



Investigation Of The Effect Of Working Capital And Cash Holdings On The Profitability Of Companies Listed In The Tehran Stock Exchange

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ABSTRACT

The present research aims to investigate the relationship between financial variables of working capital, Cash holdings, and profitability. In this research, the average collection period, average inventory turnover duration, average debt payment period, and free cash flow of the firm are independent variables, and the return on assets and return on capital are dependent variables. Also, Firm size and financial leverage are control variables. Regarding the research topic, Tehran Stock Exchange-listed enterprises make up the statistical population of the current study. 77 businesses were chosen as selected samples for this study. Companies listed on the Tehran Stock Exchange from the beginning of 2014 to the end of 2019 were used to compile data for this study. In this research, to test the hypothesis was used multiple regression analysis with the method of mixed data with fixed effects. Research results indicated that there is a significant relationship between working capital and cash holdings and return on assets. Also, there is a significant relationship between working capital and return on capital.

Keywords: working capital, cash holdings, profitability, return on assets, return on capital.

Introduction

In recent years, many companies have faced poor liquidity, and examining the factors associated with this condition is important. Efficient working capital management is an important aspect of financial management practices in all known forms of organization (Suragan and Durmuşkaya, 2022). The existence of extensive literature shows that working capital management directly affects liquidity and profitability. The possibility of bankruptcy increases for companies that are exposed to inappropriate management of working capital (Khorshidi et al., 2024). Working capital management deals with current and liabilities. A sizeable chunk of a company's total assets is its current assets. Current asset levels that are too high could result in a return on investment that is below the acceptable level (Thuy et al., 2022). However, companies with levels of little current assets will have problems and shortages in the ordinary process of operations and problems. Efficient working capital management includes planning and control of current assets and liabilities in such a way that resolves the risk of inability to fulfill short-term obligations and avoidance of excessive investment in current assets (Rahman and Naser, 2007).

The importance of working capital originates from the fact that the level of working capital is effective on profitability and acceptable risk level and, ultimately, the value of the company. The recent liquidity crisis has made working capital management and control even more crucial. To obtain the ideal working capital, managers must maintain a balance between maximizing profitability and liquidity. The best-working capital management should increase the company's value (Hoang et al., 2023). Empirical research in advanced economies of the world showed that efficient working capital management increases the company's market value a finally has a positive effect on the value of equity (Sandy et al., 2012). With regard to the mentioned subjects, the present research aims to investigate the effect of financial variables of working capital and cash holdings on the profitability of listed companies in the Tehran Stock Exchange.

Theatrical foundations

Working capital management is a concept that is usually seen in the corporate finance literature, and this reflects its importance for the company (Aktas et al., 2014). Studies have indicated that a significant part of the investment in working capital is unnecessary. Ek and Guerin (2011) have argued that there is a wide range of ways to improve the efficiency of working capital management in the majority of firms. Ernst and Young (2012) concluded that the amount of unnecessary and operational working capital for thousand American companies in 2011 has been between 330 to 590 billion dollars (between 3 to 6 percent of their sales). Also, Buchmann et al. (2008) emphasized that the net power of operational working capital as a potential source of cash to increase the funds available to the company often will be ignored by companies.

Numerous theoretical justifications are provided in the literature already in existence to comprehend the connection between working capital and business performance (Rostaminasab and Jalaei, 2023). Therefore, it is anticipated that increased investment will benefit working capital, particularly for businesses with limited working capital. This is due to working capital, which enables businesses to boost sales and profitability. On the other hand, additional investment in working capital can be a source of adverse effects and destroy shareholder value. The increase in working capital requires additional financing, which in turn includes financing costs and opportunity (Kieschnick et al., 2013). Thus, companies with a large working capital in their balance sheets are potentially faced with higher interest expense, risk, and bankruptcy. Wang et al. (2013) indicated that a decrease in the net working capital of the firm is required to increase its cash holdings. Thus, there is a replaced relationship between the Net working capital and cash holdings.

Research literature

Mun and Jang (2015), in research entitled "Working Capital, cash holding, and Profitability of restaurant firms," investigates the impact of restaurant firms' working capital on their profitability. This study reveals that a firm's cash level is an important factor for efficient working capital management. The results suggest that interactive effects exist among working capital, cash levels, and profitability.

Kroes and Manikas (2014), in research entitled "Cash flow management and manufacturing firm financial performance: A longitudinal perspective," concluded that changes in the widely used Cash Conversion Cycle (CCC) metric do not relate to changes in firm performance; however, changes in the less used Operating Cash Cycle (OCC) metric are found to be significantly associated with changes in Tobin's q.

Gomes (2013) in his research investigated the relationship between working capital management (WCM) and a firm's profitability in Portugal for the period from 2004 to 2009. Results showed that there is a concave relationship between WCM and profitability, indicating that firms have an optimal working capital level where firms should stand to maximize profitability.

Yahyazadeh et al. (2014), in their research entitled "On the relationship between working capital and profitability in listed firms of the Tehran Stock Exchange," investigated the relationship between working capital and profitability in listed firms of the Tehran Stock Exchange. The results showed that there is no nonlinear relationship between working capital and profitability. This shows no optimal level of capital flow in which the profitability is maximum. Furthermore, the results of research in automobile, chemical, and non-metal minerals show a nonlinear relationship between working capital and profitability.

Vaez et al. (2013) investigated factors affecting working capital management in Tehran Stock Exchange firms. The results of the study showed that there is a negative and significant relationship between profitability, leverage, and capital expenditure with the cash conversion cycle, and there is a positive and significant relationship between GDP and the cash conversion cycle.

Baharmoghadam et al. (2011), in research entitled "Surveying the effect of auditor type on the value relevance of earnings in the accepted company in Tehran Stock Exchange," investigated the effect of auditor type on the value relevance of earnings in accepted companies in Tehran Stock Exchange. The findings of this study indicated that there is a significant relationship between operational efficiency in working capital management and profitability. Also, in regard to variables of control, liquidity, and firm size, a significant positive relationship was found between these two variables and profitability.

The results of this study can be considered in other countries.

In Sri Lanka, Jayarathne, T.A.N.R finds that profitability is negatively associated with the account receivable period, inventory turnover period, and cash conversion cycle. This study is based on the data during 2008-2012 on listed manufacturing companies in the Colombo Stock Exchange.

In India, Rabindra Kumar Swain P.G and Utkal University, Vani Vihar, Bhubaneswar, by using a sample of 500 manufacturing firms for a period from 2005-2017

Find that Growth Opportunities, Leverage, Cash Flow, Dividend, Net Working Capital, R&D Expenditure, and Profitability positively affect cash holdings, whereas Firm Size, Assets, Tangibility, and Interest Expenses negatively affect cash holdings.

In Nigeria, Uguru, Leonard, Chukwu, and Elom, by using the sample of Nigerian Breweries Plc and Guinness Nigeria Plc for 2006 to 2014 Determined the management of the number of days account receivables are outstanding, number of days inventory held, and cash conversion cycle are significant factors in the accomplishment of the profitability objective firms in Nigeria. It was recommended to reduce heavy investments in current assets to avoid high inventory costs and excess cash holdings, and account receivables.

In Pakistan, Alina Masood and Peshawar Attaullah Shah's research findings imply that managers of firms do not misuse cash when more monitoring and control is involved by the shareholders. The results also indicate that cash holdings by the firms are maintained for the dividend payments. Finally, debt and working capital act as a cash substitute for firms which leads to less cash holdings.

In Saudi Arabian Research done by Abdul Rahman Shaik on 100 companies from nine industrial sectors listed on the Tadawul Stock Exchange starting from 2008 to 2019 Appointed a positive and significant association between the components of working capital in terms of cash conversion cycle and the firm profitability in terms of ROA, ROE, and Tobin's q, except for the GROU, where there is a negative and significant relationship. The study reported that the growth in firm performance is associated with suppliers' financing terms and inventory ordering costs. The results also showed that larger firms are more profitable than smaller firms.

Research Hypothesis

With regard to the material presented in previous sections, the following hypotheses are proposed:

Main first hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on assets.

1-1- There is a significant relationship between firm working capital and return on assets.

1-2- There is a significant relationship between cash holdings and return on assets.

Main second hypothesis: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

1-3- There is a significant relationship between firm working capital and return on capital.

1-4- There is a significant relationship between cash holdings and return on capital.

Materials and Methods

The present research aims to investigate the relationship between financial variables of working capital, Cash holdings, and profitability. In this research, the average collection period, the average inventory turnover duration, the average debt payment period, and the free cash flow of the firm are independent variables, and return on assets and return on capital are dependent variables. Also, Firm size and financial leverage are control variables. Because the present research results can be used in the decisions of managers, investors, analysts, and banking participants, the present research is applied to the research aim. Also, concerning the inference method about research hypotheses, the present research is descriptive-correlational because the regression and correlation techniques will be used to discover relations between research variables. To analyze the hypotheses, Eviews software is used. In each of the models fitted, several tests were also conducted.

Statistical population and sample

the statistical population of the present research includes listed companies in Tehran Stock Exchange. In this study, the sample will be selected through the systematic elimination method of the statistical population, that are 41 branches. In this research, considering a limited number of population companies, the sample has been based on the population. In this research, the selected samples were 77 companies. Data for this research has been collected by using the companies listed on the Tehran Stock Exchange from the beginning of 2014 to the end of 2019. In this research, to test the hypothesis was used multiple regression analysis with the method of mixed data with fixed effects.

Research models and variables

Main first hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on assets.

$$ROA = \alpha_0 + \beta_1 ACP + \beta_2 ITID + \beta_3 APP + \beta_4 FCF + \beta_5 Size + \beta_6 FL + \varepsilon$$

Main second hypothesis: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

$$ROE = \alpha_0 + \beta_1 ACP + \beta_2 ITID + \beta_3 APP + \beta_4 FCF + \beta_5 Size + \beta_6 FL + \varepsilon$$

In which:

ROA: return on assets

ROE: return on capital

ACP: average of the collection period

ITID: Average inventory turnover duration

APP: Average of the debt payment period

FCF: Free cash flow of the firm

Size: firm size

FL: financial leverage

Research findings

Descriptive statistics:

Table 1 mentions the Mean, Median (central criteria), standard deviation, maximum, and minimum (dispersion parameters).

Table 1: Descriptive statistics of studied variables

Research variables	Mean	Middle	Max	Min	SD
ROA	0.61	0.06	67.74	-21.47	4.19
ROE	0.26	0.27	10.48	-16.04	1.22
ACP	150.53	117.93	1302.26	0	3.23
ITID	33.82	16.37	794.93	0	9.89
APP	66.86	43.2	575.46	0	9.13
FCF	0.22	0.13	1.85	-10.78	0.78
Size	13.84	13.68	18.45	10.08	1.49
FL	0.68	0.67	1.02	0.26	0.165

Inferential statistics

First model test

In order to the estimation of the model coefficients related to the research hypothesis test is used the Chow test and f Limer test are used to determine the method of combined data. Based on Table 3, the result of the Chow test shows that F-statistic is less than 0.05.

Table 2: Chow test result

Null hypothesis	F statistic	Significance level	Chow test result
The use of combined data model	6.48	0.000	The null hypothesis is rejected

Table 3: Test results of main first hypotheses and its sub-hypotheses

Null hypothesis	Chi-square statistic	Significance level	Chow test result
The use of random effects model	139.278	0.000	The null hypothesis is rejected

With regard to Table 4, a significant level of the Hausman test is less than 5%. Thus, to estimate the mentioned model coefficients is used the fixed effects model.

Table 4: Test results of main first hypotheses and their sub-hypotheses

Variable	Significance level	t-statistic	Coefficients	standard error
Fixed value	0.000	-10.98	-30.91	2.81
ACP	0.000	-4.26	-0.53	0.014
ITID	0.0391	-2.27	-0.43	0.015
APP	0.000	-3.36	-1.02	0.021
FCF	0.0113	12.98	12.35	6.60
Size	0.0056	2.87	0.21	0.075
FL	0.0006	-3.45	-2.76	0.80
Determination coefficient	0.789	F statistic	17.28	
justified determination coefficient	0.743	Significance level of F statistic	0.000	
Durbin-Watson	1.82	LS method		

In the above model, when β_1 and β_2 are significant, the first hypothesis is confirmed, and when β_4 is significant, the second hypothesis is confirmed. With regard to Table 4, because the t-statistic for the average collection period, average inventory turnover duration, average debt payment period, and free cash flow of the firm has been more than +1.965, and the significant level is less than 0.05, thus, there is an inverse and significant relationship between average of collection period, average of inventory turnover duration, average of debt payment period and free cash flow and profitability of listed companies in Tehran Stock Exchange. Thus, the first hypothesis of this study is confirmed. Furthermore, there is a positive and significant relationship between free cash flow and the profitability of listed companies on the Tehran Stock Exchange. As a result, the second hypothesis of this study is confirmed.

Also, control variables of firm size have a positive relationship with profitability, and Financial Leverage has an inverse relationship with the profitability of listed companies in the Tehran Stock Exchange (T-statistic is higher than 1.965, and the significant level is less than 0.05).

Dorbin-Watson's statistic of the model is between 1.5 and 2.5. Also, the significance level of the F-statistic is 0.000, which is less than 0.05 and indicates that model is significant. Furthermore, the adjusted determination coefficient in the model is 74 percent, which indicate 74 percent of changes in the dependent variable explained by the independent and control variables.

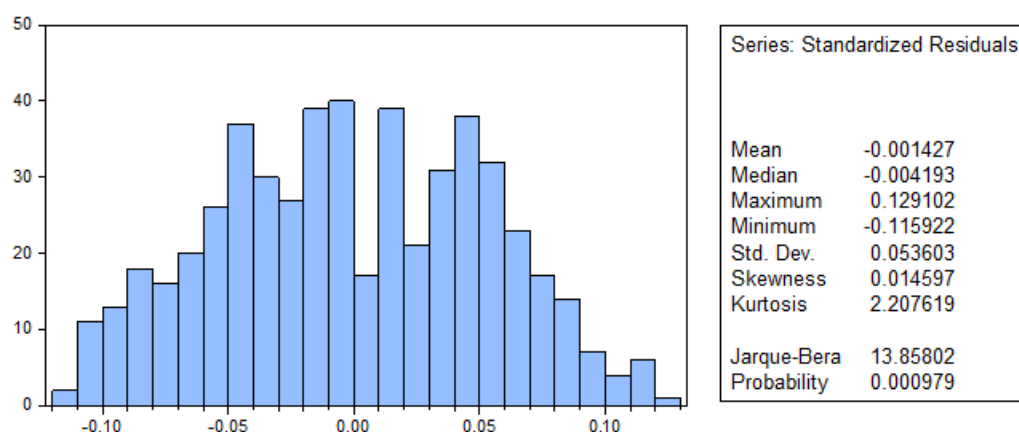


Fig. 1: Scatter plot of residuals

Test results of main second hypotheses and its sub-hypotheses

Main second hypothesis: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

1-5- There is a significant relationship between firm working capital and return on capital.

1-6- There is a significant relationship between cash holdings and return on capital.

To estimation of the model coefficients related to the research hypothesis test is used the Chow test and f Limer test are used to determine the method of combined data. The results of the test are mentioned in table 5.

Table 5: Chow test result

Null hypothesis	F statistic	Significance level	Chow test result
The use of combined data model	21.965	0.000	The null hypothesis is rejected

Table 6: Test results of main second hypotheses and its sub-hypotheses

Null hypothesis	Chi-square statistic	Significance level	Chow test result
The use of random effects model	109.981	0.000	The null hypothesis is rejected

With regard to Table 6, a significant level of the Hausman test is less than 5%. Thus, to estimate the mentioned model coefficients is used the fixed effects model.

Table 7: Test results of main second hypotheses and its sub-hypotheses

Variable	Significance level	t-statistic	Coefficients	standard error
Fixed value	0.000	5.09	0.543	0.106
ACP	0.000	4.42	0.0004	0.0001
ITID	0.000	-5.91	-0.002	0.0003
APP	0.000	-4.3	-1.001	0.0003
FCF	0.618	0.49	0.009	0.019
Size	0.039	-2.07	0.016	0.008
FL	0.699	0.39	0.046	0.118
Determination coefficient	0.42	F statistic	3.4	
justified determination coefficient	0.30	Significance level of F statistic	0.000	
Durbin-Watson	2.3	LS method		

In the above model, when β_1 and β_3 are significant, the third sub-hypothesis is confirmed, and when β_4 is significant, the fourth sub-hypothesis is confirmed. With regard to Table 7, because the t-statistic for the average of the collection period and the average of the debt payment period has been more than +1.965 and the significant level is less than 0.05, thus, there is a significant relationship between the average of the collection period, and Return on capital of the listed companies in Tehran Stock Exchange. Thus, the third sub-hypothesis of this study is confirmed. Furthermore, there is not a significant relationship between free cash flow and the return on capital of listed companies in the Tehran Stock Exchange. As a result, the fourth sub-hypothesis of this study is confirmed.

Dorbin-Watson's statistic of the model is between 1.5 and 2.5. Also, the significance level of the F-statistic is 0.000, which is less than 0.05 and indicates that model and second sub-hypothesis are significant. Furthermore, the adjusted determination coefficient in the model is significant.

Conclusions

In this study, research hypotheses were tested based on the collected data from 77 companies listed in Tehran Stock Exchange during the years from 2014 to 2019 by using the hybrid regression analysis. Initially, descriptive statistics were presented for the dependent, independent, and control variables. Then, two main hypotheses were tested. Coefficients significant test results based on the fitted regression equations indicated that there is a negative and significant between working capital and profitability, and there is a negative and significant between cash holdings and profitability and companies listed on Tehran Stock Exchange. Comparing the results of this study with similar studies is presented in three parts.

- There is a significant relationship between working capital management and cash holdings and profitability. The results of this research are consistent with studies of Rezazadeh and Heudarian (2010), Safari (2010), Ardakanian (2009), Ran (2012), Graham et al. (2011), Gill et al. (2010), Yar (2009), Padachi (2006), Delouf (2003). These researchers concluded that the impact of working capital management on investigated companies' profitability is significant and negative. The conversion cycle to cash as a measure of working capital management has a significant and negative on working capital management. Components of the conversion cycle to cash which include the accounts receivable collection period, inventory turnover period, and the period of delay in the payment of accounts payable, have a significant and negative effect on companies' profitability. This means that by managing inventories effectively and cutting the time it takes for accounts receivable to be collected, businesses can increase their level of profitability. Additionally, the shorter payment suspension periods boost the business's profitability. Overall, research findings showed that businesses' profitability is significantly impacted by how effectively they manage working capital and its many components. Additionally, the findings showed that investing in working capital management practices and improving their effectiveness with standard procedures are crucial for businesses to be profitable. Companies must consider working capital management in the process of their financial planning. Studies results by Nasiri et al. (2014), and Manouchehri (2013) showed that there is a significant relationship between companies' liquidity and profitability.
- There is a significant relationship between working capital management, cash holdings, and return on assets. The results of this research are consistent with studies of Yazdani and Gholipour (2013), Baharmoghadam et al. (2011). Man et al. (2015). Yazdani and Gholipour (2013) indicated that the cash conversion cycle has a significant and inverse relationship with the return on assets. Baharmoghadam et al. (2011) showed that liquidity and firm size have a significant and positive relationship with the return on assets. Man et al. (2015) indicated that there are interaction effects between liquidity and return on assets.
- There is a significant relationship between the average debt collection period, cash holdings, and return on capital. Concerning the significant relationship between the average debt collection period, cash holdings, and return on capital in Tehran Stock Exchange, some of the results have adverse results with this study. The results of this research are consistent with the research of Yazdani and Gholipour (2013). Yazdani and Gholipour (2013) concluded that the cash conversion cycle has a significant and inverse relationship with the return on equity.

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