Intellectual Capital and Corporate Governance Mechanisms: Evidence from Tehran Stock Exchange

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ABSTRACT

The aim of this study is to investigate the relationship between some mechanisms of corporate governance and intellectual capital in companies listed on the Tehran stock exchange during the years 2011-2015. The effects of some corporate governance indices (the number of board members, non-duty members, managerial ownership and institutional ownership) on intellectual capital was investigated. The sample comprises 104 companies listed on the Tehran stock exchange. Eviews software was used for data analysis and multiple regression was used to test the hypotheses. Results indicated that there is a positive significant relationship between the proportion of non-duty members, institutional ownership and intellectual capital, and there is no significant relationship between managerial ownership, the number of board members and intellectual capital.

Keywords: Intellectual Capital, Number of Board Members, Non-duty Members, Managerial Ownership, Institutional Ownership
JEL Classifications: G3, O34

1. INTRODUCTION

At the beginning of the 20th century and by the formation of public joint stock companies, there was a great shift in the area of economics and management. This phenomenon has led to the development of industry and economy and led to the separation of management from ownership and subsequently conflict of interest and agency problems. The community of various groups of company stakeholders highlighted the implicit and explicit issues of contracts. It is obvious that each group of public and private stakeholders seek their general and specific interests. Benefits that sometimes can be conflicting with each other. Corporate governance was raised for balancing between the different groups of stakeholders. Corporate governance is a multi-dimensional concept in which accountability of transparency, responsibility and considering fairness and rights of the stakeholders are the fundamental concepts. Disclosure of intellectual capital to inform investors about the company's efforts in the economic environment and global competition has become more important. Intellectual capital can increase problems involving individuals inside the organization due to use of such information in gaining more profits (Mashaiekhi and Seyyedi, 2015).

Today, intellectual capital plays an important role in the process of creating value for organizations. One of the most important factors of creating competitive advantage is the use of intellectual capital (Muttakin et al., 2015). According to various studies, the presence of an appropriate system of corporate governance in companies increases their ability to attract more intellectual capital. In other words, lack of good governance in companies leads to the inability to attract and retain strong intellectual capital (Safieddine et al., 2009). The present research attempts to seek whether or not corporate governance is an important factor influencing intellectual capital. In other words, this study attempts to examine how strong corporate governance affect intellectual capital. For this purpose, we first raise the concepts of corporate governance and intellectual capital and the relevant theoretical principles. Then, after a review of the literature, the research hypotheses are provided. Then, research findings are interpreted, and the final part of the study provides the conclusion to our study.

2. THEORETICAL PRINCIPLES

Intellectual capital covers all processes and assets that are not usually and traditionally reflected in the balance sheet and includes

intangible assets such as trademarks and those royalties, etc., which undertake their modern accounting method. Some researchers have considered intellectual capital as the competencies of a company where these competencies are mostly associated with the experience and the allocation of people within an organization. In fact, this is the knowledge and experience of people within the company that can create value and this takes place through processes of knowledge exchange and knowledge creation. It should be noted that these competencies are not only created by people inside the organization, but are sometimes created by because of the environment in which the organization resides (Hemmati and Jalili, 2012).

Considering the concepts of intellectual capital, it constitutes three main categories of human, structural and relational capital.

- Human capital: Human capital refers to the knowledge of employees, which they take with them upon leaving the company and includes individual skills, knowledge, experience and abilities (Beattie and Smith, 2010).
- Structural capital: This includes mechanisms and structures the main role of which are to support the employees to achieve optimal mental performance and business performance, on the other hand. In fact, this capital includes all inhuman knowledge repositories in an organization such as databases, processes, strategies and organizational charts, which give an organization value beyond physical assets (Alem et al., 2009).
- Relational capital: Includes relationships that people outside the organization have with the organization such as customer loyalty, market share, the return of orders and similar issues are included (Kok, 2007).

Corporate governance refers to a set of systems, principles and processes by which a company is managed. Corporate Governance provides instructions on how companies can be managed or controlled so that it can fulfill corporate objectives and create added value for the company. The corporate governance system is beneficial for all beneficiaries including shareholders, customers, staff and the community, in the long term (Alavi and Abbas, 2013). The existence of corporate governance is for the benefit of all financial stakeholders including investors, creditors, board members, managers and staff as well as various industries and different sectors of the economy. Good corporate governance plays an important role in improving efficiency and economic growth, as well as increased confidence. Increasing confidence of investors also plays an important role in the economy of the country. Companies also benefit from an efficient system of good governance. If the company is profitable, there is more incentive to apply corporate governance and its interests are gained either directly (through easier access to finances and low cost of capital) or indirectly through (acquiring business reputation and better business opportunities) (Safieddine et al., 2009).

Abdul Rashid et al. (2012) conducted a study in Malaysia that investigated the factors affecting disclosure of intellectual capital using multiple regression. In this regard, 130 samples were selected from among industrial production and technology sector companies in the Malaysian stock exchange from 2004 to 2008. The results of the study indicated that board size, independence

of the board, life of the company and leverage have a significant relationship with the disclosure of intellectual capital. Meanwhile, the size of the company and the type of audit had no significant relationship with intellectual capital.

Taliyang and Jusop (2011) conducted a study in which they investigated the relationship between disclosure of intellectual capital and corporate governance mechanisms in Malaysia's public companies. The independent variable examined in this study was corporate governance, which included four variables of composition of the board, two roles of managers and the size of the audit committee. A sample of 150 companies listed in the Malaysian stock exchange were investigated in each of the five industries. From among the four independent variables tested, only the large number of audit committee meetings had a positive significant relationship with disclosure of intellectual capital.

Gigante and Previati (2013) conducted a study and dealt with investigating disclosure of intellectual capital in banks in Spain, Portugal and Greece over the years 2003-2010. The results of the study indicated that the size of the company and financial performance of physical capital has no significant relationship with the amount of capital disclosure.

Khosravi and Bandarian (2014) conducted a study in which they investigated the relationship between ownership structure and characteristics of the board with intellectual capital in companies listed on the Tehran stock exchange. The hypotheses were tested using the combined data statistical method within the period of 2007-2012 using data from 140 companies selected through systematic sampling. Results indicated that institutional ownership, board size and board independence have a positive significant relationship with intellectual capital and no significant relationship was observed between the concentration of ownership and duality of the manager's role with intellectual capital.

Aflatouni et al. (2015) conducted a study during 2009-2013 in which they investigated the impact of size and independence of the board on the relationship between intellectual capital and value of the companies listed in the Tehran stock exchange. 57 companies were selected through elimination sampling and applying conditions of sampling. The test results indicated that the size of the board has a reverse and significant relationship with the day value of the company stock, and independence of the board has a direct and significant relationship with the value of company shares. Therefore, according to conducted tests on the hypothesis, it can be concluded that the size and independence of the board as a component of corporate governance along with intellectual capital, which is considered an intangible asset of companies, can have a great impact in the company share value, and consequently, retention of existing investors and attraction of potential investors.

Alavi and Abbas (2013) conducted a study in which they examined the impact of corporate governance on disclosure of intellectual capital in companies listed on the Tehran stock exchange. In this regard, the effect of some indicators of corporate governance (board size, board composition, the sameness of the manager and chairman of the board and the

internal auditing department) on disclosure of intellectual capital for the 120 companies listed on Tehran stock exchange were investigated using the Poisson data panel regression method. Results indicated that there is no significant relationship between the number of directors and disclosure of intellectual capital. There is a positive significant relationship between the number of non-duty members and the amount of disclosure of intellectual capital. There is a negative significant relationship between the sameness of the manager and chairperson of the board and disclosure of intellectual capital. There is no positive significant relationship between the internal audit unit and amount of disclosure of intellectual capital.

2.1. Hypotheses
• There is a significant relationship between the number of board members and intellectual capital.
• There is a significant relationship between non-duty members and intellectual capital.
• There is a significant relationship between managerial ownership and intellectual capital.
• There is a significant relationship between institutional ownership and intellectual capital.

3. METHODOLOGY

This is an applied and correlational study. Company information is examined by multiple regression model. All data required for the study has been extracted from the actual data of companies available in the list published by the Tehran stock exchange, and Eviews software has been used for data analysis.

3.1. Test Period of Community and the Statistical Sample
The study population is the companies listed on the Tehran stock exchange. The time domain of the study is between 2011 and 2015. The systematic elimination method was used for sampling in this study and companies that possessed all the following conditions were chosen as samples:
1. The company's fiscal year ends in March.
2. The investment brochures of the companies should not be the financial intermediation of banks and financial institutions.
3. The company should have been accepted in the Tehran stock exchange by the end of 2011.
4. The company should have not changed their fiscal year during the years under study.
5. Their data required for the study should be readily available.

By applying the above-mentioned conditions, 104 companies were selected as the statistical sample of this study from among the companies listed in the Tehran stock exchange.

3.2. Variables of the Study
In this study, the features of the company governance principles include the number of Board members, the number of non-duty Board members, the percentage of managerial ownership and institutional ownership are the independent variables. Intellectual capital is considered as the dependent variable. The specific characteristics of companies including the size and financial leverage have been considered as control variables, which will be explained separately.

3.3. The Dependent Variable
In order to calculate the dependent variables in this study, the coefficient of value added intellectual capital (VAIC) used by Pulic (1998) is used. This model emphasizes value creation of company based on the effectiveness of company's resource management. The way of calculating the coefficient of VAIC is as below.

$$VAIC = HCE+SCE+CEE$$
$$VAIC = HCE+SCE+CEE$$
VAIC = Value added intellectual coefficient
HCE = Human capital efficiency
SCE = Structural capital efficiency
CEE = Capital employed efficiency.

Where each of the variables in this model is calculated as follows:

$HCE = VA/HC$
$SCE = SC/VA$
$CEE = VA/CE$
$VA = P+I+C+D+DIV+T$
HC = The cost of salary
$SC = VA-HC$
CE = Total tangible properties - total debts.
Where:
P = Is the profit of the company
I = Is the interest expense
C = Cost of salary
D = Depreciation expense
DIV = Divided interest
T= Tax.

3.4. Independent Variables
In this study, the features of corporate governance principles including the number of board members, the number of non-duty board members, managerial ownership and institutional ownership are the independent variables.

Board size (BZ): The total number of company board members.

The percentage of non-duty board members (ND) equals the number of non-duty board members divided by total board members.

Percentage of managerial ownership (CMP) equals the percentage of shares held by members of the board of directors.

Percentage of institutional stock ownership (INSINV) equals the percentage of shares held by public corporations.

3.5. Control Variables
In this study, specific features of the companies including size and financial leverage have been considered as control variables.

Size of the company ($SIZE_{i,t}$) is obtained through natural logarithm of the company's market value.

Financial leverage ($LEV_{i,t}$) is obtained by dividing the company's total debt to total assets. Jensen (1986) indicated that high levels of debt cause agency problems. We used the division of total debts by book value of equities as the debt ratio.

4. DATA ANALYSIS METHOD

This part of the study consists of two parts: Descriptive and inferential statistics. The central indices of (mean), dispersion (standard deviation) and distribution (skewness and kurtosis) of the variables is indicated in the descriptive part, and the research hypotheses are tested in the inferential part. Before testing the hypotheses, distribution of data is measured using the Jarek Bravo test where it was found that the variables in this study are non-normal, where the data is normalized using the mathematical function.

The multivariate regression model was used in this study to test the hypothesis. The regression model used is as follows:

$$VAIC_{it} = \alpha_1 + \alpha_2 BZ_{it} + \alpha_3 ND_{it} + \alpha_4 CMP_{it} + \alpha_5 INSINV_{it} + \alpha_6 SIZE_{it} + \alpha_7 LEV_{it} + \acute{\varepsilon}$$

5. RESULTS OF THE DESCRIPTIVE STATISTICS

The results of the Table 1 indicate that the average intellectual capital is equal to 5,270,694 and its standard deviation is 16,504,717, where it can be seen that deviation is more than the mean, and this means scattered data, which the high amount of skewness and kurtosis also emphasize on the mentioned distribution of data. Mean and standard deviation of independent variables including the number of board members, ratio of non-duty members, managerial ownership and institutional ownership are 5.805 (0.554), 0.489 (0.256) 5.271 (15.93) and 7.586 (58.51), respectively. Except the ratio of non-duty members, the rest of the independent variables have high skewness and kurtosis, which indicates that these variables have normal distribution. The mean

and standard deviation of the controlled variables are 6.093 (0.577) and 0.618 (0.245), respectively.

6. RESULTS OF THE STATISTICAL TESTS OF THE HYPOTHESES

Considering the analyzed data are combined data, we should first determine the type of model estimation using the Chow (Limer) and Hausman tests.

The results of the Table 2 indicate that the error rate calculated for Arch test for the research hypotheses is more than 0.05. In other words, the hypotheses have an inconsistency problem.

The above table also indicates that the significance level of the Limer and Hausman tests is also <0.05. Therefore, the panel method with the estimation of constant effects is used to estimate the models.

7. RESULTS OF THE ASSUMPTIONS

There is a significant relationship between the number of board members and intellectual capital.

H_0: There is no significant relationship between the number of board members and intellectual capital.

H_1: There is a significant relationship between the number of board members and intellectual capital.

It can be observed from the Table 3 that the significance level of the t-test for the variable of the number of board members is more than 5% ($P > 0.05$). Therefore, H_0 is approved and H_1 is rejected. Therefore, we can say that the relationship between the two variables is rejected and the hypothesis is not confirmed. Therefore, it can be said that there is no significant relationship between the number of board members and intellectual capital.

Table 1: Description of the variables

Variables	Index	Average	Standard deviation	Skewness	Kurtosis	Jarque & Bera (error)
Intellectual capital	VAIC	5270694	16504717	6.305	46.48	444.23 (0.00)
Members of the board (number)	BZ	5.805	0.554	−1.068	14.92	3177 (0.00)
Non-duty members Ratio	ND	0.489	0.256	−0.702	2.600	46.22 (0.00)
Managerial ownership	CMP	5.271	15.93	3.205	12.46	2832 (0.00)
Institutional ownership	INSINV	7.586	58.51	21.106	468.08	4725236 (0.00)
Company size	SIZE	6.093	0.577	0.602	4.56	84.68 (0.00)
Financial leverage	LEV	0.618	0.245	0.731	6.86	302.27 (0.00)

Table 2: Limer and Hausman tests to determine data types

Description	Dissimilarity			Limer test			Hausman test		
	Statistic	Significance level	Dissimilarity	Statistic	Significance level	Method	Statistic	Significance level	Estimate
1st hypothesis	0.145	0.703	None	1.44	0.00	Panel	10.407	0.00	Constant effect
2nd hypothesis	0.145	0.703	None	1.41	0.002	Panel	13.42	0.00	Constant effect
3rd hypothesis	0.146	0.701	None	1.41	0.002	Panel	12.38	0.00	Constant effect
4th hypothesis	0.147	0.707	None	1.407	0.003	Panel	13.27	0.00	Constant effect

There is a significant relationship between the ratio of non-duty members and intellectual capital.

H_0: There is no significant relationship between the ratio of non-duty members and intellectual capital.
H_1: There is a significant relationship between the ratio of non-duty members and intellectual capital.

It can be observed from the Table 4 that the significance level of the t-test for the variable of the number of non-duty members is <5% ($P < 0.01$). Therefore, H_0 is rejected and H_1 is approved. Therefore, with a confidence level of 99%, we should be sure that intellectual capital is affected by the ratio of non-duty board members, or in other words, the ratio of non-duty board members has a significant impact on intellectual capital. T-test results indicate that the created relationship is positive, and this means that the direct effect of the independent variable on the dependent variable is such that increasing the proportion of non-duty board members increases intellectual capital.

There is a significant relationship between managerial ownership and intellectual capital.

H_0: There is no significant relationship between managerial ownership and intellectual capital.
H_1: There is a significant relationship between managerial ownership and intellectual capital.

It can be observed from the Table 5 that the significance level of the t-test for the variable of managerial ownership is more than 5% ($P > 0.05$). Therefore, H_0 is approved and H_1 is rejected. Therefore, we can say that the relationship between the two variables is rejected and the hypothesis is not confirmed. Therefore, it can be said that there is no significant relationship between managerial ownership and intellectual capital.

There is a significant relationship between institutional ownership and intellectual capital.

H_0: There is no significant relationship between institutional ownership and intellectual capital.
H_1: There is a significant relationship between institutional ownership and intellectual capital.

It can be observed in the Table 6 that the significance level of the t-test for the variable of institutional ownership is <5% ($P < 0.01$).

Table 3: Estimation of the model for the first hypothesis

$VAIC_{it} = \alpha_1 + \alpha_2 BZ_{it} + \alpha_3 SIZE_{it} + \alpha_4 LEV_{it} + \acute{\epsilon}$				
Description	**Coefficient**	**Standard deviation**	**t-statistic**	**Significance level**
Members of the board (number)	−0.140	0.101	−1.377	0.169
Company size	14.61	0.125	115.98	0.00
Financial leverage	−0.524	0.0569	−9.203	0.00
Constant value	−20.95	0.386	−54.23	0.00
Coefficient of determination	0.976			
F-statistic	162.58			
F significance level	0.00			
Durbin–Watson statistic	2.27			

Table 4: Estimation of the model for the second hypothesis

$VAIC_{it} = \alpha_1 + \alpha_2 ND_{it} + \alpha_3 SIZE_{it} + \alpha_4 LEV_{it} + \acute{\epsilon}$				
Description	**Coefficient**	**Standard deviation**	**t-statistic**	**Significance level**
Non-duty members ratio	0.159	0.0510	3.114	0.002
Company size	14.59	0.124	117.19	0.00
Financial leverage	−0.4960	0.0571	−8.67	0.00
Constant value	−21.34	0.309	−68.87	0.00
Coefficient of determination	0.977			
F-statistic	165.71			
F significance level	0.00			
Durbin–Watson statistic	2.25			

Table 5: Estimation of the model for the third hypothesis

$VAIC_{it} = \alpha_1 + \alpha_2 CMP_{it} + \alpha_3 SIZE_{it} + \alpha_4 LEV_{it} + \acute{\epsilon}$				
Description	**Coefficient**	**Standard deviation**	**t-statistic**	**Significance level**
Managerial ownership	−0.0028	0.0083	−0.336	0.735
Company size	14.58	0.129	112.57	0.00
Financial leverage	−0.527	0.057	−9.19	0.00
Constant value	−21.23	0.323	−65.62	0.00
Coefficient of determination	0.976			
F-statistic	161.86			
F significance level	0.00			
Durbin–Watson statistic	2.26			

Table 6: Estimation of the model for the fourth hypothesis

$VAIC_{it} = \alpha_1 + \alpha_2 INSINV_{it} + \alpha_3 SIZE_{it} + \alpha_4 LEV_{it} + \acute{\varepsilon}$				
Description	**Coefficient**	**Standard deviation**	**t-statistic**	**Significance level**
Institutional ownership	0.0407	0.0075	5.38	0.00
Company size	14.46	0.124	116.51	0.00
Financial leverage	−0.541	0.052	−9.8	0.00
Constant value	−20.96	0.307	−68.23	0.00
Coefficient of determination	0.977			
F-statistic	165.71			
F significance level	0.00			
Durbin–Watson statistic	2.25			

Therefore, H_0 is rejected and H_1 is approved. Therefore, with a confidence level of 99%, we should be sure that intellectual capital is affected by institutional ownership, or in other words, institutional ownership has a significant impact on intellectual capital. T-test results indicate that the created relationship is positive and this means that the direct effect of the independent variable on the dependent variable is such that if the proportion of institutional ownership increases per business unit, the performance of the intellectual capital increases. These shareholders have incentives for active monitoring of management and consequently increase in assets (Heidarpour and Fouladi, 2015).

8. CONCLUSION

The effect of some characteristics of corporate governance on the intellectual capital of companies listed in the Tehran stock exchange during 2011-2015 was investigated using the multiple regression method. No significant relationship was observed between the number of board members and intellectual capital in testing the first hypothesis. The result of this hypothesis indicated that the excessive number of managers neutralizes these advantages by increasing the costs associated with longer decision-making time and poor communication of managers, and thus, has a reversal effect. The results of testing this hypothesis are consistent with research conducted by Alavi and Abbas (2013).

There is a significant relationship between non-duty board members and intellectual capital in testing the second hypothesis. According to the guidelines expressed about the presence of non-duty members in the composition of the members of the board, the presence of a minimum number of non-duty members has always been emphasized so that non-duty managers have the ability to affect board decisions. The result of this hypothesis indicates that the larger the number of members of the board, the higher the effectiveness of the board and lower the costs of the representative that lead to better performance of intellectual capital. Results of testing the hypothesis are consistent with the empirical research conducted by Alavi and Abbas (2013); (Hemmati and Jalili, 2012; Li et al., 2008; Muttakin et al., 2015).

There is no significant relationship between managerial ownership and intellectual capital in testing the third hypothesis. This non-linear relationship can be due to the entrenchment hypothesis. Based on the entrenchment hypothesis, when the manager controls a significant portion of the company's shares, he may behave in such a way that is very inconsistent with the goal of maximizing

its value; behaviors such as specifying rewards and high salaries for him/herself, hiring relatives and close friends and significant advantages or provisioning a luxurious life that can cause serious harm to the company's goals. Results are consistent with empirical research carried out by Alavi and Abbas (2013); (Heidarpour and Fouladi, 2015).

There is a significant relationship between institutional ownership and intellectual capital in testing the fourth hypothesis. The results of this hypothesis indicates that bulk and institutional shareholders are able to specify procedures of data disclosure in financial reports according to their influence on corporate decisions, and can manage and control disclosure of intellectual capital. The results of testing this hypothesis are consistent with research conducted by Abor and Biekpe (2007); (Hemmati and Jalili, 2012; Li et al., 2008).

9. SUGGESTIONS FOR FUTURE RESEARCH

1. Considering the quality factor in disclosure of intellectual capital.
2. Conducting this research through considering the effect of other mechanisms of corporate governance and other factors affecting disclosure of intellectual capital.
3. Investigating the impact of industry type on the relationship between corporate governance and disclosure of intellectual capital.

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