Determinants of The Size Of Board Of Directors:

Evidence from Jordanian Corporation

Dr. Khaled.L.K.Alnaif

Financial, Administration and Computer Science Department,   Zarqa University College. Al-Balqa' Applied University (BAU), Amman – Tariq- Post Code:11749. B.O.Box.1023 Jordan.

E-mail:kalneif@yahoo.com

Abstract

This study aims to examine association between one of the most important corporate governance mechanisms; the size of boards of directors and firm characteristic factors, namely; firm's size, firm's age, firm's leverage and firm's profitability.

To achieve this objective of the study, the data were collected from a sample of 21 industrial Jordanian companies listed in Amman stock exchange for the period 2005 – 2012.

To test the hypotheses of the study, multiple linear regression analysis using SPSS 16.0 was utilized.

The regression analysis confirmed a significant relation between the size of boards and firm characteristic factors. In particular, the results confirm a significantly positive relation between the board size and firm's size proxy. While firm's age, firm's leverage ratio and firm's profitability are significantly negative in relation to the boards size.

 These results suggests that further research should be done regarding other corporate governance mechanisms such as; board composition, chief executive status. And also regarding other factors that may help in determining the size of board of directors.

This study will contribute by its results which have important implications for investors, decision makers and regulator on corporate governance in Jordan were they going on reform of corporate boards.

Keywords: corporate governance, board of directors size, Jordan.

1. Introduction

Board of directors is considered as one of the most important dimensions of internal corporate governance system because it serves two general functions. First, they advise managers concerning the firm's business strategy (Fama and Jensen, 1983). Second, they monitor the performance of managers (Fama, 1980).

(Lehn and Zhao 2009) took the perspective that the costs and benefits of the two functions are likely to vary across firms in a way that result in systematic associations between the attributes of firms and the size of their boards.

globally, from early 2000 or late, a lot of countries have their own set of rules and regulations of corporate governance codes in their particular region according to their needs.

The governance literature argues that firms choose board size to balance advisory needs with the costs of decision-making in large groups (Adams and Mehran (2012).

In Jordan, the Corporate Governance Code for Shareholding Companies Listed on the Amman Stock Exchange introduced by Jordan Securities Commission (JSC) in 2008 is the major step towards corporate governance reforms in Jordan (for more details it is available at (www.sdc.com.jo).

Companies Law in Jordan and Corporate Governance Code for Shareholding Companies Listed (S.C.L) on the Amman Stock Exchange (A.S.E) recommend's that board's size must be not less than five and not more than thirteen, and at least one third of the board members are independent members as determined by the Company's memorandum of association.

As the literature on the determinants of board size and structure is growing fast recently in developing countries, there seems to be a dearth of research in Arabian area.

The motivation of this study is that the size of board of directors determinations has not been investigated for Jordan as an independent case. Thus we expect this paper will contribute to the board of directors literature in Jordan.

In this context, this study aims to examine the associations between the size of boards and firm's characteristic factors, namely; firm's size, firm's age, firm's leverage and firm's profitability on industrial share holding companies in ASE in the recent period from 2005 to 2012.

1.1. Problem Definition:

While recent empirical papers have examined the idea that the ideal board size and structure may vary with firm's characteristics (Rahija, 2005), this study will try to answer the following question:

Is there association between the size of board of directors and firm characteristics? In particularly:

1- Is there association between the size of board of directors and firm's size.
2-Is there association between the size of board of directors and firm's age.
3- Is there association between the size of board of directors and firm's leverage ratio.
4- Is there association between the size of board of directors and firm's profitability.

The remainder of this paper is organized as follows: Section 2 briefly reviews the relevant literature, previous studies and hypotheses development; data, research methodology in Section 3, Section 4 presents results and discussion; section 5 provides conclusions, and section 6 provide limitation's and recommendation's.

2. Literature Review, Previous Studies And Hypotheses Development

Academic literature on board of directors size stems from agency theory by (Berle and Means , 1932). Fama (1980) on agency theory argued that board of directors is the key to monitor, supervise and coordinate with managers, and that board's size and structure are central to keep a check on managers' activity.

The theoretical governance literature argues that boards fulfill their duties of advising and monitoring management by choosing board size and composition appropriately.

Several management scientists and sociologists such as; (Kiel and Nicholson , 2006), (Adam and Mehran, 2005) and Dalton (2005) argues that large board size increases the diversity in terms of experience, skills, gender, style of management and nationality. This improves overall planning, diversified views, more of expert opinions, and more skilled managers which results in superior performance (alnaif, 2014).

On the contrary, large boards are believed to be less effective due to the coordination and process problems that occur in large team sizes, thus boards with fewer members are more effective (Lipton & Lorsch, 1992, and Jensen, 1993, and Tufano & Sevick, 1997).

2.1. Determinants of size of board of directors:

The recent literature on boards of directors treats the size and structure of boards as endogenous variables (Adams and Ferreira, 2003). Andreas et.al. (2012) distinguished four types of determinants: firm characteristics, corporate performance, ownership structure and board characteristics. While Raheja (2005) showed that optimal board size and composition are a function of the directors' and firm's characteristics.

A number of recent papers (Lehn et al., 2003; Boone et al., 2007; Coles et al., 2008; Guest, 2008; and Linck, et al., 2008) showed that board size is determined by firm specific variables, such as profitability and firm size.

Following previous empirical studies, we use four measures of the firm's characteristics; firm size, firm age, firm leverage ratio and firm profitability.

2.1.1. Firm Size and size of board of directors:

There were different views about the relation between board's size and firm's size.

One argument is that as firm size increase, external contracting relationships, operating in different product and geographic markets, complexity and advising requirement increase, so the firms would have a benefit from extra

monitoring by having more members on their boards (Booth and Deli, (1996); Cloes.et.al (2008) and Andreas, et.al (2012).

Conversely, Gilley et.al.,(na) proposed that the smaller firms should rely more on experts, such as boards of directors, and others, to offset their managers' limited knowledge/experience and lack of internal strategic planning resources. Thus, the strategic guidance of boards of directors may be much more important to the success of smaller organizations.

Empirically, Ting (2011) found that bank size and bank age are the key determinants of banks' board size. Linck and Yang (2008) and Lehn and Zhao (2009) found that board size is directly related to firm size.

From the above arguments, we expect an existence of association between size of board of directors and firm's size. thus our first null hypothesis of this study will be as the following:

H0(1): There is no significant relation between size of board of directors and firm's size.

2.1.2. Firm age and size of board of directors:

Stinchcombe (1965) argued that younger firms are more likely to be concerned with resolving important strategic issues for the first time, such as determining which opportunities to pursue, selecting a competitive strategy, and choosing methods of strategy implementation (Gilley et.al ,na). At the same time, managers in newer organizations are less likely to engage in a formal strategic planning or a thorough environmental scanning (Mohan-Neill, 1995), as a result, they may have less knowledge of external environmental factors, when compared with executives of older organizations(Gilley et.al ,na). This is largely due to the lack of managerial/analytical resources available to younger firms (Boeker & Goodstein, 1993). Therefore, by providing strategic management consultations to the top management team of young organizations, boards of directors may have important effects on their performance.

Conversely, older organizations are more likely to have well-established environmental scanning systems (Mohan-Neill, 1995) and more sophisticated strategic planning capabilities. Consequently, they may be less likely to need board member strategic influence to achieve higher levels of performance (Gilley et.al ,na).

 Based on the above theoretical perspective, the second null hypothesis could be stated as the following:

H0(2): There is no significant relation between size of board of directors and firm's age.

2.1.3. Financial leverage ratio and size of board of directors:

Berger (1997) argued that larger boards exerts pressure on managers to follow lower gearing levels. Empirically Abor and Biekpe (2007) and Hasan (2009) support this view of negative relationship between board size and leverage ratios.

On the contrary, Wen (2002) argued that larger board may find difficulty in arriving at a consensus in decision making which can ultimately affect the quality of corporate governance and will be translated into higher financial leverage levels.

Pfeffer and Salancick (1978) found a significant relationship between capital structure and board size.

Thus, our third hypothesis of this study will be as the following in a null form:

H0(3): There is no significant relation between size of board of directors and firm's leverage ratio.

2.1.4. Firm performance and size of board of directors:

Theoretical literature and results of prior empirical studies, documents mixed arguments and results regarding the relationship between performance and size .

Literature and several empirical studies consist and support's the view that board size is associated with Firm performance ,but the exact direction of this relation is not agreed upon.

The positive association between board size and firm's performance argues that large board size increases the diversity which improves overall planning, diversified views, and more skilled managers which results in superior performance.(Kiel and Nicholson (2006), Adam and Mehran (2005) and Dalton (2005). This view is confirmed by several empirical studies such as; Belkhir (2009) and Sheikh et al.(2012).

On the other hand, Lipton and Lorch (1992) and Jensen (1993) argued that firms with fewer board members have superior performance compared to companies with crowded boards. This argument was supported by several empirical studies such as; Loderer and Peyer (2002) and Lasfer (2004).

While few studies reported no significant correlation between board size and a firm's performance such as: Aggarwal et al. (2007) and Topak (2011).

Finally, Mak and Li (2001) found that the sign and significance of the relationship between board size and performance is sensitive to the estimation method.

From the above arguments, we expect an existence of association between size of board of directors and firm's size. So our fourth null hypothesis will be as the following in a null form:

H0(4): There is no significant relation between size of board of directors and firm's performance.

3. Research methodology:

In this section, we describe our data sources, sample, variables and the model used in determining the size of board of directors.

3.1. Data Sources and Sample:

The data employed in this paper are collected from different sources. We use firm specific data from annual financial reports of listed companies in the official website of Amman stock exchange (ASE) (www.ase.com).

In addition, another source of data was through reviewing different articles, papers, and relevant previous studies.

The sample consists of 21 randomly selected company from 69 listed industrial company on (ASE) at the end of 2012 for the period of 2005-2012.

The firms in the sample represent a wide range of manufacturing industries, including; Pharmaceutical and Medical Industries, Chemical Industries, Paper and Cardboard Industries, Food and Beverages, Mining and Extraction Industries, Engineering and Construction, Electrical Industries, Textiles and Leathers and Clothing.

3.2. Variables:

3.2.1. Dependent Variable:

Board of directors size: The size of the board of directors, calculated as the number of directors sitting in the board.

3.2.2. Independent Variables:

Firm's size: The size of a firm is calculated as the natural logarithm of the total assets.

Firm's age: Firm age was measured as the total number of years the firm has been in existence.

Firm leverage ratio: Leverage = Ratio of debt to total assets.

Firm profitability: Return on assets is used as proxy of profitability. Return on assets is both a measure of profitability and asset utilization and has been used in a number of recent studies (Erhardt, et al., 2003. Return on assets (ROA) is calculated as the ratio of net profit after tax divided by total assets.

Table 1 summarizes the operational definitions of the variables used in this study following the common literature.

Table 1. Definitions of Variables

Variables	Acronym	Operational definition
Board Size	BSZ	Total number of directors serving on the board of directors.
Firm's size	TA	The size of a firm is calculated as the natural logarithm of the total assets
Firm's age	Age	the total number of years the firm has been in existence.
Firm's leverage ratio	Lev	Ratio of debt to total assets.
Firm profitability	ROA	Ratio of Net income to total asset

3.3. Regression Model:

In line with prior studies that examined the determinants of board's size and structure, this study will use multiple regression analysis and employs SPSS package to test our hypotheses.

The regression specification for board size is as follows:

$$BSZ = \alpha + \beta1 TA + \beta2\ Age + \beta3\ Lev + \beta4\ ROA + \varepsilon$$

Where: BSZ, Age, Lev, and ROA as shown in table 1.

β_i's are the parameters and ε_i is the error term.

4. Results And Discussion:

4.1. Descriptive statistics

This section serves for presenting descriptive statistics and frequencies of the variables we used for analysis. Table 1 shows mean values, minimum and maximum values and other statistical indicators for each variable.

Table 2. Descriptive Statistics

Descriptive st.	B SIZE	TA	AGE	LEV	ROA
MEAN	9.05	7.316	31.8	0.30	0.025
SD	2.177	.706	12.8	0.184	0.128
MIN	5	6.295	12	0.01	-0.64
MAX	13	9.087	59	0.84	0.43

The mean value of board's size is 9 ranging from five members to maximum of thirteen members. This result is consistent with the Jordanian Corporate Governance Codes which recommend that board is between 5 to 13, and is also consistent with several previous studies such as; Alnaif, 2014 who documented that the average of board size is 9.76 members in Arabian banks and yaser et.al 2012 who documented a mean of 9.3 members in Pakistanian firms.

The mean value for firm age equals to 32 years, and the median is 43% and it ranges from 12 to 59 years.

In addition to that, the average of the total assets of 97.317.460 Millon JD, and ranging from 1,971,619 to 1.223.269.000 Millon JD ,these numbers reflects that the sample contains small, medium and large firms.

It is noticed that the average leverage ratio is 29.7% and ranging from 1% to 84%.

The mean value for firm profitability equals to 0.0253, ranging from -0.64 to 0.43.

Table 3. Board size frequencies

Size	Frequency	percent	Cumulative Percent
5	16	9.5	9.5
6	8	4.8	14.3
7	24	14.3	28.6
9	56	33.3	61.9
10	8	4.8	66.7
11	40	23.8	90.5
12	8	4.8	95.2
13	8	4.8	100
Total	168		

As it is obvious in Table 3 we notice that 33.3% of observations have a board size of (9), and 61.9% of sample have aboard size less than (9).

We also notice that a majority of 85.6% of the sample have an odd number of board size, it could be related to facilitating the voting process.

4.2. Multiple Linear Regression Analysis

Before using this model we carried out a robustness test to check for good fitness of data for regression model.

The normality of the variables was examined using the skewness and kurtosis. Table 4 shows that the values of skewness are located in the range between -.87 and +.807. On the other hand, the values of kurtosis lie between -.707 and .187. Brooke (2002), Gujarati (2003) and Hair,(2011) argued that data are said to be normal if standard kurtosis is within ±3 and standard skewness is within ±1.96. Therefore, all the variables of the study can be described to have been approximately distributed.

Table 4. Normality and multicolliniarity tests.

Variables	N	Skewness		Kurtosis		VIF	Tolerance test
		St.	Std.Error	St.	Std.Error		
Board size	168	-.287	.187	-.692	.373		
Firm's size	168	.807	.187	-.122	.373	1.63	0.631
Firm's age	168	.532	.187	-.707	.373	1.77	0.566
Firm's leverage ratio	163	.768	.190	.187	.378	1.25	0.79
Firm's profitability	168	-.085	.187	.550	.373	1.32	0.756

Furthermore, the above specification could potentially suffer from a real issue related to the correlation between independent variables. Variance Inflation Factor (VIF) and Tolerance test will be performed for all the independent variables to examine the existence of multi-co linearity.

Table:4 show that all (VIF) values are around one (1.25-1.77), thus they were far lower than the cut off value of 10 so collinearity was not a serious problem (Brooks, 2002; Gujarati, 2003).

Tolerance test results indicate that all values ranges from 0.57 to 0.79 these results indicate that co linearity problem does not seem to be an issue here among independent variables.

4.3.3 Multiple Linear Regression Analysis

In this section, we report the empirical results regarding of testing the hypothesis that board size is not associated with some of firm characteristics, namely; firm size, firm age, leverage ratio and profitability.

The multiple regression analysis results by using enter method on data consisting of the 21 firms over the period from 2005 to 2012 constructing a sample of 168 firm-year observations can be summarized in table 5.

Table 5.Regression results of board size and independent variables

	Un Standardized coefficients B	Std.Error	Standardized coefficients Beta	T. Value	Sig.
constant	0.003	1.791		0.002	0.99
Logta	1.650	0.275	0.531	5.99	0.000
Age	-0.043	0.013	-0.244	-3.188	0.002
Lev	-5.387	0.875	-459	-6.157	0.000
ROA	-0.285	1.54	-0.157	-1.851	0.066
R2	0.306	Adj.R2: 0.288			
F	17.272	0.00			

Where:

***Dependent variable**: BSZ: The size of the board of directors, calculated as the number of directors sitting on the board.*

Independent variables: *Lev: Leverage ratio: equals total liabilities divided by total assets, Logta: Firm's size refers to the natural logarithm of firm total asset, Age: Firm's age: the current year minus the year of the corporation establishment. ROA: Financial performance: net income divided by the total assets of the firm.*

Table 5 results indicates that R^2 value of our regression models is 30.6%, which means that 30.6% of the variance of board size can be predicated by independent variables. But, remaining 69.4 % of variance is attributed to other factors. This indicates a significant but minor influence of the firm's characteristics on the board size.

In addition, ANOVA (F–value) indicates that it is 17.272 and the p-value< 1% , which indicates that the combination of the predictors significantly predicts the board size, So, the model was considered to be useful.

The regression analysis confirmed a significant relation between the size of boards and firm characteristic factors, namely; firm's size, firm's age, firm's leverage (at 0.05 significant level) and firm performance (at 0.10 significant level), the levels of significance of 0.0%, 0.2% 0.1% and 6.6% respectively.

These results are consistent with our argument that firm characteristic indicators determine board size. And are in line with the arguments that treat board characteristics as endogenous variables, and no size fit all (Boone et al. (2007), Coles and Lalitha (2008), and Linck and Yang (2008).

Empirically, study results consist with the findings of some prior studies made on this topic such as; Andreas et.al. (2012) in German firms; Ting (2011) in Taiwan banks; Lehn and Zhao (2009) in US companies, and Raheja (2005) who showed that optimal board size and composition are a function of the directors' and firm's characteristics.

In particular, the results confirm a significantly positive relationship between the board size and **firm's size** proxy (logta) at 1% significant level (β = 1.650, p < 0.01). The beta coefficient for this relation is 1.650, which means that 1 $^\%$ increase in log (total assets) will result 165% increase in board size on average while all the other variables are held constant.

This result indicates that larger industrial Jordanian firms have bigger board size, in other words board size increases as firms grow in size, this result suggest that in general, Jordanian firms meet firm expansion requirements by adding extra members in the board of directors.

This result is consistent with Lehn and Zhao (2009) argument that large firms are likely to be engaged in high volume and more diverse activities than small firms, thus, large firms have more demand for information than do smaller firms.

This result also validated the earlier evidence of a positive association between firm size and firm's board size, proposed by Lehn and Zhao(2009), Coles and Naveen, (2008), Guest, (2008), Adams and Ferreira (2003), Boone et al., (2007), Lehn et al. (2004) and Yermack (1996) .

Thus, we did not accept the first null hypothesis that there is no significant relation between size of board of directors and firm size and then we accept Ha at 5% significance level.

On the other hand, Table 5 also reports that firm's age (β = -0.043, p < .01) and firm's leverage ratio (β = -5.387, p < .000) are significantly negative in relation to the boards size at 1% significant level. As will as a significantly negative relationship between the board size and firm profitability proxy ROA (β = -0.285, p < 0.10) but at 10% significance level.

The coefficient of the firm age is (-0.043) and significant at the 0.01 level or better, this means that 1 $^\%$ increase in firm age will result 4.3 % decrease in board size.

A potential explanation for the negative relation between firm age and board of directors size can be made from the perspective of that older organizations are more likely to have well-established environmental scanning systems and more sophisticated strategic planning capabilities. Consequently, they may be less likely to need board member strategic influence to achieve higher levels of performance (Mohan-Neill, 1995).

Stinchcombe (1965) also argued that younger firms are more likely to be concerned with resolving important strategic issues for the first time, such as determining which opportunities to pursue, selecting a competitive strategy, choosing methods of strategy implementation, and establishing strategic control mechanisms.

This result is consistent with Ting (2011) who found that bank age and bank size are the key determinants of banks' board size in Taiwan banks.

This result implies that we did not accept the second null hypothesis and accept Ha which is: there is a significant relation between size of board of directors and firm age and then accept Ha.

The most influential independent variable was the leverage ratio with a beta coefficient of -5.387, this result indicate that high debt firm's have smaller boards of directors.

This result is consistent with Berger (1997) arguments that larger boards exert pressure on managers to follow lower gearing levels, also it could be due to avoiding extra costs of extra board member, in addition, large boarders are more warned about debt.

This result is consistent with prior studies such as; Abor and Biekpe (2007) who found a negative correlation between the size of board and debt to equity ratio. Thus, our third null hypothesis was not accepted.

Firm performance has a coefficient (β = -0.285, p < .066), this result confirms a significant negative relationship between board size and firm performance but at 0.10 level. We have replicated the regressions with ROE as the proxies for firm performance and the results are similar.

This result is in contrast with many studies that reported no significant correlation between board size and a firm's performance such as: Aggarwal et al. (2007) US firms and Topak (2011) from Turkey firm. And it is also in contrast with many studies such as; (ALnaif,2014) who found positive relationship between board's size and banks performance in 55 Arabian banks; Adams and Ferreira (2003), and Adams and Mehran (2005).

This implies that we do not accept the fourth null hypothesis and then accept Ha which states that: there is significant relation between size of board of directors and firm performance.

So, we can derive the following regression equation:

board's size= 0.485 + 1.531 Logta - 0.038 Age - 0.045 Lev - 0.287 ROA+ e.

5. Conclusion

This study examined the association between the size of board of directors and firm characteristics, namely; firm size (logarithm of total assets), firm age, firm leverage ratio and firm profitability in JLC in ASE during the period 2005-2012.

 The multiple regression results provides an empirical evidence that the four variables are significant determinants of the size of boards. In particular, we found that board size is directly related to firm size and inversely related to firm age, firm leverage ratio and firm profitability.

We conclude that in Jordanian industrial firms, the size of board of directors varies between firms and no size fits all, firm characteristics explains just approximately 31% (R2= 0.306) of board size and we recommend that further research should be done regarding other variables.

This study will contribute by its results which have important implications for investors, decision makers and regulator on corporate governance in Jordan were they going on reform of corporate boards.

6. Limitation and recommendation

Since this study focuses only on one of corporate governance mechanisms (board size), because of the unavailability of data of other mechanisms such as: board composition, chief executive status), we would suggest building a strong data base of corporate governance data to facilitate further research regarding other corporate governance mechanisms.

—We also recommend extending the study using non financial measures, and it would be very interesting if both financial and non financial performance measures were used.

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