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INVESTIGATE THE RELATIONSHIP BETWEEN FREE CASH FLOWS AND ABNORMAL RETURNS DURING THE INITIAL OFFERING OF TEHRAN STOCK EXCHANGE

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ABSTRACT

The main purpose of this paper is to investigate the relationship between free cash flow with abnormal returns resulting from the stock of new companies to the stock exchange. The ability to predict abnormal stock return of the new companies to the Tehran Stock Exchange has been investigated by helping the various models of free cash flow including the "Lehn and Poulsen" method, the "Copeland" method, and the "Tehran Stock Exchange" method, for the period of 2003 until 2012. For this purpose, we selected 134 qualified companies according to the eliminating method and we examined them after entering into the stock exchange for monthly courses. According to conducted surveys and analysis of information, the findings show that there is a positive and significant relationship between free cash flows and abnormal stock returns in initial offering.

Keywords: *Abnormal Stock Returns, Free Cash Flow, Initial Offering of Stock, The Tehran Stock Exchange*

INTRODUCTION

Capital markets have a great and significant importance in development of economic activities, investment, and optimal allocation of capital in the economy of our country. The capital market is a market in which the stock and all stock exchanges of various companies are offered for sale, and the applicant companies can provide their required funds simply and relatively with low cost. Initial offering of stock is always one of the most controversial issues in capital markets that extensive researches have always been conducted by financial researchers about it. Meanwhile, the presence of abnormal return which has been always observed in most researches in capital markets has prompted researchers to investigate and study more than the other initial offering of stock, and the difference between the actual return of intended company and market return indicates the abnormal stock return that some of these researches can refer to Ibbostan *et al.*, (1988). In recent years, researchers like Loughran (2003) and Emerson (2007) and Yong (2008) examined the performance of IPO with respect to the various aspects. Despite the initial offering of stock has a great importance for publishers and provides several advantages for them, if it is not planned properly and based on the full knowledge of the market and the potential investor, it will bring into unpleasant consequences for publishers, and if it is repeated, the capital markets will faced to the serious challenges resulting from the lack of trust. One of the criteria for evaluating the performance and evaluating the financial health of the business units is free cash flow, which has wide application in comparison, analysis and valuation of the company's stocks and it was raised by Jensen for the first time (Gul *et al.*, 2002). In this research, we sought to explore the relationship between models of the free cash flow and abnormal returns of Tehran Stock Exchange. Recent studies indicate that abnormal return can be affected by financial information of companies. In other words, some investors have been able to use a number of financial ratios to calculate the expected rate of return that this information is not reflected in the real price of stocks due to lack of knowledge of other investors from this relationship and it causes to create an additional return for those groups of investors who are aware of this relationship.

Theoretical Principles and Research Hypotheses Designing

The possibility of buying and selling would be easy in the market through the public offering stocks of the company, and this matter increases the attractiveness of the exchange for investors. The high liquidity

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and the possibility of the rapid changes in stock price cause to attractiveness of the stocks of the accepted companies for investors on the exchange. Normally, the proposal of the initial public offering is performed by a large number of small and institutional investors to purchase the stocks of the company. The number of large investors and their ensuring of the liquidity of the investments in accepted companies on the exchange makes sure to the current owners of private companies that their companies will be sold to the highest possible value in public offering.

The Initial Public Offering

The term initial public offering, that its spread returns to the booming markets in 1990, is what a company attempts to offer the stock to the public during its activity for the first time. It is notable that companies that offered for the first time in stock exchange are not newly established and they have often at least 3 years of experience; so, the first word in this term means offering the stocks of the company to external shareholders for the first time through the stock exchange, when the cited company has found that the acceptance on the stock exchange can a great help to attract of investment in the process of its activities reduce the financing costs and even reduce the taxes whether through borrowing or through shareholders. The volume of stocks which can be traded into the market during a process of the initial public offering depends on the ownership structure before the IPO and in such a way that if the concentration of stock ownership exists before the public offering, and previous shareholders feel that they lose their powers of control in the company due to IPO, the less stocks will publish and this new stocks will be explained in a way that there exist no other large shareholders (Arash *et al.*, 2008). Against these benefits, the initial public offering of stock and entering into the stock exchange have the expenses and limitations that the most important costs can refer to the cost of providing information according to the rules of stock exchange, the costs of auditing firm and providing the audited financial statements, the costs of underwriting and issuing the stock and also some qualitative costs like duration in which the firms senior managers spend to perform the affairs related to IPO. Of course, the amount of these costs is different depending on the volume of supply and the potential of building market in various companies.

Free Cash Flow, the Criteria for Measuring the Performance of Companies

Free cash flow is the criteria for measuring the performance of companies and it shows the cash in which the company has its disposal to maintain or expand of the assets after performing the necessary expenses. Free cash flow is important because it allows the company to explore opportunities that will increase the shareholder values. Development of new products, conducting business earnings, paying the cash profits to shareholders and reducing the debts is impossible without possessing the cash. The cash must be maintained at a level that there is a balance between costs of keeping cash and costs of insufficient cash. In addition, management of the cash will affect the value of company too. Because of this, the levels of investments of the cash need to increase the other costs which is affected by the levels of net working capital. Both increasing and decreasing of the net working capital necessitate to balance free cash flows in the future and change the valuation of company in turn. Considering the proposed principles and in order to achieve the main objective of the research, the following hypotheses were proposed and tested:

H1: There is a direct relationship between free cash flows and abnormal stock return in initial offering by Lehn and Poulsen method.

H2: There is a direct relationship between free cash flows and abnormal stock return in initial offering by Copeland method.

H3: There is a direct relationship between free cash flows and abnormal stock return in initial offering by Tehran Stock Exchange method.

Review of the Related Literature

Mayring (2006) investigated the relationship between returns and unexpected incomes by the accounting methods in a study that his main purpose was to determine the response to an unexpected incomes that uses of change in earnings per share and the prediction error of the analyst. Yang *et al.*, (2008) carried out a study on the integration of payment methods and abnormal return in receptive guest companies that the research findings show that the receptive guests have received 12 items of positive abnormal return before the integration, and there is a negative relationship between cash payments and abnormal return of the

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services recipients. Chi *et al.*, (2008) dealt with the analysis of the long-term function of the initial public offerings of the stock and the effective factors on it. Their research results show the levels of abnormal performance; also the initial excessive optimism and the size of the stock supplier company were the important explanatory factors for this abnormal performance.

Bacheta *et al.*, (2008) examined the relationship between predictability of abnormal return and the expected errors in numerous financial markets and this is applicable by using the research data on participants in the stock market, the exchange market, the bond market and the money market in different countries that the obtained results of it are as follows and that firstly, there is no predictability in markets with abnormal return predictability, and it is almost impossible to predict the error in money market. Adel (2011) examined investigation the relationship between performance of companies in initial public offering and the ownership structure and they concluded that there is a reverse relationship between performance of companies in the IPO and changes in the ownership structure.

Polet and Wilson (2010), examined the average correlational relationship and market stock return and concluded that each change to be ineffective on the cumulative risk in the variance of the stock market, it can be ineffective on the risk of the stock market, or can be backfired, and also it is shown that the average relationship between daily stock return can predict the four-month abnormal return; in addition, changes in the stock market risk can be predicted by changing in average variance of individual stock. In their research, Gao *et al.*, (2006) examined the effective non-financial variables on the price of the new stocks offering of the pharmaceutical and biotechnology companies in addition to the financial variables. The most important financial variables include: operating cash flow, sales, net profit, operating profit, total assets, research and development expenses and the ratio of book value to the market value. The most important non-financial variables include: number of company products, product development stage and the legal protection of the material and spiritual rights of patent right which are considered the most important influencing variables on prices of stock offering of pharmaceutical biotechnology companies (Gao *et al.*, 2006).

Zheng (2006) examined the investigation of the relationship between characteristics of the new companies and predicting of the executives in his research. His samples are included 3186 new company to the stock exchange of Canada from 1982 to 1988. His results showed that there is a positive meaningful relationship between discounting and variables such as the annual growth of sales project and profit before tax.

MATERIALS AND METHODS

Research Method

The research method is description of the correlative and comparative in terms of performance and is applicable in terms of purpose. The statistical population consists of those companies which have been accepted in the Tehran Stock Exchange from the beginning of 1382 until the end of 1391, their stocks were offered to the public for the first time, included the statistical population of this research.

Sample selection is done among the accepted companies in the Tehran Stock Exchange by considering the following criteria:

- 1) The end of the fiscal year of company leading to the end of Esfand.
- 2) The company has no change of fiscal year during the study period.
- 3) The transaction symbol of company to be active and it deals at least once a year. 4) The financial information of company will be available during the study period.

Thus, the sampling method is eliminating systematic and on the basis of foregoing considerations, the companies that do not have the mentioned conditions have been removed from the sample. In Table 1, the annual distribution of the number of companies has been shown that their stocks were traded in the Tehran Stock Exchange for the first time during the years from 1382 to 1391 and the number of companies that were entered in test sample has been presented.

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Table 1: Distribution of sample companies

Fiscal year	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	Sum
Statistical population(N)	49	31	13	3	9	5	6	5	8	3	132
Statistical sample(n)	22	13	2	3	4	5	6	4	8	3	70

As the data collection method in the present research is a library and documents, so it needs to see the documents and take notes of them for obtaining this information and also it uses of the collected information by the statistical centers of stock exchange organization in the form of tables, graphs, etc., and computer networks. The company's financial information will be extracted from their financial statements. Information related to the stocks offering will be collected by using the *tadbir pardaz* software. Information about the daily stock returns of the company of the statistical population and market return will be extracted by the use of *rah avard novin* and *tadbir pardaz* softwares. Also, in some special cases, the Internet site of the Tehran Stock Exchange and the company's acceptance declaration of the Tehran Stock Exchange under the title of *omid nameh* have been accepted and inserted, as well as, the site of www.IPO.ir. has been used. The hypotheses testing have been conducted in confidence level of 95%. Also, the EXCEL software has been used for data classification, and the SPSS software has been used for analyzing the data.

Evaluation of the Research Variables

Independent variable for the first hypothesis: free cash flow model of Lehn and Poulsen:

$$FCF_{i,t} = (INC_{i,t} - TAX_{i,t} - INTEXP_{i,t} - PSDIV_{i,t} - CSDIV_{i,t}) / A_{i,t-1}$$

in which:

$FCF_{i,t}$: free cash flows of company i in year t

$INC_{i,t}$: operating profit before depreciation of company i in year t

$TAX_{i,t}$: total taxes of company i in year t

$INTEXP_{i,t}$: payable interest cost of company i in year t

$PSDIV_{i,t}$: payable dividend of preferred shareholders of company i in year t

$CSDIV_{i,t}$: payable dividend of common shareholders of company i in year t

$A_{i,t-1}$: the total book value of assets of company in year $t-1$

Independent variable for the second hypothesis: the free cash flow model of Copeland:

Copeland's definition of free cash flows:Free cash flows of business unit are defined as operating profit after tax plus non-cash costs after deduction of investments, property, machinery, equipment and other assets.

$$FCF_t = E_t + NCC_t - \Delta WC_t - \Delta FA_t$$

in which:

E_t : operating profit after tax of business unit in the period t

NCC_t : non-cash costs such as depreciation expense, doubtful demands expense of business unit in the period t

WC_t Delta: the increase in working capital of business unit in the period t

FA_t Delta:the increase in total gross book value of fixed assets of the business unit in the period t

Independent variable for the third hypothesis:

Alternatively, the free cash flow is calculated by subtracting of capital expenditures from operating cash flow. It is worth mentioning that the Tehran Stock Exchange will be accepted on the stock exchange in order to ensure comparability of the company's stocks,to calculate free cash flow and this calculation method is used in *omid nameh* and list companies.Operating cash flow comes at the top of the form of cash flow and the performed net capital expenditures are calculated both of the investment activities of mentioned obtaining and the free cash flow is calculated through the difference between them for 3 past years (or 3 next year if there is the data).

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The dependent variable in this research is the cumulative abnormal return. In this research, we will use of the following equation to measure abnormal returns:

$$ar_{it} = r_{it} - r_{mt}$$

Stock returns will be calculated as follows:

$$R = \frac{(1 + \text{the right of priority percent} + \text{stock awards percent}) P_t - P_{t-1} + DPS - (1000 \times \text{the right of priority percent})}{P_{t-1}}$$

And the market return is calculated as follows:

$$r_{mt} = \frac{I_{mt} - I_{m0}}{I_{m0}}$$

After calculating the monthly abnormal returns, we use of the following equation in order to calculate the average of abnormal return of the n sample share in t month:

$$AR_t = \frac{1}{N} \sum_{i=1}^n ar_{it}$$

In the above equation, we have: After calculating the average of abnormal returns rate of n share in t month, in order to calculate the cumulative rate of abnormal return the following equation has been used:

$$CAR_{q-s} = \sum_{t=q}^s AR_t$$

Operational Definitions

P_{it} : the average price of the company stocks of i in period t .

DPS : dividend stocks of company i in period t .

AR_t : the average abnormal return rate of n share in period t .

N : the number of shares.

I_{mt} : price index and cash return at the end of t .

I_{m0} : price index and cash return at the start of t .

r_{it} : stock return of companies i .

r_{mt} : price index return and cash return of Tehran Stock Exchange.

ar_{it} : abnormal return (adjusted rather to Stock Exchange return) shares i .

CAR_{q-s} : the cumulative abnormal return of new shares.

RESULTS AND DISCUSSION

Research Findings

As in present research, the information of the 134 accepted companies has been collected in Tehran Stock Exchange and extracted information includes the dependent, independent, and controlled variables, the aim of this research is to investigate the effect of independent variables on the dependent variables, therefore, regression analysis is the best method for testing the hypothesis.

Kolomogorov-Smirnov Test

Distribution normality of the dependent variable in Table 2.

Table 2: The evaluation results of the distribution normality of the dependent variable

Parameter description	Variables	CAR_{q-s}
Number	134	
Test criteria	0.948	
The meaningfulness level	0.0847	

In Table 2, as the obtained meaningfulness level of Kolomogorov-Smirnov test is more than the test error level ($\alpha = 0.05$), the H0 hypothesis test can be accepted. So, the values related to the dependent variable follow a distribution close to the normal distribution.

Analysis of the Variance Difference

The combined composed linear regression or Data Panel have been used due to the multiplicity of the used linear equations, the use of the cross-sectional linear regression for each of the five years period

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under study, and to determine the relationship between variables,.In order to determine the type of used analysis, the Chav and Hausman tests has been used.

Table 3: White variance difference test results

Hypotheses	Description	Statistic amount	Probability	P-VALUE	Result	Regression method
Sub hypothesis 1	F-statistic	26.281	0.0000	P <0.05	Variance difference	Use of GLS
	Obs*R-squared	92.474	0.0000			
Sub hypothesis 2	F-statistic	31.581	0.0637	P ≥0.05	Variance consistency	Use of OLS
	Obs*R-squared	92.256	0.0817			
Sub hypothesis 3	F-statistic	28.164	0.000	P <0.05	Variance difference	Use of GLS
	Obs*R-squared	90.529	0.000			

As the statistic of this test is not significant at the level of 5% in the second sub-hypothesis,thus assuming the variance difference is rejected and disrupting clauses of the variance consistency will be accepted.Because the statistic of this test is significant at the level of 5% in the other hypotheses, thus assuming the variance consistency is rejected and disrupting clauses of the variance difference will be accepted.

Limer F Test and Hausman Test

Because the amount of obtained p-value from the Limer F test is greater than 0.05 in the second sub-hypotheses,the zero hypothesis is confirmed (p-value> 0.05) and Integrated Data method is accepted. Also, due to the amount of obtained p-value from the Limer F test is greater than 0.05, the Hausman test is not required. Because the amount of obtained p-value from the Limer F test is zero in other hypotheses, the zero hypothesis is rejected (p-value <0.05) and the Data Panel method is accepted. Also, because the amount of obtained p-value from the Hausman test is greater than 0.05, the zero hypothesis of the Hausman test is confirmed and the random effects method is accepted.

Table 4: F Limer test and Hausman test

Hypotheses	F statistic	Limer	Probablity	P-VALE	Result	Hausman statistic	Probability	P-VALUE	Result
Sub hypothesis 1	4.519	0.000		P<0.05	Data Panel	11.884	0.0517	P≥0.05	Random effecs
Sub hypothesis 2	4.643	0.0531		P≥0.05	Integrated Data	-	-	-	-
Sub hypothesis 3	5.249	0.000		P<0.05	Data Panel	12.115	0.0626	P≥0.05	Random effects

Table 5: The results of the data analysis for the first hypothesis test

Variable	Abnormal return of stock in the initial offering(CAR_{q-s})				
	Coefficient	The standard deviation	t Statistic	p-value	
C	0.52156	0.1826	3.9185	0.004	
FCF L&P	0.5429	0.12537	3.3304	0.011	
Size	0.4931	0.27243	3.0391	0.014	
MB	-0.4917	0.2371	-3.5572	0.007	
ROA	-0.6162	0.2915	-2.4938	0.023	
Watson statistic camera		1.86347		Adjusted R-squared	
Prob(F-statistic)		0.000		0.21097	

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The Hypotheses Analysis

The First Hypothesis Test

There is a significant relationship between free cash flows and abnormal stock return in initial offering by Lehn and Poulsen method.

$$CAR_{q-s} = \beta_0 + \beta_1 FCF L\&P + \beta_2FSIZE it + \beta_3 MBit + \beta_4 ROA it + \epsilon it$$

Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.21097 and indicates that approximately 21% of the changes of the dependent variable is explainable by the independent variables of the model. And also the Watson statistic camera is 1.86347, which this is between 1.5 to 2.5, that indicates the lack of correlation between variables. As seen in Table 5, the coefficient variable of the free cash flows is equal to 0.5429 by Lehn and Poulsen method (FCF L & P) and its meaningfulness number (Prob) is 0.011. Due to the t-statistics and p-value of this variable, the results show the meaningfulness of this coefficient at the 5 percent level of error. These findings show that there is a positive and significant relationship between free cash flows and abnormal stock return in initial offering by Lehn and Poulsen method.

The Second Hypothesis Test

There is a significant relationship between free cash flows and abnormal stock return in initial offering by Copeland method.

$$CAR_{q-s} = \beta_0 + \beta_1 FCF K + \beta_2FSIZE it + \beta_3 MBit + \beta_4 ROA it + \epsilon it$$

Table 6: The results of the data analysis for the second hypothesis test

Abnormal return of stock in the initial offering (CAR_{q-s})					
$CAR_{q-s} = \beta_0 + \beta_1 FCF L\&P + \beta_2FSIZE it + \beta_3 MBit + \beta_4 ROA it + \epsilon it$					
Variable	Coefficient	The standard deviation	t Statistic	p-value	
C	0.5391	0.2735	3.461	0.011	
FCF K	0.4973	0.1366	3.228	0.015	
Size	0.6183	0.3410	3.637	0.006	
MB	-0.5519	0.2036	-3.522	0.009	
ROA	-0.8571	0.4156	-2.791	0.045	
Watson statistic camera	1.9463		Adjusted R-squared		
Prob(F-statistic)	0.000		0.2336		

Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.2336 and indicates that approximately 23% of the changes of the dependent variable is explainable by the independent variables of the model which represents a good explanatory power of this regression. And also the Watson statistic camera is 1.9463, which this is between 1.5 to 2.5, that indicates the lack of correlation between variables. As seen in Table 6, the coefficient variable of the free cash flows is equal to 0.4973 by Copeland method (FCF K) and its meaningfulness number (Prob) is 0.015. Due to the t-statistic and p-value of this variable, the results show the meaningfulness of this coefficient at the 5 percent level of error. These findings show that there is a positive and significant relationship between free cash flows and abnormal stock return in initial offering by Copeland method.

The Third Hypothesis Test

There is a significant relationship between free cash flows and abnormal return of stock in initial offering by Tehran Stock Exchange method.

$$CAR_{q-s} = \beta_0 + \beta_1 FCF + \beta_2FSIZE it + \beta_3 MBit + \beta_4 ROA it + \epsilon it$$

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Table 7: The results of the data analysis for the third hypothesis test

Abnormal return of stock in the initial offering(CAR_{q-s})				
$CAR_{q-s} = \beta_0 + \beta_1 FCF\ L\&P + \beta_2FSIZE\ it + \beta_3 MBit + \beta_4 ROA\ it + \epsilon\ it$				
Variable	Coefficient	The standard deviation	t Statistic	p-value
C	0.3729	0.0642	3.106	0.025
FCF	0.6118	0.1341	4.264	0.000
Size	0.5133	0.2024	3.153	0.014
MB	-0.4208	0.2256	-2.698	0.038
ROA	-0.7193	0.4193	-1.954	0.048
Watson statistic camera	1.92273		Adjusted R-squared	
Prob(F-statistic)	0.000		0.19034	

Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.19034 and indicates that approximately 19% of the changes of the dependent variable is explainable by the independent variables of the model. And also the Watson statistic camera is 1.92273, which this is between 1.5 to 2.5, that indicates the lack of correlation between variables. As seen in Table 7, the coefficient variable of the free cash flows is equal to 0.6118 by Tehran Stock Exchange method (FCF) and its meaningfulness number (Prob) is 0.000. Due to the t-statistic and p-value of this variable, the results show the meaningfulness of this coefficient at the 5 percent level of error. These findings show that there is a positive and significant relationship between free cash flows and abnormal stock return in initial offering by Tehran Stock Exchange method.

Discussion and Conclusion

The results of the first hypothesis test show that there is a direct and significant relationship between free cash flows and abnormal stock return in initial offering by Lehn and Poulsen method. Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.21097 and indicates that approximately 21% of the changes of the dependent variable is explainable by the independent variables of the model. According to the results of the second hypothesis test, there is a direct and significant relationship between free cash flows and abnormal stock return in initial offering by Copeland method.

Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.2336 and indicates that approximately 23% of the changes of the dependent variable is explainable by the independent variables of the model which represents a good explanatory power of this regression. According to the results of the third hypothesis test, there is a direct and significant relationship between free cash flows and abnormal stock return in initial offering by Tehran Stock Exchange method. Due to the obtained results of the regression model test as the above Table, it is observed that the amount of P-value related to the F (prob (F-statistic)) statistic, indicating that the meaningfulness of the whole regression is equal to 0.000 and this shows that the model is meaningful at the confidence level of 95%. The adjusted R-squared is equal to 0.19034 and indicates that approximately 19% of the changes of the dependent variable is explainable by the independent variables of the model.

Suggestions of the Research Results

According to the research hypotheses, it is suggested that the investors pay attention to the free cash flows of companies in initial offerings of the Tehran Stock Exchange. It is suggested that the stock exchange organization accepts the calculation method of free cash flow by the Copeland method.

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