Research Journal of Recent Sciences _____ ISSN 2277-2502
Vol. **3(3),** 65-71, March **(2014)** *Res.J.Recent Sci.*

A Study of the Correlation between Investment Opportunities and Current Assets Growth in Firms listed in Tehran Stock Exchange, Iran

Iman Abadi Hendijani
Department of Accounting, Persian Gulf International Branch, Islamic Azad University, Khorramshahr, IRAN

Available online at: www.isca.in, www.isca.me
Received 4th July 2013, revised 17th August 2013, accepted 13th October 2013

Abstract

The present paper aims at providing evidence on the link between investment opportunities and current assets growth. A sample of 66 Tehran Stock Exchange enlisted firms during a 5-year period (2004-2009) was selected and examined. For investment opportunities, the market value to book value ratio and the profit to price ratio were used as independent variables and their relationship with current assets growth was studied. By using correlation matrix main component and Pearson linear correlation coefficient, it was concluded that there is a significant relationship between investment opportunities and current assets growth in firms and enterprises.

Keywords: Investment opportunities, current assets, MBV, profit to price ratio, Tehran stock exchange.

Introduction

Today the invisible aspect of economy is based on intellectual capital. A successful investor is someone who is able to make the most valuable out of the least valuable and the most out of the least in a moment, and this is achieved only through accurate analysis of investment opportunities. Any enterprise that is able to optimally benefit from its present day investment opportunities has insured its future. Investment opportunities in fact indicate the firms' potential investment abilities. That is, the higher the ability of a firm to invest in the future, the more the investment opportunities of that firm. Future-orientation of the groups using the financial statements always directs the accountants toward searching for superior methods to change financial information. Managers consider the results of the future operations of a trading unit and its ability to attract investment as important; and the shareholders' satisfaction lies within their expected profit group. One of the superior information interpretation methods is to examine the investment opportunities[1]. The nature of investment opportunities is specified in answering the question why we invest. In simple words, investors want to obtain some profit from their money. Investors want their returns to be as high as possible but one has to note that the level of returns is affected by risks and the higher the return on an investment, the higher the risk. Investment opportunities should always be examined based on risks and returns and these two factors should never be separated[2]. Being the closest to cash funds, the current assets are considered to be an enterprise's fluid power in dealing with economic fluctuations. On the other hand, if enjoying from a good growth, current assets may protect the enterprise in the riskiness of future investments. Current assets growth is an important element in capital-based economies. With the current assets growth as a guide for dividend payment, management effectiveness evaluation, a tool for prediction and evaluation of the decisions has been used by investors, managers and financial analysts. Elevating the current assets growth is one goal of any business. Investors think about profit, a profit which is appropriate to the risk of their investments[3]. For this reason in this paper the effect of current assets growth in the creation of investment opportunities and the increase of shareholders' wealth is studied.

Research Background

Evolution of financial management and investment, together with informatics, communication and technology developments during the last decade makes it necessary to optimally use all the factors that lead to the creation of investment opportunities. Some of the recent investigations on investment opportunities are summarized here.

Cahan et al.[4], studying the relationship between a set of investment opportunities, tried to determine whether the industry was an appropriate target for accounting specialization. Using two different scales of investment opportunities and three different classification schemes of the industry, they concluded that an accountant' specialization in the levels of the industry's investment opportunities set was increasing and the changeability of investment opportunities set within each industry was decreasing.

Adam and Goyal[5] tried to determine and define the appropriate situations for calculating the investment opportunities in firms. Using real-world options, they evaluated several representation variables for investment opportunities set in order to introduce the best measure for investment opportunities. They examined the mining industry and used four variables: i. Income to stock price ratio, ii. Assets MBV, iii. Stock MBV, iv. Capital costs to assets, machinery and equipment book value ratio. The results

showed that there was a relationship between the above four variables and the investment opportunities but with different degrees of intensity.

They concluded that the assets MBV had a stronger relationship and was able to reflect the highest information content levels on investment opportunities in a firm; and there was a positive and weak relationship between capital costs to assets, machinery and equipment book value ratio and investment opportunities so that it could not be a good representative for investment opportunities in the firms.

Goyal et al.[6] examined the relationship between investment opportunities and financial policies in American firms. A sample of 122 firms between 1980 and 1995 was selected from defense and manufacturing industries, because there were many changes in investment opportunities during the said period of time. Their results showed that when the investment opportunities decreased in sample firms, they increased their debt, lengthened their debt maturity structure, decreased the use of private loans, and increasing the use of government loans, decreased their dependency on high priority loans. And in general, they support the relationship between investment opportunities and financial policies.

Khademi[7] in his investigation studied the relationship between the investment opportunities variables (assets MBV, stock MBV, profit per share to price per share ratio) in Tehran Stock Exchange. Results indicated a significant relationship between investment opportunities and assets growth.

Jaffari[8] in an investigation titled "The relationship between investment opportunities and debt levels and operating cash flow" for a 10-year period among 78 Tehran Stock Exchange firms concluded that there was an inverse relationship between investment opportunities and debt level, also there was an inverse relationship between growth opportunity and operating cash flows.

Amuzesh[3] studied the correlation between investment opportunities and sales growth in 65 Tehran Stock Exchange firms between 2003-2007. The results show that there is a correlation between investment opportunities and sales growth and the book to market value ratio of assets, machinery and equipment and the stock MBV ratio but no correlation exists between sales growth and profit per share to price per share ratio.

Research Hypotheses: In order to investigate the relationship between investment opportunities and current assets growth in Tehran Stock Exchange enlisted firms, the investment opportunities measures including: stock MBV ratio and stock profit to price ratio are used. Therefore, in this regard, one main and two secondary hypotheses are formulated as follows:

Main Hypothesis: There is a correlation between investment opportunities and current assets growth.

Secondary Hypotheses: i. There is a significant relationship between stock profit to price ratio and current assets growth. ii. There is a significant relationship between stock MBV ratio and current assets growth.

Research Methodology

Variables and Research Model: In this paper two independent variables (stock profit to price ratio and stock MBV ratio) are used in the final stage for testing the main hypothesis as representing the investment opportunities variable which is an immeasurable one.

where $\left(\frac{EPS}{P}\right)$

$$\frac{EPS}{P} = \frac{\text{fiscal year end profit per share}}{\text{fiscal year end price per share}}$$

ESP: The profit per share is calculated for ordinary shares as follows:

This indicates the profit ratio obtained for an ordinary share by the firm during a specific period. To calculate this ratio, the net profit is divided by the number of ordinary shares after deduction of taxes. Now, if the firm has some preferred stock, the profit relating to these shareholders is detracted from the after-tax profit and the residual is divided by the number of ordinary shares in order to obtain the profit per share.

P: Price per share at the end of fiscal year

The price per share consists of the last price of each share (final price of the share) at the end of fiscal year obtained based on the daily recording of price per share in the end of each transaction meeting.

Final price calculation: This is performed in two ways: Based on the weighted average of finished transactions.

In weighted average method, the averages of various stock sale and purchase prices should be calculated with attention to their numbers as follows:

$\bar{P}$: Price weighted average

$$\frac{\sum_{i=1}^{n} piQi}{\sum_{i=1}^{n} Qi} = \bar{P}$$

P_i : Traded stock price, Q_i : Traded stock number.

Based on base-line volume (in Iran's stock market): The base-line volume is the minimum number of shares to be traded every day in order to record the share at a specific price at the end of transaction meeting. Tehran Stock Exchange, in summer 2003, began to perform this procedure to control the intensive fluctuations in stock prices and especially its unbound increase.

At first the baseline coefficient was 0.0006 (15% of firm's stock dealings in 250 transaction meetings) but in March 2004, this coefficient increased to 0.0008 (20% of firm's stock dealings in 250 transaction meetings). Therefore, if the number of a firm's traded stock in a transaction day was higher than or equal to the said baseline volume, the price would be recorded as in the first case (according to weighted average); otherwise, the stock price would be calculated based on the baseline volume as follows:

$\overline{P}$: Average price at the end of transaction meeting, $\bar{P} = P_i + \left[(\bar{P} - P_i) \times \frac{N}{M} \right]$, P_i: Stock's final price on previous day, $\bar{P}$: Price weighted average on current day, N: The number of traded shares on current day, M: The firm's stock baseline volume $\frac{CMV}{BV}$ $(Stock\ MBV)$

This variable which is used as the independent variable in the second secondary hypothesis is calculated from stock market current value and stock book value.

Current Market Value (CMV): The market value for all the issued shares of a firm in the stock market is known as CMV, obtained from the product of multiplying the market price per share by the total number of shares, calculated as follows: at the end of a fiscal year, the CMV of the firm A consists of: the number of shares issued by the firm Q_i in the final price of the firm's shares at the end of fiscal year P_i therefore:

$$(CMV)A = P_i \cdot Q_i$$

Book Value (BV): Is a value derived from the firm's balance sheet and is twice the total equities divided by the total number of shares.

Investment opportunities (IOS)

$$(IOS) = f\left(\frac{E}{P}, \frac{CMV}{BV}\right)$$

This variable is used as an independent variable in the main hypothesis which is an immeasurable variable and consists of a firm's potential to perform investments. Therefore, in order to analyze it, there is need to a suitable index but there is no widespread agreement on such an index. In the present paper, the stock MBV ratio and the profit per share to price per share ratio are used, both in relation with the IOS.

$$(IOS) = f\left(\frac{E}{P}, \frac{CMV}{BV}\right)$$

Given the above equation, the higher the profit per ordinary share to market value ratio, the higher the $\frac{E}{P}$; also, as the stock MBV ratio increases, it leads to higher $\frac{CMV}{BV}$ values. As a result, the future horizon of the firm is predicted as brilliant and leads to increased IOS in the firm.

Dependent Variable: In the present paper, the dependent variable is the current assets growth.

Current Assets: Such assets are items which are expected to be converted to cash, or consumed and/or sold during a year or an operating cycle from the balance sheet date. Usually, the current assets are reflected in the balance sheet in terms of the speed of their conversion to cash or consumption. To obtain the current assets growth rate during the study period the following formula is used:

$$CA_t^0 = \frac{CA_t - CA_{t-1}}{CA_{t-1}} \times 100$$

CA^0: current assets growth during baseline period, CA_t: current assets growth during current period, CA_{t-1}: current assets growth during previous period.

Model: The following regression model is used to find the linear relationship between independent and dependent variables:

$Y = \beta_0 + \beta_1 x + \varepsilon$

In the present paper, y is the dependent variable (current assets growth) and x is the independent variable, which includes both independent variables in secondary hypotheses $\left(\frac{E}{P}, \frac{CMV}{BV}\right)$ and the independent variable in the main hypothesis (IOS). β_0: The mean effect of independent variable on dependent variable, β_1: The effect of one unit change in the independent variable on the dependent variable, ε: Regression error.

Data Collection Method: In order to collect the needed data, the financial statements presented to Tehran Stock Exchange and other information sources such as Tadbirpardaz and Rahavard Novin information banks were used.

Population and Sample: The population for the present study includes all Tehran Stock Exchange-enlisted firms during a 5-year period from 2004 to 2008. In order to determine the sample, the systematic elimination method was used in which first the firms with fiscal year not ending March 20, as well as those firms with a transaction pause of over 3 months in a year were eliminated; then the banks and investment firms, due to the different nature of their activities were eliminated. Also, the firms which during the study period did not have available information or were not profitable during the said period were excluded. At the end, 66 firms were selected to be included in the sample (table 1).

Also the error coefficient is 05.0 therefore, the sample size is calculated:

$$n = \frac{N.Z^2_{\frac{\alpha}{2}}.P(1-P)}{\varepsilon^2(N-1)+Z^2_{\frac{\alpha}{2}}.P(1-P)} = \frac{205 \times (1.96)^2 .0.5 \times 0.5}{204 \times (0.1)^2 + (1.96)^2 .0.5 \times 0.5} = \frac{196.88}{3.0004} \cong 66$$

Table-1
The number of different firms in sampling

Description	Number	Number
Population Members		404
Firms with fiscal year not ending March 20	73	
Broker and investment firms	36	
Non-profitable firms in the research period	70	
Firms with unavailable information	20	
Total excluded firms		(199)
Firms used in Cochran formula		205

N: population, n: sample size, P: success ratio, Q: failure ratio, P=q= 0.5, Z: normal distribution standard variable at 95% confidence level (1.96), e: the estimation precision e=0.1 is considered based on the researcher's opinion and previous researches.

Data Analysis Method: The primary data are used by Excel software after being collected from the said sources in order to derive the needed variable in both secondary and main hypotheses. The results of variable measurements are fed to SPSS software to test the research hypotheses. First the descriptive statistics of the research variables is calculated and then, Pearson correlation test and linear regression and the Eviews software are used to analyze the gathered information and to interpret them and to accept or reject the hypotheses.

Descriptive Statistics: Table 2 shows a summary of descriptive statistics. The mentioned values only give a general scheme of the research data distribution. According to table 2, in the first row the number of valid and lost data is reported which are for all the variables except for the current assets growth of 66 firms. But in the case of current assets growth, as a datum is lost in the first period, it will equal 65.

Table-2
Descriptive statistics

Descriptive statistics		$\frac{EPS}{P}$	$\frac{Cmv}{Bv}$	CA^{D}	IOS
Number of valid data		66	66	65	66
Number of lost data		0	0	1	0
Average		0.14704836	1.48182061	1.93710858	7.378564033
Deviation from average		0.09362139	2.28449093	6.16194013	12.61393581
Median		0.2028626	2.1404	1.27284719	5.528671329
Mode		0.23168	-1.8326	2.54654085	8.662172
Standard deviation		0.76058375	18.559292	15.6791495	10.2591999
Variance		0.57848764	344.447321	246.017897	105.3508631
Skewness		0.84210468	0.67218254	0.64253914	0.407975891
Skewness coefficient standard error		0.09495267	0.09495267	0.09711569	0.094952674
Strain		0.2275897	0.13032366	0.09868977	0.474898232
Strain coefficient standard error		0.58207234	0.58207234	0.58623626	0.582072342
Range		6.784	150.8206	182.531534	843.3698135
Minimum		-5.3168	-137.8326	-54.546541	-819.662172
Maximum		1.4672	12.988	127.984993	23.70764149
Total		9.705192	97.79886	127.848675	486.9852262
Percentiles	25^{th} percentile (1^{st} quarter)	0.1107564	1.29605	-17.125567	2.920522008
	50^{th} percentile (2^{nd} quarter)	0.2028626	2.1404	1.27284719	5.528671329
	75^{th} percentile (3^{rd} quarter)	0.3248936	3.24079	6.85980732	8.806962472

Pearson Correlation Test: Correlation analysis is a tool for determining the type and degree of the relationship between two quantitative variables. Correlation coefficient indicates the intensity of a relationship (direct or inverse). This coefficient is between 1 and -1 and if there is no relationship between the two variables, it equals to zero (table 3).

The present investigation has studied the relationship between and curr$\frac{EPS}{P}$ assets growth CA^0, and then the relationship between $\frac{EPS}{P}$ and CA^0, and finally, the relationship between IOS and CA^0 through Pearson linear correlation test.

Table-3
Linear Pearson correlation coefficient between the research variables

Sig	Linear Pearson Correlation coefficient	Number	Relationship between Variables
0.007	0.729	66	ESP/S and CA^0
0.044	0.650	66	CMV/BV and CA^0
0.038	0.710	66	IOS and CA^0
H0	H0	H0	Rejected hypothesis

In the first row, the relationship between ESP/P and CA^0 is observed where Pearson linear correlation coefficient is 0.729 and this is a positive relationship with a Sig less than 0.05. Thus, the H0 hypothesis is rejected so that:

$$H_0 : r\left(\frac{EPS}{P}, CA^0\right) = 0$$

$$H_1 : r\left(\frac{EPS}{P}, CA^0\right) \neq 0$$

That is, there is a relationship between EPS/P and CA^0.

In the second row of the table, the relationship between CMV/BV and the current assets growth CA^0 is examined which has a Pearson coefficient of about 0.650 and p-value is less than 5% which shows that H is also rejected that is, a positive and significant relationship exists between two variables so that:

$$H_0 : r\left(\frac{CMV}{BV}, CA^0\right) = 0$$

$$\frac{CMV}{BV} \quad H_1 : r\left(\frac{CMV}{BV}, CA^0\right) \neq 0$$

In the third row of the table, the relationship between IOS and current assets growth CA^0 is studied which has a Pearson coefficient about 0.710 and the sig is also less than 5%. This shows that in the following hypothesis, the H0 is rejected that is, a positive and significant relationship exists between IOS and current assets growth.

$$H_0 : r(Ios, CA^0) = 0$$
$$H_1 : r(Ios, CA^0) \neq 0$$

Research Hypotheses Testing

First secondary hypothesis: there is a relationship between profit to price ratio of each ordinary share $\frac{EPS}{P}$ and current assets growth.

$H_0 : \beta_1=0$

There is a relationship between $\frac{EPS}{P}$ and CA^0.

$H_1 : \beta_1\neq0$

There is a relationship between $\frac{EPS}{P}$ and CA^0.

$$CA^0 = \beta_0 + \beta_1\left(\frac{E}{P}\right) + \varepsilon$$

In this hypothesis, the profit to price ratio per ordinary share is considered as the first effective representative in IOS and we tested its relationship with the current assets growth rate. For this hypothesis, p-value = 0.001 (a specific value) which in the calculation of α=0.05 is lower i.e. (p-value<0.05) which supports the first hypothesis that is, a significant relationship exists between profit to price per ordinary share and current assets growth. We therefore conclude that in the firms which are affected by the economy of our country, any increase/decrease in the rate of their current assets growth is affected by the growth in the profit to price per share ratio.

Table-4
Variance analysis of EPS/P on CA^0 variable with regression model

Variables interrelations	Source of changes	Sum of squares	Degree of freedom	Mean squares	F	Sig	R	R^2
EPS/P on current assets growth CA^0	Regression	15.480	1	15.480	4.020	0.003	0.729	0.531
	Residual	242.613	63	3.851				
	Total	258.093	64					
D.W	1.099							

The linear correlation is significant at 5% level. The relationship is therefore significant. The regression model is as follows: CA^0=2.649+0.045, (t:3.527) (t:4.813), Sig:0.004 sig:0.001.

Second secondary hypothesis: There is a relationship between the stock CMV/BV and current assets growth.

H_0 : $\beta_1=0$ there is no relationship between CMV/BV and CA^0
H_1 : $\beta_1\neq0$ there is a relationship between CMV/BV and CA^0

$$CA^0\ \beta_0 + \beta_1 \left(\frac{CMV}{BV}\right) + \varepsilon$$

In this hypothesis, the stock CMV/BV is considered as the second representative in IOS and we tested its relationship with the current assets growth rate. For this hypothesis, p-value = 0.030 (a specific value) was calculated which is not higher than α=0.05 error level, i.e. (calculation t> t, df=64) indicating that the hypothesis is supported. That is, a significant relationship exists between CMV/BV and current assets growth.

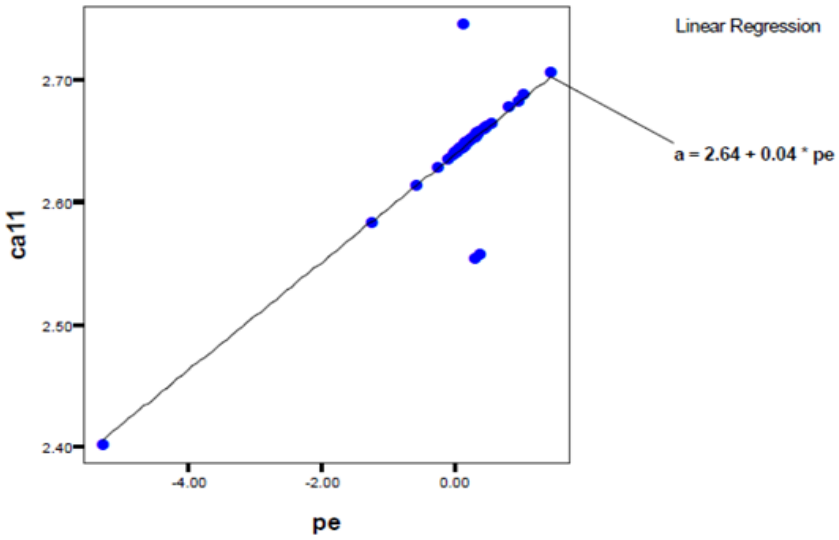

Figure-1
Regression display of the effect of EPS/P on current assets growth CA^0 variable

Table-5
Variance analysis of CMV/BV on CA^0 variable together with linear regression model

Variables interrelations	Source of changes	Sum of squares	Degree of freedom	Mean squares	F	Sig	R	R^2
EPS/P on current assets growth CA^0	Regression	92.657	1	92.657	6.887	0.100	0.650	0.423
	Residual	847.596	63	13.454				
	Total	940.253	64					
D.W	1.218							

The linear correlation is significant at 5% level. The relationship is therefore significant. The regression model is as follows: CA^0=9.711+0.225 CMV/BV , (t:3.586) (t:2.374), Sig:0.002 sig:0.030

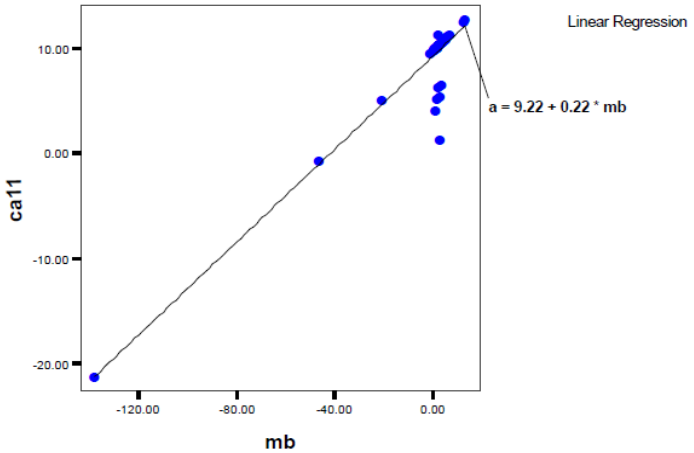

Figure-2
Regression display of the effect of CMV/BV on current assets growth CA^0 variable

And then, the main relationship in the main hypothesis is expressed as: Main hypothesis: there is a relationship between IOS and current assets growth. H_0 : β_1=0 there is no relationship between IOs and CA^0. H_1 : $\beta_1 \neq 0$ there is a relationship between IOs and CA^0.

For this hypothesis, *P-Value=/002* which is smaller than α=0.05 error level that is (calculation t> t, df=64) which supports the hypothesis that is, a relationship exists between IOS and current assets growth and since β_1 or the IOS coefficient is a positive number equal to +0.089 in its effectiveness on current assets growth, therefore the relationship between IOS and current assets growth is positive and direct and as the IOS increases, the current assets growth will be in the positive direction.

Table-6
Variance analysis of IOS on current asset growth CA^0 together with given regression model

Variables interrelations	Source of changes	Sum of squares	Degree of freedom	Mean squares	F	Sig	R	R^2
IOS on current assets growth CA^0	Regression	38.170	1	38.170	5.254	0.002	0.710	0.504
	Residual	457.695	63	7.265				
	Total	495.865	64					
D.W	1.018							

The linear correlation is significant at 5% level. The relationship is therefore significant. The regression model is as follows: CA^0=9.263+0.089 IOS, (t:2.235) (t:3.178), Sig:0.028 sig:0.002

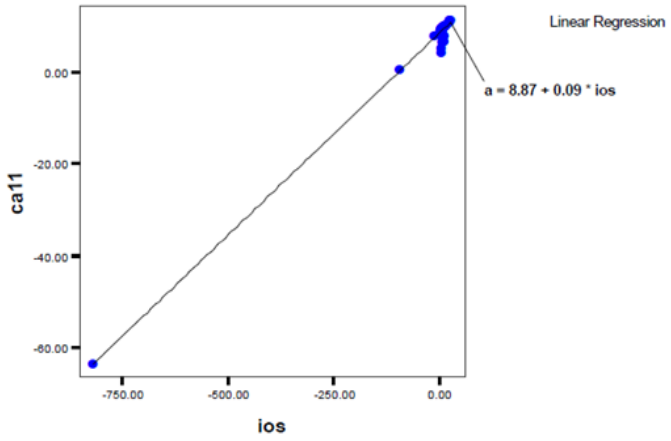

Figure-3
Regression display of the effect of IOS on current assets growth CA^0 variable

Conclusion

Considering the hypotheses testing and the performed statistical analyses, the results of the research indicate that the first secondary hypothesis is supported that is, a significant relationship exists between the profit to price per share ratio and the current assets growth. We therefore conclude that in the firms which are affected by the economy of our country, any increase/decrease in the rate of their current assets growth is affected by the growth in the profit to price per share ratio.

Also, a significant relationship was observed between the CMV/BV and current assets growth, supporting the second secondary hypothesis.

Finally, a positive and significant relationship was found between IOs and current assets growth, which supports the main hypothesis. We conclude that with the increase in IOS, in fact the firm's current assets growth will be in positive direction.

References

1. Gul F.A. and Kealey B.T., Chaebol, investment opportunity set and corporate debt and dividend policies of Korean companies, *Review of Quantitative Finance and Accounting*, **13(4),** 401-416 **(1999)**
2. Tehrani R. and Noorbakhsh A., Investment Management, published by Negahe Danesh, Tehran, Iran **(2003)**
3. Amuzesh N., A study of the correlation between IOS and sales growth in Tehran Stock Exchange firms, MA dissertation, Borujerd Azad University **(2006)**
4. Cahan S., Godfrey J., Hamilton J. and Jeter D., Auditor Specialization: The Influence of Investment Opportunities, *Available at SSRN: http://ssrn.com/abstract=920490 or http://dx.doi.org/10.2139/ssrn.920490,* **(2006)**
5. Adam T. and Goyal V.K., The investment opportunity set and its proxy variables, *Journal of Financial Research*, **31(1),** 41-63 **(2008)**
6. Goyal V.K., Lehn K. and Racic S., Growth opportunities and corporate debt policy: the case of the US defense industry, *Journal of Financial Economics*, **64(1),** 35-59 **(2002)**
7. Khademi M., The relationship between IOS and assets growth, Accountant, **207(3),** 31-39 **(2009)**
8. Jafari H., The relationship between IOS with debt level and operating cash flow, M.A. dissertation, Tehran, **(2004)**