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Cost of free cash flow delicacy, capital structure and unrelated variety

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Abstract: This research considers the effect of delicacy of free cash flow of capital structure. For considering this subject three hypotheses were written. Therefore assessing the relationship between above variables 5 years information of companies accepted in Tehran stock exchange during 2009-2013 was considered. For statistical analysis benefiting regression model of Panel Data were used for testing hypothesis based on F and T test by using Views. Regarding above discussions, result of research shows that there is diverse and meaningful relationship between ratio of debt (capital market) and free cash flow of companies accepted in Tehran stock exchange. Also the result shows that the relationship between capital structure and free cash flow is diverse and meaningful regarding unrelated variety and by attention to the modified determination coefficient that shows the degree of effectiveness of dependent variable from independent variable we can state that unrelated variety has had positive effect on the relationship between capital structure and free cash flow.

Key words: delicacy of free cash flow, capital structure, unrelated variety, stock exchange

Introuction

The role of financial structure of a company at behavior of production market is interested subject of financial economists. Structure of capital is the most important factor affecting valuing and directing companies in capital market. Companies supply their need through different methods but it has made different factors sensitive such as size of company, situation of managers, degree of production and sale, resources of acquiring primary martials, accessing markets of financial supply and their economic and political environment toward making optimized decisions (Sinaei, 2007). Choosing proper financial leverage, was a criteria for structure of capital and has had high importance because it can have significant effect on existing competitive excellence as high financial leverage will be lead to higher competitive power (Setayesh and Jamamlianpour, 20111). Considering financial supply through levelrage methods has especial importance regarding different factors. It means that choosing any cheap ofexpensive debt by a company beside changing capital cost causes creating proper profitability opportunities or creating critical situation.

Regarding the specific importance of capital structure, change in the order of financial resource of companies at specific conditions and different business strategies and also constant competitive conditions of production market, this research has the goal of considering effect of free cash flow on capital structure and changing financial resources of companies by emphasizing competition of production market. For fining an answer for this question the effect of unrelated variety of companies on the relationship of free cash flow and capital structure has been assessed.

Theoretical principles and research literature

The importance of capital structure was paid attention after studies of Modiliani and Miller(1958). They believed that there isn't any difference between financial supply through stock equities and debt by paying attention to company's value. Consideration of financial supply through leverage method has special importance by considering different factors. Important theories exist about capital structure that has been considered in developed companies that we can point theory of static balance, hierarchy theory and delicacy theory. In Asian countries some studies have been done about effective factors on capital structure that we can point Pandi(201) and Gani et al(2011) researches.

In theory of delicacy it can be stated that owners of company and shareholders delegate their authorities to managers so that they make necessary decision; but managers have personal goals that don't adapt viewpoint of stockholders such as maximizing wealth. Therefore delicacy theory causes occurrence of conflict of benefits. Based on Modiliani and Miller theory capital structure doesn't have any effect on value of company; but based on theory of delicacy even if suppositions of Modiliani and Miller is right, proper combination of debt and stock has importance in the view of company rulers.

In recent years various studies have been done about subject of free cash flow and capital structure at

internal and external levels, in the fallowing we will review some of these studies and research.

Rafel Setagiano et al (2014): in a research considered free cash flow and capital structure by regarding unrelated variety. Result of this research showed that capital market has strong effect on decision-making for companies in unrelated variety especially regarding companies that are sensitive to financial limitations.

Ha yung Ha(2011): in a research considered this question that if cost of delicacies resulted from free cash flow can increase demand for policy or not. He believed that policy is a part of mechanism of making efficient contract that facilitates problems of delicacy. According to his predictions he found that by increasing cost of delicacies resulted from free cash flow, companies identify losses more on-time than profits. In other word by increasing delicacy problems resulted from free cash flow demand for making policy becomes more.

Wang(2010): in a research considered effect of free cash flow on cost of delicacies. Result of his research denotes that free cash flow through opportunistic behavior can lead to delicacy problems.

Storz and Bergof(2006): due to his research concluded that companies having high volume of free cash flow have less abnormal consequences than companies don't have free cash flow. In fact result of their research denotes that capitalist in companies having free cash flow believed that managers of such companies tend to investment of these cash flow in projects having negative current value.

Etemadi, Montazeri(2013):in a research considered the effect of factors on capital structure of companies accepted in Tehran stock exchange. Result shows that in Static model, effect of profitability, first criteria of collateral value of assets and current ratio on capital structure was negative and meaningful and effect of competition of production market and also non-debt taxation shield on capital structure was positive and meaningful. In dynamic model, effect of profitability, first criteria of collateral value of debts and current ratio on capital structure, was positive and meaningful and effect of competition of production market, capital structure of a previous period and also size of company on structure of capital was positive and meaningful/

Setayesh and Jamalianpour(2011):in a research considered effect of capital structure and its changes on degree and type of proceeding seventh financial strategies. Result shows that among types and degree of proceeding financial strategies and capital structure and type and degree of changes in it, there was statistical relationship in most cases; of course this conclusion depends on a kind of financial strategy.

Tehrani and Hesarzadeh(2009): in their research in relationship with this action that does existence of free cash flow due to lack of information balance between managers and shareholders can lead to more investment?

Tehrani and Hesarzadeh believe that these finding adapt with Jensen viewpoint that managers may use free cash flow and apply projects with negative current value for increasing their benefits.

Mehmandosti(2007) in a research considered as considering the relationship between liquidity of stock and decisions related to capital structure of companies accepted in Tehran stock exchange and since lower liquidity(lack of liquidity) of stock, means high risk of investment for investors and fallowing that higher expected output rate, so it make decreasing liquidity or increasing lck of liquidity of financial supply more favorable through distributing stock. In this research beside explaining concept of liquidity by using combined data of 53 chosen companies having conditions in Tehran stock exchange during 1999-2003 considered the relationship of two criteria of stock liquidity << ratio of turning stock and Amihodeh criteria>> with leverage ratio by using econometric technique. Result of this research shows that lack of stock liquidity causes financial managers search debt while financial supplying and use more financial leverage.

Research Hypothesis

Hypothesis of this research are identified as:

First hypothesis: there is meaningful relationship between free cash flow and capital structure.

Second hypothesis: delicacy problem of free cash flow affects relationship of free cash flow and capital structure.

Third hypothesis: unrelated variety affects free cash flow and capital structure.

Methodology

Current research is applied regarding goal and because the relationship between two or more variables is measured correlation analysis is used.

Statistical society of this research includes all companies accepted in Tehran stock exchange during 2009-2013. For homogeneity of statistical society at implementing hypothesis test and generalizing its result the fallowing conditions about statistical society companies is considered(systematic method deletion).

The end of financial year of a company should be at the end of Esfand. 2- company shouldn't have financial year change during studying period 3- it shouldn't be investment company and like it 4- transaction symbol of company should be active and don't have transaction symbol sensation during 4

month 5- required financial information should be available
Regarding above cases statistical sample of research includes 80 companies
Introducing variables and the way of calculating them
Independent variables of this research are free cash flow and variety of companies and dependent variable of capital structure.
Free cash flow: for calculating free cash flow (FCF) pattern of Lehen and Polsen measurement that was used by Giol and Teso is used. This model is as below:

$$FCF = (INC_{it} - TAX_{it} - INTEXP_{it} - PSDIV_{it} - CSDIV_{it})/Ta_{i,t-1}$$

That in this model we have:
FCF: free cash flow, INC: operating profit before depreciation, TAX: tax on total paying income, INTEXP: financial paying costs (benefit), PSDIV: preferred stock dividend payment, CSDIV: common stock dividend payment, TA: total assets.
Variety of companies: for calculating variety of companies the criteria of <<entropy criteria>> was used.
Based on palpodefinition (1985) entropy means balanced mean of stock of operation of different sections of company from total operation of company. This mean of weight means diverse logarithm of ration of total operation in each section. Therefore total variety of a company can be obtained through the fallowing relation:

$$TD = \sum_{j=1}^{M} \sum_{i=1}^{N} p_{ij} \ln \frac{1}{p_{ij}}$$

P= ratio of company sale in business, M= number of industries in which companies are active
N= number of business in which companies are active, J=industry, I=company
In 1995 Raganatan by exact consideration of this criteria concluded that entropy relationship, in some cases, is not counted as proper criteria for measurement of organizational variety then he presented a renewed criteria of entropy that accuracy increases measurement of variety of company to some extent. Mentioned criteria areconsisting of two components:
It shows part of the number of sections
A part that denotes the way and degree of distributing operations in different sections.
The fallowing relationship shows related and unrelated variety of companies:

$$R\ entropyi = \left[\left(\sum_{j=1}^{m} p_j \sum_{i=1}^{n} \left(\frac{p_{ij}}{p_j} \right) \ln \left(\frac{p_i}{p_{ij}} \right) \right) \Big/ \sum_{j=1}^{m} p_j \ln n_j \right] \frac{\sum_{j=1}^{m} n_j}{m}$$

R entropy=related variety

$$Uentropyi = \left[\sum_{j=1}^{m} \left(p_j \ln \left(\frac{1}{p_j} \right) \right) \Big/ \ln M \right] M$$

U entropy= unrelated variety
Capital structure: in this research logarithm of financial leverage (notebook value of debt/notebook value of assest) is used as capital structure and shows how much a company has used debt for supplying assets (Sinaei, 2007).
Financial leverage= notebook value of total debt/ notebook value of total asset
Methodology: for statistical analysis two descriptive and inferential methods have been used. In descriptive section, central index and distribution are paid attention and at inferential section multi-variables regression test is sed. These tests are implemented through statistical software of E-views and at 95% of certainty. For testing hypothesis of this research firstly independents and dependents variables are calculated and then by observing all pre-suppositions of regression tests of panel data, testing hypothesis are done.

Findings of research

Table 1. descriptive statistics of research variables

Mean	0/615	0/095	0/257
Standard deviation	0/173	0/155	0/594
Skewness	0/016	0/668	2/570
Stretch	3/129	4/628	8/587
Jark bara	0/294	73/399	953/71
Probability	0/862	0/001	0/001
Number of observations	400	400	400

Observing presented amount for skewness and kortosis shows that probably data fallows normal distribution that regarding result of Jark Bara test and presented probability of data(except variable of financial leverage) has normal distribution therefore testing hypothesis is done regarding central limit of data.

Correlations

In this research for determining correlation between quantitative variables Pearson correlation has been used.

Table 2. result of correlation test of variables

DR	correlation	1	-----	-----
	Probability			
FCF	correlation	-0/45	1	-----
	Probability	0/001		
UENTROPY	correlation	-0/17	0/15	1
	Probability	0/001	0/02	

Regarding the result of correlation between considering variables there is significant correlation. As it is observed in above table there is correlation between financial leverage (DR) and free cash flow(FCF) with 45% correlation and unrelated variety with 17% correlation and regarding negative correlation coefficient the type of relationship is diverse.

Stability test of variables

Table 3. result of stability test of variables (Diki-foler generalzed test)

	ADF test statistic	Test critical values 5% level	
DR	8/307	2/868	0/001
FCF	17/594	2/868	0/001
UENTROPY	9/631	2/868	0/001

Regarding summarized result in above table and since absolute value of calculated amount by Diki-foler generalized test is bigger than critical amount, hypothesis H0 based on instability is rejected and series are stables and it can be stated that testing hypothesis and regression is not false. Also calculated probabilities denotes confirming hypothesis of stabilities of series.

Testing hypothesis

Testing first hypothesis: for distinguishing choice between pooled or panel F-limer test was used, then for determining and choosing one of these two patterns of constant effect or random effect, Hausman test has been used.

Table 4. result of f-limer and Hausman first hypothesis

Name of dependent test	Name of independent test	f-limer probability test	probabilityhausman test	Cross-sections
Capital structure	Free cash flow	0/027	0/020	Fixed

Regarding the result of F-limer and Hausman test in table 4 it is observed that panel model with distinguished effects is used.

Result of first hypothesis by using panel data model shows that the relationship between capital structure and free cash flow was approved and regarding negative T statistic the relationship between capital structure and free cash flow is negative it means that by increasing free cash flow, capital structure is decreased.

It is necessary to mention that in testing hypothesis, Dorbin –watson statistics shows correlation in board data for the whole subordinate hypothesis it is near to so it is concluded that the problem of self –correlation doesn't exist in testing hypothesis. Result related to modified determination coefficient denotes the degree of effectiveness of dependent variable is from independent variable 15% of changes of capital structure is resulted from free cash flow.

Table 5. result of first hypothesis test

Variables	coefficients	T statistics	Probability
Free cash flow	0/720	-15/143	0/001
Cross-sections fixed			
R-squared	0/15	Durbin-Watson stat	1/963
Adjusted R-squared	0/146	Prob(F-statistic)	0/001
F-statistic	4/995		

Testing second hypothesis

Table 6. result of f-limer and Hausman test of second hypothesis

Name of dependent variable	Name of independent variables		f-limer probability test	Probability of Hausman test	Cross-sections
Capital structure	Free cash flow	Delicacy problem of free cash flow	0/040	0/045	fixed

Regarding result of F-limer test that is observed in table 6 panel model with distinguished effect is used.

Table 7. result of testing second hypothesis

Variables	coefficient	t-statistics	probability
Free cash flow	-0/0697	-13/722	0/001
Delicacy problem of free cash flow	0/024	1/359	0/005
Cross-sections fixed			
R-squared	0/12	Durbin-Watson stat	2/029
Adjusted R-squared	0/11	Prob(F-statistic)	0/001
F-statistic	4/969		

Result of second hypothesis by using panel data shows that the relationship of capital structure and free cash flow regarding problem of delicacy of free cash flow has been approved and regarding negative t statistic the relationship between capital structure and free cash flow is negative. The relationship between capital structure and delicacy problem f free cash flow is positive.

In is necessary to state that in testing hypothesis, Dorbin-watson statistic for the whole subordinate hypothesis is close to 2 so it can be concluded that problem of self-correlation doesn't exist in testing hypothesis. Result related to modified determination coefficient of 12% of changes of capital structure is resulted from free cash flow that in comparison with previous hypothesis the problem of free cahs flow causes decrease of this ratio to the previous hypothesis.

Testing third hypothesis

Table 8. result of f-limer and Hausman test of third hypothesis

Dependent variable test	Independent variable test		f-limer probability test	Hausman test probability	Cross-sections
Capital structure	Free cash flow	Unrelated variety	0/049	0/537	random

Regarding result of f-limer and Hausman test that is observed in table 2 panel models with distinguished effect is used.

Table 9. result of testing third hypothesis

Variables	Coefficints	T statistics	Probability
Free cash flow	-0/72	-16/856	0/001
Unrelated variety	0/021	1/90	0/056
Cross-sections Random			
R-squared	0/16	Durbin-Watson stat	1/918
Adjusted R-squared	0/15	Prob(F-statistic)	0/001
F-statistic	153/141		

Result of testing third hypothesis by using panel data model shows that the relationship between capital structure and free cash flow regarding unrelated variety has been approved and regarding negative T-statistics the relationship between capital structure and free cash flow is negative and there isn't meaningful relationship between capital structure and unrelated variety.

It is necessary to mention that in testing hypothesis, statistic of Dorbin Watson for the whole subordinate variables is closed to 2 therefore it can be concluded that there isn't self-correlation problem in testing hypothesis. Result related to determination coefficient of 16% of changes of capital structure is resulted from free cash flow that in comparison with previous hypothesis unrelated variety causes increase of this ratio to previous hypothesis.

Conclusion

Investors and creditors tend to invest in companies that have higher free cash flow. Because it is one assessment tool of the power of repayment and determining financial flexibility of companies, is index of free cash flow. This research considers effect of capital structure on free cash flow of companies accepted in Tehran stock exchange. Result shows that there is diverse and meaningful relationship between ratio of debt and free cash flow of companies accepted in Tehran stock exchange. Fatma et al(2011) believed that in case of creating debt, the manager is obliged to accept draft of installment payment that finally causes limitation of manager behavior on free cash flow also by adding variable of free cash flow result shows that this variable has direct relationship with financial leverage it means companies that have problem in cash flow are fallowing liquidity absorption through loan and their methods of financial supply, on the one hand by adding unrelated variety that denotes variety of activities of a company has diverse relationship with capital structure. This conclusion is adapted with findings of Fatma et al(20110, so regarding theoretical and experimental background and findings of research, shareholders, investors, creditors and financial analysis and agencies are suggested during investment time pay attention to the relationship between capital structure

and free cash flow of companies. Also organization of Tehran stock exchange as supervising institute on companies and committee of writing accounting and auditing standards are suggested to distribute necessary information in the field of parts of corporate governance and free cash flow of companied for better utilization of users of financial statements. Also managers of companies are advised to pay more attention to free cash flow.

Regarding obtained result it is advices investors not only pay attention to the degree of free cash flow but to the effective factors on the way of using free cash flow. Because decision-making that is done by management against such cases can determine effectiveness of management at optimized use of these resources in opportunities of proper investment to much extent.

Companies having highfree cash flow are advised to invest additional fund in projects with current positive value to be able to change viewpoint of shareholders and investors toward themselves.

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