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EVALUATION OF THE RELATIONSHIP BETWEEN THE BOARD SIZE AND BOARD INDEPENDENCE WITH THE COMPANY'S SALES MANIPULATION

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ABSTRACT

The authority of managers in using the principles of realization and matching, estimating and predicting are among the factors affecting the quality of earnings. In one hand, due to their higher knowledge of the company, it is expected from them to provide information in such a way that reflects the company's status well. On the other hand, the manager, either willingly or unwillingly, wants to show the company status desired due to reasons such as survival in company, receiving rewards and other factors. Thus, managers might manipulate the sales for various reasons. The objective of this research is to evaluate the relationship between the board size and board independence with the company's sales manipulation in the listed companies in the Tehran Stock Exchange. The dependent variable is sales manipulation and independent variables included board size and board independence. The research population included the listed companies in Tehran Stock Exchange. A total of 204 companies were also selected as the sample using the Cochran formula. The temporal domain of the research was 2011-2015. The data was collected using the information included in the Rahavard-e Novin software and review of the reports and financial statements of the listed companies in the Tehran Stock Exchange by referring to formal website of Tehran Stock Exchange. The research results suggest that there is a significant relationship between the board size and board independence with the company's sales manipulation.

Keywords: Board Size, Board Independence, Sales Manipulation.

INTRODUCTION

Growth and expansion of business activities and the development of stock exchange companies have resulted in emergence of a class of investors and shareholders. Unlike past, they are not directly involved in the management of their own earnings, but they have entrusted the duty of management and control of their resources and assets (company) to professional and competent managers. Due to necessity and in line with their benefits, managers normally do their best in this way in order to gain appropriate benefits in this regards. Thus, researchers generally believe that managers tend to manipulate the earnings to provide steady image of the profitability process in the flexible framework of accounting principles and practices. Sales manipulation means that managers try to increase sales throughout the year temporarily by offering price discounts or very mild credit conditions, which will result in increased earnings (Fakhari et al., 2015). Managers can temporarily increase the sales, and thus, increase the company earnings by offering a price discount or taking longer sales periods for their products. Abnormal cash flows (resulting from sales manipulation), abnormal production (resulting from product manipulation), and abnormal discretionary expenditures (resulting

from manipulation of abnormal discretionary expenditures) are recognized earnings management criteria based on real activities (Fallah Nejad and Beshkuh, 2018). Investigations suggest that the manipulation of earnings in companies suspected to earnings manipulating results in an abnormal increase in accruals and production expenditures as well as an abnormal reduction in discretionary expenditures and operating cash flows.

Research objectives:

1. Evaluation of the relationship between the board size and the company's sales manipulation
2. Evaluation of the relationship between the board independence and the company's sales manipulation

Research hypotheses

Hypothesis 1) Board size has a significant relationship with the company's sales manipulation.

Hypothesis 2) Board independence has a significant relationship with company's sales manipulation

METHODOLOGY

This research is an applied study in terms of objective. It is also quasi-experimental analytical study in terms of method and nature. It is a combination of time series and cross sectional in terms of time of study. Moreover, different tests, including descriptive indices in descriptive statistic section and statistical tests in inferential statistic section were used to analyze the data, given the research variables which included company value, organizational characteristics of management and sales manipulation. Descriptive statistics, Pearson correlation and regression are used to analyze the data in this research. The Kolmogorov-Smirnov statistics are used in SPSS software to determine the normality of research and regression residuals. The regression model was used to test the hypotheses of the research. Research literature requires library studies. We also used statistical software such as Rahavard-e Novin and statistical sites and so on to collect research data. Data are collected in EXCEL software and analyzed using SPSS statistical software.

Regression model of the first hypothesis:

$$A. CFO_{it} = \beta_0 + \beta_1 B. SIZE_{it} + \beta_2 Size_{it} + \beta_3 DEBT_{it} + \beta_4 AUD. Q_{it} + \beta_5 AGE_{it} + \varepsilon_{it}$$

Regression model of the second hypothesis

$$A. CFO_{it} = \beta_0 + \beta_1 B. IND_{it} + \beta_2 Size_{it} + \beta_3 DEBT_{it} + \beta_4 AUD. Q_{it} + \beta_5 AGE_{it} + \varepsilon_{it}$$

Research variables and their measurement:

Dependent variable

The objective of this research is to describe and predict the variability of the dependent variable of sales manipulation. They are measured in this way:

Sales manipulation (A.CFO): Abnormal operating cash flow (resulting from sales manipulation) is one of earnings management criteria based on real activities (Fallah Nejad and Beshkh, 2018). Abnormal operational cash flow criterion is used to measure the manipulation variable. This criterion was introduced by Roychowdhury (2006):

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \alpha_2 \left(\frac{S_{it}}{A_{it-1}} \right) + \alpha_3 \left(\frac{\Delta S_{it}}{A_{it-1}} \right) + \varepsilon_{it}$$

After estimating the above model, the parameters obtained to calculate expected operating cash flows of each company are used as follows:

$$\frac{N.CFO_{it}}{A_{it-1}} = a_1 \left(\frac{1}{A_{it-1}} \right) + a_2 \left(\frac{S_{it}}{A_{it-1}} \right) + a_3 \left(\frac{\Delta S_{it}}{A_{it-1}} \right)$$

Finally, the difference between the real operating cash flows and the estimated level calculated in the above model are considered to be abnormal operating cash flows:

$$A.CFO_{i,t} = CFO_{i,t} - N.CFO_{i,t}$$

In addition, researchers such as (Visvanathan, G. (2008). Corporate governance and real earnings management. (Academy of Acco, 2008; Garven, 2009; Ji and Kim; 2013) Fallahnejad and Beshkuh (2018) used the criterion of abnormal cash flow to measure sales manipulation.

Independent variable:

Independent variables of this study included board size and board independence measured as follows:

Board size (B.SIZE): it is equal to the natural logarithm of the number of members of the board of directors (Chtourou et al., 2001).

Board Independence (B.IND): it is equal to the number of non-executive members (independent) in the composition of the board of directors divided by the total number of members of the board of directors (Klein, 2002, San and Liu, 2013).

The control variables in this study included firm size, financial leverage, and audit quality, company age, measured as follows:

Firm size: calculated through normal logarithm of book value of the total assets (Godard, 2002, Kouki et al., 2011).

Financial Leverage (DEBT): it is equal to the ratio of current debt and long-term debt to total company assets (Klein, 2002)

Audit quality (AUD.Q): An auditor type indicator is used to measure the audit quality. If the company is audited by an audit organization, the dummy variable zero (0) will be used, otherwise (if it is audited by other institutions of the community of official accountants), the dummy variable one (1) will be used (Chi et al, 2011).

Company age (AGE): it is equal to the normal logarithm of the years of acceptance in stock exchange and financial year related to the presentation of financial statements (Huguet et al., 2016).

Review of literature

In a study on the relationship between the board independence and the earnings management, Yung Peasnell and Pope (2000) reported that the number of non-executive directors is reversely associated with the probability of management of abnormal accruals to avoid reporting of loss or a reduction in earnings. After studying the relationship between corporate governance and earnings management, Chtourou et al. (2001), found that an independent board limits earnings management activity. After investigating the relationship between



independence of members of the board of directors and earnings manipulation, Celine (2002) provided evidence on with regard independence of board members and earnings and showed that companies with members of the board of directors independent of executive directors reported less abnormal accruals.

Xie and others (2003) evaluated the relationship between earnings management and the independence of board members and reported that there is a significant relationship between the ratio of independent managers in the board and earnings management. Companies with more independent managers will less likely manage the earnings. Mashayekhi (2007) evaluated the relationship between the three characteristics of corporate governance (board size, duality of the CEO's duty, representatives of institutional stakeholders in the board) and earnings management. The results showed that board size, duality of the CEO's duty and representatives of institutional stakeholders in the board have significant relationship with earnings management.

After evaluating the characteristics of corporate governance and earnings management, Chang and Sun (2008) found a significant negative relationship between the board independence and abnormal accruals. In addition, a significant and negative relationship was found between independence of board and earnings management. Jamal Chouaibi et al. (2016) evaluated the effect of board characteristics on real earnings management. The results of the study revealed the negative effect of board size, the board independence and the number of board meetings on sales manipulation. With regard to duality of CEO's duty variable, results did not show relationship between this variable and the level of sales management. Abbaszadeh (2010) evaluated the earnings manipulation and achieved a model for predicting earnings manipulation in companies with zero-bound earnings. The results of the study suggest that it is impossible in the Iranian market to judge the earnings manipulation in the zero-bound earnings explicitly as in other markets. It is suggested that future studies to examine last three quarter of the year and smaller deciles.

Aflatouni (2012) reviewed evidence on manipulation of real activities (real earnings management) to achieve zero-bound earnings in listed companies in Tehran Stock Exchange during the period of 2002-2009. The results of the research showed that companies suspected to real earnings management have low abnormal operating cash flow and abnormal discretionary expenditures and abnormal production expenditures. Ansari et al (2013) evaluated the effect of company performance on real earnings management and general earnings management. The research sample included 135 listed companies in Tehran Stock Exchange. In this research, the effect of the company's performance on the general level of earnings management was tested and a negative relationship was found between the company performance and the general level of earnings management.

Rahnemaye Roodposhti et al. (2014) evaluated the ability to explain the models of discretionary accruals and the discretionary income model to explore earnings management. The results revealed that earnings management models based on discretionary accruals had more ability to predict earnings management in comparison with the discretionary income model. Khorshidyan (2014) examined the relationship between accounting conservatism, institutional ownership and earnings manipulation during the period of 2008-2012. The results of the hypotheses test suggest that the first and second digits of the company's net earnings in both groups follow Benford's law and no earnings manipulation is seen in them.



Salamat (2015) evaluated the relationship between growth opportunities and real earnings management. The results show that the company's growth opportunities affected the real earnings management by the manipulation of sales and production activities, but they do not have an effect on the real earnings management through the manipulation of discretionary expenditures.

RESULTS

Descriptive indices of variables

The research variables are summarized in Table 1.

Table 1: Index describing variables under central indices, dispersion indices, and distribution form indices

Variable	n	min	max	mean	SD	Variance	Skewness coefficient	Kurtosis coefficient
Firm size (Logarithm of book value of total assets)	520	4.41	8.14	6.0407	.87464	.765	-2.965	20.168
sales manipulation (Abnormal operating cash flow criterion)	520	-.67	.76	.0627	.15937	.025	.226	2.030
Financial Leverage (Current debt ratio and Long-term total assets)	520	0.065	1.94	.6555	.29534	.087	.610	2.163
Company age (Logarithm of the number of years of activity in the stock exchange)	520	1.041	1.68	1.3028	.15785	.025	-.404	8.478
Board Independence (Number of independent members of the board of directors to the total number of members of the board of directors)	520	0.166	.83	.5235	.23473	.055	-.768	-.029
Board size (normal logarithm of the number of board members)	520	5.00	9.00	5.8115	.70987	.504	-2.826	25.704



Since indices and descriptive statistics cannot be calculated for the qualitative variables (dummy or two-dimensional) with a nominal scale, the absolute and relative frequency of them was sufficed.

Absolute and relative frequency of companies audited by the audit firm / other companies

audit quality (Auditor type index)	The number of companies audited by the audit firm (dummy variable zero)	The number of companies audited by other audit firms (dummy variable one)
Absolute frequency	133	387
Relative frequency	25.5%	74.5%

Testing the hypotheses

Examining the assumption that the dependent variable of the research is normal

The results of the Kolmogorov-Smirnov test are presented in Table (2):

The results of the Kolmogorov-Smirnov test are presented in Table (2):

{H0: distribution of data is normal H1: distribution of data is not normal

Table 2: Results of Kolmogorov-Smirnov test

variable	n	Kolmogorov-Smirnov statistic	p-value
Sales manipulation	520	1.354	.061

Based on the Table 2 of the Kolmogorov-Smirnov test, it is concluded that as the level (p-value) for dependent variables is higher than the significance level of the test ($\alpha = 0.05$), the data have a normal distribution.

Analyzing the hypotheses**Testing the first hypothesis**

Hypothesis 1: The board size has a significant relationship with the company's sales manipulation.

H0: The board size has no significant relationship with company's sales manipulation.

H1: The board size has a significant relationship with the company's sales manipulation.

$$\begin{cases} H_0: \rho_1 = 0 \\ H_1: \rho_1 \neq 0 \end{cases}$$

We examine the relationship between board size and sales manipulation in the first step in order to examine and test our hypotheses, since the regression relation can be used when a correlation between variables can be proved. If the Pearson correlation coefficient between the board size and the company's sales manipulation at a minimum confidence level of 95% is smaller than 0.05, statistical hypothesis H_0 will be rejected and the hypothesis H_1 at the minimum confidence level of 95% will be accepted.

Table 3: Pearson correlation coefficient, significance level, and the number of statistical samples between the board size and company's sales manipulation

	Independent variable dependent variable	Sales manipulation
Board size	Pearson correlation coefficient	-.045
	significance level	.008
	n	520

Table 3 presents the correlation coefficient, the significance level and the number of data. Pearson correlation coefficient between the variables is shown in the table. This figure shows a relationship between the two variables at the error level of 0.05. Given the SPSS software outputs, as Sig is less than 0.05, H_0 is rejected at the 5% error level and the correlation between the variables is confirmed.

Table 4: Correlation coefficient, correlation of determination, and Durbin-Watson test between the variables of the board size and the company's sales manipulation

model	Correlation coefficient	correlation of determination	Adjusted correlation of determination	Estimate standard error	Durbin-Watson test
1	.627	.394	.384	.21621	1.658

Based on the Table 4, the correlation coefficient between variables is 0.627 and the calculated coefficient of determination is 0.394, which is the percentage of variations resulting from the sales manipulation variable explained by the board size variable. One of the hypotheses of regression is the independence of error. If the hypothesis of independence of errors is rejected and the errors are correlated with each other, it will be impossible to use regression.

Durbin-Watson statistic is used to examine the independence of the errors. If the Durbin-Watson statistic value is between 1.5 and 2.5, the hypothesis of the correlation between the errors is rejected and regression can be used. The Durbin-Watson value is 1.658 and this figure shows that the errors are independent of each other and is no auto-correlation between the errors, and the hypothesis of the correlation between the errors is rejected and the regression can be used.

Table 5: Analysis of variance of regression between board size and company's sales manipulation

model	Sum of square	df	Mean square	Statistic F	sig
Regression	.428	5	.086	3.451	.000
Residual	12.754	514	.025		
sum	13.182	519			

Table 5 shows the analysis of variance, F statistic or the significant level (Sig) is used for the significance of the whole regression and the null hypothesis and the opposite hypothesis for significance are as follows:

$$\left\{ \begin{array}{l} H_0 = \text{there is no significance model or there is no linear relationship between two variables} \\ H_1 = \text{there is significance model or there is linear relationship between two variables} \end{array} \right.$$

Significance value is = 0.000, which is smaller than 0.05, so the H_0 hypothesis is rejected and the opposite hypothesis is accepted. It means that there is significance model or linear relationship between the two variables.

Table 6: The coefficients of the regression equation between the board size and the company's sales manipulation

model	Non-standardized coefficients		standardized coefficients	Statistic t	Significance level	Tolerance	VIF
	B	Std.Error	Beta				
Content value	.152	.089		1.704	.089		
Board size	-.011	.010	-.050	-2.122	.000	.935	1.070
Firm size	.018	.009	.097	2.059	.040	.853	1.172
Financial leverage	-.084	.024	-.156	-3.521	.000	.963	1.038
Audit quality	7.035	.016	031.0000	.004	.997	.927	1.078
Company age	-.057	.044	-.057	-1.303	.193	.992	1.008



VIF and Tolerance values are used to examine lack of correlation between the independent variables. As value of the VIF statistic for all variables is less than 5, so it can be stated that there is no strong collinearity between the variables included in the model. Thus, lack of collinearity between the independent variables can be ensured. Column B also presents the constant value and independent variable coefficient in the regression equation, respectively. The rest of the columns in this table include the column coefficient criterion β , the statistic t and sig , used to test the assumption of equality of each of the coefficients of column B with number zero. The above table shows the regression coefficients of the variables affecting the dependent variable. Given the significance level of the variable of board size (000), it can be stated that there is significant relationship between the board size and sales manipulation at the 99% confidence level.

Testing the second hypothesis

Hypothesis 2: The board independence has a significant relationship with the company's sales manipulation.

H₀: The board independence has no significant relationship with company's sales manipulation.

H₁: The board independence has a significant relationship with the company's sales manipulation.

$$\begin{cases} H_0: \rho_1 = 0 \\ H_1: \rho_1 \neq 0 \end{cases}$$

We examine the relationship between board independence and sales manipulation in the first step in order to examine and test our hypotheses, since the regression relation can be used when a correlation between variables can be proved. If the Pearson correlation coefficient between the board independence and the company's sales manipulation at a minimum confidence level of 95% is smaller than 0.05, statistical hypothesis H_0 will be rejected and the hypothesis H_1 at the minimum confidence level of 95% will be accepted.

Table 7: Pearson correlation coefficient, significance level, and the number of statistical samples between the board independence and company's sales manipulation

	Independent variable dependent variable	Sale's manipulation
board independence	Pearson correlation coefficient	.097
	significance level	.026
	n	520

Table (4-7) presents the correlation coefficient, the significance level and the number of data. Pearson correlation coefficient between the variables is shown in the table. This figure shows that the relationship between the two variables at the error level of is 0.05. Given the SPSS software outputs, as Sig is less than 0.05, H_0 is rejected at the 5% error level and the correlation between the variables is confirmed.

Table 8: Correlation coefficient, correlation of determination, and Durbin-Watson test between the variables of the board independence and the company's sales manipulation

model	Correlation coefficient	correlation of determination	Adjusted correlation of determination	Estimate standard error	Durbin-Watson test
1	.646	.417	.407	.32995	1.943

Based on the Table 8, the correlation coefficient between variables is 0.646 and the calculated coefficient of determination is 0.417, which is the percentage of variations resulting from the sales manipulation variable explained by the board independence variable. One of the hypotheses of regression is the independence of error. If the hypothesis of independence of errors is rejected and the errors are correlated with each other, it will be impossible to use regression.

Durbin-Watson statistic is used to examine the independence of the errors. If the Durbin-Watson statistic value is between 1.5 and 2.5, the hypothesis of the correlation between the errors is rejected and regression can be used. The Durbin-Watson value is 1.943 and this figure shows that the errors are independent of each other and is no auto-correlation between the errors, and the hypothesis of the correlation between the errors is rejected and the regression can be used.

Table 9: Analysis of variance of regression between board independence and company's sales manipulation

Model	Sum of square	df	Mean square	Statistic F	sig
Regression	.466	5	.093	3.771	.000
Residual	12.715	514	.025		
Sum	13.182	519			

Table 9 shows the analysis of variance, F statistic or the significant level (Sig) is used for the significance of the whole regression and the null hypothesis and the opposite hypothesis for significance are as follows:

$$\begin{cases} H_0 = \text{there is no significance model or there is no linear relationship between two variables} \\ H_1 = \text{there is significance model or there is linear relationship between two variables} \end{cases}$$

Significance value is = 0.000, which is smaller than 0.05, so the H_0 hypothesis is rejected and the opposite hypothesis is accepted. It means that there is significance model or linear relationship between the two variables.

Table 10: The coefficients of the regression equation between the board independence and the company's sales manipulation

model	Non-standardized coefficients		standardized coefficients	statistic t	Significance level	Tolerance	VIF
	B	Std.Error	Beta				
Content value	.082	.079		1.028	.304		
Board independence	.050	.030	.074	1.677	.094	.969	1.032
Firm size	.014	.008	.079	1.731	.084	.897	1.115
Financial leverage	-.079	.024	-.147	-3.287	.001	.943	1.060
Audit quality	.000	.016	.00124	.024	.981	.928	1.078
Company age	-.062	.044	-.061	-1.415	.158	.995	1.005



VIF and Tolerance values are used to examine lack of correlation between the independent variables. As value of the VIF statistic for all variables is less than 5, so it can be stated that there is no strong collinearity between the variables included in the model. Thus, lack of collinearity between the independent variables can be ensured. Column B also presents the constant value and independent variable coefficient in the regression equation, respectively. The rest of the columns in this table include the column coefficient criterion β , the statistic t and sig , used to test the assumption of equality of each of the coefficients of column B with number zero. The above table shows the regression coefficients of the variables affecting the dependent variable. Given the significance level of the variable of board size (0.094), it can be stated that there is no significant relationship between the board independence and sales manipulation at the 95% confidence level, but there is significant relationship at the confidence level of 90%.

DISCUSSION AND CONCLUSION

Based on tests and analyses performed through multivariate linear regression and correlation and considering the outputs of the SPSS software in examining the relationship between the board size and the company's sales manipulation, the result suggests that the significant level obtained for the independent variable (board size) is 0.000, which is less than 5%. As a result, board size has a significant effect on sales manipulation. The calculated coefficient (-0.11) also shows a negative relationship between the variables studied. The results of the research revealed a significant inverse relationship between the board size and the company's sales manipulation at the 99% confidence level. Thus, it can be stated that with increasing the level of independent variable (board size), the level of dependent variable (sales manipulation) is reduced and with reducing independent variable (board size), the level of dependent variable (sales manipulation) increases.

Based on the tests and analyses performed through multivariate linear regression and correlation and considering the outputs of the SPSS software in examining the relationship between the board independence and the company's sales manipulation, the result suggests that the significant level obtained for the independent variable (the board independence) is equal to 0.094, which is greater than 5%, indicating lack of effect of independence of board on the company's sales manipulation at 95% confidence level, but there is a significant relationship at the 90% confidence level. The calculated coefficient (.050) also indicates a direct (positive) relationship between the variables studied. The research results revealed a direct correlation between the board independence and the company's sales manipulation at the 90% confidence level. Thus, it can be stated that with increasing the level of independent variable (the board independence), the level of dependent variable (sales manipulation) increases, and with increasing independent variable (the board independence) the level of dependent variable (sales manipulation) is reduced.

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