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A Study of the Relationship of Free Cash Flow to Growth Opportunities

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ABSTRACT

Free cash flow includes cash surplus that can be divided among investors after making investment in fixed assets and working capital. Growth opportunity is referred to as the ratio of market value to book value of stockholder' equity. The purpose of the study is to review the relationship of free cash flow to growth opportunities. The research is an applied study in terms of purpose and it is correlational descriptive in terms of implementation. Using a library method, necessary information was extracted. Using Cochran formula, 110 companies during 2008-2012, i.e. 550 companies-year, were selected as statistical sample. For hypothesis test, Eviews 7 and Sata 11 software applications were used. In order to examine whether there is a variance inconsistency, disturbance terms derived from Wald's modified statistic and Durbin-Watson test at 5% error level were used. The findings of the research indicated that there is a positive significant relationship between free cash flow and growth opportunities.

KEY WORDS: free cash flow, growth opportunities, Tehran Stock Exchange

1. INTRODUCTION

Over time, the growth of corporations has given rise to the emergence and spread of a class of stockholders who has no direct involvement in the management of companies but they manage and supervise company affairs via the selection of the board of directors. Such evolution has made a new chorus of professional managers manifest themselves, though they have no share in the capital of enterprises run by themselves or it was too little; as a result, management of enterprises was detached from their ownership of the capital [1]. Free cash flow takes on importance because it allows company to search for opportunities as it raises shareholder value. It is not feasible to perform business transactions, pay shareholders quick profit, and reduce debts without having access to fund, and development of new products. On the contrary, cash must be kept at a level that a balance between cost of maintenance and cost of insufficient cash is maintained. Free cash flow can be helpful in the assessment of a company's financial health, because it excludes all accounting assumptions from income structure. One way to fundamentally analyze securities is to evaluate cash flows of business units, because the method forges a direct relationship between company value and economic efficiency of its assets. Free cash flow is a benchmark for measuring company's performance, which represents the cash the company has at its disposal subsequent to covering expenses necessary for maintenance and development of assets. Free cash flow is important because it allows company to search for opportunities and raise shareholder value. A company that have limited investment opportunities is expected to have high free cash flow, because a vast amount of cash may put into use as investment opportunities (actual and potential) arise. However, an increase in the rate of investment from surplus funds would bring a decrease in the funds. Therefore, the conflict of interest between managers and shareholders flares up when company yield free cash flow with (positive) significance and face little growth opportunities[2].

2. Theoretical foundation and research literature

2.1. Free cash flow

It involves a surplus of cash that can be divided among investors subsequent to an investment in fixed assets and working capital. The benchmark can provide necessary information for analysts to measure company's domestic growth capability and financial elasticity [3].

2.2. Growth opportunities

Growth opportunities assume a prominent role in company's financial theory. In general, it is believed that they take on special importance in determining company's liability policy. It is also expected that companies with great growth opportunities would have little debts as well as more short-term debt than long-term, private debt than

* Corresponding Author: Dr. Mohammad Reza Pour Ali, Assistant Professor of Accounting, Department of Accounting, Islamic Azad University, Chalus Branch public debt, and more important debts (e.g. guaranteed liabilities). Growth opportunities suggest the ratio of market value to the book value of stockholder's equity [4]. Growth opportunities will be elaborated in different classifications.

2.2.1. Various growth opportunity indices

In particular, five indicators for growth opportunity are widely used:

1- The ratio of market value of company asset to book value of assets is equal to the ratio of total book values of debts, book value of preferred stock, and market value of common stock to book value of assets at the end of a period.

2- The ratio of market value of stockholder's equity to book value of stockholder's equity at the end of a period [5].

3- cost-benefit ratio is equal to ratio of earnings per share to stock market value at the end of a period [6].

4- The ratio of capital costs to book value of assets at the end of a period

5- The ratio of research and development cost to book value of assets at the end of the year [7].

Research background

3.1. Domestic research

In a research entitled "a study of the effect of free cash flow and institutional shareholders on companies listed on the Tehran Stock Exchange", using data of 90 selected companies, and using multivariate linear regression during 1999-2005, Mehrani and Bagheri (2009) concluded that there is a direct significant relationship between earnings management and large free cash flow in companies with low growth, while there was found no significant relationship between earnings management and institutional stockholders in companies with free cash flows and low growth.

Dastgir and Sharifi-Mobarakeh (2011), in a research entitled "free cash flow and operating cash flow with stock returns", came to the conclusion that in case of growth opportunities there is a negative relationship between capita; structure and dividend, and if there is no growth opportunity, there will be a positive significant relationship.

3.2. Foreign research

Goyal et al. (2002), in a study entitled "growth opportunities and corporate debt policy", found out that debt policy issued in a period that grow opportunities are low lasts longer than that of periods when growth opportunities are high. In general, according to them, there is an inverse relationship between debt policy and growth opportunities, in that as growth opportunity is low, debt policy lasts longer.

Chang et al. (2005), in a research entitled "the relationship between earnings management and high free cash flow with low growth", found out that there is a direct significant relationship between the forgoing variables. That is to say, the managers of companies with high free cash flow and low growth adopt voluntary profit increasing accruals rather than low earnings and losses from investment in projects with negative net present value. Moreover, having reviewed institutional stockholders and auditing enterprises with high quality auditing (six big auditing firms in USA), they found that forgoing factors caused the relationship between earnings management and freed cash flow to weaken and prevented managers from attempting to manage earnings.

Griphen et al (2010), in a research entitled "free cash flow, growth opportunities with auditing remuneration", concluded that cash flows and growth opportunities influence intrinsic risk of auditing and auditors' efforts to achieve a reasonable level of audit risk.

Similarly, the researchers argued that optimal level, high dividend, and repayment of share would decrease free cash flow available, and therefore it reduces the problem of agency and the rate of fee requested by auditor. The result of the research indicated that auditing fees in companies with high free cash flows, high growth opportunities and in companies with high free cash flows and low growth opportunities are remarkably greater than companies with low free cash flow and high and low growth opportunities. Such high fee is mainly associated with auditors' effort rather than audit risk. Likewise, the results of the research suggested that rate of audit fee will decline as the level of debt rises in companies with high free cash flows. However, the results do not offer us evidence on audit fee change as a result of a relationship between available cash flow and dividend as well as repayment of shares.

4. RESEARCH METHODOLOGY

The research is an applied study in terms of type, and it is descriptive-correlational in terms of method. The population of the research consists of reports, and financial statements of listed companies on the Tehran Stock Exchange. As common characteristics of the companies considered by the researcher for determining statistical population, we can refer to the following points:

1- Their fiscal year ending March 31

2- They are listed on stock exchange by March 31, 2008

- 3- Do not become a member of investment, financial companies, bank, and insurance companies
- 4- The company in question has ongoing activity in the course of the study and its share has been traded
- 5- They made no change in their fiscal year during the course of the study.
- 6- Their necessary financial data become available for research during the course of the study

Using Cochran formula, 110 companies, i.e. 550 companies-year for five years from 2008 to 2012, were selected as statistical samples. In the research, a library method was used to collect data. Information on research literature and theoretical discussion has been gathered by studying books, papers, and academic theses. Data required by companies were extracted by Tadbir Pardaz software application, Rahavard-Novin designed by Database Center of Tehran Stock Exchange, which included financial statements of companies, and reports released by the stock exchange. Fish instrument was also used to summarize the library studies or the research literature.

5- Research Model

It is a mix of the studies, [8][9][10]

The following relationship is used to test the hypothesis about a significant relationship between free cash flow, profit sustainability and the growth opportunities of companies listed on the Tehran Stock Exchange: (5-1) equation

 $G=\alpha_0+\alpha_1\;FCF+\alpha_2\;SIZE+\alpha_3\;BV+\alpha_4\;D+\alpha_5\;E+\alpha_6ROA+\alpha_7\;LEV+\epsilon$

Where G: growth opportunities which suggest the ratio of market value to book value of stockholder's equity Growth opportunity: stock market price×number of stock released

Book value of stockholder's equity

FCE: free cash flow of a commercial unit

After Jensen, different research has been conducted and a variety of definitions were offered concerning free cash flow. The forgoing aspects include operating profit before being deducted from depreciation expenses and after being deducted from payable tax, interest, preferred and normal shareholder's profit [12], where it is determined as follows:

Where

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

FCF_(i,t): Free cash flow of company i in year t

INC_{i.t}: Operating income before amortization of company i in year t

TAX (i,t):Total payable tax of company i in year t

INT EXP_{i,t}:payable interest expense of company i in year t

PSDIV_{i,r}: Payable preferred shareholder dividend of company i in year t

CSDIV_{i.r}: Payable common shareholder dividend of company I in year t

A (i,t-1): Total book value of assets of company in year t-1

6. Descriptive statistics

Prior to data analysis, certain primary steps have to be taken. A researcher is advised to organize and summarize data as it makes concealed points come to light and their initial characteristics become visible in the first place, when he is faced with a stack of collected information to be used for a study. A researcher first conducts an explorative review before directly getting into statistical tests so that he can make them follow right path to get results by realizing technique of data distribution and their other properties that can be divulged through computing some statistical indices. Supplying frequency table, calculating statistical indicators, and drawing diagrams are often essential to explain data. Hence we first deal with an explanation of data in what follows before getting statistical tests started:

Table 6-1-central and distributional indicators of each of research variables

variable	strain	Skewness	SD	mean	maximum	minimum
Growth opportunity	0/5232	1/156	0/447	1/024	1/775	0/754
Free cash flow	-0/1478	-2/3526	7472859	26030874	62532547	147523
Company size	1/1965	-3/0327	5/022748	21/48752	55/05186	12/25155
Book value of	1/1099	2/3145	4914105	1377466	53954054	-1038497
stockholder's equity						
Dividend	-0/3132	-1/1074	11783791	141366159	184825653	36
Net income	0/1006	-1/0059	1788076	429106	20056791	-3975928
Return on assets	1/1469	1/2154	15/39	8/37	210/08	-43/91
Debt ratio	0/3669	1/2691	0/015	0/265	0/421	0/125

Coefficient of skewness is negative concerning all the research variable except ROA, BV, G, and LEV, which implies that variables are skewed to the left and they tend to be larger. The rate is positive for the variables, which indicate that the variables are skewed to the right and tend to be smaller. Similarly, the positive coefficients of some variable elongations suggest that normal distribution is longer as data cluster around the mean.

6-1- Test of stationary variable

If variables of time series are unstable, estimate of coefficients leads to a spurious regression. Firstly,unit root test and panel co-integration are performed on the variables of the model in order to avoid a spurious regression and test stationary variable.

6-1-1 Augmented Dicky-Fuller method

In general, a variable of time series is called stationary when its mean variance remains constant over time, and autocorrelation coefficients between different courses are the unique function of the length of lags. Overall, if time origin of a series is changed, from t to t+m; i.e. we change it from 2008 to 2009, its mean, variance, and covariance will remain constant over time, then it is a stationary series; otherwise, it is not a stationary series. In order to make sure whether xt time series is a static process (order of integration zero) or it is divergent (order of integration 1), we use augmented Dicky-Fuller test. Reviewing calculated statistic values and the probability of approving them indicate that the null hypothesis about the non-stationary of all variables are not confirmed as they all remain at stationary level.

statistics	probability	variables
-4/469529	0/0008	Growth opportunity
-4/170338	0/0015	Free cash flow
-4/128709	0/0015	Company size
-6/270121	0/0003	Book value of stockholder's equity
-5/657012	0/0019	Dividend
-6/170338	0/0000	Net income
-4/186438	0/0020	Return on assets
-5/654781	0/0027	Debt ratio

Table 6-2 pool unit root test for variables by augmented Dicky-Fuller method

6.1.2. Lane- Levine's method

In integrated data (panel), the use of unit root test for the data has more power than conventional unit root tests such as Dicky-Fuller, advanced Dicky-Fuller, and Phillips-Perron test[13]. In this research, Lane-Levine's test was used. The null hypothesis of the research suggests unit root of variables. Review of calculated statistical values and the probability of approving them indicate that the null hypothesis about the non-stationary state of all variables is not confirmed, as all variables of the study remain at stationary level.

statistics probability		variables	
4/869	0/0130	Growth opportunity	
3/179	0/0230	Free cash flow	
7/222	0/0015	Company size	
6/254	0/0020	Book value of stockholder's equity	
-1/590	0/0310	Dividend	
2/8825	0/0053	Net income	
6/228	0/0000	Return on assets	
-5/017	0/0031	Debt ratio	

Table 6-3—pool unit root test for variables by Lin and Levine's method

6-2. Heteroscedasticity

In this section, a heteroscedasticity estimate which is caused by different characteristics of companies is dealt with. Once cross-sectional units come with the same variance, as it varies across units, we face group wiseheteroscedasticity. Like stationary variable, we here need an application of a method suitable for pooling data. We use Wald's modified statistic to review group wise heteroscedasticity among the residuals of fixed effect regression model. Given the test run by Iowiz software application, here we use Stata11 instead. The results indicate that the null hypothesis on heteroscedasticity is confirmed.

Table 6-4 the results o	f heteroscedasticity using	Wald's modified statistic
	,	,

probability	Chi-square statistic	explanation
0/9783	-6715/32	Wald's modified statistic

6-3- determining method of model estimate-test of significance of fixed effect method

The method of the present model estimate based on integrated (panel). The method is a mix of "data of time series" and "cross-sectional data". There are defects in each of time series model and cross-sectional data, as they can be reduced in an integrated model, where F test and Hausman Test are initially used to determine either of two methods, fixed effects or random effect. The results of both tests are presented in the following table:

6-3-1- F statistic test

	Table 6-5 the results of F statistic test							
probability Degree of freedom Statistic value explanation								
	*0/009 109		1/7745421	Cross-section F				
	*0/000	109	155/262532	Cross-section Chi-square				

* five percent error level

6-3-2- Hausman Test

Table 6-6: the results of Hausman test						
probability	Degree of freedom	Statistic value	explanation			
*0/001	19	7/441852	Cross-section F			

Given the results of both tests (F and Hausman), the probability obtained is less than 5 percent in both of them, and therefore we use the regression model related to fixed effect method instead.

7. Hypothesis test

In order to test hypothesis, having performed Hausman and F tests and selected fixed effect method, we set out to estimate the coefficients of the model using the estimation generalized least square method (EGLS).

 H_0 : There is no significant relationship between free cash flow and growth opportunity of companies listed on the Tehran Stock Exchange.

 H_1 : There is a significant relationship between free cash flow and growth opportunity of companies listed on the Tehran Stock Exchange.

Table 7-1: Hypothesis regression test						
Sig level	statistict	SD	Effect coefficient	Variable name		
*0/009	2/015	0/259	0/141	Growth opportunity		
*0/009	2/115	0/057	0/352	Free cash flow		
*0/011	1/966	0/369	0/196	Company size		
0/086	1/247	0/409	0/009	Book value of stockholder's equity		
0/214	-0/632	0/229	-0/147	Dividend		
*0/035	1/748	0/336	0/085	Net income		
0/202	0/775	0/547	0/107	Return on assets		
*0/047	-1/699	0/044	-0/196	Debt ratio		

* five percent error level

Table 7-2- the explanatory capability and total significance of the model

ANOVA		Durbin-Warson	R		
Significance level	Total significance		Adjusted coefficient of determination	Coefficient of determination	
**0/000	15/025	1/525	0/583	0/598	

Given table 7-2, since Durbin-Watson test statistic value remain at distance of 1.5 to 2.5, the hypothesis on lack of correlation between errors is confirmed, so we can use regression. With respect to the significance of F test value (15.025) at error level smaller than 0.01, we can draw a conclusion that the regression model of the research which is a mix of independent, control, and dependent variables is good, as set of independent and control variables are able to explain the changes of growth opportunities. The value of adjusted coefficient of determination is equal to 0.583, which indicates that 58.3 percent of the total variation of the research dependent variable depends on the independent and control variables in this model. Additionally, coefficient of variable effect of free cash flow on growth opportunity is equal to 0.352, which indicates a direct positive relationship of free cash flow to growth

opportunity, and indicate that growth opportunities of company will increase, if free cash flow increases. On the contrary, given the significance level of t statistic of free cash flow variable (0.009), due to its error level less than 5 percent, we cannot confirm H_0 even with 95 percent confident level. Thus, we claim that there is a significant relationship between free cash flow and growth opportunities of companies listed on the Tehran Stock Exchange. Moreover, with respect to positive coefficient of FCF (0.352), the relationship is direct. Therefore, the regression model of the research is as follows:

G=0/141+0/352FCF+0/196SIZE0/009+BV-0/147D+0/085E+0/107ROA -0/196LEV

Similarly, given the table of hypothesis regression test, dividend control and debt ratio variables are not significant, so we can remove them from the final model.

8. RESULTS AND DISCUSSION

The statistical results indicate that there is a significant relationship between free cash flow and growth opportunities, which acknowledges that growth opportunities of company will increase, as free cash flow increases. Therefore, financial supply company and enterprise managers are required to pay necessary attention to profit making opportunities and development and activities of companies as well as drawing up strategies in their assessments; moreover, company managers had better take a good account of future growth opportunities in selecting the most suitable method for financial supply. Likewise, such companies are good options for investment. Company managers can offer further growth opportunities to companies by adding free cash flow components, as well as raising free cash flow. The results obtained from the hypothesis demonstrated that there is a positive significant relationship between free cash flow and growth opportunities. The result is consistent with the ones obtained from Dastgir and Sharifi-Mobarak (2011), and Chang et al (2005), while it is inconsistent with the results obtained by Vidhan Guyal et al (2002), and Griffen et al (2010), and it is also consistent with the results obtained by Mehrani and Bagheri (2009) when it comes to companies with high free cash flow and low growth as it is inconsistent with them concerning low free cash flow and low growth.

9. Conclusion

In this research, a positive significant relationship between free cash flow and growth opportunity was observed. According to the findings of the research, it is recommended that the information about free cash flow be divulged in annual financial statements of companies listed on the Tehran Stock Exchange, and the users of financial statements are recommended to analyze free cash flow variable in order to make a proper judgment about company's performance. Likewise, financial users and analysts are advised to pay regard to existing growth opportunities when it comes to determining company value and reviewing its performance.

Additionally, given positive and negative coefficients of control variables, the research which exerts direct and inverse effect on dependent variable, and considering independent variable, managers, investors, and other users are recommended to take account of direct and inverse effects of returns on assets, debt ratio, etc., in order to analyze free cash flow and evaluate growth opportunity of company.

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