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Value of financial flexibility and quantitative aspects of net working capital: Evidence from Tehran Stock Exchange

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Abstract

The value of the financial flexibility factor is less addressed by the academic literature. This value is not directly visible to companies and should be measured and tested. This paper investigates the relationship between the value of financial flexibility, investment efficiency in net working capital and speed of adjustment of net working capital. This is an applied descriptive-correlational paper. The data were analyzed using the statistical population including 100 companies listed in the Tehran Stock Exchange for the period of 2005 to 2020. The multivariate linear regression method was used to test the research hypotheses. The results of the estimation of the regression model showed that there is a positive significant relationship between the value of financial flexibility and investment efficiency in net working capital and the speed of adjustment of net working capital. In addition, considering the value of financial flexibility factor in investment decisions can lead to more efficient investment opportunities and more optimal working capital policies for the company.

Keywords: Value of financial flexibility, Investment efficiency in net working capital, Speed of adjustment of net working capital
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1 Introduction

Understanding the financial decisions of companies is considered an important challenge in economic and financial research. During the past decades, approaches such as agency cost and market inefficiency have been presented to understand financial decisions. However, empirical evidence about financial decisions shows that there is a less addressed factor, namely financial flexibility. In fact, financial managers believe that financial flexibility is the first effective variable in making decisions about the company's financial policies [8, 25, 38].

Financial flexibility affects the way companies design redeemable and convertible bonds [43]. As a result, company managers in Europe and The US consider financial flexibility as the most important factor in financial decisions [11, 26].

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This value becomes more important, especially in recession conditions caused by negative shocks to the company's income, the reduction of the company's shares and capital and the shortening of commercial bonds [1, 9].

Contrary to financial flexibility studies, many aspects of working capital have been investigated in the financial literature because the working capital and net working capital components include a large part of the company's assets. Previous studies showed that investment in working capital is less than optimal and companies usually ignore the role of working capital as a potential source for company growth [4]. However, there are many methods to improve working capital efficiency [15].

On the other hand, working capital can serve as a source of liquidity for the company and provide a way to avoid relying on other alternative internal financial reserves. Faced with fluctuations in cash flows used to invest in fixed assets, companies can smooth such high fluctuations by using working capital [14]. The relationship between cash and inventory has also been investigated in many recent empirical studies [11, 21]. If the level of liquidity is less than cash, accounts receivable can be used as a substitute for cash to finance customers (credit sales) to increase sales and profitability, or the company can encourage customers to pay earlier to increase working capital efficiency [27]. Therefore, it is reasonable to argue that there are internal relationships between the components of working capital, net working capital, the level of internal financial flexibility and also the value of financial flexibility.

The company's efficient investments in working capital increase performance and reduce the company's risk, which, as a result, reduces the cost of the company's capital. The lack of internal financial resources can force the company to underinvest in working capital components. Therefore, there is an obvious relationship between the value of financial flexibility and the efficiency of investment in working capital. Working capital can help the company as a source of internal financial flexibility [4, 26]. Unnecessary and additional levels of working capital can be used to increase internal flexibility (cash reserves) for other investments. In addition, companies can take advantage of the commercial credit offered by suppliers and other short-term financing methods in addition to using cash.

Accordingly, the following questions can be asked in this research:

1. What effect does the value of financial flexibility have on investment efficiency in net working capital?
2. What effect does the value of financial flexibility have on speed of adjustment of net working capital?

2 Theoretical foundations and the literature review

The literature has not provided a criterion for measuring the "value of financial flexibility" and only [23] have provided a theoretical framework for defining and calculating the value of financial flexibility. So far, this framework has not been used practically. Therefore, considering the importance of financial flexibility in financial decisions, it is necessary to correctly define it operationally and calculate it so that its impact on financial decisions can be examined.

Today, in all business units, working capital accounts for the majority of the company's capital, and accordingly, working capital management is one of the important duties of the financial manager of the company and plays an important role in achieving goals and policies, and the success of the company. Today, companies cannot continue their activities without working capital. Another important issue regarding working capital investment is that the investment made, like other investments, must be a necessary performance asset to increase the value of the company.

On the other hand, the speed of adjustment of net working capital towards the target is also an important factor that should be taken into account. However, until now, researchers have rarely addressed this issue, and more examined long-term financial policies such as capital structure, distribution profit, cash retention and external financing. Therefore, investigating the impact of the value of financial flexibility on the efficiency of investment in working capital and the speed of adjustment of net working capital is a research gap that can lead to the improvement of managers' financial decision-making and cause a noticeable increase in the value of the company.

2.1 Financial flexibility

As an important and effective factor in financial decisions, companies can achieve financial flexibility by using many methods. One of the most common and effective ways to meet the company's financing needs is to rely more on internal financial sources such as cash flows and cash holdings [22]. Companies that have limited external financing rely more on internal cash flows for investment expenses [13]. Also, more cash reserves reduce the problem of underinvestment, especially for companies with more growth opportunities and companies with high cash flow volatility [12, 34]. However, flexibility through cash reserves gives decision-making power to managers, and managers may not use these funds in line with the interests of investors, causing the problem of over-investment and free cash flow agency costs. become

[24]. In addition, companies that are members of business groups with less cash holdings can also benefit from their ability to transfer resources from investing in less efficient sectors to investing in more efficient and more profitable sectors [32]. In addition to cash reserves, financial flexibility can also be achieved through changes in the dividend policy. Managers can save cash by reducing profit distribution to improve the company's ability to invest in long-term profitable projects [7].

2.2 Working capital literature

The working capital literature is classified into several main categories as follows. The first category includes the determining factors of each component of working capital and the impact of those components on the performance and value of the company. There is also a long list of studies about business credit, including factors affecting business credit [19], business credit and stock returns [32], business credit and bankruptcy risk [3], business credit as an advocacy title for the market [41]. Similarly, some recent studies on inventory include investment in inventory and firm performance [5], investment in inventory and cost of capital [32], inventory and stock price. [33], inventory and company risk management [6]. Another related literature considers the specific value of each component of working capital. For example, [28] reported a positive relationship between the demand for trade credit (through accounts receivable and as financing) and excess stock returns, and investors value accounts receivable for companies without financial constraints are valued less, this implies that investors consider the demand for trade credit as a substitute for cash, because if accounts receivable is a substitute for cash, its value should increase with increasing financial limit. [29] provided evidence on market valuation of accounts payable. The results showed that there is a positive relationship between accounts payable and shareholder value, but the market valuation of accounts payable is lower than cash. [6] showed that shareholders attribute a positive value to any excess value in inventory, but this valuation is lower than cash or accounts receivable, and the effect of inventory maintenance on stock wealth is strengthened by increasing the financial limit.

In addition to studies on the working capital adjustment speed [20], [4] provided evidence of a curvilinear relationship between investment in working capital and firm performance and showed that the optimal level of working capital for companies with financial constraints is lower than companies without financial constraints. [1] showed that when the level of working capital is closer to the optimal level, stock performance and operating performance increase, and the decrease in net working capital is used to finance investments. Moreover, it becomes fixed like cash purchases and capital expenditures in the coming year. The evidence of [21] shows that the shareholders reward the shares of companies with a bold working capital policy by holding more shares of that company in economic cycles, especially in fluctuating and declining market cycles.

2.3 Foreign literature

[9] examined the relationship between financial constraints and optimal working capital using a sample of 17,161 Indian companies during the period from 1993 to 2015. They used the method of partial adjustments and adjustment speed towards the target to calculate the optimal working capital. The results showed that there is no systematic behavior for working capital towards the target of Indian companies. Also, the results indicate that the results do not change, even after classifying the companies into four categories based on the deviation from the optimal working capital.

[22] investigated the relationship between financial flexibility and dividend smoothing. The findings of the research showed that there is a positive relationship between the speed of adjusting the capital structure and the dividend smoothing. The findings showed that there is a positive relationship between the speed of adjusting the capital structure and the dividend smoothing. Also, the results indicated that there is a non-linear relationship between unused debt capacity and the dividend smoothing. They showed that companies that adjust their capital structure more quickly, smooth their dividends more.

[36] research (2017) indicate that a higher degree of financial flexibility reduces the negative effect of liquidity shocks on investment.

[40] investigated the effects of the value of financial flexibility on working capital investment efficiency and working capital adjustment speed using a sample of 8204 American non-financial companies using the Faulkender and Wang [18] model from 1978 to 2013. The results showed that companies with a higher financial flexibility value suffer from both over-investment and under-investment in working capital and especially the problem of over-investment. In addition, the results confirmed that companies that manage working capital on an active basis have a higher working capital adjustment speed than companies that use a passive approach in working capital management. The results also showed that the speed of working capital adjustment for companies that have working capital above the target

level is more than the companies that are at a level lower than the optimal target. More importantly, their results showed that the value of financial flexibility increases the speed of adjustment of working capital and this increase is done by influencing the deviation from the previous target working capital and the level of target working capital. [40] examined the effects of the value of financial flexibility on investment efficiency, the results also showed that the speed of adjustment of net working capital for companies that have working capital above the target level is more than the companies that are at a low level. They are more than the optimal target. More importantly, their results showed that the value of financial flexibility increases the speed of working capital adjustment and this increase is done by influencing the deviation from the previous target working capital and the level of target working capital does not change. Also, the results indicated that the speed of working capital adjustment decreases with the increase of the level of financial constraints and the positive effect of the value of financial flexibility on the speed of adjustment of working capital is significant only in companies with financial constraints. In addition, the speed of working capital adjustment is higher in special industries and it is low in standard industries, and the positive effect of the value of financial flexibility on the speed of working capital adjustment is significant only in standard industries. According to the obtained results, achieving and maintaining financial flexibility is necessary to avoid the deviation of investment in working capital. Also, the results support the role of replacing working capital as a source for providing liquidity within the company, such as cash reserves.

[42] examined the maintenance and application of financial flexibility in the period of global financial restrictions in 1555 Japanese companies using the panel data method and the Deangelo and Deangelo model. In this model, it is assumed that when firms unexpectedly face cash shortages, they maintain financial flexibility by increasing unused debt capacity and paying high dividends. The results show that Japanese companies did not effectively use financial flexibility to increase their external financing power during the 2008 fiscal year crisis.

[1] stated that for companies that have excess working capital, investment can be a suitable solution to reduce working capital from one period to another and increase the company's performance. If the company transfers the used resources for more important activities, the reduction of working capital can lead to an increase in the company's performance.

2.4 Domestic literature

[16] investigated the effect of financial flexibility value on financial policies and the cost of equity capital using the [24] model. The research sample included 84 companies in the period of 2016-2018. The results showed that the value of financial flexibility has a significant negative effect on the variables of financial leverage and the cost of equity capital, and it has a significant positive effect on the cash holding variable. Also, it does not have a significant effect on the company's profit distribution decisions.

[16] investigated the importance of working capital management in determining the profitability of companies in two industries, automobile and chemical from 2002-2013 on samples of 64 companies using regression statistical method with mixed data. The obtained results showed that increasing the length of the receivables collection period, the inventory circulation period, the repayment period of accounts payable and the cash conversion cycle has a negative and significant effect on the profitability of companies. Therefore, managers can increase profitability by reducing the length of the receivables collection period, the inventory turnover period, the debt repayment period and the cash conversion cycle at the optimal level.

[33] investigated the effect of financial flexibility on capital structure decisions. The research results showed that there is a significant and direct relationship between the financial flexibility of companies in the past years and the financial leverage of the current year. Also, the results indicate that companies with a high marginal value of financial flexibility tend to maintain their debt capacity in the current period, but there is a significant possibility that they will engage in deliberate but temporary deviations from their target leverage ratio in the near future.

[30] examined the effect of financial flexibility on the level of changes in cash assets and financial leverage in a sample consisting of 107 listed companies and in the period of 2005-2013. To measure financial flexibility, Faulkender and Wang [18] model, cash assets held by Ozkan and Ozkan [37] model were used. The results indicated that financial flexibility has a significant negative relationship with changes in cash assets held at the beginning and end of the period and also a significant positive relationship with financial leverage.

[39] investigated the relationship between financial flexibility and dividends of companies listed on the Tehran Stock Exchange. The results of the research showed that financial flexibility has an inverse and significant effect in relation to dividends. On the other hand, companies that have high flexibility usually pay less dividends.

3 Research methodology

3.1 Research hypotheses

According to the stated theoretical foundations, the hypotheses of the research can be stated as follows:

First hypothesis: The value of financial flexibility has a significant effect on investment efficiency in net working capital.

The second hypothesis: The value of financial flexibility has a significant effect on speed of adjustment of net working capital.

3.2 Statistical population and sample

The sample size screening table is as follows:

Table 1: Determining the sample size

No.	Description
711	The number of companies listed on the Tehran Stock Exchange until the end of 2020
57	The number of companies delisted from the stock market during the research period
37	The number of companies entered the stock market in the research period
128	The number of companies with fiscal years do not end on march 20 in the research time period
20	The number of companies changed fiscal year in the research time period
31	The number of companies engaged in investment and financial mediation in the research period
123	The number of companies with a trading break of more than six months in the time period of the research
215	A number of companies lacking the information required for research.
100	Total

3.3 Variables and research model

This is a practical semi-experimental research. The statistical population of the research includes the stock companies of Tehran during the years 2005 to 2020. The statistical sample was selected using the systematic elimination method. The multivariate regression method was used to test the hypotheses. The data analysis tool includes statistical software Eviews.

Mathematical models were used in the following steps to measure the value of the final financial flexibility and formulas related to the dependent and control variables of the research:

The first step: estimating the final value of holding cash using the following model: Model (3.1)

$$\begin{aligned} R_{i,t} - R_{i,t}^{B} = {} & \lambda_0 + \lambda_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_2 SGR_{i,t} + \lambda_3 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \lambda_4 SPREAD_{i,t} + \lambda_5 TANG_{i,t} \\ & + \lambda_6 SGR_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_7 \frac{\Delta E_{i,t}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_8 SPREAD_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} \\ & + \lambda_9 TANG_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \lambda_{10} \frac{C_{i,t-1}}{M_{i,t-1}} + \lambda_{11} \frac{\Delta I_{i,t}}{M_{i,t-1}} + \lambda_{12} \frac{\Delta D_{i,t}}{M_{i,t-1}} + \lambda_{13} ML_{i,t} + \lambda_{14} \frac{NF_{i,t}}{M_{i,t-1}} + i, t. \end{aligned} \tag{3.1}$$

In the above model, the symbols I and T represent the company and the year under investigation, respectively, and the variable ΔX also represents the first-order difference of the above variables. It is assumed that the expected changes in the X variable are equal to zero (except for the cash holding variable). The definitions of other variables in model (3.1) are as follows:

$R_{i,t} - R_{i,t}^{B}$ is the return of the company's annual accumulated surplus, such that $R_{i,t}$ is the annual return on the company's shares and $R_{i,t}^{B}$ represents the return of the entire market (portfolio) at the end of year T.

$C_{i,t}$: The company's cash holding (sum of cash and short-term investments of the company), $M_{i,t-1}$: The market value of the company at the beginning of the period, $SGR_{i,t}$: The growth rate of the company's sales, $E_{i,t}$: Net operating profit (loss) before the deduction of interest and taxes of the company, $SPREAD_{i,t}$: The difference between the offer price for buying and selling the company's shares (information asymmetry), $TANG_{i,t}$: Tangible fixed assets

of the company (asset return), $I_{i,t}$: Interest expense of the company, $D_{i,t}$: Dividend paid to the common shareholders of the company, $ML_{i,t}$: Company market leverage (ratio of total liabilities to total assets), $NF_{i,t}$: Cash flow resulting from company financing activities, $\Delta NA_{i,t}$: Changes in non-cash current assets, and $\Delta RD_{i,t}$: Change in R&D cost.

It should be mentioned that all the variables are in the scale of stock market value. To calculate. $R_{i,t} - R^B_{i,t}$, the cumulative annual surplus yield, the following equation is used:

$$R_{i,t} = \{(1++) * (P_{i,t} + DPS) - P_{i,t-1} - (1000)\}/\{P_{i,t-1} + (1000)\}.$$

A, B: Capital increase percentage from receivables and cash received, accumulated earnings and reserves, P_T: stock price, DPS: cash profit per share, R_M: stock market return The expected cash holding is calculated as follows:

$$C_{i,t} - C_{i,t-1}/M_{i,t-1} = \alpha_0 + \alpha_1 Spread_{i,t-1} + \alpha_2 CF_{i,t-1}/M_{i,t-1} + \alpha_3 Size_{i,t-1} + \varepsilon_{i,t}.$$

Information asymmetry ($Spread_{i,t}$) is also calculated as follows:

$$SPREAD_{i,t} = \frac{1}{D_I} \sum_{D=1}^{D} \frac{1}{\sum VOLUME_{i,t}} \sum_{T=1}^{T} \left(2 \times \frac{|PRICE_{i,t} - (ASK_{i,t} + BID_{i,t}/2)|}{(ASK_{i,t} + BID_{i,t}/2)} \times VOLUME_{i,t} \right)$$

D: the number of stock trading days, $VOLUME_{i,t}$: The volume of stock trading, $ASK_{i,t}$: The highest bid price of the stock, $BID_{i,t}$: The lowest bid price of the stock and $PRICE_{i,t}$: The stock price.

Model (3.1) will be estimated using the data integration method at the level of the whole year-companies. The ordinary or generalized least squares regression was used to estimate the model. Having identified the indicators that determine the value of financial flexibility, they should now be combined as a mixed measure. This will be done in two steps. In the first step, the market's reaction to the changes in cash will be measured and analyzed. Based on this analysis, a weight is assigned to each variable. In the second step, the final measure of financial flexibility value will be calculated for each company-year.

Second step: Calculating the value of financial flexibility (final value of cash)

Based on the estimated regression coefficients of unexpected changes in cash and the interactive effect of financial flexibility value factors in model (3.1), the value of financial flexibility for each company-year is calculated through the following relationship:

$$VOFF_{i,t} = \lambda_1 + \lambda_6 SGR_{i,t} + \lambda_7 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \lambda_8 SPREAD_{i,t} + \lambda_9 TANG_{i,t} \tag{3.2}$$

In the above model, $VOFF_{i,t}$: The value of the company's financial flexibility and it reflects the value that shareholders attribute to the company's financial flexibility through estimated weights (from model (3.1)). The definitions of other variables are similar to model (3.1).

3.3.1 Factors affecting net working capital

Following previous research such as [1, 28], the inefficient part of investment in working capital will be calculated through the estimation residuals of model (3.3) below. Net working capital is a function of the following variables: Model (3.3)

$$\begin{aligned} NWC_{i,t} = {} & \alpha_0 + \alpha_1 SGR_{i,t-1} + \alpha_2 SVol_{i,t-1} + \alpha_3 CF_{i,t-1} + \alpha_4 DIFF_{i,t-1} + \alpha_5 GPM_{i,t-1} \\ & + \alpha_6 Age_{i,t-1} + \alpha_7 MP_{i,t-1} + \alpha_8 Spread_{i,t} + \alpha_9 Size_{i,t-1} + Ind_i + Year_t + \Delta_{i,t} \end{aligned} \tag{3.3}$$

In the above model, $NWC_{i,t}$: Net working capital of the company, $SGR_{i,t-1}$: Company sales growth rate, $SVol_{i,t-1}$: Company sales volatility, $CF_{i,t-1}$: Operating cash flow of the company, $DIFF_{i,t-1}$: Financial distress of the company, $GPM_{i,t-1}$: Gross profit margin of the company, $Age_{i,t-1}$: Company age, $MP_{i,t-1}$: Company market power, $Spread_{i,t}$: Information asymmetry, $Size_{i,t-1}$: Company size (natural logarithm of total company assets), Ind_i: Synthetic variable of the industry, $Year_t$: Firm's year, $\Delta_{i,t}$: Deviation from the optimal net working capital of the company.

3.3.2 The value of financial flexibility and investment efficiency in net working capital

To test the first hypothesis, the measure of investment efficiency in net working capital will be estimated on the value of financial flexibility and a set of control variables presented in the following model. The control variables of model (3.4) are taken from the results of previous research.

$$WCEff_{i,t} = \beta_0 + \beta_1 VOFF_{i,t-1} + \beta_2 RD_{i,t-1} + \beta_3 GINDEX_{i,t-1} + \beta_4 MTB_{i,t-1} + \beta_5 LEV_{i,t-1} \quad (3.4)$$

3.3.3 The value of financial flexibility and the speed of adjustment of net working capital

Following the experimental technique that has recently been used in research to estimate the speed of adjustment of financial leverage and cash holding by Falkender et al. [17], Jiang and Lie [31] and An et al. [2], in this research, a model traditional partial adjustments will be used to examine the dynamics of these adjustments as follows [40]:

$$NWC_{i,t} - NWC_{i,t-1} = \Delta NWC_{i,t} = \rho_0 + \rho_1 \left(NWC^*_{i,t} - NWC_{i,t-1}\right) + \varepsilon_{i,t} \quad (3.5)$$

$NWC_{i,t}$: Net working capital of the company, $NWC^*_{i,t}$: Target level of net working capital of the company, $\Delta NWC_{i,t}$: Adjustment in working capital of the company, $\varepsilon_{i,t}$: The residual of the model (other factors).

The fitted values of model (3.5) which represent the determining factors of net working capital will be used as an index of determining factors of net working capital. Assuming that the target level of working capital can be fully explained through the determinants included in model (3.3). In other words, $NWC^*_{i,t} = \beta X_{i,t}$ so that the vector X represents the factors affecting the level of working capital, including the working capital of the previous year. The expression $(NWC^*_{i,t} - NWC_{i,t-1})$ is also the amount of net deviation of working capital from the target level. ρ_1 also represents the speed of adjustment, which measures the actual speed of adjustment of net working capital towards the target and is a value between zero and one. When the adjustment speed value is one, the adjustment is complete. According to Liao et al. [35], Jiang and Lie [31] and Brisker and Wang [10], the advantage of this method is that it allows interaction to be included in the model to examine the factors affecting the speed of adjustment. Model (3.5) can be rewritten in the following form: Model (3.6)

$$NWC_{i,t} = (1-\rho)NWC_{i,t-1} + \rho\beta X_{i,t} + \varepsilon_{i,t}. \quad (3.6)$$

Then model (3.6) is adjusted so that the value of financial flexibility and other factors affecting the speed of adjustment of net working capital are entered into the model in the following form [40]: Model (3.7)

$$\Delta NWC_{i,t} = (\gamma_0 + \gamma_1 VOFF_{i,t-1} + \gamma_2 X_{i,t-1}) \times TWCR_{i,t} + \varepsilon_{i,t}. \quad (3.7)$$

In model (3.7), $TWCR_{i,t} = NWC^*_{i,t} - NWC_{i,t-1}$. Also, γ_1 is the desired variable that measures the effect of financial flexibility value on the speed of adjustment of net working capital. γ_2 is the vector of mutual regression coefficients between the control variables and the deviation of the company's net working capital. Model (3.7) can be estimated using econometric methods. The following regression models were used to test the research hypotheses:

$$WCEff_{i,t} = \beta_0 + \beta_1 VOFF_{i,t-1} + \beta_2 RD_{i,t-1} + \beta_3 GINDEX_{i,t-1} + \beta_4 MTB_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 GPM_{i,t-1}$$

$$SOAW_{i,t} = \beta_0 + (\beta_1 VOFF_{i,t-1} + \beta_2 GINDEX_{i,t-1} + \beta_3 GPM_{i,t-1} + \beta_4 SVOL_{i,t-1} + \beta_4 MP_{i,t-1}) \times TWCR_{i,t} + \varepsilon_{i,t}.$$

3.4 Data analysis methods

The data was first analyzed using descriptive statistics such as mean, standard deviation and correlation coefficient, and then linear regression model was used for statistical tests. Also, Eviews software was used to analyze the data in this research. It should be noted that multiple linear regression was used to test the research hypotheses. The underlying assumptions of the regression used in this research were examined to ensure the interpretation of the regression relationships. Also, before performing the multiple linear regression test, a series of presuppositions (classical assumptions) should be tested.

4 Research findings

4.1 Test of research models

The probability values of the research variables show that there is a positive and significant relationship between the value of financial flexibility, investment efficiency in net working capital and speed of adjustment of net working capital.

Tables 2 and 3 Summary of the regression test results of the first and second hypotheses.

Table 2: Summary of the regression test results of the first hypotheses

First hypothesis test			
VARIABLES	β	**T-STATISTICS**	**PROBABILITY**
C	0.5438	3.5354	0.0004
VOFF	0.0220	1.8788	0.0605
RD	−3.71	−0.2979	0.7658
GINDEX	−0.1376	−0.6412	0.5214
MTB	0.0022	3.5888	0.0003
LEV	−0.1293	−0.5818	0.5607
The coefficient of determination		0.09	
Durbin-Watson		1.0840	
F-statistic		0.0044	

Table 3: Summary of the regression test results of the second hypotheses

Second hypothesis test			
VARIABLES	β	**T-STATISTICS**	**PROBABILITY**
C	−0.0888	−10.0681	0.0000
VOFF	0.0696	16.0910	0.0000
GINDEX	−0.0084	−0.7169	0.4735
GPM	−0.0085	−0.5187	0.6041
SVOL	0.0005	0.7198	0.4718
MP	−0.0825	−0.8067	0.4200
The coefficient of determination		0.31	
Durbin-Watson		1.7883	
F-statistic		0.0000	

4.2 The results of the research hypothesis test

The value of the coefficient of determination in the test of the first hypothesis shows that 9% of the changes in the dependent variable is explained by the independent and control variables. The probability value of the model shows that at the 5% error level, the linear regression model is significant. Durbin-Watson value (1.0840) shows that the assumption of non-correlation between errors is acceptable. According to the modelling of consolidated data, we must first determine which of the assumptions of the same width from the origin or their difference should be applied for different sections. After determining the probability that the width from the origin is not the same for different sections, the method used in estimating the model (fixed and random effects) should be determined. Therefore, the Hausman test is used. The probability value of the Hausman test is less than 5%. The above model is estimated as fixed effects. The variable probability value of financial flexibility value (0.0605) and the positivity of the regression coefficient (0.0220) indicate that there is a positive and significant relationship between the value of financial flexibility and investment efficiency in net working capital.

The value of the coefficient of determination in the second hypothesis test shows that about 31% of the changes in the dependent variable is explained by the independent and control variables. The probability value of the model shows that the linear regression model is significant at the 5% error level. Durbin-Watson value (1.79) shows that the assumption of no correlation between errors is acceptable. The probability value of Limer's F is more than 5%, and the pooled data method is accepted. The value of variable probability VOFF (0.000) and the positives of the regression coefficient (0.31) indicate that there is a positive and significant relationship between the value of financial flexibility and the speed of adjustment of net working capital.

5 Discussion and conclusion

This paper presented empirical evidence about the considerations of financial flexibility, the value of financial flexibility, and the effects of the value of financial flexibility on the investment policies of working capital of companies, and some important results were also obtained from these findings. The lack of financial resources within the company can reduce investment in the working capital elements of the company. Because measuring the value of financial flexibility is based on the cash holding policy, it can be said that these results can be considered as a substitution between cash and the working capital of the company.

The results of the research in the period from 2005 to 2020, considering 100 companies, show that there is a positive relationship between the value of financial flexibility and the efficiency of investment in net working capital. Increasing the value of financial flexibility increases the investment efficiency in the net working capital of the company.

Companies that have good financial flexibility can withstand financial crises and when profitable opportunities arise, they can provide the necessary liquidity for investment at a minimum cost and avoid non-optimal investments. This finding is inconsistent with that of [40]. We found that an important mechanism by which the value of financial flexibility can affect the speed of adjustment of net working capital is the deviation of the current year's working capital from its optimal level in the previous year. The results of the research show that there is a positive relationship between the value of financial flexibility and the speed of adjustment of net working capital. Excess working capital can be used to carry out projects with added value and lead to an increase in the company's performance. Considering that there is a relationship between cash as the main source of the value of financial flexibility and other elements of net working capital, it is expected that proportional changes can be observed and the need for financial flexibility through monetary policy, indicating a positive relationship between the value of financial flexibility and net working capital is expected.

Considering the impact of financial flexibility value on the working capital of companies, governments should use mechanisms that lead companies to appropriate methods of working capital. In addition, the Tehran Stock Exchange and Securities Organization can teach companies the methods of identifying factors affecting the financial flexibility of companies, as well as the use of a suitable model for working capital management, by holding necessary training courses. According to the results of this research, it is suggested that investors use this financial policy as a criterion for their actions in order to increase efficiency and reduce the risk of their investments.

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