Impact of Board Size on Financial Performance: The Case of BIST Manufacturing Industry^{*}

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Abstract

The board constitutes one of the fundamental corporate governance mechanisms in firms. The structure and size of the board and its impact on the performance of the firm is one of the most discussed issues of corporate governance. The present study aims to test the impact of the board size on the financial performance of the firms. The study's sample utilizes data from 2002-2012 belonging to 136 firms operating in manufacturing industry section of Borsa Istanbul (BIST). In empirical analyses, Robust estimator developed by Beck-Katz (1995) was used. The results of the conducted analyses suggest a positive relation between the board size, and Return on Asset and Z Altman score. Another result of the study, on the other hand, suggests that board size doesn't have an impact of Tobin's q and return on equity.

Key words:

Board Size, Financial Performance, Manufacturing Industry, Turkey

1.INTRODUCTION

The board uses its authorities and liabilities in the frame of regulations, main contract, in-company regulations and policies in line with the authority bestowed on it in the general assembly by shareholders, and represent the company. Board is the body of strategic decision-making, representation and highest executive body of a firm (Aygün et al., 2010). Board aims to maximize the market value of the firm while making decisions. The board conducts the corporate businesses in such a way as to provide long-term and steady gain for the shareholders. They also ensure the continuity of the delicate balance between the shareholders and the need for growth of the company (www.spk.gov.tr).

Mission of the board is to direct the corporation in a proactive manner as the highest authority in decision making while enabling shareholders to profit continuously and permanently in the long-term. The board is a body with various influences both as conductor and as arbitrator, determining the rules of the game, although not within the daily operations. The boards are in charge of expected return-risk profile of strategic choices, short and long term balance of the performance, the fair protection of benefits between shareholders, listing priorities and encouraging innovation along with protecting the balance between inspection and control functions. Thus, it is important for the decisions of the board to have a foresighted balance. The obligations of directing, inspecting, rule-making as well as exemplifying necessitate having a strong structure for boards (Argüden, 2007: 15).

The present study aims to test the impact of the board size on the financial performance of the firms. In line with this purpose, a sample consisting of all firms in BIST manufacturing industry listings was set for the period of 2002-2012. A total of 136 firms operating in manufacturing industry during this period were included in the analysis.

The study consists of four sections. First section summarizes other studies measuring the relationship between the board size and financial performance of the firms. The following section consists of assertion of hypotheses and evaluation of the data of the study by way of analyses and the concluding section puts forth the impact of board size on the performance of the firms in Turkey.

2.LITERATURE REVIEW

There are many studies analyzing the relationship between corporate governance and performance of the firm. The majority of these studies are oriented towards ascertaining the impact of board size which is another dimension of corporate governance on the performance of firms. Some of these studies reveal an increase in the effectiveness of the firm as the board size grows while some others suggest the opposite, i.e. a decrease in the effectiveness of the firm as the board size grows.

Fama and Jensen (1983) argue that the increase in the number of the members of the board slows down the decision-making processes of the firm, causing the board to pass off the problems, thus, leading to a decrease in firm value and effectiveness. Studies of Lipton and Lorsch (1992) and Jensen (1993), aiming to empirically measure the relationship between the board size and firm performance, suggest that "as size of the board grows, the decision-making processes slow down and this causes communication problems and impacts the firm's performance negatively." In the study taking the studies of Lipton and Lorsch (1992) and Jensen (1993) as reference, Yermack (1996) analyzed 452 USA firms operating in the years of 1984-1991 and evaluated the impact of board size on the accounting- and market-based performances of the firms. Lipton and Lorsch (1992) and Jensen (1993) consistently suggested a negative relationship between board size, and Tobin's q and ROA. In their study analyzing 879 Finnish firms in the period of 1992-1994, Eisenberg, Sundgren and Wells (1998) evaluated the relationship between the board size and performance of the firms. Instrumental variables and generalized linear models were used in the mentioned study. The results of the analysis suggested a negative relationship between the board size and ROA. They interpreted these findings as the probability of the presence of communication and coordination problems in the firms with bigger boards. Similar results were put forth by Vo and Phan (2013); Samuel (2013); Arosa et al. (2013); Gill and Obradovich (2013); Bhagat and Bolton (2013); Uchida (2011); O'Connell and Cramer (2010); Guest (2009); Bennedsen et al. (2008); Cornett et al. (2007); Haniffa and Hudaib (2006), Mak and Kusnadi (2005); Lasfer (2004) as well.

Kiel and Nicholson (2003) studied the impact of board structure on the value of the firms publicly-traded in Australian Stock Exchange. Their study used the data of 348 firms belonging to the period of 1996-1998. The results of their analyses suggested a positive and statistically significant relation between board size and Tobin's q. Similarly, Chen, Cheung, Stouraitis and Wong (2005) aimed to measure the relationship between the board and partnership structure, and performance of 412 firms publicly-traded in Hong Kong stock exchange. The results of the analysis using data belonging to the period of 1995-1998 suggested a positive relationship between the board size and Tobin's q. But they were not able to find a significant relationship between board size, and ROA and ROE. Choi, Park and Yoo (2007) analyzed corporate governance reforms in terms of Korean firms. In the study covering the period of 1999-2002, 450 firms' data were used and positive results were obtained concerning the relationship between board size and Tobin's q. Similar results were obtained concerning the relationship between board size and Tobin's q. Similar results were obtained concerning the relationship between board size and Tobin's q. Similar results were obtained to concerning the relationship between board size and Tobin's q. Similar results were obtained concerning the relationship between board size and Tobin's q. Similar results were obtained by Kim (2013); Saravanan (2012); Elsayed (2011); Rashid et al. (2010); Larmou and Vafeas (2009); Kyereboah-Coleman (2006); Beiner et al. (2006); Kiel and Nicholson (2003) as well.

Moscu (2013) analyzed the impact of the characteristics of the board on the performance of the firms registered in Romanian stock exchange. Data of the year 2010 and belonging to 62 firms were used. Positive and statistically insignificant results were obtained between board size, and ROA and ROE at the end of empirical analyses. The study conducted by Kumar and Singh (2013) analyzed the relationship of management and partnership structure and value of 176 firms publicly-traded in Indian Stock Exchange. The study covered the period of 2008-2009 and utilized regression and correlation methods. The results of their analyses suggested a negative and statistically insignificant relation between board size and Tobin's q. Horváth and Spirollari (2012) analyzed the impact of the board's characteristics on the performance of 136 American firms found in S&P 500 exchange index. The results of the study covering the years of 2005-2009 suggested a statistically insignificant relationship between board size and Tobin's q. Similar results were put forth by Priva and Nimalathasan (2013); Velnampy (2013); Baptista et al. (2011); Chen and Nowland (2010); Lefort and Urzúa (2008); Kim (2007); Bozec (2005); Oxelheim and Randøy (2003) as well.

3. METHODOLOGY

The present study aims to test the impact of the board size on the financial performance of the firms. In line with this purpose, a sample consisting of all firms in BIST manufacturing industry listings was set for the period of 2002-2012. A total of 136 firms operating in manufacturing industry during this period were included in the analysis. These firms were divided to 9 sub-sectors. Table 1 shows the sub-sectors of 136 firms in the manufacturing industry.

Sector	Number of the Firms
Food, Beverage and Tobacco	21
Textile, Clothing and Leather	21
Wood Products and Furniture	2
Paper and Paper Products, Printing and Publishing	10
Chemicals, Petroleum, Rubber and Plastic Products	24
Stone and Earthbound Industry	24
Key Metal Industry	11
Metallic Items, Machinery and Equipment Manufacturing	20
Other Manufacturing Industries	3
Total Number of Firms	136

Table 1: Sector-Based Distribution of the Firms Operating in Manufacturing Industry

Data was analyzed using Stata 13 program. In the estimation of regression model, the variance of error term is not equal to the unit matrix in case of heteroskedasticity, autocorrelation and correlation between the units. This results in the inconsistency of the model and affects its effectiveness. Due to the above mentioned reasons, either standard errors should be corrected without touching the parameter estimations (robust standard errors should be obtained) or proper methods should be used to make estimations in case at least one case of heteroskedasticity, autocorrelation and correlation between units is present in the model (Tatoğlu, 2013: 242). Although least-square method is frequently preferred for the regression analyses found in the literature, the present study uses the method of robust estimators due to the reasons mentioned above. The robust estimators used in the literature have been developed by Huber Eicker White (1967, 1967, 1980), Wooldridge (2002), Newey-West (1987, 1994), Parks-Kmenta (1967, 1986), Beck-Katz (1995), Driscoll and Kraay (1998). Due to the presence of heteroskedasticity, autocorrelation or correlation between units (cross-section dependency) in the present study and due to its ability of being implemented in case of robustness against these problems, Robust estimator developed by Beck-Katz (1995) was preferred.

Table 2 shows 4 dependent and 5 independent variables used in the study.

Table 2: Variables Used for the Analysis

Variables	Definitions	Codes						
Dependent Variables								
Return on Assets	Net Profit of the Period/Total Assets	ROA						
Return on Equities	Net Profit of the Period/Total Equities	ROE						
Tobin's q	Market value to the book value of total assets.	TOBIN						
Z Altman	Z Altman Score	ALTMAN						
Basic Independent	Basic Independent Variables							
Board Size	This indicates the number of the members of the firms' boards.	BSIZE						
Duality	If ceo is also a member of the board, it is 1, otherwise it is 0.	DUAL						
Control Variables								
Firm Size	Logarithm of Total Assets	ASSET						
Level of Liabilities	Total Liabilities/Total Assets	LEVERAGE						
Firm Age	Current Year-Year of Establishment	AGE						

4.FINDINGS

Table 3 shows the results of descriptive statistics belonging to dependent and independent variables used in the analyses.

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	ROA	ROE	TOBIN	ALTMAN	BSIZE	DUAL	LEVERAGE	ASSET	AGE
Mean	0.024	0.076	1.984	3.182	6.549	0.578	0.461	19.03	36.11
Median	0.034	0.064	1.239	2.840	7.00	1.00	0.436	18.97	37.00
Maximum	2.992	42.93	109.46	93.65	18.00	1.00	0.997	23.56	77.00
Minimum	-4.452	-60.30	0.146	-33.97	3.00	0.00	0.006	15.32	3.00
Std. Dev.	0.191	2.255	4.309	4.202	2.046	0.494	0.229	1.467	11.83
Skewness	-6.441	-8.773	15.73	8.565	0.714	-0.316	0.283	0.438	-0.038
Kurtosis	241.31	458.09	325.53	173.91	4.109	1.100	2.252	3.017	3.488
Observations	1496	1496	1496	1496	1496	1496	1496	1496	1496

Table 3: Descriptive Statistics

As seen in Table 3, average member number of boards (board size) of the firms operating in BIST manufacturing industry and covered in the study is 6.5. Mean ROA and ROE have been calculated as 2.4% and 7.6% respectively. Mean Tobin's q ratio and Z Altman score, on the other hand, have been established as 1.98 and 3.18 respectively.

Table 4: Correlation Table										
	ROA	ROE	TOBIN	ALTMAN	BSIZE	DUAL	LEVERAGE	ASSET	AGE	
ROA	1.000									
ROE	0.169	1.000								
TOBIN	0.007	-0.002	1.000							
ALTMAN	0.348	0.046	-0.007	1.000						
BSIZE	0.192	0.027	-0.027	0.219	1.000					
DUAL	-0.014	0.027	-0.046	-0.014	-0.045	1.000				
LEVERAGE	-0.332	-0.080	0.033	-0.468	-0.294	0.087	1.000			
ASSET	0.160	0.016	-0.056	0.096	0.477	0.019	-0.075	1.000		
AGE	0.035	0.005	0.006	-0.0002	0.179	0.125	-0.026	0.293	1.000	

Table 4 of the study consists of the correlation table indicating the relationship between dependent and independent variables. As correlation table reveals, there is a positive relationship between board size, and ROA and ALTMAN while there isn't a significant relationship between the independent variables. Table also indicates that there is not a relation between ROE and Tobin's q, and board size.

Table 5: Robust Estimator Results

VARIABLE	Model 1 ROA	Model 2 ROE	Model 3 TOBIN	Model 4 ALTMAN
BSIZE	2.08 ^{**}	0.35	-0.44	2.35**
DUAL	0.41	0.52	-1.82**	1.57 [*]
LEVEAGE	-8.5****	-3.42**	1.89 [*]	-18.12***
ASSET	9.55***	1.83**	-1.63**	11.43***
AGE	-0.76	-0.57	035	-1.90 [*]
Constant	-2.12***	-0.56***	1.42***	1.35***
Observations	1496	1496	1496	1496
Number of the Firms	136	136	136	136
Probability	0,00000	0,00000	0,00000	0,00000
Wald Chi ²	372.48	34.25	1003.55	3210.24
R-squared	0.1404	0.0202	0.1749	0.5068

***, ** and * indicate significance at the level of 1%, 5% and 10% respectively

Table 5 shows the results of robust estimator, developed by Beck-Katz (1995) to be robust in the face of the presence of heteroskedasticity, autocorrelation or correlation between units. The board size appears to be influential on ROA and ALTMAN when the results or the models are evaluated. A positive relation is suggested between board size, and ROA and ALTMAN. In other words, return on assets increases and the risk of financial failure decreases as board size grows. On the other hand, no significant relation was established between board size, and ROE and Tobin's q. It may be suggested that the board size is not influential on return on equity and market value of the firm. A statistically insignificant relation was established between duality, another independent variable, and ROA and ROE. Additionally, a negative relationship between duality and Tobin's q is suggested while another negative relationship between Z Altman score and duality is suggested by the results. The market value of the firms as well as the risk of financial failure decreases in case of the presence of duality in firms.

A negative relationship between leverage ratio, and ROA, ROE and ALTMAN was observed while a positive and significant relationship was observed between Q and leverage ratio when the control variables of the study were analyzed. The increase in the usage of liabilities causes the resource cost to increase, therefore increases the risk of financial failure while decreasing profitability. There was a positive relation between total assets which constitute the other control variable as the indicator of firm size and ROA, ROE and ALTMAN; on

the other hand, Q had a negative and significant relation. The increase in firm size, in other words, causes an increase in return on assets and return on equity while decreasing the risk of financial failure. Firm age, as the other control variable, was observed not to be influential on ROA, ROE and Q. But there was a negative relationship between firm age and ALTMAN score.

5.CONCLUSION

The present study aims to test the impact of the board size on the financial performance of the firms. In line with this purpose, a sample consisting of all firms in BIST manufacturing industry listings was set for the period of 2002-2012. A total of 136 firms operating in manufacturing industry during this period were included in the analysis.

The results of the conducted analyses suggest a positive relation between the board size, and return on assets and Z Altman score. In other words, return on assets increases and the risk of financial failure decreases as the board size grows. This may be explained by the increase of effectiveness of decision-making processes of the firms. Additionally, executives may start to prioritize the firm's interests rather than their own along with the increase in the board size. But, board size is not influential on market performance indicator and return on equity.

Finally, there are some limitations to the present study analyzing the relationship between board size and financial performance. The findings of the present study should, first of all, be interpreted in terms of firms in BIST manufacturing industry. Another limitation is its usage of data covering only the period of 2002-2012. Future studies may be conducted to analyze the impact of board size on various sectors and their findings may be compared with the findings of this one.

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