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Impact of Cash Holdings on Return on Assets of Companies Listed on the Tehran Stock Exchange

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Abstract

This study aims to investigate the impact of cash holdings on the return on assets (ROA) of companies listed on the Tehran Stock Exchange. This research is categorized as a descriptive accounting study. From a purpose-oriented perspective, it is applied research, and methodologically, it employs a correlational–regression approach. The statistical population comprises all companies listed on the Tehran Stock Exchange between 2010 and 2015. A sample of 102 companies was selected using the purposive elimination method. Data analysis was performed using the PLS2 technique. The results of the structural equation modeling indicated that the significance level between cash holdings and return on assets is 0.000, which confirms a significant relationship between the two variables at a 0.05 error level. Therefore, it can be concluded that cash holdings have a significant impact on the return on assets of companies listed on the Tehran Stock Exchange. Moreover, based on the factor loadings, this relationship is found to be direct.

Keywords: Cash Holdings, Return on Assets, Tehran Stock Exchange, Structural Equations.

Introduction

Return on assets (ROA) is a measure of a firm's performance that is unaffected by interest expenses and taxes. This ratio excludes the effects of financial structure and tax rates, emphasizing the operational performance of the entity, and is thus a reliable metric for intra-firm comparisons. It typically exhibits greater stability in terms of internal elements (Ashrafi Shahri, 2016, p. 152). Return on equity (ROE), also referred to as return on net worth, indicates the profitability of the capital invested in the company. This ratio serves as an important metric for demonstrating the efficiency of the deployed capital and is regarded as a key indicator of the firm's "effectiveness." Hence, it is sometimes referred to as the "effectiveness ratio" (Bashiri, 2013, p. 153). In essence, ROE reflects the returns earned by investors for each unit of investment, and it serves as an index for shareholder value within the entity (Nowo, 2011, p. 53). It should be noted that the calculated return in this context pertains to all resources belonging to shareholders. Consequently, ROE includes not only the company's capital but also retained earnings and other reserves (Sehat et al., 2011). Given that not all assets of a business entity are financed by shareholders' equity, the return on assets does not necessarily reflect returns generated for shareholders. In order to determine shareholder returns, a portion of the resources used to finance assets must be deducted.

On the other hand, managers aim to maintain an optimal level of cash holdings as a defensive measure against potential losses. Cash enters the firm through product sales, asset sales, and new financing. Since cash inflows and outflows do not occur simultaneously, a certain level of cash is required to act as a buffer. Due to the growing prevalence of electronic transactions and non-paper-based payment mechanisms, the transactional necessity for holding cash may diminish. Nevertheless, there is still demand for liquidity, which must be managed effectively (Azimi & Shah Mohammadi, 2014). The motivations behind holding cash are of significant importance, as cash is both the most liquid asset and the least profitable one for firms. In a favorable economic environment, holding large amounts of cash may not be necessary due to the opportunity cost associated with it. However, in uncertain

or adverse economic conditions, maintaining an appropriate level of cash becomes essential to cope with potential risks. The level of cash holdings is a critical factor in cash management (Mun & Jan 2015).

Transaction cost theory explains why firms hold excess cash to reduce transaction costs; because lack of liquidity means they have to borrow cash at a higher interest rate or lose business opportunities, so they try to keep their cash at an optimal level. One of the ways that firms can secure their cash is by converting working capital into cash during operations. For this reason, it can be said that for firms that hold cash and whose working capital is positive, the more cash they hold, the less they expect to convert their working capital into cash during operations and have desirable profitability. Balancing the level of cash held can affect the profitability of the firm (Mun and Jan 2015).

When a firm engages in operational activities, it must maintain a balance between liquidity and profitability. Liquidity ensures the firm can meet its obligations and reflects continuous operation. Liquidity and profitability are both critical concerns for financial management practitioners and theorists. Ignoring profitability may threaten the firm's long-term viability while overlooking liquidity may lead to the inability to repay debts and potential bankruptcy (Keshtavar & Fazel Yazdi, 2013). Based on the above, this study aims to examine the impact of cash holdings on the return on assets of companies listed on the Tehran Stock Exchange.

Theoretical Foundations of the Research

Return on Assets (ROA)

A company’s performance is related to its ability to generate profit or, more generally, to maximize profitability. Therefore, profitability indicators are widely considered as measures of performance (Maama, 2016). Various indicators used to assess a company’s profitability include: the break-even point, net profit margin, return on assets (ROA), return on equity (ROE), net return, cost structure, and others (Gill, 2010). The most common ratios used are ROA, ROE, and net profit margin (Rostami, 2014).

Return on assets is a measure of business performance that is not influenced by interest and tax expenses. This ratio eliminates the effects of financial structure and tax rate and focuses on the operational performance of the business unit. As such, it is a suitable metric for internal company comparisons. This ratio shows greater stability in terms of internal elements (Izadinia, 2010). It indicates the efficiency of management in utilizing available resources to earn profits and is one of the profitability ratios in which the source of profit is analyzed concerning the source from which it was obtained, rather than in absolute terms (Kheiralahi, 2016). If additional assets are used in operations, it is equivalent to an increase in operating costs. One of the significant advantages of the ROA formula is that it prompts managers to control operating assets and continuously manage costs, net profit margin, and sales volume (Sehat et al., 2011). ROA emphasizes that it is not just investment that matters, but the return a company generates, which alongside other factors, creates value for shareholders (Gharabiglou, 2016, p. 20).

In this study, changes in operational performance within companies and industries are examined according to levels of working capital. In other words, the direct and actual impact of accounts receivable, inventory, accounts payable, cash, and current liabilities on operational performance—rather than market expectations of their effects on firm value—is investigated.

Cash

The term liquid assets is used to describe cash and assets that are easily converted to cash. It can be said that different assets exhibit different degrees of liquidity. Money itself is the most liquid asset, other assets have different degrees of liquidity, which depend on how easily they can be converted to cash. Apart from cash, other assets have two dimensions: 1. The time required to convert them to cash, 2. The degree of certainty that they will be converted to cash, or the price paid to convert the asset to cash (Dastgir, 2011).

One of the important criteria in determining working capital is liquidity management, which refers to a company’s ability to generate cash. While current and quick ratios, as well as liquidity ratios, are traditional and useful indicators of liquidity, they do not provide a complete picture of working capital management. Due to the limitations of traditional liquidity ratios, research suggests using continuous liquidity measures in managing

working capital. The continuous liquidity measure refers to the inflows and outflows generated by the company through the procurement of raw materials, production, sales, and the process of receivables collection. This measure is a function of the cash conversion cycle (Yousefzadeh & Azami, 2015).

Maintaining cash and managing working capital, as part of short-term financial decisions, can lead to greater financial flexibility and enable management to allocate resources more effectively. These decisions ultimately lead to maximizing shareholder wealth and increasing investment returns. One of the most important models for determining firm value is the present value of the future cash flows model. According to this model, the firm's value is a function of the present value of future cash flows and the terminal value of the firm at liquidation. In this model, free cash flow is a function of changes in working capital. Thus, the firm's value depends on working capital and how it is managed in the future. Working capital management can affect free cash flows and also the cost of capital (Samadi & Imeni, 2012).

Cash management aims to maximize accessible cash flows and interest income from surplus cash. On one hand, the process begins when a customer writes a cheque to the company to settle their debt. On the other hand, it ends with payments to suppliers, employees, and the government for accounts payable. All activities between these start and end points fall within the scope of cash management. A company's efforts to encourage timely payment of invoices fall under receivables management. Conversely, the company's decisions regarding the timing of paying its bills are part of current liabilities management (Dastgir, 2011).

Cash management strategies are based on two main objectives: 1. Ensuring cash availability for company payments, 2. Minimizing idle cash .These two goals may conflict, and a balance must be struck between them. Nevertheless, fulfilling payment obligations on time is more important than minimizing idle cash (Tehrani, 2011). Budgeting for cash is a key factor in cash management. Moreover, techniques are employed to accelerate cash inflows and slow down cash outflows (Tehrani, 2011).

Literature Review

Autukaite and Molay (2014) investigated the effect of cash holdings and working capital management on firm value in the French stock exchange. They concluded that although companies make short-term decisions daily, firm value is a matter that belongs to long-term strategic planning.

Sami (2016) examined the impact of cash holdings on corporate profitability. The results indicated a significant positive relationship between cash holdings and profitability. This means that strong financial performance is a result of the cash reserves held by large firms. The positive correlation reflects the belief of Jordanian managers that poor liquidity management leads to cash shortages and payment difficulties, ultimately harming profitability.

Mun and Jan (2015) explored the relationship between working capital, cash holdings, and profitability. The primary aim of this study was to assess the effectiveness of working capital management in overcoming financial crises and economic uncertainties. The results revealed a strong U-shaped negative relationship between working capital and corporate profitability, suggesting an optimal level of working capital for firms. Another key finding was that cash level is a significant factor in effective working capital management, acting as a moderating variable. Additionally, the study found dynamic relationships between working capital, cash, and firm profitability.

Khan et al. (2016) examined the relationship between working capital management, financial constraints, and profitability in textile companies listed in Pakistan from 2005 to 2014. The results showed that firms facing greater (or fewer) financial constraints tend to have shorter (or longer) net operating cycles. Moreover, the study found an inverse U-shaped relationship between investment in working capital and firm performance. Based on empirical evidence, financial managers should maintain an optimal level of working capital to maximize profitability, as excessive investment beyond the optimal point can negatively affect returns.

Afrifa (2016) analyzed the role of cash flow in the relationship between net working capital and firm performance. The findings suggested that firms with limited cash flow should aim to reduce their investment in working capital, while firms with accessible cash flow should consider increasing working capital investment to improve performance.

Sheu et al. (2012) studied the role of working capital management in enhancing firm profitability and ensuring sufficient liquidity. The extended hypothesis results showed that profitability and liquidity variables reinforce each other positively in some sectors, while a trade-off exists in others. The study also found a negative relationship between the cash conversion cycle and net operating profit, and a positive relationship between the current ratio and net operating profit, suggesting that liquidity and profitability reinforce one another beyond the predictions of traditional working capital theory. Ultimately, the research concluded that the relationship between profitability and liquidity is not linear or concave but is influenced by the internal structure of different business units.

Lamptey et al. (2017) examined the impact of working capital management on the performance of small and medium-sized enterprises (SMEs) in Ghana, using annual financial reports from 2011 to 2015 across Accra, Ashanti, and Brong Ahafo regions. The findings indicated that the cash conversion cycle accounts receivable days and inventory days had a significant negative relationship with performance. Conversely, accounts payable days had a positive relationship with performance. It was concluded that effective working capital management significantly influences SME performance. These results imply that by reducing the cash conversion period, average days of accounts receivable, and average days of inventory turnover, small and medium-sized enterprises can increase their profitability. This research recommends that small and medium-sized enterprises should consider reducing the cash conversion period, average days of accounts receivable, and average days of inventory turnover, and should also consider negotiating favorable payment terms with their suppliers.

Foroughi et al. (2016) examined the effect of cash holdings and positive working capital on firm value in selected companies listed on the Tehran Stock Exchange. The aim was to assess how cash holdings and positive working capital affect firm value. The results of testing the research hypotheses show that, on the one hand, the level of cash holdings has a positive effect on the value of the company, that is, with an increase in the level of cash holdings, the value of the company increases and with a decrease in the level of cash holdings, the value of the company decreases, and on the other hand, positive working capital does not have a significant effect on the value of the company.

Method

This study belongs to the category of descriptive research in the field of accounting. In terms of purpose, it is considered applied research, and in terms of methodology, it is of the correlational-regression analysis type. The statistical population of this study includes all companies listed on the Tehran Stock Exchange during the period from 2010 to 2015. The research sample consists of 102 companies selected using a purposive (eliminative) sampling method. The criteria considered for selecting companies are as follows: The company must have been listed on the Tehran Stock Exchange before 2010, To increase comparability, the financial year must end in March, Required data to calculate the research variables must be available for the period under study, and the financial statements and explanatory notes must be fully accessible, The company must not be a bank or financial institution (including investment companies, financial intermediaries, holding companies, or leasing firms). The primary data required to identify working capital, cash holdings, and return on assets were collected from the Tehran Securities and Exchange Organization (SEO) database, audited financial statements, board of directors' reports, and the "Rahavard Novin" financial information software.

Research Variables

Dependent Variable

The dependent variable in this study is Return on Assets (ROA), calculated as:
ROA = Net Profit / Book Value of Total Assets

Control Variables

The control variables include firm size, Gross Domestic Product (GDP), sales growth, and financial leverage:

1. Firm Size: The natural logarithm of the company's total assets.
2. Gross Domestic Product (GDP):

GDP Growth= Gross Domestic Product (n)− Gross Domestic Product (n−1)/ Gross Domestic Product (n−1)

3. Sales Growth:

Sales Growth= Course sales (n) − Course sales (n−1)/ Course sales (n-1)

4. Financial Leverage:

Leverage=Total Liabilities/Total Assets

Dummy Variable

Cash holdings are considered as a dummy variable: 1 for positive cash level and 0 for negative cash level:

Cash=Cash Assets/Total Revenue

Table 1: Validity and Reliability for the Measurement Model

Variable	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Cash	0.719	0.770	0.640
ROA	0.835	0.950	0.829

Given that all variables have Cronbach's Alpha values above 0.7, the reliability is considered good. Composite reliability values are also above 0.7 for all variables, indicating acceptable consistency. Moreover, the AVE values exceed 0.5, confirming convergent validity (see Table 1).

Table 2: Discriminant Validity for the Measurement Model

Variables	Cash	ROA
Cash	0.814	
ROA	0.325	0.795

Table 2 shows that, since all values meet the standard thresholds, the results are acceptable.

Data analysis was conducted using multiple regression analysis with the aid of EViews and SmartPLS 2 software.

Research Model

As previously mentioned, this study investigates the effect of cash holdings on the return on assets of companies listed on the Tehran Stock Exchange. To assess this relationship, the research model proposed by the researcher—based on the literature and the model introduced by Mun and Jan (2015)—is employed:

$$ROA_{i,t} = \beta_3 * SIZE_{i,t} + \beta_4 * GROWTH_{i,t} + \beta_5 * GDP_t + \beta_6 * LEV_{i,t} + a_i + \varepsilon_{i,t}$$

Table 3: Operational Definitions of Variables

Variable Name	Operational Definition
Return on Assets (ROA)	Earnings before interest, taxes, and depreciation divided by total assets (Mashayekh et al., 2016)
Cash Holdings (CASH)	Dummy variable for cash level of firm *i* in year *t*: total cash and equivalents minus current liabilities; coded 1 for positive and 0 for negative levels (Mashayekh et al., 2016)
Firm Size (SIZE)	Natural logarithm of total assets (Mun & Jan 2015)
Sales Growth (GROWTH)	Year-over-year change in sales (Mun & Jan, 2015)
GDP Growth (GDP)	The annual GDP growth rate compared to the previous year (Mashayekh et al., 2016)
Financial Leverage (LEV)	Total liabilities divided by total assets for firm *i* in year *t* (Mashayekh et al., 2016)

Findings

A summary of the descriptive statistics related to the variables used in this study is presented in Table 4. The reported statistics include central tendency indices such as the mean and median, and measures of dispersion such as variance and standard deviation of the variables employed in the research.

Table 4: Descriptive Statistics

Variable	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque–Bera	Prob.
Return on Assets	0.401	0.38	1.38	-0.43	0.30	2.85	0.010	6539	0.000
Cash Holding	0.71	1	1	0	0.45	1.86	-0.932	120	0.000
Firm Size	4.78	5.01	6.9	0.10	1.14	8.39	-2.06	1166	0.000
Sales Growth	177608	180303	331941	2837	53657	3.14	-0.17	368	0.000
GDP Growth Rate	0.01	0.02	0.81	-0.93	0.29	2.96	0.036	516	0.000
Financial Leverage	1	1.04	1.44	0.02	0.24	8.39	-2.07	1171	0.000

According to Table 4, the main central tendency index is the mean, which indicates the equilibrium point and the center of the distribution. It is an appropriate indicator for showing the centrality of the data. For example, the mean of the return on assets variable is 0.401, indicating that most of the data for this variable are concentrated around this point. The results also indicate that among the research variables, the GDP growth rate has the least fluctuation and dispersion during the study period based on the coefficient of variation (standard deviation divided by the mean), implying that the GDP growth rate has had relatively low stability and consistency.

Before analyzing the research data, the stationarity of the variables is examined. Stationarity means that the mean and variance of the variables over time and their covariance across different years are constant. Thus, using these variables in the model will not lead to spurious regression. For this purpose, the unit root test was conducted, and the results are presented in Table 5.

Table 5: Unit Root Test Results

Variable		Levin, Lin & Chu	Im, Pesaran & Shin	ADF-Fisher
Return on Assets	Relevant statistics	35.44	9.03	443.22
	Sig.	0.0000	0.0000	0.0000
Cash Holding	Relevant statistics	-11.52	-3.00	130.234
	Sig.	0.000	0.0013	0.0002
Sales Growth	Relevant statistics	-23.77	-6.05	371.44
	Sig.	0.0000	0.0000	0.0000
Firm Size	Relevant statistics	-39.96	-7.14	371.90
	Sig.	0.0000	0.0000	0.0000

As shown in Table 5, the p-values of all dependent and independent variables are less than 0.05, confirming that all variables are stationary.

Table 6: Results of Goldfeld–Quandt Test and White Tests for Heteroskedasticity

Test Type	Test Statistic	Prob. Value	Conclusion
Breusch–Pagan–Godfrey	32016.78	0.004	Homoskedastic residuals
Goldfeld–Quandt	113.649	0.007	Homoskedastic residuals

The results of the two tests above indicate that the residuals of the fitted model have constant variance; therefore, the estimated coefficients are efficient (Table 6).

The results obtained from the analyses of path coefficients and the R^2 criterion confirm the significance and strength of the effects of each independent variable on the dependent variable. Chart 1 shows the structural equation model based on path coefficients.

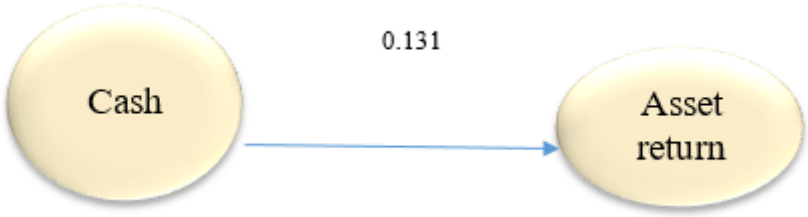

Chart 1: Structural Equation Model Based on Path Coefficients

The most basic criterion for evaluating relationships between constructs in the model (structural section) is the T-value. If the T-values exceed 1.96, 2.58, and 3.27, it indicates the validity of the relationships and, consequently, supports the hypotheses at confidence levels of 95%, 99%, and 99.9%, respectively. The T-test results are shown in Chart 2, which confirms the research hypotheses at the 95%, 99%, and 99.9% significance levels.

Chart 2: Structural Equation Model Based on T-values

Table 7: Results of the Second Model

Relationship Type	Factor Loading	T-value	Relationship
Direct (Significant)	0.131	4.776	Cash Holding → Return on Assets

Table 7 presents the structural equation modeling results for the second model. The significance level is 0.000, indicating statistical significance at the 0.05 error level. Therefore, it can be stated that cash holding has a significant effect on the return on assets of listed companies on the Tehran Stock Exchange. Additionally, the factor loading indicates that this relationship is positive and direct.

Conclusion

The present study aimed to examine the effect of cash holding on the return on assets of companies listed on the Tehran Stock Exchange. The structural equation modeling showed a significance level of 0.000, indicating a statistically significant relationship between the two variables at the 0.05 error level. Therefore, it can be concluded that cash holding has a significant and direct impact on the return on assets of listed companies. This finding is consistent with the results of Seyed Yasin Tavakkoli (2011) and Mehdi Bozmehrani (2011).

Given the significant effect of cash holding on the return on assets of companies listed on the Tehran Stock Exchange, it is recommended that firms pay careful attention to maintaining an appropriate level of cash. Holding excessive cash may lead to reduced purchasing power and increased agency costs for the company. Conversely, insufficient cash holdings may result in missed investment opportunities and negatively affect profitability. Moreover, the damage from holding excess cash and the resulting costs may outweigh the costs of maintaining low levels of cash. Cash flow is a fundamental tool for company evaluation and a powerful mechanism for

analyzing firm value. It also plays a central role in many financial decisions. Therefore, it is recommended that cash management be conducted by professionals in this field.

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