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The Relationship between Working Capital Management and Profitability (Case Study: Lavan Oil Refining Company)

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Abstract

This study examines the relationship between working capital management and profitability in Lavan Oil Refining Company, has paid to this, Lavan Refinery Company's financial statements from 1390 to first quarter of 1395 (Persian date) were studied. In this study the effect of different variables, including average collection period of receivables, working capital, inventory turnover period, the average duration of debt and the cash conversion cycle on company's operating profit have studied. Current ratio, debt ratio and the sales are used as control variables. To analyze the relationship, Pearson correlation and regression were used. The results suggest that there are meaningful relationships between working capital management and profitability. An increase in receivables collection period, increases the profitability but increase in debt payment period, inventory turnover and cash cycle, will decline the profitability.

Key words: average collection period, the average duration of debt, inventory turnover period, the cash conversion cycle, profitability.

1. Introduction

More than one hundred years, financial management as a discipline has undergone a major transformation and has become expanded more each day. Various areas for this context have been more specialized accordingly and continue their role in organizations. During the past centuries, large amounts of goods are mass-produced from industrial manufacturing companies and hyper profits have been collected. This made planning and control issues, particularly in terms of liquidity will gradually be considered in financial management and Working capital management as a specialized business unit was formed so many financial Managers spend all of their time and energy managing their working capital. From the perspective of financial managers working capital management is a simple concept and is the company's ability to understand the difference between short-term assets and liabilities [1]. Maintaining an optimum level of cash for debt payments is evidence of the importance of working capital. In practice, working capital management as one of the issues on the use of unexpectedly good opportunities for investment entity is a sign of flexibility and Access to raw materials on time so that the company can meet customer demand in the organizations. Thus many executives involved identifying key factors that affect working capital to optimize its [2].

Any decision taken in working capital field by business unit managers has significant impacts on operational efficiency and return of the entity which changes the value of the company and ultimately shareholder wealth. In the present study, which was conducted in the area of financial management, the attempt is made to review and analyze the relationship between working capital management and profitability of petrochemical companies using the concepts and theories of financial management and library studies, in Lavan Oil Refining Company.

Working capital management is considered as one of the important areas of financial management, organizational management, because it directly affects the liquidity and profitability of the company. There is possibility of bankruptcy for companies exposed to inappropriate management of working capital even though there is positive profitability. Working capital management deals with significant assets and current liabilities. A significant portion of the company's total assets is consisting of current assets. Current assets excessive levels can lead to the realization of return on investment which is less than the standard minimum. However, companies that have little current assets will encounter with shortages and problems in the ordinary course of operations [3]. Efficient working capital management involves planning and controlling current assets and liabilities is such, mitigate or avoid the risk of failing to meet short-term commitments on the one hand and avoid excessive investment in these assets on the other [3].

Many studies have emphasized the fact that managers spend considerable time in their everyday issues and one of the most important decisions related to working capital management [4].[1& 2] One reason for this is that current assets are short-term investments that convert to other asset classes constantly [3].

In general, decisions about the different levels of working capital, abundant, frequent and time-consuming. One of the ultimate goals of any company is to maximize profits in the long run, but also to maintain the company's liquidity is an important goal. The problem is that to make a profit at the expense of the loss of liquidity can cause serious problems for a company. Therefore, we must establish a balance between these two objectives and a fundamental objective to be achieved at the expense of other target, because they both have their own importance if a company does not pay attention to profitability, cannot last for long. On the other hand, failing to be concerned with the problems of liquidity may lead to bankruptcy or failure to pay debts on time. Due to the above reasons working capital management should be of particular interest and ultimately affect the profitability of the company [3].

Companies must have the optimum level of working capital to maximize their value. Abundant inventory and generous credit policy can lead to increased sales. Large inventory reduces the risk of inventory shortage and trade credit because the evaluation of the quality of the product before paying for customers can increase sales [5]. The other component of working capital is accounts payable. Delaying payments to suppliers for the entity provides the opportunity to assess the quality of products purchased and can be a flexible, affordable source of financing for companies. On the other hand, if the supplier in order to pay before the deadline, the discount offer delayed payment of bills can be very expensive. A common

1 Raymond, Pee-Novo, 1380, financial management, translation and adaptation of the first volume Jhankhani Ali and Ali Parsaeian, SAMT publishing; Raheman and Nasr, 2007," Working Capital Management and Profitability-Case of Pakistan Firms" International Review of Business Research Papers.

2 Nazir.M, Afza. Talat,2008," ON THE FACTOR DETERMINING WORKING CAPITAL REQUIREMENTS" Proceedings of ASBBS, Volume 15, Number 1, Pp.293-301; Vedavinayagam Ganesan,2007," An Analysis of Working Capital Management Efficiency in Economic Activity" Mid-American Journal of Business, Vol.10, N. 2, Pp.45-50.

standard for measuring the working capital cash conversion cycle, is the time interval between receipt of the funds to purchase raw materials and goods sold, as this interval is longer, higher investment in working capital is done. Long increase in cash cycle may increase profitability because it leads to increased sales. However, if the cost of higher investment in working capital is higher than benefits from holding inventory or granting trade credit to customers, Profit-making of entity may be reduced by increasing the cash cycle.

Discussion about the importance of working capital management, its constituent components and their impact on profitability leads us to the problem that we are going to analyze it. The question is whether we are going to analyze it is that, doe’s working capital management affect profitability of petrochemical companies?

Working capital management is one of the sectors that plays a vital role in the management of an organization such as in some cases, debates have likened working capital and liquidity to blood that flow in the veins of the entity in order to The entity be able to survive the beating heart of the business and the management of this sector has learned that the organization's task is to pump blood vessels [6].

It is necessary to do researches in the oil and gas industry issues to find evidence for reviewing problems that facing managers in the industry. As well as reflect on the importance of the issue highlights the following points:

a. Currently, the liquidity situation is uncomfortable in the oil and gas companies and Most Iranian companies in the country prefer to convert their cash into other assets d due to the positioning of inflation and economic sanctions. This causes the oil and gas companies are debt maturity powerless and hurt the reputation of the organization.

b. Experience has shown that most of those companies that faced financial turmoil and, ultimately, the fate of some of them went toward bankruptcy; one major reason is capital management.

1.1. Research objectives

- Check whether management policies in relation to working capital will affect the profitability of Lavan Oil Refining Company.
- Check whether there are links between the various components of working capital management and operating profit of Lavan Oil Refining Company.

1.2. Hypothesis

To study the relationship between working capital management and profitability hypotheses to be tested and handed follows:

1. There is a meaningful relationship between average collection period and net operating income (EBIT) in Lavan petrochemical company.
2. There is a meaningful relationship between Inventory turnover and net operating income (EBIT) in Lavan petrochemical company.
3. There is a meaningful relationship between average debt payment period and net operating income (EBIT) in Lavan petrochemical company.
4. There is a meaningful relationship between cash conversion cycle and net operating income (EBIT) in Lavan petrochemical company.

1.3. Importance of working capital management

Working capital meets Short-term financing needs of the firms. The need to maintain adequate working capital can hardly be questioned. As the blood circulation in the human body to sustain life is a very important need, cash flow for sustaining business operations is essential [6]. Working capital in a company set an amount that is invested in current assets. If deduct current liabilities, Net working capital is obtained. Many current liabilities from current assets are financed. At the same time, some companies provide part of their current assets from long-term debt or equity location [7].

Each business unit with profit current ratio more than one, has positive working capital. For a certain level of current debt, the greater the working capital will lead to higher current ration than it is now. Long-term financing Contracts often require maintenance of a certain amount of working capital. The purpose of taking these cases provide adequate safety margins for lenders because it assumes that current assets compared to other assets provide pay more liquidity [8]. The success of a business depends on its ability to receive cash more than its payments. Many small businesses have cash flow problems due to poor financial management, especially lack of planning.

1.4. Background of petrochemical industry in IRAN

Although petrochemical industries, are intermediate industry groups, but like a mother industry, feed other industries and in the field of manufacturing materials they can also be a good alternative for many capital goods. The importance of this industry in the economy to the extent that Half of the gross national income of a country like America can be obtained from petrochemical industry and its related fields and spend a lot of profit from the Petrochemicals research on future products. Petrochemical raw materials, crude oil and gas are found in abundance in Iran. Unfortunately, the bulk of the crude oil are exported**.** The need for petrochemical products in IRAN is rising, and country has considerable advantages in the field of petrochemical industry, because in addition to scores of puberty in the world, has rich reserves of gas that it extracted a much lower cost price than crude oil used as a raw material for the petrochemical with respect of other countries**.** In addition to the above issues, Iran has a large domestic consumer market for petrochemical products produced, that minimizes the risk of fluctuations in demand and prices on world markets. Expanded and non-dependent industries such as petrochemical can have giant effects that are remarkably useful in the creation of employment opportunities for manpower of country. So do any research in the field of development assistance and better manage the petrochemical industry, will be a step towards the realization of **Resistive economic** goals. Therefore, we decided to study the relationship between working capital management and profitability of petrochemical companies to pay and the service although small in petrochemical industry**.**

2. Literature review

Soenen (1993) for the first time investigated the relationship between the business cycle as a criterion for working capital and return on investment in US companies. Chi-square test results showed a negative correlation between net trade cycle time and return on assets. Moreover, this negative relationship was in terms of different types of different industries [9].

Shin, H.H and Soenen, L (1998), studied the relationship between a standard cash conversion cycle and profitability of the company for a large sample of US companies for the period 1975-1994. They found a strong negative relationship between them, which suggests that managers can create shareholder value by reducing the cash conversion cycle to a reasonable minimum [10].

Deloof M. (2003), investigated The relationship between working capital management and profitability of the company in 1009 for a sample of Belgian company during the 1992-1996. He used days of receipt of accounts receivable, inventories and accounts payable as trade credit criteria and inventory policies. Further these, the cash conversion cycle as a comprehensive criterion used for working capital management. The results of the survey showed that business unit managers can increase profit by reducing days outstanding of accounts receivable and inventory turnovers [5].

Raheman and Nasr, (2007), studied The effect of working capital management on profitability of 94 companies listed on stock exchanges in Pakistan during the 1999-2004. He investigated the effects of various factors such as average collection period of receivables turnover, inventory turnover period, the average payment period and the cash conversion cycle on net operating profit and concluded that there is a strong negative relationship between high working capital and profitability ratios. In addition, managers can create value for shareholders by reducing the cash conversion cycle to an optimum level. This research confirms the results of similar studies on the relationship between capital and profitability [3].

As far as the researchers are aware researches have not examined the relationship between working capital management and profitability of companies operating in the petrochemical industry. This study is trying to bridge the gap between existing knowledge and provide useful information for financial managers and the executives to be able to make better decisions in the allocation and management of working capital, and shareholders value creation.

3. Methodology

Lavan Oil Refining Company is studied in this research, to meet this, financial statement of this corporation have been obtained from 1390 till first quarter of 1395 from Tehran Stock Exchange and investigated. The research type is Scrolling - exploration of correlation in which uses regression for analyzing. The resulting curve is regression and the equation called regression equation. In this study, quantitative analyzes in order to test the hypotheses used two methods**. At first** The Pearson correlation model is used, to measure the degree of relationship between working capital variables and profitability (EBIT). **Then** in order to estimate the causal relationship between working capital variables and profitability, regression analysis will be used. Excel software was used for analysis.

3.1. Defining and measuring of variables

- **Profitability:** accounting researchers use operating profit as an index for profitability. In this research we use EBIT as indicator of profitability and this dependent variable is extracted from financial statements.
- **Working capital:** The four components of average receivables collection period, average inventory turnover period, the average duration of debt, cash conversion cycle as components of working capital management have been studied and calculation of them is as followed.
- **The average collection period (DSO):** as the independent variable is obtained by dividing accounts receivable by sales, multiplied by 365.
- **The average inventory turnover period (ITID):** as an independent variable is obtained from dividing the cost of goods sold by inventory times 365.
- **The average debt payment period (APP):** as the independent variable is obtained from accounts payable divided by cost of goods sold, multiplied by 365.
- **Cash conversion cycle (CCC):** as an independent variable is obtained from deducting the solvency from the total volume of collection of receivables and inventory turnover period, in other words: CCC = DSO + ITID – APP.
- **Control variables:** This study sought to examine the relationship between working capital management and profitability in Lavan Oil Refining Company**.** Since there

are other factors that can affect the profitability of the business units, it is necessary that these factors with their effects be considered. The three variables sales, leverage and liquidity are monitored as control variables. Sales (S) in different years and thus is under control. The amount of leverage is another factor that can affect profitability, from the degree of supervision by the creditors, and through its role in determining the capital structure. The leverage by dividing total debt by total assets (DR) is measured**.** Current ratio (CR) as a measure of liquidity that is obtained by dividing by current liabilities current is also controlled as variable.

3.2. The hypothesis test model

The model to test hypothesis and estimate regression is presented respectively. the equation 1 was used to test hypothesis no.1 as following:

$$EBIT = \beta 0 + \beta 1\ (DSO) + \beta 2(CR) + \beta 3\ (DR) + \beta 4\ (S) + \varepsilon \qquad (1)$$

Where EBIT stands for earnings before interest and tax; DSO for number of days' sale is outstanding; CR for current ratio (current assets divided by current liabilities); DR for debt ratio (total debts divided by total assets); S for net sale of company in term of dollar amounts and finally ε for model residuals.

the equation 2 was used to test hypothesis no.2 as following:

$$EBIT = \beta 0 + \beta 1\ (ITID) + \beta 2(CR) + \beta 3\ (DR) + \beta 4\ (S) + \varepsilon \qquad (2)$$

Where EBIT stands for earnings before interest and tax; ITID for average inventory turnover period (as an independent variable is obtained from dividing the cost of goods sold by inventory times 365); CR for current ratio (current assets divided by current liabilities); DR for debt ratio (total debts divided by total assets); S for net sale of company in term of dollar amounts and finally ε for model residuals.

the equation 3 was used to test hypothesis no.3 as following:

$$EBIT = \beta 0 + \beta 1\ (APP) + \beta 2(CR) + \beta 3\ (DR) + \beta 4\ (S) + \varepsilon \qquad (3)$$

Where EBIT stands for earnings before interest and tax; APP for the average debt payment period (as the independent variable is obtained from accounts payable divided by cost of goods sold, multiplied by 365); CR for current ratio (current assets divided by current liabilities); DR for debt ratio (total debts divided by total assets); S for net sale of company in term of dollar amounts and finally ε for model residuals.

the equation 4 was used to test hypothesis no.4 as following:

$$EBIT = \beta 0 + \beta 1\ (CCC) + \beta 2(CR) + \beta 3\ (DR) + \beta 4\ (S) + \varepsilon \qquad (4)$$

Where EBIT stands for earnings before interest and tax; CCC for Cash conversion cycle (as an independent variable is obtained from deducting the solvency from the total volume of collection of receivables and inventory turnover period, in other words: CCC = DSO + ITID – APP); CR for current ratio (current assets divided by current liabilities); DR for debt ratio (total debts divided by total assets); S for net sale of company in term of dollar amounts and finally ε for model residuals.

4. Results

For the first hypothesis the correlation is .466 between EBIT & DSO. This shows that there is a meaningful relationship between them but this relation is positive. This indicates that increase in collection of receivables, will increase net operating income and vice versa. The summary of this test has been presented in table 1.

Table 1- the hypothesis test no.1 result

Dependent variable	Correlation coefficient between EBIT & DSO	test	result
EBIT	0.466	Correlation	reject H_0
	EBIT = 34221562.53 + 142608.28 (DSO) -2512871.37(CR) -33324255.13(DR) - 0.093 (S) + ε		

For the second hypothesis the correlation is -0.781 between EBIT & ITID. This shows that there is a meaningful relationship between them but this relation is negative. This indicates that in case of increasing inventory turnover period, net operating income will decrease and vice versa. The summary of this test has been presented in table 2.

Table 2- the hypothesis test no.2 result.

Dependent variable	Correlation coefficient between EBIT & ITID	test	result
EBIT	-0.781	Correlation	reject H_0
	EBIT = 29600000.55 -91439.23 (ITD) + 6032729.034 (CR) -25394236.02 (DR) - 0.15 (S) + ε		

For the third hypothesis the correlation is -0.155 between EBIT & APP. This shows that there is a meaningful relationship between them but this relation is negative. This indicates that in case of increase of debt payment duration, net operating income will decrease and vice versa. The summary of this test has been presented in table 3.

Table 3- the hypothesis test no.3 result.

Dependent variable	Correlation coefficient between EBIT & APP	test	result
EBIT	-0.155	Correlation	reject H_0
	EBIT = 23155861.29-106115.45 (APP) -7103725.37 (CR) -21906816.58 (DR) +0.052 (S) + ε		

For the third hypothesis the correlation is -0.275 between EBIT & CCC. This shows that there is a meaningful relationship between them but this relation is negative. This indicates that in case of increase of cash conversion cycle, net operating income will decrease and vice versa. The summary of this test has been presented in table 4.

Table 4- the hypothesis test no.4 result.

Dependent variable	Correlation coefficient between EBIT & CCC	test	result
EBIT	-0.275	Correlation	reject H_0
	EBIT = 24319080.80 + 199376.55(CCC) -31122762.17 (CR) -29648009.33 (DR) + 0.31 (S) + ε		

5. Conclusion, discussions and recommendations

The results of research are summarized in table 5 and 6.

Table 5- the summary of tests.

Hypothesis number	Results
1	confirmed
2	confirmed
3	confirmed
4	confirmed

Table 6- The results for existence of relationship between two variables.

Independent v. / .Dependent v	DSO	ITID	APP	CCC
EBIT	POSITIVE	NEGATIVE	NEGATIVE	NEGATIVE

It can be said that managers can create wealth for shareholders with proper management of accounts receivable. Also Company managers are able to reduce inventory turnover period as much as possible to causes a positive value and profitability for shareholders and this was achieved with proper management of inventory. they are able to reduce debt as much as possible to create a positive value and profitability for their shareholders and this requires effective management of payments and usage credit terms of creditors or suppliers. Financial managers will be able to manage cash conversion cycle in reducing platform manner and this requires Liquidity planning and optimal management of receivables and payments and utilization of investment and financial opportunities.
It is recommended to research about other companies active in the oil and gas industry must be examined separately and to compare the results obtained across various industries. It is also suggested that in future studies to investigate the causes of lack of attention to working capital management in companies active in the oil and gas industry. It is useful in future studies to investigate the role of working capital management in going concern of the oil and gas companies. We hope that carry out future research on components of working capital management, especially management of cash, tradable securities market, accounts receivable and inventories, independently.

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