



Corporate Governance and Relationship between Ownership Structure, Social Responsibility and Tax Avoidance

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Abstract: *This study was conducted to evaluate the effect of corporate governance mechanisms on the relationship between ownership structure and social responsibility and tax avoidance of listed companies in Tehran Stock Exchange during 2009-2015. For this aim panel data regression analysis and total of 162 listed companies in the Tehran Stock Exchange were examined during this period. Examining the results in the first hypothesis shows that the corporate governance mechanisms have a significant effect on the relationship between ownership structure and tax avoidance, so that the effect of ownership structure in companies with family and institutional ownership on the effective tax rate (tax avoidance) is negative, but these relationships is reversed in companies with governmental ownership. In addition, involvement of governance mechanisms reverses this relationship. The second hypothesis results suggest that corporate governance criteria have a positive effect on the ownership structure of social responsibility. It means that strategic plan of sample companies in various ownership structures is to participate in social responsibility plans. Finally, examining the third hypothesis indicated that in companies with strong governance structure (such as higher institutional ownership), there is a negative relationship between corporate social responsibility and tax avoidance.*

Keywords: *Corporate Governance, Ownership Structure, Social Responsibility, Tax Avoidance.*

INTRODUCTION

Tax avoidance reducing the cash outflow from the company to the government, has been viewed as a value for shareholders. A general tax avoidance perspective suggests that opportunistic managers are looking for financial abuse by lack of transparency in financial reporting; also, they do it for their own personal benefits to avoid paying tax (Bahri Sales et al., 2014). The transparency in financial reporting facilitates the shareholders' supervision on managers' performance. For the lack of transparency in financial reporting, the control and supervision of shareholders on managers would decrease. Opportunistic managers also use other methods and techniques to pay tax less, imposing cost for owners of the company. Despite the benefits of social responsibility and social accountability, many companies act in contrast to these goals (Amir Hosseini and Ghobadi, 2016). Tax domains are considered among the beneficiaries, since they are a part of profit used in producing public goods. Tax avoidance involves efforts to reduce the amount of tax paid in different ways, some of which are legal, and some others are not legal known as tax aggression. As the tax status and social

responsibilities of organizations involve diversion of resources towards non-stakeholder the relationship between corporate social responsibility and tax avoidance has drawn the attention of many people.

As tax costs are one of the most important costs of the company and lead to a liquidity outflow in the company and reduce shareholder profits, the tax cost and payable tax are always considered by executive managers, directors' board and shareholders of companies. Thus, adopting tax policies (aggressive or conservative) is one of the policies considered in evaluating the action of managers by shareholders and the entire capital market (Abdoli et al., 2013). Corporate governance is a set of procedures used to ensure that the company's assets are used efficiently and not used for conflicting goals by the stakeholders. Strong corporate governance structure will lead to a better supervision of the management, timely generation of accounting information, and increased speed of identification of bad news to inform directors' board and taking required actions. Research literature on the corporate governance structure emphasizes on the role of independent or non-executive members of the board in reducing the problems caused by agency problem through monitoring and directing executive management behavior and designing incentives for them. Corporate social responsibility is a set of economic, legal, ethical, and humanitarian responsibilities in key decisions of the big companies and factories. It helps companies and factories measure the interests of non-stakeholder benefits. Accordingly, the present study aims to evaluate the effect of corporate governance mechanisms on the relationship between ownership structure and social responsibility and tax avoidance.

Problem statement

Given the process of privatization and downsizing of government, evaluating the effect of corporate governance mechanisms on corporate tax avoidance in the Iranian capital market has great importance. Moreover, as there are major shareholders in the ownership composition of the most of listed companies in the Tehran Stock Exchange who have high ability to supervise in comparison with other shareholders in terms of corporate governance, and as institutional owners have more influence in companies, it can be expected to change the rate of company's payable tax by manipulating in the reported profit.

Thus, one of the objectives of this research is to examine whether ownership structure in listed companies in Tehran Stock Exchange has an effect on their tax avoidance. In the last two decades, the principles of corporate governance have become one of the main aspects of business, and its importance is growingly increasing. The results of many empirical studies conducted in other countries also suggest that the good principles of corporate governance improve the performance of companies. One of the elements related to the performance of companies is tax management (tax avoidance).

If management can reduce the effective rate of tax in long term and pay less tax, it will manage the tax. If it is done better, it would bring better performance for management of the company, because it will lead to increase in net profit after tax and reduction in cash outflow as a result of it (Gupta and Newberry, 1997). Corporate governance mechanisms are expected to be associated with tax management. The relationship between these mechanisms and the performance of companies has been examined and confirmed in several studies. Several studies have proven that the board size, the composition of the board, duality of CEO duties and the audit firm size are the elements of the corporate governance mechanisms affecting the tax management. In this regard, the effect of corporate governance mechanism, including the board size, the ratio of non-members in the board structure (independence of directors' board), the auditor size on the relationship between ownership structure and tax management (tax avoidance) and the corporate avoidance responsibility will be examined.

Theoretical principles

Tax avoidance: Tax avoidance is a form of official abuse of tax laws. This category is related to searching and finding the ways to avoid paying tax in the tax laws, in which taxpayers exclude themselves among those subject to pay tax. For example, the conversion of work force income into capital, which has a lower tax rate, is an example of tax avoidance (Pour Heydari and Sarvestani, 2013). Suppose that value added tax is applied to a business such as bicycle sale. Now, if a seller sales fewer bicycles to pay less tax, his behavior will be

based on tax avoidance. If the seller reports fewer bicycle sales to the tax office in order to pay less tax, his behavior will be considered as tax avoidance. Thus, legal tax avoidance is a behavior in order to reduce tax obligations, in which an individual seeks to bypass the law or complete use of legal gap. However, fraud or illegal tax avoidance refers to acts against the law, such as unreal reporting of income and sale, deductions, and preparing incorrect statements. Tax areas are considered among the beneficiaries, since they are a part of profit used in production of public goods. Tax avoidance involves efforts to reduce the amount of tax paid in different ways, some of which are legal, and some others are not legal known as tax aggression.

Corporate governance: Corporate governance is a set of internal and external corporate control mechanisms determining how and by whom the company is run. Paying attention to effective corporate governance and increasing the efficiency of contracts among the stakeholders to strengthen the responsibility culture and enhance the transparency of information in companies and information units, which all or part of their capital has been provided through people, lead to effective resource allocation and finally economic growth and development (Babajani and Abdi, 2010).

Ownership structure: ownership structure means family ownership, institutional ownership, and governmental ownership (Khanjan, 2004).

Corporate social responsibility: it is a set of economic, legal, ethical and humanitarian responsibilities in key decisions of the companies. It helps companies and factories measure the benefits and interests of non-stakeholder stakeholders (Irannezhad Parizi, 1992). Corporate social responsibility emphasizes on responsibility as the basis for the behavior of an organization in the community and indicates responsible business along with the production of wealth (Omidvar, 2007). The relationship between organizational responsibility and tax avoidance has drawn the attention of many scholars, which is a response to research in this area. Following Zaman Khan (2010), Sandhu and Kapoor (2010), four dimensions of customers, employees, environment, and institutions in the community have been considered for social responsibility in this study.

Review of literature

Naderi Khorshidi and Selghi (2015) conducted a study entitled "evaluation of the effect of organizational capacities and industry structure on social responsibility in listed companies in Tehran Stock Exchange". Its results showed that intra-organizational operations, profitability, operational capability and industry structure operations, including competition level, industry type and industry profitability had a significant relationship with social responsibility. Didar et al (2014) conducted a study entitled "evaluation of the relationship between corporate governance mechanisms and tax gap. They investigated the relationship between some corporate governance mechanisms including the independence of the board of directors, duality in CEO duties, institutional shareholders, governmental ownership, internal audit, auditor opinion, auditor change and transaction with those related to tax gap. The results of the study indicated that the relationship between the independence of directors' board, governmental ownership, the type of auditor opinion, the auditor change and the financial leverage and tax gap is negative, while internal audit and firm size variables have positive relationship with tax gap.

In a study entitled "evaluation of the relationship between ownership structure and corporate tax avoidance", Rezaei and Moshiri (2014) examined the ownership structure through block and institutional ownership and tax avoidance through two criteria of effective tax rate and permanent tax dispute. The results revealed a negative and significant relationship between block ownership and the criterion of permanent tax dispute, but no significant relationship was found between the block ownership and effective tax rate. In addition, a negative and significant relationship was found between institutional ownership and the criterion of permanent tax dispute, and no significant relationship was found between institutional ownership and effective tax rate.

In a research entitled "corporate ownership, tax avoidance and management", Anwar et al. (2014) found that family, governmental and external ownership reduced the effective tax rate (tax avoidance rate), and the

governance mechanism of board composition reverses this relationship. In a research entitled "evaluation of the effect of board directors' independence on tax management", Lanis and Richardson (2011) concluded that the number of non-executive members of the board had a negative and significant relationship with the aggressive tax procedure. In other words, as the number of non-executive members of board increases, the company shows fewer tendencies to manage the tax. In a research entitled "evaluation of the effect of corporate strategic characteristics on tax management", Minnick and Noga (2010) showed that reward plans act as incentives for managers to invest in long-term plans. The results also showed that tax management affects shareholders and is positively associated with increased revenue of shareholders.

Research hypotheses

Hypothesis 1: Corporate governance mechanisms have a significant effect on the relationship between ownership structure and tax avoidance.

Hypothesis 2: Corporate governance mechanisms have a significant effect on the relationship between ownership structure and social responsibility.

Hypothesis 3: Corporate governance mechanisms have a significant effect on the relationship between corporate social responsibility and tax avoidance.

Secondary hypotheses

1-A- The board size as a legal governance mechanism affects the relationship between ownership structure and tax avoidance.

1-B- The independence of directors' board as a legal governance mechanism affects the relationship between ownership structure and tax avoidance.

1-C- The auditor size as legal governance mechanism affects the relationship between the ownership structure and tax avoidance.

2-A- The board size as a legal governance mechanism affects the relationship between ownership structure and social responsibility.

2-B- The independence of directors' board as a legal governance mechanism affects the relationship between ownership structure and social responsibility.

2-C- The auditor size as a legal governance mechanism affects the relationship between ownership structure and social responsibility.

3-A- The board size as a legal governance mechanism affects the relationship between corporate social responsibility and tax avoidance.

3-B- Independence board of directors as a legal governance mechanism affects the relationship between corporate social responsibility and tax avoidance.

3-C- The auditor size as a legal governance mechanism affects the relationship between corporate social responsibility and tax avoidance.

Methodology

This research is considered as descriptive-correlational (post-event) study as it aims to explain the effect of corporate governance mechanisms on the relationship between ownership structure and social responsibility and tax avoidance in listed companies in Tehran Stock Exchange. This type of research method is used to perform the studies, which seek to examine the cause or causes of certain relationships in past. This type of research method has relatively high credibility since it aims to achieve a causal relationship between research factors. In this type of studies, it is impossible to manipulate the variables by the researcher or create "artificial" or laboratory conditions by researcher due to many reasons (Momeni and Faal Ghayumi, 2007). The current research is considered among the correlation studies in terms of methodology.

It is also an applied research in terms of objective. Research hypotheses are based on panel data. Statistical analyses will be performed using Eviews 6 software. A library method was first used in this research to

collect data and information. In the library method, theoretical principles of the research are collected from Persian and Latin specialized books and journals. Then, to collect data of the present study, CDs of video archive of the Tehran Stock Exchange Organization, the official website of the Tehran Stock Exchange, and other related websites such as the Kodal site, the accounting information of stock exchange companies, and other information sources were used. In this study, panel data method is used given the type of data and methods of analysis. This technique combines time-series and cross-sectional data which is used widely by researchers, nowadays. This method is used for cases which are not solved by time series or cross-sectional or when the number of data is low. Time series and cross-sectional data are combined due to the increasing number of observations, increasing the degree of freedom, reducing the heterogeneity of variance, and reducing the col-linearity between the variables.

Statistical population and sample

Companies are evaluated using four key performance indicators: economic, environmental, social, and corporate governance. Our sample includes 100 companies from a wide range of industries from 2009 to 2015, and the initial evaluation of investment for corporate social responsibility relies on environmental and social factors and corporate governance. The research selected sample includes the companies which meet the following criteria:

1. Financial information of the company should be available for the research period.
2. Their fiscal year ends at last day of the given year
3. It should not be investment company financial intermediary or insurance company
4. It should not have change in fiscal period during the study period.

Considering the criteria mentioned above, a sample of 162 companies and the information of 1134 companies - year were selected from the statistical population of the listed companies in the Tehran Stock Exchange from 2009 to 2015 and examined.

Operational definition of research variables

The independent variable of the research was ownership structure, assessed using the following criteria:

1. Family ownership: The percentage of shares owned by families having more than 5% of the company's ownership
2. Institutional ownership: Institutional ownership includes a number of ordinary shares held by institutional investors (large investors such as banks, insurance companies and investment companies). To calculate the percentage of institutional ownership in each company, the number of institutional ownership shares will be divided by the total number of ordinary shares of the company at the end of the financial period (Rezaei and Moshiri, 2014).
3. Government ownership: The percentage of shares owned by governmental organizations.

First dependent variable: Tax avoidance with the effective tax rate criterion (ERT)

One of the dependent variables of this study is tax avoidance, which is assessed by effective tax rate in this study. The effective rate of tax is calculated as follows:

$$Ert_{it} = \text{tax-paid}_{it} / \text{tax-all}_{it}$$

Where,

ERT = is effective tax rate of the company i at the end of year t;

tax-paid_{it} = The amount of tax paid by company at the end of the fiscal year t and can be derived from the cash flow statement

tax-all_{it} = tax savings on company income at the end of fiscal year t, derived from the balance sheet (if the tax savings on income is not specified, it is derived through multiplying net profit of company margin at a rate of 22.5% of the tax savings on income).

The second dependent variable: Corporate Social Responsibility (CSR)

The corporate social responsibility is the ability of a company to report its actions and operations to the social environment in a way that brings benefit for both society and the company.

Based on the research conducted by Jalili and Gheisari (2014), corporate social responsibility is paying serious attention to the effect of company operations on society. It is determined based on the sum up of score of four corporate social responsibilities in the leadership and intra-organizational communication processes, social responsibility of the company in the workplace, social responsibility of the company in the marketplace and industry based on Vigo Responsibility Institute Criteria.

Data on the four indicators of social responsibility were derived by referring to the reports of the board's activities.

$CSR_{it} = \text{community it} + \text{environment} + \text{work place it} + \text{market place it}$

Where, CSR is corporate social responsibility indicator, Community is the corporate social responsibility in leadership and intra-organizational communications, Environmental is the corporate social responsibility in environment, Work Place is the corporate social responsibility at workplace, and marketplace is the corporate social responsibility in marketplace and industry (Jalili & Gheisari, 2014).

Moderating variables

The moderating variable of the present study is the various mechanisms of corporate governance, which include the following cases:

1. Board size: The number of members of the board.
2. Board directors' independence (composition): board of director's independence means the ratio of non-executive members in the composition of directors' board.
3. Audit firm size: it is equal to 1, if the auditor is an audit firm, otherwise, it equals to zero.

Controlling variables

This research includes the control variables (other factors affecting tax avoidance) as follows:

1. Firm size: The natural logarithm of the total assets of the company
2. Capital intensity: ratio of property, equipment and machinery to total assets
3. Financial leverage: The ratio of total debts to total assets
4. Rate of return on assets: the ratio of operating profit to total assets

Results

The following table presents the descriptive statistics for the study period (2009 to 2015).

Table 1: Summary of the results of descriptive statistics

	Variable	Variable symbol	mean	median	SD	skewness	kurtosis	min	max
Tax avoidance	Effective rate of tax	ERT	0.529	0.525	0.538	1.586	1.967	0.000	2.49
Ownership structure	Family ownership	FAM	0.212	0.199	0.266	1.866	3.043	0.000	1.38
	Institutional ownership	INS	0.639	0.623	0.037	1.702	2.140	0.180	0.731
	Governmental ownership	GOV	0.148	0.144	0.187	1.885	3.052	0.000	0.97
Corporate governance	Board size	BS	5	4	1.247	3.624	9.196	0.4	0.9
	Board independence	BI	0.602	0.598	0.080	1.893	3.104	0.142	0.722
	Audit size	AS	0.569	0.603	0.495	-0.282	-1.924	0.00	1
Controlling variables	Firm size	SIZE	13.49	13.10	1.63	0.082	1.056	7.40	17.89
	Capital intensity	CAPINT	0.186	0.191	0.087	-0.187	0.854	0.000	0.350

	Return on assets	ROA	0.226	0.231	0.244	-0.176	-0.866	0.9	0.46
	Financial leverage	LEV	0.673	0.656	0.141	2.782	8.257	0.22	0.83

As one-year period is not a suitable criterion for tax avoidance, the effective tax rate is considered for a long period of time to control it. In this research, 7-year period was considered. The mean effective tax rate is 52.9 and its median is 52.5%. The closeness of these two values indicates the relative symmetry of the distribution of this variable.

Homogeneity of variables

White's test was used to examine the presence or non-presence of heterogeneity problem of variance in each of the models. Its general results are presented in the table below.

Table 2: The results of White's heterogeneity test

Hypotheses	Description	Significance	Result	Regression method
Hypothesis 1-A	f-statistic	P< 0.05	Variance heterogeneity	The use of General Least Squared
	Obs*R-squared			
Hypothesis 1-B	f-statistic	P<0.05	Variance heterogeneity	The use of General Least Squared
	Obs*R-squared			
Hypothesis 1-C	f-statistic	p>0.05	Variance homogeneity	The use of Ordinary Least Squared
	Obs*R-squared			

Statistical analysis of the first hypothesis

The first hypothesis of this research is as follows: there is a relationship between ownership structure and tax avoidance. To test this hypothesis, model 1 was used:

Model 1

$$ERT_{it} = \alpha_0 + \alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it} + \alpha_4 BS_{it} + \alpha_5 BI_{it} + \alpha_6 AS_{it} + \alpha_7 BS_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_8 BI_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_9 AS_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_{10} SIZE_{it} + \alpha_{11} CAPINT_{it} + \alpha_{12} LEV_{it} + \alpha_{13} ROA_{it} + \varepsilon_{it}$$

To use regression models, it should be determined that if data are panel of pooled type. F-Limmer test is used for this purpose. If its significance level is less than 0.05, the data are panel type. The F-Limmer statistic was calculated to be 4.33 and its significance level is 0.009 (0.05). In other words, F-Limmer suggests the rejection of the null hypothesis (the efficiency of the pooled method) and significance of panel method versus the pooled method. In the case of panel data, we should also determine their fixed and random effects. The Hausman test is used in this regard.

In this test, if the significant level is less than 0.05, the effects are fixed, otherwise, they are random. The result of the Hausman test also rejects the null hypothesis (the efficiency of the random effects) and it indicates the efficiency of fixed effects versus the random effects. In general, the fixed-effect type of panel data model is accepted for estimating the considered equation.

Table 3: The results of the tests used for the first model of research

Statistical index / Test type	Test statistic	Probability value	Result
F-Limmer	4.33	0.009	Panel method
Hausman	25.30	0.002	Fixed effects efficiency

To estimate the coefficients of independent variables, the following hypotheses can be tested using partial t statistics. The results of the estimation of the regression model are presented in the table below.

Table 4: The results of estimating the first regression with the dependent variable of tax avoidance

variable	Statistical index	Variable symbol	Coefficient estimation	Statistic t	Probability
	Fixed value	A	0.139	3.27	0.11
Ownership structure	Family ownership	FAM	-0.254	-2.39	0.033
	Institutional ownership	INS	-0.211	-2.57	0.028
	Governmental ownership	GOV	0.379	2.89	0.016
Corporate governance criteria	Board size	BS	0.178	1.19	0.127
	Board independence	BI	-0.210	-3.24	0.009
	Audit firm size	AS	0.249	3.36	0.007
Corporate governance mechanism and ownership structure	Simultaneous effect of board size and family ownership	BS*FAM	0.257	3.12	0.006
	Simultaneous effect of board size and institutional ownership	BS*INS	0.245	2.14	0.014
	Simultaneous effect of board size and governmental ownership	BS*GOV	0.218	3.31	0.005
	Simultaneous effect of board independence and family ownership	BI*FAM	0.125	1.24	0.102
	Simultaneous effect of board independence and institutional ownership	BI*INS	0.178	1.60	0.114
	Simultaneous effect of board independence and governmental ownership	BI*GOV	-0.110	-1.99	0.120
	Simultaneous effect of audit firm size and family ownership	AS*FAM	0.113	1.20	0.152
	Simultaneous effect of audit firm size and institutional ownership	AS*INS	0.217	2.22	0.001
	Simultaneous effect of audit firm size and governmental ownership	AS*GOV	0.326	2.18	0.012
Controlling variables	Firm size	SIZE	-0.228	-5.59	0.025
	Capital intensity	CAPINT	0.126	1.87	0.001
	Financial leverage	LEV	0.263	4.62	0.213

	Return on assets	ROA	0.127	1.35	0.003
Model fit	Model's coefficient of determination	R ²	0.52		
	Model's adjusted coefficient of determination	Adj-R ²	0.49	Durbin-Watson	1.89
	Model goodness of fit	F	11.37	Significance	0.001
	Computational F in White's method	F WHITE	13.42	Significance	0.003

The results presented in the table in relation to t statistic indicate that the independent variable coefficient is significant at 5% level. All obtained coefficients have acceptable level. Hence, the obtained results can be trusted for variables. The results of the Durbin Watson statistical test in this research are presented in the table below. The Durbin-Watson statistic is 1.89, and as it is close to 2, it will show the lack of auto-correlation in the model; so, we conclude that there is no auto-correlation in the models.

Based on the results of this test in the table, the value White's statistic is 13.42 and larger than the F statistic, which is equal to 11.37 at the significance level of 5%. In addition, as the statistic of these tests is larger than the Fisher statistic value and the statistic f probability value for the research first model is less than 0.05, it represents the heterogeneity of the variance. Thus, homogeneous hypothesis of variance is rejected (H₀ hypothesis is rejected) and the heterogeneity of variance of error terms is accepted. Such a problem in regression will cause the ordinary least squared results not to be the most efficient. To solve the variance heterogeneity, the general least squares method is used.

The R² statistic or adjusted coefficient of determination has been obtained to be 0.49. Thus, about 50% of the variations of the dependent variable (tax avoidance) are explained by the independent variable. As all coefficients are significant in the model, coefficient of determination has high value. Thus, there is no problem of multi collinearity in the model. In fact, multi collinearity means a linear relationship among all or some of the model explanatory variables. In multi collinearity, the model R² is high model, while significant ts are related to small coefficients. As a result, the coefficient of determination is high and there is no multi collinearity problem in the model. Therefore, the coefficient of each variable can be interpreted as follows:

Note: as effective tax rate in this research is measurement criterion for tax avoidance, as this indicator is larger, the tax avoidance level of the company will be lower. Therefore, the relationship between the effective rate of tax and tax avoidance is reverse.

Statistical analysis

The probability value of the family ownership variable (one of the ownership structure criteria) is 0.033, which is less than the error level of 5%, indicating that this variable has a significant relationship with the dependent variable of effective rate of tax. Given the coefficient sign of this variable and value of statistic t (-2.39), it can be concluded that this variable has a reverse relationship with effective rate of tax; that is to say, as one unit of this variable increases, the effective rate of tax (rate of tax avoidance) will decrease by 3.54 units, provided that other conditions remain constant. Statistical results are similar to institutional companies. Family companies, avoid paying tax more in comparison with their competitors. Family companies refer to the companies which members of the family founding the company are senior management, board of directors, or major shareholders continue their activity. Owners who are the managers of family companies can have a lot of tax avoidance by using tax planning. Thus, they are likely to demand more benefits from the company. Family and institutional ownership reduce the effective rate of tax (rate of tax avoidance), and the

governance mechanism reverses this relationship. Companies with a high institutional level generally avoid paying taxes more.

The probability value of directors' board' independence value (among the corporate mechanism criteria) is 0.009, which is less than the error level of 5%, indicating that this variable is statistically significant for the dependent variable (tax avoidance). Given the coefficient sign of this variable (2.10), it can be concluded that this variable has a reverse relationship with effective rate of tax; that is to say, as one unit in this variable increases, the effective rate of tax (rate of tax avoidance) will decrease by 2.10 units, provided that other conditions remain constant.

Board of directors' independence means the ratio of non-executive members in composition of the board. The results indicate a negative correlation between the percentage of non-executive members and the rate of effective tax; also, results show a positive and significant relationship between the percentage of non-executive members and the avoidance of tax payments. In other words, as the number of non-executive members on the board increases, the avoidance of tax payment will also increase. The probability value of the board size variable (one of the corporate governance criteria is 0.127, which is higher than the error level of 5%, indicating that this variable does not have statistically significant effect on dependent variable (tax avoidance). In Iran, the board size does not affect the tax avoidance because since it generally consists of a fixed number of 5 people.

The probability value of the variable of audit firm size (one of the corporate governance mechanism criteria) is 0.007, which is less than the error level of 5%, indicating that this variable has statistically significant effect on dependent variable (tax avoidance). Given the coefficient of the mentioned variable (0.249), it can also be argued that this variable has a direct relationship with effective rate of tax rate (tax avoidance rate); that is to say, as one unit in this variable increases, the effective rate of tax rate (tax avoidance rate) would increase by 2.10 units, provided that other conditions remain constant.

Therefore, there is a positive and significant relationship between the size of the audit firm and the effective rate of tax. In other words, there is a negative and significant relationship between the size of the audit firm and the tax management. The result of this hypothesis suggests that in the companies audited by the audit firm, tax avoidance is lower due to more precise auditing and higher monitoring of this organization on company profits and taxes. The results of the relationship between the company's specific characteristics and the effective rate of tax rate indicate that there is a negative and significant relationship between the firm size and the effective rate of tax, given the coefficient and significance level of the firm size variable. In other words, larger companies show higher tendency to tax management in Iran due to more facilities.

The relationship between the financial leverage of the companies and the effective rate of tax is also positive and significant. In other words, companies with high financial leverage have a lower tendency for tax management due to the use of interest expense as a tax shield. Moreover, there is no significant relationship between return on assets and capital intensity and effective tax rate. Additionally, the involvement of governance mechanisms criteria (in the case of interaction's effect on the variables and the size of the board, the independence of directors' board and the size of the audit firm) reverses the relationships.

Statistical analysis of the second hypothesis

The second hypothesis of this research is as follows: There is a relationship between ownership structure and corporate social responsibility. To test this hypothesis, model 2 is used:

Model 2

$$CST_{it} = \alpha_0 + \alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it} + \alpha_4 BS_{it} + \alpha_5 BI_{it} + \alpha_6 AS_{it} + \alpha_7 BS_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_8 BI_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_9 AS_{it} + (\alpha_1 FAM_{it} + \alpha_2 INS_{it} + \alpha_3 GOV_{it}) + \alpha_{10} SIZE_{it} + \alpha_{11} CAPINT_{it} + \alpha_{12} LEV_{it} + \alpha_{13} ROA_{it} + \varepsilon_{it}$$

Table 5: The results related to tests used for the second model of research

Statistical index Test type	Test statistic	Probability value	Result
F-Limmer	3.61	0.002	Panel method
Hausman	19.76	0.004	Fixed effects efficiency

Based on the table below, F-Limmer computational statistic is 3.61 and its significance level is 0.002 ($p < 0.05$). In other words, the F-Limmer value indicates the rejection of the null hypothesis (the efficiency of pooled method) and indicates the significance of panel method versus the pooled method. The result of the Hausman test also suggests the rejection of null hypothesis (Efficiency of random effects) indicating the efficiency of constant effects versus random effects. In general, fixed effects type of panel data model is accepted to estimate the equation. The results of estimating the regression model are presented in the following tables.

Table 6: The results of second regression estimation with dependent variable of corporate social responsibility

variable	Statistical index	Variable symbol	Coefficient estimation	Statistic t	Probability
	Fixed value	α	0.126	2.12	0.015
Ownership structure	Family ownership	FAM	-0.170	-2.30	0.024
	Institutional ownership	INS	-0.122	-2.46	0.018
	Governmental ownership	GOV	0.166	3.25	0.003
Corporate governance criteria	Board size	BS	0.291	2.26	0.014
	Board independence	BI	0.264	3.39	0.007
	Audit firm size	AS	0.229	1.10	0.121
Corporate governance mechanism and ownership structure	Simultaneous effect of board size and family ownership	BS*FAM	0.155	1.14	0.119
	Simultaneous effect of board size and institutional ownership	BS*INS	0.217	2.20	0.031
	Simultaneous effect of board size and governmental ownership	BS*GOV	0.136	3.15	0.011
	Simultaneous effect of board independence and family ownership	BI*FAM	-0.172	-2.54	0.044
	Simultaneous effect of board independence and institutional ownership	BI*INS	0.110	1.07	0.246
	Simultaneous effect of board independence and governmental ownership	BI*GOV	0.314	0.415	0.003
	Simultaneous effect of audit firm size and family ownership	AS*FAM	0.126	1.25	0.095
	Simultaneous effect of audit firm size and institutional ownership	AS*INS	0.177	1.05	0.133
	Simultaneous effect of audit firm size and	AS*GOV	0.135	1.16	0.120

	governmental ownership				
Controlling variables	Firm size	SIZE	0326	4.13	0.004
	Capital intensity	CAPINT	0.214	2.10	0.022
	Financial leverage	LEV	-0.141	-2.28	0.036
	Return on assets	ROA	0.346	4.26	0.002
Model fit	Model's coefficient of determination	R ²	0.32		
	Model's adjusted coefficient of determination	Adj-R ²	0.30	Durbin-Watson	2.04
	Model's goodness of fit	F	10.22	Significance	0.001
	Computational F in White's method	F WHITE	12.40	Significance	0.006

The results presented in the above table with regard to statistic t indicate that the independent variable coefficient is significant at 5% level. All the obtained coefficients have an acceptable level; so, the obtained results can be trusted for the variables. The results of the Durbin-Watson statistical test in this study are presented in the table.vnvThe Durbin-Watson statistic value is equal to 2.04, and when this statistic value is close to 2, it will show a lack of auto-correlation in the model; therefore, we conclude that there is not auto-correlation in the models.

Based on the results of this study, the value of White's statistic is 12.40 and greater than the F statistic table, which is equal to 10.22 at 5% level. Therefore, the hypothesis HO on homogeneity of variance is rejected and the heterogeneity of the variance of error terms is accepted. To solve the variance heterogeneity problem, the general least squared method is used. Such a problem in regression will cause the ordinary least squared results not to have the highest efficiency, anymore. As shown in table, the R² statistic or the adjusted coefficient of determination is equal to 0.30. Hence, 30% of the variations in the dependent variable (corporate social responsibility) are explained by independent variables. Since all coefficients are significant in the model, the coefficient of determination is high. Therefore, there is not a multi collinearity problem in the model. So, the coefficient of each variable can be interpreted as follows.

Statistical interpretation

As results of the table show, the significant level of corporate family ownership is 0.025, which is less than 0.05, and the value of the t statistic is 2.30, which is higher than 2. Therefore, the results of the model indicate that the independent variable affects the dependent variable at the 95% confidence level, but as coefficient of the independent variable is negative and equal to -0.170, family ownership has a negative and significant effect on the dependent variable (corporate social responsibility). It can be concluded that in companies with family ownership, corporate social responsibility decreases. As there is a high probability that investment in social responsibility programs will incur significant short-term costs and the market show response for social responsibility programs in long term, it is less likely that company with family ownership take part in social responsibility due to the costs. The reason is that they prefer short-term benefits.

The probability value of the institutional ownership variable (one of the ownership structure criteria) is 0.018, which is less than the error level of 5%, indicating that this variable has a significant relationship with the dependent variable of corporate social responsibility. Given the sign of coefficient and the value of statistic t (-2.46), it can be stated that this variable is inversely associated with the level of social responsibility, in a way that with increase in one unit of this variable, level of social responsibility will increase by 1.22 units, provided that other conditions remain constant. The statistical results in companies with governmental ownership are the opposite. Undoubtedly, the structure of companies has undergone considerable changes in the last few decades owing to growing benefits of investment institutions such as banks, private equity funds in stock of other companies, insurance companies and pension funds.

Based on the risk-averse theory, governmental ownership views the social programs and action of the companies as tool to reduce the potential risk. Therefore, based on this theory, the effect of governmental ownership on social responsibility will be positive. Companies can attract and retain governmental ownership through social programs and activities. In contrast, based on narrow-minded institutions, institutional ownership is considered as narrow-minded investors, which focuses only on short-term returns, and managers of such institutions are measured and encouraged based on their short-term returns.

As investment in such programs and activities is a long-term decision that requires time to save money, organizations investing in social responsibility cannot be able attract institutional ownership capital. Accordingly, this claim shows that institutional ownership has a negative effect on the corporate social responsibility. Current evidence on the relationship between social responsibility and ownership structure was limited. While Iranian companies have a positive attitude towards environmental issues, the current actions have had less effect. Corporate governance criteria have a positive effect on social responsibility. It means that strategic program of sample companies is to participate in social responsibility programs. However, high tax rates will exacerbate the corporate governance systems. In contrast, lower tax rates will improve corporate governance systems, leading to higher tax revenues.

Statistical analysis of the third hypothesis

The third hypothesis of this research is as follows: There is a relationship between corporate social responsibility and tax avoidance. To test this hypothesis, model 3 is used:

$$ERT_{i,t} = \alpha_0 + \alpha_1 CSR_{CO\ i,t} + \alpha_2 CSR_{REN\ i,t} + \alpha_3 CSR_{WO\ i,t} + \alpha_4 CSR_{MA\ i,t} + \alpha_5 BS_{i,t} + \alpha_6 BI_{i,t} + \alpha_7 AS_{i,t} + \alpha_8 BS_{i,t} (SCR\text{-}SCORE) + \alpha_9 BI_{i,t} (SCR\text{-}SCORE) + \alpha_{10} AS_{i,t} (SCR\text{-}SCORE) + \alpha_{11} SIZE_{i,t} + \alpha_{12} CAPINT_{i,t} + \alpha_{13} LEV_{i,t} + \alpha_{14} ROA_{i,t} + \varepsilon_{i,t}$$

The independent variable of this study is the corporate social responsibility (dimensions of corporate social responsibility in companies and society), which is expressed based on sum of scores of four indicators as follows.

SCR-SCORE_{it} = a set of corporate social responsibility criteria

Based on the table below, F-Limmer computational statistic is 5.27 and its significance level is 0.004 (p < 0.05). In other words, the F-Limmer value indicates the rejection of the null hypothesis (the efficiency of pooled method) and indicates significance of panel method versus the pooled method. The result of the Hausman test also suggests the acceptance of null hypothesis (Efficiency of random effects) and suggests the efficiency of random effects versus fixed effects. In general, random effects type of panel data model is accepted to estimate the equation.

Table 7: Results related to tests used for the third model of research

Statistical index Test type	Test statistic	Probability value	Result
F-Limmer	5.27	0.004	Panel method
Hausman	30.24	0.056	Fixed effects efficiency

As shown in the table above, the significance of the chi-square statistic is greater than 0.05, which indicates that random effect method is preferred to fixed effects. Based on the results of Hausman test, the random data hypothesis is not rejected. So, the random effects data model was applied for estimating the related model. In this case, the Bruce-Pagan test should be performed first to select OLS fixed effects or Random Effects method (FGLS). Based on the table, as the probability value is less than 0.05, the FGLS method is used to estimate data disregarding the factor of variance inflation.

Table 8: Results of Bruce-Pagan test

Chi-square test	probability	Result
4.18	0.019	H0 hypothesis on estimation by GLS method is confirmed

The results presented in the table with regard to statistic t indicate that the independent variable coefficient is significant at 5% level. All the obtained coefficients have an acceptable level, so that the obtained results for variables can be trusted. The Durbin-Watson statistic is 1.90, and when it is close to 2, it will show that there is no auto-correlation in the model; therefore, we conclude that there is no auto-correlation in the models.

Table 9: The results of estimating the third regression of the effect of corporate governance mechanisms on the relationship between social responsibility and tax avoidance

variable	Statistical index	Variable symbol	Coefficient estimation	Statistic t	Probability
	Constant value	α	0.146	2.11	0.026
Corporate social responsibility criteria	Social responsibility in leadership and intra-organizational communication	CSRCO	0.152	3.27	0.015
	Social responsibility in environment	CSREN	0.120	1.34	0.127
	Social responsibility in workplace	CSRWO	0.322	3.65	0.009
	Social responsibility in marketplace	CSRMA	0.379	4.10	0.002
Sum of criteria	Sum of corporate social responsibility criteria	SCR-SCORE	0.309	3.45	0.007
Corporate governance mechanism and corporate social responsibility	Simultaneous effect of board size and corporate social responsibility	BS*SCR-SCORE	0.247	3.16	0.005
	Simultaneous effect of independence of board of directors and corporate social responsibility	BI*SCR-SCORE	-0.250	-0.130	0.146
	Simultaneous effect of audit firm size and corporate social responsibility	AS*SCR-SCORE	0.112	2.33	0.029
Model fit	Model's coefficient of determination	R^2	0.57		
	Model's adjusted coefficient of determination	Adj- R^2	0.55	Durbin-Watson	1.90
	Model's goodness of fit	F	14.22	significance	0.003
	Computational F in White's method	F WHITE	10.50	Significance	0.058

Based on the results of this test, White's statistic value is 10.50, which is smaller than F statistic, which is equal to 14.22 at 5% level. Therefore, the hypothesis H_0 which is homogeneity of variance is accepted. To solve the variance heterogeneity problem, the general least squared method is used. As the statistic of all tests is smaller than F-Fisher statistic, and the probability of the statistic is greater than 0.05, the heterogeneity of variance hypothesis is rejected and the homogeneity of the variance of error terms is accepted. Therefore, there is no problem of heterogeneity of variance between the residuals. The R^2 statistic or the adjusted coefficient of determination is equal to 0.55, so 55% of the variations of the tax avoidance's dependent variable are explained by independent variables. The coefficient of each variable can be interpreted as follows.

Statistical interpretation

As the results show, in evaluating the simultaneous effect of board size and corporate social responsibility, the significant level of interactional variables is equal to 0.005, which is less than 0.05. Thus, the results of the model show that independent variable has a significant effect on the dependent variable at the 95% confidence. In addition, as coefficient of the independent variable is positive and equal to 0.247, the effect of corporate governance mechanisms on corporate social responsibility is positive and significant. It can be concluded that in companies with higher corporate governance that participate in social responsibility, the effective rate of tax (tax avoidance) increases. Thus, social responsibility can have a positive effect on the effective rate of tax. Hence, in companies with higher level of social responsibility disclosure, the effective rate of tax is higher; as a result, tax avoidance decreases. In companies with strong governance structures (such as higher institutional ownership), there is a negative relationship between corporate tax avoidance and corporate social responsibility. The responses between corporate governance and tax are mutual. In fact, corporate governance rules have structural effects on meeting corporate tax obligations on the one hand, and tax plans (from the government point of view) and their linking to tax strategies (from the company point of view) can have a significant effect on the creation of a dynamic corporate governance on the other hand.

Conclusion

The results of testing the research hypotheses suggest that there is a positive relationship between the family ownership structure and institutional ownership structure and tax avoidance, but this relationship is reverse in governmental ownership. In other words, given the characteristics of corporate strategic principles, the ownership structure in Iran has an effect on corporate tax avoidance. The results of the first hypothesis revealed that there is a significant relationship between the characteristics of corporate strategic principles and the effective rate of tax (tax avoidance). In addition, companies pay attention to social issues considering the type of ownership structure, pay for their social responsibilities and participate in activities; so, the corporate governance criteria in relation to ownership structure are to participate in social responsibility programs. However, high tax rates will exacerbate the corporate governance system, and vice versa; low tax rates will improve corporate governance systems and increase tax revenues. Finally, the effect of corporate governance mechanisms on the corporate social responsibility is positive and significant. Hence, it can be concluded that in companies with higher corporate governance participating in social responsibility, the effective rate of tax (tax avoidance) increases; so, social responsibility affects the effective rate of tax. Thus, in companies where corporate social responsibility disclosure is at a higher level, the effective rate of tax is higher, as well; as a result, tax avoidance decreases.

Recommendations

Given the confirmation of hypothesis of "the corporate governance mechanism has a significant effect on the relationship between ownership structure and tax avoidance" and based on the results of the research, companies with higher social function pay the taxes timely. Therefore, they should consider the criteria such as corporate social responsibility, firm size, and etc. in adopting economic decisions, since these factors were the most important criteria in tax avoidance of companies.

Given the confirmation of the hypothesis of "corporate governance mechanisms have a significant effect on the relationship between the ownership structure and corporate social responsibility", accounting standards formulation authorities are recommended to take necessary actions to encourage companies with family and institutional ownership to disclose the information of corporate social responsibility voluntarily in explanatory notes.

Given the confirmation of the hypothesis of "corporate governance mechanisms have a significant effect on the relationship between social responsibility and tax avoidance", as corporate governance rules have structural

effects on meeting the tax obligations of companies, also, as tax plans (from the government point of view) and linking them with tax strategies (from the company point of view) can have a significant effect on the creation of a dynamic corporate governance, managers are recommended to pay much attention to this issue. The investors are also recommended to invest in companies, which participate in social responsibilities and have no tax avoidance.

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