The Analysis of the Relationship between Board of Director Composition and Risk Management in the Firms Listed in Tehran Stock Exchange

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Abstract

The purpose of this study is to investigate the relationship between the composition of board of directors and risk management. In this study, for each of the variables related to the composition of the board, including board size, board independence and financial literacy of the board, CEO duality functions, the board meeting frequency, as well as the two control variables, firm size and financial leverage, a hypothesis is formulated and its impact upon the risk management is investigated. The research population consists of the companies listed in Tehran Stock Exchange during the years 2007-2012. The sample consists of 107 companies from 20 different industries. The correlation and multiple regression tests were used to examine the hypotheses. The results indicate that there is a significant positive correlation between the size of board of directors, board meeting frequency, financial literacy of the board, the CEO dual functions, controlling variables and risk management. But, there is no significant correlation between the independence of the board of directors and risk management.

Keywords: RISK MANAGEMENT, SIZE OF BOARD OF DIRECTORS, FINANCIAL LITERACY OF BOARD OF DIRECTORS, BOARD MEETING FREQUENCY

Introduction

The composition, arrangement, level of expertise, literacy of the board of directors, and the number of board meetings held during the financial year are all part of the corporate governance mechanisms and have special correlations with one another according to theoretical principles of corporate governance and risk management. Nowadays, this is widely accepted in financial literature that risk management can lead to conflicts of interest between managers and shareholders; this conflict is exacerbated specially at the time when executive directors receive reward based on the stock options. However, the board is always expected to approve the company's risk management objectives and policies and monitor the methods used to achieve those objectives.

Research Statement and Significance

The complexities of the conflict of interests of managers and owners, on the one hand, and the significance of the firm performance upon other stakeholder groups, on the other hand, has long been considered by governments, professional associations and community groups, hence their serious preoccupation to come up with an appropriate model. The main concern is first to keep the owners and the interests of minority shareholders. The circle of stakeholder groups gradually widened to include creditors, customers, employees and finally the whole society (Hosseini, 2007). With the development of privatization, the creditors show sensitivity toward collecting the principal and secured interest of the loans granted in comparison with
the time when the companies were state-owned. The new owners of companies are seeking to increase the financial strength of their companies in settlement of principal and secured interest of the loans and to reduce financial costs. Because of the nature of trade and investment activities due to which taking profit entails taking risk, risk plays a key role in financial markets. Therefore, it should be recognized, measured, and predicted so that it can be managed (Fadaeinejad and Iqbal Nia, 2011). Therefore, regarding the importance of these issues, the analysis of the correlations between the board of directors and risk is deemed necessary.

**Review of Literature**

In agency theory, the most important duty of the board is to control and the composition of the board plays a significant role in boosting the performance of its controlling function. As a means of controlling in the company, the board composition determines the power of the board. Thus, the board composition is an important factor in explaining members’ ability to perform tasks and to help the company. The corporate governance literature lists out four sets of features for the board as follows: composition, characteristics, structure, and process. The board composition is related to the number of various board members: inside/outside, female/male, foreign/native, and the members’ dependence upon other companies. The features of board of directors include the records of the members such as experience, tenure, practical records, independence, share ownership, and other variables that affect the interests and functions of the members. The structure of the board of directors includes organization of the board, the role of the dependant boards of directors in holding companies, committees of boards of directors, the formal independence of one-class and two-class boards, the board leadership, and the information flow among the board structures. The process of board of directors reflects the decision-making processes, the board styles, the number and length of board meetings, observation of the board ceremonies and plans, and the culture of the board in evaluation of the board members (directors). Based on the above characteristics, there are different theoretical perspectives toward board of directors and each of which has a different view upon the importance of these features. (Rezaei and Qalibaf Asl, 2007).

Rasaeian et al (2010), in a research, indicated that there was a significant negative correlation between cash maintenance and percentage of dormant members of the board of directors in the companies listed in Tehran Stock Exchange.

Izadinia and Rasaeian (2010), in a research, showed that there was no significant correlation between the percentage of dormant board members and the company’s value. Khedmati Hampa (2009) in his Master's thesis concluded that the number of dormant members of the board of directors did not have any impact upon the company's income smoothing. Aghayan and Chalaki (2010), in a research, showed that there was a significant negative correlation between board independence and earnings management; however, there was no significant correlation between the CEO’s influence, the CEO duality functions, board size, CEO’s tenure on the board, and risk management. Azazi et al (2011), in a research, showed that there was a significance correlation between risk, return, and firm size.

Setayesh et al (2010), in a study, showed that the percentage of the dormant members of the board had impact upon smoothing of gross margin and institutional ownership, and managing ownership upon operating income soothing and net income. Also, the sameness of the chairman and managing director does not have impact upon income smoothing. Ahmadpour et al (2010), in a study, concluded that with the incentive to manipulate earnings being high, and dormant directors and institutional investors play a poor role in reducing accrual anomaly.
Kumara and Guo (2012) in their research on Exchange Firms of Colombo in Sri Lanka, found a weak correlation between the size of the board, the board of directors, and company's value. Also, there was a negative correlation between the dormant members of the board and the firm's financial performance; hence a negative correlation between the dormant members of the board and the return of assets gained which is not significant.

Zhou et al (2011), in their study, indicated that there was a significant positive correlation between corporate governance and the performance of Chinese companies listed.

Wang et al (2012), in their study in the United States, showed that the size of the board, outside directors, CEO duality, the average age of directors, and chairman of the board (the separation of the chairman from the executive manager) had a negative impact upon holding bank companies. Le (2009) in a research stated that the companies with a greater share of the dormant directors in the board, the separate positions for CEO and Chairman, and a smaller board would have smaller cash maintenance. Shiu-Wan Huang et al (2012), in a research, showed that the size of the board, the average age of directors, and the percentage of senior owner managers of foreign shareholders all indicated a significant positive correlation with firm performance. The number of committees and the duality of institutional ownership have a negative correlation with performance.

Nimalathasan and Pratheepkanth (2012) in their research in Sri Lanka studied a 5-year period from 2007 to 2011. The results show a positive correlation between systematic risk management and profitability. Prasetyo (2011) studied 118 companies in Indonesia in the period between 2000 and 2009. The results showed that there was a significant correlation between corporate governance and systematic risk. Guangming et al (2011), in a study, analyzed 833 Chinese companies in 2006. Their results showed that corporate governance can reduce the cost of capital. Ldamn et al (2010) studied 205 Australian companies in the time period of 2007-2009. Their results showed that corporate governance may better reduce risk and also the company's cost of capital.

**Variables**

In order to test the hypotheses of this study, the variables are divided into three groups of independent variables, dependent, and controlling.

Board size: From the agency point of view, one could argue that a larger board is more likely to be alert to the agency problems. Because, more people will supervise the work of the management (Nicholson, 2003).

Board meeting frequency: Vafis (1999) showed that by increasing the board meeting frequency, the performance of the commercial unit is improved.

Board independence: in the present study, the ratio of dormant members of the board to the total members of the board of directors is used to measure the independence of board members. The dormant board member is the member with no the executive responsibility in the company (Kumara and Giu, 2012).

Financial literacy of the board: In order to oversee the management and participation in decision-making, the board of directors requires a variety of skills such as accounting, banking, and law to be effective for increasing the company's value (Hillman and Patzvl , 2000).
The Chairman and Managing Director being the same: the lack of managing director in the position of the CEO plays an important role in the efficiency of the function of the board (Setayesh et al, 2011).

In this study, the risk management of the companies listed in Tehran Stock Exchange is considered as the dependent variable, which is defined as follows: Risk management is the process through which an organization or an investor reacts against different kinds of risks, in an optimal manner. Accordingly, the risk manager should identify all kinds of risks, then measure them, and assess their effects on the financial situation of the Organization or institution, and finally use appropriate means to reduce or eliminate the risk (Ebrahimi, Ghanbary; 2006). In this study, the Sharpe single index model where beta is defined as the systemic risk indicator is used to estimate risk. The size and structure of corporate debt also have been used as control variables in this study.

Research Hypotheses
1. There is a significant correlation between the board size and risk management of the listed companies in Tehran Stock Exchange.
2. There is a significant correlation between the board independence (the percentage of dormant members of the board) and risk management of the listed companies in Tehran Stock Exchange.
3. There is a significant correlation between the board meeting frequency and risk management of the listed companies in Tehran Stock Exchange.
4. There is a significant correlation between the financial literacy of the board and risk management of listed companies in Tehran Stock Exchange.
5. There is a significant correlation between the sameness of Chairman and Managing Director (CEO duality task) and risk management of the companies listed in Tehran Stock Exchange.
The Research Methodology
The type of the study is applied research and the method used in it is descriptive (correlation) in terms of purpose. As for the method of analysis, it is a correlational research using a post-hoc approach (from the past information) and is employed for collecting data needed from the Tehran Stock Exchange's website. The software used is also Rahavard-e-Novin. For the data analysis the software SPSS, Exius, and Excel were used.

Research Population and the Sample
The population of the research includes all companies listed in Tehran Stock Exchange, from 2007 to 2012. As for sampling, just like (Kumara and Guo, 2012, and Rasaeian, 2010), the method of judgmental sampling (systematic removal), is used as explained in the following:
1. In order to increase the comparability, their fiscal periods end in March.
2. During the years 2007 to 2012, there must be no change in financial year and the operations not skipped.
3. Financial statements, accompanying notes and annual reports of the mentioned period must be completely present in the Exchange website.
4. The Book value of equity interests must not be negative during the period under discussion.
5. The selected company must not be a part of investment companies, financial intermediation, banks, insurance, holding, leasing and etc, because the methods of financial reporting and corporate governance in these companies are different.
6. Companies must be profitable.
7. The intended company must be consistently active during the study period and its shares be traded.

With regards to the above conditions, 135 companies were selected; and finally, after observing the above conditions and analyzing the reports of the existing 135 companies in Tehran Exchange up to the end of the year 1391, and considering the revelation of the information used in the research, 107 of the companies were selected as the sample.

Methods and Tools of Data Analysis
In this study, regarding the type of data and methods of analysis, the method of "combined data" is used. The combined data means a set of data consisting of a large number of descriptive variables (N) which during a specified time period (T) are examined. As such, the observations would be N × T which can be estimated using different models. Therefore, in this study, the combined data analysis is used. The models of this research are presented as follows:

1. Risk Management_{it-} = \alpha + \beta_1 \text{BRDSZE}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + U_{it}
2. Risk Management_{it-} = \alpha + \beta_1 \text{BRDIND}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + U_{it}
3. Risk Management_{it-} = \alpha + \beta_1 \text{BRDMEET}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + U_{it}
4. Risk Management_{it-} = \alpha + \beta_1 \text{BFE}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + U_{it}
5. Risk Management_{it-} = \alpha + \beta_1 \text{DUAL}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + U_{it}
Table 1- The Method of Calculation of the Independent, Dependent, and Controlling Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Method of Calculation and Data Collection</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable: Board Composition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board Size</td>
<td>BRD SZ</td>
<td>Number of the Board of Directors</td>
<td>Xie et al, 2003</td>
</tr>
<tr>
<td>Board meeting frequency</td>
<td>BMEET</td>
<td>Number of the Meetings Reported</td>
<td>Mashayekhi and Mohammadabadi, 2010</td>
</tr>
<tr>
<td>Board Independence</td>
<td>BRD IND</td>
<td>Ratio of Dormant Members to Total Members</td>
<td>Schmid et al, 2011</td>
</tr>
<tr>
<td>Board Financial Literacy</td>
<td>BFE</td>
<td>The Group of Board Members who have Financial literacy</td>
<td>Hashem Alhosseini et al, 2010</td>
</tr>
<tr>
<td>Sameness of CEO and Managing Director</td>
<td>DUAL</td>
<td>Analysis of Sameness of CEO and Managing Director</td>
<td>Setayesh et al, 2011</td>
</tr>
<tr>
<td>Dependent: Risk Management</td>
<td>RM</td>
<td></td>
<td>Azazi et al, 2011</td>
</tr>
<tr>
<td>Controlling</td>
<td>SIZE</td>
<td>Natural Algorithm of the Firm Market Value</td>
<td>J. French et al, 2012</td>
</tr>
<tr>
<td>Financial Leverage</td>
<td>LEV</td>
<td>Total Liability</td>
<td>J. French et al, 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Assets</td>
<td></td>
</tr>
</tbody>
</table>

Analysis Method

Table 2- Statistical Tests Needed for Regression Analysis

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>The Statistic Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance of the Total Regression Equation</td>
<td>Statistic F, ANOVA test</td>
</tr>
<tr>
<td>Significance of Singular Coefficients</td>
<td>Statistic t</td>
</tr>
<tr>
<td>Self-Correlation</td>
<td>Durbin Watson</td>
</tr>
</tbody>
</table>

The First Regression Test:
According to the results, it can be seen that there is a direct positive correlation between the size of the board and risk management meaning that by increasing the size of the board of directors, risk management increases. And this correlation is statistically significant regarding the regression coefficient and statistic value = 0.832t, sig = 0.033. According to Table 3, the regression equation regarding the statistic F = 1.902 at sig =0.04 indicates that the overall equation is significant. Both statistics of Durbin Watson and Durbin h with values of 1.651 and 1.335076 confirm the lack serial autocorrelation problem in the model.

\[ Y = 0.033x_2 + 0.029k_1 - 0.044k_2 \]
Table 3- The Analysis of ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Squares</th>
<th>Degree of Freedom</th>
<th>F value</th>
<th>F probability (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Risk Management</td>
<td>Regression</td>
<td>2.166</td>
<td>3</td>
<td>1.902</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>510.698</td>
<td>638</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>512.863</td>
<td>641</td>
<td></td>
</tr>
</tbody>
</table>

The Second Regression Test:
The results indicate that the correlation between board independence and risk management is not statistically significant regarding the regression coefficient and statistic value of \( t = 0.715 \), \( \text{sig} = 0.175 \). Also, the regression equation regarding the statistic \( F = 0.841 \) at \( \text{sig} = 0.175 \) indicates that the overall equation is not significant. However, both statistics Durbin Watson DW and Durbin h with values of 1.649 and 1.32668 confirm the lack of serial autocorrelation problem in the model. In Table 4, the results of the ANOVA test for the model above shows that in this model, the null hypothesis is proved and therefore, the counter-assumption has been rejected by 90 percent confidence level.

Table 4- The Analysis of ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Squares</th>
<th>Degree of Freedom</th>
<th>F value</th>
<th>F probability (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Risk Management</td>
<td>Regression</td>
<td>2.021</td>
<td>3</td>
<td>0.841</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>510.843</td>
<td>638</td>
<td>0.472</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>512.863</td>
<td>641</td>
<td></td>
</tr>
</tbody>
</table>

The Third Regression Test:
According to the results, it can be seen that there is a direct positive correlation between the board meeting frequency and risk management meaning that by increasing in the board meeting frequency, risk management increases. This correlation according to the regression coefficient and statistic \( t = 0.268 \), \( \text{sig} = 0.069 \) is statistically significant. Also, the regression equation regarding the statistic \( F = 1.694 \) at \( \text{sig} = 0.046 \) indicates that the overall equation is significant. However, both statistics Durbin Watson DW and Durbin h with values of 1.650 and 1.33426 confirm the lack of serial autocorrelation problem in the model.

\[ Y = 0.011 x_3 + 0.030k_1 - 0.044k_2 \]

In Table 5, the results of the ANOVA test for the model above shows that in this model also, the null hypothesis is rejected and therefore, the counter-assumption has been proved by 95 percent confidence level.
Table 5- The Analysis of ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Squares</th>
<th>Degree of Freedom</th>
<th>F value</th>
<th>F probability (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Risk Management</td>
<td>Regression</td>
<td>1.669</td>
<td>3</td>
<td>1.694</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>511.194</td>
<td>638</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>512.863</td>
<td>641</td>
<td></td>
</tr>
</tbody>
</table>

The Fourth Regression Test:
According to the results, it can be seen that there is a direct positive correlation between the financial literacy of the board and risk management meaning that by increasing the financial literacy of the board, the risk management increases. And, this correlation, according to the regression coefficient and statistic $t = 0.268$, $\text{sig} = 0.089$ is statistically significant. Also, the regression equation regarding the statistic $F= 1.694$ at $\text{sig} = 0.046$ indicates that the overall equation is significant. However, both statistics Durbin Watson DW and Durbin h with values of 1.650 and 1.33426 confirm the lack of serial autocorrelation problem in the model.

$$Y=0.011 x_5+0.030k_1-0.044k_2$$

In Table 6, the results of the ANOVA test for the model above shows that in this model also, the null hypothesis is rejected and therefore, the counter-assumption has been proved by 95 percent confidence level, and the regression model is in general correct and significant.

Table 6- The Analysis of ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Squares</th>
<th>Degree of Freedom</th>
<th>F value</th>
<th>F probability (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Risk Management</td>
<td>Regression</td>
<td>1.669</td>
<td>3</td>
<td>1.694</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>511.194</td>
<td>638</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>512.863</td>
<td>641</td>
<td></td>
</tr>
</tbody>
</table>

The Fifth Regression Test:
According to the results, it can be seen that there is a direct positive correlation between the duality of function of managing director and the risk management meaning that by increasing of function of managing director, the risk management increases. And, this correlation, according to the regression coefficient and statistic $t = 3.420$, $\text{sig} = 0.001$ is statistically significant. Also, the regression equation regarding the statistic $F= 4.581$ at $\text{sig} = 0.003$ indicates that the overall equation is significant. However, both statistics Durbin Watson DW and Durbin h with values of 1.685 and 1.36255 confirm the lack of serial autocorrelation problem in the model.

$$Y=0.134 x_9+0.028k_1-0.038k_2$$
In Table 7, the results of the ANOVA test for the model above shows that in this model also, the null hypothesis is rejected and therefore, the counter-assumption is proved by 99 percent confidence level.

Table 7- The Analysis of ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Squares</th>
<th>Degree of Freedom</th>
<th>F value</th>
<th>F probability (sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Risk Management Regression</td>
<td>10.814</td>
<td>3</td>
<td>1.685</td>
<td>0.003</td>
</tr>
<tr>
<td>Residual</td>
<td>502.050</td>
<td>638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>512.863</td>
<td>641</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions**

According to the results, there is a direct positive correlation between risk management and the board size meaning that by increasing the board size the risk management is increased. The reason is that a larger board is more likely to be alert to the agency's problems, because, more people will supervise the work of the management. When the board is greater, it is likely to have more independent members with valuable expertise. The reason is that the number and frequency of board meetings, is considered an important factor in the effective performance of supervisory duties. It can be proved that by increasing the board meeting frequency, the performance of the commercial unit is improved. Also, there is a direct positive correlation between risk management and financial literacy, meaning that by increasing the financial literacy of the board, the risk management increases. In order to oversee the management and participation in decision-making, the board requires skills such as accounting, law and etc. for it to be effective in increasing the company's value. The underlying issue is that members with no experience in knowledge of accounting or finance, they have less ability to discover problems in financial reporting. There is a direct positive correlation between risk management and the managing director's duality function, meaning that by increasing the frequency of duality of managing director and CEO, the risk management increases. The reason is that there should be a balance of power between the board members so that no one be able to control the company's process of decision-making unconditionally. But, there is no significant correlation between the board's independence and risk management. In this study, an independent member is a dormant board member whose presence in the board of directors does not have negative impact upon risk management.

**Suggestions and Limitations**

The results obtained from the test of hypothesis generally confirm the effects of the board composition upon emergence of risk management. Thus, we can get better risk management among companies listed in Tehran Stock Exchange if we strengthen the board composition. To achieve this objective, in the early stages, we must pay attention to factors such as the number of board members, the financial literacy of board members, and the duality function of managing director among companies. In the next stages, by providing and promoting the organizational culture and atmosphere based on participation and closeness, they add to their stability and communality. Moreover, holding board meetings periodically results in improvement of management and performance models, empowerment, and accordingly, creation of commitment to work, positive behaviors, and the members' paying attention to interests and resources of the organization. Also, due to the diversity of views in presenting
different dimensions for the variables studied in this research, and the lack of consistency in the researches on them, doing similar research on other tools is recommended. Although the research variables were explained either individually or in relations with other ones, lack of sufficient literature on corporate governance, risk management, and also of similar researches on theoretical framework in native and foreign sources, would partly limit theoretical delineation of the debate and prevent the researcher from making comparison between the present results with the results of similar studies.
References


