Studying the relationship between working capital management and profitability of listed companies in Tehran stock exchange
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Abstract
Present study examines the relationship between working capital management and profitability for listed companies on Tehran stock exchange. 147 companies were selected for the period of 2005-2009. The effect of various variables of working capital management including cash conversion cycle (CCC), the current ratio (CR), current asset to total asset ratio (CATAR), current liabilities to total asset ratio (CLTAR) and debt to asset ratio (DTAR) on return on assets and return on equity are studied. Multivariate regression and Pearson correlation are used to test hypothesis. The results of the statistical test of the hypothesis show a negative significant relationship exist between cash conversion cycle (CCC) and return on assets and there is also a negative significant relationship between cash conversion cycle (CCC) and return on equity. However, the relationship between current ratio and return on equity is insignificant.

Key words: working capital, working capital management profitability return on assets, return on equity

INTRODUCTION
Capital is one of the most important trade factor and largest instrument for attracting the profit. Each firm should have capital in order to access profit from its trade. Importance of trade unit can be understood by their capital. Subject of capital, also forms the fundamental discussion in the financial management and can be claimed that all trade activities need to capital. Capital refers to all financial resources that trade unit consumes it and in this connection, financial management determines the framework of the relationship between capital and firm. Generally, in all organizations particularly in small size, a great part of organization capital is working capital. Working capital includes all short term assets which companies use it in daily activities. Working capital is an indicator for measuring the liquidity which is defined as adequacy of cash for doing firm’s obligations.

Firm with proper situation of liquidity, has enough cash for the payment of bills. On the contrary, companies with improper situation cannot pay their bills on the maturity data. (Pike and Bill, 2006: 340). Thus, working capital management is very important and should be done on the basis of supply chain management. Working capital management refers to determination of volume and combination of resources and consumptions of working capital so that leads to increase in shareholder's wealth (Neveu 2001:1) working capital management indicates policies and decisions which is adopting about working capital in order to change types of current assets and short term financial resources. Correct controlling the working capital management can affect importantly on the firm’s profitability.

RESEARCH IMPORTANCE AND NECESSITY
Working capital management has been studied from 1995 to 2008 in other countries by several researches including Soenen (1993), Soenen and shin (1998), Delpoof (2003) and samiloglu and demirgunes (2008). General results of these studies in different stock exchanges in America, Belgium, India, Pakistan and Turkey are almost the same and indicate that there is significant relationship between different variables of working capital management and profitability. In respect of importance of working capital management and inadequacy of researches on this subject in our century we examine working capital management in Tehran stock Exchange based on previous studies which done in other countries, and also models or variables which were used in these studies.

Working capital management is one of the parts which play vital role in structural management of organization. So that, sometimes working capital management and liquidity are resembled as a circulating blood in a trade unit. Management of working capital is also known as a heart which pumps

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the blood to vessels of organization (Kesseven, 2006: 49). Examination of working capital management is particularly important due to following reasons:

- The existence of inflationary situations and devaluation of money purchasing power in Iran’s economy stimulated managers of trade units would rather other types of properties than cash money. It caused managers face money difficulties for the payment of their current debts.
- Empirical evidence show that deficiency of working capital in the most of companies which have faced disorganized financial condition, is the main reason for their bankruptcy.

LITERATURE REVIEW

Izadima and Taki (2010) examined the effects of working capital management on capability of profitability for listed companies on Tehran Stock Exchange for the period of 2001-2008. In this study return on total assets is considered as a measure for capability of profitability. The results indicate that there is a negative significant relationship between cash conversion cycle and return on assets and also a lot of investment in inventories and accounts receivable leads to declining of profitability.

Mohmmadi (2009) examined the impact of working capital management on profitability for listed companies on Tehran Stock Exchange. The study analyses a sample of 92 companies for the period of 1996-2005. Research findings show that there exist negative relationship between number of days accounts of days accounts receivable, number of days inventories, member of days accounts payable, cash conversion cycle and profitability.

YaghoobNejad, et al. (2010) examined the relationship between working capital management and profitability. For this purpose, selected a sample of 86 active companies on Tehran stock exchange for the period of 2002-2007. This study for analysis the data has used regression and Pearson correlation. The results show that there is a negative relationship between variables of working capital management and profitability. Also, the results indicate that increase in number of days accounts receivable, number of days accounts payable, number of days inventories and cash conversion cycle leads to decrease in profitability of companies. Managers can increase the shareholder’s wealth by reducing number of days accounts receivable, number of days inventories and cash conversion cycle.

Soenen (1993) examined the relationship between net trade cycle as a indicator of waking capital and investment return in American companies. Chai-Square Test results showed a negative relationship between net trade cycle time and properties return. Future, the negative relation is different for different industries. An important significant relationship for almost half of considered companies indicated that negative relation depends on type of industry.

Soenen and shin (1998) investigated the relation between measure of the cash conversion cycle and corporate profitability for a large sample of listed American firms for the 1975-1994 period. They found a strong negative relation. This result indicates that managers can create value for their shareholders by reducing the cash conversion cycle to a reasonable minimum.

Deloof (2003) investigated the relationship between working capital management and profitability for a sample of 1009 Belgian Companies for the period of 1960-1992. In this study have been used cash conversion cycle inventories and number of day’s accounts receivable as indicators of trade credit and cash conversion cycle as comprehensive indicator of working capital management. The results show that manager can increase profitability of trade by reducing the number of accounts receivable, inventories and also by reducing cash conversion cycle.

Samiloglu and Demirgunes (2008) examined the effect of working capital management on profitability for a sample of Turkish companies, for the period of 1998-2007. Empirical findings show that accounts receivables period, inventory period and leverage affect firm profitability negatively; while growth (in sales) affects firm profitability positively.

PROBLEM STATEMENT

One of the main purposes of any firm is maximize the profit. But, maintaining liquidity of the firm also is an important objective. The problem is that at the cost of liquidity can bring serious problems to firm. Thus, strategy of firm must be a balance between these two objectives of the firms. Because the
importance of profit and liquidity are the same so, one objective should not be at the cost of the other. If firm ignores about profit, firm cannot survive for a longer period. Conversely, if firm does not care about liquidity, firm may face the problem of insolvency and bankruptcy (Rahman and Nasr, 2007: 281). Therefore, when a trade unit operates, have to maintain an optimal balance between liquidity and profitability and preserve always it. Liquidity as a precondition warrants trade unit ability to trade obligations and in fact, indicates that the firm operates continuously. Liquidity and probability are two important subjects for scientists and financial executives. In this connection, it is said that Non-profitable firm, called as a patient case in the economy. However, firm with lack of liquidity has less life expectancy. One of the major determinant of firm’s market valuation is their profitability which it’s changes affect the market valuation and ultimately has impact on shareholder’s wealth. Firms’ working capital management affect directly the profitability of firms. Thus, it can be said that firms’ working capital management is one of the determinants of firms’ market valuation. (Shareholders’ wealth) which it’s changes has non-denial impacts on the changes of shareholders’ wealth. Therefore, working capital management is important due to its impact on firm’s profitability and risk as well as its value. In fact, working capital management, to maintain on optimal balance between trade activities cycle and liquidity circulation of firm for the purpose of profitability and increase in firm’s value. Therefore, the lack of understanding about the impact of working capital requirements on profitability, the lack of clarity about its determinants, and the lack of management’s ability to plan and control its components may lead to insolvency and bankruptcy, so that a large number of business failures may come form the inability of financial manager to plan and control current assets and current liabilities of their respective firms (Gill, 2011: 30).

Existence of mentioned matters is the major reason for undertaking this study. Thus, the question of present study is: what relation is there between working capital management and profitability of listed companies in Tehran stock exchange?

RESEARCH OBJECTIVE
The main objective:
- Determination of relationship between working capital management and profitability for listed companies in Tehran stock exchange.

Secondary objectives:
- Determination of relationship between working capital management and return on assets for listed companies in Tehran stock exchange.
- Determination of relationship between working capital management and return on equity.

Working capital and its management
Working capital is the total of the amounts invested in current assets of the company. Generally, it is assumed that the current liabilities must be met by current assets. Because, maturity date of current assets coincides with maturity date of current liabilities (maximum maturity date is one year). Lack of coincidence between maturity date of current assets and current liabilities leads to liquidity problems of the firms. Of course, some of companies may try to secure a part of their current assets through shareholders’ rights which is called fixed working capital. Current assets including cash stock, short term investment, claims stock of raw materials and goods, and also current liabilities means accounts and trade bills payable, pre receipts and short term bank credits (Pike and bill, 2006: 337). The working capital management from financial managers’ point of view is a simple and clear concept ensuring the firm ability to grasp differences between assets and short-term debts (Yaghob nejad, 2010: 118).
Therefore, working capital management is one of the most important problems that firms’ managers may face it. Working capital management plays an important role for the firms’ maintenance and growth. Working capital management refers to financing methods, investment and control of working capital. In other words, working capital management is practical part of financing which includes all current accounts of firm. Working capital management relates to adequacy of current assets and risk resulting from current liabilities (Pike and Bill 2006: 338). Working capital management is of particular important due to its impact on risk, returns and shareholders’ wealth. Companies by using various strategies related to working capital management can affect the amount of firm’s liquidity. These strategies determine their
risk level and returns (Nikoomaram et al, 2004: 8). In other words, firms by using efficient working
capital management can facilitate access to following objectives:

1- Enough liquidity: firms face difficulties if they have not enough cash for the payment of their
invoices on maturity date. Thus one of the most important objectives of working capital
management is access to enough liquidity in order to undertake daily activities and prevention of
disturbances in trade cycle operations.

2- Minimizing risk
Firms must ensure that their short term obligations do not exceed their current assets. Comparison of
assets and liabilities among the current accounts is a responsibility which aims to minimize risk of
inability to the payment of invoices and other obligations.

3- Maximizing firm’s value
Firms maintain working capital for the same reason that maintain other assets, means help to maximizing
share’s value of the firms and consequently firms’ value. Investment of idle moneys, minimizing the
stocks, fast receipt of receivable and elimination of costly short term financing, all lead to increase in
firms’ value.

HYPOTHESIS
Present study consists of two main hypotheses and each of them includes five secondary hypothesis:

1- There is a significant relation between working capital management and return on assets
   1-1 - There is a significant relation between cash conversion cycle and return on assets.
   1-2 – There is a significant relation between current ratio and return on assets.
   1-3 – There is a significant relation between current assets to total assets ratio and return on
   assets.
   1-4 –These is a significant relation between current liabilities to total assets ratio and return on
   assets.
   1-5 – There is a significant relation between total liabilities to total assets ratio and return on
   assets.

2- There is a significant relation between working capital management and return on equity.
   2-1- there is a significant relation between cash conversion cycle and return on equity.
   2-2- there is a significant relation between current ratio and return on equity.
   2-3- there is a significant relation between current assets to total assets ratio and return on
   equity.
   2-4- there is a significant relation between current liabilities to total assets ratio and return on
   equity.
   2-5- there is a significant relation between total liabilities to total assets ratio and return on equity.

RESEARCH METHOD
In respect of objective, present study is applied work and on the basis of collecting data method is
descriptive – correlation. To analyze data, first, to test normality of data is used Kolmogorov Smironow
test. Them, multivariate regression and Pearson correlation are applied to test hypothesis.

Statistical population
The statistical population of this study includes all companies listed on Tehran stock exchange during
1384-1388 that have following conditions:
   - They are member since march 2005
   - Their data are accessible
   - Their end of fiscal year in March
   - They are not investment and financial companies

147 companies are selected with above conditions. Also, since the statistical population is limited, sample
size equals to statistical population.

Temporal and spatial scope
Research’s spatial scope is listed companies at Tehran stock exchange. The main reason for this selection
is access to company’s reports and financial invoices. Temporal scope is also limited for the period of
Research variables
In this study, cash conversion cycle, current ratio, current assets to total assets, current liabilities to total assets and total liabilities to total assets are used to measure profitability. Also, profitability includes return on assets rate and return on equity rate.

- Cash conversion cycle (CCC): is calculated by (number of days inventories + number of days accounts receivable) – number of days accounts payable
- Return on assets (ROA): is calculated by $\frac{\text{operating profit}}{\text{total assets}}$
- Return on equity (ROIC/ROE): is calculated by $\frac{\text{net profit}}{\text{total equities}}$
- Current ratio (CACLR): is calculated by $\frac{\text{current assets}}{\text{current liabilities}}$

Research models
The following two models were run to examine the relationship between profitability measures and working capital management measures.

Model (1) examines the relationship between return on assets and working capital management measures:

$$\text{ROA}_{i,t} = \beta_0 + \beta_1 \text{CCC}_{i,t} + \beta_2 \text{CACLR}_{i,t} + \beta_3 \text{CATAR}_{i,t} + \beta_4 \text{CLTAR}_{i,t} + \beta_5 \text{DTAR} + \epsilon_{i,t}$$

Model (1) examines the relationship between return on equity and working capital management measures:

$$\text{ROIC}_{i,t} = \beta_0 + \beta_1 \text{CCC}_{i,t} + \beta_2 \text{CACLR}_{i,t} + \beta_3 \text{CATAR}_{i,t} + \beta_4 \text{CLTAR}_{i,t} + \beta_5 \text{DTAR} + \epsilon_{i,t}$$

RESEARCH FINDINGS
Results obtained from testing hypothesis 1 offer the following:

Hypothesis 1-1: According to table (1), t statistic value for CCC (cash conversion cycle) is equal to −6.66 and at the confidence level of 0.95, Ho hypothesis is rejected. Therefore, it can be concluded that there is a negative significant relation between the cash conversion cycle and return on assets. This relationship between cash conversion cycle and return on assets has a logical base and was expected. On the other hand, changes in cash conversion cycle lead to changes in firm’s financial resources and access to financial resources is also one of the effective factors on profitability.

Hypothesis 1-2: T statistic value for CACLR (current ratio) is equal to 0.27 and at the confidence level 0.95, Ho hypothesis is not rejected. In other words, there is significant relationship between current ratio and return on assets (ROA). Mechanism of return on assets calculations says that changes in ratio of return on assets is arisen from changes in net profit margin and asset turn over. Thus, the lack of relation seems more harmonious with facts. Hypothesis 1-3: T statistic value for CATAR (current assets to total assets ratio) is equal to 3.45 and Ho hypothesis is rejected in the confidence level of 0.95. In other words, there is a significant positive relationship between current assets to total assets ratio and return on assets. When current assets to total assets ratio increases, return on assets rate also increases. In fact, increase in firm’s current assets to total assets ratio can be interpreted as a symbol for increase in trade activities or reducing of non-current assets that ultimately leads to increase in asset turnover and return on assets.

Hypothesis 1-4: T statistic value is equal to −3.6 for CLTAR (current liabilities to total assets ratio) and Ho hypothesis is rejected in the confidence level of 0.95. In other words, there is a negative significant relationship between current liabilities to total asset ratio and return on assets. By increasing the current liabilities to total asset ratio increases short term cost of financing and ultimately reduces profitability. On the other hand, increase in current liabilities to total assets ratio can be arisen from reducing of assets that leads to decrease in activities and profitability.

Hypothesis 1-5: T statistic value is equal to −6.38 for variable of DTAR (current liabilities to total assets ratio) and Ho Hypothesis is rejected in the confidence level of 0.95. In other words there is a negative significant relationship between total liabilities to total assets ratio and return on assets. By reducing of total liabilities to total assets ratio. Increases the return on assets ratio and by it's increasing, decreases the return on assets rate increase in total liabilities in comparison with total assets can be interpreted as a
symbol of low productivity of firm’s assets or increase in cost price of assets, that ultimately it leads to reducing of return on assets.

Table 1 (testing of hypothesis model 1)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardize d Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>VIF</th>
<th>Tolerance</th>
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<td>Std Error</td>
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<tr>
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<td>.000</td>
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<td>-6.658</td>
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<td>CACLR</td>
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<td>.190</td>
<td>3.453</td>
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<td>.332</td>
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<tr>
<td>CATAR</td>
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<td>.043</td>
<td>-.217</td>
<td>-3.057</td>
<td>.002</td>
<td>.199</td>
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<tr>
<td>CLTAR</td>
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<td>.036</td>
<td>-.356</td>
<td>-6.378</td>
<td>.000</td>
<td>.323</td>
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<tr>
<td>DTAR</td>
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<td></td>
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</tr>
</tbody>
</table>

a.Dependent Variable: ROA

Consequently, according to the confirmation of hypothesis 1-1, 1-3, 1-4, and 1-5 of hypothesis 1, existence of significant relation between working capital management and return on assets in model 1 was confirmed.

Results obtained from testing hypothesis 2 offer the following:
Hypothesis 2-1: according to table (2), t statistic value for ccc (cash conversion cycle) is -5.46 and H₀ hypothesis is rejected in the confidence level of 0.95. In other words, there is a negative significant relationship between cash conversion cycle and return on equity. By reducing cash conversion cycle, increases return on equity and vice versa.

Hypothesis 2-2: t statistic value for CACLA (current ratio) in equal to 0.895 and H₀ hypothesis is not rejected in the confidence level of 0.95. In other words there is insignificant relationship between current ratio and return on equity.

Hypothesis 2-3: t statistic value for CATAR (current assets to total assets ratio) is equal to 0.105 and H₀ hypothesis is not rejected in the confidence level of 0.95. In other words there is a insignificant relationship between current assets to total assets ratio and return on equity.

Table 2. (testing hypothesis of model 2)

<table>
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<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
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<th>Sig.</th>
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<td>Std Error</td>
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</table>

a.Dependent variable: ROIC

Hypothesis 2-4: t statistic value for CLTAR (current liabilities to total assets ratio) is equal to - 2.287 and H₀ hypothesis is rejected in the confidence level of 0.95. In other words, there is a negative significant
relationship between current liabilities to total assets ratio and return on equity. By reducing current liabilities to total assets ratio increases rate of return on equity and vice versa.

Hypothesis 2-5: t statistic value for variable of DTAR (total liabilities to total assets ratio) in equal to -3.845 and H₀ hypothesis is rejected in the confidence level of 0.95. In other words, there is a negative significant relationship between total liabilities to total assets ratio and return on equity. By reducing total liabilities to total assets ratio, increases return on equity rate and vice versa.

Consequently, according to the confirmation of hypothesis 2-1, 2-4 and 2-5, existence of significant relation between working capital management and return on equity in model 2 was confirmed.

SUGGESTIONS BASED ON RESEARCH FINDINGS
- Results from testing the hypothesis 1-1 reflect that this is a negative relationship between cash conversion cycle and profitability. Companies in order to improve their operation and increase in shareholder’s wealth, must adopt policies and plans to reduce number of day accounts receivable.
- Results from testing the hypothesis 1-3 reflect that these is a positive relationship between current assets to total assets ratio and profitability. Companies must adopt suitable policy for financing and assets turnover in order to increase in return on assets rates and profitability.
- Results from testing the hypothesis 1-4 and 2-4 reflect that these is a negative relationship between current liabilities to total assets ratio and profitability. Firms must adopt suitable policies for the management of cash in financing part and sales; meanwhile have to use suitable policies in order to prevent from reducing of assets.
- Results from testing hypothesis 1-5 and 2-5 reflect that these is a negative relationship between total liabilities to total assets ratio and profitability (return on assets – return on equity). Firms must, identify the ways which lead to reduce the productivity of firms’ assets or increase in cost price of assets by reviewing their plans.

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