

## INVESTIGATING THE EFFECT OF DEBT DEFAULT RISK ON AVOIDANCE OF PAYING TAXES IN COMPANIES LISTED ON TEHRAN STOCK EXCHANGE

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**Abstract:** One of the most important methods of providing state expenditures is the collection and receipt of a variety of taxes. Authorities of the economy and development believe that acquisition of tax revenues for providing the state expenses improves the unfavorable economic indicators such as inflation, unemployment etc. In third world countries the share of state tax revenues from GDP is very small and the share of state payment in relation with GDP is always more than the share of taxes.

The aim of this study was to determine the relationship between "debt default risk and avoidance of paying taxes". In this regard the selected companies of Tehran Stock Exchange qualified for joining to the activities during the 5-year period under study were mentioned and the availability of all required data was defined as a statistical population. Based on appropriate statistical formula, among these companies 100 companies were selected as a random sample by the systematic elimination method and were analyzed for the period of 2010-2014 that it includes in total 500 years. In this research the regression and correlation have been used for investigating the research hypotheses. For analyzing data and testing the research hypotheses the software EVIEWS has been used.

After designing and testing the research hypotheses that were done for each hypothesis separately, the following results were obtained:

1. There is a relationship between the risk of default and avoidance of paying taxes.
2. There is a relationship between the risk of default and avoidance of paying taxes in conditions of market stagnation.
3. There is a relationship between the default risk and avoidance of paying taxes in the conditions of market boom.
4. Amount of avoidance of paying taxes in conditions of market stagnation is more than the conditions of market boom.

**Keywords:** Default risk, avoidance of paying taxes, the market stagnation, market boom, Tehran Stock Exchange

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## INTRODUCTION

One of the most important methods for providing state expenditure is the collection and receipt of a variety of taxes. Authorities of the economy and development believe that acquisition of tax revenues for providing the state expenses improves the unfavorable economic indicators such as inflation, unemployment etc. In third world countries the share of state tax revenues from the GDP is very small and the share of state payments in relation to GDP is always more than the share of taxes. (Haghighat and Mohammadi, 2013, 214).

Meanwhile companies spend the time, money and great effort for limiting their tax payments. The primary argument of this discussion is that reduction of the tax payments is in interest of other claimants of the company's interests including its shareholders. Tax avoidance strategies are among cases that today are considered as an integral part of the capital management strategies which include the structuration of the transactions and business dealings for making a profit from defects of the tax laws and regulations that cause to reduce a large amount of the payable tax of companies. Given that the tax of great companies represents a main item for the company cost, the management of these companies turns towards developing the strategies for reduction of the amount of company's tax. Tax avoidance is a process through which the companies try to reduce the payments resulting from income tax. Paying the taxes leads to decrease the profit and remaining cash for the company's other interested such as shareholders. Therefore there is this motivation naturally that the company and its shareholders take actions for avoiding tax payment. According to this concept, Dyreng *et al.* (2007) have defined the tax avoidance as the ability to pay a small amount of cash income tax in relation to the profit before company's tax. Now a days most companies when they face with marginal profit of more marginal cost find the motivation for the avoidance of paying taxes. In fact, when companies are under financial harsh conditions, the advantages of avoiding the profit become dominant on costs and the motivation of companies for avoiding tax increases.

This research will investigate the effect of the debt default risk conditions on the tax avoidance and in particular the impact of market conditions on the relationship between default risk conditions and avoidance of paying taxes.

## THE THEORETICAL FRAMEWORK AND LITERATURE OF RESEARCH

Rego (2003) has defined the avoidance of paying tax as the use of the tax planning techniques that reduce legally payment of corporate income tax. Avoidance of paying the tax generally has been defined as the obvious reduction of tax. Activities of the avoidance of paying tax are related commonly to the tax-saving tools that

transfer the resources from the state to shareholders and therefore increase the company's value after tax (Desai & Dharmapala, 2009). Many researches have been done in order to respond this question why some companies more than others avoid the tax? Some researchers have raised several factors as triggers and interests for the activities of avoidance of paying to respond the desirable question.

Cost saving resulting from the activities of avoidance of paying tax could be the valuable amount for the company's financial weakness and decrease the financing through debt or cash (Kim et al., 2005). Since the tax shield is a form of tax support, the companies that apply the tax shield have lower debt and cash flow saving resulting from the tax shield can be a substitute for the amount of company's debt. In summary the existence of the non-debt tax shield may be cause to less use of the debt. If the activities of avoidance of paying tax are an alternative to the use of debt, this can increase the debt quality and reduce the expected cost of bankruptcy and the risk of inability to pay debt and ultimately the cost of debt (Richardson, 2015).

The issue of representation confirms the concepts of avoidance of paying tax and shows that avoidance of paying tax may not always increase the outside shareholder wealth. According to this theory, the activities of avoidance of paying tax may have a role in the diversion of interest towards the managers themselves whose range is changeable from manipulation and theft of corporate profits to the excessive reward of managers in the various forms. The avoidance of paying tax potentially may reduce the company's after tax value. Therefore the costs that are directly related to the tax planning activities, the additional costs of observance of laws and regulations and non-tax costs namely the costs of representation may be better than the tax benefits for the shareholders' (Richardson, 2015).

Haghighi and Mohammadi (2013) in a research with title investigating the relationship between tax avoidance and quality of disclosure and value of the company paid to this issue. The research findings indicate that the companies with high transparency, potential of less agency conflicts have the more avoid taxes relative to companies with low transparency as well as external people do not attach special importance to corporate tax avoidance. Therefore in the companies that implemented the program of tax avoidance the existence of acceptable transparency have very special important.

Khodami pour and Amininia (2013) in the research with titled the investigating the relationship between avoid paying taxes and cost of debt and the impact of institutional ownership on this relationship paid to this issue. The results of the research showed that there is a negative relationship between the avoid paying taxes and the cost of debt. This negative relationship indicates that the proper tax

effect of avoid paying taxes could be used as a debt for the company, therefore the avoidance of paying taxes can be was as a substitute used of the debt. In addition, these results indicate that the level of institutional ownership on the relationship between avoidance of paying taxes and cost of debt don't have the significant effect.

Karimzadeh and Jalali (2014) in the research with titled investigating the factors affecting on the tax evasion in the Iran (from the perspective of employees of administration on tax affairs of the Isfahan city) paid to this issue. The purpose of this research was to investigate the factors affecting on the tax evasion in the level of legal entities in the one of the government agencies. The role of heptathlon factors (low level of tax culture, unfavorable of the society economy conditions, lack of reward and punishment system taxpayers, complexity and ambiguity of tax laws, inefficient human resource, existence the discrimination between taxpayers, lack of knowledge and awareness of tax in the taxpayers) On the tax evasion was investigated. Statistical population of research 134 people and the number of samples based on the Cochran formula 71 people and sampling method is simple random. The data accumulation instrument was the researcher constructed questionnaire that its validity was confirmed by university elites and tax experts and its reliability obtain by using Cronbach's alpha. The results show that among the mentioned factors the low level of tax culture, unfavorable the society economy conditions, lack of knowledge and awareness of tax of taxpayers, lack of reward and punishment system of taxpayers, the complexity and ambiguity of tax laws respectively have the most important role on the tax evasion.

Ding et al. (2010) in their research of the effective tax rate of long-term cash for the test the amount of avoid corporate tax during the period of 10 years was used. The results of the research showed that there is the frequency of cross-sectional differences in avoidance of paying taxes by companies and almost 25 percent of the companies have the ability to keep the cash effective tax rate below 20%.

Moznen and Polsko (2002) paid to investigate the size and source of create the tax accounting differences. They found evidence that these differences are increasing and only a small set from the variables are able to explain this increase. They stated that the managers' incentives for the increase accounting profit reported to shareholders and at the same time reduce the taxable profits are such as causes of create this difference. (Richardson, 2015)

Richardson et al. (2015) in a research have investigated the relationship between financial harsh conditions and avoidance of paying tax by companies. This research has investigated the impact of financial harsh conditions on the avoidance of paying tax and, in particular, the impact of the global financial crisis on the relation between

the financial harsh conditions and the avoidance of paying tax. Based on a sample formed of 203 Australian companies in the four-year period 2006 to 2010 the regression results have shown that financial harsh conditions have a significant relationship with avoidance of paying tax. More importantly, based on results of regression the relation between financial harsh conditions and avoidance of paying tax due to the global financial crisis has become more prominent.

### **RESEARCH HYPOTHESES**

1. There is a relationship between risk of default and avoidance of paying taxes.
2. There is a relationship between the risk of default and avoidance of paying taxes in the market stagnation conditions.
3. There is a relationship between the default risk and avoidance of paying taxes in the market boom conditions.
4. The amount of avoidance of paying taxes in the market stagnation conditions is more than the market boom conditions.

### **RESEARCH METHOD**

The desirable population in this study consists of all companies listed in the Stock Exchange. Periods of time is annual and include a five-year period from the 2010 to 2014. The sampling method of the present research is the sampling of systematic elimination; therefore the statistical sample in the present research includes those companies listed on the stock exchange that:

- 1) have been present in fiscal years of 2010 to 2014 in exchange.
- 2) were not member of the investment companies and banks.
- 3) their fiscal year ended in March.
- 4) their trading symbol did not stop more than 4 months

Thus the sample of present research consists of 100 companies that they are qualified above conditions and they were investigated and since the data structure is in the form of panel data, as a result the number of observations is 500 cases.

Since the research has been done as a field one and deals with the real data of companies, the information of these companies is collected from the stock exchange site and *Rahhavar* and *Nowin* software. For summarizing, classifying, processing and analyzing the data the *Excel* and *7Eviews* software was used.

The present research due to investigation of the relationships between the variables is of proof kind and also due to the use of the regression model in direction of the influence of variables on each other the research is of the correlation type.

Stipulated pattern based on the effective factors on avoidance of paying tax has been designed in the specified period. Their factors and symbols have been explained in the following stipulated pattern that in this model the dependent variable is the tax avoidance and the independent variable is the debt default risk. Also for testing the hypotheses the normal regression (OLS) is used. Also Hausman test and some tests for assumptions of the classical model and also the post-test have been used also.

The model used in this research that has been explained in the “conceptual framework” is as the following relation:

$$CTA_{it} = \alpha + \beta_1 MERTON_{it} + \beta_2 FAGE_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 CINT_{it} + \beta_6 RDINT_{it} + \beta_7 INVENT_{it} + \beta_8 THAV_{it} + \beta_9 MKTBK_{it} + \varepsilon_{it}$$

In which:

CTA: avoidance of paying taxes

MERTON: probability of default risk

FAGE: company lifetime

SIZE: Size of company

LEV: Financial Leverage

CINT: investment

RDINT: research and development expenditure

INVENT: existing reserves

THAV: a dummy variable, if the companies are subordinate one, otherwise zero

MKTBK: Market value to book value

### **The research variables**

#### **The definition of variables**

##### **Dependent variable: tax avoidance (CTA)**

In this research according to the research done by Richardson et al. (2015) first the tax-accounting gap (or accounting -tax difference) will be used for measuring the tax avoidance; it shows there is a great difference between accounting income and taxable income in most companies, this in turn will lead to tax avoidance behavior.

$$CTA = \mu + \varepsilon$$

In which:

CTA: Tax avoidance of company

$\mu$  is the remaining amount and  $\varepsilon$  is the error expression.

for calculating  $\mu$  and  $\varepsilon$  we operate with the following method:

The regression model of ordinary squares minimum (OLS) is used for a part of BTG, which is related to profit management:

$$BTG = \beta_1 TA + \mu + \varepsilon$$

In which:

BTG: the tax-accounting gap

TA: the total accruals in the year t which are calculated through subtracting profit before unexpected items minus operational cash.

$\mu$  is the remaining amount and  $\varepsilon$  is the error expression.

The more remaining amount of BTG represents the higher levels of tax avoidance.

Tax-accounting Gap (BTG) is calculated based on the following equation:

$$BTG = AI - TI$$

In which:

BTG: the tax-accounting Gap

AI: accounting of income before tax

TI: taxable income.

That:

$$TI = \frac{ITE}{CTR}$$

In which:

TI: taxable income.

ITE: income tax expense

CTR: companies' tax rate based on the tax laws of the country.

### **Independent variable: the probability of default risk (MERTON)**

In the credit risk literature a term of distance to default (DD) usually is used that represents the number of standard deviations that the expected value of the asset / in the maturity date has distance from the point of default, therefore:

$$DD = \left[ \frac{\ln L - \ln A_i + \left( \mu - \frac{\sigma^2}{2} \right) (T)}{\sigma \sqrt{T}} \right]$$

$$\Rightarrow \text{Prob}(\text{Default}) = \Phi(-DD)$$

A : property market value

L : value of debts

$\mu$  : impulse rate

$\alpha 2$  : annual powerof the value of assets

T : Time

$\Phi$  : cumulativenormal distribution

The market value of company's assets is one of the unknowns of formulathat is not observable directly;what can be observed is the book value of assets thatcan be different with their market valuefor various reasons.For the public stock companiesthe stock market valueisobservableand it is obtained from the stock price multiplied by the number of shares in the hands of shareholders. The relationship between the stock value and the value of assets at maturity date can be explained like this:as long as the value of assets is less than the value of debts,stock value will be zeroand all assets arrives to creditors; but if the value of the assets is higher than the nominal value of bonds without coupon, the shareholders will receive the remaining value. Thedaily value ofassetsis calculated according to thisequation:

Asset market value = market value of equity + value of debts

The value of debts also is the book value of debt.To calculate the annual variance of the log changes of asset value, the variance of return of asset value is calculate through the following equation:

$$\sigma^2 = \frac{\sum_{i=1}^n (R_t - \bar{R})^2}{n-1}$$

To estimate the expected change in the value of asset,by usingthe obtainedamountsof asset value we can estimate the expected return through the capital assets pricing model (CAPM).



$$E(R_i) - R_f = \beta_i (E(R_m) - R_f)$$

And  $R_f$  represents a rate of risk-free return and  $R_m$  represents the market portfolio return. In this research we have used the interest rate of bonds of central bank (20%) and the total index of Tehran Stock Exchange as representative  $R_f$ . By regression of returns of  $R_m$  representing asset value versus total index, we obtain an estimation of beta of assets. Market risk premium has been considered also with the regression of expected return of the different stock ( $E(R_m)$ ) vis-a-vis the entire index. With being determined the coefficient of beta related to the assets of each company and the market risk premium in the market, the expected return of asset is determined; but this amount is not the rate of drift that was mentioned in formula. The impulse rate for logarithmic returns is proposed; therefore the impulse rate is obtained from the logarithm of expected return of assets.

### **Control variables**

Company lifetime (FAGE): it is calculated according to the difference between the company establishment date to the current date.

Company size (SIZE): it is measured with the natural logarithm of total assets.

Financial leverage (LEV): the total debt to the total assets

Investment (CINT): property, machinery and equipment to total assets

The research and development expenditure (RENT): R & D expenditure to total assets

Inventory (INVINT): Inventory to total assets

Market value to book value (MKTBK): value of capital market to the book value of capital

Subordinate company (THAV): If the company is the subordinate the number one, and otherwise the number zero

### **Moderating variable: the market stagnation and boom**

They are determined based on the stock market returns; in this case the period of economic boom is one in which market returns are more than the average period of the research, and the period of economic stagnation is one in which the market return is less than the average period of the research.

### **Research findings**

Table 1 is the descriptive statistics of research variables:

**Table 1**  
**Descriptive statistics of research variables**

|                    | Market value to book value | Animal variable | Inventory reserves | R&D expenditure | investment | Financial Leverage | size of company | Company Lifetime | probability of default risk | Avoidance of paying taxes |
|--------------------|----------------------------|-----------------|--------------------|-----------------|------------|--------------------|-----------------|------------------|-----------------------------|---------------------------|
| Average            | 9.138186                   | 0.625581        | 0.253605           | 0.005093        | 0.254442   | 0.65788            | 13.819          | 3.4584           | 26.2610                     | -50177.0                  |
| Middle             | 4.200000                   | 1.000000        | 0.230000           | 0.001190        | 0.210000   | 0.67000            | 13.645          | 3.5600           | 19.5950                     | -37000.                   |
| maximum            | 233.5200                   | 1.000000        | 0.670000           | 0.119440        | 1.000000   | 2.21000            | 18.450          | 4.1100           | 158.370                     | 204512.                   |
| Minimum            | 0.110000                   | 0.000000        | 0.000000           | 3.00E-05        | 0.000000   | 0.02000            | 10.100          | 2.0800           | -52.1200                    | -232126.                  |
| Standard deviation | 16.86161                   | 0.484536        | 0.140211           | 0.013215        | 0.189154   | 0.22895            | 1.2790          | 0.4234           | 24.1320                     | 85526.9                   |
| Skewness           | 7.445025                   | -0.51896        | 0.647788           | 4.885622        | 1.251071   | 0.82816            | 0.7464          | -0.6776          | 1.52165                     | 0.22565                   |
| Elongation         | 84.06281                   | 1.269320        | 3.000455           | 30.12689        | 4.535428   | 8.65378            | 4.6211          | 2.7844           | 6.60576                     | 2.91232                   |
| Jakbra test        | 121706.0                   | 72.96623        | 30.07342           | 14894.93        | 154.4103   | 621.864            | 87.026          | 33.740           | 398.883                     | 3.78707                   |
| significance level | 0.000000                   | 0.000000        | 0.000000           | 0.000000        | 0.000000   | 0.00000            | 0.0000          | 0.0000           | 0.00000                     | 0.15053                   |
| Observations       | 500                        | 500             | 500                | 500             | 500        | 500                | 500             | 500              | 500                         | 500                       |

Given that the data structure is combined, for investigating the combinativeness of 22 the test of constant and random effects should be performed. Limmer test has been used in this regard. In Limmer test the null hypothesis is that there are not the individual or group effects. After displaying the test results, if the probability of the test of statistic is smaller than 0.05, the panel data model is accepted.

**Table 2**  
**Results of Limmer and Hausman F- tests**

| <i>Statistic</i> | <i>p-value</i> | <i>Amount of statistics</i> | <i>Result</i>    |
|------------------|----------------|-----------------------------|------------------|
| F Limmer         | 0.0000         | 65.244951                   | Panel method     |
| Hausman          | 0.0126         | 21.000676                   | Constant effects |

The probability of Limmer F-test for the first hypothesis is less than 5%, so the hypothesis H<sub>0</sub> (combinatory model) is not confirmed; in other words, there are group or individual effects and it should be used the panel data in order to estimate model. In the next step for determining the use of constant versus random effects model of Hausman test conducted according to the model, the probability of test is less than 0.05; so the hypothesis H<sub>0</sub> (random effects model) is confirmed. This means that there is a relationship between independent variables and the estimated

**Table 3**  
**The best estimation of the pattern**

| $CTA_{it} = \beta_0 + \beta_1 MERTON_{it} + \beta_2 FAGE_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 CINT_{it} + \beta_6 RDINT_{it} + \beta_7 INVINT_{it} + \beta_8 THAV_{it} + \beta_9 MKTBK_{it} + \epsilon_{it}$ |                   |                  |                        |                                       |                             |
|---|-------------------|------------------|------------------------|---------------------------------------|-----------------------------|
| probability of t-test.  | T-test statistics | Standard error   | estimation coefficient |                                       |                             |
| 0.0494  | 1.971872          | 104243.6         | 205555.1               | $\beta_0$                             | Width of the origin         |
| 0.0000  | 4.335255          | 81.43173         | 353.0273               | $MERTON_{it}$                         | probability of default risk |
| 0.0143  | -2.461725         | 30576.73         | -75271.51              | $FAGE_{it}$                           | Company Lifetime            |
| 0.7297  | 0.345755          | 5113.297         | 1767.951               | $SIZE_{it}$                           | size of company             |
| 0.2412  | -1.174012         | 11303.48         | -13270.41              | $LEV_{it}$                            | Financial Leverage          |
| 0.0105  | -2.571935         | 17518.95         | -45057.60              | $CINT_{it}$                           | investment                  |
| 0.6896  | 0.399805          | 228833.4         | 91488.85               | $RDINT_{it}$                          | R&D expenditure             |
| 0.0135  | -2.484425         | 18172.93         | -45149.27              | $INVINT_{it}$                         | Inventory reserves          |
| 0.9216  | 0.098430          | 24239.40         | 2385.888               | $THAV_{it}$                           | Animal variable             |
| 0.5698  | 0.568911          | 110.9495         | 63.12035               | $MKTBK_{it}$                          | Market value to book value  |
| Durbin -Watson  | 68.11787          | F statistic      | 0.950283               | coefficient of determination          |                             |
| 2.019387  | 0.000000          | probability of F | 0.936332               | Adjusted coefficient of determination |                             |

regression error. According to results of Hausman and Limmer F-test the constant effects model has been used for estimating the parameters and test of the hypotheses.

Results of estimation show that the probability of t-statistic for constant coefficient and the coefficients of the variables of default risk probability, company lifetime, investment and the inventory reserves to the tax avoidance is less than 5%; therefore the estimation coefficient of the above variables is statistically significant. The probability of t-test for variables of the company size, financial leverage, research and development expenditure, animal variable of subordinate companies and the market value to book value in relation to tax avoidance is more than 5%; therefore the estimation coefficient of above variables is not statistically significant. Thus in the confidence level of 95% these variables are not significant. Adjusted coefficient of determination shows the explanatory power of the independent variables that are able to explain the amount of 94% of changes of dependent variable. Probability of F-statistics indicates that the whole model is statistically significant and due to the hypothesis, since the variables of default risk probability, company lifetime, investment and inventory reserves

in relation to avoidance of paying taxes in the model is significant,  $H_0$  assumption is rejected; this means there is a relationship between the risk of default and avoidance of paying taxes.

The regression equation is as follows.

$$\begin{aligned} CTA_{it} = & 205555.1 + 353.0273MERTON_{it} - 75271.51PAGE_{it} + 1767.951SIZE_{it} \\ & - 13270.41LEV_{it} - 45057.60CINT_{it} + 91488.85RDINT_{it} \\ & - 45149.27INVINT_{it} + 2385.888THAV_{it} + 63.12035MKTBK_{it} \end{aligned}$$

**Table 4**  
The best estimation of model in market stagnation conditions

| $CTA_{it} = \beta_0 + \beta_1 MERTON_{it} + \beta_2 PAGE_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 CINT_{it} + \beta_6 RDINT_{it} + \beta_7 INVINT_{it} + \beta_8 THAV_{it} + \beta_9 MKTBK_{it} + \varepsilon_{it}$ |                   |                      |                        |                                       |                             |
|--|-------------------|----------------------|------------------------|---------------------------------------|-----------------------------|
| probability of t-test.   | T-test statistics | Standard error       | estimation coefficient | In the market stagnation conditions   |                             |
| 0.0000   | -5.721263         | 79823.64             | -456692.0              | $\beta_0$                             | Width of the origin         |
| 0.0100   | -2.605902         | 201.0105             | -523.8136              | $MERTON_{it}$                         | probability of default risk |
| 0.2772   | -1.090263         | 13749.58             | -14990.66              | $PAGE_{it}$                           | Company Lifetime            |
| 0.0000   | 6.334687          | 4828.682             | 30588.19               | $SIZE_{it}$                           | size of company             |
| 0.7604   | -0.305528         | 21716.46             | -6634.988              | $LEV_{it}$                            | Financial Leverage          |
| 0.6765   | 0.417983          | 30351.57             | 12686.43               | $CINT_{it}$                           | Investment                  |
| 0.0207   | 2.335919          | 443120.9             | 1035094.               | $RDINT_{it}$                          | R&D expenditure             |
| 0.0002   | 3.841834          | 38894.54             | 149426.3               | $INVINT_{it}$                         | Inventory reserves          |
| 0.2600   | 1.130452          | 11147.99             | 12602.27               | $THAV_{it}$                           | Animal variable             |
| 0.0065   | 2.756900          | 315.6627             | 870.2505               | $MKTBK_{it}$                          | Market value to book value  |
| Durbin – Watson  | 8.138400          | F statistic          | 0.611358               | coefficient of determination          |                             |
| 1.646580   | 0.000000          | the probability of F | 0.589766               | Adjusted coefficient of determination |                             |

Results of estimation show that the probability of t-statistic for constant coefficient and the coefficients of the variables of default risk probability, company size, research and development expenditure, the inventory reserves and market value to book value in relation to the tax avoidance in the market stagnation conditions is less than 5%; therefore the estimation coefficient of the above variables is statistically significant. The probability of t-test for variables of the company lifetime, financial leverage, investment and animal variable of subordinate companies in relation to tax avoidance is more than 5%; therefore the estimation

coefficient of above variables is not statistically significant. Thus in the confidence level of 95% these variables are not significant. Adjusted coefficient of determination shows the explanatory power of the independent variables that are able to explain the amount of 59% of changes of dependent variable. Probability of F-statistics indicates that the whole model is statistically significant and due to the hypothesis, since the variables of default risk probability, company size, research and development expenditure, inventory reserves and market value to book value in relation to avoidance of paying taxes in the market stagnation conditions in the model is significant,  $H_0$  assumption is rejected; this means there is a relationship between the risk of default and avoidance of paying taxes in the market stagnation conditions.

The regression equation is as follows.

$$\begin{aligned} \text{CTA}_{it} = & -456692.0 - 523.8136\text{MERTON}_{it} - 14990.66\text{FACE}_{it} + 30588.19\text{SIZE}_{it} \\ & - 6634.988\text{LEV}_{it} + 12686.43\text{CINT}_{it} + 1035094\text{RDINT}_{it} \\ & + 149426.3\text{INVINT}_{it} + 12602.27\text{THAV}_{it} + 870.2505\text{MKTBK}_{it} \end{aligned}$$

**Table 5**  
The best estimation of pattern in the market boom conditions

| $\text{CTA}_{it} = \beta_0 + \beta_1\text{MERTON}_{it} + \beta_2\text{FACE}_{it} + \beta_3\text{SIZE}_{it} + \beta_4\text{LEV}_{it} + \beta_5\text{CINT}_{it} + \beta_6\text{RDINT}_{it} + \beta_7\text{INVINT}_{it} + \beta_8\text{THAV}_{it} + \beta_9\text{MKTBK}_{it} + \varepsilon_{it}$ |                   |                  |                        |                                       |                             |
|---|-------------------|------------------|------------------------|---------------------------------------|-----------------------------|
| probability of t-test.  | T-test statistics | Standard error   | estimation coefficient | In the market boom conditions         |                             |
| 0.0000  | -4.564052         | 68084.38         | -310740.6              | $\beta_0$                             | Width of the origin         |
| 0.0223  | -2.299622         | 456.2767         | -1049.264              | $\text{MERTON}_{it}$                  | probability of default risk |
| 0.8201  | 0.227702          | 11579.34         | 2636.644               | $\text{FACE}_{it}$                    | Company Lifetime            |
| 0.0000  | 4.674780          | 4217.720         | 19716.92               | $\text{SIZE}_{it}$                    | size of company             |
| 0.7660  | -0.297888         | 24934.60         | -7427.719              | $\text{LEV}_{it}$                     | Financial Leverage          |
| 0.6217  | 0.494016          | 26354.81         | 13019.70               | $\text{CINT}_{it}$                    | Investment                  |
| 0.9237  | 0.095900          | 365315.9         | 35033.67               | $\text{RDINT}_{it}$                   | R&D expenditure             |
| 0.0003  | 3.669556          | 40441.01         | 148400.5               | $\text{INVINT}_{it}$                  | Inventory reserves          |
| 0.4454  | -0.764372         | 10162.70         | -7768.085              | $\text{THAV}_{it}$                    | Animal variable             |
| 0.5808  | 0.552883          | 304.8319         | 168.5363               | $\text{MKTBK}_{it}$                   | Market value to book value  |
| Durbin – Watson   | F statistic       |                  | 0.429584               | coefficient of determination          |                             |
| 1.820046  | 0.000062          | probability of F |                        | Adjusted coefficient of determination |                             |

Results of estimation show that the probability of t-statistic for constant coefficient and the coefficients of the variables of default risk probability, company size, the inventory reserves in relation to the tax avoidance in the market boom conditions is less than 5%; therefore the estimation coefficient of the above variables is statistically significant. The probability of t-test for variables of the company lifetime, financial leverage, R & D expenditure, investment and animal variable of subordinate companies and market value to book value in relation to tax avoidance in the market boom conditions is more than 5%; therefore the estimation coefficient of above variables is not statistically significant. Thus in the confidence level of 95% these variables are not significant. Adjusted coefficient of determination shows the explanatory power of the independent variables that are able to explain the amount of 41% of changes of dependent variable. Probability of F-statistics indicates that the whole model is statistically significant and due to the hypothesis, since the variables of default risk probability, company size, inventory reserves in relation to avoidance of paying taxes in the market boom conditions in the model is significant, H0 assumption is rejected; this means there is a relationship between the risk of default and avoidance of paying taxes in the market boom conditions.

The regression equation is as follows.

$$\begin{aligned} \text{CTA}_{it} = & 310740.6 - 1049.264\text{MERTON}_{it} + 2636.644\text{FAGE}_{it} + 19716.92\text{SIZE}_{it} \\ & - 7427.719\text{LEV}_{it} + 13019.70\text{CINT}_{it} + 35033.67\text{RDINT}_{it} \\ & + 148400.5\text{INVINT}_{it} - 7768.085\text{THAV}_{it} + 168.5363\text{MKTBK}_{it} \end{aligned}$$

## DISCUSSION AND CONCLUSION

The aim of this research was to investigate the relationship between the debt default risk and avoidance of paying taxes in the time 2010 to 2014 in Tehran Stock Exchange. The results indicate that there is a relationship between the default risk and tax avoidance in the Tehran Stock Exchange generally and in the boom and stagnation conditions of market. The results of present research are justifiable by use of the representation theory. The issue of representation confirms the concepts of tax avoidance and shows that the tax avoidance may not always increase the wealth of outside shareholders. According to this theory, tax avoidance activities may have a role in the diversion of profits to the managers themselves that their range are changeable from manipulation and theft of company profits up to excessive reward of managers in different forms. Tax avoidance may potentially reduce the company's after-tax value. Therefore, the costs that are directly related to the tax planning activities, the additional costs of law and regulation observance and non-tax costs, namely the costs of representation, might be better than tax benefits for shareholders (Wang, 2010).

In total, this research showed that managers do not overestimate the tax avoidance strategies that influence the taxable income. In fact, managers seek to reduce tax costs of the financial statements. Also, the managers look for the strategies that reduce the tax of cash payments. In fact, it can be said that the managers seek the strategies that reduce the income tax payment of the next year (McGuire et al., 2012).

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