

Studying the relation between financial ratios and economic performance by using of Q-Toubin index in companies listed on Tehran Stock Exchange

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Abstract

The main subject of this research is to study and analyze the relation between economic performance and financial ratios of companies listed on Tehran Stock Exchange, therefore in each group, financial ratios which had low interior correlation and economic performance of companies have been considered as independent and dependent variables respectively. The main ideas of presented hypotheses are that there is a meaningful relation between proposed financial ratios and economic performance of companies. The purpose of this research is to study the relation between financial ratios based on Q-Toubin index and economic performance of active companies in Tehran stock Exchange. In this research the required information has been studied in time period of 2009 to 2014, in order to study the correctness of research hypotheses, the method of time and sectional data combination has been used. The obtained results of studying all companies show that there is a meaningful relation between all financial ratios and economic performance of companies.

Key words: financial ratios, economic performance, Q-Toubin, Tehran Stock Exchange

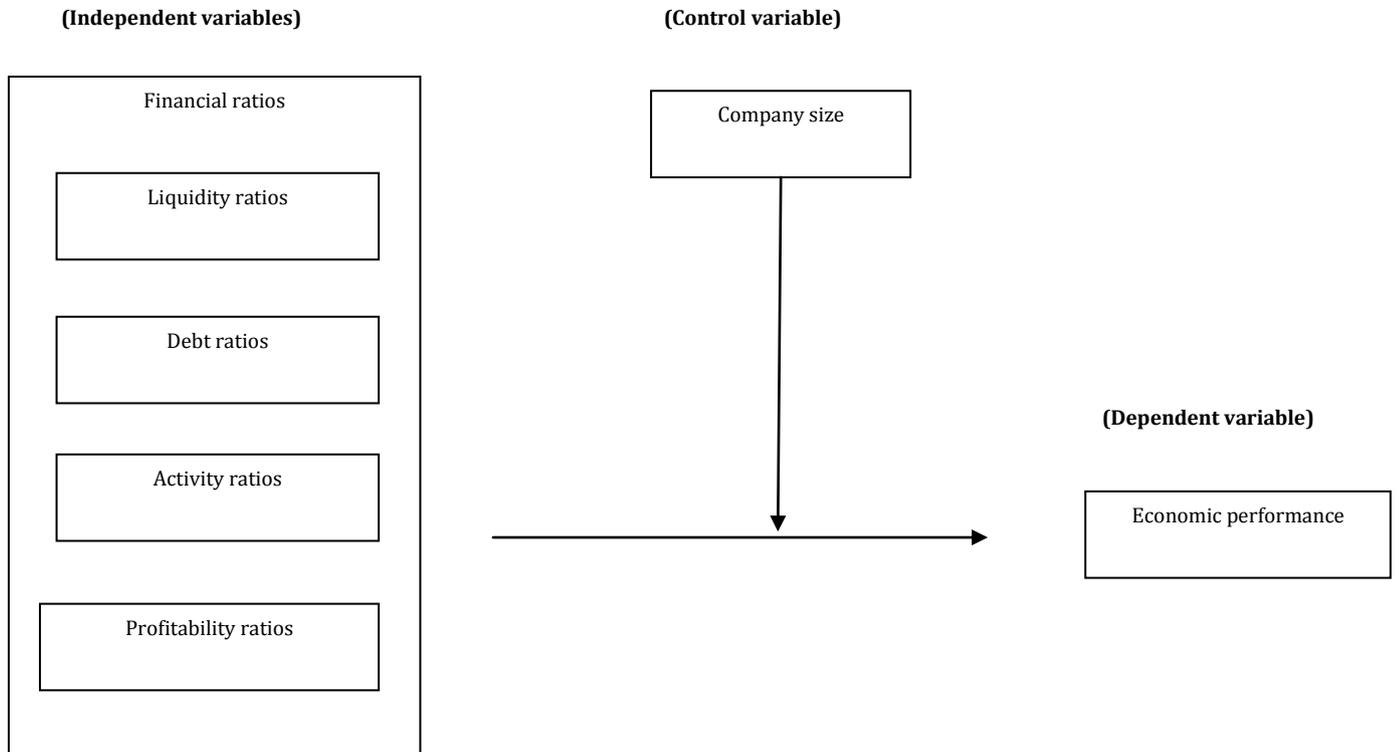
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Introduction

Economic development in each country undoubtedly depends on development and dynamic growth of money and capital markets. Especially capital market which is supplier of required mid-term and long-term funds of economic units. With regard to the incremental importance and spread of capital market in equipping and collecting small individual capitals toward manufacturing activities, identifying the manner of investors' behavior and effective variables on economic performance in these markets have been very important (Hashemi, 2011). In decisions-making of investor in Stock Exchange, the first and most important factor that the investors are facing with it is efficiency and studying the economic performance of companies listed on Stock Exchange. Since economic performance changes under the influence of different factors and each one of these factors somehow causes to decrease or increase the economic performance of companies, studying and analyzing each one of the factors is necessary. On the other hand, financial lists in fact are an abstract of financial reports of companies that present much information content of interior situation of companies (Namazi and Rostami, 2006). The variety of users' information requirements of financial information of companies has caused that they in their analyses apply financial information of different companies and each group of users depending on its requirement selects special method. Different methods have been used for evaluation of the company's profitability. One of these used methods is to utilize of financial ratios. Financial ratios in fact are the abstract of financial report of companies which have much information content of interior situation of company and can constitute the main structure of financial decision-makers. Financial ratios first time were applied for anticipating the bankruptcy and financial distress (Mahdavi and Baratipour, 2008). The advantage of using these ratios is simple method of calculating them with regard to the information of financial reports. These special features of financial ratios have persuaded many researchers to study the relation between change in financial ratios (which is in fact change in interior situation of company) and change in other factors like profit, liquidity situation, shares price (Miri et al, 2010). Also the main subject in this research is to study the relation between the changes of each share profit and changes in financial ratios of companies and finally present a model in order to estimate the profit of each share. For this purpose, the current research seeks for responding to this question that is there meaningful relation between financial ratios and economic performance by using of Q-Toubin index in companies listed on Tehran Stock Exchange?

Research background

1-Ookaner (1973) studied the usefulness of financial ratios for investment in earned shares. In this research, the investment efficiency rate in Stock Exchange has been identified as one of the important factors in decision-making and for this purpose, classification and grading the Stock Exchange based on future efficiency rate is one of the paces



Graph 1: descriptive graph of the research

that can help decision –makers. For anticipating the efficiency rate and grading the stock exchange, he used of financial ratios as independent and descriptive variables and tested the power of anticipating the ratios by using of univariate and multivariate Regression. The obtained results of his research stated this issue that financial ratios are not useful for anticipating the efficiency rate and ratios can’t be used for grading the shares. Ookaner knows the weakness in selecting the ratios as one of the reasons of this conclusion. The selected financial ratios in this research were selected by experimental method. Ookaner in this study had considered the ratios as independent variables which were used by investors and other researchers. But these ratios didn’t have high correlation with shares efficiency rate.

2-Aksoo, Akstin, Green and Rounen (1995) in a research studied the ability of earning anticipation by financial ratios. They used of two ratios of capital efficiency and assets efficiency for anticipation and concluded that if the efficiency is analyzed to smaller components; its anticipation accuracy will be more increased.

3-Nissim and Panman (1999) in a research used of financial ratios for evaluating the Stock Exchange. In this research a model was presented that the evaluation of earning for Stock Exchange had been taken, instead of using of earning, financial ratios as the representative of comprehensive earning were used and with anticipating the process of financial ratios changes and their relation with shares value, future value of shares was anticipated. In this research it was determined that profitability ratios and company development ratios show higher correlation with earning. Nissim and Panman in this research assumed that according to the earning evaluation model, two ratios of profitability and development determine the shares price and therefore these ratios can be used for evaluation of Stock Exchange.

4-Psillaki & Margaritis (2007) accomplished a research entitled “studying the relation between efficiency and leverage”. At first they determined the efficiency of the companies by using of DEA technique and then determined the relation between efficiency and leverage by using of Charki regression Analysis. The result showed that there is positive and meaningful relation between efficiency and leverage and this relation is intensified for more leveraged companies. This relation can be this message for creditors that more efficient companies have more ability for paying their debt and they can also create more leverage.

Hypotheses and the research model

1-There is meaningful relation between liquidity ratios and economic performance of companies listed on Tehran Stock Exchange.

2-There is meaningful relation between leveraged ratios and economic performance of companies listed on Tehran Stock Exchange.

3-There is meaningful relation between activity ratios and economic performance of companies listed on Tehran Stock Exchange.

4-There is meaningful relation between profitability ratios and economic performance of companies listed on Tehran Stock Exchange.

This research according to existing theoretical bases has used of four models in order to prove the above hypotheses that its analysis method has been accomplished by using of E-views econometric plan and in the form of panel data:

$$Q_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 Size_{it} + \beta_3 MB_t + \beta_5 ROE_t + \varepsilon_{it}$$

$$Q_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 Size + \beta_3 MB_t + \beta_5 ROE_t + \varepsilon_{it}$$

$$Q_{it} = \beta_0 + \beta_1 AR_{it} + \beta_2 Size + \beta_3 MB_t + \beta_5 ROE_t + \varepsilon_{it}$$

$$Q_{it} = \beta_0 + \beta_1 PR_{it} + \beta_2 Size + \beta_3 MB_t + \beta_5 ROE_t + \varepsilon_{it}$$

in which:

Q_{it} indicates the performance evaluation index of company which is calculated as follows:

$$Q = \frac{(\text{Shares market value} + \text{Debts book value})}{\text{Assets book value}}$$

LR_{it} indicates the liquidity ratio index; this ratio is obtained from comparing the current asset or its constituent items with current debt. The most important liquidity ratios which are used in this research consist of current ratios of current assets divided by current debts:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current ratio debts}}$$

This ratio is the most common means for measuring the power of paying the short-term debts. Because it can be realized through it that the assets which are converted to cash money during financial year are manifold of debts that their due date will come during the financial year. Generally it can be said whatever the current ratio is more, creditors will have more supply, because if current asset is also damaged, the company can respond to the creditor again. But it should be regarded that too great amount of this ratio indicates that current assets aren't used well or short-term credit sources are used little.

LEV_{it} the indicator of leveraged ratio, this ratio determines and evaluates the used financial sources relation of commercial unit in terms of debts or the salary of shareholders and in fact it studies their combination manner. The used leveraged ratio in this research consists of debt ratio which is obtained from total debts divided by total assets.

$$\text{Debt ratio} = \frac{\text{Total debts}}{\text{Total assets}}$$

Generally, lenders and creditors prefer relatively low debt ratio. Great debt ratio usually means that the company has been forced to use more facilities for supplying the required sources.

AR_{it} indicates the activity ratios, activity ratios determine that to what extent the institution applies its sources effectively. These ratios are related to the comparison of the sale volume and investment in different assets like inventories, fixed assets, debtors etc. The most important of these ratios consist of assets circulation ratio, inventory circulation ratio, current capital circulation ratio and charges collection period.

In this research, assets circulation ratio is used as an index for activity ratios which is obtained from sale earning divided by total assets.

$$\text{Assets circulation ratio} = \frac{\text{Sale}}{\text{Total assets}}$$

Above ratio indicates that how the assets of a company have been applied in order to create the sale earning.

PR_{it} indicates the profitability ratio, profitability ratios indicate that the institution to what extent should be managed effectively and desirably and in fact it measures the success rate of company in gaining net efficiency ratio to sale earning or investments. The most important of them consist of: assets efficiency, salary efficiency of shareholders and profit margins to sale.

In this research, the assets efficiency ratio is used as an index for profitability ratios which is obtained from net profit divided by total assets.

$$(\text{Percental}) \text{assets efficiency} = \frac{\text{Net profit}}{\text{Total assets}} \times 100$$

Some of analysts know this ratio as final index for determining the competence and efficiency of management in managing the commercial unit affairs. The intended ratio is an efficiency that the company has gained for all investors and creditors. Size indicates the company size which is natural logarithm of total assets at the end of financial year,

MB_t indicates market value ratio to book value of company at the end of t-year and

ROE_t indicates salary efficiency of shareholders which is calculated from the profit before unexpected items divided by book value of shareholders' salary at the end of t-year. The reasons of selecting the simple Q-Toubin as the performance evaluation standard are as follows:

1-In calculating Q-Toubin, market information is used, therefore this standard is more related than accounting profit and it is more consistent with reality (Khodaparast et al, 2011).

2-Calculating other Q-Toubin prescriptions require calculating the debts market value and replacement value of company assets. With regard to existing information in financial notes and statements of companies listed on Tehran Stock Exchange and with regard to the existing obstacles and constraints, especially in relation with accessibility to the required information, calculating the debts market value and assets replacement value of Tehran Stock company is difficult and often impossible (Khataee, Ziaee, 2012).

Statistical population

The statistical population of this research includes all non-financial companies listed on Tehran Stock Exchange during the time period of 2009-2014. With regard to available information, 50 companies were studied as statistical sample of research during the time period of 2009-2014.

Estimation of the research hypotheses

The first hypothesis testing

For testing the first hypothesis, at first Chow test is used by the method of applying determined combinative data that the results of this test have been mentioned in the following table:

Table 1: Limer F-statistic for the first hypothesis

Null hypothesis	F- Probability	F	Chow test result
Sectional and time effects aren't meaningful. (<i>pooled data method is suitable</i>)	0.0004	2.24	H₀ hypothesis is rejected.

Source: the researcher estimation

As it is seen in table, Chow test results show that the obtained probability for F-statistic is less than 5 percent, so for testing this hypothesis data have been used in the Panel form. Now in order to determine this issue that for estimating the model parameters, fixed effects model should be used or random effects, Hasman test has been used that the obtained results of this test have been presented in the following table.

Table 2: Hasman test for determining the fixed effects model or random effects

Null hypothesis	P-value of Hasman test	Test result
Using of random effects model	0.000	H₀ hypothesis is rejected

Source: the researcher estimation

Since the *p-value* of Hasman test is less than 0.05, therefore null hypothesis of Hasman test is rejected and the parameters of multivariate Regression equation of fixed effects model should be estimated by **E-views 7** software.

Table 3: estimation relating to the first hypothesis

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	0.186093	0.330878	0.562424	0.5745
Liquidity ratio	0.198707	0.053993	3.680226	0.0003
Company size	0.153131	0.049435	3.097634	0.0022
Ratio of market value to book value	0.017713	0.006125	2.891964	0.0043
Ratio of shareholders salary to profit	-0.01147	0.003774	-3.039700	0.0027

Source: the researcher estimation

The results relating to the first hypothesis model show that with increasing of liquidity ratio that in this research current ratio has been used, company has had better economic performance and it conforms to theoretical bases which were proposed in second chapter. In other words, coefficient relating to liquidity ratio indicates that with increasing one unit of liquidity ratio, economic performance of the company will be increased 18 percent. With regard to the output of E-views econometric plan which has been inserted in the above table, positive and meaningful effectiveness of company value and the market value ratio to book value can be realized that each one has a coefficient equal to 15 percent and %1 respectively.

The second hypothesis testing

For testing the second hypothesis, at first Chow test is used by the method of applying determined combinative data that the results have been mentioned in the following table:

Table 4: Limer F-statistic for the second hypothesis

Null hypothesis	F-probability	F	Chow test result
Sectional and time effects aren't meaningful. (pooled data method is suitable)	0.0002	1.9	H₀ hypothesis is rejected.

As it is seen in the table, Chow test results show that the obtained probability for F-statistic is less than 5 percent, so for testing this hypothesis, data have been used in the panel form. Now in order to determine this issue that for estimating the model parameters, fixed effects model should be used or random effects, Hasman test has been used that the obtained results of this test have been presented in the following table:

Table 5: Hasman test for determining the fixed effects model or random effects

Null hypothesis	P-value of Hasman test	Test result
Using of random effects model	0.000	H₀ hypothesis is rejected

Source: the researcher estimation

Since *P-value* of Hasman test is less than 0.05, therefore null hypothesis of Hasman test is rejected and the parameters of multivariate Regression equation of fixed effects model should be estimated by using of E-views 7 software.

Table 6: estimation relating to the second hypothesis

Variables	coefficient	Std. Error	t-Statistic	Prob.
C	1.038439	0.292783	3.546785	0.0005
Leveraged ratio	-1.0253	0.162037	-6.328075	0.0000
Company size	0.161570	0.046255	3.493048	0.0006
Market value ratio to bank value	0.019232	0.005751	3.344204	0.0010
Shareholders salary ratio to profit	-0.01388	0.003549	-3.913131	0.0001

Source: the researcher estimation

The results relating to the second hypothesis model show that with increasing of leveraged ratio, economic performance of the company is weakened and therefore there is a negative meaningful relation between leveraged ratio and economic performance of the company. The reason of it refers to this issue that in this research, total debts ratio to total assets was used for quantification of leveraged ratio. It is clear that with increasing of gap between debts with asset, the performance domain of company is weakened which is consistent with existing theoretical bases in this field. In other words the coefficient relating to leveraged ratio indicates that with increasing one unit of leveraged ratio, the economic performance of company will decrease as well as the related coefficient in the table.

With regard to the output of E-views econometric plan which has been inserted in above table, positive and meaningful effectiveness of the company value and the market value ratio to the book value can be realized that each one has a coefficient equal to 16 percent and %1 respectively.

The third hypothesis testing

For testing this third hypothesis, at first chow test has been used by the method of applying determined combinative data that the results of this test have been mentioned in the following table:

Table 7: Limer F-statistic for third hypothesis

Null hypothesis	F-Probability	F	Chow test result
Sectional and time effects aren't meaningful. (pooled data method is suitable)	0.0001	2.41	H₀ hypothesis is rejected.

Source: the researcher estimation

As it is seen in the table, Chow test results show that the obtained probability for F-statistic is less than 5 percent, so for testing this hypothesis, data have been used in the panel form. Now in order to determine this issue that for estimating the model parameters, fixed effects model should be used or random effects, Hasman test has been used that the obtained results of this test have been presented in the following table.

Table 8: Hasman test for determining the fixed effects model or random effects

Null hypothesis	P-value of Hasman test	Test result
Using of random effects model	0.000	H₀ hypothesis is rejected.

Source: the researcher estimation

Since the *P-value* of Hasman test is less than 0.05, therefore null hypothesis of Hasman test is rejected and the parameters of multivariate regression equation of fixed effects model should be estimated by using of **E-views 7** software.

Table 9: estimation relating to third hypothesis

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.92097	0.984767	-4.997095	0.0000
Activity ratio	0.582161	0.108525	5.364320	0.0000
Company size	0.944865	0.157352	6.004772	0.0000
Market value ratio to book value	0.009997	0.004155	2.406043	0.0171
Shareholders salary ratio to profit	-0.00067	0.002676	-0.251720	0.8015

Source: the researcher estimation

Coefficient relating to the activity ratio in estimating the above table indicates this issue that there is meaningful relation between activity ratios and economic performance of companies listed on Tehran Stock Exchange. In other words with increasing of the sale earnings ratio to total assets that in this research was introduced as the activity ratios index, economic performance of company is also promoted, therefore with increasing one unit in sale earnings ratio to total assets, the company performance changes 58 percent on the positive side.

Also according totwo above hypotheses, we can see the positive and meaningful effect of the company size and market value ratio to book value on economic performance of the company.

The fourth hypothesis testing

For testing the fourth hypothesis, at first Chow test is used by applying determined combinative data that the results of this test have been mentioned in the following table:

Table 10: Limer F-statistic for the fourth hypothesis

Null hypothesis	F-Probability	F	Chow test result
Sectional and time effects aren't meaningful. (pooled data method is suitable)	0.0005	1.77	H₀ hypothesis is rejected.

Source: the researcher estimation

As it is seen in the table, the results of Chow test show that the obtained probability for F-statistic is less than 5 percent, so for testing this hypothesis, data have been used in the panel form. Now in order to determine this issue that for estimating the model parameters, fixed effects model should be used or random effects, Hasman test has been used that the obtained results of this test have been presented in the following table.

Table 11: Hasman test for determining the fixed effects model or random effects

Null hypothesis	P-value of Hasman test	Test result
Using of random effects model	0.000	H₀ hypothesis is rejected.

Source: the researcher estimation

Since the *P-value* of Hasman test is less than 0.05, therefore null hypothesis of Hasman test is rejected and estimating the parameters of multivariate Regression equation of fixed effects model has been accomplished by using of **E-views 7** software.

Table 12: estimation relating to the fourth hypothesis

Variable	coefficient	Std. Error	t-Statistic	Prob.
C	-3.41979	1.025162	-3.335861	0.0010
Profitability ratio	0.676848	0.293931	2.302744	0.0223
Company size	0.763919	0.167450	4.562069	0.0000
Market value ratio to book value	0.008209	0.004373	1.877281	0.0620
Shareholders salary ratio to profit	-0.00154	0.002860	-0.540250	0.5896

Source: the researcher estimation

The results relating to the fourth hypothesis model show that with increasing of profitability ratio that in this research, net profit ratio to total assets has been used, the company has had better economic performance and it conforms with theoretical bases in existing literature. In other words, coefficient relating to profitability ratio indicates that with increasing one unit of profitability ratio, economic performance of the company will be increased 67 percent. On the other hand, coefficient relating to the company size indicates this issue that in studied companies there is a positive relation between the company size and economic performance of the company. In other words with one percent increase of the company size, the economic performance of company will be increased 76 percent. Also coefficient relating to the market value ratio to the book value and the shareholders salary ratio to the profit indicate so little effect on economic performance of the company.

Discussion and conclusion

The main subject of this research is to study and analyze the relation between economic performance and financial ratios of the companies listed on Tehran Stock Exchange, therefore in each group financial ratios that had low interior correlation and economic performance of the companies have been considered as independent and dependent variables respectively. The main ideas of presented hypotheses are that there is a meaningful relation between proposed financial ratios and the economic performance of companies. The purpose of this research is to study the relation between financial ratios based on Q-Toubin index and the economic performance of active companies in Tehran Stock Exchange. In this research the required information was studied for 50 companies listed on Tehran Stock Exchange during the time period of 2009-2014. Also for studying the correctness of the research hypotheses, the method of sectional and time data combination has been used. With regard to the constraint of statistical population of this research to the companies listed on Tehran Stock exchange and also exerting the constraints for screening in order to gain the sample, in generalization of this research results, caution should be exercised. In data analysis, the following issues are thinkable: One of the problems of using the financial ratios is the large number of them which for some reasons it causes to use less of them. Firstly, large number of financial ratios requires more time for analyzing and causes that it allocates much time of financial analysts such as inside and outside the company (managers, shareholders, financial institutions, investors,...) to itself. Secondly all financial ratios don't have equal importance. Therefore the ratios should be analyzed that have high importance and most importantly, much and additional information always causes more bewilderment and mistakes. Thirdly, the research cost should be always considered. Definitely analyzing large number of financial ratios causes more cost. For more using of financial ratios and also solving the above problems, suitable number of financial ratios should be selected. The results relating to the first hypothesis model showed that with increasing of liquidity ratios that in this research, current ratio has been used, the company has had better economic performance and it conforms to existing theoretical bases. In other words, coefficient relating to liquidity ratio indicates that with increasing one unit of liquidity ratio, economic performance of the company will be increased 18 percent. On the other hand with regard to output of E-views econometric plan, positive and meaningful effectiveness of the company value and the market value ratio to the book value can be realized that each one has a coefficient equal to 15 percent and %1 respectively. The result of first hypothesis conforms to the result of similar research which was accomplished by Varal (2012), because increasing of asset and in contrast

decreasing of the company debt can be effective on improving the economic performance of company. The results relating to the second hypothesis model show that with increasing of leveraged ratio, the economic performance of company is weakened and therefore there is a negative meaningful relation between the leveraged ratio and economic performance of company. The reason that there is a negative relation between these two variables refers to this issue that in this research, total debts ratio to total assets for quantification of leveraged ratio was used. It is clear that with increasing of gap between debt and asset, the performance domain of company is weakened which is not consistent with existing theoretical bases in this field. In other words the coefficient relating to the leveraged ratio indicates that with increasing one unit of leveraged ratio, the economic performance of company will be decreased as well as related coefficient in the table. With regard to the output of E-views econometric plan which is inserted in the related table, positive and meaningful effectiveness of the company value and the market value ratio to the book value can be realized that each one has a coefficient equal to 16 percent and %1 respectively. The result of the second hypothesis doesn't conform to the result of similar research which was accomplished by Anthony Kirbour (2007) because they have concluded that there is a positive meaningful relation between financial leverage ratio as the capital structure and performance. The results relating to the third hypothesis model show that there is meaningful relation between the activity ratios and economic performance of companies listed on Tehran Stock Exchange. In other words with increasing of the sale earning ratio to total assets that in this research was introduced as the activity ratios index, the economic performance of company is also promoted, therefore with increasing one unit in the sale earnings ratio to total assets, the company performance changes 58 percent on the positive side. The result of third hypothesis conforms to the results of similar researches which were accomplished by Jouse et al (2003), Kabaler et al (2013) and Gol et al (2013) who had achieved positive meaningful relation between the ratios of activity and capital management in circulation and economic performance. It didn't conform to the results of Ogantip et al (2012) and they have concluded that there is a negative meaningful relation among the cash conversion cycle, the market value and company performance and they also show the positive relation of the debts ratios with market value and their negative relation with the company performance. The results relating to the fourth hypothesis model show that with increasing of profitability ratio that in this research, net profit ratio to total assets has been used, the company has had better economic performance and it conforms with theoretical bases in existing literature. In other words the coefficient relating to profitability ratio indicates that with increasing one unit of profitability ratio, the economic performance of the company will be increased 67 percent. On the other hand the coefficient relating to the company size indicates that in studied companies there is a positive relation between the company size and the economic performance of company. In other words with one percent increasing of the company size, the economic performance of company will be increased 76 percent. The result of fourth hypothesis doesn't conform to the results of similar researches which were accomplished by Ibrahim-Il et al (2009) and Machour et al (2000) and after data analysis with multivariate regression method they concluded that the decision of the capital structure choice generally isn't effective on the company performance or its effect is weak.

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