted R Square	0.895				
F Change	48.362				
Durbin-Watson	2.004				

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

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## 288 **5. CONCLUSION**

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

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

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

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

Last research hypothesis (H4) 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.

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 in future. The author suggest 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.

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