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**STUDYING THE EFFECT OF TAX RISK ON VALUE AND COST OF EQUITY  
CAPITAL OF COMPANIES LISTED IN TEHRAN STOCK EXCHANGE**

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**ABSTRACT**

This research tried to experimentally and theoretically study the relation between tax risk and firm value with equity capital cost in companies listed in Tehran stock exchange. Therefore, two hypotheses provided and studied through data of companies listed in Tehran stock exchange within the period of 2007-2013. Hypotheses analyzed through multivariate regression method by using panel data. According to data obtained from the first hypothesis, it stated that there is a positive, significant relation between tax risk variable and firm value. Moreover, the result of second hypothesis shows that there is no significant relation between tax risk variable and equity capital cost.

**Key terms: Tax risk, firm value, equity capital cost, tax avoidance**

**INTRODUCTION**

According to Hanloun and Heatzman (2010), tax avoidance is “reducing firm tax transparency”. Regarding to this definition, any activity including various management efforts and transactions to decrease firm tax is part of tax avoidance whether these activities are legal, illegal or vague. Recent studies view tax avoidance as the wide scope from continuous tax planning activities using legal and reliable economic activities to

totally vague activities of reducing firm paid tax (Hanloun and Heatzman, 2010 and Lizovski et al, 2012). Of these activities to avoid tax payment is investment in government bonds exempting from tax.

Tax risk determined considering the position of continuous activities influencing firm tax. In other word, tax risk refers to some level of inherent uncertainty in firm tax status. Rigo and Wilson (2012) express that firm vague

tax status indicates vague, unclear facts series about firm, which are not easily seen by firm auditor. Thus, according to the aforementioned definition, tax risk can be regarded as a set of tax avoidance through technical measures, which vaguely shows firm tax status.

Following the scandals of 2007, which caused dissatisfaction in companies and cynicism of managers misleading the investors, they concluded that managers too much concern their own interests, which is highly dangerous. As a result, investors' tendency toward short-term income caused by changes in price increased. In these cases, managers inevitably involved in activities leading to increased risk including investment in excessive-risk projects and speculative activities, which overshadow the interests of long-term investors and the community (Frank et al, 2009). Generally, it stated that investors are always ready to take the risk of getting expected return; and in this case, the investors are willing to take the tax risk thereby future cash flow and income following tax increase, too. However, this relation is not necessarily linear; further, accepted risk level is of critical importance. Indeed, the purpose of this research is to study the effect of tax risk on firms' value and equity capital cost in Tehran stock

exchange. The present study seeks for answering to this question that to what extent the investors are willing to take firms' tax risk.

Considering companies' valuation model, based on which firms' future cash flow discounted by firm expected rate of return and calculated through firm value, it is expected that tax risk not only influences future cash flows, but also influences expected return or cost of capital. According to this theory, if tax risk influences cost of capital in addition to future cash flow expectations; then, it would be necessary for investors to consider information uncertainty influencing cost of capital in tax risk decision-making (Rigo and Wilson, 2012).

Studies conducted in this area are as follows: Pourheiydari (2013) studied the differences between taxable profits determined by tax auditors and tax assessors. Research results indicated the significance difference between taxable profit determined by tax auditors and tax assessors.

Izadiniya and Rasaeiyan (2008) investigated the relation between capital structure and firms' tax. The obtained results showed that there is no significant relation between capital structure and tax of companies listed in Tehran stock exchange.

Khodamipour and Torkzade (2011) examined the relation between tax and conservatism in financial reporting and relevance of accounting information. The results revealed companies that their net operating cash flow is much larger than taxable income, are much more conservative comparing other companies; however, it is not true about companies with net operating cash flow less than taxable income. Moreover, research results also demonstrated that tax not only decreases relevance of accounting information presented by firms, but also leads to more relevant information. Saghafi and Bovalou (2009) studied the relation between cost of shareholders' equity and four profit quality characteristics including stability, quality of accruals, predictability, and interest smoothness within 2000-2005. They calculated cost of equity using Gordon model. Research results showed that profit stability is the only effective factor influencing cost of equity. Rahmani and Fallahnejad (2010) studied the relation between the quality of accruals and common share cost of equity. They also applied Gordon model and found out the significant relationship between the quality of accruals and ordinary share cost of equity. Furthermore, research results demonstrated that the relation between nondiscretionary

accruals and ordinary share cost of capital is much stronger than the discretionary accruals.

Wilson (2009) in his study presented tax escape prediction model by using firm particular features. His findings showed that in the companies using tax escape, there is a high difference between final and declared taxable income and these companies use aggressive financial reporting procedures. In addition, firms attempting tax avoidance, show higher positive and abnormal returns.

Elliot et al (2010) studied the effect of accounting transparency on analysts' incorrect pricing expectancy. They provided experimental and theoretical evidences showing that the features of firm institutional investors may lead to increased accounting transparency and instigate professional investors' expectations. The results demonstrate that analysts' expectations influenced by accounting transparency. Furthermore, higher transparency of financial statements not only reduces incorrect pricing expectation, but also instigates incorrect pricing expectation.

Perotti and Wagenhofer (2011) investigated the relation between profit qualitative features and surplus return. They selected large samples of US non-financial intermediary firms within the years of 1988-

2000 and concluded that market data- based characteristics (profit reaction coefficient and relevance of profit to stock value) offer much reliable return than accounting data based characteristics including the quality of accruals and abnormal accruals.

Francis et al (2008) studied the effect of four dimensions of quality including the quality of accruals, profit variability, discretionary accruals and common factor on the cost of equity. Research results showed that these four quality dimensions have negative, significant relation with the cost of equity.

The present research tried to consider two aspects of the relation between firm value and tax risk. It initially investigated that whether an optimum level of tax risk exists in shareholders' perspective. Theoretically, tax risk has cost and is also useful to firm; in this regard, an optimum level of tax risk achieved through costs and interests' equality.

### **Research hypotheses**

According to theoretical basics and earlier studies, research hypotheses organized as follows:

**First hypothesis:** There is a significant, nonlinear relation between tax risk and firm value.

**Second hypothesis:** There is a significant relation between tax risk and cost of capital shares.

## **MATERIALS AND METHODS**

### **Population and research sample**

Research statistical population was all companies accepted in Tehran stock exchange. Sample companies characterized as follows:

### **Data collection method**

Research data collected through library method. In this method, research theoretical basics gathered from Persian and English specific books and journals. Then, video and statistics CD archives of Tehran Stock Exchange, Tehran Stock Exchange website, and other related web sites, accounting information of stock companies as well as other information sources were used for data gathering. Data prepared by Excel software. Research hypotheses studied and tested using regression analysis such that the relation between dependent and independent variables initially determined by multiple linear regressions; then, coefficient of determination and significance test of independent variables were determined to verify research hypotheses. In addition, Fisher test applied to verify significance of research general model. Data analyzed using Eviews 8 software.

Research conducted on all companies accepted in Tehran stock exchange within 2007-2013 (a seven-year period).

**Verification tests**

As stated, there are various different patterns of using panel data. Many tests used to test the accuracy and strength of different models including F-Limer test and Hausman test, which are described as follows.

**F-Limer test (Chow)**

This test performed to apply pooled data models versus panel data models with fixed effects. The hypotheses are as follows:

$H_0$ : Pooled Model

$H_1$ : Fixed Effect Model

Required data to test the hypotheses extracted from Tadbirpardaz software as well as firms' financial statements. Once data prepared in Excel software, the hypotheses analyzed and tested through Eviews 8 statistical software. Research model was estimated by pooled data model. In this study, tests' results analyzed at error level of 5%.

**RESULTS**

Table 1: Descriptive statistics of model variables

Variable	Mean	Median	Maximum	Minimum	Standard deviation
Firm market value	5.49	5.39	7.6	3.9	0.67
Cost of capital stock	0.388	0.35	1.78	-0.76	0.422
Tax risk	0.032	0.014	0.382	0	0.056
Discretionary accruals	0.000003	-0.000004	1.09	-0.783	0.897
Company loss	0.118	0	1	0	0.323
Sales growth	0.985	0.14	1.94	-0.98	2.64
Financial leverage	0.647	0.65	0.98	0.1	0.183
Book to market value ratio	0.806	0.62	8.52	0.03	0.987
Firm size	13.28	13.17	18.32	9.79	1.37

According to obtained results, it stated that all variables are properly distributed.

**Studying reliability of research variables**

Unit root test is the most common tests of verifying reliability of a time series process. If studies revealed that regression residuals

are reliable (i.e.  $I(0)$ ), conventional econometric methods may be used for estimation and t and F statistics may be used for statistical inferences; otherwise, data differentiation required (Noufersti, 1999; 80).

Table 2: Results of Augmented Dicky Fuller unit root test for all research variables

1- Variable	2- Test statistic value	3- Error level	4- Level of reliability
Firm market value	5- 724.26	6- 0.000	7- $I(0)$
Cost of equity capital	8- 443.85	9- 0.000	10- $I(0)$
Tax risk	11- 814.85	12- 0.000	13- $I(0)$
Discretionary accruals	14- 673.08	15- 0.000	16- $I(0)$
Sales growth	17- 831.02	18- 0.000	19- $I(0)$
Financial leverage	20- 838.17	21- 0.000	22- $I(0)$

Ratio of book to market value	23- 700.61	24- 0.000	25- I(0)
Firm size	26- 708.33	27- 0.000	28- I(0)

As seen in the above table, the results of augmented Dicky Fuller unit root test show that all research variables are reliable.

**Correlation coefficient test**

Variables	Market value	Cost of equity capital	Tax risk	discretionary accruals	Sales growth	Financial leverage	Ratio of book to market value	Firm size
Market value	1							
Cost of equity capital	0.087	1						
Tax risk	0.123	0.009	1					
Discretionary accruals	0.002	0.117	0.071	1				
Sales growth	0.085	0.247	-0.005	0.161	1			
Financial leverage	-0.277	0.068	-0.244	-0.02	-0.035	1		
Ratio of book to market value	-0.017	-0.101	-0.097	-0.036	-0.017	-0.101	1	
Firm size	0.505	0.094	-0.054	0.008	-0.059	0.068	0.081	1

Colored cells are significant at the error level of 5%.

Table 3: Pearson correlation coefficients

As seen in Table 3, correlation coefficient of research independent variables in models demonstrates their large independency.

**Inferential statistics**

As stated earlier, the purpose of this research is to study the relation between tax risk and value of companies accepted in Tehran Stock Exchange. To estimate the model, it is

necessary to firstly conduct F-Limer test in order to study using panel data methods with fixed effects versus pooled data method for the aforementioned model. The test hypotheses are as follows:

$H_0$ : Ordinary pooled data

$H_1$ : Panel data with fixed effects

The results of F-Limer test represented in Table 4.

Table 4: Results of F-Limer test

Statistics	Error level	Accepted method
5.33	0.000	Panel data methods with fixed effects

As seen in Table 4, the results indicate that  $H_0$  was rejected; thus, panel data model with fixed effects is the preferred method. Therefore, Huasman test is used in the

following to determine estimation method.

Test hypotheses are as follows:

$H_0$ : Panel data with random effects

$H_1$ : Panel data with fixed effects

The results of Hausman test are illustrated in Table 5.

Table 5: Hausman test results

Statistics	Error level	Accepted method
108.34	0.000	Panel data method with fixed effect

As seen in Table 5, the results show rejecting of  $H_0$ ; thus, panel data method with fixed effects is the preferred method. In the

following, the results of research model are shown in Table 6 with panel data method with fixed effects.

Table 6: Results of estimating research model

<u>Variable</u>	<u>Variable coefficient</u>	<u>t-student statistics</u>	<u>Error level</u>
Intercept	0.154	28.79	0.000
$\frac{\Delta Sale_{it} - \Delta Rec_{it}}{TA_{it-1}}$	0.06	3.64	0.000
$\frac{PPE_{it}}{TA_{it-1}}$	-0.098	-4.26	0.000
<i>F-statistic (P-Value)</i>	(0.000)6.007		
<i>Adjusted R- Squared</i>	0.394		
<i>Durbin - Watson Stat.</i>	2.05		

According to obtained results and as stated earlier, residuals of research variables calculated through obtained coefficients for all years and considered as the criterion of discretionary accruals.

The first hypothesis test is studied in the following.

**First hypothesis test**

The purpose of this research is to study the relation between tax risk and firms' values. First, the results of F-Limer test are shown in Table 7.

Table 7: Results of F-Limer test

Statistics	Error level	Accepted method
98.88	0.394	Panel data method with fixed effects

As Table 7 shows, the results indicated rejecting of  $H_0$ ; thus, panel data method with fixed effects is the preferred method. The

results of Hausman test are shown in Table 8 as follows.

Table 8: The results of estimating model number 1

<u>Variable</u>	<u>Variable Coefficient</u>	<u>T-student variable</u>	<u>Error level</u>
Intercept	6.03	162.5	0.000
Tax risk	0.735	4.15	0.000
Tax risk square	2.61	2.51	0.000
Discretionary accruals	0.009	0.604	0.546
Firm lose	-0.114	-4.23	0.000
Sales growth	0.011	1.54	0.123
Financial leverage	-0.92	-24.31	0.000
<i>F-statistic (P-Value)</i>	(0.000) 86.63		
<i>Adjusted R- Squared</i>	0.356		
<i>Durbin - Watson Stat.</i>	2.32		

According to the results of Table 9 and F-statistics (86.63) and error level (0.000), it may be stated that research model, in general, is highly significant at confidence level 99%. Moreover, regarding the obtained adjusted coefficient of determination (35%), it expressed that research independent and control variables generally explains more than 35% of dependent variable changes.

Further, according to Durbin-Watson statistics (2.32), it stated that there is no first order self-correlation among model residuals.

**Second hypothesis test**

The purpose of the second hypothesis is to study the relation between tax risk and firms' cost of equity capital. Table 10 represents the results of testing F-Limer test.

**Table 10: Results of F-Limer test**

Statistics	Error level	Accepted method
2.104	0.000	Usual pooled data method

As the results in Table 10 show,  $H_0$  rejected; thus, panel data method with fixed effects is better.

**Table 11: Results of estimating model number 1**

Variable	Variable coefficient	t-student statistics	Error level
Intercept	-7.83	-3.13	0.002
Tax risk	-0.051	-0.172	0.864
Ratio of book to market value	-0.141	-2.246	0.025
Sale growth	0.028	2.91	0.004
Financial leverage	0.329	3.001	0.003
Firm size	0.609	3.25	0.001
<i>F-statistic (P-Value)</i>	0.000 3.93		
<i>Adjusted R- Squared</i>	0.254		
<i>Durbin - Watson Stat.</i>	1.76		

According to the results seen in Tables (4-7) and considering obtained F- statistics (3.93) and error level (0.000), it stated that research model is highly significant at confidence level 99%. Moreover, regarding obtained adjusted coefficient of determination for the model, which is 25%, it can be said that in general research control and independent variables explain more than 25% of changes in dependent variable. Furthermore, according to Durbin-Watson statistics, which is 1.76, it can be stated that there is no first order self-correlation in model residuals.

**RESULT AND DISCUSSION**

One of the most critical risks involving companies is tax risk, which causes large costs to the firm. This risk not only leads to cash penalties, but also seriously hurts firm reputation (Wilson, 2008). Tax risk referred to some level of uncertainty in firms' tax status and stability of approaches. Potential costs resulted from tax risk include tax penalties due to concealing economic facts and tax avoidance as well as delays in tax payment.

In fact, the purpose of this research is to study the effect of tax risk on firm value and cost of equity in Tehran stock exchange. The present research tries to find the answer to this question that to what extent the investors are willing to take firms' tax risk.

### **Analyzing the results of testing research hypotheses**

#### **1. First hypothesis**

Objective of this hypothesis is to study that whether there is a significant relation between tax risk and firm value in companies listed in Tehran stock exchange. Obtained results show that there is a positive, significant relation between tax risk and firm value.

In addition, obtained findings also demonstrate that the firm losing variable (-0.114) and financial leverage (-0.566) have significant, negative relation with firm value. Regarding the result of first hypothesis, it can be stated that considering the coefficient and significance of tax risk variable (0.735), tax risk variable has a positive, significant relation with market value. Moreover, according to significance of tax risk square variable (2.61), it can be expressed that this is a linear relation; in addition, firm value is a linear, direct function of tax risk such that increasing tax risk also increases firm value.

#### **2. Second hypothesis**

The purpose of this hypothesis is to study that whether there is a significant relation between tax risk and cost of equity capital in Companies listed in Tehran stock exchange. Obtained results show that there is no significant relation between tax risk and cost of equity capital.

Furthermore, the results also show that there is a positive and significant relation among variables of sales growth (0.028), financial leverage (0.329) and firm size (0.609); and the variable of ratio book to market value (-0.141) has a negative, significant relation with the cost of equity capital. Regarding the result obtained for the second hypothesis, it may be stated that according to coefficient and insignificance of tax risk variable (-0.051), tax risk variable has no significant relation with firms' cost of equity capital.

### **CONCLUSION**

The purpose of this research is to study the relation between tax risk and value of companies listed in Tehran stock exchange. According to firms' valuation model by which future cash flows discounted by expected rate of return and calculated through firm value, it is expected that tax risk influences denominator (expected return or cost of equity) in addition to effecting the above model numerator (future cash flows). Therefore, if tax risk influences cost of

capital in addition to future cash flows expectations, it would be necessary for investors to consider information uncertainty in tax risk decision-making. Two hypotheses were formulated and tested. The results in general showed that there is a significant, nonlinear relation between tax risk and firms' values such that increased tax risk initially increases firm value; while, extending this trend led to inverse effect. The result of second hypothesis showed that there is no significant relation between tax risk and cost of equity capital. Therefore, it expressed that firms' tax risk resulted from firms' measures reducing paid taxes to the government, almost positively influences firms' market value; however, this effect is to some particular level exceeding over it reduced firm value. There are several reasons for this including tax avoidance leading to cynicism and distrust in community, government, and different groups to firm. Whereas, a firm is related to a chain of different groups in society and its activity and survival depends on interaction of these groups. Any opportunistic behavior causes discontent of other groups and leads to negative outcomes. On the other hand, in macro perspective, the firm and its profitability not only belongs to the owners, but also many groups benefited; further, the firm is responsible to all these

groups rather than meeting requirements of some particular group.

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