# Model of the comprehensive index of tax avoidance and company' attributes

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## ABSTRACT

The topic of taxes has a crucial role in the financial and economic literature of every country. In the informational atmosphere of accounting in Iran, the tax is one of the foundations which affects the financial reports. So it seems that many companies are struggling with tax avoidance and because of that, determining the affecting factors on the tax avoidance level is very important which no comprehensive index has been proposed for it yet. Therefore, in this research, by focusing on various indexes by using the fuzzy method, a comprehensive index for evaluating tax avoidance is introduced. And then, we investigate the effect of the comprehensive model of tax avoidance evaluation on the company attributes by using multivariate regression. Also, for testing and evaluating the function of the designed model, the data of the 102 companies during the years from 1390 to 1398 have been utilized by the hybrid approach. So, a questionnaire for an opinion poll from experts about validity and importance of considered criteria for evaluating the tax avoidance of company was provided and distributed among them and by using one of the multiple-criteria decision-making models (Shannon Entropy), validity and importance of the criteria were determined. Also, confirmatory factor analysis was used to evaluate the relationships of the latent variable in this tax avoidance research. The achieved results demonstrate that the suggested model is a suitable index for tax avoidance. Furthermore, the results showed that the company attributes (company size, profitability, and progress of company) could affect tax avoidance, and it causes an increase in tax avoidance.

**Keywords:** tax avoidance, comprehensive index of tax avoidance, multiple-criteria decision-making model, company attributes.

## 1. Introduction

Effective tax rate always has a crucial role in a company, and it is a strategic concern not only for the company managers but also for the policymakers. So the tax function is utilized in regard to the various topics of the company decisions such as investing decisions, financing the long-term capital, strategic integration, and dividend policy (Brealy and Myers, 1996; Auerbach and Slemrod1997). This happens because tax avoidance is structurally compatible with company attributes. According to the political expenses theory, developed and profitable companies are struggling with higher tax avoidance. Meanwhile, these companies use better tax planning too (Zimmerman 1983). In this regard, some researchers investigate the relationship between tax avoidance and profitability (Gupta and Newberry, 1997; Chen et al., 2010; Lazar, 2014).

On the other hand, Gupta and Newberry (1997), Derashid and Zhang (2003), Janssen (2005), Chen et al. (2010), and Noor et al. (2010) identified the consequences of the tax avoidance on capital intensity; because the depreciation of the tangible assets is exempt from taxes. And because of that, the companies with a high amount of tangible fixed assets pay fewer taxes. So the tax avoidance is lower in these companies.

From a wider perspective, Dyreng et al. (2017) investigated American companies. They found a significant decrease in tax avoidance during the past 25 years. This decline in tax avoidance was seen almost for both multinational and native companies, which may exist different reasons for decreasing tax avoidance in these companies. In another aspect, Isin (2018) analyzed the syndicated loans of the American companies which are traded publically. He concluded that tax avoidance has a positive relationship with the loan. He also concluded that access to public and private debt financing at the same time reflects a higher financial flexibility of the company at the company's level. Furthermore, he believed that there are some ways that through them, companies can decrease the deductible expenses and use the average tax avoidance of the industry as a principal variable for tax avoidance incentives.

In another related context, Acharya et al. (2018) found out that banks decrease their financial credit after capital adequacy test to the relatively dangerous borrowers. Conesa and Dominguez (2020) investigated

Judd's (1985) reasoning again, which states that capital income should not be used for the goals of tax redistribution. They concluded that generally, the tax of the optimal profit is not zero under stable conditions. Since tax is an inseparable part of the company decisions, not only the company executives but also policymakers pay a lot of attention to tax avoidance to detect the attributes of companies that determine the tax avoidance. So the fundamental question of stakeholders that had always been an important issue is how we can achieve an index to measure and clarify companies' tax avoidance? We try to detect these factors and answer this question according to the affecting factors on tax avoidance of companies and the expert's opinions. And another question is, what effects does the comprehensive index of tax avoidance model have on companies' attributes?

Based on this subject, the goal of current research is to introduce a new model for evaluating companies' tax avoidance by fuzzy decision-making models, which is proposed for the first time. Also, the relationship between the tax avoidance model and companies' attributes is investigated. By using this index, we expect that we can simply calculate the index of companies' tax avoidance at any time, and we can realize this point that whether the company has tax avoidance or not?

The current study's findings can provide helpful data as academic achievement for investors, policymakers of the capital market, accounting standards setters, and other accounting information users. In the following parts of the article, after the presentation of the theoretical basics, the background of the research, and then the research method and findings will be presented.

## Theoretical basics and current literature review

### Tax avoidance and size of a company

Various studies have been conducted on taxes and the size of the company around the world. The theoretical foundations of this research are generally based on two hypotheses of political expenditure and political power, the relationship between taxation and the size of the company through which they are examined. Watts and Zimmerman (1986) showed that larger companies are more regulated by the government and more prone to political costs, thereby , these companies are expected to be less prone to tax evasion.

It is in contrast to the hypothesis of political power developed by Salmond and Siegfried (1977). According to this hypothesis, larger companies enjoy superior political and economic power over smaller ones. Using economic power, these companies are lobbying that they see as influencing the laws. Although some researchers believe that the political cost hypothesis may not be established in developing countries, because in such countries the government is unable to engage and cooperate with large companies in order to achieve economic and national development goals, which can crystallize in tax concessions. However, interpretations can be expected to have a significant relationship between company size and tax avoidance (Mehrani & Seyedi, 2014).

Size of a company is the most comprehensive variable which has been used in the earlier researches about companies' taxes, and it is related to the political expenses theory. For instance, Zimmerman (1983) and Noor et al. (2010) found out that there is a positive relationship between the company's size and tax avoidance. According to the political expenses theory, developed and profitable financial firms attract more political attention than the less developed and low-profit ones. Because the tax shields of profit and depreciation are often stable in a short period, companies' tax price has a positive correlation with the companies' profitability, and for this reason, the taxes are rightly taken. However, Richardson and Lanis (2007) found a negative relationship, and they concluded that bigger companies should have lower tax avoidance than smaller companies because they have significant funds for handling the political process, and they have proper tax planning to achieve optimal tax savings. Liansheng et al. (2012) found a positive correlation between the company's size and tax avoidance among private companies. So, we can conclude that the political expenses theory can explain the relationship between the size of a company and tax avoidance for private companies which are under its control. At the same time, the political power theory can explain this relationship for state-owned firms which are under control. And there is no problem with firms that have been in a preferential tax condition before. So, the first theory of the research has been set as follows:

**First theory:** there is a significant relationship between the size of a company and the comprehensive index of the tax avoidance model.

### Tax avoidance and company profitability

The management performance of a company can be measured by the level of profitability of the company. According to the representation theory, the government as chief executive seeks to maximize tax revenue, while the company's director as a representative seeks to reduce the tax burden that must be paid (Irianto et al., 2017). Therefore, companies with higher levels of profitability tend to avoid paying more taxes. Under the bonus hypothesis scheme, companies that earn more are more inclined to increase their income by reducing tax costs.

Based on the trading theory, financial firms with higher profitability have higher tax burdens, and it is expected to find a positive relationship between profitability, amount of debt, and tax price (Kathleen and Shastri, 2005; Graham and Tucker, 2006; Lemmon et al. 2008). Some studies such as Gupta and Newberry (1997), Chen et al. (2010), and Lazar (2014) found a positive relationship between profitability and tax avoidance because profitable companies are more prone to high taxes than low-profit companies. On the other hand, Derashid and Zhang (2003) and Noor et al. (2008, 2010) showed the negative association between profitability and tax avoidance. They concluded based on their findings that companies with high profitability probably have more tax advantages and can manage the taxes efficiently. Effective tax rate is considered as a measure of tax avoidance in companies that there are several consequences related to the company performance . For example, Sofyn et al. (2016) showed that corporate tax optimization was negatively correlated with corporate performance for Tunisian companies, and it could be argued that corporate profitability is directly related to the minimization of tax rates as well. Contrasting with the above research, Navabia et al. (2016) used tax avoidance as a measure to assess the actual loads of corporate taxes and expressed a positive and significant relationship with profitability. Similarly, Salavo (2017) stated that tax avoidance can have a significant impact on corporate profitability, which managers also reduce profitability in companies by avoiding paying taxes.So, according to the mentioned conclusions, the second theory of the research has been set as follows:

**Second theory:** there is a significant relationship between company profitability and comprehensive index of tax avoidance.

**Tax avoidance and company growth**

Ribeiro et al. (2015) found the significant and negative effect of tax avoidance on the company's growth while calculating the tax avoidance by using the earnings before taxes. Here the growth is measured as the ratio of the market's capital to the cost of equity. Derashid and Zhang (2003) concluded that potential companies grow more, and because of that, they show more tax avoidance. So, based on the previous researches, the relationship between company growth rate and tax avoidance is obtained by debt level (Titman and Wessels, 1988; Chaplinsky and Niehaus, 1990; Smith and Watts, 1992; Rajan and Zingales, 1995). Zou and Xiao (2006) and Billett et al. (2007) found out that there is a significant and negative relationship between leverages and growth opportunities. In the current study, we assume that there is a significant and negative relationship between leverages and tax avoidance, and there is a positive relationship between company growth and tax avoidance; so, according to the mentioned conclusions, the third theory is set as follows:

**Third theory:** there is a significant relationship between company growth and the comprehensive index of the tax avoidance model.

International background

Choibi et al. (2021) investigated the impact of corporate social responsibility practices on tax avoidance in French companies using a sample of 119 companies during 2010 and 2019. The results showed that companies that do not perform social responsibility activities behave more aggressively than other companies in tax avoidance. Dakhli, A. (2021) in their research investigated the impact of ownership structure on tax avoidance with the mediating role of corporate social responsibility using 200 French companies during 2007-2018. The results showed that institutional ownership has a negative impact on tax avoidance and the higher the ratio of institutional ownership, the less likely it is to avoid tax avoidance in companies. The results also showed that social responsibility has a mediating role in the relationship between institutional ownership and tax avoidance. Duan et al. (2018) investigated the effect of chief executor officers' fame on the tax avoidance in the S&P500 companies during fiscal period of 2004 to 2011. Their extracted sample included 2841 CEOs. This research used the CEOs' full names and the tickers of companies' stock prices to achieve the search

volume index for CEOs. According to the industry-year fixed effects model, their findings showed that CEOs with more fame have their particular ways of managing to have a lower tax effective rate. Also, they concluded that companies with more famous CEOs pay higher fees to the auditors, which shows that the CEOs of these companies want to use more from tax planning services of auditors. Van Der Pilos (2017) investigated the effect of independent directors on tax avoidance by using the data of 495 S&p500 companies during the fiscal period of 2007 to 2015. According to the fixed effects regression model based on the panel data, he concluded that the tax avoidance level would be low when more independent directors are present in the board of directors because the board of directors is a mechanism of internal control that decreases the tax avoidance of companies. Also, the accounting profession recognizes the board of directors' role in management surveillance. Park et al. (2016) investigated the relationship between management ability and tax avoidance in Korea during the fiscal period of 1999 to 2011. In this study, the data envelopment analysis was used for evaluating the directors' ability. They found out that there is a negative association between tax avoidance and company value. Also, the results showed that management capability reduces the negative relationship between tax avoidance and company value. Taylor and Richardson (2014) investigated the relationship between tax avoidance and directors' role and attributes. They formed a sample of 200 Australian companies and evaluated them during the period of 2006 to 2010. They concluded that reporting the uncertain tax position, tax specialty of the board of directors' members, and remuneration of chief directors have a significant and positive relationship with firms' tax avoidance. On the other hand, the companies that at least one member of their board of directors have tax dependence have a significant and negative relationship with tax avoidance.

## Domestic background

Iran also has many pieces of research about tax avoidance which are mentioned below. Nobakht & Nobakht (2020) in a research on the effect of tax avoidance on accounting criteria of the company's value using 180 companies during 2009-2018. The findings show that tax avoidance has a positive and significant effect on corporate value accounting

criteria, which means that by increasing tax avoidance, the value of the company increases. The intensity of this increase in the estimated value of the company through free cash flow resulting from the business is greater than the estimated value of the company through free cash flow for the business unit, which can be due to the neutralization of the financing effect in it. Therefore, the results of this study confirm the value creation theory in the relationship between tax avoidance activities and company value. Rahimi and Foroughi (2020) investigated the effect of tax avoidance on investment efficiency based on a sample of 152 companies during 2008-2017. According to the research findings, increasing tax avoidance reduces the efficiency of the company's investment. Conclusion: Although it can be said that tax avoidance activities require hiding facts and conducting complex transactions that lead to opportunistic management behaviors and reduce the efficiency of the company's investment, but in Iran, tax avoidance is a procedure that is not necessarily intended to create more efficiency but also normally by companies. Hajian Nezhad and Danesh Saravardi (1398) executed a study with this title: investigating the effect of agency costs and liquidity on tax avoidance by using the profitability during the years between 1390 and 1394 in the listed companies in Tehran Stock Exchange. Their findings demonstrated that profitability could explain each of the liquidity and agency cost variables as an endogenous variable. According to the results of simultaneous equations, liquidity has a negative effect on tax avoidance, and agency cost has a positive effect on tax avoidance. Khajavi et al. (1397) investigated the role and motivation of the board of directors in the company's tax avoidance by using a sample that includes 104 listed companies in Tehran Stock Exchange during the years from1390 to 1395. The study results showed that disclosing the uncertain tax condition by the board of directors indicates aggressive tax behavior and tax avoidance as a result. Also, the motivation of remuneration for the board has a significant and positive effect on tax avoidance. However, the diversity of gender had no significant effect on tax avoidance. This means the presence of women on the board of directors has not prevented tax avoidance. Sheybani Tezerji and Khodamipour (1397) investigated the moderating role of real earnings management on the relationship between customer concentration and tax avoidance by using a sample of 79 listed companies in the Tehran stock exchange during a period from 1385 to 1394. The research findings showed that the company's customer concentration has a significant and positive effect on tax avoidance actions. Moreover, the findings showed that the positive relationship between customer concentration and tax avoidance is more sensible when the company involves less in the real earnings management.

Kamali Monfared and Ahmadi (1396) investigated the effect of management ability on the tax avoidance and company value by using the data envelopment analysis and a sample that consists of 81 listed companies in the Tehran stock exchange during the years from 1384 to 1392. The research results showed that management ability has a negative effect on tax avoidance, and this result is consistent with the agency theory. Also, the results show that the tax avoidance and its interaction with the management ability have no significant effect on the company's market value, and it cannot affect the investors' reaction in the efficient capital market. Gholamikian and Faghih (1396) investigated the effect of tax avoidance on earning predictability by using the compositional data analysis method and a sample that consists of 99 listed companies in the Tehran stock exchange during the years from 1384 to 1392. The research findings showed that tax avoidance reduces earning predictability.

Reviewing the domestic and foreign researches indicated that several factors had been utilized as affecting factors on the tax avoidance in these studies. According to the mentioned information, it is obvious that the amount of intensity and weakness of these factors is different in every country based on their social and economic environment. So, investigating this matter is a challenging subject: can we provide a comprehensive index for tax avoidance of Iranian companies? The aim of this research is to introduce a comprehensive index based on Iran's condition for measuring tax avoidance by combining these factors. Presenting this index can help the investors and others to understand better the investment, handling, planning, etc. Also, it determines its reliance on the company's information.

Research method, community, and statistical sample

Current research wants to present a model to measure the comprehensive index of tax avoidance by

fuzzy logic approach and investigate the effect of company attributes on tax avoidance of listed companies in the Tehran stock exchange. The methodology of this research from the perspective of objective is practical and from the perspective of the method is survey and descriptive-analytical. This research from the perspective of data collecting method is descriptive, and from the perspective of the type of data is qualitative and quantitative research. This research uses a mixed-method approach. Some parts of research use the quantitative method, and some use the qualitative method. Considering this matter that this research has a new topic, and it intends to investigate the followings:

1) Investigating and explaining the effective criteria of evaluation of the companies' tax avoidance
2) Explaining a comprehensive index for evaluation of the companies' tax avoidance

The current research community consists of all the listed public companies in the Tehran stock exchange, and the time range of this research is nine years during the period from 1390 to 1398. Statistical samples are selected according to the following conditions:

1) They must be listed in the Tehran stock exchange by the end of March 1398.
2) For increasing the comparability, the end of their fiscal year should be at the end of March. Their activity and fiscal year should not change during the desired period of time.
3) The required information for calculating the research's variables should be available during the periods of research.
4) They should not be a member of the investment companies and financial intermediaries.

The final version of the research had 102 companies after applying mentioned conditions.

## Suggested model for evaluating tax avoidance

In the current study for providing the model of tax avoidance evaluation, at first, we should extract ten factors (company's social responsibility, management ability, the expected return rate of shareholders, company's value, the existence of audit committee, customer's concentration, corporate governance, smoothing the taxable income, managerial overconfidence, and auditor's industrial specialization) by using the content analysis method and library

research. After mentioning these ten factors for the expertise, their opinion during the three stages of the interview increases these ten factors to 15. The five suggested factors by expertise opinions are: (lack of liquidity, reserves, advanced receive, profitability, and company age).

## Affecting factors on tax avoidance

### A) company's social responsibility:

One of the factors that affect the companies' tax avoidance activities is the amount of company information disclosure, such as disclosing the company's social responsibility. According to the important research of Yegane and Rezaii (1397), the companies that have a high disclosure of social responsibility, do fewer tax avoidance activities. So, it is expected that disclosing the issues related to the company's social responsibility, which can follow their origin by using the stakeholders' theory, has a significant and direct relationship with the company's tax avoidance. Therefore, in this research, we tried to investigate based on the research by Maranjory and Alikhani (1393), which disclosed the listed companies in the Tehran stock exchange by using the content analysis method.

For evaluating each aspect of the social responsibility disclosure in the listed companies in the Tehran stock exchange, we should find each desired aspect in the reports of the board of directors in the sector of the company's social responsibility report. Then, after checking them, if any of the sub-sectors were related to the aspects of the disclosed social responsibility, they will be numbered one, and otherwise, they will be numbered zero.

- **The environmental issues aspect of the social responsibility**

Total scores of this parameter include pollution control, preventing environmental damages, recycling or preventing wastage, natural resources protection, researching and development, environmental policy, investing in environmental projects, and other environmental issues that were reported in the reports of the board of directors, which are members of the sample. To measure the aspect of the environmental issues of social responsibility, we should first analyze the contents of the selected companies' board reports. If the mentioned criteria were met in each company,

value one is considered for them. Otherwise, they will earn a zero score (Maranjory and Alikhani 1393).

- **The aspect of the social responsibility employees**

Total scores of this parameter include union relations, sharing cash dividend, staff participating, health and safety, retirement benefits, and other customers that were reported in the reports of the board of directors, which are members of the sample. For measuring the aspect of the employees of social responsibility, we should first analyze the contents of the selected companies' board reports. If the mentioned criteria were met in each company, value one is considered for them. Otherwise, they will earn a zero score (Maranjory and Alikhani 1393).

- **The aspect of the products and services of the social responsibility**

The total score of this parameter includes product development, market share, product quality/ISO, product safety and health, stop producing, and other products and services that were reported in the reports of the board of directors, which are members of the sample. For measuring the aspect of the products and services of the social responsibility, we should first analyze the contents of the selected companies' board reports. If the mentioned criteria were met in each company, value one is considered for them. Otherwise, they will earn a zero score (Maranjory and Alikhani 1393). So, total scores of all parameters (community, staff, environment, and products) are considered for measuring the social responsibility index.

**B) Management ability**

Rose and Shepard (1997), Shavinina and Medvid (2009), and Bertrand and Schoar (2003) stated that the directors use various styles and methods in their decisions in financial and investment fields, and this indicates that directors with high abilities can cause enhancement in the quality of the company function by their high managerial ability and using their managerial styles and methods. Focusing on the managerial abilities causes better understanding from determining factors of the strategies for companies tax planning. Francis et al. (2013) investigated the relationship between managerial abilities and tax avoidance. They found out that there is a significant and negative relationship between managerial abilities and tax avoidance. This matter means that capable executives have low tax avoidance. This relationship

was explained in this way that high-ability executives convert the resources to more income. So, they do not spend their time on tax avoidance activities. So, a reverse and significant relationship between managerial abilities and tax avoidance is expected.

The pattern of Demerjian et al. (2012) is used for evaluating managerial ability. In this pattern, the managerial ability is calculated by using the intrinsic properties of the company. Demerjian et al. (2012) used the data envelopment analysis method for evaluating the company's performance. They used the input-output data, which is mentioned in equation 2, for measuring the system function.

**Equation 2:**

$$\llbracket max \rrbracket\_v\ \theta = Sale/(V\_1\ CoGS + V\_2\ SG\&A + V\_3\ NetPPE + V\_4\ OpsLease + V\_5\ R\&D + V\_6\ Goodwill + V\_7\ Intan)$$

In this model, COGS represents the Cost Of Goods Sold at the year t, SG&A represents the Selling General & Administrative expenses at the year t, NetPPE represents the Net Property, Plant, and Equipment at the beginning of the year t, OpsLease represents the operating lease costs at the year t, R&D represents the Research and Development expenses at the year t, Goodwill represents the goodwill that purchased at the beginning of the year t, Intan represents the net balance of the intangible assets at the beginning of the year t, and Sales represents the sales amount. It is worth mentioning that since the expenses of the research and development and the information related to the rents by listed companies in the Tehran stock exchange cannot be identified in the financial statements, its effect has been removed from the model.

The calculated value for the company performance is in the range of zero to one. The aim of calculating the company performance is to evaluate managerial ability.

Demerjian et al. (2012) divided the company performance into two separate sectors, the performance according to the intrinsic properties of the company and the managerial ability, for controlling the effect of intrinsic properties of the company on their model. These five properties are controlled by the following model that was presented by Demerjian et al. (2012)

**Equation 3:**
Firm Efficiency=$\alpha_0 + \alpha_1$ Size+$\alpha_2$ Market Share+$\alpha_3$ FCF+$\alpha_4$ AGE+$\alpha_5$ Forein Currency Indicator+$\varepsilon$

In this model, Size: company size, which is equal to the natural logarithm of the total company's assets, Market share: market share of the company which is equal to the ratio of the company sales to the total industry sales, FCF: if this variable is positive, so the operational cash flow is equal to one, and if it is negative the operational cash flow is equal to the zero, AGE: the age of listing the company in the stock exchange, and it is equal to the natural logarithm of the number of the years that the company have been listed in the stock exchange, Foreign currency indicator: is a dummy variable that it is 1 for companies that have exports (sales by foreign currency) otherwise, it is zero, and the rest of the model indicates the level of managerial ability.

**C) The expected return rate of shareholders**
Since the company investors establish the balance between risk and return based on their own decisions, they are interested in estimating the future expected return of their investment with the help of reported information by companies and other evidence. Higher quality of provided information leads to a lower amount of ambiguity in estimating the expected return. And also, the risk of information will be reduced (Kordestani and Majdi 1386). Increasing the company's information risk leads to an increase in the expected return rate for incurred risk compensation to the investors (Francis et al., 2004). Lambert et al. (2007) believed that the tax avoidance activities could increase the expected return rate of shareholders by direct effect and their evaluation of companies' risks. The relationship between tax avoidance activities of companies and the level of expected return rate of shareholders can be directly followed based on the model of the Lambert et al., And also by evaluating the companies' risk by investors, which can lead to an increasing in the expected return rate of companies. According to the results of the previous researches, a significant and reverse relationship between tax avoidance activities and the expected return rate of investors is expected. So, based on the research by Abbasi and Bashiri Jouybari (1394), the profit index ratio to the industry moderated price, which indicates the evaluation of investors from the expected return rate of companies, will be used to calculate the expected return rate of shareholders. This index is calculated by the ratio of the return to the company price to the median return to the industry price (Francis et al., 2004). This index preserves the importance of profits that are small in comparison with the stock price, and it is an optimal standard of the expected return rate of shareholders.

**D) Company value**
Since tax avoidance is one of the crucial strategies of the company (Hanlon and Heitzman, 2010), so generally, tax avoidance by the company indicates the transfer of wealth from the government to the companies, and this action increases the company value. So it is expected that tax avoidance activities lead to an increase in company value, and there is a significant and direct relationship between them. According to the research by Jabbarzadeh Kangarloui (1395), we will use the q Tobin ratio for evaluating the company value. We use the ratio of the equity market value and debt book value to the company's asset book value for calculating this standard.

**E) Existence of audit committee**
The audit committee is one of the members of the elements of corporate governance, and the companies and shareholders rely on the judgment of the audit committee members for closer monitoring on fields such as risk, preventing the company resources wastage, accuracy of financial reporting, and observance the laws and regulations requirements (Jamei and Rostamian, 1395). The audit committee helps the shareholders to be sure that their benefits will reach their maximum by auditing (Etemadi and Shafakheibari. 1390), and it plays a crucial role in improving the control of the company (Baker and Owsen, 2002). So, the presence of an independent audit committee can affect tax avoidance activities (Francis, 2004) and reduce the tax avoidance of that company (Richardson et al., 2013). So, a significant and reverse relationship between the audit committee and tax avoidance is expected. To evaluate the audit committee based on the research by Richardson et al. (2013), we use a dummy variable. According to this variable, if the company has an audit committee, the value one is considered for it, and if it does not, the value zero is considered.

**F) Customer concentration**

The customer concentration is a criterion for evaluating the customer concentration and customer orientation of companies, and it is one of the most critical attributes of the relationship between customer and Supplier Company. Furthermore, customer concentration plays a vital role in companies' tax avoidance as an important attribute in the company's business operation (Huang et al., 2016). According to the available theoretical literature, companies with concentered customers have more motivation for cash holding, and there are many reasons in accounting literature for supporting this perspective. First, the company's dependence on the major customers requires more risks in the company's cash flows because losing one major customer can significantly reduce the company's cash flows (Dhaliwal et al., 2016). The second reason is that the companies with concentrated customers hold more cash to major customers be assure from the company's financial capability for continuing their activity and supplying the required products (Wang, 2012). The third reason is that the major customers are often interested in using their bargaining ability to earn suitable benefits from the supplier company, and this will cause low profitability and less cash flow with more volatility for the company (Gosman and Kohlbeck, 2009; Lane and Piercy, 2006). So, according to the mentioned reasons, the companies with more concentrated customers hold more cash. Since tax avoidance policies cause reducing in cash withdrawal from the company, so, it is expected that the companies with more concentrated customers also have more tax avoidance activities, and this shows that there is a significant and direct relationship between customer concentration and tax avoidance (Cen et al. 2017; Huang et al. 2016). So, according to the research by Mardani et al. (1397), and following Kordestani and Abbasi (1393) and Huang et al. (2016), we use the ratio of the company sales to the major customer to the total company sales for evaluating the customer concentration. The range of changes of customer concentration is from 0 to 1. A larger (smaller) amount of it indicates the higher (lower) customer concentration of the company. There is no standard or obligation in Iran for disclosing the major customers, but according to statement 131 of the financial accounting standard-setting board, if the income of sales to a customer is 10 percent or more than 10 percent of the total company's income,

disclosing this customer is essential in the financial statements (Kordestani and Abbasi, 1393). The current study has used this standard for determining the major customers.

**G) Corporate governance**

In recent decades, corporate governance has become one of the principal aspects of the business, and noticing that is increasing day by day. In the limited approach of corporate governance, the government has an important role as one of the principal stakeholders. So, the results of companies' operations lead to profit. In this perspective, even though the company does not consider itself obligated to improve the level of accountability for observing the other stakeholders' rights, it has to comply with the government's rights which is ruling the calculation and paying the taxes by force and law requirements (Babajani and Abdi, 1398). In the same way, Satori (2008) states that there is a reciprocity interaction between corporate governance and tax. Also, Gharanjik and Garkaz (1397) believed that corporate governance mechanisms reduce the company's tax avoidance. So, a significant and reverse relationship is expected between corporate governance mechanisms and the company's tax avoidance. We have used the following variables for measuring it by following Safari Gerayli and Rezaei Pitenoei (1397) and Heidari et al. (1395):

1) Institutional shareholders (INST): the institutional shareholders have more motivation and ability to receive timely information and evaluate the disclosure of the company's financial information. In this research, the total stock which is under the ownership of banks and insurances, investment companies, pension funds, investment banking companies, and mutual funds, and government institutions and bodies are divided by the total number of company's published stock for evaluating the amount of institutional shareholders ownership.

2) The board size (BS): the board size, which is one of the important parameters of corporate governance, means the number of directors (consists of inside and outside directors) of the company (Heidari et al., 1395).

**H) Smoothing the taxable income**

In the financial reporting framework, smoothing requires profit allocation at different periods to report the comparable figures during the year. One of the smoothing tools of the taxable income is income changing during the tax year, and also using the financial tools such as exchange option. For example, Schulz et al. (1992) observed that companies postponed their income confirmation in 1986 and 1987 for exploitation from tax rate reduction in the future. Also, to smooth taxable income, the tax strategies such as changes in methods of journalizing for detecting the income, investment laws, and iterative reductions can be used for speeding up the taxable income to possess tax benefits or tax credits (Hanway and Vance, 2010). So, a significant and reverse relationship is expected between smoothing the taxable income and tax avoidance. To evaluate the taxable income smoothing, we used the standard deviation of paid tax which is homogenized with the total assets from the past two years until the current year by following the research by Khodamipour and Roostaei (1393).

**I) Managerial overconfidence**

The overconfidence of the chief executive officer is defined as the capability of the CEO for a very positive prediction of the results (Malmendier and Tate, 2005). A director who has overconfidence will systematically overestimate the future return of the investment projects. In other words, this director overestimates the possibility and effect of the favorable incidents on the company's cash flows and underestimates the possibility and effect of unfavorable incidents on the company's cash flows (Heaton, 2002). So, it is expected that the directors who have overconfidence also have more capital costs (Ben et al., 2010). And these directors invest too much money in investments projects (Malmendier and Tate, 2005). Because of this increase in the capital costs (fixed assets), the depreciation expenses will increase, which will lead to low profit and lower tax. Based on the overconfidence of the directors, the corporate disclosure can reveal better the goals of the tax avoidance activities and the motivation of earning benefits by intra organization persons. So, it is expected that managerial overconfidence has a significant and direct relationship with the company's tax avoidance. So, to evaluate the managerial overconfidence, since this index indicates the number of excess investments in the assets, we can

use the ratio of the residual regression of the total asset growth to the sales growth, which can be estimated separately for each industry-year similar to the research by Scherand and Zechman (2011). If the residuals of regression are more than zero, this index will be equal to one; otherwise, it will be equal to zero. Using this index indicates that in companies whose assets grow at a higher rate than the sales, the directors invest more in the company compared to their counterparts.

**J) Auditor industrial specialization**

Nowadays, increasing the level of industrial specialization is one of the strategies used in accounting institutions for increasing the level of profitability. The meaning of auditor specialization in the industry is to make creative ideas for helping (creating value-added) the employer, also provide perspectives and new solutions for some issues that the employer is facing with them in the related industries (Kend, 2008). The auditor may have two different and separate roles at the same time, such as auditting and tax consulting of companies. According to the accounting literature, accounting institutions seek to educate their personals and professionals more, and increase the level of their specialty in various fields such as tax in a particular industry (Ferguson et al., 2003). Previous research has shown that the auditor's specialty and science in the tax and customer industry is one of the main factors that employer companies note for tax planning (Bonner et al., 1992). So it is expected that the presence of expert auditors in the industry has a significant and reverse relationship with tax avoidance. So, the market share approach is used to calculate the level of the auditor's specialty in the industry. Based on this approach, the auditor's specialty in the industry is an imaginary variable. If you suppose that the market share of a particular accounting institution is higher than the calculated proportion by the $\left(\frac{1}{number\ of\ available\ accounting\ institutions\ in\ the\ industry}\right) \times 0.5$ equation, in that case, the mentioned accounting institution is considered as an expert in the industry, and the value of the variable related to the specialty of the auditor will be one. And otherwise, it will be zero (Ebrahimi Kordlar and Rahmati, 1392).

Since using each one of the mentioned indexes alone may disrupt the measurement of the company's tax

avoidance, so in current research, a weighted composite index is used for every company for evaluating the company's tax avoidance. Using this comprehensive index reduces the skewness due to the single use of each affecting factor on the tax avoidance, and it provides a more accurate index for the test.

**Lack of liquidity of the company**: is the result of subtraction of the quick ratio as follows:

$$\text{Liquidity} = \text{quick ratio} - 1$$

**Quick ratio**: is calculated by the following formula.

$$\text{Current debt/ (inventory} - \text{current assets)}$$

**Reserve**: is estimated by the ratio of the company reserve to the total debt.

**Advanced receive**: is estimated by the division of the advanced receives to the total debts.

**Company's profitability:** two indexes are used for calculating profitability. The experts' desired index is obtained by the ratio of the net profit to the entire company's assets. Also, for fitting the comprehensive index model of the tax avoidance with profitability, the return index of the equity is used, which is calculated by the result of the division of the net profit to the total equity.

**Age of company:** the years of the company's activity since the date of its establishment.

**Interest coverage ratio:** is the ratio of the operating income (EBIT)[1] to the interest expenses.

**Non-debt tax shield:** is measured by the ratio of the depreciation to the total assets.

**Tangible assets:** is measure by the ratio of the tangible fixed assets to the total assets.

## Research findings
### Descriptive statics

To provide an overview from important attributes of the variables in the table (1), which were used in the evaluation of the company's tax avoidance, some descriptive statics concepts of these variables such as the number of observations, mean, minimum and maximum observations, and standard deviation are provided. As you see, the mean of the company's social responsibility is 13.128, and the mean of the

managerial ability is 0.003, and the mean of the shareholders' expected return rate is 6.587. The mean of the company's social responsibility indicates that most of the sampled companies own a high information disclosure such as information disclosure of the company's social responsibility. In addition, positive values of the median of the managerial ability score for the desired index show that the companies' directors are more interested in investments with a positive net value which is indicating that directors' ability is in the field of the company's investments.

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[1] Earnings Before Interest And Taxes

**Table (1). Descriptive statistics of the research's variables**

| variable | Mean | Median | Minimum | Maximum | Standard deviation |
|---|---|---|---|---|---|
| Company's social responsibility | 13.128 | 13.000 | 8.000 | 18.000 | 3.112 |
| Managerial ability | 0.0038 | 0.0039 | -0.005 | 0.0048 | 0.001 |
| Shareholders' expected return rate | 6.587 | 6.658 | 0.001 | 7.841 | 0.876 |
| Company's value | 1.482 | 1.308 | 0.489 | 6.527 | 0.612 |
| Existence of audit committee | 0.780 | 1.000 | 0.000 | 1.000 | 0.4138 |
| Customer concentration | 0.438 | 0.000 | 0.000 | 1.000 | 0.496 |
| Institutional shareholders | 0.350 | 0.243 | 0.010 | 0.991 | 0.318 |
| Board size | 4.493 | 5.000 | 3.000 | 7.000 | 1.456 |
| Smoothing the taxable income | 0.0247 | 0.0239 | -0.0003 | 0.0376 | 0.0076 |
| Management overconfidence | 0.504 | 1.000 | 0.000 | 1.000 | 0.499 |
| Auditor industrial specialization | 0.703 | 1.000 | 0.000 | 1.000 | 0.456 |
| Lack of liquidity | 0.834 | 0.796 | 0.358 | 3.809 | 1.684 |
| Profitability | 0.134 | 0.108 | 0.339 | 0.528 | 0.138 |
| Reserve | 0.051 | 0.043 | 0.034 | 0.069 | 0.016 |
| Advanced receive | 0.234 | 0.218 | 0.198 | 0.314 | 0.361 |
| Age of company | 6.87 | 24.00 | 5.00 | 15.00 | 16.00 |
| Source: research's findings | | | | | |

According to the fuzzy multiple-criteria decision-making technique, which has been explained in the research method section, the importance of desired final factors from experts' perspective for the company's tax avoidance is as follows:

The achieved results from the table (2) indicate that among considered 15 factors by experts' opinions and the results of studies, only the 12 mentioned factors in table 2 can affect the tax avoidance based on the final obtained weight. Factors of the company's social responsibility, the presence of an audit committee, and customer concentration were deleted from the model because of their low level of importance. So, we can state the obtained weight of each factor as follow:

$$
\begin{aligned}
ETR - Index_{it} = {} & 0.172P_1 + 0.148P_2 + 0.129P_3 \\
& + 0.124P_4 + 0.118P_5 + 0.096P_6 \\
& + 0.058P_7 + 0.044P_8 + 0.033P_9 \\
& + 0.031P_{10} + 0.019P_{11} \\
& + 0.028P_{12}
\end{aligned}
$$

In this model, $P_i$ is the standardized factor of affecting factors on the tax avoidance.

**Table2. Degree of importance according to the entropy for tax avoidance parameters from experts' perspective**

| Affecting factors | Managerial ability | Shareholders' expected return rate | Company's value | Corporate governance | Smoothing the taxable income | Management overconfidence | Auditor industrial specialization | Lack of liquidity | Reserves | Advanced receive | Profitability | Age of company |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wj(weight) | 0.019 | 0.028 | 0.096 | 0.033 | 0.044 | 0.031 | 0.172 | 0.058 | 0.148 | 0.129 | 0.118 | 0.124 |

**Calculating the company's tax avoidance**

**Table 3. Descriptive statistics of tax avoidance**

| variable | symbol | mean | maximum | minimum | Standard deviation |
|---|---|---|---|---|---|
| Tax avoidance | ETR | 0.598 | 0.652 | 0.515 | 0.035 |

The table 3 shows the descriptive statistics of the company's tax avoidance based on the provided model.

**Testing the first hypothesis of research**

According to the statistics section of the model estimation in the table (4), it is concluded that the F-test and its significance level indicate the regression significance (F statistic value is bigger than its critical value, and its level of significance is under 0.05 error level). Also, the moderated determination coefficient of the model is 50% which is a considerable amount and indicates the model's power. To test the first hypothesis of the research, since the acceptable level of significance is 95% and the significance level of the tax avoidance variable is (0.0004), so we can state that the first hypothesis is accepted and the direct relationship between tax avoidance and the company size is one of the standards of the company's attributes. Also, according to the significance level of the control variables of the research except for interest coverage ratio because of its significance level, which is more than 0.05, we can state that there is a significant relationship between control variables and the size of the company.

**Table 4. Estimation results of the first model of the research**

$$SIZE_{i.t} = \beta_0 + \beta_1 ETR_{i.t} + \beta_2 NDT_{i.t} + \beta_3 AST_{i.t} + \beta_4 ICR_{i.t} + \beta_5 Loss_{i.t} + \beta_6 LEV_{i.t} + \varepsilon_{i.t}$$

| variable | Dependent variable: company size | | | | |
|---|---|---|---|---|---|
| | coefficients | standard error | Statistics t | possibility | Hypothesis direction |
| Constant coefficient | 0.020 | 0.019 | 1.074 | 0.2837 | positive |
| Tax avoidance | 1.615 | 0.454 | 3.555 | 0.0004 | positive |
| Non-debt tax shield | 3.713 | 1.115 | 3.330 | 0.0010 | positive |
| Tangible assets | 0.095 | 0.038 | 2.474 | 0.0139 | positive |
| Interest coverage ratio | -0.003 | 0.006 | -0.482 | 0.6297 | negative |

| | | | | | |
|---|---|---|---|---|---|
| loss | 0.053 | 0.026 | 2.016 | 0.0448 | positive |
| Financial leverage | -0.311 | 0.0623 | -4.991 | 0.0061 | negative |
| Coefficient of determination | 0.532 | | | | |
| Moderated coefficient of determination | 0.508 | | | | |
| Durbin-Watson | 1.861 | | | | |
| F-test | 18.5126 | | | | |
| Possibility (F-test) | 0.00000 | | | | |
| Source: research findings | | | | | |

**Testing the second hypothesis of the research**

According to the statistics section of the model estimation in the table (5), it is concluded that the F-test and its significance level indicate the regression significance (F statistic value is bigger than its critical value, and its level of significance is under 0.05 error level). Also, the moderated determination coefficient of the model is 61% which is a considerable amount and indicates the model's power. To test the second hypothesis of the research, since the acceptable level of significance is 95% and the significance level of the tax avoidance variable is (0.0004), so we can state that the second hypothesis is accepted and the direct relationship between tax avoidance and the company's profitability is one of the standards of the company's attributes. Also, according to the significance level of the control variables of the research, which is less than 0.05, we can state that there is a significant relationship between control variables and the company's profitability.

**Table 5. Estimation results of the second model of the research**

$$ROA_{i.t} = \beta_0 + \beta_1 ETR_{i.t} + \beta_2 NDT_{i.t} + \beta_3 AST_{i.t} + \beta_4 ICR_{i.t} + \beta_5 Loss_{i.t} + \beta_6 LEV_{i.t} + \varepsilon_{i.t}$$

| variable | Dependent variable: company size | | | | |
|---|---|---|---|---|---|
| | coefficients | standard error | Statistics t | possibility | Hypothesis direction |
| Constant coefficient | 0.098 | 0.031 | 3.068 | 0.0023 | positive |
| Tax avoidance | 3.529 | 1.150 | 3.068 | 0.0000 | positive |
| Non-debt tax shield | 4.128 | 1.343 | 3.072 | 0.0000 | positive |
| Tangible assets | 0.162 | 0.071 | 2.268 | 0.0142 | positive |
| Interest coverage ratio | -0.086 | 0.041 | -2.076 | 0.0387 | negative |

| | | | | |
|---|---|---|---|---|
| loss | 0.076 | 0.020 | 3.647 | 0.0000 | positive |
| Financial leverage | -0.557 | 0.257 | -2.162 | 0.0311 | negative |
| Coefficient of determination | 0.692 | | | | |
| Moderated coefficient of determination | 0.613 | | | | |
| Durbin-Watson | 1.982 | | | | |
| F-test | 21.3617 | | | | |
| Possibility (F-test) | 0.00000 | | | | |
| Source: research findings | | | | | |

### Testing the third hypothesis of the research

According to the statistics section of the model estimation in table (6), it is concluded that the F-test and its significance level indicate the regression significance (F statistic value is bigger than its critical value, and its level of significance is under 0.05 error level). Also, the moderated determination coefficient of the model is 61% which is a considerable amount and indicates the model's power. To test the third hypothesis of the research, since the acceptable level of significance is 95% and the significance level of the tax avoidance variable is (0.0004), so we can state that the third hypothesis is accepted and the direct relationship between tax avoidance and the company's growth is one of the standards of the company's attributes. Also, according to the significance level of the control variables of the research, which is less than 0.05, we can state that there is a significant relationship between control variables and the company's growth.

**Table 6. Estimation results of the third model of the research**

$$GWT_{i.t} = \beta_0 + \beta_1 ETR_{i.t} + \beta_2 NDT_{i.t} + \beta_3 AST_{i.t} + \beta_4 ICR_{i.t} + \beta_5 Loss_{i.t} + \beta_6 LEV_{i.t} + \varepsilon_{i.t}$$

| variable | Dependent variable: company size | | | | |
|---|---|---|---|---|---|
| | coefficients | standard error | Statistics t | possibility | Hypothesis direction |
| Constant coefficient | 0.098 | 0.031 | 3.068 | 0.0023 | positive |
| Tax avoidance | 3.529 | 1.150 | 3.068 | 0.0000 | positive |
| Non-debt tax shield | 4.128 | 1.343 | 3.072 | 0.0000 | positive |
| Tangible assets | 0.162 | 0.071 | 2.268 | 0.0142 | positive |
| Interest coverage ratio | 0.086 | 0.041 | 2.076 | 0.0387 | positive |
| loss | 0.076 | 0.020 | 3.647 | 0.0000 | positive |
| Financial leverage | 0.557 | 0.257 | 2.162 | 0.0311 | positive |
| Coefficient of determination | 0.692 | | | | |

| Moderated coefficient of determination | 0.613 |
|---|---|
| Durbin-Watson | 1.982 |
| F-test | 21.3617 |
| Possibility (F-test) | 0.00000 |
| Source: research findings | |

## Conclusion

The tax avoidance issue is presented mostly for companies that have separation of ownership and control because real persons are less involved in tax avoidance and evasion because of the possibility of being detected and fined, and also for risk aversion and intrinsic motivations such as social duty. However, the company's shareholders usually expect a reduction in tax debts and an increase in tax avoidance by directors. So, tax avoidance can be a reflection of the agency theory, and it can lead to some tax decisions that follow the director's benefits. Because of this, finding control methods and motivations for minimizing the agency expenses is one of the challenges that the shareholders and board are facing. In the same way, the tax avoidance issue is one of the favorite topics for researchers. Indeed, the measurement techniques improvement is the origin of the significant part of the literature enhancement in every field. In financial literature, there are various indexes for measuring the company's tax avoidance. Since the level of tax avoidance is not directly observable, so the researchers have used some affecting factors on tax avoidance. The current study aims to provide a new model for evaluating the companies' tax avoidance and the effects of the company's attributes on the tax avoidance based on the provided model, which is introduced for the first time. In Iran's economy, tax avoidance can be one of the biggest problems facing the tax system. Tax avoidance is defined as the legal use of the tax system for personal gain, in order to reduce the amount of tax payable by means of the law itself. According to the Definition of Slimard (2004) the legitimate type of tax avoidance arises from the difference between tax laws and accepted accounting principles. During the recent period, the literature of tax avoidance has grown dramatically and the impact of many factors inside and outside the company on the issue of tax avoidance has been investigated. Among these factors we can mention the effects of company size, Financial Leverage, Optional item reporting rate, Revenue Transfer, Corporate Governance factors and Board Features, Information content of taxable income, reputation of CEOs, independent managers, quality of internal information and quality of company disclosure and agency costs For example, Ming and Noga (2010) have also conducted studies showing that companies with the lowest amount of independent boards and the highest amount of bonuses to CEOs and boards of directors are doing more tax avoidance. Also, Jalilian et al. (2019) expresses tax avoidance as a kind of use of legal gaps in tax laws to reduce taxes. In line with the findings of Kim et al. (2017), which suggest that tax avoidance has an adverse effect on the corporate information environment, tax avoidance also requires the use of a complex structure that allows managers to manipulate the company's performance criteria. Assuming companies potentially face agency conflicts, the negative impact of tax avoidance on the company's information environment allows managers to divert company resources in the long run .This argument suggests that tax avoidance is to the detriment of the interests of a company's shareholders. As Desai and Dharmapala (2009) put it, opportunistic managers can use tax avoidance techniques to advance their interests and create tensions between managers and shareholders in tax avoidance.

In this research, a weighted composite index is used to evaluate the companies' tax avoidance. After determining the affecting factors on tax avoidance and their weight by experts, the suggested model of the research was presented. In the suggested model, the measurement of the companies' tax avoidance based on the fuzzy model is a new index to evaluate the companies' tax avoidance. We can simply calculate the tax avoidance of a particular company at any time by using this model and considering every one of the affecting factors on the company's tax avoidance.

Also, this model provides the possibility of knowing that the tax avoidance of a company is low or high.

Also, the results of the analysis of the research theories show a significant and direct relationship between tax avoidance and the company's attributes, such as the size of the company, profitability, and growth of the company. We can conclude from the obtained results that directors try to avoid paying the company's taxes according to the sizes of companies, transactions volume, and opportunistic behaviors. Also, the profitability as an attribute of the company can cause that the companies with high profitability avoid paying taxes, so directors can achieve most of the benefits. The obtained result is aligned with the researches by Chen et al. (2016) and Kumar Panda and Nanda (2020).

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