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# Relationship between corporate governance and firm performance

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**Abstract**
Good governance generates investors goodwill and confidence. Better corporate framework benefits firms through greater access to financing, lower cost of capital, better firm performance and more favourable treatment of all stakeholders. But poorly governed firms are expected to be less profitable. So, Corporate Governance is an important factor in determination of firm performance. The purpose of this study is to investigate the impact of Corporate Governance on the performance of the selected Indian listed companies by constructing Corporate Governance Index (CGI). Multiple regression is used covering the 2010–2019 period. The study shows that the growth rate of the CGI and the five sub-indexes show significant rising trend. The audit committee governance index represents the highest score compared to other index and followed by nomination & remuneration committee governance index, disclosure & transparency governance index and shareholder rights governance index. The study also found a positive relationship between firm performance and corporate governance index. Finally, it can be concluded that this study supports the stakeholder theory in the India. The corporate governance code in the India is established based on principles of corporate governance, which require good corporate governance practice providing to the interests of all stakeholders.

**Keywords:** corporate governance, corporate governance index, firm performance

## Introduction

Corporate Governance means the extent to which companies run in an open and honest manner. It is believed that good governance generates investors goodwill and confidence. Better corporate framework benefits firms through greater access to financing, lower cost of capital, better firm performance and more favourable treatment of all stakeholders. But poorly governed firms are expected to be less profitable. Corporate Governance refers to the process, mechanism and structure by which the business affairs of the company are directed, managed and governed directly. Its objective is to enhance long term shareholder value through improving corporate performance and accountability while taking in to account the interest of other stakeholders. The three key constituents of corporate governance are - Shareholders, Board of Directors and Management. The issue of corporate governance came to the fore-front in India only since the adaptation of liberalization, privatization and globalization program by the Central Government in 1991. The first formal attempt to formalize a code for good governance came from the Confederation of Indian Industries (CII) in 1998. Several Indian companies voluntarily initiated in-house reviews of their existing governance practices, particularly their board structure, operational mechanism and information disclosure norms. In May 1999 Securities Exchange Board of India (SEBI) set up the Kumar Mangalam Birla Committee on Corporate Governance. The committee gave its recommendations in February 2000. SEBI incorporated Clause 49, which required all listed companies (paid up capital more than Rs 3 crores or net worth Rs 25 crores at any time in history of the company) to comply by 31st March 2003. Various researches have been conducted to investigate the relationship between corporate governance and firm performance, but the results have been mixed and inconclusive. In this study, we are going to examine the impact of Corporate Governance on the performance of the selected Indian listed companies by constructing Corporate Governance Index (CGI).

## Literature Review

A review of the relevant studies is presented below

Gupta, Nair & Gogula (2003) [22], in their paper "Corporate Governance Reporting by Indian Companies: A Content Analysis Study" for a sample of 30 Indian companies listed in BSE for the year 2003 indicated that the disclosures were still inconclusive and the variation within the companies was also high. They used ordinary least squares regression method, the significant determinants of corporate governance disclosures were size of the company, number of independent directors, and overseas listing status.

Gupta & Parua (2006) [23], in their study "An Enquiry into Compliance of Corporate Governance Codes by the Private Sector Indian Companies" for a sample of 1245 companies for the period 2004-05 observed that more than 70% of the sample companies comply with 80% or more of the codes and in respect of code-wise

compliance rate, the compliance rate was greater than 80% in respect of 17 codes. Almost all the companies had compliance rate which was significant and the grand compliance rate was significant.

Bhuiyan & Biswas (2007) [5], in their study "Corporate Governance and Reporting: An Empirical Study of the Listed Companies in Bangladesh" for a sample of 155 listed Public Limited Companies for the period July 2006 shows that corporate governance disclosure index is significantly influenced by local ownership, the SEC notification, and the size of the company. Belonging to financial or non-financial institution, age, multinational company and size of the board of directors have no significant impact on corporate governance disclosure.

Balasubramanian, Black & Khanna (2010) [3], in their study "The Relation Between Firm-level Corporate Governance and Market Value: A Study of India" for a sample of 506 Indian public companies for the period 2006 indicated that cross-sectional evidence of a positive relationship for an overall governance index and a sub-index covering shareholder rights and also found that the association is stronger for more profitable firms and firms with stronger growth opportunities. They use descriptive statistics, scatter plot, OLS regression model.

Sarkar, Sarkar & Sen (2012), in their study "A Corporate Governance Index for Large Listed Companies in India" for a sample of 500 large listed Indian firms for the period 2003 to 2008 found a rising trend in the level of the Corporate Governance Index of Indian companies and There was a strong association between the Corporate Governance Index and the market performance of companies. The study also indicated that Indian markets tend to reward companies that carry out governance reforms. It provides an impetus to regulators as well as to push for further reforms.

Haldar & Rao (2013) [25], in their study "Corporate Governance Index for Indian Companies" for a sample of 500 large BSE listed firms for the period 2008 to 2011 revealed that an escalating trend in the level of Corporate Governance Index of Indian Companies. The study also confirms that Indian markets values companies that carry out governance reforms proactively and encourages regulators to initiate further reforms.

Rajyalakshmi & Memdani (2014) [35], in their article "Comparative Study of Corporate Governance Disclosure practices adopted by Listed Companies in Manufacturing and Software sectors in India" indicated that software sector being more advanced and modern, they are scoring better in their disclosure scores as well.

Vo & Nguyen (2014) [38], in their study "The Impact of Corporate Governance on Firm Performance: Empirical Study in Vietnam" for a sample of 342 firms listed in Ho Chi Minh City Stock Exchange (HOSE) for the period 2008 to 2012 found that duality role of the CEO is positively correlated with firm performance, whereas, board independence has opposite impact on firm performance and there is a structural change in relation between managerial ownership and firm performance. The study fails to provide an empirical evidence support the statistically significant relationship between board size and firm performance. They measured corporate governance by dual role of the CEO, board's size, board independence and ownership concentration and firm's performance measured by return on asset (ROA), return on equity (ROE), Z-score by Altman (1968) and Tobin's Q.

Haider, Khan & Iqbal (2015) [24], in their study "Impact of Corporate Governance on Firm Financial Performance in Islamic Financial Institution" for a population Islamic banks in Punjab, Pakistan for the period 2008 to 2012 revealed that the positive relationship between corporate governance and financial performance and strong positive relationship in large board size and firm financial performance in developing countries like Pakistani circumstances. They use board size, number of meeting and audit committee size to measure corporate governance level and return on equity, return on asset and earning per share as a measure of financial performance.

Otieno, Mugo, Njeje & Kimathi (2015) [32], in their study "Effect of Corporate Governance on Financial Performance of SACCOS in Kenya" for a sample of 53 sacco of Nakuru District indicated that the relationship between size of the board and financial performance was insignificant at 5% significance level. Management style also affected financial performance of Sacco's. The study conclude that the detrimental effect of large board size is arguably the result of boards becoming less effective at both the advisory and monitoring functions.

Rao & Desta (2016) [37], in their study "Corporate Governance and Financial Performance: A study with reference to Commercial Banks in Ethiopia" for a sample of 19 banks operated in Ethiopia. They construct two regression models one for return on equity and another for return on asset. The study indicated that disclosure practice, board size, board gender diversity and ownership type have no significant impact on the financial performance of Ethiopian commercial banks, whereas asset size and capital structure have significant effect on both on the return on equity and return on asset. Content analysis was applied to determine the level of disclosure. Correlation and regression were used to determine the relation between the corporate governance and financial finance. They used CEO duality, Chairman of Audit Committee, Proportion of Non-Executive Directors, Concentrated Ownership structure, Institutional Investors, Gearing Ratio as corporate governance variables. Return on asset used as a measure of Financial Performance. Multiple regression analysis had been employed to test the relationship between firms' financial performance and corporate governance.

Ararat, Black, Yurtoglu (2017) [2], in their study "The effect of corporate governance on firm value and profitability: Time-series evidence from Turkey" for a sample of Turkish public firms from 2006 to 2012 indicated that TCGI predicts higher market value (with firm fixed effects) and higher firm-level profitability with firm random effects. They build Turkey Corporate Governance Index, (TCGI) composed of sub-indices for board structure, board procedure, disclosure, ownership, and shareholder rights.

Ram (2017) [36], in his study "An empirical study on impact of corporate governance disclosure practices on financial performance of select financial banks" for a sample of 14 companies selected from the financial services sector listed on NSE for the period 2006 to 2015 found that a significant impact of corporate governance disclosure scores on the financial performance measurement variables such as Return on Assets, Return on Capital and Earnings per Share whereas, Return on Equity, Book Price per Share, Market Price per share and Dividend per Share were not significantly influenced by corporate governance disclosure scores. He used descriptive statistics, correlation analysis and OLS regression analysis.

Maheshwari (2018) [30], in her study "Corporate Governance Practices in Indian Corporate It Sector Included in Bse Sensex: A Comparative Study" showed that the Infosys Ltd. scored the highest score i.e.95 in Corporate Governance Index and all the companies are doing excellent corporate governance practices. The study also found that all IT Sector companies included in BSE SENSEX fulfilled almost mandatory requirements in all sub-indices of the SEBI (Listing Obligations and Disclosure Requirements) Regulations 2015.

Panda & Panchali (2019) [34], in his study "Corporate ownership structure and performance: An enquiry into India" showed a positive relationship (in majority cases) between the ownership of promoters and performance. The study also revealed that a negative impact is observed in case of non-promoter non-institutional investors, but the mixed impact has been found in case of non-promoter institutional ownership.

**Research Gap**

Though some studies have been conducted on Corporate Governance but very few studies conducted in India with the effect of corporate governance index on firm performance. Moreover, the results of those study relating to the developed countries are controversial in the context of a developing countries like India.

So, the present study links the gap between the effect of corporate governance index and firm performance of Indian listed companies.

**Objectives of the Study**

The present study examines how firm performance of the Indian listed companies is affected by corporate governance index. The objectives of the studies are as follows:

1. To assess the impact of corporate governance index (CGI) on the financial performance of the selected Indian listed companies.
2. To assess the impact of corporate governance index (CGI) on the firm value of the selected Indian listed companies.

**Hypotheses**

The following hypotheses have been formulated:

**$H0_1$:** There is no significant relation between Corporate Governance Index and financial Performance.

**$HA_1$:** There is significant relation between Corporate Governance Index and financial Performance.

**$H0_2$:** There is no significant relation between Corporate Governance Index and firm value.

**$HA_2$:** There is significant relation between Corporate Governance Index and firm value.

**Database and Methodology**

**Selection of Sample:** 30 Indian Listed Companies are chosen from Indian listed companies, especially from two different leading sectors (Manufacturing and Service). These companies are selected on the basis of their average market capitalization.

**Source of Data:** The study is based on the secondary data. Data was collected from the annual reports of the sample companies as well as data was collected from Capital line database.

**Period of the Study:** The study has been covered a period of ten years starting from the financial year 2010 to 2019.

**Methodology**

The first statistical techniques applied in this study are descriptive statistics, which comprise the analysis of the overall mean, minimum, maximum, standard deviation, coefficient of variance, skewness and kurtosis for each individual variable. For identifying the nature of the trend in each of the selected variable during the period under study linear trend equation was fitted and in order to examine whether the slopes of the trend lines were statistically significant or not "t-test" was used.

**Estimation Techniques**

Panel data regression analysis (The choice amongst the three models Pooled OLS regression model, Fixed effects model and Random effect models three statistical tests like Restricted F Test, Breusch-Pagan Lagrange Multiplier Test, Hausman Test are carried out) The specification tests like, Correlation matrix, Variance Inflation Factor (VIF), Hettest and Imtest test and Robust standard error are applied for unbiased and efficient regression results.

**Construction of Corporate Governance Index**

As SEBI regulations relating to clause 49 of the listing agreement are applicable to the listed companies in India, we have selected some listed companies in manufacturing sectors and service sector. Corporate governance disclosure practices adopted by these companies are to be examined from the CG section of annual reports of the companies. A list of 65 items from the Corporate Governance section of the annual reports was collected and divided them into five dimensions like Board of Directors, Audit Committee, Nomination & Remuneration Committee, Shareholder Rights and Disclosure & Transparency. A dichotomous procedure is followed to score each of the disclosure items comparing with the parameters selected basing on the suggested list of items by SEBI. A score of 1 is awarded to the company if the company has complied requirements and a score of 0 given if it has not complied the requirements in that parameters. All the 65 parameters are given equal weight as they are considered to be equally important.

**Variables Used:** Corporate governance Index was measured by Board of Directors Governance Index, Audit Committee Governance Index, Nomination & Remuneration Committee Governance Index, Shareholder Rights Governance Index and Disclosure & Transparency Governance Index. In this study financial performance was measured by Return on Assets and Return on Assets. Whereas firm value was measured by Tobin's Q and Market value to Book value. These are considered as dependent variables. We will also use Leverage, Liquidity, Growth and Size of the firm as control variables.

**Table 1:** Variables Definitions

| Variable | Description | Measurement |
|---|---|---|
| CGI | Corporate Governance Index | Total Score of individual company*100/ maximum possible score. |
| BDGI | Board of Directors Governance Index | Constructed from eighteen parameters relating to Board of directors. |
| ACGI | Audit Committee Governance Index | Constructed from eleven parameters relating to Audit Committee. |
| NRCGI | Nomination & Remuneration Committee Governance Index | Constructed from eleven parameters relating to Nomination & Remuneration Committee. |
| SRGI | Shareholder Rights Governance Index | Constructed from eight parameters relating to Shareholder Rights. |
| DTGI | Disclosure & Transparency Governance Index | Constructed from seventeen parameters relating to Disclosure & Transparency. |
| LEV | Leverage | It is measured by total debt divided by equity. |
| LIQ | Liquidity | It is measured by Current Ratio. i.e. Current assets divided by current liabilities. |
| GROWTH | Growth of Sales | It is calculated by current year increase in sales divided by previous year sales. |
| SIZE | Firm Size | Size from assets is determined as natural log of total assets at book value at year end |
| ROA | Return on Assets | Earnings before interest and taxes (EBIT) / Total Assets |
| ROE | Return on Equity | Profit after tax (PAT) / New worth |
| TQ | Tobin's Q | *TQ* = (*Market Capitalization* + *Total Assets* – *Equity*)/*Total Assets* |
| M/B | Market value to Book value | Market capitalization / Net book value, where net book value = total assets value minus outside liabilities |

**Model specification**

The model has investigated the effect of corporate governance index on firm performance, after controlling for corporate characteristics, i.e. leverage, liquidity, growth and size. The index consists of five sub-indices: board of directors' governance index, audit committee governance index, nomination & remuneration committee governance index, shareholders' rights governance index and disclosure & transparency governance index. Financial performance is measured by Return on Assets (ROA) and Return on Equity (ROE). Whereas. Tobin's Q (TQ) and Market Value to Book Value (M/B) is used as an indicator for firm's valuation.

$$\text{Firm performance} = \beta_0 + \beta_1 CGI_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + u_{it}$$

**Findings**

**Descriptive Statistics**

This section delivers the descriptive statistics for all observations, including the mean, minimum, maximum, standard deviation, coefficient variation, skewness and kurtosis for each variable. The descriptive statistics for the firm performance such as return on assets (ROA), return on equity (ROE), Tobin's Q (TQ) and market to book value (M/B); corporate governance index (CGI), consist of corporate governance sub-index such as board

of directors' governance index (BDGI), audit committee governance index (ACGI), nomination & remuneration committee governance index (NRCGI), shareholder rights governance index (SRGI) and disclosure & transparency governance index (DTGI); and the firm characteristics included leverage (LEV), liquidity (LIQ), growth (GROWTH) and firm size (SIZE) of listed companies in the India, which are presented in Table 1.

**Table 2:** Descriptive statistics of Dependent, Independent and Control Variables

| Variable | Min | Max | Mean | Std. Dev. | Covariance | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| ROA | 16.11 | 22.51 | 17.80 | 2.05 | 11.54 | 0.0000 | 0.0000 |
| ROE | 10.35 | 30.09 | 21.33 | 4.86 | 22.79 | 0.0000 | 0.0000 |
| TQ | 2.87 | 4.45 | 3.60 | 0.60 | 16.69 | 0.0000 | 0.0000 |
| M/B | 1.69 | 8.35 | 5.71 | 2.19 | 38.32 | 0.0000 | 0.0000 |
| CGI | 73.13 | 95.74 | 84.41 | 9.70 | 11.49 | 0.0098 | 0.0000 |
| BDGI | 63.15 | 92.22 | 77.44 | 12.86 | 16.60 | 0.2396 | 0.0000 |
| ACGI | 91.21 | 99.39 | 95.70 | 2.61 | 2.72 | 0.0000 | 0.0000 |
| NRCGI | 79.70 | 96.06 | 89.06 | 6.21 | 6.97 | 0.0000 | 0.0000 |
| SRGI | 70.42 | 94.17 | 78.88 | 9.33 | 11.83 | 0.4798 | 0.8935 |
| DTGI | 67.65 | 98.04 | 84.06 | 14.17 | 16.85 | 0.0001 | 0.1367 |
| LEV | -0.06 | 0.97 | 0.30 | 0.27 | 90.62 | 0.4790 | 0.0000 |
| LIQ | 2.14 | 2.80 | 2.40 | 0.20 | 8.44 | 0.0000 | 0.0000 |
| GROWTH | 4.28 | 24.59 | 14.70 | 7.51 | 51.11 | 0.0000 | 0.0000 |
| SIZE | 8.96 | 9.98 | 9.47 | 0.32 | 3.38 | 0.0041 | 0.0003 |

As shown in Table1, audit committee governance index represents the highest score compared to other index, with a mean score of 95.70% and followed by nomination & remuneration committee governance index (89.06%), disclosure & transparency governance index (84.06%) and shareholder rights governance index (78.88%). In contrast, the board of directors' governance index represents the lowest score, with a mean of 77.44%. In general, the average CGI is 84.41% (SD = 9.70 & CV=11.49). The highest instability is observed in disclosure & transparency governance index (CV 16.85%) while audit committee governance index with CV 2.61% has been recorded the lowest instability. The statistics disclose that the maximum implementation of index is represented by the audit committee governance, with a score of 99.39%. In contrast, among all of the corporate governance categories, the minimum implementation index is by board of directors' governance and disclosure & transparency governance in corporate governance, with scores of 63.15% and 67.65%. Overall, the maximum average CGI is 95.74%, while the minimum average governance index is 73.13%, indicating significant variation in corporate governance practices among the sample companies. The mean value for ROA is 17.80%, with a minimum of 16.11% and a maximum of 22.51%. The ROE averages around 21.33%, with a minimum value of 10.35% and a maximum value of 30.09%. The mean value for Tobin's Q is 3.60, with a minimum value of 2.87 and a maximum value of 4.45. A Tobin's Q value of more than 1 represents a positive investment opportunity. The M/B averages around 5.71, with a minimum value of 1.69 and a maximum value of 8.35. The highest instability is observed in market to book value (CV 38.32%) while return on assets with CV 11.54% has been recorded the lowest instability. It can be observed that leverage has a mean of 0.3 and the greatest variation, ranging from a minimum of -0.06 to a maximum of 0.97. There appears to be variation between the maximum and minimum values among most of the companies' leverage. The mean liquidity is 2.40, with a minimum of 2.14 and a maximum of 2.8. Growth has a mean of 14.7 and the greatest variation, ranging from a minimum of 4.28 to a maximum of 24.59. The mean firm size is 9.47, with a minimum of 8.96 and a maximum of 9.98. The highest instability is observed in leverage (CV 90.62%), followed by growth (CV 51.11%). While firm size with CV 3.38% has been recorded the lowest instability. The skewness and kurtosis fall within the range of 0±1.0. So, firm performance, leverage, liquidity, growth, firm size, CGI and sub-index data are normally distributed.

**Trend Analysis**

To assess the Corporate Governance disclosures practices followed by selected Indian listed companies over the time, trend growth analysis has been made. which are presented in Table 2.

**Table 3:** Estimated whole periods' growth rate of Variables of the selected listed Indian Companies, 2010 to 2019

| Variable | Adjusted R2 | DW | F | Year (b) | Growth Rate (%) |
|---|---|---|---|---|---|
| ROA | 0.539 | 0.758 | 11.54* | 0.521* | 2.93* |
| ROE | 0.043 | 2.649 | 1.404 | 0.62 | 2.91 |
| TQ | 0.726 | 1.698 | 24.827* | 0.172* | 4.78* |
| M/B | 0.066 | 1.893 | 1.638 | 0.298 | 5.22 |
| CGI | 0.894 | 1.34 | 76.64* | 3.049* | 3.61* |
| BDGI | 0.87 | 1.18 | 61.05* | 3.993* | 5.16* |

| | | | | | |
|---|---|---|---|---|---|
| ACGI | 0.805 | 2.98 | 38.12* | 0.783* | 0.82* |
| NRCGI | 0.899 | 1.693 | 80.84* | 1.956* | 2.20* |
| SRGI | 0.848 | 1.02 | 51.316* | 2.866* | 3.63* |
| DTGI | 0.829 | 1.198 | 44.749* | 4.31* | 5.13* |
| LEV | -0.034 | 2.201 | 0.7 | -0.026 | (-)8.67 |
| LIQ | 0.211 | 2.414 | 3.403*** | (-)0.037** | (-)1.54** |
| GROWTH | -0.124 | 1.036 | 0.006 | 0.068 | 0.46 |
| SIZE | 0.95 | 0.895 | 171.659* | 0.103* | 1.13* |

From the trend analysis of Corporate governance index and it's five sub-indexes, it is found that the growth rate of the CGI and the five sub-indexes such as board of directors' governance index, audit committee governance index, nomination & remuneration committee governance index, shareholder rights governance index and disclosure & transparency governance index show rising trend and the trends are significant. Among the five sub-indexes, the growth rates of board of directors' governance index of selected listed companies are the highest followed by disclosure & transparency governance index, shareholder rights governance index, nomination & remuneration committee governance index and audit committee governance index in this order. It indicates that the implementation of corporate governance principal in Indian listed companies has gradually improved during the study period. In performance analysis, it is found that the growth rate of Return on assets and Tobin's Q shows an increasing trend during the study period. But in case of Return on Equity and Market to Book value during the study period fail to identify any significant upward trend. The current ratio has shown declining trend over the study period. It implies Indian listed companies taking more liquidity risk to maximise their return. The natural logarithm of total assets has an upward trend, indicating the invested in total assets of Indian listed companies is gradually increased over the study period. But the leverage and growth of sales fail to identify any significant downward trend and upward trend respectively during the study period.

**Panel data analysis**

In order to assess the relationship between corporate governance practice (corporate governance index and corporate governance mechanisms) and the performance of listed companies in the India from 2010 to 2019, panel data regressions have been employed. Some econometric issues are needed to be addressed that related to panel data.

**Specification Test**

The study conducts pair-wise correlation matrix and Variance inflation Factor to check the presence of multicollinearity. Correlation matrix of all variables include in the analysis is presented in Table 3, which is calculated based on data of 30 firms with 300 firms' year observations. From the table it is found that the correlation coefficients for all the independent variables are less than 0.5. So, we can say that the independent variables of the model do not exhibit severe multicollinearity.From Table 3, it is found that in all cases, all the VIFs are less than 3. Hence, collinearity does not seem to be a problem in the regression model.

**Table 4:** Pair-wise Correlation Matrix and Variance Inflation Factor

| | **CGI** | **LEV** | **LIQ** | **GROWTH** | **SIZE** | **VIF** |
|---|---|---|---|---|---|---|
| CGI | 1 | | | | | 1.07 |
| LEV | -0.0648 | 1 | | | | 1.03 |
| LIQ | -0.038 | -0.0001 | 1 | | | 1.08 |
| GROWTH | -0.0584 | 0.0058 | -0.0152 | 1 | | 1.02 |
| SIZE | 0.2397* | 0.1242** | -0.2631* | -0.1308** | 1 | 1.19 |
| Note: * 1% Significance level; ** 5% Significance level; *** 10% Significance level; | | | | | | |

**Heteroskedasticity Test**

The results of Hettest and Imtest test shown below Table indicate that the model is suffering from heteroskedasticity. Hence, to control the adverse effect of heteroscedasticity problem the study is used robust standard errors while computing the individual coefficients through the regression models to make results best linear unbiased estimator.

**Table 5:** Test of Heteroskedasticity

| **Test** | **Regression Model** | **Results** |
|---|---|---|
| Breusch-Pagan / Cook- Weisberg test | Model 1 (Dependent variable: ROA) | Chi2 (1)= 14.38* |
| | Model 1 (Dependent variable: ROE) | Chi2 (1)= 0.64 |
| | Model 1 (Dependent variable: TQ) | Chi2 (1)= 2.89 |
| | Model 1 (Dependent variable: M/B) | Chi2 (1)= 38.62* |
| White's Information Matrix test | Model 1 (Dependent variable: ROA) | Chi2 (20)= 74.70* |
| | Model 1 (Dependent variable: ROE) | Chi2 (20)= 60.32* |

| | | |
|---|---|---|
| | Model 1 (Dependent variable: TQ) | Chi2 (20)= 32.39** |
| | Model 1 (Dependent variable: M/B) | Chi2 (20)= 75.41* |

**Regression Analysis**

This section uses a multiple regression analysis of the model. The model has been tested, in which the independent variables are corporate governance index and firm performance **[**Return on assets (ROA), Return on equity (ROE), Tobin's Q (TQ) and Market to book value (M/B), after controlling for corporate characteristics, i.e. leverage (LEV), liquidity (LIQ), growth (GROWTH) and firm size (SIZE).

Firm performance = $\beta_0 + \beta_1 CGI_{it} + \beta_2 LEV_{it} + \beta_3 LIQ_{it} + \beta_4 GROWTH_{it} + \beta_5 SIZE_{it} + u_{it}$

**Table 6:** Regression result of Pooled OLS Model of Selected Indian Listed Companies for the period 2010 to 2019

| **Model** | **ROA (Model 1)** | | **ROE (Model 2)** | | **TQ (Model 3)** | | **M/B (Model 4)** | |
|---|---|---|---|---|---|---|---|---|
| Variable | Coefficient | t-Stat | Coefficient | t-Stat | Coefficient | t-Stat | Coefficient | t-Stat |
| Intercept | -2.5063 | -0.42 | 16.8224 | 1.04 | 2.2474 | 1.34 | 5.859 | 1.16 |
| CGI | 0.2832 | 4.73* | 0.2299 | 1.41 | 0.102 | 6.05* | 0.3005 | 5.93* |
| LEV | -0.7293 | -1.85*** | -11.476 | -10.72* | -0.1321 | -1.19 | 4.9065 | 14.71* |
| LIQ | 1.0867 | 2.93* | -1.2813 | -1.27 | -0.2673 | -2.56* | -1.2193 | -3.88* |
| GROWTH | 0.1922 | 7.17* | 0.069 | 0.95 | -0.0006 | -0.08 | -0.0342 | -1.51 |
| SIZE | -0.93 | -2.16** | -0.9883 | -0.85 | -0.6934 | -5.72* | -2.4887 | -6.84* |
| F-Statistic | 18.75* | | 25.44* | | 12.63* | | 51.30* | |
| $R^2$ | 0.2418 | | 0.302 | | 0.1768 | | 0.4659 | |
| Adj. $R^2$ | 0.2289 | | 0.2902 | | 0.1628 | | 0.4568 | |
| No. of Obs. | 300 | | 300 | | 300 | | 300 | |

**Note:** * 1% Significance level; ** 5% Significance level; *** 10% Significance level;

**Table 7:** Regression result of Fixed Effect Model of Selected Indian Listed Companies for the period 2010 to 2019

| **Model** | **ROA (Model 1)** | | **ROE (Model 2)** | | **TQ (Model 3)** | | **M/B (Model 4)** | |
|---|---|---|---|---|---|---|---|---|
| Variable | Coefficient | t-Stat | Coefficient | t-Stat | Coefficient | t-Stat | Coefficient | t-Stat |
| Intercept | 40.0776 | 3.69* | 178.8278 | 4.15* | 10.232 | 3.86* | 51.8263 | 5.64* |
| CGI | 0.3375 | 6.21* | 0.8206 | 3.80* | 0.1085 | 8.18* | 0.3906 | 8.50* |
| LEV | -0.27 | -1.06 | -12.1907 | -12.05* | 0.0102 | 0.16 | 5.9144 | 27.45* |
| LIQ | 0.5384 | 1.48 | 0.6783 | 0.47 | -0.0612 | -0.69 | -0.1226 | -0.4 |
| GROWTH | 0.2098 | 12.21* | 0.1158 | 1.70*** | 0.0097 | 2.32** | 0.0063 | 0.44 |
| SIZE | -5.8117 | -4.01* | -23.8946 | -4.15* | -1.6669 | -4.71* | -8.5153 | -6.94* |
| F-Statistic | 34.93* | | 33.83* | | 15.09* | | 162.47* | |
| $R^2$-Within | 0.3972 | | 0.3896 | | 0.2217 | | 0.754 | |
| $R^2$-Between | 0.0852 | | 0.0431 | | 0.1081 | | 0.0321 | |
| $R^2$-Overall | 0.1461 | | 0.107 | | 0.1173 | | 0.272 | |
| No. of Obs. | 300 | | 300 | | 300 | | 300 | |

***Note:** * 1% Significance level; ** 5% Significance level; *** 10% Significance level;*

**Table 8:** Regression result of Random Effect Model of Selected Indian Listed Companies for the period 2010 to 2019

| **Model** | **ROA (Model 1)** | | **ROE (Model 2)** | | **TQ (Model 3)** | | **M/B (Model 4)** | |
|---|---|---|---|---|---|---|---|---|
| Variable | Coefficient | z-Stat | Coefficient | z-Stat | Coefficient | z-Stat | Coefficient | z-Stat |
| Intercept | 18.0805 | 2.44** | 27.7205 | 1.43 | 6.1527 | 3.10* | 18.9936 | 3.22* |
| CGI | 0.2624 | 5.81* | 0.2556 | 1.59 | 0.0941 | 8.26* | 0.2743 | 7.11* |
| LEV | -0.2983 | -1.17 | -11.9897 | -11.84* | 0.004 | 0.06 | 5.8221 | 25.74* |
| LIQ | 0.4433 | 1.28 | -0.9182 | -0.76 | -0.1095 | -1.28 | -0.542 | -1.80*** |
| GROWTH | 0.2029 | 11.87* | 0.069 | 1.02 | 0.0081 | 1.95** | -0.0067 | -0.44 |
| SIZE | -2.7851 | -3.14* | -2.443 | -1.3 | -1.0928 | -4.52* | -3.8847 | -5.69* |
| Wald $c^2$ | 168.52* | | 150.00* | | 74.32* | | 702.40* | |
| $R^2$-Within | 0.3875 | | 0.3572 | | 0.2142 | | 0.7404 | |
| $R^2$-Between | 0.1013 | | 0.1196 | | 0.1239 | | 0.0128 | |
| $R^2$-Overall | 0.2017 | | 0.2976 | | 0.1396 | | 0.4289 | |
| No. of Obs. | 300 | | 300 | | 300 | | 300 | |

***Note:** * 1% Significance level; ** 5% Significance level; *** 10% Significance level;*

Table 5 to 7 shows the regression results of the relationship between corporate governance index and firm performance of selected listed Companies in India for Pooled OLS model, Fixed effect model (FEM) and Random effect model (REM). The F statistics of the pooled regression model and fixed effect model are statistically significant and also the Wald-statistic of the random-effect model is statistically significant. Therefore, they are well fitted. In order to select the appropriate model (Pooled OLS regression model, fixed effects model and Random effect model) the Restricted F Test, Breusch-Pagan Lagrange Multiplier Test and Hausman Test are carried out.

**Table 9:** Result of Tests for Selection of Appropriate model of Selected Indian Listed Companies for the period 2010 to 2019

| Purpose | Null Hypothesis | Test | Test Statistic | | | |
|---|---|---|---|---|---|---|
| | | | For Return on Assets (ROA) | For Return on Equity (ROE) | For Tobin's Q (TQ) | For Market to Book Value (M/B) |
| Selection between Pooled Regression Model and Fixed Effects Model | All $u_i = 0$ | Restricted F Test | $F_{(29,265)}=18.67^{*}$ | $F_{(29,265)}=3.85^{*}$ | $F_{(29,265)}=27.93^{*}$ | $F_{(29,265)}=18.69^{*}$ |
| Selection between Pooled Regression Model and Random Effects Model | Var (u) = 0 | Breusch-Pagan Lagrange Multiplier Test | $\chi^2_{(1)}=491.69^{*}$ | $\chi^2_{(1)}=38.27^{*}$ | $\chi^2_{(1)}=661.78^{*}$ | $\chi^2_{(1)}=406.96^{*}$ |
| Selection between Fixed Effects Model and Random Effects Model | Difference in coefficients is not systematic | Hausman Test | $\chi^2_{(5)}=3.80$ | $\chi^2_{(5)}=13.40^{**}$ | $\chi^2_{(5)}=1.10$ | $\chi^2_{(5)}=1.03$ |

**Note:** 1% Significance level; ** 5% Signifivance level;

From Table 8, it is found that test statistics in Restricted F Test, Breusch-Pagan Lagrange Multiplier Test are statistically significant, whereas Hausman Test is not statistically significant. Hence the regression results of the REM are used for statistical inference and further analysis of the individual coefficients. Finally, we have made the robust estimation of the coefficients of the regression models under study. These models take care of the heteroskedasticity in the observation and the estimates are unbiased and efficient. The regression results are presented below:

**Table 10:** Summarized Regression results of Selected Indian Listed Companies for the period 2010 to 2019

| Variable | ROA Model | | ROE Model | | TQ Model | | M/B Model | |
|---|---|---|---|---|---|---|---|---|
| | Coefficient | z Stat | Coefficient | t Stat | Coefficient | z Stat | Coefficient | z Stat |
| CGI | 0.2624 | $3.26^{*}$ | 0.8206 | 1.18 | 0.0941 | $2.79^{*}$ | 0.2743 | $3.37^{*}$ |
| LEV | -0.2983 | -1.53 | -12.1907 | $-111.77^{*}$ | 0.004 | 0.26 | -5.8221 | $-42.57^{*}$ |
| LIQ | 0.4433 | 1.15 | 0.6783 | 0.62 | -0.1095 | -1.00 | -0.542 | $-1.87^{***}$ |
| GROWTH | 0.2029 | $3.34^{*}$ | 0.1158 | 1.18 | 0.081 | $3.13^{*}$ | -0.0067 | -0.23 |
| SIZE | -2.7851 | $-1.86^{***}$ | -23.8946 | -1.31 | -1.0928 | $-2.45^{**}$ | -3.8847 | $-2.37^{**}$ |
| Intercept | 18.0805 | 1.53 | 178.8278 | 1.57 | 6.1527 | $2.25^{**}$ | 18.9936 | $1.72^{***}$ |
| | Wald $c^2$ | $33.93^{*}$ | F-Statistic | $6861.55^{*}$ | Wald $c^2$ | $42.75^{*}$ | Wald $c^2$ | $13641.22^{*}$ |
| | $R^2$ | 0.2017 | $R^2$ | 0.107 | $R^2$ | 0.14 | $R^2$ | 0.4289 |

***Note:** * 1% Significance level; ** 5% Significance level; *** 10% Significance level;*

The empirical results of the Model are presented in Table 9. Since Wald $\chi^2$ test is significant at 1% probability level, therefore Model is well fitted. R-squared values range from 0.1396 to 0.4289, indicating that the models are capable of explaining variability ranging from 13.96% to 42.89% in the performance of the listed companies. The results show that the CGI is positively significantly correlated with ROA, TQ and M/B at 1% probability level but an insignificant association with ROE. Leverage has a significant negative relationship with ROA and M/B. The results indicate that the higher the debt will decrease in firm performance. It increases the cost of operations and pay higher interest rates. Liquidity is negatively significant with M/B. The results indicate that the higher level of liquidity will decrease the firm performance. Because it increases the opportunity cost of the company, which lost the possibility to invest these amounts to get generate return. So, the Indian listed companies need to maintain a trade-off between profitability and liquidity. Growth is positively significantly related with ROA and TQ. It confirms that sales volume will increase the performance. Firm size has a

significant and negative association with ROA, TQ and M/B. Because large investment in total assets increases the agency costs due to the need for more control, which will decrease in firm performance.

**Conclusion**

The present study is an attempt to investigated the effect of corporate governance on firm performance by constructing Corporate Governance Index (CGI) of some selected listed Companies in India for a period of 10 years from 2010 to 2019. Corporate governance Index was measured by Board of Directors Governance Index, Audit Committee Governance Index, Nomination & Remuneration Committee Governance Index, Shareholder Rights Governance Index and Disclosure & Transparency Governance Index. In this study financial performance was measured by Return on Assets and Return on Assets. Whereas firm value was measured by Tobin's Q and Market value to Book value. These are considered as dependent variables. We will also use Leverage, Liquidity, Growth and Size of the firm as corporate characteristics. The corporate governance in Indian listed companies are satisfactory and has gradually improved during the study period. The audit committee governance index represents the highest score compared to other index and followed by nomination & remuneration committee governance index, disclosure & transparency governance index and shareholder rights governance index. The study also found a positive relationship between firm performance and corporate governance index. This result supports the stakeholder theory in the India. The corporate governance code in the India is established based on principles of corporate governance, which require good corporate governance practice providing to the interests of all stakeholders. The Indian listed companies also need to maintain a trade-off between profitability and liquidity and large investment in total assets increases the agency costs due to the need for more control, which will decrease in firm performance.

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