The moderating effect of the firm size on the relationship between the financial crisis and the ownership structure (Evidence from Tehran Stock Exchange)

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ABSTRACT

The present research has been performed to investigate the moderating effect of the firm size on the relationship between the financial crisis and the ownership structure among the companies listed on the Tehran Stock Exchange. Current research is an applied and descriptive-correlative study. The research statistical society included the accepted companies on the Tehran Stock Exchange (TSE). The period of the data acquisition was the period 2014 to 2019. To gather the required data and also to measure the research variables, the data of the previous performance of the related institutions were used. To analyze the gathered data, SPSS and EVIEWS softwares have been used and the obtained results show that the relationship between the financial crisis and the ownership structure is significant but the relationship between the firm size and the ownership structure is irrelevant. On the other hand, the results confirmed that the firm size moderates the relationship between the financial crisis and ownership structure.

Keywords:

1. Introduction

The financial or economic crisis refers to a wide range of situations in which some of the financial resources lose a large part of their nominal value. In the 19th and early 20th centuries, many financial crises were due to the banking crisis and many economic crises happened during these crises. The other situations, which are known as financial crises, include the stock market crash, bursting the economical bubbles, and the monetary unit crisis. The ownership structure is one of the important elements when different economical systems are compared. The economic system that is considered for ownership is based on theoretical bases that the investigation of these bases is crucial in understanding and explaining this structure. The firms' ownership structure can be very various and a wide range of real and legal shareholders can play a role in this structure. The shareholders of any company consist of individuals and institutes with different interests, goals, investment horizons, and different abilities.

Capital allocation which is the most important factor for production and economic development is done optimally. Capital market effectiveness significantly helps the economic development of countries. When the capital market is effective, the share price is very close to the share intrinsic value and the savings will be allocated optimally to profitable investments so that it will be beneficial for investors and also be a significant help for the economy of countries. Investors are drivers of the capital market and providers of financial resources for companies. Thus, for optimal allocation of resources in the economy of countries, investors need to have enough knowledge about financial science (Dastgir, 2014). Investing in different projects is crucial in the growing procedure of Companies. As higher the net present value of these investments, it can expect that the future cash inflow to the company increase. The company can perform other investments with this obtained cash which leads to the growth and development of the company. But this growth and investment require resources to finance the projects. In the current economy, large cartels have enough power to make political and even geographical changes in regions and certainly, they have more resources in comparison to the small and medium companies. Thus, their access to these resources can help them in implementing profitable projects, the profitability guarantee, and the

future growth of the company (Dastgir, 2014). The firm size is used as a variable for accessing the capital market because increasing capital is easier for big companies due to stable presence and they have more assets to support the creditors; therefore the firm size is related to cash reminding negatively (Karami & Omrani, 2015). In the present research, it has been considered the moderating effect of firm size on the relationship between the financial crisis and the ownership structure on the TSE.

Literature review

In Moin Encyclopedic Dictionary (2005), ownership means the right that a human has respect to a thing and he/she can have any possession on it unless in cases that law excepted, and the ownership structure means determining the composition of the company's shareholders and in some cases, it means determining the final major owner of company's share (Etemadi et al, 2009). Since some owners based on their ownership percentage have more effective control over their own company, the ownership structure (including owners' specifications and their ownership percentage) is considered a potential element in company governance (Barzegar et al, 2016). Based on Osta (2011), ownership is categorized into four different classes: institutional ownership, corporate ownership, managerial ownership, and foreign ownership. Many economic theorists believe that any of the ownership classes can affect the companies' performance (Etemadi et al, 2009).

The financial crisis is called to a wide range of situations that in them, some financial resources lost a large part of their nominal value. In the 19th and early 20th centuries, many financial crises were related to banking crises, and many economic crises happened during these crises. Other cases, which are called financial crises are: stock market crash, bursting economic bubbles, and currency unit crises (Yazdani & Esmaeeli, 2017). Gordon (1971), in the first academic study on the financial crisis, defined it as the company's profitability reduction that increases the possibility of interest and debt insolvency. Whitaker (1999) considered the financial crisis as a situation that the company's cash flows are lower than the sum of interest costs related to long-term debt. In the financial field, a financial crisis starts to happen in a company, when it has difficulty in fulfilling its obligations to creditors. A company's debt may be used to finance its

activities but this increases the possibility of experiencing a financial crisis (Kordestani et al, 2014). If the company's financial crisis doesn't improve, it will lead to bankruptcy. Accountants should have a good knowledge of the main causes of bankruptcy because they are the ones that can inform the management before bankruptcy occurrence and offer preventative solutions (Newton, 1998). Predicting the companies' financial crisis and bankruptcy always has been an interesting subject for investors, creditors, and governments. Timely detection of companies that are on the verge of bankruptcy is very desirable. Since the capital market of Iran is young and is not considered an efficient market, scientific research can develop theoretical foundations for this market so that information published by the TSE becomes useful for decision makings of ownerships and potentially investors (Mirjalili, 2015).

In many previous studies, the firm size is representative of different aspects of the company. The firm size can be representative of the company's leverage. The leverage here is defined as fixed costs in the cost list of the company. The operational leverage depends on operational fixed costs (all fixed costs except the interest of debts) and the financial leverage depends on financial fixed costs such as interest or profit of loans. The operational and financial leverages are tools to achieve more earnings. The firm size can be representative of competitive advantage. Since obtaining more market shares requires more production and sales, thus the availability of enough financial resources and being enough big in size can result in more production and a better marketing situation so these can create a competitive advantage. The firm size can be representative of management ability and the quality of accounting plans. The firm size can be a result of strong management that tries to enhance the company's economical resources by using accounting plans. The firm size can be the indicator of information effectiveness. Typically the bigger companies are more attractive to analysts and investors, so accounting information is more efficient in these companies. And finally, the firm size can be representative of the company's total risk. Higher financial strength can reduce the company's total risk because the bigger companies are more reliable since they are well-known from the viewpoint of financial analysts. The relation between earnings management and firm size was considered by some accounting analysts. Since there are ambiguities in the prediction of earning, only those managers can be successful that their earning quality is higher. Also bigger companies, due to being well-known to analysts, have less motivation to smooth the earnings. Albert and Richardson considered the company size along with industry type (core and periphery) in relation to earning management and concluded that in the core industries, the bigger companies have a smoother earning in comparison with big companies belonging to periphery industries. To sum up, those authors who focused on firm size asked this question "Do the firms with different sizes show different reactions in relation to earning management and smoothing?" (Shoorvarzi & Pahlavan, 2010).

Ahadi (2018) in his MA thesis considered the effectiveness of financial crisis prediction patterns and for this purpose, he investigated and compared the predictive power of non-going concern or going concern by using the ZIMSKI, SPRINGATE, and ALTMAN patterns. His results showed that these patterns have the ability to predict non-going concern in the companies listed on the TSE. But there is a significant difference between their results.

Makkian et al. (2019) to predict the financial crisis used the neural network model along with logistic regression and audit analysis as two statistical methods to compare the results and used a model to predict the bankruptcy of design and manufacturing companies in Kerman Province (Iran). Obtained results showed that the neural network model has merits over the other two methods.

Saeedi (2019) considered the financial distress of companies by using the Bayesian networks and for this purpose, offered two models developed by using the Bayesian networks and one model developed by using logistic regression. The first model is a simple Bayesian network. It is based on conditional correlation which can predict healthy and unhealthy companies with an accuracy of 90%. The second model that is based on conditional possibility has an accuracy of 93%. Finally, the accuracy of the logistic regression is 90%. Namazi and Kermani (2017) considered the relationship between ownership structure and performance of companies listed on the TSE. Their results obtained by using the panel data showed that there is a negative and significant relation between institutional performance and company performance and there is a positive and significant

relation between corporate ownership and performance. In addition, they showed that managerial ownership negatively and significantly affects the corporation performance. Yazdanian (2016) investigated the information of four mechanisms of corporate governance system including the institutional investors' ownership, presence of non-executive managers in board combination, separation of CEO from board chairman, and internal audit presence extracted from 177 companies and considered their relation with earning management by adjusted Jones model. Obtained results showed that when the ownership percentage of institutional investors in companies is higher than 45%, the earnings management will reduce. In addition, his findings showed that there is not a significant relationship between the presence of non-executive managers in the board combination, the absence of the CEO as chairman or vice chairman of the board, and internal audit presence in Iranian companies with earnings management. Cheng (2018) proposed the financial distress prediction model which is a combination of neural network learning methods and the Logit model. He used the radial basis function network (RBFN) to develop a prediction model. In this study, the superior performance of the proposed RBFN compared with logit traditional analysis of neural networks. He used seven variables (3 quantitative and 4 qualitative variables). The statistical society included 64 Taiwanese companies established on Stock Exchange and were challenged with financial distress in 2004. Obtained results showed that the proposed RBFN model has merits over the other two models in accuracy and also the precision of prediction of the unknown data.

Wu (2017) obtained the following results by considering the significant role of ownership structure in debt financing policies in a sample including 833 Japanese firm-year observations during 8 years: 1) there is a significant and positive relation between debt and free cash flow that it is stronger in companies with low growth opportunities in comparison with companies with high growth opportunities; 2) in companies with low growth opportunity, the institutional investors prevent the managers from over-investment; 3) in companies with high growth opportunity, the institutional investors support the more borrowing.

Zhang and Lin (2016) compared the predictive ability of four widely used financial distress models and offered reliable predictive models for industrial companies in Taiwan. Multiple audit analysis, Logit, PROBIT, and artificial neural networks were their methods. In their study, 20 variables were used to progress a predictive model for financial distress. Their results showed that Logit, Probit, and neural networks have higher prediction accuracy and can be generalized.

Zingales (2016) considered the companies' growth relation and concluded that the companies with higher assets have the ability to beat the competitors in the market. In comparison with their competitors, they can have higher growth and use the power of their assets to gain the market share and use their internal resources and assets for implementing their plans and projects. In addition, financial leverage is used less. Also, in this study, Zingales concluded that companies with high sales due to high cash inflow to the company, in comparison with other companies can provide the resources more easily. Therefore, the growth of these companies is faster than other companies. In conclusion, Zingales considered cash resources and no financial constrains as effective factors in companies' growth.

Coli and Covadrini (2015) in their research examined the relationship between firm size, growth, and age of the company. They examined the non-linear relation between companies' growth, age, and size and considered the non-linear function of the company's age. Their results imply that the relation between the company's age and growth is a non-linear and inverse relation; by increasing the company's age, its growth reduction will reduce exponentially. Also, they obtained an inverse linear relation between the size and the growth of companies.

Ivan (2014) proposed a relationship between companies' size, growth, and age based on the information extracted from economical bases and organizational age. Obtained results showed that there is a negative relationship between the companies' growth and size and a negative relationship between their growth and age. Ivan believed that older companies have older technology and they have considerable assets and their growth is not the same as new established and young companies. Additionally, he stated that big companies have a small growth, due

to a lot of business activities, but their progress is slow.

In the present study, we want to examine the moderator effect of firm size on the relationship between the financial crisis and ownership structure in the companies listed on the Stock Exchange. Thus, we present the research hypothesizes as follows:

H1: The financial crisis and firm size affect the ownership structure of the companies listed on the Stock Exchange.

H2: The firm size has a moderator effect on the relationship between the financial crisis and ownership structure in the companies listed on the Stock Exchange.

Research methodology

Since the main aim of the present research is to help managers, shareholders, and actual and potential investors and other stakeholders, this study is categorized as an applied research. The moderator effect of firm size on the relationship between the financial crisis and ownership structure will be investigated and determined in the companies listed on the TSE. Since the relation between the above variables will be identified, thus this study is a descriptive-correlative research. This method of research is suitable for studies that their aims are to determine the causes of the definite relations that happened in the past. The statistical society in this res earch includes the established companies on the TSE. The research period was from 2014 to 2019. The sample is selected based on the following criteria:

1) The selected companies should be members of established companies on the TSE from early 2014 until the end of 2019.

2) The selected companies should not change their financial year during the research period.

3) The type of companies' activity should be manufacturing and commercial. Those companies that belong to investing companies, financial intermediation, banks, and financial and credit institution groups, are excluded. The financial intermediation companies are eliminated because their type of activities and their accounting-numbers economical nature are different significantly from manufacturing and commercial companies.

4) To be able to compare the results, their financial year should be ended on March 20th.

By considering the above research limitations, 97 companies have been selected as the research sample.

3.1. The regression model and measurement method of research variables

To test the research hypothesizes, we use the following regression model (Mohamud Jama Ali and Elegwa Muluklu, 2016):

$$Model\ 1: Own\_Stru = \beta_0 + \alpha_0 Fin\_Cris + \alpha_1 Size + \varepsilon_0$$
$$Model\ 2: Own\_Stru = \beta_0 + \alpha_0 Fin\_Cris + \alpha_1 Size + \alpha_2 Fin\_Cris * Size + \varepsilon_0$$

Where, *Own_Stru* is the ownership structure, *Fin_Cris* is the financial crisis, *Size* is the firm size, β_0 is a constant and ε_0 is the model error.

The Model (1) measures the effect of the financial crisis and the firm size on the ownership structure of the companies established in Stock Exchange. If α_1 and α_2 be positive coefficients, it means that financial crisis and firm size variables have a positive and significant effect on the ownership structure. Therefore, the first hypothesis (H1) is accepted and if this relationship does not be significant, the H1 is not acceptable.

The Model (2) measures the moderator effect of the firm size on the relationship between the financial crisis and ownership structure in companies accepted on the TSE. If this model is statistically significant, it means that the firm size variable has an effect on the relationship between the financial crisis and the ownership structure. Thus, the second hypothesis is acceptable.

Investigating the collinearity between variables

In this section, to make sure that there are no common effects between variables and also, to prove the lack of any collinearity between variables, the variance inflation factor (VIF) is computed. The values of all VIFs are smaller than 10 and therefore, there is not any collinearity between the explanatory variables. Table 1 shows the VIF values for the explanatory variables.

Table 1. The value of the variance inflation factor (VIF) for different variables

Variable	VIF
The Ownership structure	1.009
The Financial crisis	1.215
The Firm size	1.070

Chow and Hausman's test

The results of Chow's test are illustrated in table 2.

Table 2. The results of Chow's test for the research model

Test result	Prob	F value
Null hypothesis reject	0.0000	95.96

As it can be seen in the table, the value of *Prob* is smaller than 0.05, and therefore, the hypothesis that the width from the origin is the same; is not valid. Thus, in this step, the panel data model is accepted. Then, the fixed effects model against random effects model should be examined. For this purpose, the Hausman's test is used and its results are shown in table 3.

Table 3. The Hausman's test results for the research model

Test result	Significance level	Square value of K
Null hypothesis not rejection	0.5558	682

Since the significance level of the test is higher than 0.05, thus the zero hypothesis isn't rejected. It means that the random effects model is more effective. Therefore, the research model is estimated by the random effects method.

Results

In this section, the research model will be evaluated to consider the significant relationship between the financial crisis and the ownership structure and also, to examine the moderator role of the firm size in this relationship. The coefficients of the effect estimated computed by the random effects method are summarized in tables 4 and 5.

Table 4. The model estimation results by considering random effects

Independent variable	Symbol	Beta	Standard deviation error	t-student value	Significance level	VIF	result
Width from origin	β	178.138	41.3103	4.3122	0.0012	-	Confirmed
Financial crisis	Fin-Cris	0.423	0.138	-3.066	0.028	1.215	Confirmed
Firm size	Size	20.250	6.162	-3.286	0.022	1.070	Confirmed
R^2-adjusted Determination coefficient	0.42	Durbin-Watson					1.624199
F value	9.915229	ARCH test value					0.07292
F-test	0.009261	ARCH test significance level					0.7926

Table 5. The model estimation results by considering random effects

Independent variable	Symbol	Beta	Standard deviation error	t-student value	Significance level	VIF	result
Width from origin	B	83.0932	35.7849	2.3220	0.0426	-	Confirmed
Financial crisis	Fin-Cris	0.01554	0.041	-2.9	0.04	1.215	Confirmed
Firm size	Size	3.9811	2.191	-0.95	0.39	1.070	Rejected
Firm size× financial crisis	Fin_Cris×size	0.605	0.657	0.059	0.00	-	Confirmed
R^2-adjusted Determination coefficient	0.75	Durbin-Watson					1.55738
F value	19.8094	ARCH test value					0.850132
F-test significance level	0.000332	ARCH test significance level					0.3782

Since the obtained significance levels in table 4 are less than 0.05, it reveals that the relationship between the independent variable of the financial crisis and the ownership structure is significant and the relationship

between the firm size and the ownership structure is significant as well. Therefore, the first hypothesis is confirmed. On the other hand, the obtained significance levels in table 5 illustrate that the relationship between the financial crisis and the ownership structure is significant but the relationship between the firm size and the ownership structure is not significant. By considering the mutual effect of firm size on the relationship between the financial crisis and the ownership structure, it reveals that the firm size moderates this relationship, and therefore, the second hypothesis of the research is confirmed.

4.1 The results of the model goodness-of-fit tests

Based on the indices of goodness-of-fit of the model, it can be seen that the significance level of the statistics of F computed by the analysis of variance in all three models is less than the first type error of 0.05, and it shows the significance of the estimated regression model. Also, the adjusted R.Squared coefficients of the model also show that in the first model, 42% and in the second model, 75% of the variations in the dependent variable are due to the changes of the independent variables.

4.2 The results of the initial assumptions of regression Tests

The results of Durbin-Watson's statistic estimation in order to confirm the independence of the error components show that the estimation of this statistic approximately is equal to the experimental value of 2 and therefore the assumption of the independence of the error components can be accepted.

The obtained results of the significance level of the ARCH test for all three models that have been analyzed to check the lack of heterogeneity of variance among the error components are higher than 5%, which indicates that the opposite hypothesis i.e., the homogeneity of variance between the error components of the model is not rejected, thus the initial assumptions of the regression are valid.

Discussion and conclusions

The obtained results showed that the relationship between the financial crisis and the ownership structure is significant but the relationship between the firm size and the ownership structure is not significant.

On the other hand, it revealed that the firm size moderates the relationship between the financial crisis and the ownership structure. These findings were in agreement with previous studies such as Saeedi (2019), Namazi and Kermani (2017), Mashayekhi and Farhadi (2015), Ivan (2014), Coli and Covadrini (2015). Based on obtained results, the relationship between the financial crisis and the ownership structure is significant and this means that the probability of bankruptcy in the companies with a weak ownership structure is higher than the other companies, thus the ownership structure of these companies should be modified to avoid companies from the financial crisis. Based on the obtained results, the firm size moderates the relationship between the financial crisis and the ownership structure. Thus, we can conclude that in the bigger companies, the owners' ability to monitor the company's activity is reduced and the possibility of opportunistic behaviors such as tax management is provided. Based on the results of the present research, it is recommended that tax authorities should be more careful to detect those companies that significantly avoid tax payments, particularly those companies with financial distress and especially during economic recession periods. In addition, knowing the relation between tax avoidance and the financial crisis level of these companies likely is useful and valuable for investors in evaluating the risks related to future cash flows and investment costs. Ignoring the ownership structure has negative influences on the company credit, and it increases the future risks of tax debts and related crimes, and finally leads to a financial crisis, thus it is suggested that investors and other stakeholders consider the results of this study in their decision makings. In order to reduce the financial and credit risks of the company, before establishing any strategy, it is obligatory to repair the ownership structure and the firm size.

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