# Board Size and Corporate Performance: An Empirical Investigation

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**Abstract** *The subject of corporate governance has always been of keen interest to the researchers in the area of management and finance. This paper basically concentrates on the corporate board of directors which is an internal corporate governance mechanism. Since the effectiveness of boards counts on several characteristics such as board size, board composition, leadership structure etc, therefore considering this viewpoint, the present study is based on the analysis of board size of BSE listed companies in India. This analysis broadly embraces the relationship between board size and performance as represented by various indicators such as Operating Profit Margin, Return on Assets, Return on Equity, Earnings per Share and Tobin's Q. Spearman's rho correlation, One Way ANOVA and Kruskal-Wallis tests were applied to draw the inferences. Results of the study remained robust and thus concluded that both board size and firm performance were independent of each other as board size was not found to be associated with firm performance.*

**Keywords** *Corporate Governance, Board Size, Firm Performance*

## INTRODUCTION

The subject of corporate governance has always been of keen interest to the researchers in the sphere of management and finance. It is the system by which companies are directed and controlled.[1] In corporate form of organization, since the owners i.e. the shareholders (principals) of the companies are dispersed over distant places, these are run by the professional managers (agents). Due to the separation of ownership, control and management, managers adopt self-opportunistic behaviour and perform against the interests of the shareholders. It results into the loss of shareholders' control over the managerial decisions and ultimately, the shareholders bear the risk associated with these decisions, the phenomenon which is commonly known as 'agency problem' in the principal-agent paradigm (Jensen and Meckling, 1976; Fama and Jenson, 1983). An effective internal corporate governance mechanism to mitigate the effect of these agency problems is board of directors (Donaldson and Davis, 1991; Jensen, 1993). In addition, the corporate governance dispute (i.e. agency problem) in the developed markets like U.S and U.K is associated with the "managers-shareholders agency problem" i.e. agency conflicts between widely dispersed shareholders and professional managers due to the diffused shareholding structures existent in these countries. In contrast, there is preponderance of concentrated shareholding structures (family-owned and family-run business groups) in corporate sector of emerging markets like India where the agency problem is linked with the expropriation of weak minority shareholders by the controlling shareholders which is another agency problem called "majority-minority agency problem" (Chakrabarti, et al., 2010; Varottil, 2010). According to OECD Principles of Corporate Governance (2004), "the corporate governance framework should ensure the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the shareholders".[2] Since the effectiveness of a board rests on the several characteristics such as board size, its composition, leadership structure etc, therefore considering this viewpoint, this study examines, in particular, the role of board size on the firm performance relying on different performance indicators.

The remainder of this paper is structured as follows. In the first section, review of past literature has been presented followed by the development of objectives. Thereafter, research methodology (i.e. sample selection and variables measurement) has been delineated in the following section. In the next section, results of the study have been presented and last section covers discussion of the results and conclusions thereof.

1 http://www.ecgi.org/codes/documents/cadbury.pdf

2 http://www.oecd.org/corporate/corporateaffairs/corporategovernanceprinciples/31557724.pdf

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## LITERATURE REVIEW

An enormous amount of conceptual as well as empirical research has been conducted on the size of boards and its linkage with firm performance. However, past literature raises a question about whether the board size should be larger or smaller. Studies advocating large size boards are in consonance with the tenets of resource dependency perspective (Pfeffer, 1972). It is also due to the reason that larger boards having directors from widely diverse backgrounds offer high quality advice and counsel due to their wealth of expertise and knowledge (Dalton and Dalton, 2005). Contrary to this, larger boards can be less effective than smaller boards (Lipton and Lorsch, 1992; Jenson, 1993; Raheja, 2003), due to the reason that larger boards cause problems like directors' free-riding, lack of coordination, diffusion of responsibility, less cohesive decision making etc. as suggested by the literature. Empirical evidences on the association between board size and firm performance have too generated mixed findings. For example, on the one hand, larger board sizes are related with higher firm performance (Dalton et al., 1999; Larmou and Vafeas, 2010; Uadiale, 2010), however, on the other side, Yermack (1996) in an analysis of 452 companies ranked by the Forbes magazine as one of the 500 largest US public corporations found that board size was inversely associated with firm value. In addition, Eisenberg et al. (1998) also found significant negative correlation between board size and profitability for the sample of small Finnish firms. Cheng et al. (2008) also demonstrated a significant relation between smaller boards and better firm performance (before the passage of antitakeover laws). Similarly, several other studies have provided evidences of the negative effect of board size on performance (Barnhart and Rosenstein, 1998; Hermalin and Weisbach, 2003; Bennedsen et al., 2004; Bonn et al., 2004 (for Japanese firms only); Mak and Kusnadi, 2005; Guest, 2009; Ranti and Sameul, 2012). In addition, there are some studies which have stated no relationship between the board size and firm performance (Topak, 2011; Al-Matari et al., 2012). Moreover, Jenson (1993) had pointed out that when boards go beyond seven or eight people, they are less likely to function effectively and are easier for the CEO to control. Some empirical studies have also adduced an inverse impact in case of board size having more than seven members (Yermack, 1996; Bennedsen et al., 2004).

In comparison to the developed countries, where a vast amount of literature has been available on the linkage between board size and firm performance, few studies have been conducted in India on the relationship between board size and firm performance, and that too are characterised by the disparate results with lack of convincing evidence. Where some of the empirical studies on corporate board size in India have demonstrated positive relationship with firm performance (Kathuria and Dash, 1999; Dwivedi and Jain, 2005 (weak relationship); Jackling and Johl, 2009), there are other studies that have stated a negative relationship (Ghosh, 2006; Garg, 2007; Ghosh, 2007; Dey and Chauhan, 2009). Apart from that, few studies have reported insignificant (or no effect) relation between board size and firm performance (Mayur and Saravanan, 2006; Sarkar and Sarkar, 2009).

Based upon the above mixed views, this study basically addresses two research questions: 1) whether there is any correlation between board size and firm performance and 2) whether the board size should be larger or smaller in the context of an emerging market like India. Therefore, the objectives to be covered in this study are stated as follows:

1. To analyse the size of the boards of sampled companies.
2. To examine the relation between board size and firm performance of sampled companies.

## RESEARCH METHODOLOGY

The initial sample of the study was comprised of entire 'A' group companies listed on BSE out of which all banks and finance companies (including housing finance, financial institution and other financial services) had been excluded (since these companies are associated with highly regulated industries). In addition, those companies were also removed from the sample, whose financial year ending date was other than 31st March, 2011. In this way, remaining 137 'A' group companies became part of the final sample after excluding two more companies to maintain the data accuracy. This study had basically focused upon one corporate governance variable i.e. board size, the data for which had been extracted from the corporate governance section of the annual reports of the respective sampled companies. The annual reports of the sampled companies had been downloaded from Ace Equity database and the respective websites of the sampled companies. Firm performance had been measured through four accounting based measures, namely, Return on Assets, Return on Equity, Operating Profit Margin (Return on sales), and Earnings per Share as well as through one market-based performance measure i.e. Tobin's Q ratio. The data with respect to the performance indicators had been obtained from the Prowess database of Centre for Monitoring Indian Economy (CMIE). The study had collected the data for the period of one financial year ending on March 2011. The measurement of all the variables (independent as well as dependent) has been explained in Table 1.

In order to study the relationship between board size and different firm performance indicators (i.e. second objective), bivariate correlation analysis was performed to test the following null and alternate hypotheses::

**Hypothesis 1(a)**: There is no significant correlation between board size and firm performance.

**Table 1: Variables' Definitions and Sources of Data Collection**

| Variable | Acronym | Measurement | Source |
|---|---|---|---|
| Board Size | BODSZE | Total number of directors on the board of a company | Corporate Governance Reports |
| Operating Profit Margin | OPM | Profit before interest and taxes (net of prior period and extraordinary items) divided by net sales | Prowess Database |
| Return on Assets | ROA | Profit before interest and taxes (net of prior period and extraordinary items) divided by total assets | Prowess Database |
| Return on Equity | ROE | Profit after tax (net of prior period and extraordinary items) minus Preference dividend divided by net worth | Prowess Database |
| Earnings per Share | EPS | Profit after tax (net of prior period and extraordinary items) minus preference dividend divided by equity shares (paid up) | Prowess Database |
| Tobin's Q | TOBIN Q | The market value of equity plus total borrowings divided by total assets | Prowess Database |

**Hypothesis 1(b)**: There is significant correlation between board size and firm performance.

Thereafter, board size was categorized into three groups i.e. board size of 5 to 8 members, board size of 9 to 12 members and board size of more than 12 (>12) members and then, One Way ANOVA (Analysis of Variance) was employed to compare the mean values of different performance variables amongst three board size categories. For this, null and alternate hypotheses have been framed as follows:

**Hypothesis 2 (a):** There is no significant difference in the means (group means) of firm performance variables between three board size categories (or Ho: $\mu1=\mu2=\mu3$)

**Hypothesis 2 (b):** There are at least two group means that are significantly different from each other.

## DATA ANALYSIS AND RESULTS OF THE STUDY

This section covers the analysis of the board size of BSE 'A' group companies and its relationship with firm performance of these companies. Table 2 presents the results of the correlation analysis. Spearman's rho correlation analysis was performed as the distribution of the variables was not normal. It showed that board size was not significantly correlated with any of the performance measures used in the study; however it showed a positive direction with all measures of performance except Tobin's Q ratio. Albeit insignificant correlation for Tobin's Q, its negative sign indicates inverse correlation between board size and market valuation of companies. Thus, hypothesis 1(a) was accepted which states that there is no significant correlation between board size and firm performance and thereby, hypothesis 1(b) was automatically rejected. Table 3 provides the summary of descriptive statistics of One Way ANOVA which indicated that mean value of Operating Profit Margin (Return on Sales) of the sampled companies was 38.4 percent. It was 13.1 percent in case of Return on Assets (ROA) and 16 percent for Return on Equity (ROE). However, Earnings per Share (EPS) showed the mean value of 22.48 while Tobin's Q ratio was 2.63 on an average. The minimum and maximum value of each performance indicator has also given in the table, for example, Return on Assets ranges from a negative value of 1.8 percent to a maximum of 49.5 percent. Moreover, the study found that the average board size was 11 (10.78) ranging from a minimum value of 5 to the maximum of 20 (not reported in Table 3). it was also observed that majority of the Indian companies' boards were having the board size between 9 to 12 members followed by the companies having board size of 13 or more than 13 members and the companies having board size between the range of 5 to 8 members. Table 4 shows the test of homogeneity of variances and displays the result of Levene statistic which is calculated to test for the equality of group variances3. It indicated that out of the five, in case of two performance indicators i.e. Return on Assets (ROA) and Earnings per Share (EPS), the significance value is not greater than 0.05 which means that the variances of the groups are not similar. Therefore, these two performance measures were not considered for the purpose of One Way ANOVA. Instead, the results of these two performance indicators were analysed through Robust Tests of Equality of Means by employing the Welch statistic which tests the equality of group means4.

Table 5 holds the results of One Way ANOVA to see whether there are statistically significant differences between our group means. It showed that neither of the performance measures was significantly different between the different board size categories as in all the cases the significance levels are above 0.05. These results proved that both board size and firm performance are independent of each other. Thus, the

3 It is to be noted that this test is not dependent upon the assumption of normality, available in http://publib.boulder.ibm.com/infocenter/spssstat/v20r0m0/index.jsp?topic=%2Fcom.ibm.spss.statistics.help%2Fidh_onew_opt.htm

4 *Ibid.*

**Table 2: Results of Correlation Analysis**

| Performance Variable | | BODSZE | OPM | ROA | ROE | EPS | TOBIN Q |
|---|---|---|---|---|---|---|---|
| BODSZE | Correlation Coefficient | 1.000 | 0.050 | 0.041 | 0.061 | 0.130 | -0.043 |
| | Sig. (2-tailed) | | 0.562 | 0.637 | 0.479 | 0.129 | 0.614 |
| OPM | Correlation Coefficient | | 1.000 | 0.287** | 0.132 | -0.003 | 0.185* |
| | Sig. (2-tailed) | | | 0.001 | 0.125 | 0.970 | 0.030 |
| ROA | Correlation Coefficient | | | 1.000 | 0.913** | 0.482** | 0.656** |
| | Sig. (2-tailed) | | | | 0.000 | 0.000 | 0.000 |
| ROE | Correlation Coefficient | | | | 1.000 | 0.496** | 0.567** |
| | Sig. (2-tailed) | | | | | 0.000 | 0.000 |
| EPS | Correlation Coefficient | | | | | 1.000 | 0.129 |
| | Sig. (2-tailed) | | | | | | 0.132 |
| TOBIN Q | Correlation Coefficient | | | | | | 1.000 |
| | Sig. (2-tailed) | | | | | | . |

** denotes significance at 0.01 level (2-tailed), * denotes significance at the 0.05 level (2-tailed).

**Table 3: Descriptives of One Way ANOVA**

| Performance Variable | Board Size Category | N | Mean | Min. | **Max.** |
|---|---|---|---|---|---|
| OPM | 5-8 members | 31 | 0.558 | -0.051 | 7.903 |
| | 9-12 members | 68 | 0.245 | -0.041 | 1.039 |
| | 13 or more members | 38 | 0.489 | 0.034 | 8.068 |
| | Total | 137 | 0.384 | -0.051 | 8.068 |
| ROA | 5-8 members | 31 | 0.149 | -0.007 | 0.495 |
| | 9-12 members | 68 | 0.116 | -0.018 | 0.330 |
| | 13 or more members | 38 | 0.144 | 0.033 | 0.357 |
| | Total | 137 | 0.131 | -0.018 | 0.495 |
| ROE | 5-8 members | 31 | 0.192 | -0.027 | 1.032 |
| | 9-12 members | 68 | 0.125 | -2.792 | 0.836 |
| | 13 or more members | 38 | 0.198 | 0.031 | 0.683 |
| | Total | 137 | 0.160 | -2.792 | 1.032 |
| EPS | 5-8 members | 31 | 17.335 | -6.266 | 65.525 |
| | 9-12 members | 68 | 19.757 | -182.115 | 118.774 |
| | 13 or more members | 38 | 31.565 | 0.772 | 112.742 |
| | Total | 137 | 22.484 | -182.115 | 118.774 |
| TOBIN Q | 5-8 members | 31 | 2.984 | 0.596 | 10.601 |
| | 9-12 members | 68 | 2.581 | 0.427 | 13.458 |
| | 13 or more members | 38 | 2.422 | 0.718 | 7.917 |
| | Total | 137 | 2.628 | 0.427 | 13.458 |

study accepted the hypothesis 2(a) that states that there is no significant difference in the means (group means) of firm performance variables between three board size categories. In other words, hypothesis 2(b) was automatically rejected. Table 6 exhibits Robust Tests of Equality of Means of the Return on Assets (ROA) and Earnings per Share (EPS). As per the significance level reported in the Table 6, no significant differences between the groups had been observed in case of Return on Assets (ROA). However, the study noticed some differences (but at a weak significance level) in the mean values of Earnings per Share (EPS) between the different board size groups.

**Table 4: Test of Homogeneity of Variances**

| Performance Variable | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|
| OPM | 2.603 | 2 | 134 | 0.078 |
| ROA | 4.264 | 2 | 134 | 0.016 |
| ROE | 0.343 | 2 | 134 | 0.710 |
| EPS | 3.519 | 2 | 134 | 0.032 |
| TOBIN Q | 2.430 | 2 | 134 | 0.092 |

## ROBUSTNESS TESTS

In this section, two additional tests were performed, for example, the study used another definition of Tobin's Q in order to see the differences. This Tobin's Q was estimated as market value of equity plus book value of preference share capital plus book value of total borrowings divided by book value of total assets (fixed assets plus investments plus current assets) which has been derived from Garg (2007). Again, the study noticed no significant differences in the means of the any of the performance measures between the different board size groups (except some weak significance for Earnings per Share). In addition, the study also applied Kruskal-Wallis test in order to compare the medians of different performance variables among different board size groups. The results of the Kruskal-Wallis test have been displayed in Table 7. Findings of this test also remained consistent i.e. firm performance (all the measures) was not statistically different (not even at 10 percent sig. level) amongst three board size groups. In all, these tests reinforced the main findings of the study.

## DISCUSSION OF THE RESULTS

One of the findings of the study is that the mean board size was 10.78 or 11 members and majority of the Indian companies' boards were having the board size between 9 to 12 members. Mean board size reported in this study was similar to some of the other Indian studies such as Dwivedi and Jain (2005) and Kumar and Singh (2013). However, this finding was not found to be in line with the observation made by Jensen (1993) that when boards go beyond seven or eight people, they are less likely to function effectively and are easier for the CEO to control. Secondly, board size was not found to be significantly correlated with any of the performance measure, thus found to be somewhat consistent with Jackling and Johl (2009) (only for ROA) and also

**Table 5: Results of One Way ANOVA**

| Performance Variable | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| OPM | Between Groups | 2.672 | 2 | 1.336 | 1.472 | 0.233 |
| | Within Groups | 121.587 | 134 | 0.907 | | |
| | Total | 124.259 | 136 | | | |
| ROE | Between Groups | 0.173 | 2 | 0.087 | 0.989 | 0.375 |
| | Within Groups | 11.754 | 134 | 0.088 | | |
| | Total | 11.927 | 136 | | | |
| TOBIN Q | Between Groups | 5.686 | 2 | 2.843 | 0.543 | 0.583 |
| | Within Groups | 702.122 | 134 | 5.240 | | |
| | Total | 707.808 | 136 | | | |

**Table 6: Robust Tests of Equality of Means**

| Performance Variable | | Statistica | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| ROA | Welch | 2.128 | 2 | 61.463 | 0.128 |
| EPS | Welch | 2.464 | 2 | 80.607 | 0.092* |

**denotes significance at 5 percent level and *denotes significance at 10 percent level
a-Asymptotically F distributed)

**Table 7: Kruskal-Wallis Test (Ranks and Test Statistics)**

| Group | N | Mean Ranks | | | | |
|---|---|---|---|---|---|---|
| | | OPM | ROA | ROE | EPS | TOBIN Q |
| 5-8 members | 31 | 75.74 | 73.03 | 69.23 | 65.90 | 71.58 |
| 9-12 members | 68 | 62.51 | 63.34 | 65.38 | 65.65 | 67.07 |
| 13 or more members | 38 | 75.11 | 75.84 | 75.29 | 77.53 | 70.34 |
| Total | 137 | | | | | |
| No. of Groups | | 3 | 3 | 3 | 3 | 3 |
| Chi-square | | 3.609 | 2.833 | 1.520 | 2.427 | 0.335 |
| Degrees of freedom | | 2 | 2 | 2 | 2 | 2 |
| Asymp. Sig. | | 0.165 | 0.243 | 0.468 | 0.297 | 0.846 |

supported the finding of Al-Matari et al. (2012) as far as Tobin's Q was concerned. Thirdly, the study could not locate any relationship between size of the boards and financial performance of companies, thus found to some extent in line with the findings of Mayur and Saravanan (2006), Sarkar and Sarkar (2009) and Topak (2011). In other words, the study observed no significant differences in the means of any of the firm performance measures used amongst three board size categories which is in stark contrast to the finding observed in Garg (2007). In addition, based upon the findings, the question of whether to have a larger board size or a smaller one was found to be irrelevant as it did not have any significant bearing on the firm performance. As far as the relationship between board size and firm performance is concerned, it can vary according to the type of corporate ownership structures prevalent in one country. Therefore, the reason for this insignificant association in an Indian context can be the family influence in corporate boards due to the concentrated corporate ownership structures prevalent in this country (whereby most of the companies are family-owned or family run businesses). Presence of family members as controlling shareholders on the boards dominates the process of decision making, which in turn, extenuates the contribution of non-family directors on the board. This could be the reason that why the size of the board was found to be immaterial and only the dominance of family members prevail in Indian corporate boards. This insignificant association also seems to explain that quality of a board in terms of skills and abilities of board members to effectively perform their functions can represent a better criterion in judging the board effectiveness instead of its size. This similar argument is also made in a study by Dhawan (2006).

## CONCLUDING REMARKS AND SCOPE FOR FUTURE RESEARCH

In light of the above discussion, findings of the study overall concluded that *firm performance was independent of the board size.* The results of this study gainsay the findings of all previous studies (in India as well as in other countries) that have reported significant relationship between board size and firm performance. However, research on any issue is not an end in itself, rather it is the beginning point for other researchers to find out the research gaps and fill it. The present finding could be due to the reason that the study had been undertaken for one year's data only i.e. 2011. The study of more than one year at a time on the relationship between board size and firm performance would provide more detailed explanation for deeper understanding of this issue. Even this study can be extended in future by covering other governance variables like CEO duality, board independence etc. As far as India is concerned, empirical literature on board structure is very limited which potentially provides opportunities for the researchers to investigate these issues in depth and come forward with some interesting results in this stream of corporate governance.

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