The Impact of Firm Size on Relationship between Tax and Capital Structure of the Listed Companies in Tehran Stock Exchange

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Abstract

The current investigation examines the relationship between tax as an accounting variable and capital structure as factor based on stock price and bond with regard to firm size. Firms supply their cash mainly through different methods, but various factors such as firm size would impact their decisions as well as financing methods would impact taxable incomes, hence, this study uses data of the listed companies in Tehran stock exchange during 2009 to 2013 and examined the given data in the form of data panel regression in order to investigate the impact of firm size on relationship of between tax and capital structure. The results suggested that tax in big firms has negative impact on capital market and debt ratio in capital market getting increased along with increased tax, but in small firms, increased tax lead to increased capital market, i.e. debt ratio getting increased.

Keywords: Capital structure; Tax; Firm size; Panel data.

Introduction

In capital markets, firms' credits largely depend on their capital structure, and in fact, the basic of production and providing services depend on how financial resources are supplied and consumed. For this reason, capital structure is regarded as the most important factor in valuating firms and their tendencies in capital markets. Most firms supply their cash through different methods, but some factors such as firm size have limited optimized decisions in this field, hence, this research attempts to examine the impact of firm size on the relationship between tax and capital structure of the listed companies in Tehran stock exchange. In recent years, the role accounting information has been emphasized than before. Therefore, accounting information has been used by investors, creditors and stakeholders in the forms of reports and financial statements to make some decisions. Also, extensive advancements in employing quantitative models of behavioral sciences and information technology play and essential role in accounting evolution. On the other hand, arising these evolutions have provided various backgrounds for scientific and empirical researches in accounting. “Related values” researches examining the relationships between bonds' prices and accounting variables are typically the empirical researches.

Theoretical Foundations

Capital structure is the combination of debt and shareholders' equity by which firms finance their cash assets. It is the combination of firms' used long-term resources and changing this would led to changing in firms' capital costs. The main goal of capital structure decisions is to create long-term cash resources to minimize a firm's capital cost in order to maximize firm value. This composition is called "optimized capital structure".

One of the most challenging issues financial managers now faced with is the relationship between the components forming capital structure, such as a mixture of bonds and stocks for financing and firm's stock price. A firm need capitals to be established and need more capitals to be developed. The necessary capitals are supplied from various resources and different forms.

Capital Structure

Every firm has own return and risk, and its financial resources are supplied by the owners of common stocks, preferred stocks and securities, and each of them demand returns fits with its risk. Supplying this return would put firms to face with costs, hence, a firm's capital cost can be defined as "minimum return a firm should earn to supply expected return of investors and debt owners (Baghomian & Azizzadeh Moghaddam, 2014).

Since the firm goal is to maximize shareholders' wealth, and if rate of investment return higher than capital cost rate, and rate of return increased without increased risk, it leads to increased shareholders' wealth. Since increase in return (preferred stocks and debt owners have fixed return), surplus rate of return belongs to ordinary shareholders, consequently it leads to shareholders' wealth maximization.

The Effective Factors on Capital Structure

Ownership Rights

Dated papers issue raises a question that how much is the amount of new owners rights of these bonds.In some situations, of course, debt may impose some constraints in management practices, such as prohibition from paying tax. Ownership rights of preferred shareholders depend on having the given stock to voting right, and this is without voting right, except its kind, for common shareholders and they can receive all wages. But if shareholders don't tend to joint ownership rights, a firm tries to finance through preferred stock or debt (Kimigari & Eynali, 2008).

Solvency Obligations

Debt has expiration and should be paid according to the given condition, but preferred stock usually has no expiration, however, has redemption authority which enables its clearing. If a firm doesn't want to encounter with redemption obligations, common or preferred stocks would have the highest priority (Kimiagari & Einali, 2008).

Claim to Assets

Bonds' owners are the first claimants when a firm to be closed or liquidated, and then preferred and ordinary shareholders. And if a firm doesn't want to grant priority right to assets to the new investors, common stock would has higher priority (Antonio et al, 2002).

Claim to Earnings

Bonds should be paid, regardless of earnings, and preferred shareholders have the first right and priority to be partner in a firm, but in a determined degree. Ordinary shareholders have the full right to be the partner in the firm's profit. Then, if a firm wants to constrain the new shareholders' rights to the share of profits, debt or preferred stock has the highest priority. In addition to the above factors, other internal and external factors impact financing policy, such as the firm's risk level (Antonio et al, 2002).

Research Background

Baghomian & Azizzadeh (2014) in their research titled "the relationship between firm characteristics and capital market" concluded that size indices, tangible assets and firm risk have direct and significant relationship with capital structure, and firm's growth opportunities have adverse and significant relationship with capital structure. Moreover, there is no significant relationship between firm age and industry with capital structure.

Fathi et al, (2013) in a research titled "meta-analysis of effective factors in capital structure in firm level" concluded that size, assets structure, growth opportunities, liquidity, profitability and volatility have distinct role in decision-making about capital structure. Additionally, these factors in countries with different development levels, have different impacts on capital structure and they are different in various occasions.

In their research titled "examining the relationship between financial flexibility and capital structure", Highlight & Bashiri (2012) examined this relationship between the listed companies in Tehran stock exchange during 1999 to 2007. The results indicated that firms keep low risk capital and debt, and balanced leverage ratios. They use debt financing during growth period and keep high leverage ratios. They are also depend on inter-organizational financial during maturity period and have low leverage ratios.

Research Method and Data Collection

First step: The available documents and thesis in libraries, and existing articles and scientific database in internet are used to provide history, literature and theoretical basics.

Second step: In this research, the library method is used from Latin and Persian books, theses to collect data about theoretical basics and research literature, especially some reliable financial journals such as Praquest, Science Direct and SSRN, etc.

Data analysis is conducted using panel data method, because this method contains cross-sectional and time series.

Since we face with two models of fixed effects and random effects in panel data method, Hausman test is used to select between them which is measured by Chi-square statistics selected based on conformity to the tables.

Laslo (2016) in his research on unlisted eastern Euro, examined how tax affects financing methods, and concluded that debt finance is the best method for reducing tax paid.

Examining decisions of capital structure in seven industrial countries U.S, England, Canada, France, Germany, Italy and Japan, Robins (2015)showed that financial leverage has negative relationship with firm profitability, and positive relationship with firm value, fixed and tangible assets, and firm size.

Strong (2014) examined the relationship between the variables of firm size, firm age, business risk, sale growth rate, tax, profitability and intangible assets with debt ratio, and concluded that the relationships between the variables and debt ratios depend on the base of calculating the dependent variable (market value or book value).

Coalarof (2014) in an investigation in Canada, showed that small firms don't follow hierarchy theory, but big firm do.

Research Hypotheses:

1. There is a reverse relationship between tax and capital structure in big firms.
2. There is no reverse relationship between tax and capital structure in small firms.

Statistical Population and Sample:

The research statistical population includes data of all branches of Bank Sepah in Markazi Province during 2009 to 2013. As well, the statistical population covers all listed companies in Tehran stock exchange, and the sample includes all companies meet the following condition:

1. They should have announced estimated annual income during the given period.
2. They should be listed before 2009 in Tehran stock exchange and should not be loss ones.
3. Its fiscal year should end in 19/3 on each year and should not change its fiscal year during the study.
4. Banks, insurance and investment companies are not considered.
5. The selected samples should active in various industries and their data should be available.

The Research Variables and Model

In this investigation, tax, capital structure, firm size and firm growth are regarded as independent, dependent, moderating and control variables, respectively.

The Research Model

Regarding proposed hypotheses and mentioned variables, the used model for testing hypotheses are as follow:

$$CapitalStructurei,t=\beta0+\beta1LTaxit+\beta2Growthi,t+\beta3QRatios i;t+\beta4Pf i;t+\varepsilon i,t$$

Capital structureit: capital structure for firm i in year t

LTaxit: growth of firm i in year t

QRatioi,t: market to book value of firm i in year t

Pfi,t: profitability of firm i in year t

Dependent variable:

In this research, the dependent variable includes capital structure or financial leverage (DR) which is calculated through debt divided by assets.

DR: Total assets/debts

Independent variables

Firms' taxes are regarded as independent variables in this research which is calculated through final tax.

Moderating variable:

Since the aim of the study is to examine the effects of firm size on the relationship between tax and capital structure, firm size is considered the moderating variable and moderating effects are examined, according to the proposed hypothesis. To measure firm size, logarithm of firms' stock market value is used.

Size = Log (Ait)

Control variables:

To control other possible effective factors on capital structure, firm growth is regarded as the control variable.

Firm growth:

Firm growth is the improvement of firm's current assets to previous financial year. This variable includes changes in logarithm of firms' assets.

QRatioi.t: It is Tobin's Q which indicates firm value, or by some experts, is intangible assets.

PFi.t: Profitability of firm i in year t

1. Descriptive statistics of the research variable: The descriptive statistics of the research variables includes, mean, median, minimum, maximum, standard deviation, skewness and kurtosis are offered in the following table.

As it can be seen, descriptive statistics of the variables has been examined in the above table.

Variable	Median	mean	Max.	Min.	SD	Skewness	Kurtosis
CapitalStructure	6.244	6.000	8.000	4.000	0.927	-0.417	2.928
LTax	0.193	0.192	0.457	0.014	0.108	0.215	2.507
Growth	0.187	0.074	1.646	0.018	0.321	3.704	16.397
QRatios	1.666	2.000	2.000	1.000	0.474	-0.707	1.500
PF	14.58	17.69	18.94	0	30.279	-1.054	2.465

Pearson Correlation Test:

The person correlation matrix is calculated using SPSS software with regard to each firm-year as an observation. The relationship between the variables is calculated through Pearson coefficient in the below table:

The obtained results indicate that there is a significant correlation between the variables and most variables have significant relationship together, but with different correlations.

Table 1.1. The results of Pearson test

Variable	Capitalstructure	LTax	Growth	Qratios	PF
Capitalstructure		**-0.24 (0.01)**	**0.14 (0.01)**	**0.071 (0.32)**	**0.40 (0.00)**
Ltax			**-0.41 (0.00)**	**0.32 (0.04)**	**0.37 (0.00)**
Growth				**0.51 (0.00)**	**0.36 (0.04)**
QRatios					**0.041 (0.00)**
PF					

The Reliability Test of the Research Variables

In current investigation, Lin, Levin and & Chow, and Im, Pesaran and Shin are used to examine the reliability of the variables, indicated in the following table:

As it can be seen, H0 of Lin, Levin and Chow is rejected for all variables in 95% error level, so all variables are durable.

Group	Variable	Lin, Levin and Chow	Probability value	Result
Big firms	CapitalStructure	-37.437	0.000	Durable
	LTax	-13.149	0.000	Durable
	Growth	-111.643	0.000	Durable
	QRatios	-19.627	0.000	Durable
	PF	-10.873	0.000	Durable

Small firms	CapitalStructure	-11.628	0.000	Durable
	Ltax	-31.058	0.000	Durable
	Growth	-15.877	0.000	Durable
	QRatios	-22.617	0.000	Durable
	PF	-34.627	0.000	Durable

To ensure about durability of the variables, Im, Pesaran and Shin tests are used which the obtained results are shown in the following table:

As it can be seen, H0 of IM, Pesaran and Shin is rejected for all variables in 95% error level, so all variables are durable.

Table 2.1. Panel cumulative unit test of Im, Pesaran and Shin

Group	Variable	Im, Pesaran and Shin	Probability value	Result
Big firms	CapitalStructure	7.878	0.000	Durable
	LTax	28.789	0.000	Durable
	Growth	8.783	0.000	Durable
	QRatios	9.281	0.000	Durable
	PF	9.281	0.000	Durable
Small firms	CapitalStructure	8.627	0.000	Durable
	Ltax	10.628	0.000	Durable
	Growth	7.249	0.000	Durable
	QRatios	17.009	0.000	Durable
	PF	15.184	0.000	Durable

Estimated model for big firms

Firstly, the tests of model recognitions are conducted, and then the model is estimated:

Chaw test (F-Limer)

Chaw test is used for the first mode showed in below tables:

The amount of probability value indicates that H0is rejected which used from pooling model. It can be said that the panel data can be used in big firms' model.

Table 3.1. The results of Chaw test for big firms

Test impact	Statistics	Probability value
Cross-section F	8.525	0.00
Cross-section chi-square	26.004	0.00
Period F	31.571	0.00
Period Chi-square	48.067	0.00
Cross-section/period F	9.367	0.00
Cross-section/period chi-square	42.558	0.00

Hausman test and selecting between fixed or random effects

The results of Hausman test for big firms are as follows:

Table 4.1. The results of Hausman test for big firms

X^2 statistics	Probability value	Kind of effects
13.447	0.000	Fixed effects

If the calculated test statistics is higher than the table's amount, H0 is rejected and correlation is confirmed, therefore, the fixed effects method should be used.

Pesaran Test (sectional independence residues):

The results of Pesaran for big firms are offered in the following table:

H0is not rejected, hence, residuals are not correlated between periods and they are not correlated.

Table 5.1. Pesaran Test for Big Firms

Pesaran statistics	Probability value
0.711	0.456

Testing Hypothesis for Big Firms

Regarding the obtained results from F and Hausman test, the model is estimated with Ordinary Least Squares (GLS) of weighted sectional regressions frameworks and according to sectional fixed effects method. The results of the model estimation for big firms are provided in the following table using fixed effects method.

As it can be seen, the amount of R2 is 0.834, i.e. the independent variables can describe 83.4% independent variable changes. Therefore, the provided model has high explanatory power and F-statistics is significant in 99% significance level for all coefficients of estimated model which confirms the reliability of fitted model. The Durbin-Watson statistics also confirms lack of correlation between errors. The results indicate that tax significantly impact firm's capital structure in 95% level.Regarding the sign of coefficient, it can be said that there is a reverse relationship between tax and capital structure in big firms.

Growth in big firms has significant impact on capital structure in 95% level, so it can be said that there is a reverse relationship between firm growth and capital structure.

Market to book value ratio in big firms significantly influence on capital structure with 95% level. Regarding the sign of market to book value ratio (Tobin's Q), it can be said that there is a direct relationship between this variable and capital structure.

Profitability in big firms significantly impact on capital structure in 95% level. Since coefficient of profitability has positive sign, it can be said that profitability has direct relationship with capital structure.

The Results of Chaw Test for Small Firms:

The results of Chaw test for small firms are offered in the following table:

The amount of probability value indicates that H0 is rejected which used from pooling model. It can be said that the panel data can be used in small firms' model.

Table 6.1. The Results of Chaw Test for Small Firms

Test impact	Statistics	Probability value
Cross-section F	6.841	0.00
Cross-section chi-square	37.86	0.00
Period F	44.086	0.00
Period Chi-square	53.740	0.00
Cross-section/period F	9.667	0.00
Cross-section/period chi-square	41.209	0.00

Hausman Test for Small Firms:

The results of Hausman test for small firms are offered in the following table:

The results of Hausman test for small firms indicate that H0 is rejected, and the fixed effects method is suitable, hence, this method should be used to estimate the model of small firms.

Table 7.1. The Results of Hausman Test for Small Firms

X^2 statistics	Probability value	Kind of impact
11.573	0.000	Fixed effects

Pesaran Test for Small Firms:

The results of Pesaran test for small firms are offered in the following table:

It can be seen that H0is confirmed for small firms, so residuals have sectional independence.

Table 8.1. Pesaran Test for Small Firms

Pesaran statistics	Probability value
0.451	0.347

The Results of the Second Hypotheses Research

Regarding F-Limer and Hausman tests, the model is estimated with Ordinary Least Squares (GLS) of weighted sectional regressions frameworks and according to sectional fixed effects method to control co-linearity between residuals statements.

The result of the estimation of the model for small firms is provided in below table:

Table 9.1. The Results of the Calculation of the Model for Small Firms

Variable	Coefficient	t-statistics	Probability value
LTax	0.176	3.865	0.002
Growth	-0.177	-4.451	0.000
QRatios	1.841	1.475	0.257
PF	0.361	2.150	0.143
F-statistics= 97.667	Probability value F-statistics= 0.000	R^2= 0.795	Durbin-Watson statistics: 1.759

As it can be seen, the amount of R2 is 0.878. Therefore, the provided model has high explanatory power and F-statistics is significant in 99% significance level for all coefficients of estimated model which confirms the reliability of fitted model. The Durbin-Watson statistics also confirms lack of correlation between errors. The results indicate that tax significantly impact firm's capital structure in 95% level for small firms. But the coefficient of tax indicates that there is a direct relationship between tax and capital structure in these firms (small firms).

Growth in small firms don't significant impact capital structure in 95% level, i.e. Tobin's Q indicating a firm's reliability, would not increase capital structure.

Profitability in small firms don't significant impact on capital structure in 95% level. In other words, increase in profitability doesn't significantly impact on increase in capital structure in small firms.

The Second Hypothesis: There is a direct relationship between tax and capital structure in small firms.

Small firms would not face with increased assets along with increased profit which leads to increased tax, but their debt would be increased, hence, increase in tax would occur along with increase in capital structure.

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