

# Board Size: An Empirical Study of Companies Listed in NSE CNX 100 Index



**Luvnica Rastogi**  
Research Scholar  
Deptt. of Commerce and  
Business Studies  
Jamia Millia Islamia  
New Delhi



**Najeeb Uzzamman Khan Shervani**  
Professor and Head  
Department of Commerce &  
Business Studies  
Jamia Millia Islamia,  
New Delhi

**M. Mustafa**  
Former Prof.  
Deptt. of Commerce and  
Business Studies  
Jamia Millia Islamia  
New Delhi

## Abstract

Corporate boards of directors play a central role in the corporate governance of modern companies. This study examines the relationship between board size and firm valuations of companies listed in the NSE 100 index covering a five year period, 2008-09 to 2012-13, using the ordinary least squares (OLS) method on cross – sectional data, pooled data and panel data have been employed. In a cross-sectional data, data on one or more variables is collected at the same point in time. A typical multiple regression equation and the random effects model has been used in this study. In the Indian context the results are in consonance with similar studies showing a positive impact of larger board sizes on firm valuations measured by Tobin's Q, RONW and ROCE.

**Keywords:** Corporate Governance, Firm Value, Board Size, Tobin's Q, RONW, ROCE

## Introduction

In the economic and strategic management literature, boards are considered as the institutions to mitigate the effects of agency problem existent in the organizations. As boards are considered to be large decision-making groups, size can affect the decision-making process and effectiveness of the board. Ideal size of the board has been an issue of debate over the years. There are extreme variations in board size across countries. The average board size of a British company in 1996 was 7, whereas, on the other extreme, some of the Japanese companies were having around 60 directors on their boards (Balasubramanian, 1997).

There is mixed evidence in the empirical literature linking board size to corporate performance. One group of researchers (Dalton et al., 1998; Pearce & Zahra, 1992) predicts board size to have a positive association with firm performance. Proponents of this view argue that a larger board will have representation of people with diverse backgrounds, who bring knowledge and intellect to the board and thus improve the quality of strategic decisions. Size is thus assumed to be associated with the breadth of perspectives in the planning process. Board size is also found to be related to strategic change in an organization.

From this perspective, smaller boards are assumed to have inadequate recognition of the need to initiate or support strategic change, a lack of clear understanding of alternatives, and/or lack of confidence in recommending strategic change (Goilden & Zajac, 2001). An alternative explanation relates this relationship to board composition. Larger boards could consist of more outsiders who foster more careful decision-making policy in firms since the reputation cost, if the firm fails, is likely to be high in comparison with their private benefit if a project turns out to be profitable. This basically refers to the difference in risk preference of inside and outside directors (Eisenberg et al., 1998).

The other view suggests that larger board would be less effective than smaller boards. This view is based on the social psychological research and group dynamics. As larger boards suffer from the problem of diffusion of responsibility or social loafing, wherein individual members of the board discount the likelihood that others will detect their poor contributions. Larger board size may also make it difficult for the members to use their knowledge and skills effectively due to problems of coordinating the contributions. The board thus becomes more symbolic and less a part of the management process (Hermalin & Weisbach, 2001). Various researchers later presented empirical evidence which supports this view and finds a negative relationship between board size and corporate performance (Goodstein et al., 1994; Yermack, 1996; Eisenberg et al., 1998; Van-Ees & Postma, 2002). Yet another view assumes the relationship between board size to be an inverted "U" shaped, with an optimal board size existing midway. Below this optimal or the most efficient board size, there is a positive relation between board size and corporate

performance followed by a negative relationship (Goilden&Zajac, 2001; Vafeas, 1999).

## Literature Review

The evidence on the relationship between the board and firm's value is mixed. The board of directors with their high level of associations with the external environment plays an important role according to the resource dependency theory. People with the diverse backgrounds comprising bigger boards are expected to bring diversified knowledge and expertise to the board.

### Arguments in Favor of a Larger Board Size

Van den Berghe and Levräu (2004) contend that by increasing the number of directors, the pool of expertise available to the firm increases and so larger boards are will have more knowledge and skills at their disposal as compared to smaller boards. Further, Forbes and Milliken (1999), and Goodstein, Gautam, and Boeker (1994) provide evidence that larger boards reduce the domination by the CEO. Pearce & Zahra (1992), and Dalton, Daily, Ellstrand, & Johnson (1998) report positive association between board size and performance. Kathuria and Dash (1999) investigated the relationship between the size of the board and firm performance for 504 Indian firms. They found the size of the firm was directly related to the number of directors, corporate equity and foreign equity, but inversely related to the equity held by the directors. Kathuria and Dash, however, noted that the contribution of additional director decreased as the board size increased. More than two-third of the firms in the sample had a board size between 6 to 11, with an average board size of 9 directors. Jackling and Johl (2009) also found the board size to be significant and positively associated with financial performance for Indian firms. This indicated that larger boards brought in greater depth of intellectual knowledge than smaller boards and hence improved decision-making and in turn the value of the firm, thereby supporting the resource dependency theory. Clugh, Meador and Kumar (2010) carried out an investigation to analyze the relationship between the size of the board and the firm's performance. This study reveals that a governance structure that incorporates a large size of board members creates better opportunities and more resources. This will enhance the financial performance of the company. An excessively autonomous board has a high percentage or proportion of independent directors that lowers the firm's performance.

### Arguments in Favor of Smaller Board Size

Advocates of a smaller board, on the other hand, argue that large boards impede communication, and decision-making thus reducing the effectiveness of monitoring. According to Jensen (1993) 'as groups increase in size they become less effective because of coordination and process problems overwhelm the advantage from having more people draw on'. Further, Jensen argued that when boards grow beyond seven or eight members, they are less likely to function effectively and it becomes easier for the CEO to control. Lipton and Lorsch (1992) also suggest limiting the number of directors to ten people,

with an ideal of eight or nine members. The Cadbury Committee (Cadbury, 1992) recommended the ideal board size of eight to ten members with equal number of executive and non-executive directors. Yermack (1996) analysed 452 large US firms and found a significant negative relationship between board size and firm value which attenuated as the board size increased. He concluded that the incremental costs rise as boards grow in size. The inverse relationship was found to be robust when control variables such as firm size, industry affiliation, board composition, ownership, growth opportunities, diversification, and firm age were introduced. Inverse relationship has also been reported by Eisenberg, Sundgren, and Wells (1998), Hermalin and Weisbach (2003), Mak and Kusnadi (2003), Alshimmiri (2004), Andres, Azofra and Lopez (2005). Garg (2007) analysing Indian companies also found the board size to be significantly negative for all performance variables except market adjusted stock prices (MASR). Reddy, Locke, & Scrimgeour (2010) also concluded that board size did not significantly effect the performance of firms in New Zealand.

### Other Views

Findings of Beiner et al (2006), suggest that the size of the board of directors is an independent control mechanism. As per them the variations in board size is due to the specific requirements of the firm and its operating environment. Mayur and Saravanan (2008) examined the board size of select Indian banks and find that board sizes do not really matter in the performance of these banks.

Vafeas (1999) and Goilden & Zajac (2001) both report a non-linear inverted 'U'-shaped relationship between board size and performance, while Weirner and Pape (1999) opine that the corporate governance system in a country is context – specific and is influenced by legal, institutional, and cultural factors. With the view to reconcile the differences in findings on the 'optimal' size of the board, Bennedsen, Kongsted, and Nielson (2008) acknowledge that the association between board size and firm's performance might be linked to various characteristics of a firm such as size, age, industry affiliation, and other unobserved factors.

### Objectives of the Study and Methodology

The purpose of the analysis is to find the relationship between board size and firm values.

**Ho: There is no relationship between board size and firm values as measured by Tobin's Q, RONW and ROCE.**

### Research paradigm adopted in this Study

The research paradigm used in this study is positivism. Since this study is conducted depending upon the previously existing relationships and involves numerical data in conducting the research, it has used deductive reasoning and quantitative techniques. This study adopted a positivist approach, because a positivist approach seeks facts or causes of social phenomena. The reasoning is deductive because the hypotheses were derived first and the data were collected later to confirm or negate the propositions. The selection of the sample, the sources

of data, the procedure in collecting and coding the data, and the quantification of variables and method of data analysis are described below.

### Sampling Design adopted in this study

Probability sampling technique has been used in this study. Among the various types of probability sampling technique, this study used the simple random sampling. According to Rutherford (2001), the method of simple random sampling is a technique of sampling in that a certainly happening group of people would be selected from the chosen cluster of population for the study and each unit of population has equal chances of being selected. In this research, the samples have been selected from all the firms listed in the National Stock Exchange CNX 100 with each of the firms have equal chances of being selected.

### Sample Selection

The study is limited to the companies listed on the National Stock Exchange of India (NSE). NSE is a leading stock exchange in India which provides modern, fully automated screen-based trading system with national reach. For the purpose of the present study, companies constituting CNX 100 which is a diversified 100 stock index accounting for 38 sectors of the economy. CNX 100 is owned and managed by India Index Services & Products Ltd. (IISL). IISL is India's first specialized company focused upon the index as core products. The CNX 100 Index represents about 81.78% of the free float market capitalization of the stocks listed on NSE as on December 31, 2013. The total traded value for the last six months ending December 2013 of all index constituents is approximately 79.24% of the traded value of all stocks on the NSE. Impact cost for CNX 100 for a portfolio size of Rs. 50 Lakhs is 0.08% for the month December 2013.

The composition of Nifty CNX 100 has undergone changes over time. Between April 1, 2008 and November 1, 2013, 38 companies were excluded from CNX 100. These 38 companies which were excluded have been added back to the initial set of 100 companies. From the 138 companies so selected, all banking companies have been excluded as they are governed by the Banking Regulation Act, 1949. Also excluded were companies which were common or which merged or got delisted from the stock exchange during the period 2008-09 and 2012-13. Further, Satyam Computer Services Limited has been excluded from the sample, for obvious reasons besides excluding 5 companies for which data for all five years was not available. These screening criteria thus reduced the sample size to 105 companies. Table 1 delineates the sample selection process.

**Table 1**

S.No.	Description	Number of Firms
1	CNX 100(a)	100
	Add: Changes in Nifty CNX 100(b)	38
	Less: Companies which were :	
3.	Banking Companies	30
4.	De-listed or Merged Companies	3
5.	Company Specifically Excluded	1
6.	Company for which data was not available.	5

	Sub-Total(c)	39
	Total Sample(a+b-c)	99

### Selection of time period

Data relating to the sample has been collected for five years: 2008-09 and 2012-13. Last five years has been taken to do a trend analysis of the impact of corporate governance on firm value in the given period, so that a recent study can be carried out. Corporate Governance is gaining a lot of importance worldwide so it was a demand to study a recent trend. Recently in India with the introduction of new companies bill and the amendments in the companies had caused a lot of impact on the performance of the firm and how much compliance the companies need to adhere.

### Sources of Data

The data required to compute the corporate governance variables has largely been extracted from the Corporate Governance reports included in the Annual Reports of the sample companies. Data has also been supplemented from Prowess, a database of Indian companies, maintained by the Centre for Monitoring the Indian Economy (CMIE), ISI Emerging Markets, and also the corporate filings with NSE and BSE.

### Corporate Governance Variable

Composition and size of boards on performance of Indian companies is intended to be analyzed. This corporate governance variable has been described below:

### Board Size

Board size is taken as the number of directors on the board of a company.. A firm is assigned as score in a graded way as follows

If the board size is 5 or less, the firm gets a score of 0.50, if it ranges between 6 or 7, the firm gets a score of 0.65, if the board size is 8 or 9, the firm gets a score of 0.80, if it is 10 or 11, the firm gets a score of 1.00, if is 12 or 13, the firm gets a score of 0.95 and if the board size is more than 14, the firm gets a score of 0.90

A survey was conducted for this study for the grading of the scores. The various views of professionals from various agencies such as Ministry of Corporate Affairs, Institute of Directors, Board members, academicians, practicing company secretaries, and, stock analysts were taken and the above grading is defined.

### Promoters' Equity

The proportion of equity shareholding of the promoters to the total equity of the company is known as promoter's equity. Higher the ratio of promoter equity to total equity means concentrated shareholding pattern of the promoters.

### Corporate Holding in excess of 10%

When the corporate holds more than 10% share capital of another company. A dummy variable is assigned '0' if more than 10% of the equity of the sample firm is held by another firm in the promoters' category and '1' otherwise.

### Institutional Shareholding

It is the proportion of equity shareholding of Mutual Funds (MFs) and Foreign Institutional Investors (FIIs) to the total equity.

### ADR/GDR Issuance

More stringent international accounting disclosure norms of the firms which issue American Depository Receipts (ADRs) or Global Depository Receipts (GDRs). Higher the disclosure better the governance, a dummy variable that equals '1' is assigned if a firm has ADRs / GDRs outstanding and '0' otherwise.

### ESOPs

A firm with ESOPs should, therefore, have better quality of governance as compared to a firm not having ESOPs. Hence a dummy variable that equals '1' is assigned if a firm has an ESOP plan and '0' otherwise.

**Non-Promoter Shareholding:** Higher concentration of non-promoter shareholding would be linked to higher firm value.

### Proportion of Outside Directors

This shows the percentage of outside, independent directors to the total number of directors on the board of the firm. If the board is dominated by outside directors, we expect such a board to be more transparent and effective.

### Performance Measures

**Tobin's Q** - This ratio is devised by James Tobin. It is based on the notion that combined market value of all the companies on the stock market should be equal to their replacement cost of assets. For the present study, this ratio has been calculated with the help of following formula:

$$TQ = \frac{\text{Total market value of the firm}}{\text{Average total assets}} = \frac{MVS + PS + D}{TA}$$

Where MVS = Market value of all outstanding shares = firm's Stock price \* Outstanding shares

TA = Firm's assets, i.e. cash, receivables, inventory and plant book value

PS is the liquidating value of preferred stock

D = Debt = (AVCL - AVCA) + AVLTD

Where AVCL = Accounting value of the firm's Current Liabilities

AVLTD = Accounting value of the firm's Long Term Debt

AVCA = Accounting value of the firm's Current Assets = Cash + Inventories + Receivables

### Return on Net Worth

Also known as a return on equity, Return On Net Worth (RONW) describes the portion of net income that is eventually returned as a percentage of the equity held by shareholders in a company. ROE is expressed as a percentage and calculated as:

**Return on Net Worth = Net Income/Shareholder's Equity**

### Return on Capital Employed

A financial ratio that measures a company's profitability and the efficiency with which its capital is employed. Return on Capital Employed (ROCE) is calculated as

**ROCE** = Earnings Before Interest and Tax (EBIT) / Capital Employed

### Control Variables

$$\text{Leverage} = \frac{\text{Long Term Debt}}{\text{Shareholder's Funds}} \times 100$$

### Type of Company

The companies are classified into foreign, government and private sector and factored in by including a dummy variable for different categories.

### Firm Size Gross

fixed assets and the sales of the firm determine the size of the. Log transformation of these two variables has been used to correct skewness in firm size.

### Leverage

This is the ratio of long-term debt and shareholder's fund. This has been included to control for variations in capital structure and a proxy for default risk.

### Industry

The sample consists of firms from 19 industry sectors.

**Risk:** Risk is measured by beta

**Ratio of R&D expenditure to Sales:** This is the ratio of Research and Development Expenditure to Sales and is an indicator of the firm's future growth capabilities and prospects.

**Ratio of Advertisement Expenditure to Sales:** This is the ratio of firm's expenditure on advertisement to Sales.

**Ratio of PBDITA to Sales:** This is the ratio of Profit before depreciation, Interest, Taxes and amortization to Sales and is an indicator of the firm's operational efficiency.

### Estimation Methods

In order to examine the linkage between corporate governance and firm performance regression models using the ordinary least squares (OLS) method on cross-sectional data, pooled data and panel data have been employed. In a cross-sectional data, data on one or more variables is collected at the same point in time. A typical multiple regression equation is as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + u \quad (1)$$

where,

'y' is the dependent variable,

'x1, x2, .....xk' are the 'k' independent variables,

$\beta_0$  (the constant term) is the intercept parameter of the regression line

$\beta_1 \dots \beta_k$  are the slope parameters which denote the partial effects of xis on y, holding all other factors constant, and u is the stochastic error or disturbance term.

In the present study, the firm performance indicators (RoNW, ROCE, Tobin's Q) have regressed on the corporate governance variables and other control variables. In pooled data, data has elements of both time series and cross-section. Panel data is a special type of pooled data in which repeated measurements at different time periods on the same individual units such as persons, families, firms, cities,

states, countries etc is considered. In a balanced panel data, all individual units are observed in all time periods. As panel data has both cross-sectional and time series dimensions, the general OLS regression model is:

$$y_{it} = \beta_0 + \beta_1 x_{i1t} + \beta_2 x_{i2t} + \dots + \beta_k x_{ikt} + v_{it} \quad t=1,2,3,\dots,T \quad (2)$$

In the notation  $y_{it}$ , 'i' denotes the person, firm, city etc, and 't' denotes the time period. In the composite error term ( $v_{it}$ ) is composed of  $a_i$  and  $u_{it}$ . The  $a_i$  represents all unobserved, time-constant factors that affect  $y_{it}$  and is referred to as the unobserved effects, or fixed effects or unobserved heterogeneity while  $u_{it}$  represents unobserved factors that change over time and affect  $y_{it}$  and is called the idiosyncratic error or time-varying error. There are various ways of estimating the slope parameters ( $\beta_1, \beta_2, \dots, \beta_k$ ) of interest, depending upon the treatment of the unobserved effects ( $a_i$ ). In the fixed-effects (FE) model, the composite error ( $v_{it}$ ) comprises of  $a_i$  and  $u_{it}$ , out of which the unobserved effect, time-invariant error ( $a_i$ ) is permitted to be correlated with the explanatory variables ( $x_{itj}$ ) while the idiosyncratic error ( $u_{it}$ ) is assumed to be uncorrelated with explanatory variables ( $x_{itj}$ ). Further, it is assumed that the idiosyncratic error ( $u_{it}$ ) is homoskedastic and serially uncorrelated (across t). In fixed-effects model, the average of equation (2) for each 'i' is deducted from the equation (2) to get:

$$y_{it} - \bar{y}_i = \beta_1(x_{i1t} - \bar{x}_{i1}) + \beta_2(x_{i2t} - \bar{x}_{i2}) + \dots + \beta_k(x_{ikt} - \bar{x}_{ik}) + (u_{it} - \bar{u}_i) \quad t=1,2,3,\dots,T \quad (3)$$

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{i1t} + \beta_2 \ddot{x}_{i2t} + \dots + \beta_k \ddot{x}_{ikt} + \ddot{u}_{it} \quad t=1,2,3,\dots,T \quad (4)$$

Equation (4) is then estimated by pooled OLS and hence  $a_i$  is eliminated. Under fixed-effects model, any explanatory variable that is constant over time for all 'i' also gets swept away by the fixed effects transformation. Hence, explanatory variables which are constant over time (such as gender) need to be excluded from the fixed-effects model. Under the fixed effects or the first-differencing models, the time constant error term ( $a_i$ ) is modelled as being correlated with the explanatory variables and is therefore eliminated away either by time-demeaning or first differencing.

However, in the random effects model (RE), it is assumed that  $a_i$  is purely random; a strong assumption implying that  $a_i$  is uncorrelated with the explanatory variables ( $x_{it}$ ). The advantage of the RE model is that it yields estimates of all coefficients and hence marginal effects, even those of timeinvariant explanatory variables. These estimates would, however, are inconsistent if the FE model is appropriate. However, as the time-constant error ( $a_i$ ) is included in the composite error ( $v_{it}$ ) in each time period, it ( $v_{it}$ ) is serially correlated across time i.e.

$$\text{Cov}(v_{it}, v_{is}) = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_u^2}, t \neq s \quad (5)$$

where,  $\sigma_a^2$  is the variance in  $a_i$  and  $\sigma_u^2$  is the variance in  $u_{it}$ . This serial correlation in the error term may be substantial. The usual pooled OLS standard errors ignore this correlation and are therefore incorrect. This issue is resolved using the generalised least squares (GLS) transformation method which eliminates serial correlation. Using GLS transformation, we have,

$$y_{it} - \lambda \bar{y}_i = \beta_0(1-\lambda) + \beta_1(x_{i1t} - \lambda \bar{x}_{i1}) + \beta_2(x_{i2t} - \lambda \bar{x}_{i2}) + \dots + \beta_k(x_{ikt} - \lambda \bar{x}_{ik}) + (v_{it} - \lambda \bar{v}_i) \quad (6)$$

$$\lambda = 1 - \sqrt{\frac{\sigma_u^2}{\sigma_u^2 + T\sigma_a^2}}$$

Where,

is the adjustment using the GLS transformation which quasi-demeans the data on each variable. While the fixed effects estimator subtracts the time averages from the corresponding variables, the random effects transformation subtracts a fraction of that time average, where the fraction depends upon  $\sigma_a^2, \sigma_u^2$  and the number of time periods 'T'. The transformation allows for explanatory variables that are constant over time. As Hsiao (2003) has opined that "**when inferences will be made about a population of effects from which those in the data are considered to be a random sample, then the effects should be considered random**". Hence, the random effects model has been used in this study.

## Results and Analysis

### Descriptive statistics

This section gives us the basic description of the firms surveyed by the researcher.

Industries

Table 2

Industry	Freq.	Percent	Cum.
Automobile	8	8.08	8.08
Cement & Cement Products	4	4.04	12.12
Chemicals & Fertilisers & Pesticides	2	2.02	14.14
Computers - Hardware	1	1.01	15.15
Construction	8	8.08	23.23
Consumer Goods	11	11.11	34.34
Electrical And Electrical Equipment	1	1.01	35.35
Electrical And. ELECTRICAL EQUIPMENT	2	2.02	37.37
Industrial Manufacturing	5	5.05	42.42
It	6	6.06	48.48
Media, Hotels & Entertainment	2	2.02	50.51
Metals	9	9.09	59.6
OIL, GAS And PETROCHEMICALS	13	13.13	72.73
Pharmaceuti Cals	13	13.13	85.86
Power	4	4.04	89.9
Services	5	5.05	94.95
Telecom	3	3.03	97.98
Telecommunication Services	1	1.01	98.99
Textile Products	1	1.01	100
Total	99.00	100.00	

From the table above we can observe that about 13.13% of the industries chosen for the survey were Oil, Gas and Petrochemicals and Pharmaceutical companies.

**Board Size and Firm Performance**

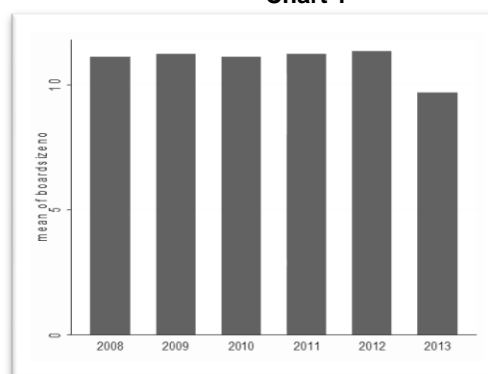
This section below shows the relation between the board size and firm performance for the Indian firms of the sample.

Table 3

	2008 - 09	2012 - 2013
Mean	11.18	11.29
Median	11	11
Maximum	21	19
Minimum	5	4
Standard deviation	3.19	3.14
Skewness	0.43	0.20
Kurtosis	2.99	2.86

Source: (Original) Developed by own Data Collection and Analysis

Chart 1



Source (Original) Developed by own Data Collection and Analysis

From the table above we can observe that the mean board size in the year 2008 – 09 was 11.18 and 11.29 in the year 2012 – 13. The smallest board in 2008 – 09 comprised of 5 members and 4 members in 2012 – 13. The median board size for both the years was 11.

Table 4

Board size	2008 - 09		2012 - 13	
	Number of firms	%	Number of firms	%
5 or less	1	0.99	2	2.0
6 – 7	11	10.89	9	9.2
8 – 9	16	15.84	16	16.33
10 – 11	29	28.71	22	22.45
12 – 13	19	18.81	24	24.49
More than 14	25	24.75	25	25.51

From the table above we can observe that about 28.71% of the industries in the year 2008 – 09 had 10 – 11 board members and 25.51% of the industries had more than 14 board members in the years 2012 – 13.

**Correlation Between Number of Directors and Performance Measures**

Table 5

	Tobin's Q	ROCE	RONW
2008 – 09	0.0268	-0.1153	-0.0796
2012 – 13	-0.153	0.1485	0.013

From the table above, we can observe that board size had positive correlation with Tobin's Q and negative correlation with ROCE and RONW in the year 2008 – 09. But in the year 2012 – 13, the Tobin's Q had negative correlation and ROCE and RONW had positive correlation coefficients. The Tobin's Q had positive correlation with board size in the year 2008 – 09, but it turned out negative but not significant during the year 2012 – 13.

ANOVA between the means of Board size and other variables  
 Table 6

Sl no	Variables	Board size						F	Prob>F
		≤ 5	6 - 7	8 - 9	10 – 11	12 - 13	> 14		
1	AGR/GDR	0	0.13	0.06	0.1	0.04	0.04	1.8	0.114
2	ESOPs	0	0.13	0.32	0.39	0.31	0.30	3.12	<b>0.009</b>
3	Sales advertisement ratio	0.02	0.03	0.04	0.03	0.31	0.30	1.43	0.21
4	R & D expenses/ sales	0	0.01	0.01	0.01	0.00	0.00	5.9	<b>0.000</b>
5	Operating profit/ sales	6.19	0.27	0.33	0.65	0.26	0.65	8.94	<b>0.000</b>
6	Advertisement expenses/ sales	0.02	0.02	0.04	0.03	0.02	0.01	1.52	0.182
7	No of outside directors	3.5	3.51	4.58	5.45	6.44	8.12	164.26	<b>0.000</b>
8	No of board meetings	5.12	6.66	6.00	6.58	6.75	7.83	5.21	<b>0.000</b>
9	CEO duality	1	0.68	0.63	0.52	0.64	0.44	4.35	<b>0.000</b>
10	Promoters equity%	71.63	56.5	54.38	50.97	51.50	53.72	2.48	<b>0.03</b>
11	Corporate holding	1	1	1	0.99	0.98	0.88	8.10	<b>0.000</b>
12	Institutional holding	0.11	0.24	0.38	0.59	0.46	0.44	4.97	<b>0.000</b>
13	Tobin's Q	1.54	17.62	19.68	30.66	191.11	6.70	0.59	0.71
14	ROCE	2.3	20.42	26.79	25.21	21.48	26.59	2.62	<b>0.02</b>
15	RONW	1.99	17.89	25.62	22.39	19.04	23.63	2.67	<b>0.02</b>

The table above shows the ANOVA results between the board size and other parameters used in the study. There was a significant difference between the board size in the means of ESOP's, R & Expenses/sales, Operating profit /sales, Number of outside directors, number of board meetings, CEO duality, Promoter's equity %, Corporate holding, Institutional holding, ROCE and RONW. The mean ESOPs moved from 0.13 for board size of ≤ 5 to 0.3 for board size of > 14. But board size of 10 – 11 had highest mean of 0.39 for ESOPs. The mean R & D expenses/ sales was high for the board size of 6 – 11 members. The operating profit was also high for board

size of 10 – 11 members and > 14. The number of outside directors and board activity had shown a proportionate increase to board size. The CEO duality, promoters equity % and corporate holding had shown a proportionate decrease to the board size. The institutional holding had a mean high for a board size of 10 – 11 members. The ROCE and RONW had significant high values with the board size. In order to find the association between the performance measures and board size along with other independent variables, a regression analysis was applied by using STATA for different financial years.

2008 – 2009

Table 7

Source	SS	df	MS	Number of OBS	=	74
Model	3197.11091	26	122.965804	F ( 26,47)	=	1.33
				Prob > F	=	0.195
Residual	4349.58225	47	92.5443031	R - squared	=	0.4236
Total	7546.69316	73	103.379358	Adj R squared	=	0.1048
				Root MSB	=	9.62

Tobinq	Coef .	Std. Err.	t	P> t	[95% Conf. Interval ]
Boardsize	- . 5736285	13.22454	-0.04	0. 966	-27.17797 26 . 03071
Promo Tersequity	- . 1032241	0.109724	-0.94	0.352	- . 3239603 0.1175121
Corporateholding	-7.427335	11.32324	-0.66	0.515	-30.20675 15.35208
Institutional Share Holding	-5.444229	5 .261659	-1.03	0.306	-16.02932 5.140863
Adrgdr	3.115354	6.037171	0 . 52	0.608	-9.029868 15.26058
Esops	-4.531001	3.393942	-1.34	0.188	-11.35873 2.296729
Rdexpensessales	5.342447	32.70427	0 . 16	0.871	-286.66036 71 . 13495
Operatingprofitnetsales	37.66588	131.1681	0.29	0.775	-226.2103 301.542
Advertisementexpensessales	10.56511	7.606211	1.39	0.171	-4.736616 25.86683
Industry_1	58 . 6974	55.82431	1 . 05	0.298	-53.60662 171.0014
Industry_2	-1.112457	10 . 66866	-0.1	0.917	-22.57504 20.35012
Industry_3	1.049719	11 . 87934	0.09	0.93	-22.84843 24.94787
Industry_4	0.2554559	12.75726	0 . 02	0.984	-25.40884 25.91975
Industry_5	0.2482675	14.81145	0 . 02	0.987	-29 . 54852 30 . 04505
Industry_6	26.18853	11.7563	2.23	0.031	2.537908 49.83915
Industry_7	2.992324	11.03288	0.27	0.787	-19.20297 25.18762
Industry_8	14.72318	13.91267	1 . 06	0.295	-13 .26551 42.71186
Industry_9	3 . 801646	10.80125	0.35	0.726	-17.92766 25.53095

# Asian Resonance

Industry_10	5.554779	10.70958	0.52	0.606	-15.99012	27.09967
Industry_11	-4.389489	14.73924	-0.3	0.767	-34.04102	25.26205
Industry_12	1.569375	10.59525	0.15	0.883	-19.74551	22.88426
Industry_13	-1.041312	10.2537	-0.1	0.92	-21.66909	19.58647
Industry_14	2.582411	11.12483	0.23	0.817	-19.79785	24.96268
Industry_15	-0.4790341	14.07942	-0.03	0.973	-28.80318	27.84511
Industry_16	1.042844	10.69693	0.1	0.923	-20.47661	22.5623
Industry_17	0.3552436	11.78837	0.03	0.976	-23.3599	24.07039
Industry_18	0	(omitted)				
Industry_19	0	(omitted)				
Cons	16.00562	22.80094	0.7	0.486	-29.86396	61.87519

**Source: (Original) Developed by own Data Collection and Analysis**

year 2008 – 09. None of the independent variables had significantly positive or negative relationship with Tobin's Q.

From the table above we can observe that the board size had negative relation with Tobin's Q for the

**Table 8**

Source	SS	df	MS	Number of obs	=	74
Model	17928.3206	26	689.550793	F ( 26 , 47)	=	1.77
				Prob > F	=	0.0438
Residual	18308.8383	47	389.54975	R-squared	=	0.4947
Total	36237.1589	73	1079.10054	Adj R squared	=	0.2152
				Root MSB	=	19.737

Roce	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	3.050412	27.13233	0.11	0.911	-51.5328 57.63363
Promo Tersequity	0.1258534	0.225117	0.56	0.579	-0.3270236 0.5787303
Corporateholding	-17.50244	23.2315	-0.75	0.455	-64.23818 29.2333
Institutionalshareholding	.0949883	10.79517	0.01	0.993	-21.62208 21.81206
Adrgdr	-10.82413	12.38626	-0.87	0.387	-35.74207 14.09381
Esops	-2.84793	6.963234	-0.41	0.684	-16.85615 11.16029
Sal Esadvertisement Ratio	-6.423881	67.09823	-0.1	0.924	-141.4081 128.5604
Rdexpensessales	227.0873	269.1131	0.84	0.403	-314.2984 768.4729
Operatingprofitnetsales	16.87776	15.6054	1.08	0.285	-14.51626 48.27178
Advertisementexpensessales	352.6381	114.5328	3.08	0.003	122.2278 583.0484
Industry_1	25.15509	21.88853	1.15	0.256	-18.87895 69.18913
Industry_2	30.11995	24.37243	1.24	0.223	-18.91107 79.15096
Industry_3	8.787909	26.17363	0.34	0.739	-43.86664 61.44246
Industry_4	2.482831	30.38814	0.08	0.935	-58.65022 63.61588
Industry_5	10.43238	24.12	0.43	0.667	-38.0908 58.95555
Industry_6	22.82726	22.63578	1.01	0.318	-22.71006 68.36458
Industry_7	0	(omitted)			
Industry_8	49.18675	28.54415	1.72	0.091	-8.236685 106.6102
Industry_9	37.40176	22.16055	1.69	0.098	-7.17951 81.98304
Industry_10	43.65203	21.97248	1.99	0.053	-0.5508948 87.85496
Industry_11	-13.61089	30.24	-0.45	0.655	-74.44592 47.22415
Industry_12	33.44045	21.7379	1.54	0.131	-10.29057 77.17147
Industry_13	17.38157	21.03716	0.83	0.413	-24.93975 59.70288
Industry_14	7.976425	22.82443	0.35	0.728	-37.9404 53.89325
Industry_15	9.73307	28.88627	0.34	0.738	-48.37861 67.84475
Industry_16	13.37392	21.94653	0.61	0.545	-30.77681 57.52465
Industry_17	5.993234	24.1858	0.25	0.805	-42.66232 54.64879
Industry_18	0	(omitted)			
Industry_19	0	(omitted)			
Cons	4.443241	46.77991	0.09	0.925	-89.6658 98.55228

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with ROCE for the year 2008

– 09. Only advertisement expenses/ sales had significantly positive association with ROCE.

**Table 9**

Source	SS	df	MS	Number of obs	=	74
Model	14470.9067	26	556.573336	F ( 26 , 47)	=	1.68
				Prob > F	=	0.0597



Residual	15549.1876	47	330.833778	R-squared	=	0.4820
Total	30020.0943	73	411.234169	Adj R squared	=	0.1955
				Root MSB	=	18.189

ronw	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
boardsize	19.98242	25.00407	0.80	0.43	-30.31927 70.28411
promo tersequity	0.1848143	0.2074587	0.89	0.38	-0.2325388 0.6021674
corporateholding	2.105929	21.40921	0.10	0.92	-40.96384 45.1757
institutionalshareholding	-0.6999661	9.948389	-0.07	0.94	-20.71354 19.31361
adrgdr	-6.307124	11.41468	-0.55	0.58	-29.27049 16.65624
esops	5.644587	6.417036	0.88	0.38	-7.264824 18.554
sal esadvertising ratio	28.99688	61.83503	0.47	0.64	-95.39914 153.3929
rdexpensessales	190.3742	248.0037	0.77	0.45	-308.545 689.2934
operatingprofitnetsales	13.84283	14.38131	0.96	0.34	-15.08863 42.77429
advertisementexpensessales	300.9385	105.5488	2.85	0.01	88.60163 513.2754
Industry_1	26.87809	20.17158	1.33	0.189	-13.7019 67.45809
industry_2	22.80585	22.46065	1.02	0.32	-22.37915 67.99085
industry_3	15.26475	24.12056	0.63	0.53	-33.25956 63.78906
industry_4	-3.077081	28.00448	-0.11	0.913	-59.41483 53.26067
industry_5	17.23399	22.22802	0.78	0.44	-27.48301 61.95099
Industry_6	28.98367	20.86022	1.39	0.17	-12.98169 70.94903
Industry_7	0	(omitted)			
industry_8	37.23556	26.30514	1.42	0.16	-15.68356 90.15468
Industry_9	31.34933	20.42227	1.54	0.131	-9.734972 72.43364
industry_10	38.91288	20.24895	1.92	0.061	-1.822751 79.64852
industry_11	-11.57768	27.86797	-0.42	0.68	-67.64079 44.48544
industry_12	31.08131	20.03277	1.55	0.13	-9.21943 71.38206
industry_13	20.61521	19.387	1.06	0.29	-18.38641 59.61683
industry_14	11.26431	21.03407	0.54	0.60	-31.05078 53.57941
industry_15	15.78051	26.62042	0.59	0.56	-37.77287 69.33389
Industry_16	13.28549	20.22504	0.66	0.51	-27.40204 53.97302
Industry_17	12.40212	22.28866	0.56	0.58	-32.43687 57.24112
industry_18	0	(omitted)			
industry_19	0	(omitted)			
cons	-37.25358	43.11048	-0.86	0.39	-123.9807 49.47351

Source: (Original) Developed by own Data Collection and Analysis

From the table above we can observe that the board size had positive relation with RONW for the year 2009 – 10. Only advertisement expenses/ sales had significantly positive association with RON

Table 10

Source	SS	df	MS	Number of obs	=	92
Model	478883.907	27	17736.441	F ( 26 , 47)	=	1.37
				Prob > F	=	0.1514
Residual	827830.874	64	12934.8574	R-squared	=	0.3665
Total	1306714.781	91	14359.5031	Adj R squared	=	0.0992
				Root MSB	=	113.73

Tobing	Coef .	Std. Err.	t	p> t	[95% Conf. Interval]
Boardsize	95.61678	128.7476	0.74	0.46	-161.5861 352.8197
Promo Tersequity	0.8380111	1.14422	0.73	0.467	-1.447831 3.123854
Corporateholding	58.62717	128.0172	0.46	0.649	-197.1166 314.371
Institutionalshareholding	-4.123181	42.07681	-0.10	0.922	-88.18126 79.9349
Adrgdr	37.93287	63.54006	0.6	0.553	-89.00299 164.8687
Esops	-59.70626	33.17404	-1.8	0.077	-125.979 6.566511
Sal Esadvertising Ratio	-1045.331	883.2299	-1.18	0.241	-2809.786 719.1233
Rdexpensessales	-234.8867	1058.962	-0.22	0.825	-2350.407 1880.634
Operatingprofitnetsales	-10.10222	10.33041	-0.98	0.332	-30.73958 10.53515
Advertisementexpensess	955.3472	766.7851	1.25	0.217	-576.4821 2487.176

Industry_1	-24.8306	130.1948	-0.19	0.849	-284.9246	235.2634
Industry_2	29.52826	136.3161	0.22	0.829	-242.7944	301.8509
Industry_3	-7.448136	140.004	-0.05	0.958	-287.1382	272.2419
Industry_4	0	(omitted)				
Industry_5	233.4216	128.9063	1.81	0.075	-24.09836	490.9416
Industry_6	-6.416954	135.0164	-0.05	0.962	-276.1432	263.3093
Industry_7	0	(omitted)				
Industry_8	9.9693	157.3619	0.06	0.950	-304.3973	324.3359
Industry_9	-28.98164	130.056	-0.22	0.824	-288.7984	230.8352
Industry_10	-11.72896	133.5704	-0.09	0.93	-278.5665	255.1086
Industry_11	-28.98977	151.733	-0.19	0.849	-332.1113	274.1317
Industry_12	-3.712214	129.7005	-0.03	0.977	-262.8188	255.3944
Industry_13	-37.84848	127.6638	-0.30	0.768	-292.8862	217.1893
Industry_14	2.017186	135.0999	0.01	0.988	-267.8759	271.9103
Industry_15	-2.673995	136.0158	-0.02	0.984	-274.3967	269.0487
Industry_16	-21.6489	132.1041	-0.16	0.870	-285.5571	242.2593
Industry_17	24.72876	145.0501	0.17	0.865	-265.0422	314.4997
Industry_18	-57.20888	170.4144	-0.34	0.738	-397.6508	283.2331
Industry_19	-33.30561	171.8778	-0.19	0.847	-376.6711	310.0598
Cons	-151.6975	235.45	-0.64	0.522	-622.063	318.668

**Source: (Original) Developed by own Data Collection and Analysis**

2009 – 10. Only ESOP's had significantly negative relationship with Tobin's Q at 10% significance levels.

From the table above we can observe that the board size had positive relation with Tobin's Q for the year

**Table 11**

Source	SS	df	MS		Number of obs =	93
Model	30437.8362	27	1127.3273		F ( 26 , 47) =	2.56
					Prob > F =	0.0011
Residual	28640.831	65	440.62817		R-squared =	0.5152
Total	59078.6672	92	642.15943		Adj R squared =	0.3138
					Root MSB =	20.991

Roce	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	-7.946502	23.75685	-0.33	0.739	-55.39221 39.49921
Promo Tersequity	-0.1230887	0.21057	-0.58	0.561	-0.5436259 0.2974486
Corporateholding	-45.18872	23.62222	-1.91	0.06	-92.36555 1.988103
Institutionalshareholding	-12.19407	7.765749	-1.57	0.121	-27.70334 3.315205
Adrgdr	-7.927873	11.72448	-0.68	0.501	-31.34327 15.48752
Esops	-0.181528	6.122545	-0.03	0.976	-12.40909 12.04604
Sal Esadvertisement Ratio	1.297255	162.9891	0.01	0.994	-324.2144 326.8089
Rdexpensessales	103.6892	195.4492	0.53	0.598	-286.6497 494.0281
Operatingprofitnetsales	-4.98849	1.903884	-2.62	0.011	-8.790809 -1.18617
Advertisementexpensessales	350.9506	141.4633	2.48	0.016	68.42891 633.4723

Industry_1	-0.5141339	24.02261	-0.02	0.983	-48.4906	47.46233
Industry_2	13.16915	25.15778	0.52	0.602	-37.0744	63.4127
Industry_3	3.367499	25.83954	0.13	0.897	-48.23762	54.97262
Industry_4	0 (omitted)					
Industry_5	-1.486208	23.78515	-0.06	0.95	-48.98843	46.01602
Industry_6	18.79003	24.9104	0.75	0.453	-30.95948	68.53954
Industry_7	0 (omitted)					
Industry_8	1.237449	24.9104	0.04	0.966	-56.74698	59.22188
Industry_9	26.88766	23.99828	1.12	0.267	-21.04022	74.81554
Industry_10	35.00509	24.64137	1.42	0.16	-14.20711	84.2173
Industry_11	-27.1925	28.00213	-0.97	0.335	-83.11662	28.73162
Industry_12	12.3112	23.92985	0.51	0.609	-35.48001	60.10241
Industry_13	1.413122	23.53536	0.06	0.952	-45.59023	48.41647
Industry_14	-7.5377	24.92657	-0.3	0.763	-57.3195	42.2441
Industry_15	-5.387468	25.10145	-0.21	0.831	-55.51852	44.74358
Industry_16	1.493082	24.37328	0.06	0.951	-47.18371	50.16987
Industry_17	-7.075689	26.76286	-0.26	0.792	-60.52481	46.37343
Industry_18	-12.11038	31.44083	-0.39	0.701	-74.90205	50.6813
Industry_19	-36.13809	31.72099	-1.14	0.259	-99.48928	27.21309
Cons	77.95223	43.45505	1.79	0.077	-8.833498	164.738

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had negative relation with ROCE for the year

2009 – 10. Operating profit/ net sales had significantly negative and advertisement expenses/ sales had significantly positive association with ROCE.

**Table 12**

Source	SS	df	MS	Number of obs =	93
Model	21813.646	27	807.912814	F ( 26 , 47) =	2.27
				Prob > F =	0.0037
Residual	23138.2431	65	355.972971	R-squared =	0.4853
Total	44951.8891	92	488.60749	Adj R squared =	0.2715
				Root MSB =	18.867

Row	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
Boardsize	-6.601384	21.35312	-0.31	0.758	-49.2465 36.04373
Promo Tersequity	-0.1209428	0.1892644	-0.64	0.525	-0.4989298 0.2570442
Corporateholding	-25.47165	21.2321	-1.20	0.235	-67.87509 16.93179
Institutionalshareholding	-11.76707	6.980005	-1.69	0.097	-25.7071 2.172965
Adrgdr	-8.45632	10.53819	-0.80	0.425	-29.50253 12.58989
Esops	3.186227	5.503061	0.58	0.565	-7.804146 14.1766
Sal Esadvertisement Ratio	-8.082127	146.4977	-0.06	0.956	-300.6583 284.494
Rdexpensessales	103.5508	175.6735	0.59	0.558	-247.2933 454.395
Operatingprofitnetsales	-4.408065	1.711248	-2.58	0.012	-7.825663 -.9904663
Advertisementexpensessales	304.4992	127.1499	2.39	0.020	50.56322 558.4351
Industry_1	6.134998	21.59198	0.28	0.777	-36.98717 49.25717
Industry_2	12.89866	22.61229	0.57	0.570	-32.2612 58.05853
Industry_3	8.847973	23.22508	0.38	0.704	-37.53571 55.23165
Industry_4	0 (omitted)				
Industry_5	6.582867	21.37855	0.31	0.759	-36.11305 49.27878
Industry_6	21.53061	22.38995	0.96	0.340	-23.18521 66.24643
Industry_7	0 (omitted)				

Industry_8	2 . 892192	26 . 09611	0.11	0.912	-49.22533	55.00971
Industry_9	22 . 09971	21 . 57012	1.02	0.309	-20.97879	65.17821
Industry_10	37.92485	22.14813	1.71	0 . 092	-6 .308027	82 .15773
Industry_11	-19.18943	25.16886	-0.76	0.449	-69 .45511	31.07625
Industry_12	15.97512	21.50861	0.74	0.460	-26 . 98055	58 .93078
Industry_13	5. 744011	21.15403	0.27	0.787	-36.50351	47.99153
Industry_14	-0.4656185	22 .40448	-0.02	0.983	-45.21046	44.27922
Industry_15	3 . 165008	22 . 56166	0.14	0.889	-41.89375	48.22376
Industry_16	7.007328	21.90717	0.32	0 .750	-36 .74431	50 .75897
Industry_17	-1.460412	24.05497	-0.06	0 . 952	-49 . 50151	46 .58069
Industry_18	-3 .426164	28.25962	-0.12	0 . 904	-59 . 86453	53 .0122
Industry_19	-30 .14122	28.51143	-1.06	0.294	-87.08248	26.80005
Cons	49 .42717	39. 05824	1.27	0.210	-28.57751	127.4319

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had negative relation with RONW for the year 2009 – 10. Institutional share holding and operating profit/ net sales had significantly negative and advertisement expenses/ sales had significantly positive association with RONW.

2010 – 11

**Table 13**

Source	SS	df	MS	Number of obs =	95
Model	127865.895	27	4735.7739	F ( 26 , 47) =	2.82
				Prob > F =	0.0003
Residual	112365.032	67	1677.09002	R-squared =	0.5323
Total	240230.927	94	2555.64816	Adj R squared =	0.3438
				Root MSB =	40.952

Tobinq	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	-4.837229	45.77109	-0.11	0. 916	-96.19671 86.52225
Promo Tersequity	0.7868459	0.4376442	1.80	0.077	-0.0866957 1.660387
Corporateholding	51.19264	45.83322	1.12	0.268	-40.29086 142.6761
Institutionalshareholding	37.4858	16.75543	2.24	0.029	4.041824 70.92978
Adrgrdr	53 .61261	22 .1215	2.42	0.018	9.4579 97.76732
Esops	-7.155255	11.69146	-0.61	0.543	-30 .4915 16.18099
Sal Esadvertising Ratio	148 .8454	471.7655	0.32	0.753	-792 .8025 1090.493
Rdexpensessales	-251.374	387.5224	-0.65	0.519	-1024 .872 522.1239
Operatingprofitnetsales	8.145116	6.342949	1.28	0.204	-4.515463 20.80569
Advertismentexpensessales	-121.5214	558.89	-0.22	0.829	-1237. 07 994 .0277
Industry_1	2.00431	44.64836	0.04	0.964	-87.11419 91.12281
Industry_2	9.759213	48.07133	0.20	0.84	-86.19157 105.71
Industry_3	-6.012249	52.85084	-0.11	0.91	-111.503 99.47846
Industry_4	14 .35948	61.12281	0.23	0.815	-107 .6422 136 .3611
Industry_5	105.877	45.56932	2.32	0.023	14 .9203 196 .8338
Industry_6	10 .79343	45.79306	0.24	0.814	-80.60991 102 .1968
Industry_7	0	(omitted)			
Industry_8	1.677687	52.52761	0.03	0.975	-103 .1679 106 .5232
Industry_9	9.381167	45.68415	0.21	0.838	-81.80478 100 .5671
Industry_10	-12 .24583	45.52884	-0.27	0.789	-103 .1218 78.63011
Industry_11	1.440713	52.7343	0.03	0.978	-103.8174 106.6988
Industry_12	1.643691	44.92153	0.04	0.971	-88.02006 91.30744
Industry_13	8.957463	43 .16901	0.21	0.836	-77.20824 95.12317
Industry_14	13 .01248	46 .0754	0.28	0.778	-78.95442 104 .9794
Industry_15	13 .26084	48.88324	0.27	0.787	-84.31052 110 .8322
Industry_16	1.448818	45.59249	0.03	0.975	-89.55416 92.4518
Industry_17	6.396634	49.63426	0.13	0.898	-92.67377 105.467
Industry_18	0	(omitted)			
Industry_19	24 .6816	60.63244	0.41	0.685	-96.34126 145 .7045
Cons	-107.6404	88.4009	-1.22	0.228	-284.0893 68.80854

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had negative relation with Tobin's Q for the year

2010 – 11. Promoter's equity had significantly positive relationship with Tobin's Q.

**Table 14**

Source	SS	df	MS		Number of obs =	95
Model	25764.4899	27	954.240368		F ( 26 , 47) =	2.15
					Prob > F =	0.006
Residual	29763.9875	67	444.238619		R-squared =	0.4640
Total	55528.4774	94	590.728483		Adj R squared =	0.248
					Root MSB =	21.077

Roce	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	5.623043	23 .55707	0.24	0.812	-41.39706 52.64315
Promo Tersequity	-0.103055	0.2252429	-0.46	0.649	-0.5526417 0.3465318
Corporateholding	-5.294805	23 .58905	-0.22	0.823	-52.37874 41.78913
Institutionalshareholding	-5.410919	8.62354	-0.63	0.532	-22.62358 11.80174
Adrgdr	-3 .66314	11.3853	-0.32	0.749	-26.3883 19.06202
Esops	-7.606157	6.017259	-1.26	0.211	-19.61666 4.404342
Sal Esadvertising Ratio	-275.795	242 .8042	-1.14	0.26	-760.4342 208.8441
Rdexpensessales	54.71285	199.4467	0.27	0.785	-343.3843 452.81
Operatingprofitnetsales	1.355454	3 .264534	0.42	0.679	-5.160583 7.871491
Advertismentexpensessales	444.7716	287.6447	1.55	0.127	-129.3695 1018.913
Industry_1	25.5694	22 .97923	1.11	0.27	-20.29734 71.43613
Industry_2	27.1788	24.74094	1.1	0.276	-22.20432 76.56192
Industry_3	5.416428	27.20081	0.2	0.843	-48.87662 59.70947
Industry_4	-7.925364	31.45816	-0.25	0.802	-70.71611 54.86538
Industry_5	9.931348	23 .45322	0.42	0.673	-36.88148 56.74418
Industry_6	42 .23964	23 .56838	1.79	0.078	-4.803036 89.28232
Industry_7	0	(omitted)			
Industry_8	5.53648	27.03446	0.2	0.838	-48.42452 59.49748
Industry_9	35.14263	23 .51232	1.49	0.14	-11.78816 82.07342
Industry_10	37.57037	23 .43239	1.6	0.114	-9.200868 84.34161
Industry_11	3 .447807	27.14083	0.13	0.899	-50.72552 57.62114
Industry_12	19.3086	23 .11982	0.84	0.407	-26.83876 65.45596
Industry_13	11.44685	22 .21785	0.52	0.608	-32.90017 55.79387
Industry_14	13.5075	23 .71369	0.57	0.571	-33.82523 60.84022
Industry_15	9.058523	25.1588	0.36	0.72	-41.15865 59.2757
Industry_16	13 .70232	23 .46514	0.58	0.561	-33.1343 60.53895
Industry_17	14.09139	25.54533	0.55	0.583	-36.89731 65.08008
Industry_18	0	(omitted)			
Industry_19	-8.087408	31.20578	-0.26	0.796	-70.3744 54.19959
Cons	10.32243	45.49741	0.23	0.821	-80.49078 101.1356

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with ROCE for the year 2010 – 11. None of the variables had significantly positive or negative association with ROCE.

**Table 15**

Source	SS	df	MS		Number of obs =	95
Model	20257.5941	27	750.28127		F ( 26 , 47) =	2.12
					Prob > F =	0.0067
Residual	23683.9185	67	353.49132		R-squared =	0.0067
Total	43941.5126	94	467.4629		Adj R squared =	0.4610
					Root MSB =	0.2438

Ronw	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	2 .67841	21.0137	0.13	0.899	-39.2651 44.62192
Promo Tersequity	-0.0571151	0.2009243	-0.28	0.777	-0.4581617 0.343931
Corporateholding	7.681458	21.04222	0.37	0.716	-34.31899 49.68191
Institutionalshareholding	-3 .957853	7.692487	-0.51	0.609	-19.31212 11.39642
Adrgdr	-8.355485	10.15607	-0.82	0.414	-28.62709 11.91612
Esops	-4.657003	5.367597	-0.87	0.389	-15.37077 6.056765
Sal Esadvertising Ratio	-186.113	216 .5895	-0.86	0.393	-618.4274 246.2015
Rdexpensessales	53 .40068	177.9131	0.30	0.765	-301.7154 408.5168

Operatingprofitnetsales	2.646226	2.912074	0.91	0.367	-3.166298	8.45875
Advertisementexpensessales	321.3821	256.5887	1.25	0.215	-190.7711	833.5353
Industry_1	26.87011	20.49825	1.31	0.194	-14.04456	67.78478
Industry_2	22.61996	22.06975	1.02	0.309	-21.43144	66.67137
Industry_3	8.576634	24.26404	0.35	0.725	-39.85459	57.00785
Industry_4	-28.01005	28.06173	-1.00	0.322	-84.0215	28.00141
Industry_5	8.398396	20.92106	0.40	0.689	-33.36022	50.15701
Industry_6	37.27309	21.02378	1.77	0.081	-4.690556	79.23674
Industry_7	0	(omitted)				
Industry_8	-1.617279	24.11564	-0.07	0.947	-49.7523	46.51775
Industry_9	25.2675	20.97378	1.20	0.233	-16.59635	67.13134
Industry_10	36.24233	20.90248	1.73	0.088	-5.479183	77.96385
Industry_11	4.323603	24.21054	0.18	0.859	-44.00083	52.64803
Industry_12	19.9982	20.62366	0.97	0.336	-21.1668	61.16319
Industry_13	12.30841	19.81907	0.62	0.537	-27.25062	51.86744
Industry_14	16.1299	21.15341	0.76	0.448	-26.09248	58.35228
Industry_15	11.70486	22.4425	0.52	0.604	-33.09055	56.50027
Industry_16	13.89437	20.9317	0.66	0.509	-27.88547	55.67422
Industry_17	13.81817	22.7873	0.61	0.546	-31.66547	59.3018
Industry_18	0	(omitted)				
Industry_19	-7.374591	27.8366	-0.26	0.792	-62.93669	48.1875
Cons	-5.077755	40.58522	-0.13	0.901	-86.08619	75.93068

Source: (Original) Developed by own Data Collection and Analysis

From the table above we can observe that the board size had positive relation with RONW for the year 2010 – 11. None of the variables had significantly positive or negative association with RONW.

2011 – 12

Table 16

Source	SS	df	MS	Number of obs =	96
Model	82364.7233	27	3050.5431	F ( 26 , 47) =	3.48
				Prob > F =	0.0000
Residual	59557.747	68	875.84922	R-squared =	0.5804
Total	141922.4703	95	1493.92074	Adj R squared =	0.4137
				Root MSB =	29.595

Tobing	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
Boardsize	-9.810473	30.94854	-0.32	0.752	-71.56733 51.94638
Promo Tersequity	0.070232	0.3167379	0.22	0.825	-0.5618088 0.7022727
Corporateholding	-6.112881	29.58675	-0.21	0.837	-65.15233 52.92657
Institutionalshareholding	-9.753465	12.55373	-0.78	0.440	-34.80404 15.29711
Adrgdr	43.54524	16.31136	2.67	0.009	10.99642 76.09405
Esops	-14.66649	8.381468	-1.75	0.085	-31.39145 2.058467
Sal Esadvertisement Ratio	511.2258	123.2624	4.15	0.000	265.2595 757.1921
Rdexpensessales	-89.91557	353.6349	-0.25	0.800	-795.5831 615.7519
Operatingprofitnetsales	-1.627535	2.963676	-0.55	0.585	-7.541458 4.286389
Advertisementexpensessales	-144.005	53.20442	-2.71	0.009	-250.1728 -37.83724
Industry_1	-1.061523	32.29332	-0.03	0.974	-65.50184 63.37879
Industry_2	19.6369	34.70739	0.57	0.573	-49.62063 88.89442
Industry_3	12.47875	38.04058	0.33	0.744	-63.43004 88.38755
Industry_4	18.90907	44.23343	0.43	0.670	-69.35737 107.1755
Industry_5	88.32426	32.64568	2.71	0.009	23.18082 153.4677
Industry_6	-9.525749	32.42446	-0.29	0.77	-74.22776 55.17626
Industry_7	0	(omitted)			
Industry_8	-4.478537	37.93042	-0.12	0.906	-80.1675 71.21043
Industry_9	8.972363	32.88224	0.27	0.786	-56.64313 74.58786
Industry_10	10.38356	33.12486	0.31	0.755	-55.71607 76.48318
Industry_11	-18.23882	38.5197	-0.47	0.637	-95.10368 58.62603
Industry_12	9.471869	32.36295	0.29	0.771	-55.10739 74.05113
Industry_13	6.184733	31.299	0.2	0.844	-56.27146 68.64092
Industry_14	7.46454	32.26131	0.23	0.818	-56.91189 71.84097
Industry_15	4.441021	34.96314	0.13	0.899	-65.32683 74.20887
Industry_16	8.874086	32.91297	0.27	0.788	-56.80273 74.5509

# Asian Resonance

Industry_17	5.516292	35.73602	0.15	0.878	-65.79383	76.82642
Industry_18	0	(omitted)				
Industry_19	-6.77253	43.26787	-0.16	0.876	-93.11223	79.56717
Cons	11.05665	63.09007	0.18	0.861	-114.8376	136.9509

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had negative relation with Tobin's Q for the year

2011 – 12. ADR/GDR and sales / advertisement ratio had significantly positive and ESOPs and advertisement expenses / sales had significantly negative relation with Tobin's Q

**Table 17**

Source	SS	df	MS	Number of obs =	97
Model	23031.7192	27	853.026638	F ( 26 , 47) =	3.07
				Prob > F =	0.0001
Residual	19201.7282	69	278.285916	R-squared =	0.5453
Total	42233.4474	96	439.931744	Adj R squared =	0.3674
				Root MSB =	16.682

Roce	Coef .	Std. Err.	t	P>  t	[95% Conf . Interval]
Boardsize	18.17844	17.44386	1.04	0.301	-16.62111 52.97799
Promo Tersequity	-0.0334338	0.1779126	-0.19	0.851	-0.3883598 0.3214922
Corporateholding	-27.98937	16.66354	-1.68	0.098	-61.23222 5.25348
Institutionalshareholding	-3.592737	7.074914	-0.51	0.613	-17.7068 10.52133
Adrgdr	-16.45422	9.191227	-1.79	0.078	-34.79022 1.881771
Esops	-7.99881	4.724207	-1.69	0.095	-17.42335 1.425725
Sal Esadvertising Ratio	245.2838	69.48014	3.53	0.001	106.6747 383.8929
Rdexpensesales	311.9852	199.3345	1.57	0.122	-85.67623 709.6466
Operatingprofitnetsales	-1.671739	1.670021	-1.00	0.32	-5.00334 1.659861
Advertisementexpensesales	-82.94314	29.9839	-2.77	0.007	-142.7594 -23.12689
Industry_1	28.26807	18.19918	1.55	0.125	-8.038294 64.57444
Industry_2	24.17534	19.55946	1.24	0.221	-14.84471 63.1954
Industry_3	8.104064	21.43543	0.38	0.707	-34.65845 50.86657
Industry_4	-0.236028	24.92281	-0.01	0.992	-49.95567 49.48362
Industry_5	5.76894	18.39903	0.31	0.755	-30.93612 42.474
Industry_6	40.97282	18.2731	2.24	0.028	4.518991 77.42666
Industry_7	0	(omitted)			
Industry_8	17.69927	21.38019	0.83	0.411	-24.95305 60.3516
Industry_9	30.52157	18.53308	1.65	0.104	-6.450914 67.49406
Industry_10	35.94835	18.6711	1.93	0.058	-1.29948 73.19618
Industry_11	5.390166	21.70555	0.25	0.805	-37.91123 48.69156
Industry_12	21.05834	18.24017	1.15	0.252	-15.3298 57.44649
Industry_13	13.95748	17.56387	0.79	0.43	-21.08149 48.99645
Industry_14	14.27161	18.18227	0.78	0.435	-22.00102 50.54425
Industry_15	12.16463	19.70611	0.62	0.539	-27.14798 51.47723
Industry_16	13.05737	18.55115	0.70	0.484	-23.95115 50.0659
Industry_17	10.72917	20.14155	0.53	0.596	-29.45212 50.91046
Industry_18	0	(omitted)			
Industry_19	-3.540605	24.38225	-0.15	0.885	-52.18186 45.10065
Cons	16.74041	35.50449	0.47	0.639	-54.0891 87.56993

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with ROCE for the year 2011

– 12. Corporate holding, ADR/GDR, ESOPs and advertisement expenses / sales had significantly negative and sales advertisement ratio had significantly positive association with ROCE

**Table 18**

Source	SS	df	MS	Number of obs =	97
Model	15977.5245	27	591.760167	F ( 26 , 47) =	2.97
				Prob > F =	0.0001
Residual	13725.2469	69	198.916622	R-squared =	0.5379
Total	29702.7714	96	309.403869	Adj R squared =	0.3571
				Root MSB =	14.104

Ronw	Coef .	Std. Err.	t	p> t	[95% Conf. Interval]
Boardsize	18.96038	14.74798	1.29	0.203	-10.46103 48.3818
Promo Tersequity	-0.0434006	.1504169	-0.29	0.774	-0.3434742 0.2566729
Corporateholding	-15.26682	14.08825	-1.08	0.282	-43.37212 12.83848
Institutionalshareholding	-4.960867	5.981513	-0.83	0.41	-16.89366 6.971925
Adrgdr	-16.22209	7.770758	-2.09	0.041	-31.72433 -0.7198538
Esops	-4.611681	3.994099	-1.15	0.252	-12.57969 3.356329
Sal Esadvertisement Ratio	205.417	58.74225	3.50	0.001	88.22946 322.6046
Rdexpensessales	303.592	168.5281	1.8	0.076	-32.61244 639.7964
Operatingprofitnetsales	-0.4555167	1.411926	-0.32	0.748	-3.272231 2.361198
Advertisementexpensessales	-64.01287	25.35001	-2.53	0.014	-114.5847 -13.44099
Industry_1	29.08808	15.38657	1.89	0.063	-1.607281 59.78344
Industry_2	20.72953	16.53662	1.25	0.214	-12.26013 53.71919
Industry_3	9.643761	18.12267	0.53	0.596	-26.50997 45.79749
Industry_4	3.603341	21.07109	0.17	0.865	-38.43233 45.63901
Industry_5	5.740425	15.55553	0.37	0.713	-25.29201 36.77286
Industry_6	35.7256	15.44906	2.31	0.024	4.905565 66.54563
Industry_7	0	(omitted)			
Industry_8	13.4638	18.07597	0.74	0.459	-22.59677 49.52437
Industry_9	26.71538	15.66887	1.70	0.093	-4.543154 57.97391
Industry_10	35.46821	15.78556	2.25	0.028	3.976883 66.95953
Industry_11	4.953158	18.35105	0.27	0.788	-31.65618 41.56249
Industry_12	22.50797	15.42122	1.46	0.149	-8.256533 53.27246
Industry_13	16.305	14.84945	1.10	0.276	-13.31883 45.92884
Industry_14	15.69118	15.37227	1.02	0.311	-14.97565 46.35802
Industry_15	13.15437	16.6606	0.79	0.432	-20.08263 46.39136
Industry_16	15.61061	15.68414	1	0.323	-15.67839 46.89961
Industry_17	11.74985	17.02875	0.69	0.493	-22.22158 45.72128
Industry_18	0	(omitted)			
Industry_19	4.580864	20.61407	0.22	0.825	-36.54307 45.7048
Cons	1.253323	30.01741	0.04	0.967	-58.62976 61.13641

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with RONW for the year 2011 – 12. ADR/GDR, advertisement expenses/ sales had significantly negative and sales advertisement ratio RD expenses sales had significantly positive association with RONW.

**2012 - 13**

**Table 19**

Source	SS	df	MS	Number of obs =	90
Model	57986.5431	25	2319.46173	F ( 26 , 47) =	2.66
				Prob > F =	0.0009
Residual	55893.8574	64	873.341522	R-squared =	0.5092
Total	113880.4005	89	1279.55506	Adj R squared =	0.3175
				Root MSB =	29.552

Tobing	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	-18.00393	35.8096	-0.5	0.617	-89.54183 53.53397
Promo Tersequity	-.1797733	.3799125	-0.47	0.638	-.9387358 .5791891
Corporateholding	24.30924	123.1324	0.20	0.844	-221.676 270.2944
Institutionalshareholding	-21.29095	14.03278	-1.52	0.134	-49.32465 6.742744
Adrgdr	76.26775	19.73253	3.87	0.000	36.84749 115.688
Esops	-11.31452	8.631926	-1.31	0.195	-28.55877 5.929739
Sal Esadvertisement Ratio	-13.56031	105.1795	-0.13	0.898	-223.6806 196.56
Rdexpensessales	-877.177	427.5966	-2.05	0.044	-1731.399 -22.95467
Operatingprofitnetsales	1.37514	6.641532	0.21	0.837	-11.89285 14.64313
Advertisementexpensessales	53.58504	178.6128	0.3	0.765	-303.235 410.4051
Industry_1	21.81525	25.81199	0.85	0.401	-29.75013 73.38064
Industry_2	43.54183	29.27937	1.49	0.142	-14.95044 102.0341
Industry_3	37.55062	34.38333	1.09	0.279	-31.13797 106.2392
Industry_4	0	(omitted)			
Industry_5	106.1687	25.6156	4.14	0.000	54.99562 157.3417



Industry_6	38.85727	27.9925	1.39	0.170	-17.06419	94.77872
Industry_7	0	(omitted)				
Industry_8	0	(omitted)				
Industry_9	30.94931	28.09841	1.10	0.275	-25.18371	87.08234
Industry_10	30.19648	27.4385	1.10	0.275	-24.61822	85.01118
Industry_11	28.73004	32.64008	0.88	0.382	-36.47602	93.9361
Industry_12	31.01441	26.52318	1.17	0.247	-21.97174	84.00056
Industry_13	25.30658	25.98983	0.97	0.334	-26.61408	77.22724
Industry_14	47.53515	25.13987	1.89	0.063	-2.687525	97.75782
Industry_15	19.17944	29.70047	0.65	0.521	-40.15408	78.51296
Industry_16	31.35134	27.85392	1.13	0.265	-24.29327	86.99594
Industry_17	28.37938	28.77547	0.99	0.328	-29.10622	85.86498
Industry_18	0	(omitted)				
Industry_19	22.34472	39.20481	0.57	0.571	-55.9759	100.6653
Cons	-14.00596	135.7466	-0.1	0.918	-285.191	257.1791

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had negative relation with Tobin's Q for the year 2012 – 13. ADR/GDR had significantly positive and R&D expenses/sales had significantly negative relationship with Tobin's Q.

**Table 20**

Source	SS	df	MS	Number of obs =	90
Model	14774.3115	25	590.972458	F ( 26 , 47) =	1.79
				Prob > F =	0.0326
Residual	21160.3762	64	330.630878	R-squared =	0.4111
Total	35934.6877	89	403.760536	Adj R squared =	0.1811
				Root MSB =	18.183

Roce	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	13.18368	22.03328	0.60	0.552	-30.83285 57.20022
Promo Tersequity	-0.0536009	0.2337562	-0.23	0.819	-0.5205827 0.4133809
Corporateholding	8.438945	75.76208	0.11	0.912	-142.9132 159.7911
Institutionalshareholding	-4.120679	8.634223	-0.48	0.635	-21.36952 13.12816
Adrgdr	-6.41465	12.14122	-0.53	0.599	-30.66953 17.84023
Esops	-5.706095	5.311135	-1.07	0.287	-16.31631 4.904118
Sal Esadvertisement Ratio	-27.30529	64.71589	-0.42	0.674	-156.5901 101.9796
Rdexpensessales	150.3459	263.0958	0.57	0.57	-375.2484 675.9401
Operatingprofitnetsales	1.269434	4.086466	0.31	0.757	-6.894221 9.433089
Advertisementexpensessales	168.2741	109.8986	1.53	0.131	-51.27361 387.8218
Industry_1	19.26576	15.88185	1.21	0.23	-12.46189 50.99341
Industry_2	20.73359	18.0153	1.15	0.254	-15.2561 56.72328
Industry_3	4.850291	21.15571	0.23	0.819	-37.41309 47.11367
Industry_4	0	(omitted)			
Industry_5	4.964321	15.76101	0.31	0.754	-26.52192 36.45056
Industry_6	31.849	17.2235	1.85	0.069	-2.5589 66.25689
Industry_7	0	(omitted)			
Industry_8	0	(omitted)			
Industry_9	20.34427	17.28866	1.18	0.244	-14.1938 54.88234
Industry_10	31.46947	16.88262	1.86	0.067	-2.257449 65.19639
Industry_11	5.551292	20.08311	0.28	0.783	-34.56932 45.67191
Industry_12	15.59923	16.31944	0.96	0.343	-17.0026 48.20107
Industry_13	10.38867	15.99128	0.65	0.518	-21.55758 42.33491
Industry_14	13.51442	15.46831	0.87	0.386	-17.38707 44.41592
Industry_15	4.449324	18.2744	0.24	0.808	-32.05798 40.95663
Industry_16	8.077316	17.13823	0.47	0.639	-26.16024 42.31487
Industry_17	5.305164	17.70525	0.30	0.765	-30.06513 40.67546
Industry_18	0	(omitted)			
Industry_19	-7.579116	24.12232	-0.31	0.754	-55.76898 40.61075
Cons	-10.79043	83.52349	-0.13	0.898	-177.6478 156.0669

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with ROCE for the year 2012 – 13. None of the independent variables had significantly positive or negative association with ROCE.

**Table 21**

Source	SS	df	MS		Number of obs =	90
Model	16241.9892	25	649.67957		F ( 26 , 47) =	0.76
					Prob > F =	0.7699
Residual	54455.374	64	850.86522		R-squared =	0.2297
Total	70697.3632	89	794.3524		Adj R squared =	-0.0711
					Root MSB =	29.17

Ronw	Coef .	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	-5 .620965	35.3458	-0.16	0.874	-76.23232 64 .99039
Promo Tersequity	0.3299046	0.3749919	0.88	0.382	-0.4192279 1.079037
Corporateholding	-64.72082	121.5376	-0.53	0.596	-307.5201 178.0784
Institutionalshareholding	-0.2307348	13 .85103	-0.02	0.987	-27.90134 27.43987
Adrgdr	4 .197442	19.47695	0.22	0.83	-34.71225 43.10713
Esops	10.83282	8.520127	1.27	0.208	-6 .188094 27.85373
Sal Esadvertising Ratio	15.26342	103.8173	0.15	0.884	-192 .1354 222.6623
Rdexpensessales	-287 .6468	422.0584	-0.68	0.498	-1130 .805 555.5118
Operatingprofitnetsales	-2 .403058	6.555512	-0.37	0.715	-15.4992 10.69308
Advertismentexpensessales	14 .11484	176.2994	0.08	0.936	-338.0837 366.3134
Industry_1	30.19235	25.47768	1.19	0.24	-20.70516 81.08987
Industry_2	16.26542	28.90015	0.56	0.576	-41.46926 74.0001
Industry_3	25.81449	33 .938	0.76	0.45	-41.98446 93.61343
Industry_4	0	(omitted)			
Industry_5	3 .40912	25.28383	0.13	0.893	-47 .10113 53 .91937
Industry_6	44.43308	27.62995	1.61	0.113	-10 .76409 99.63025
Industry_7	0	(omitted)			
Industry_8	0	(omitted)			
Industry_9	30.60686	27 .73448	1.1	0.274	-24.79914 86.01285
Industry_10	28.75606	27 .08312	1.06	0.292	-25.34868 82 .86081
Industry_11	20.72977	32.21733	0.64	0.522	-43 .63175 85 .09128
Industry_12	18.95678	26 .17966	0.72	0.472	-33 .3431 71.25666
Industry_13	19.55959	25.65322	0.76	0.449	-31.6886 70.80778
Industry_14	38.61157	24 .81427	1.56	0.125	-10 .96063 88 .18376
Industry_15	22.15202	29.3158	0.76	0.453	-36 .41302 80.71706
Industry_16	16.15076	27.49316	0.59	0.559	-38 .77314 71 .07467
Industry_17	2.971287	28 .40277	0.1	0.917	-53.76977 59.71234
Industry_18	0	(omitted)			
Industry_19	15.67283	38 .69704	0.41	0.687	-61.63339 92 .97905
Cons	44.87464	133.9884	0.33	0.739	-222 .798 312.5473

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with RONW for the year 2012 – 13. None of the independent variables had significantly positive or negative association with RONW.

The year wise OLS regression had shown negative relation of Tobin's Q to the board size. However, ROCE had positive but significant

association with the firm size. Even RONW had either negative or positive estimates but they were not significant.

**Pooled OLS**

In order find the association between the performance measures and board size along with other independent variables, a pooled OLS analysis was applied by using STATA for different financial years

**Table 22**

Source	SS	df	MS	Number of obs =	90
Model	127584.846	15	8505.6564	F ( 26 , 47) =	0.76
				Prob > F =	0.7699
Residual	1696322.2	432	3926.6949	R-squared =	0.2297
Total	1823907.046	447	4080.3513	Adj R squared =	-0.0711
				Root MSB =	29.17

Tobinq	Coef .	Std. Err.	t	p> t	[95% Conf. Interval]
Boardsize	1.443694	27 .71877	0 .05	0 .958	-53 .03674 55 .92413
Promoter S Equity	0.6991241	0.2551052	2 .74	0.006	.1977224 1.200526
Corporateholding	26 .21788	26 .65396	0 .98	0 .326	-26 .16969 78 .60544

Ins Titutitional Shareholding	28 .75711	9.740343	2 .95	0 .003	9 .612755	47 .90147
Adrgdr	45 .84422	14 .10869	3 .25	0 .001	18 .114	73 .57444
Esops	-2 .028024	6 .60824	-0.31	0 .759	-15 .01632	10 .96028
Salesadvertisement Ratio	-9.763926	50 .27391	-0.19	0 .846	-108 .5758	89 .04796
Rdexpenses Sales	-364 .2713	227 .913	-1.6	0 .111	-812 .2275	83 .68493
Operat Ingpr Of It Net Sales	1.043076	1.585008	0 .66	0 .511	-2 .072211	4 .158363
Advertisement Expenses Sales	20 .19245	48 .51847	0 .42	0 .677	-75 .16918	115.5541
Year_1	-6 .221935	63 .27025	-0.1	0 .922	-130 .5778	118 .1339
Year_2	9.036532	63 .17459	0 .14	0 .886	-115 .1313	133.2043
Year_3	1.237155	63 .18121	0 .02	0 .984	-122 .9437	125.418
Year_4	-1.62686	63 .16067	-0 .03	0 .979	-125.7673	122 .5136
Year_5	-3 .563255	63 .21008	-0 .06	0 .955	-127 .8008	120.6743
Year_6	0	(omitted)				
Cons	-65 .40419	76 .7833	-0 .85	0 .395	-216 .3195	85 .51111

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive but non significant relation with Tobin's Q. Promoters equity, Institutional share holding and ADR/GDR had a positive and also significant relation with Tobin's Q.

**Table 23**

Source	SS	df	MS	Number of obs =	450
Model	23620.9458	15	1574.72972	F ( 15 ,434) =	3.27
				Prob > F =	0.0000
Residual	208723.028	434	480.928636	R-squared =	0.1017
Total	232343.9738	449	4080.35134	Adj R squared =	0.0706
				Root MSB =	21.93

Roce	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Boardsize	13.66597	9.697326	1.41	0.159	-5.393596 32 .72553
Promoter S Equity	0.1113575	0.089144	1.25	0.212	-0.0638501 0.286565
Corporateholding	-24.55232	9.321773	-2.63	0.009	-42 .87375 -6 .230883
Ins Titutitional Shareholding	2.030147	3.408688	0.6	0.552	-4 .669442 8.729736
Adrgdr	-7.957018	4.937133	-1.61	0.108	-17.66068 1.746646
Esops	-5.064852	2.310842	-2.19	0.029	-9.606686 -0.5230191
Salesadvertisement Ratio	45.8277	17.59322	2.6	0.01	11.24919 80.40621
Rdexpenses Sales	40.40428	79.75798	0.51	0.613	-116.3556 197 .1642
Operat Ingpr Of It Net Sales	-1.279239	0.554666	-2.31	0.022	-2 .369404 - .1890732
Advertisement Expenses Sales	40.25612	16.97942	2.37	0.018	6.884007 73.62823
Year_1	-3.400114	22.14218	-0.15	0.878	-46.91935 40.11912
Year_2	-7.152498	22.1065	-0.32	0.746	-50.60161 36.29661
Year_3	-9.210242	22.11098	-0.42	0.677	-52 .66815 34.24767
Year_4	-11.22118	22.10175	-0.51	0.612	-54.66096 32 .2186
Year_5	-11.21636	22.12111	-0.51	0.612	-54.6942 32 .26148
Year_6	0 (omitted)				
Cons	38.23451	26.85644	1.42	0.155	-14.55034 91.01936

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive but non significant relation with ROCE. Corporate shareholding, ESOPs and

operating profit /net sales had significantly negative relation and Sales advertisement ratio and advertisement expenses / sales had a positive and significant relation with ROCE

**Table 24**

Source	SS	df	MS	Number of obs =	450
Model	16855.6357	15	1123.7091	F ( 15 ,434) =	2.37
				Prob > F =	0.0027
Residual	205379.03	434	473.22357	R-squared =	0.0758
Total	222234.6657	449	4080.3513	Adj R squared =	0.0439
				Root MSB =	21.754

Ronw	Coef.	Std. Err.	t	P>   t	[95% Conf. Interval]
Boardsize	9.254128	9.619331	0.96	0.337	-9.652138 28 .16039
Promoter S Equity	0.1667721	0.088427	1.89	0.06	-0.0070263 .3405704
Corporateholding	-14.44181	9.246799	-1.56	0.119	-32.61589 3 .732264
Ins Titutitional Shareholding	1.815694	3.381272	0.54	0.592	-4.830011 8.461399

Adrgdr	-9.218232	4.897424	-1.88	0.06	-18.84385	0.4073854
Esops	0.5318579	2.292256	0.23	0.817	-3.973446	5.037162
Salesadvertisement Ratio	35.17171	17.45172	2.02	0.044	0.8713213	69.47211
Rdexpenses Sales	58.16059	79.11649	0.74	0.463	-97.33852	213.6597
Operat Ingpr Of It Net Sales	-0.9247635	0.5502048	-1.68	0.094	-2.006161	.1566338
Advertisement Expenses Sales	33.09652	16.84285	1.97	0.05	-0.0071772	66.20022
Year_1	7.310637	21.96409	0.33	0.739	-35.85857	50.47985
Year_2	2.259405	21.9287	0.1	0.918	-40.84025	45.35906
Year_3	0.711585	21.93314	0.03	0.974	-42.3968	43.81997
Year_4	-0.7427452	21.92399	-0.03	0.973	-43.83314	42.34765
Year_5	0.8375989	21.9432	0.04	0.97	-42.29055	43.96574
Year_6	0 (omitted)					
Cons	15.17154	26.64043	0.57	0.569	-37.18877	67.53184

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive but non significant relation with RONW. Promoter's equity, sales advertisement ratio and advertisement expenses/ sales had significantly positive relation and ADR/GDR and operating profit /net sales had a negative and significant relation with RONW.

The pooled OLS estimates had shown positive estimates with performance indicators including

Tobin's Q, ROCE and RONW. However the estimates were not significant at even at 10% significance levels.

### Random effects regression

In order find the association between the performance measures and board size along with other independent variables, random effects regression analysis was applied by using STATA for different financial years

**Table 25**

Random-effects GLS regression				Number of obs =	448
Group variable : id				Number of groups =	97
R-sq : within =	0.0121			Obs per group : min =	1
between =	0.4752			avg =	4.6
overall =	0.2881			max =	6
				Wald chi2(27) =	66.66
corr (u_i,x) =	0 (assumed)			prob > chi2 =	0.0000

Tobing	Coef .	Std. Err.	z	P> z	[95% Conf. Interval]
Boardsize	15.65636	32.46904	0.48	0.630	-47.98179 79.29451
Promo Tersequity	0.6909852	0.3718386	1.86	0.063	-.0378052 1.419776
Corporateholding	16.08317	33.21047	0.48	0.628	-49.00817 81.1745
Institutionalshareholding	23.46332	11.80723	1.99	0.047	0.32157 46.60506
Adrgdr	44.68577	22.96564	1.95	0.052	-0.3260511 89.69759
Esops	-19.24321	12.48301	-1.54	0.123	-43.70945 5.223041
Sal Esadvertisement Ratio	10.35428	42.27857	0.24	0.807	-72.51019 93.21876
Rdexpensessales	-183.4801	287.1567	-0.64	0.523	-746.2968 379.3367
Operatingprofitnetsales	0.6836988	1.334949	0.51	0.609	-1.932754 3.300152
Advertisementexpensessales	31.57249	48.56868	0.65	0.516	-63.62037 126.7654
Industry_1	-12.57464	49.97889	-0.25	0.801	-110.5315 85.38218
Industry_2	6.397417	54.07398	0.12	0.906	-99.58563 112.3805
Industry_3	-17.00216	57.73718	-0.29	0.768	-130.165 96.16064
Industry_4	-9.954125	66.97701	-0.15	0.882	-141.2267 121.3184
Industry_5	121.5534	51.52135	2.36	0.018	20.57338 222.5334
Industry_6	-5.973189	49.62017	-0.12	0.904	-103.2269 91.28056
Industry_7	0 (omitted)				
Industry_8	-7.902275	59.34045	-0.13	0.894	-124.2074 108.4029
Industry_9	-10.02706	51.56869	-0.19	0.846	-111.0998 91.04572
Industry_10	-18.74491	52.52	-0.36	0.721	-121.6822 84.1924
Industry_11	-10.23182	57.26007	-0.18	0.858	-122.4595 101.9958
Industry_12	-9.666788	50.55205	-0.19	0.848	-108.747 89.41341
Industry_13	-11.4085	49.19292	-0.23	0.817	-107.8249 85.00785
Industry_14	4.264108	50.04547	0.09	0.932	-93.82321 102.3514
Industry_15	-8.083107	53.01754	-0.15	0.879	-111.9956 95.82937
Industry_16	-13.5063	52.06968	-0.26	0.795	-115.561 88.5484

# Asian Resonance

Industry_17	-0.7215415	55 . 50665	-0.01	0.990	-109.5126	108.0695
Industry_18	-20.82	67.26322	-0.31	0.757	-152 .6535	111 . 0135
Industry_19	0	(omitted)	-0.31			
Cons	-61.51302	70 .31646	-0.87	0.382	-199.3308	76 .30472
Sigma U	41. 709155					
Sigma_E	43.748892					
Rho	0.4761453	(fraction		due		to u_i)

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with Tobin's Q. Promoter's equity, institutional share holding and ADR/GDR had significantly positive relationship with Tobin's Q.

**Table 26**

Random-effects GLS regression				Number of obs =	450
Group variable : id				Number of groups =	98
R-sq : within =	0.0139			Obs per group : min =	1
between =	0.4332			avg =	4.6
overall =	0.3705			max =	6
				Wald chi2(27) =	65.07
corr (u_i,x) =	0(assumed)			prob > chi2 =	0.0001

Roce	Coef .	Std. Err.	z	P> z	[95% Conf. Interval]
Boardsize	0.939783	7.611399	0.12	0.902	-13.97828 15.85785
Promo Tersequity	-0.0021668	0.1056931	-0.02	0.984	-0.2093215 0.2049879
Corporateholding	-11.07325	8.579163	-1.29	0.197	-27.8881 5.741605
Institutionalshareholding	-2 . 797665	2 . 782312	-1. 01	0 . 315	-8 .250896 2 . 655567
Adrgdr	-7 . 310803	8 .48485	-0 . 86	0 . 389	-23 . 9408 9.319198
Esops	-4 . 338828	4 . 752443	-0 . 91	0 . 361	-13 . 65345 4 . 975789
Sal Esadvertisement Ratio	14 .37677	9 . 746152	1.48	0.14	-4.725334 33 .47888
Rdexpensessales	5.479539	65.56187	0.08	0.933	-123 .0194 133 .9784
Operatingprofitnetsales	0.2488499	0.308498	0.81	0.42	-0.3557951 0.853495
Advertismentexpensessales	12 .81654	12 .27445	1. 04	0.296	-11.24093 36 . 87402
Industry_1	24 . 06407	19 . 11435	1.26	0 . 208	-13 . 39938 61 . 52751
Industry_2	26.90809	20 .67287	1.3	0 . 193	-13.60999 67 .42618
Industry_3	9.516191	22 .04868	0.43	0.666	-33.69843 52 .73082
Industry_4	-1.16939	25.50858	-0.05	0.963	-51.16529 48.82651
Industry_5	9.736238	19.56188	0.5	0.619	-28.60434 48.07682
Industry_6	50 . 91955	18.93057	2.69	0 . 007	13.81633 88.02278
Industry_7	0	(omitted)			
Industry_8	14 .60779	22 . 6705	0 . 64	0 . 519	-29. 82557 59 . 04115
Industry_9	33 .26084	19 .72146	1.69	0 . 092	-5 .392515 71 .9142
Industry_10	37.72816	19.86366	1.9	0.058	-1.203905 76.66022
Industry_11	11.60752	21.96199	0.53	0.597	-31.43718 54 .65223
Industry_12	21.74427	19.14876	1.14	0.256	-15.7866 59.27515
Industry_13	10 .42171	18.73046	0.56	0.578	-26.28931 47 . 13273
Industry_14	19.82676	18 . 95788	1. 05	0 . 296	-17 . 33002 56 . 98353
Industry_15	5.857896	20 . 17208	0 . 29	0 . 772	-33 . 67865 45 . 39444
Industry_16	12.55677	19.83494	0.63	0.527	-26.31901 51.43255
Industry_17	11.66596	21.14314	0.55	0.581	-29.77385 53 .10576
Industry_18	0.6472873	25.61226	0.03	0.98	-49.55183 50.8464
Industry_19	0	(omitted)			
Cons	14 .41531	22 . 12201	0.65	0 . 515	-28 . 94303 57 . 77365
Sigma U	17 . 320549				
Sigma_E	8.7406989				
Rho	0.79702559	(fraction of variance due to u_i)			

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with ROCE. None of the independent variables had significantly positive or negative association with ROCE.

**Table 27**

Random-effects GLS regression		Number of obs =	450
Group variable : id		Number of groups =	98
R-sq : within =	0.0091	Obs per group : min =	1
between =	0.4372	avg =	4.6
overall =	0.2911	max =	6

		Wald chi2(27) =	61.97
corr (u <sub>i</sub> ,x) =	0(assumed)	prob > chi2 =	0.0001

Ronw	Coef .	Std. Err.	z	P> z	[95% Conf. Interval]
Boardsize	4 .412716	10. 64685	0.41	0.679	-16.45473 25.28016
Promo Tersequity	. 0550468	0.1237737	0.44	0.657	- . 1875452 0.2976389
Corporateholding	-8.373979	11.0245	0.76	0.448	-29.9816 13 .23364
Institutionalshareholding	-2.185178	3.882101	0.56	0.574	-9.793955 5.423599
Adrgr	-7.535812	7.8381	0.96	0.336	-22.8982 7. 826582
Esops	1.62908	4.276195	0.38	0.703	-6.752108 10.01027
Sal Esadvertisment Ratio	12 .75391	13 .8006	0.92	0.355	-14 .29477 39.80258
Rdexpensessales	-70.44284	94.08242	0.75	0 .454	-254.841 113 . 9553
Operatingprofitnetsales	0.1419468	0.4358333	0.33	0.745	-0.7122708 0.9961645
Advertismentexpensessales	8 .661241	16.03866	0.54	0.589	-22 .77396 40.09645
Industry_1	23 . 14609	17. 12005	1.35	0 .176	-10 .4086 56 .70078
Industry_2	17.72224	18 . 52429	0.96	0.339	-18 .5847 54.02918
Industry_3	10.17849	19.77703	0.51	0.607	-28.58379 48.94076
Industry_4	-9. 91691	22.93082	0.43	0.665	-54 .86049 35.02667
Industry_5	6 .726152	17.6332	0.38	0.703	-27.83428 41.28658
Industry_6	43.37547	16.99219	2.55	0.011	10.0714 76.67955
Industry_7	0	(omitted)			
Industry_8	5 .617419	20.3322	0.28	0.782	-34 .23296 45.4678
Industry_9	24.78403	17.66507	1.4	0.161	-9.838871 59.40693
Industry_10	31.78569	17. 96832	1.77	0 .077	-3 .431567 67.00294
Industry_11	9 .092869	19. 62152	0.46	0 .643	-29.36461 47 .55035
Industry_12	18.06701	17.2993	1.04	0.296	-15.83899 51.97301
Industry_13	9.179856	16 . 82701	0.55	0.585	-23 .80048 42.16019
Industry_14	22 . 88153	17. 12409	1.34	0 .181	-10. 68107 56 .44413
Industry_15	7.898469	18 . 14922	0.44	0.663	-27.67334 43 .47028
Industry_16	10.68242	17.82888	0.6	0.549	-24.26155 45.62638
Industry_17	8.801491	19. 00895	0.46	0.643	-28.45537 46.05836
Industry_18	-1.684344	23.0265	0.07	0. 942	-46.81546 43 .44677
Industry_19	0	(omitted)			
Cons	4.897332	23 .5645	0.21	0.835	-41.28823 51.0829
Sigma_U	14.368518				
Sigma E	13 .924519				
Rho	0.51568901	(fraction of variance due to u <sub>i</sub> )			

**Source: (Original) Developed by own Data Collection and Analysis**

From the table above we can observe that the board size had positive relation with RONW. None of the independent variables had significantly positive or negative association with RONW.

The performance indicators Tobin's Q, ROCE and RONW had a positive but no significant relation with the board size. This shows that the board size does not influence the performance indicators (Tobin's Q, ROCE and RONW).

**Testing of Hypothesis**  
**Hypothesis**

**H1A: There is a positive relationship between the board size and the firm performance as measured by Tobin's Q, RONW and ROCE.**

From the pooled OLS table we can observe that, the regression coefficient between Tobin's Q and board size was 15.65 and its corresponding p value is 0.630>0.05. Since the p value is more than 0.05 we can conclude that there is a positive but not significant relationship between Tobin's Q and the board size. Hence the hypothesis can be rejected.

The regression coefficient between ROCE and board size was 0.94 and its corresponding p value is 0.902>0.05. Since the p value is more than 0.05 we

can conclude that there is a positive but not significant relationship between ROCE and the board size. Hence the hypothesis can be rejected.

The regression coefficient between RONW and board size is 4.41 and its corresponding p value is 0.679>0.05. Since the p value is more than 0.05 we can conclude that there is a positive but not significant relationship between Tobin's Q and the board size. Hence the hypothesis can be rejected.

**Conclusions**

The relation between board size and firm value was investigated by using correlation, ANOVA, Year wise regressions, pooled OLS regressions and random effect regressions. The correlations indicated a non significant relation with board size, but ANOVA analysis had shown significant relationship with ROCE and RONW with high mean performance in companies with board size of 8 - 11. The year wise regression, pooled OLS and random effects regression had shown a non significant relation of board size with Performance indicators. These results were also similar to the results obtained by Varshney et al (2012). However, most of the literature available had shown that the depth of the knowledge increases with increase in the board size and hence resulting in increased performance. But this study had not shown

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any such significant relationship. This is in corroboration with the study by Yermack et al (1996) which had shown a reciprocal relationship with the board size and firm performance.

We found a non-significantly positive association between the size of board and firm performance, when performance was measured by Tobin's Q, RONW and ROCE. The coefficient on board size was not significant with the traditional measures as the dependent variables.

The findings of this empirical study reveal that larger boards are less effective than small boards. The evident reasons, as suggested by previous scholars, are very pertinent. As board size increases, group dynamics, communication gap and coordination costs increase; this affects firm's negatively. Board size is becoming insignificant for PSUs as a performance measure, and the reasons are straightforward. PSU performance in India in subject to political control, and here, the board is not as strong a corporate governance mechanism as it should be.

## Limitations and Scope for Future Research

The current study is quite exhaustive. However, further research can be carried out in order to understand the reasons or factors that are responsible for affecting board size negatively. The Indian firms are also slowly, but surely, moving towards the Anglo-American model of corporate governance, wherein the diffused ownership patterns, as opposed to the concentrated ownership patterns, emerge. Along with this, board independence would gain greater prominence and affect firm performance, as opposed to the current situation. Whether this happens or not can again be a subject for future research.

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