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A study on the Relationship between Cash Flow and Stock Abnormal Returns Considering Investment Opportunities in the Petrochemical and Cement Industry of Tehran (Iran) Stock Exchange

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Abstract: purpose of this study is to investigate the relationship between cash flow and stock abnormal returns considering investment opportunities in the petrochemical and cement industry of Tehran Stock Exchange. Operating cash flow, capital investment and financing have been studied as independent variables and a stock abnormal return has been used as the dependent the variable. To test the research hypotheses and to investigate the relationship between the variables data of 44 companies listed in Tehran Stock Exchange, that is to say 22 companies from petrochemical industry and 22 companies from cement industry have been selected as the statistical sample for time period of 2007-2012. Collected data have been analyzed using pooled data analysis method based on multivariate regression analysis. Growth opportunities index of Tobin Q ratio has been used as the adjustment (damper) variable. To estimate the hypotheses test appropriate model in pooled data Chow and Hausman tests have been used. This study consisted of six hypotheses. The hypotheses test results indicate the confirmation of the three hypotheses of first to third in both industry groups. This means that by increasing cash flow from operations and capital investment, stock abnormal returns for shareholders increase and by increasing financed cash flow, the stock abnormal return is reduced. By adding growth opportunities variables to the research model different results have been obtained. First, confirming the fourth hypothesis in both groups of petrochemical and cement companies, it has been concluded that by increasing the growth opportunities and Tobin's Q ratio, the intensity of the relationship between operating cash flow and stock abnormal returns will also increase. The fifth hypothesis has been approved just in petrochemical companies. The result shows that when there are more growth opportunities for the company, the invested cash flow leads to higher abnormal stock returns for shareholders. But, the sixth hypothesis has been rejected in both groups.

Key words: Cash Flow, Stock Abnormal Return, Growth Opportunities, Tobin's Q Ratio

INTRODUCTION

Capital market development is one of the main economic growth and development pivots in any society. In this regard, after the end of the war between Iran and Iraq, Iran's capital market has experienced relatively large

changes, such as major ups and downs in the stock trading, the chief volume of public companies share cession through Tehran Stock Exchange, and an increasing in the number of listed companies in Tehran Stock Exchange[1]. Important role of capital market in economic development and affecting changes on Tehran Stock Exchange has led to many researches be done on Tehran Stock Exchange[2].

Investors when investing in ordinary shares should do extensive reviews. In other words, they need a lot of factors to consider when investing because they are converting their assets to ordinary shares[3]. If investors without regard to a series of factors attempts to invest, they will not get the desired results from investments. The major factors that shareholders are in much attention include profitability, return on equity and cash flows of the company[4].

RESEAECH THORETICAL BASES

Managers must be completely familiar with various aspects and dimensions of the corporate activity to make decision and conduct the business unit. Liquidity management and the corporate performance assessment are two examples of these activities. The common role of the financial manager in the preparation of the financial report based on recorded information is founded on accounts, the corporate activity, efficiency and also liquidity management[5].

Liquidity indicates the company's ability in short-term obligations. In other words, the company's liquidity is a link between the cash that will be delivered to the company in short-term and the cash that the company will need [6].

The investment atmosphere in risky assets and especially the world of investment in the stock are very competitive and combined with abundant inherent and environmental complexities. Given the changes that have happened in the today world, countries, especially developing countries are faced with numerous threats and to solve economic problems they require finding appropriate ways to make better use of their available resources and wealth. In this respect, one important thing to do is the development of investment[7].

Since the investors convert their most cash assets to stock, they should take a lot of factors into consideration when investing. Tehran Stock Exchange as a market offers buyers and sellers of stock necessary facilities, including financial statements of, the companies. One factor that is taken into account by stock buyers is the companies' stock returns. So that by any change in stock returns they can transform at any time, their money into securities or vice versa[8].

Research on various issues affecting the stock market can help stakeholders to make the proper decision, so that optimal allocation of economic resources is done more effectively and investment condition becomes better[9]. Cash flows information has an important role in decision-making of users and is defined as one of the objectives of accounting and financial reporting. Therefore, a lot of research has been conducted on the cash flows, which has led to different results.

Another important measure of corporate performance evaluation is Tobin's Q index. Tobin's Q ratio is obtained by dividing the company's market value to the replacement value of the assets of the company. This ratio was introduced by Mr. "James Tobin" in the analysis of macroeconomic for future capital investing activities prediction in 1978[10].

When Tobin's Q Indicator is larger than one, it means that asset investment has generated revenues whose worth is more than the capital expenditures. In contrast, when the Tobin's Q is smaller than one it shows that the asset investment has not been suitable and it has not yielded too much[2].

Abnormal earnings are the earnings in excess of the return on equity and being aware of that will be effective on the economic decisions of the actual and potential investors. Hence, identifying the factors affecting the abnormal earnings and their stability are of critical issues raised in economic decisions. In previous studies it has been concluded that cash flows have greater power for predicting abnormal earnings, but still this is an ambiguous communication[11].

Following the previous research, the present study has taken cash flows arising from operating, investing and financing into consideration. The correlation between stock abnormal returns of petrochemical and cement companies listed at Tehran Stock Exchange and cash flows from investing activities will be examined in this study. To increase the generalizability of the research results, the statistical tests and surveys are conducted and will be analyzed regarding investment opportunities. Therefore, in this study we sought to answer the question of whether the cash flow has a significant relationship with stock abnormal returns and whether the relationship between investment cash flows and stock abnormal returns are different with regard to Tobin's Q ratio of cement and petrochemical industry companies.

RESEARCH BACKGROUND

Ziobrowski et al., on a study examined the abnormal returns for ordinary stock investment. In their study, abnormal return means the difference between stock returns and market returns. The scope of the study was the stock that was selling and buying by government agency of America country. The investigation found that prior to the purchase of stock by government agency the stock abnormal return was close to zero and after the purchase a significant positive stock return has been earned by them. The study demonstrates the effectiveness of trading strategies by government agency[3].

Bey Lin et al., investigated the impact of research and development costs on stock return and data transfer. The results showed that the companies that had negative abnormal returns had growing research and development expenses. The explanation of this phenomenon was that investment in research and development costs is not sufficiently profitable[4].

McKelvey on a study conducted as a master's thesis has investigated the variables such as free cash flow, Tobin's Q ratio and dividend payments. In this study, a positive relationship has been seen between changes in return and

income for the years that the specified declared dividend will be paid. This relationship was studied for companies with Tobin's Q ratio less than or greater than one. The research results indicate that the relationship is stronger for lower Tobin's Q ratios. These companies also have more free cash flow. Some similarities of McKelvey's research with the present study are the manner of calculating Tobin's Q ratio, abnormal return and regression equation used to assess variables significance[2].

Research Hypotheses

Hypothesis 1: There is a significant relationship between the "operating cash flow" and "stock abnormal return" in the petrochemical and cement industries.

Hypothesis 2: There is a significant relationship between the "investment cash flow" and "stock abnormal return" in the petrochemical and cement industries.

Hypothesis 3: There is a significant relationship between the "financing cash flow" and "stock abnormal return" in the petrochemical and cement industries.

Hypothesis 4: Regard to Tobin's Q ratio, "operating cash flow" and "stock abnormal returns" in the petrochemical and cement industries have different relationship.

Hypothesis 5: Regard to Tobin's Q ratio, "investment cash flow" and "stock abnormal returns" in the petrochemical and cement industries have different relationship.

Hypothesis 6: Regard to Tobin's Q ratio, "financing cash flow" and "stock abnormal returns" in the petrochemical and cement industries have different relationship.

Research variables and empirical models

In this study, three groups of dependent, independent, and damper variables are used. The dependent variable in the study is stock abnormal returns. Research independent variable is cash flow that includes 1 - Operating cash flow, 2 - investment cash flow, and 3-financing cash flow.

Growth opportunities variable is used as damper variable.

Table (1) represents the study variables, types, the manner of calculation and their abbreviations.

Table 1. Research Variables

Variable name	Abb.	Variable type	Manner of measuring
Stock abnormal returns	AR	Dependent	The difference between the stock actual return and the expected return: $AR_{i,t} = E(R_{i,t}) - E(R_{j,t})$
Operating cash flows	CFO	Independent	Net cash flow obtained from operating activities extracted from cash flow statement

Investment cash flows	CFI	Independent	Net cash flow obtained from investment activities extracted from cash flow statement
Financing cash flows	CFF	Independent	Net cash flow obtained from financing activities extracted from cash flow statement
Growth opportunities	IOS	Damper	It is calculated through Tobin's Q ratio value. If Tobin's Q is more than one, it shows high growth opportunity and if it is less than one, it represents low growth opportunities.

Measuring stock abnormal return

The stock abnormal return is the result of the difference between the stock actual return and the expected return.

Actual return per share is calculated as follows:

$$R_{i,t} = \frac{P_1(1+\alpha) + D - [P_0 + \alpha(1000)]}{P_0 + \alpha(1000)} \quad (1)$$

Where:

$R_{i,t}$: is the actual return per share *i* in the year *t*, P_1 : is the share price at the end of the year *t* , P_0 : is the share price at the beginning of the year *t*, α : is the capital increase percentage, D : is the cash earnings of stock and 1000 : is capital increase to nominal amount of 1,000 Rials per share according to trade law.

In the present research, to calculate the expected return per share capital assets pricing model $(CAPM)$ is used and its calculation method is as follows[3].

$$E(R_{j,t}) = R_f + \beta(R_m - R_f) \quad (2)$$

In the above equation:

$E(R_{j,t})$: is the expected return per share j in the year *t*, R_f : is the risk-free return rate, R_m: is the market return rate and β : is the systematic risk of the company. Systemic risk (β) is calculated as follows:

$$\beta = \frac{Cov(R_i, R_m)}{Var(R_m)}$$

With respect to the above descriptions, according to this model, the abnormal returns are calculated as follows:

$$AR_{i,t} = E(R_{i,t}) - E(R_{j,t}) \quad (3)$$

In this equation, $AR_{i,t}$ is the abnormal return, $E(R_{i,t})$ is the actual return and $E(R_{j,t})$ represents the expected return of the stock.

Measuring cash flows

The cash flow including the three main categories are extracted from cash flow statement of the sample companies.To have standard variables state, cash flow is divided by total assets.

Measuring growth opportunities

To measure the growth opportunities variable, Tobin's Q ratio is used. Tobin's Q was originally designed and proposed by Tobin (1996) to estimate the value of intangible assets of companies. Q value of the companies is their market value ratio to current replacement cost of their assets. Several methods have been proposed to calculate the Tobin's Q, but different approaches lead to the same value. In this study to calculate the Tobin's Q, the ratio of market value to book value of assets (Kim and Morris, 2003) is used as follows:

(4) Tobin's Q = (MVE + PS + DEBT) / TA

Where:

MVE, is obtained by multiplying the number of common stock by the stock price.

PS, is the book value of preferred stock that due to the lack of existence in Iran, is deemed to be zero.

DEBT, is the total current liabilities value and book value of long-term liabilities.

TA, is the book value of total assets of the company.

If Tobin's Q is more than one, it shows high growth opportunity and if it is less than one, it represents low growth opportunities.

MATEREAL AND METHOD

This research is an applied- descriptive study based on objective, and based on the nature and methods is correlational one. The study is based on a quasi-experimental research design using a post-hoc approach (from the past data).

STATISTICAL SAMPLE AND POPULATION

The statistical population of this study included all corporations that are listed in Tehran Stock Exchange between the years of 2007 to 2012 and have retained their membership in this period. Quality of information and access to financial information of these companies as well as having more homogeneous information due to the regulations of Tehran Stock Exchange are reasons for selecting and investigating stock exchange companies.

Reviewing companies listed in Tehran Stock Exchange, 44 companies (equivalent to 264 years - company) that are 22 companies from the petrochemical industry and 22 companies from cement industry are selected for models estimation and research hypotheses test. Full names of the sample companies are presented in appendix after the fifth chapter of the thesis.

RESULTS

Descriptive statistics

In this study, first using raw data, the research variables have been calculated and then descriptive statistics of the study, including mean, median, maximum, minimum and standard deviation of research data are calculated and presented in Table (2). The mentioned values are only an overview of the status of the research data distribution.

The results presented show that mean (and standard deviation) of independent variables i.e. operating, investment and financing cash flows have been respectively 0.1892 (0.3281) 0.1219 (0.1627) and 0.0936 (0.0934). Also, the mean (and standard deviation) of the study dependent variable i.e. stock abnormal return has been 0.0838 (0.2463).

Table 2. Descriptive statistics of research variables

Variables	Sign	Mean	Median	Maximum	Minimum	Standard deviation
Stock abnormal returns	AR	0.0838	0.0739	0.4289	-0.2983	0.2463
Operating cash flows	CFO	0.1892	0.1827	0.4310	-0.2178	0.3281
Investment cash flows	CFI	0.1219	0.1086	0.3183	-0.0457	0.1627
Financing cash flows	CFF	0.0936	0.0892	0.2679	-0.0738	0.0934
Growth opportunities	IOS	0.6127	0.5899	1.0000	0.0000	0.1029

Source: Researcher Calculations

Diagnostic test in pooled data

In this study, the total number of observations of each section is 44 observations in a 6 year period. Statistical sample of the study is divided into two groups of petrochemical industry companies (22 companies) and cement industry companies (22 companies). Therefore, to achieve better results pooled data method is used to estimate regression models. in the petrochemical enterprises group data relating to 22 companies during a six-year period (132 years - company) and in the cement enterprises group data relating to 22 companies during a five-year period (132 years - company) have been combined and the estimates have been done accordingly.

As noted in Chapter III, in panel data usage different models are applied to test the hypotheses. The models include methods such as the fixed effect model, the random effect model and pooled data model. Also, there is a variety of tests

to determine the model type that fits the research data, such as the Chow test, Hausman test.

Research models to test the hypotheses, which were described in detail in Chapter III, are formulated as follows:

(1)

$$AR_{it} = \beta_0 + \beta_1 CFO_{it} + \beta_2 CFI_{it} + \beta_3 CFF_{it} + \varepsilon_{it}$$

(2)

$$AR_{it} = \beta_0 + \beta_1 CFO_{it} * IOS_{it} + \beta_2 CFI_{it} * IOS_{it} + \beta_3 CFF_{it} * IOS_{it} + \varepsilon_{it}$$

Models (1) and (2) have been used to test the first to sixth hypotheses in two groups of petrochemical and cement companies. The dependent variable in both models is abnormal returns index (AR).

Thus, diagnostic tests have been carried out for both models and in both groups of A and B companies (four tests). To examine the model test type in different levels and time periods of panel data, bound F test (Chow) and Hausman test are used. The Chow test results are presented in Table (3).

Table 3. Results of the Chow test

Tested model		Chow test statistic	p-value	Test results
Model (1)	Petrochemical group	2.2136	0.2897	Pooled data model
	Cement group	0.6259	0.6843	Pooled data model
Model (2)	Petrochemical group	6.1248	0.0034	Doing Hausman test Panel data
	Cement group	9.2411	0.0000	Doing Hausman test Panel data

Source: Researcher Calculations

As can be seen in Table (3), Chow test results in the model (1) approve the hypothesis of the test based upon the similarity of the intercept in all periods in both petrochemicals and cement groups and reject the null hypothesis. Therefore, pooled data estimation method for estimation of the model (1) in both groups, is a more appropriate option. Under this method, all data are combined together and are estimated by ordinary least squares regressions. However, in the case of model (2) Chow test results do not confirm the null hypothesis of the test based upon the similarity of the intercept in all periods. Hence, panel model (fixed or random effects) must be used to test the fourth to sixth hypotheses. Hausman test is done to select the most suitable model between fixed and random effects models. The results are presented in Table (4).

Table 4. Results of Hausman test

Tested model		Hausman test statistic	*p-value*	Test results
Model (2)	Petrochemical group	0.0834	0.9161	Random effects model
	Cement group	2.2856	0.6127	Random effects model

Source: Researcher Calculations

Hausman test results for model (2) show that the null hypothesis of this test is approved. Therefore, the random effect is a more appropriate option model to estimate model (2) in both petrochemical and cement sample groups.

The results of the first model estimation

The research first model is used to test the first to third hypothesis. Dependent variable in these hypotheses is stock abnormal returns and the independent variable is the cash flows. The first model significance test results and reviews of the coefficients using pooled data in the petrochemical industry companies for years 2007 to 2012 are available in Table (5). As can be seen in the table, the F-statistic is significant at the 99% confidence level. Thus, the research model is significant generally, and the independent variables are able to explain the dependent variable. In addition, the coefficient of adjusted determination obtained from the model test is 0.4108. This figure shows that approximately 41% of the variability of the dependent variable i.e. stock abnormal returns is resulted from the variability of the independent variables included in the model, and the other 59% of the variability is due to other factors.

Table 5. Test results of the first to third hypotheses model in the petrochemical industry

Description	Coefficient	t-static	p-value
CFO	0.1709	4.4236	0.0192
CFI	0.1482	6.3265	0.0004
CFF	-0.3396	-9.8273	0.0000
Fixed coefficient	0.0224	6.6554	0.0000
R-squared		0.4261	
Adjusted R-squared		0.4108	
F-static		4.6286	
p-value		0.0000	
D-W		2.2891	
Observations No.		132	

Source: Researcher Calculations Dependent Variable: AR

Durbin-Watson test statistic is 2.2891. This test is used to check the error autocorrelation. Its optimal rate for the lack of autocorrelation is 2. If the value of this statistic is between 1.5 and 2.5, the autocorrelation is rejected at values of

the model error. Due to the fact that Durbin-Watson statistic value is obtained 2.2891, the presence of autocorrelation in the model error values is rejected.

According to the results in Table 4, the t-statistic related to the first hypothesis independent variable (CFO) and its significance level (p-value) are respectively, 4.4236 and 0.0192. As the considered error level for this study is 0.05, then the operating cash flow in petrochemical companies has a significant influence on stock abnormal returns, and the research first hypothesis is approved with 95% confidence level. Coefficient of the first independent variable (operating cash flow) is positive. As a result, the relationship between operational cash flow and stock abnormal returns is a direct relationship. In other words, by operating cash flow increasing in the petrochemical industry companies, the level of stock abnormal returns for the shareholders in the desired companies will increase.

The t-statistic related to the second hypothesis independent variable (CFI) and its significance level (p-value) are respectively, 6.3265 and 0.0004. Therefore, the investment cash flow in petrochemical companies has a significant influence on stock abnormal returns, and the research second hypothesis is approved with 99% confidence level. Coefficient of the second independent variable (investment cash flow) is positive. As a result, the relationship between investment cash flow and stock abnormal returns is a direct relationship. In other words, by investment cash flow increasing in the petrochemical industry companies, the level of stock abnormal returns for the shareholders in the desired companies will increase.

Also, the t-statistic related to the third hypothesis independent variable (CFF) and its significance level (p-value) are respectively, -9.8273, and 0.0000. As the obtained error level is less than 0.01, then the financing cash flow in petrochemical companies has a significant influence on stock abnormal returns, and the research third hypothesis is approved with 99% confidence level. Coefficient of the third independent variable (financing cash flow) is negative. As a result, the relationship between financing cash flow and stock abnormal returns is an inverse relationship. In other words, by financing cash flow increasing in the petrochemical industry companies, the level of stock abnormal returns for the shareholders in the desired companies will decrease.

The first model significant test results and reviews of the coefficients of the model using pooled data in the cement industry companies for years 2007 to 2012 are available in Table (6).

Table 6. Test results of the first to third model in the cement industry

Description	Coefficient	t-static	p-value
CFO	0.2431	8.3228	0.0000
CFI	2.2436	5.3244	0.0013
CFF	-0.1164	-4.3459	0.0142
Fixed coefficient	-0.0042	-6.9904	0.0000
R-squared		0.3109	
Adjusted R-squared		0.2936	
F-static		6.2136	

p-value	0.0000
D-W	2.0934
Observations No.	132

Source: Researcher Calculations Dependent Variable: AR

As can be seen in Table, the F-statistic is significant at the 95% confidence level. Thus, the research model is significant generally, and the independent variables are able to explain the dependent variable. In addition, the coefficient of adjusted determination obtained from the model test is 0.2936. This figure shows that approximately 29% of the variability of the dependent variable i.e. stock abnormal returns is resulted from the variability of the independent and control variables included in the model and the other 71% of the variability is due to other factors.

Durbin-Watson statistic value is obtained 2.0934. Therefore, the presence of autocorrelation in the model error values is rejected.

According to the results in Table 6, the t-statistic related to the first hypothesis independent variable (CFO) and its significance level (p-value) are respectively, 8.3228 and 0.0000. As the obtained error level is less than 0.01, then the operating cash flow in cement companies has a significant influence on stock abnormal returns, and the research first hypothesis is approved with 99% confidence level. Coefficient of the first independent variable (operating cash flow) is positive. As a result, the relationship between operating cash flow and stock abnormal returns is a direct relationship. In other words, by operating cash flow increasing in the cement industry companies, the level of stock abnormal returns for the shareholders in the desired companies will increase.

The t-statistic related to the second hypothesis independent variable (CFI) and its significance level (p-value) are respectively, 5.3244 and 0.0013. Therefore, the investment cash flow in cement companies has a significant influence on stock abnormal returns, and the research second hypothesis is approved with 99% confidence level. Coefficient of the second independent variable (investment cash flow) is positive.

Also, the t-statistic related to the third hypothesis independent variable (CFF) and its significance level (p-value) are respectively, -4.3459, and 0.0142. As the obtained error level is less than 0.01, coefficient of the third independent variable (financing cash flow) is negative. As a result, the financing cash flow in cement companies has a positive significant influence on stock abnormal returns, and the research third hypothesis is approved with 95% confidence level.

As the results of the first to third hypotheses testing show, the positive relationship between operating and investment cash flow and stock abnormal returns in both petrochemical and cement companies is confirmed.

The results of the second model estimation

The research second model is used to test the fourth to sixth hypotheses. Dependent variable in these hypotheses is stock abnormal returns and the

independent variable is the cash flows. The second model significance test results and reviews of the coefficients using pooled data in the petrochemical industry companies for years 2007 to 2012 are available in Table (7). In this section, Tobin's Q variable (IOS) is added to the first model and the second model is set up to investigate the effect of growth opportunities on the relationship between cash flows and abnormal returns.

As can be seen in the table, the F-statistic is significant at the 99% confidence level. Thus, the research model is significant generally, and the independent variables are able to explain the dependent variable. In addition, the coefficient of adjusted determination obtained from the model test is 0.3496. This figure shows that approximately 35% of the variability of the dependent variable i.e. stock abnormal returns is resulted from the variability of the independent variables included in the model, and the other 65% of the variability is due to other factors.

Table 7. Test results of the fourth to sixth model hypotheses in the petrochemical companies

Description	Coefficient	t-static	p-value
CFO* IOS	0.4361	6.6902	0.0000
CFI* IOS	1.0842	4.8003	0.0006
CFF* IOS	-0.0326	-1.9804	0.0825
Fixed coefficient	0.8544	4.5586	0.0268
R-squared		0.3634	
Adjusted R-squared		0.3496	
F-static		6.6903	
p-value		0.0000	
D-W		2.2891	
Observations No.		132	

Source: Researcher Calculations Dependent Variable: AR

According to the results in Table 7, the t-statistic related to the fourth hypothesis independent variable (CFO*IOS) and its significance level (p-value) are respectively, 6.6902 and 0.0000. Therefore, the operating cash flow by adding Tobin's Q ratio to the model, in petrochemical companies has a significant influence on stock abnormal returns, and the research fourth hypothesis is approved with 99% confidence level. Coefficient of the first independent variable (operating cash flow) is positive. As a result, the relationship between operating cash flow and stock abnormal returns is a direct relationship. In other words, by operating cash flow increasing in the petrochemical industry companies and in higher growth opportunities, the level of stock abnormal returns for the shareholders in the desired companies will increase. The coefficient of this variable before adding growth opportunities was 0.1709 and by the addition of Tobin's Q ratio the coefficient increased to 0.4361. It shows that the intensity of the relationship between operating cash flows and abnormal stock returns has become more by the addition of growth opportunities variable.

The t-statistic related to the fifth hypothesis independent variable (CFI*IOS) and its significance level (p-value) are respectively, 4.8003 and 0.0006. Coefficient of the fifth independent variable (investment cash flow) is positive. Therefore, the investment cash flow in petrochemical companies by the addition of growth opportunities variable, has a significant influence on stock abnormal returns, and the research fifth hypothesis is approved with 99% confidence level. The coefficient of this variable before adding growth opportunities was 0.1482 and by the addition of Tobin's Q ratio the coefficient increased to 1.0842. It shows that the intensity of the relationship between investment cash flows and abnormal stock returns has become more by the addition of growth opportunities variable.

Also, the t-statistic related to the sixth hypothesis independent variable (CFF*IOS) and its significance level (p-value) are respectively, -1.9804, and 0.0825. As the obtained error level is higher than 0.05, then the financing cash flow in petrochemical companies by the addition of growth opportunities index, has a significant influence on stock abnormal returns, and the research sixth hypothesis is not approved at 5% error level. Coefficient of the third independent variable (financing cash flow) is negative. As a result, the relationship between financing cash flow and stock abnormal returns is an inverse relationship. In other words, by financing cash flow increasing in the petrochemical industry companies, the level of stock abnormal returns for the shareholders in the desired companies will decrease.

The second model significant test results and reviews of the coefficients in the cement industry companies for years 2007 to 2012 are available in Table (8).

Table 8. Test results of the fourth to sixth model hypotheses in cement companies

Description	Coefficient	t-static	p-value
CFO* IOS	0.3978	6.2184	0.0000
CFI* IOS	0.0243	0.5663	0.1429
CFF* IOS	-0.0074	-0.2738	0.4271
Fixed coefficient	-0.1026	-4.1093	0.0242
R-squared		0.2284	
Adjusted R-squared		0.2039	
F-static		8.2386	
p-value		0.0000	
D-W		2.1102	
Observations No.		132	

Source: Researcher Calculations Dependent Variable: AR

As can be seen in the table, the F-statistic is significant at the 99% confidence level. Thus, the research model is significant generally, and the independent variables are able to explain the dependent variable. In addition, the coefficient of adjusted determination obtained from the model test is 0.2039. This figure shows that approximately 20% of the variability of the dependent variable i.e. stock

abnormal returns is resulted from the variability of the independent variables included in the model, and the other 80% of the variability is due to other factors.

Durbin-Watson statistic is 2.1102, so the existence of autocorrelation in the model error values is rejected.

According to the results in Table 8, the t-statistic related to the fourth hypothesis independent variable (CFO*IOS) and its significance level (p-value) are respectively, 6.2184 and 0.0000. Coefficient of the independent variable (operating cash flow) is positive. As the obtained error level is less than 0.01, therefore, the operating cash flow in cement companies by the addition of growth opportunities variable, has a significant influence on stock abnormal returns, and the research fourth hypothesis is approved with 99% confidence level. The coefficient of this variable before adding growth opportunities was 0.2431 and by the addition of Tobin's Q ratio the coefficient increased to 0.3978. It shows that the intensity of the relationship between operating cash flows and abnormal stock returns has become more by the addition of growth opportunities variable.

The t-statistic related to the fifth hypothesis independent variable (CFI*IOS) and its significance level (p-value) are respectively, 0.5663 and 0.1469. Also, the t-statistic related to the sixth hypothesis independent variable (CFF*IOS) and its significance level (p-value) are respectively, -0.2738, and 0.4271. As the obtained error level is higher than 0.05, then the investment and financing cash flows in cement companies by the addition of growth opportunities index, has no significant influence on stock abnormal returns. So, the research fifth and sixth hypotheses are not approved at 5% error level.

As the test results of the fourth to sixth hypotheses indicate, a positive relationship between operating and investment cash flows with the existence of opportunities growth, and stock abnormal returns in the petrochemical companies group is confirmed and a positive relationship between operating cash flows with the existence of opportunities growth, and stock abnormal returns in the cement companies group is confirmed.

With regard to the results obtained in this study, the following recommendations are offered for future research:

1. Evaluation of the impact of cash flows on stock abnormal returns in other active industries in the Exchange and comparison of the results with the present research.

2. Evaluation of the impact of cash flows on stock actual returns and comparison of the results with the present research.

3. Determination of the correlation between cash flow and stock normal returns and abnormal returns in companies other than Tehran Stock Exchange, such as the companies covered by Iran National Industries Organizations, Mostazafan Foundation, Bank of Industry and Mine and other private corporates that are active in Iran.

4. Evaluation of the other liquidity indicators effect such as current and immediate ratios and free cash flow and … on stock abnormal returns in the Exchange companies.

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