The effect of liquidity and transparency criteria on production growth with an emphasis on the moderating role of shareholders' added value

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ABSTRACT

The purpose of this research is to explain the effect of liquidity and transparency criteria on production growth, emphasizing the moderating role of shareholders' added value in companies listed on the Tehran Stock Exchange. In order to fulfill the purpose of the research, research information was collected from the financial statements of listed companies in the period of 2010 to 2011.Multivariate regression method with panel data was used for statistical analysis. The findings of the research model test show that the criteria of stock liquidity and transparency in financial reporting have a significant effect on production working capital. Also, the findings of the research show the moderating role of shareholder added value in influencing the criteria of stock liquidity and transparency in financial reporting on production working capital.

Keywords:

shareholder added value, transparency in financial reporting, stock liquidity.

1. Introduction

Empirical literature shows that the share of the stock market in economic growth may be related to structural factors at the level of the country and the market. Darrat (1999)[1] by analyzing Saudi Arabia, Turkey and the United Arab Emirates through multivariate Granger causality tests, found that financial deepening is a necessary causal factor of economic growth. Demirguç-Kunt and Levine (2001)[2] and Demirguç-Kunt et al. (2013) show that market development in stock markets and banks is parallel to the economic development of countries. McGowan (2008)[3] suggests that industrialized economies also develop capital markets. They will have a finding and Lin et al. (2009)[4] argue that there is an endogenously determined optimal financial structure for the economy at each stage of development. Cecchetti and Kharroubi (2012)[5] argue that financial prosperity generally does not increase growth and there is an urgent need to re-evaluate the relationship between finance and real growth. Yu et al. (2012) argue that the positive financial-growth relationship creates by Levin (1997) is a long-term relationship (i.e., more than 20 years) and underdeveloped countries may experience lower economic growth despite financial and stock market development in the short term, mainly due to incorrect legal systems and Political stability. Rioja and Walf (2014)[6] found that banks have a significant positive effect on capital accumulation and stock markets, however, did not contribute to capital accumulation or productivity growth in low-income countries. Francis and Ofori (2015)[7] by using From data collected from 101 countries from 1980 to 2009, argue that political regimes matter for stock market volatility and that political preferences have a positive and statistically significant effect on stock market volatility—the effect in the 1980s and 1990s is the strongest.

However, focusing only on the traditional measures of stock market development such as turnover and/or market value, there are also studies that analyze the stock market growth relationship specifically for Turkey. Çetintaş and Barışık (2003)[8] using turnover rate and total market capital to measure stock market size, found that banking and stock market development are statistically significant Granger causes of economic growth in Turkey. Kaplan (2008)[9] shows the existence of a long-term relationship between real economic activity and stock prices, and also the direction of causality from stock prices to real economic activity in Turkey. Suitaş and Koçukkaya (2011)[10] by involving the average volume of bond market transactions and Securities (2011) could not find a long-term causality between financial development and economic growth during the period from 1991 to 2005. Also, the findings of Araç and Ozcan (2014)[11] by involving the ratio of total volume/GDP as an indicator of capital market development with several indicators of other banking sector supports both the advance of supply and demand under the hypothesis. Coşkun and Umit (2016)[12] argue that the stock market development policies and the share of the stock market in growth may have structural limitations. This study differs from the existing stock market growth literature by considering the effects of sub-components of the capital market and the debt market. Organization for Economic Cooperation and Development (2011) argues that institutional investors, namely pension funds, insurance companies, mutual funds, and sovereign wealth funds, reduce reliance on the banking system and act as shock absorbers during financial crises and they help the capital market and economic growth. Ong and Sy (2004)[13] argue that in emerging markets, exponential growth in the local mutual fund industry has clearly contributed to the development of local securities and derivatives markets, which in turn has attracted investment flows from foreign funds. It has played a key role and has led to the growth of production in various industries

Theoretical foundations of research
Transparency and production growth

Nordin et al. (2007) explain the transparency of the capital market as follows: the transparency of the capital market means the availability of information. A

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1. Darrat
2. Demirguc-Kunt and Levine
3 . McGowan
4 . Lin et al
5. Cecchetti and Kharroubi
6. Rioja and Valev
7. Francis and Ofori

8. Çetintaş and Barışık
9. Kaplan
10. Soytaş and Küçükkaya
11 . Araç and Ozcan
12 . Coşkun and Umit
13 . Ong and Sy

transparent institution is an institution that allows people inside and outside the organization to obtain the necessary facts. themselves to form their opinions about the actions and processes in that institution. Clement et al. (2003) define transparency as: information that is reliable and economically, socially, and politically accessible to all stakeholders. They showed that transparency is the opposite of secrecy. Concealment refers to the conscious concealment of one's actions, while financial transparency is a form of transparency related to financial matters with the accuracy, completeness, and availability of information (timeliness). The view of the Organization for Economic Cooperation and Development (2012) is broader and presents the transparency of the capital market as a mutual relationship between organizations and other interested groups. The more the exchange of information in societies, the more informed decision making will be, and the accountability of the private and public sector on how to obtain and consume resources will be better, and as a result, the growth of corruption will decrease. From an economic point of view, transparency means correct and comprehensive information about the economy and the transparency of the mechanisms governing economic relations, including the production and distribution of wealth in society. Capital market transparency and economic corruption are contradictory. Therefore, the United Nations Development Program equates corruption with increasing monopoly of individual power, decreasing accountability, trust and transparency. The lack of transparency of the capital market and as a result economic corruption has a destructive effect on investment and growth, and this leads to not reaching the economic development goals of countries. The lack of transparency of the capital market will stop the competitive forces that are needed for the markets. Reduction of tax revenues and quality of infrastructure and public services. Lack of transparency can lead to inefficiency of government policies. To drive investment and economy from its productive form to rent and underground activities and expand mafia organizations. It is also associated with the waste of national resources. Because the lack of transparency of the capital market diverts the budget from its purpose. These resources cannot contribute to the economic growth of the country. The World Bank considers the lack of transparency of the capital market and corruption as the biggest obstacle to social and economic development. Because by distorting legal regulations, it destroys development and weakens the institutional foundations on which economic growth relies. In the absence of transparency of the capital market, the conditions for realizing a competitive economy will not exist or will be weak. Also, it is not possible to monitor and follow up financial violations, and therefore monetary, financial and commercial policies will not be carried out efficiently. which will cause the lack of confidence of investors and the reduction of investment and ultimately the reduction in the growth of production, and in addition, it is not possible to plan an applicable policy, recognize worthy people and supervise civil institutions.

Liquidity and production growth

The capital market, which has high liquidity, will increase productivity (Obstfeld, 1994)[14].

Few studies have been done on the relationship between stock market liquidity and economic growth. Yu et al. (2012)[15] shows that one of the main factors in production growth is capital market liquidity.

Levine and Zervos (1998)[16] showed that stock market liquidity positively predicts growth, capital accumulation and productivity improvement even after controlling for economic and political factors. Beck and Levine (2004)[17] claim that stock markets Liquid stocks have positively affected the economic growth of the period 1976-1998 in selected countries.

In case of non-liquidity in a short time, since investors may need their capital at any time for necessary expenses or investment with a higher rate of return, so they invest in a place where the possibility and speed of liquidation is higher.

Research hypotheses

According to the proposed theoretical framework, the research hypotheses are as follows:

The first hypothesis of stock liquidity has a significant effect on production working capital.).

The second hypothesis transparency in financial reporting has a significant effect on production working capital.

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14 . Obstfeld
15 . Yu et al
16 . Levine and Zervos
17 . Beck and Levine

The third hypothesis of the added value of the shareholder has a moderating role in influencing the liquidity of the shares on the working capital of production.

The fourth hypothesis is that the added value of the shareholder has a moderating role in the influence of transparency in financial reporting on production working capital.

research methodology

research method

This research is correlational in nature and content and practical in purpose. The research is done in the framework of deductive-inductive arguments, which means that the theoretical foundations and background of the research are done through the library, magazines and other reliable sites in a deductive format, and data collection is done inductively to confirm and reject the hypotheses. Also, due to the fact that the data used in the current research is real and historical information, it can be classified as post-event type.

Data analyzing method

Due to the type of data studied, the simultaneous comparison of cross-sectional and longitudinal data using panel data patterns method (panel data) has been used to estimate coefficients and test hypotheses. First, to determine the method of using panel data and distinguishing homogeneous Flimer's test is used for their heterogeneity. In this test, the null hypothesis is that the data is homogeneous, and if it is confirmed, all the data should be combined with each other and parameters should be estimated using a classical regression. otherwise, the data were considered as panel data. If the results of this test based on the use of data are panel data, one of the fixed effects or random effects models should be used to estimate the research model. To choose one of the two models, the Seman tests must be performed. The null hypothesis of the Seman tests is that the random effects model is suitable for estimating panel data regression models.

Population and statistical sample

The statistical population of this research includes all companies admitted to the Tehran Stock Exchange. The time period of the research is considered from 2009 to 2019. Also, in this research, a sample of 671 companies has been selected based on the following

criteria from the statistical population of companies admitted to the Tehran Stock Exchange:

A) According to the period of access to information (2008-2019), the company was admitted to the stock exchange before 2009 and its name was not removed from the list of the mentioned companies until the end of 2010;

B) In order to increase the ability to measure and equalize the conditions of the selected companies, the financial year of the companies should end at the end of March every year.

C) Due to the lack of clear demarcation between operational activities and financing of financial companies (investment and financial mediation companies), these companies have been excluded from the sample.

D) Companies whose information was incomplete to calculate the primary variables of the financial statements were excluded from the sample.

Research variables

In this research, working capital is the dependent variable. For this purpose, it is calculated from the ratio of the difference between current assets and current liabilities on the book value of all assets.

In this research, the independent variables are as follows:

Stock liquidity

Stock liquidity indicates the ability to quickly exchange a large amount of stock with a small cost and without being affected by the importance of its price (Liyu, 2006; Suvatish et al., 2019). To calculate liquidity, several criteria have been proposed in the researches of Cueto (2009), Agarol (2008), Rubin (2007), Izdinia and Rasaian (2009), Rahmani et al. , the number of traded shares, the volume of traded shares, the share turnover ratio and the difference in the bid price of buying and selling shares. One of the most important criteria for measuring the liquidity of a stock is the stock turnover rate, which is calculated by the ratio of the total number of shares traded annually divided by the total number of shares issued (Lu and Wang, 2000; Jayarayan and Milburn, 2012). The advantages of using the stock turnover rate as a measure of liquidity are: a) this measure has a strong

theoretical support; b) It is relatively easy to find the data related to the turnover rate of the transaction volume and it provides the possibility of calculating the change from month to month in the liquidity of assets (Liu, 2006; Eslami Bidgholi and Saranj, 2017; Satash et al., 2019). Therefore, consistent with some researches, this criterion has also been used in this research.

Relation 3
Number of shares issued / Number of shares traded = Stock liquidity

Financial transparency

The transparency of financial reports is calculated using the three-year moving sum of the absolute value of the annual discretionary accruals:

Relation 4
$$OPAQUE = AbsV(DisAcc_{t-1} + AbsV(DisAcc_{t-2}) + AbsV(DisAcc_{t-3})$$

where DisAcc is annual discretionary accruals. The logic of using the mentioned measure is that in companies where the absolute value of discretionary accruals is more stable, the probability of profit management is higher and therefore less company-specific information is disclosed to investors. In order to distinguish between normal and discretionary accruals, the modified Jones model is used. For this purpose, the following cross-sectional regression is fitted using the data of companies in each of the industries:

relation 5
$$\frac{TA_{it}}{Assets_{it-1}} = \alpha_0(\frac{1}{Assets_{it-1}}) + \beta_1(\frac{\Delta Sales_{it}}{Assets_{it-1}}) + \beta_2(\frac{PPE_{it}}{Assets_{it-1}}) + \varepsilon_{it}$$

where TAit is the total accruals of company i during year t, Assetsit-1: total assets of company i at the end of year t, □Salesit is the change in sales of company i at year t and PPEit is the property, machinery and equipment of company i at the end of year t. Annual discretionary accrual items (DisAccit) are calculated using the estimated parameters of equation (6):

relation 6
$$DisAcc_{it} = \frac{TA_{it}}{Assets_{it-1}} - \left\{ \hat{a}_0(\frac{1}{Assets_{it-1}}) + \hat{\beta}_1(\frac{\Delta Sales_{it} - \Delta Re\,c\,eivables_{it}}{Assets_{it-1}}) + \hat{\beta}_2(\frac{PPE_{it}}{Assets_{it-1}}) \right\}$$

Considering □Receivablesit in relation (7) is the standard adjustment of Jones model (1991). This variable takes into account the change in sales due to the bold identification of suspicious sales.

Kothari et al. (2005) argue that if the performance of companies is not a function of a random step and shows patterns such as reversion to the mean and momentum, the application of adjusted Jones and Jones models is not correct because it ignores the effect of the company's performance on accruals. Therefore, they presented an approach to estimate discretionary accruals that considers the company's performance through investment returns. For this purpose, first, regression (7) is fitted using the cross-sectional data of each industry separately for each of the investigated years:

Relation 7
$$\frac{TA_{it}}{Assets_{it-1}} = \alpha_0(\frac{1}{Assets_{it-1}}) + \beta_1(\frac{\Delta Sales_{it}}{Assets_{it-1}}) + \beta_2(\frac{PPE_{it}}{Assets_{it-1}}) + \beta_3(\frac{Income_{it-1}}{Assets_{it-1}}) + \varepsilon_{it}$$

where Incomeit-1 is the net profit of company i in year t-1. The estimated coefficients obtained by fitting the equation (7) are used to estimate optional accrual items:

relation 8
$$DisAcc_{it} = \frac{TA_{it}}{Assets_{it-1}} - \left\{ \hat{\alpha}_0(\frac{1}{Assets_{it-1}}) + \hat{\beta}_1(\frac{\Delta Sales_{it} - \Delta Re\,c\,evables_{it}}{Assets_{it-1}}) + \hat{\beta}_2(\frac{PPE_{it}}{Assets_{it-1}}) + \hat{\beta}_3(\frac{Income_{it-1}}{Assets_{it-1}}) \right\}$$

In this research, shareholder added value is the moderating variable. For this purpose, the total changes in the price of each share of the company and the cash profit of each share during the management's tenure are calculated.

The controlling variables are as follows:

- **size of the company**

The size of the company mainly reflects the state of the company in terms of profitability, volume of activity and value of the company and is calculated through the natural logarithm of the book value of total assets.

Relation 9
(book value of total assets) LN = company size

- **Financial Leverage**

It represents the financial risk of the company and is calculated through the ratio of the book value of total liabilities to the book value of total assets.

Relation 10
Total assets / total liabilities = financial leverage

- **Sales growth**

It expresses the profitability of the company and is obtained from the ratio of the difference between the sales amount of this year and the sales amount of the previous year over the sales amount of the previous year.

Relation 11
Last year's sales / (previous year's sales - this year's sales) = sales growth

- **Rate of return on assets**

It expresses the performance of the company and is calculated from the ratio of net profit to total assets.

Relation 12
Total assets / net profit = rate of return on assets

Working Capital, $_{it}$ = β_0 + β_1 Stock Liquidity $_{it}$ + β_2 Financial reporting transparency $_{it}$ + β_3 Size $_{it}$ + β_4 Financial Leverage $_{it}$ + β_5 ROA $_{it}$ + β_6 Sale Growth $_{it}$ + ε $_{it}$

Working Capital, $_{it}$ Value Added Shareholder $_{it}$ = β_0 + β_1 Stock Liquidity $_{it}$ + β_2 Financial reporting transparency $_{it}$ + β_3 Value Added Shareholder $_{it}$ + β_4 Stock Liquidity $_{it}$ × Value Added Shareholder $_{it}$ + β_5 Financial reporting transparency $_{it}$ × Value Added Shareholder $_{it}$ + β_6 Size $_{it}$ + β_7 Financial Leverage $_{it}$ + β_8 ROA $_{it}$ + β_9 Sale Growth $_{it}$ + ε $_{it}$

Descriptive Statistics

The statistical description of research variables is as follows:

Figure 1. Descriptive statistics of research variables

Variable Name	Average	Variable Name	Average	Variable Name	Average	Variable Name
Working capital	٠/٢٠٦٠٠٣	٠/١٨٦٠٤٧	٢/٢٤٩٦٥٥	-١/٧٧٤١٢٣	٠/٣٣١٣٩٥	٠/٥٥٨٦٤٧
Stock liquidity	-٠/٦٧٧١٨٥	-٠/٥٧٩٩٣٣	٠/٨٢٥٠٤١	-٤/٨٦٧٤٧٢	٠/٧٣٧٩٤٠	-٠/٩٤٠٢٣٧
Financial reporting transparency	-١/٥٨E-١٢	-٠/٠٠٩٢٠٦	١/٦١٢٧٠٠	-٢/٢٩٠٤٣٤	٠/١٨٢٣٠٢	-٠/٠٣٨٧٣٩
shareholder's added value	٢٣٩٣/٦٨٩	١٩٢/٧٥	٢٠٧١٤٠	-٦١٥٠٥	١١٠٩٩/٨	٨/٢٣٠٦١٣
size of the company	١٤/٣٩٥١٠	١٤/١٧٠٠٣	٢٠/٧٦٨٦٩	١٠/٠٣١٢٢	١/٦٦٣٩٥٦	٠/٧٦٨٣٣٨
Financial Leverage	٠/٥٧٦٣٢٠	٠/٥٨٠٣٤٧	٢/٠٧٧٥٠٦	٠/٠٣١٤٣١	٠/٢١٢١٣١	٠/٥٠١٧١٦
Rate of return on assets	٠/١٨	٠/١٢٥١٦٣	١/٩٧٤٦٣٢	-٠/٦٠٥٤٤٩	٠/٢٣٦٢٠٥	٢/٠٤٢٠٣٦
Sales growth	٠/٣١٥٨٦٣	٠/٢٢١٠٠٠	٦/٠٩٤٧٤٠	-٠/٩٠٩١٨٩	٠/٥٣٨٧٥٤	٤/٠١٤٨٤٠

Figure 2. The results of the first research hypothesis test

Variable name	Coefficients	The standard deviation	Statistics T	Significance level	Collinear statistic
Stock liquidity	٠/٠٤٣٧٢٠	٠/٠٠٧٠٤٩	٦/٢٠١٩٥٦	٠/٠٠٠٠	١/٠٣٦٦١٣
size of the company	-٠/٠٣٢٦٨٩	٠/٠٠٣١٨١	-١٠/٢٧٧٤٠	٠/٠٠٠٠	١/٠٧٢٩٨٤
Financial Leverage	-٠/٥٢٥٣٦٩	٠/٠٢٩٥٦٢	-١٧/٧٧١٩٦	٠/٠٠٠٠	١/٥٠٦٣٦٢
Rate of return on assets	٠/٦٩١٤٨٦	٠/٠٢٨٤٢٦	٢٤/٣٢٦٠٧	٠/٠٠٠٠	١/٧٧٦٨٨٦
Sales growth	٠/٠٢١٨٥٧	٠/٠١٠٢٤١	٢/١٣٤٢١٧	٠/٠٣٣٠	١/١٦٦١٧٣
Constant	٠/٨٧٧٥٨٦	٠/٠٤٧٢٤٤	١٨/٥٧٥٧٤	٠/٠٠٠٠	-
The coefficient of determination ٠/٥٦٤٧٥٣:	statistics ٤٧٥/١٦١١ :f (٠/٠٠٠٠٠)	statistics :f Limer ١٥/٤٩٣٧٠١ (٠/٠٠٠٠٠)	:Hasman statistics ١٦/٩٨١٢٩٨ (٠/٠٠٤٥)	Variance heterogeneity ١١/٦٩٦٩٣ :statistic (٠/٠٠٠٠٠)	-Watson Durbin :statistics ١/٥٠٣٤٨٧

Figure 3. The results of testing the second hypothesis of the research

Variable name	Coefficients	The standard deviation	statistics T	Significance level	Collinear statistic
Constant	٠/٣١٥٩٣٠	٠/٠٧٦٢١٦	٤/١٤٥١٧٠	٠/٠٠٠٠	-
Financial reporting transparency	٠/٣٧٤٦٧٦	٠/٠٢٠٢٩٨	١٨/٤٥٨٥٩	٠/٠٠٠٠	١/٢٤٧٢٤٣
size of the company	٠/٠٠٠٧٦٩	٠/٠٠٥١٢٤	٠/١٤٩٩٨٣	٠/٨٨٠٨	١/٠٧٣٤٥٠
Financial Leverage	-٠/٤٠١٤٨٨	٠/٠٢٥٧٤٧	-١٥/٥٩٣٦٦	٠/٠٠٠٠	١/٥٠٣٨٦٤
Rate of return on assets	٠/٦١٨١٩٠	٠/٠٢٢٩٣٤	٢٦/٩٥٤٦٤	٠/٠٠٠٠	١/٩٣٩٩١٠
Sales growth	-٠/٠٠٢٧٨٢	٠/٠٠٦٥٤٦	-٠/٤٢٥٠٢٤	٠/٦٧٠٩	١/١٤٢٦٤٢
The coefficient of :determination ٠/٨٥٧٦٥٥	statistics f ٥٨/٥٢٢٢١ (٠/٠٠٠٠٠)	statistics :f Limer ١٨/٨٠٧٦٤٣ (٠/٠٠٠٠٠)	:Hasman statistics ٠/٠٠٠٠٠ (١/٠٠٠٠)	Variance heterogeneity ٣٢/٦٦٣٨٢ :statistic (٠/٠٠٠٠٠)	-Watson Durbin :statistics ١/٥٣٧٣٨٩

Test of the second hypothesis

The results of the second hypothesis test are as follows:

The significance level for each variable as well as for the whole model has been calculated at the confidence level of 95%. According to the coefficient of determination of the fitted model, it can be claimed that 56.47% of the changes in the dependent variable of the research hypothesis are explained by the corresponding independent and control variables. Autocorrelation is a violation of one of the standard assumptions of the regression model, and the Durbin-Watson statistic can be used to determine the absence of autocorrelation in the regression model. The calculated Durbin-Watson statistic (1.503) is between 2.5-1.5, which indicates the absence of autocorrelation and shows the independence of the remaining error components. As seen in Figure 2, the significance level

of the t statistic for the variable of stock liquidity is lower than the acceptable error level of 5%, therefore, the significant effect of the above variables on working capital is confirmed. According to the level of significance obtained from F limer's test, the investigated sections were not homogeneous and had no individual differences, so the use of panel data method is appropriate for the research model. Also, according to the significance level obtained from the Hausman test, the difference in the coefficients is not systematic. Therefore, using the fixed effects method is preferable to the random method. The reported collinearity statistic shows the absence of collinearity in the regression estimation of the research model. The variance heterogeneity statistic and the calculated significance level show the presence of variance heterogeneity, which was corrected by White's error correction.

The significance level for each variable as well as for the whole model has been calculated at the confidence level of 95%. According to the coefficient of determination of the fitted model, it can be claimed that 85.76% of the changes in the dependent variable of the research hypothesis are explained by the corresponding independent and control variables. Autocorrelation is a violation of one of the standard assumptions of the regression model, and the Durbin-Watson statistic can be used to determine the absence of autocorrelation in the regression model. The calculated Durbin-Watson statistic (1.537) is between 2.5-1.5, indicating the absence of autocorrelation and showing the independence of the remaining error components. As seen in Figure 3, the significance level of the t statistic for the financial reporting transparency variable is lower than the acceptable error level of 5%, so the significant effect of the above variable on working capital is confirmed. According to the level of significance obtained from F limer's test, the studied sections were not homogeneous and had no individual differences, so the use of panel data method is appropriate for the research model. Also, according to the significance level obtained from the Hausman test, the difference in the coefficients is systematic. Therefore, using the random effects method is preferable to the fixed method. The reported collinearity statistic shows the absence of collinearity in the regression estimation of the research model. The variance heterogeneity statistic and the calculated significance level show the presence of variance heterogeneity, which was corrected by White's error correction.

Test of the third hypothesis
The results of the third hypothesis test are as follows:

The significance level for each variable as well as for the whole model has been calculated at the confidence level of 95%. According to the coefficient of determination of the fitted model, it can be claimed that 56.70% of the changes in the dependent variable of the research hypothesis are explained by the corresponding independent and control variables. Autocorrelation is a violation of one of the standard assumptions of the regression model, and the Durbin-Watson statistic can be used to determine the absence of autocorrelation in the regression model. The calculated Durbin-Watson statistic (1.503) is between 2.5-1.5, which indicates the absence of autocorrelation

and shows the independence of the remaining error components. As can be seen in Figure 4, the significance level of the t-statistic for the variable of stock liquidity * shareholder's added value is lower than the acceptable error level of 5%, therefore, the significant effect of the above variables on working capital is confirmed. According to the level of significance obtained from F limer's test, the studied sections were not homogeneous and had no individual differences, so the use of panel data method is appropriate for the research model. Also, according to the significance level obtained from the Hausman test, the difference in the coefficients is not systematic. Therefore, using the fixed effects method is preferable to the random method. The reported collinearity statistic shows the absence of collinearity in the regression estimation of the research model. The variance heterogeneity statistic and the calculated significance level show the presence of variance heterogeneity, which was corrected by White's error correction.

The fourth hypothesis test
The results of the fourth hypothesis test are as follows: The significance level for each variable as well as for the whole model has been calculated at the confidence level of 95%. According to the coefficient of determination of the fitted model, it can be claimed that 59.23% of the changes in the dependent variable of the research hypothesis are explained by the corresponding independent and control variables. Autocorrelation is a violation of one of the standard assumptions of the regression model, and the Durbin-Watson statistic can be used to determine the absence of autocorrelation in the regression model. The calculated Durbin-Watson statistic (1.591) is between 2.5-1.5, indicating the absence of autocorrelation and showing the independence of the remaining error components. As seen in Figure 5, the significance level of the t-statistic for the variable of transparency of financial reporting × shareholder value added is lower than the acceptable error level of 5%, therefore, the significant effect of the above variables on working capital is confirmed. According to the level of significance obtained from F limer's test, the studied sections were not homogeneous and had no individual differences, so the use of panel data method is appropriate for the research model. Also, according to the significance level obtained from the Hausman test,

the difference in the coefficients is not systematic. Therefore, using the fixed effects method is preferable to the random method. The reported collinearity statistic shows the absence of collinearity in the regression estimation of the research model. The variance heterogeneity statistic and the calculated significance level show the presence of variance heterogeneity, which was corrected by White's error correction.

Figure 4. The results of the third hypothesis test of the research

Variable name	Coefficients	The standard deviation	statistics T	Significance level	Collinear statistic
Stock liquidity	٠/٠٣٢٨٨٨	٠/٠٠٩٥٤٦	٣/٤٤٥٢٣٥	٠/٠٠٠٦	١/٩٠٨٧٧٦
shareholder's added value	-٠/٠٠١٤٠٤	٠/٠١٤٧٧٨	-٠/٠٩٤٩٧٥	٠/٩٢٤٣	٢/١٠١٣٣٩
Liquidity of shares * shareholder's added value	٠/٠٣٣٣٤٧	٠/٠١٤٤٨٠	٢/٣٠٢٩٩١	٠/٠٢١٤	٢/٢٥٨٤٥٤
size of the company	-٠/٠٣٢٠١٢	٠/٠٠٣١٨٢	-١٠/٠٦٠٦٠	٠/٠٠٠٠	١/٠٧٨٢٩٤
Financial Leverage	-٠/٥٢٣٦٧٨	٠/٠٢٩٧٥٧	-١٧/٥٩٨٧٠	٠/٠٠٠٠	١/٥٣٢٧٠٨
Rate of return on assets	٠/٧٠٢٥٨٣	٠/٠٢٩٤٧٨	٢٣/٨٣٤٣٥	٠/٠٠٠٠	١/٨٦٤٨٧٥
Sales growth	٠/٠٢٤٢٤٣	٠/٠١٠٢٨٩	٢/٣٥٦١٤٣	٠/٠١٨٦	١/١٨٢٠١٢
Constant	٠/٨٦٥٦٩٤	٠/٠٤٧٦٢٥	١٨/١٧٧٣٧	٠/٠٠٠٠	-
The coefficient of determination: ٠/٥٦٧٠٤٧	statistics f: ٣٤٢/٢١١٥ (٠/٠٠٠٠٠)	statistics Limer f: ١٥/٣٨٣٣١٨ (٠/٠٠٠٠٠)	Hasman statistics: ٢١/٠٥٨٤٧١ (٠/٠٠٣٧)	Variance heterogeneity statistic: ٨/٨٠٥٤٢٦ (٠/٠٠٠٠٠)	Watson Durbin statistics: ١/٥٠٣٩٦٦

Figure 5. The results of the fourth research hypothesis test

Variable name	Coefficients	The standard deviation	statistics T	Significance level	Collinear statistic
Financial reporting transparency	٠/٢٥٧٧١٦	٠/٠٤٨٢٤٧	٥/٣٤١٦٣٤	٠/٠٠٠٠	٣/١٦٠٠٨٨
shareholder's added value	-٠/٠٠٧١٥٦	٠/٠١٠٦٣٦	-٠/٦٧٢٨١٧	٠/٥٠١١	١/١٥٥٨٦٨
Transparency of financial reporting x shareholder's added value	٠/١٨٦١٤١	٠/٠٥٨٨٠٣	٣/١٦٥٥٢٢	٠/٠٠١٦	٣/٠٤١٧٨٢
size of the company	-٠/٠٣١٨١٦	٠/٠٠٣٠٨٢	-١٠/٣٢٢١٦	٠/٠٠٠٠	١/٠٧٤٥١١
Financial Leverage	-٠/٥٤١٥٣٢	٠/٠٢٨٧٥٦	-١٨/٨٣١٦٦	٠/٠٠٠٠	١/٥٢٠٠٧٣
Rate of return on assets	٠/٥٥٧٨٨٥	٠/٠٣٠٢٣٠	١٨/٤٥٠٤٤٤	٠/٠٠٠٠	٢/٠٨٢٨١٠
Sales growth	٠/٠٢٣٦٤٨	٠/٠٠٩٩٦٣	٢/٣٧٣٦٥١	٠/٠١٧٧	١/١٧٦٨٣٩
Constant	٠/٨٦٨٨٧٤	٠/٠٤٥٦٤٣	١٩/٠٣٦٣٦	٠/٠٠٠٠	-
The coefficient of determination: ٠/٥٩٢٣٠١	statistics f: ٣٧٩/٠٩٤٠ (٠/٠٠٠٠٠)	statistics Limer f: ١٨/٩٢٤٥٨٦ (٠/٠٠٠٠٠)	Hasman statistics: ٢٥/٨٩٥٩٢٩ (٠/٠٠٠٥)	Variance heterogeneity statistic: ٢٢/٧٧٤٤١ (٠/٠٠٠٠٠)	Watson Durbin statistics: ١/٥٩١١٥٦

Conclusion

Working capital management is actually the basic element of the daily activities of companies (Mesbah et al., 2015). Working capital management includes all decisions related to the management of current assets and liabilities, i.e. determining the optimal amount of cash, receivables, inventory of goods and current liabilities and the relationship between current assets and current liabilities (Abuzaid, 2012).). Implementing an effective working capital system is a great way for many companies to improve revenues (Bandra, 2015). With optimal management of working capital, companies can shorten their operational and cash cycles and ultimately increase their profitability

(Tran et al., 2017). The shorter the operating and cash cycles of the companies, the more profitable the companies are (Nastitti et al., 2019). The importance of working capital management is closely related to the fact that most companies invest large amounts of money in current assets and rely on current liabilities as a source of credit (Koralon, 2014). Management's inability to manage working capital will potentially create financial problems for companies; In other words, companies that have good working capital show increased performance (Afrifa and Tingbani, 2018). Effective management, on the one hand, aims to not keep the working capital more than necessary, and on the other hand, the working capital should not decrease too much to cause disruption in the company's production activities. Excessive circulating capital causes cash to be kept, potentially leading to waste of resources, theft, dissatisfaction with management efficiency and, as a result, loss of profit. On the other hand, insufficient circulating capital leads to stagnation, increased performance inefficiency and, as a result, reduced production and profitability (Mabandla and Makani, 2019). In fact, effective management seeks to establish a balance between these two situations, because circulating capital more than necessary or less than that creates risks and problems for the company. Basically, the management of working capital, regardless of its size, is important for business life and production growth. The purpose of this research is to explain the effect of liquidity and transparency criteria on production growth, emphasizing the moderating role of shareholders' added value in companies listed on the Tehran Stock Exchange. The findings of the research model test show that the criteria of stock liquidity and transparency in financial reporting have a significant effect on production working capital. Also, the findings of the research show the moderating role of shareholder added value in influencing the criteria of stock liquidity and transparency in financial reporting on production working capital.

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