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# Board diversity and firm's financial performance: A study on DSE listed pharmaceutical companies in Bangladesh.

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***Abstract:*** *Thestudy examines the impact of board diversity on the firms' financial performance of Dhaka Stock Exchange listed pharmaceutical companies in Bangladesh. Based on existing experimental studies, five major board characteristics (board size, gender diversity, board composition, CEO duality, and qualification of independent director) have been selected to identify their impact on firm's financial performance (ROE, ROA, and NAVPS). The study is mainly based on secondary data which collected from Annual reports of the seven sample companies during 2012 to 2017. To identify the impact or relationship of various variables, different statistical tools such as regression, correlation and variance analysishave been applied. The results show that pharmaceutical companies' financial performance can be driven by corporate board diversity but not every mechanism has significant impact on firms' financial performance. The predictors board size, board composition and CEO duality have positive impacton the other hand gender diversity has negative impacton ROE and ROA but all predictors except dummy have positive impacton NAVPS. The paper suggests that to increase the shareholder's value, companies should focus on board diversity mechanisms and also suggest that the board of directors should include trained and mature female directors.*

***Keywords:*** *Board diversity, corporate governance, financial performance, pharmaceutical industry*

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## I. Prelude

The corporate governance has attracted worldwide attention with a series of collapse of high profile companies like Medici Bank (1494), Enron (2001), WorldCom (2001), HIH insurance (2001), Nortel (2009), Dynegy (2012), Dick Smith (2016) etc. These corporate failures have withered the trust of investors worldwide. Some of the scandals which made headlines all around the world were somewhere related to poor corporate governance. Corporate Governance is a system by which corporate entities are directed and controlled including board practices and composition and their relationship to firm performance (Cadbury, 1992). Corporate Governance (CG) involves a set of relationship between company's management, its board, its shareholders and other stakeholders (OECD, 2004). The board of directors is considered as resources because they have skills, experience, knowledge and judgment that are much important to meet the needs of the firm. Board diversity is asignificant corporate governance issue faced today.The board of directors (BoD) is one of the internal governance mechanisms intended to ensure that the interests of the shareholders and management are closely aligned. Diversity is one of the current problems faced by the firms and is related to the age, qualification, size, gender and independence of directors. Diversity of boards may have impact on the firm performance.Financial performance in refers to the degree to which financial objectives being or has been accomplished and is an important aspect of finance risk management,it is also used to measure firm's overall financial health over a given period of time (Kalathinkal& Ahmed, 2014).After apparels, the pharmaceuticals industry has been one of the most successful stories of Bangladesh in the last three decades. The pharmaceutical sector is highly developed in Bangladesh and contributes significantly to the country's economy. After the promulgation of Drug Control Ordinance-1982, the development of the sector was accelerated.The local pharmaceutical manufacturers cater to 97 % of the country's demand and are expanding their business in the global market (Rahman, 2012).This study hasenormous significance to pharmaceutical regulators, investors, academics practitioners, corporate stakeholders and the public at large. The study examines the effects of board diversity on the firm financial performance of pharmaceutical companies of Bangladesh.

## II. Statement Of The Problem And Justification

A good number of corporate entities failed during last two decades and these failures were due to lack of good governance, high executive compensation, poor accountability, earnings management, assets revaluation and use of creative accounting etc. Thus, the majority of these corporate failures have been attributed to an absence or dereliction of efficient disclosure and corporate governance. Corporate governance research has been influenced mainly by agency theory. Agency theory attributes a significant role to the board

of directors. As the board of directors playing an important strategic role in letting the growth path of the firm in a competitive setup, investigating board characteristics and diversity due to their potential significance in influencing firm performance and return is very important. This empirical study is about examining the relationships between the board diversity among various pharmaceutical companies listed in DSE and the financial performance of the companies during the study period of 2012-2017. The study has special significance in performance measurement of pharmaceutical companies in relation to their individual board compositions. The findings of the study can guide to answer questions like whether the board composition affects the pharmaceutical firms' performance or not.

## III. Prior Research And Research Gap

In order to investigate and reveal previous discovered empirical evidence in the relation between board diversity and firm financial performance, prior research has to be analyzed.A large list of articles found to be useful for this research.

Giannetti and Zhao (2016) tested whether diversity leads to higher performance volatility or not and showed that firms with diverse boards have less persistent strategies and analysts make larger forecast errors in predicting their performance supporting the conjecture that board members' diverse preferences lead too hard to predict decisions and also stated that executive and director turnovers are higher in firms with diverse boards.

Jindal and Jaiswall (2015) examine the various facets of diversity among the board of directors for a cross-sectional sample of listed firms in India and their association with the accounting and stock-based measures of firm performance as proxied by return on assets (ROA) and Tobin's Q respectively.The study found the board diversity has significant impact on financial performance in the Indian context.

Rashid and Sajjad (2015) investigated and suggested based on result that a higher proportion of female and young board of directors leads to lower firm value. On the other hand, higher representation of foreign directors improves the firm value. Therefore, to take advantage of this finding, the board of directors should include trained and mature female, foreign and qualified young directors.

Darmadi (2011) examined the associations between diversity of board members and financial performance of the firms listed on the Indonesia Stock Exchange (IDX). Three demographic characteristics of board members—gender, nationality, and age—are used as the proxies for diversity. The study reavled that both accounting and market performance have significant negative associations with gender diversity, nationality diversity have no influence on firm performance and the proportion of young members is positively related to market performance.

Dalton and Dalton (2008) stated that the existence of a new legislative after the crisis such as Sarbanes Oxley Act (SOX) 2002 has provided guidelines on board composition, board audit committees, board independence and other corporate governance practices but neither one of that mentions the gender composition or diversity of BoDs.

Marimuthu and Kolandaisamy (2009) conducted a study and found that there are various characteristics of boards. Demographic is one of the characteristics of the boards. Demographic characteristics include age, tenure, gender, specialization which is related to many cognitive bases, values and perceptions that influence the decision making of BoDs.

Carter, Simkins and Simpson (2003) examined the relationship between board diversity and firm value for Fortune 1000 firms. Board diversity is defined as the percentage of women, African Americans, Asians, and Hispanics on the board of directors. The study found significant positive relationships between the fraction of women or minorities on the board and firm value.

Bhagat and Black (2002), in studying the effect of independent directors on firm performance and found that low-profit firms are more likely to increase the percentage of independent directors on their boards. Vafeas (1999) recently investigated how the frequency of board meetings affects board composition and performance. Using data from 1990 to 1994 for 307 firms, this author found that board activity is increasing with board size, number of positions in other boards held by outside directors (proxy for human capital), and number of committees.

Yermack (1996) found that board size was negatively related to firm value. The study showed that smaller boards are more likely to dismiss the CEO following periods of poor performance and to key CEO compensation to firm performance. Eisenberg et al. (1998) similarly found significant negative correlation between board size and profitability.

It is evident from the review of prior literature that the relationship between board diversity and firm financial performance has been addressed in the developed world even in some developing nations like India and Malaysia but not in Bangladesh. There is dearth of literature on the above issues using Bangladesh setting. Here is the research gap and to fulfill this research gap the present study has been undertaken.

## IV. Research Objectives

The main objective of the study is to examine the effect of board diversity on thefinancial performance of pharmaceutical companies in Bangladesh. To achieve the main objective the specific objectives are-

i. to examine the relationship between board size and firm financial performance;
ii. to examine the relationship between board composition and firm financial performance;
iii. to examine the relationship between gender diversity in board and firm financial performance;
iv. to examine the relationship between CEO duality and firm financial performance;
v. to examine the relationship between independent director qualification and firm financial performance;

## V. Methodology of the research

This research study isempirical in nature, based on both quantitative and qualitative data.The data for the study is collected from secondary sources such as annual report, office files, published articles and journals etc. Entire population for this study is comprisedall pharmaceutical companies listed on the DSE in the last five years (2012–2017). The sample is taken more than 40 percent of the pharmaceutical companies such as The ACME Laboratories, ACI Ltd., Beximco Pharmaceuticals Ltd., The IBN Sina Pharmaceuticals Industry Ltd., Orion Pharma Ltd., Square Pharmaceuticals Ltd. and RenataLtd. The independent variable used in this research is board characteristics namely board size, board composition, gender diversity, CEO duality and qualification of independent director whereas the dependent variable is firm performance. Firm performance can be measured in various ways namely Return on Asset (ROA), Return on Equity (ROE) and Net asset value Per Share (NAVPS).

The independent and dependent variables are measured as following:

| **Variables (Dependent)** | **Acronym** | **Operationalization** |
|---|---|---|
| **Return on Asset (%)** | ROA | Net income divided by total asset of the company. |
| **Return on Equity (%)** | ROE | Net income divided by shareholders equity of the company. |
| **Net Asset Value Per Share** | NAVPS | Net asset value divided by number of outstanding share |
| **Board Size (number)** | BOARDSIZE | Total number of directors serving on the board of directors. |
| **Gender Diversity (%)** | GENDIV | The number of women members on the board relative to total number of board of directors. |
| **Board Composition (%)** | BOARDCOM | The number of independent directors on the board relative to total number of board of directors. |
| **CEO Duality** | DUALITY | Dummy variable equal to "1" if a person holds two positions in the board and "0" otherwise. |
| **Qualification of Independent Director** | QUALIFICATION | Dummy variable equal to "1" if the company compiles all the requirements regarding the qualification of independent directors and "0" otherwise. |

The relationship between the board diversity and firm financial performance is tested applying multiple regression models and hypothesis is tested applying ANOVA techniques. All data is analyzed by the help of Statistical Package for Social Sciences (SPSS) software 20.

**Model specification**

The Econometric model employed in this study for multiple linear regression models is given as:

**Model-1:** $ROE = \beta0 + \beta1\ (BOARDSIZE) + \beta2\ (GENDIV) + \beta3\ (BOARDCOM) + \beta4\ (DUALITY) + \beta5\ (QUALIFICATION) + \varepsilon$

**Model-2:** $ROA = \beta0 + \beta1\ (BOARDSIZE) + \beta2\ (GENDIV) + \beta3\ (BOARDCOM) + \beta4\ (DUALITY) + \beta5\ (QUALIFICATION) + \varepsilon$

**Model-3:** NAVPS = β0 + β1 (BOARDSIZE) + β2 (GENDIV) + β3 (BOARDCOM) + β4 (DUALITY) + β5 (QUALIFICATION) + ε

Where β0 is the constant term, β is the coefficient of the independent variables of the study and ε the normal error term.

## VI. Data analysis and results

### 6.1 Multiple linear tregression analysis

Multiple linear regression analysis is a technique for modeling the linear relationship between two or more variables. Here the researcher has used the SPSS software to apply multiple regression analysis to determine the relationship of dependent variables (return on equity, return on asset and net asset value) with independent variables (board size, gender diversity, board composition and CEOduality). The dummy variable qualification of independent directors has been removed from the regression model as it gives constants or has missing correlations.

**Table-01: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .618[a] | .383 | .300 | 5.90855 |
| a. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY | | | | |
| | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 2 | .250[a] | .062 | -.063 | 5.75770 |
| a. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY | | | | |
| | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 3 | .669[a] | .448 | .375 | 56.86955 |
| a. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY | | | | |

This is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable is associated with the dependent variable. Above table indicates the value of R Square is the proportion of variance about 38.3%, 6.2% and 44.8% in the dependent variable (ROE, ROA and NAVPS) which can be explained by the independent variables (BOARDIN, DUALITY, BOARDSIZE and BOARDW) respectively.

### 6.2Beta coefficient

After the evaluation of the R square, it is important to evaluate the regression beta coefficients. The beta coefficient is the degree of change in the outcome variable for every 1-unit of change in the predictor variable.

**Table-2: Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -22.305 | 10.689 | | -2.087 | .046 | | |
| | BOARDSIZE | 2.892 | .921 | .632 | 3.139 | .004 | .508 | 1.969 |
| | GENDIV | -.062 | .087 | -.148 | -.713 | .482 | .478 | 2.090 |
| | BOARDCOM | .404 | .169 | .397 | 2.394 | .023 | .746 | 1.340 |
| | DUALITY | 6.684 | 2.584 | .420 | 2.587 | .015 | .782 | 1.279 |

a. Dependent Variable: ROE

The unstandardized coefficient gives to estimate for b values and tells about the relationship between ROE and each preditor either positive or negative. The predictor board size, board composition and CEO duality have positive values indicating positive relationship and gender diversity has negative value indicating negative relationship with ROE.The table shows the p-value is smaller than 0.05, so b coefficients are statistically significant.The smaller value of Sig. and the larger the value of t indicates the greater the contribution of thepreditor. From the magnitude of the t-statistics, the study shows that the board size had slightly more positive than board composition and CEOduality; gender diversity had very little negative impact on ROE.

It is seen that the VIF value for each independent value is small is less than 10 and that indicates estimated result of econometric model for ROE with respect to independent variables is free from multicollinearity and data also reliable.

**Table-3: Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 2 | (Constant) | 3.810 | 10.689 | | -2.087 | .046 | | |
| | BOARDSIZE | .143 | .921 | .632 | 3.139 | .004 | .508 | 1.969 |
| | GENDIV | -.062 | .087 | -.148 | -.713 | .482 | .478 | 2.090 |
| | BOARDCOM | .219 | .169 | .397 | 2.394 | .023 | .746 | 1.340 |
| | DUALITY | .428 | 2.584 | .420 | 2.587 | .015 | .782 | 1.279 |

a. Dependent Variable: ROA

The above table, the unstandardized coefficient gives to estimate for b values and tells about the relationship between ROA and each preditor either positive or negative. The predictor board size, board composition and CEO duality have positive values indicating positive relationship and gender diversity has negative value indicating negative relationship with ROA.

The table shows the p-value is smaller than 0.05, so b coefficients are statistically significant. The smaller value of Sig. and the larger the value of t indicates the greater the contribution of the preditor. From the magnitude of the t-statistics, the study shows that the board size had slightly more positive than board composition and CEO duality; gender diversity had very little negative impact on ROA.

It is seen that the VIF value for each independent value is small is less than 10; it indicates estimated result of econometric model for ROA with respect to independent variables is free from multicollinearityi.e. data is reliable.

**Table-4: Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 3 | (Constant) | -372.471 | 102.884 | | -3.620 | .001 | | |
| | BOARDSIZE | 39.167 | 8.869 | .841 | 4.416 | .000 | .508 | 1.969 |
| | GENDIV | 3.117 | .838 | .729 | 3.717 | .001 | .478 | 2.090 |
| | BOARDCOM | 1.943 | 1.625 | .188 | 1.196 | .241 | .746 | 1.340 |
| | DUALITY | 21.278 | 24.869 | .131 | .856 | .399 | .782 | 1.279 |

a. Dependent Variable: NAVPS

The above table, unstandardized coefficient gives to estimate for b values and these values indicates the individual contribution of each predictor to the model. The b values tell about the relationship between ROA and each preditor either positive or negative. The predictor board size, Gender diversity board composition and CEO duality have positive values indicating positive with NAVPS. The table shows the p-value is smaller than 0.05, so b coefficients are statistically significant. The smaller value of Sig. and the larger the value of t indicates the greater the contribution of the preditor. From the magnitude of the t-statistics, the study shows that the board size and CEO duality had slightly more positive impact than board composition and gender diversity on NAVPS. To test the presence of multicollinearity the researcher has tested the VIF value for the independent variables. It is seen that the VIF value for each independent value is small is less than 10 and that indicates estimated result of econometric model for NAVPS with respect to independent variables is free from multicollinearity.

### 6.3Hypothesis Test

**Hypothesis: $H_0$1**: Board diversity (Independent varaiables) does not affect firm financial performance (ROE)

**Table-5: ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 648.852 | 4 | 162.213 | 4.646 | .005[b] |
| | Residual | 1047.329 | 30 | 34.911 | | |
| | Total | 1696.181 | 34 | | | |

a. Dependent Variable: ROE

b. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY

The F-test has the null hypothesis that there is no linear relationship between the variables (in other words $R^2=0$). Here, $p < 0.005$, which is less than 0.05, and indicates that, overall, the regression model (independent variables) statistically significantly predicts the dependent variable. Therefore null hypothesis is rejected. So there is a linear relationship between board diversity and firm financial performance (ROE).

**Hypothesis: $H_0$2**: Board diversity (Independentvaraiables) does not affect firm financial performance (ROA)

**Table-6: ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 2 | Regression | 66.163 | 4 | 16.541 | .499 | .737[b] |
| | Residual | 994.532 | 30 | 33.151 | | |
| | Total | 1060.695 | 34 | | | |

a. Dependent Variable: ROA

b. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY

The F-test has the null hypothesis that there is no linear relationship between the variables (in other words $R^2=0$). Here, $p < 0.737$, which is greater than 0.05, and indicates that, overall, the regression model (independent variables) not statistically significantly predicts the dependent variable. Therefore null hypothesis is accepted. So there is a little linear relationship between board diversity and firm financial performance (ROA).

**Hypothesis:** **$H_0$3**: Board diversity (Independent varaiables) does not affect firm financial performance (NAVPS)

**Table-07: ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 3 | Regression | 78799.296 | 4 | 19699.824 | 6.091 | .001[b] |
| | Residual | 97024.357 | 30 | 3234.145 | | |
| | Total | 175823.653 | 34 | | | |

a. Dependent Variable: NAVPS

b. Predictors: (Constant), BOARDSIZE, GENDIV, BOARDCOM, DUALITY

The F-test has the null hypothesis that there is no linear relationship between the variables (in other words $R^2=0$). Here, $p < 0.001$, which is less than 0.05, and indicates that, overall, the regression model (independent variables) statistically significantly predicts the dependent variable. Therefore null hypothesis is rejected. So there is a linear relationship between board diversity and firm financial performance (NAVPS).

### 6.4 Correlation Statistic

Correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship**.** The researcher has used the SPSS software to analyze the Pearson Correlation among the independent variables.

**Table-8: Correlations[c]**

| | | BOARDSIZE | GENDIV | BOARDCOM | DUALITY |
|---|---|---|---|---|---|
| BOARDSIZE | Pearson Correlation | 1 | -.675** | -.414* | -.376* |
| | Sig. (2-tailed) | | .000 | .014 | .026 |
| GENDIV | Pearson Correlation | -.675** | 1 | .440** | .401* |
| | Sig. (2-tailed) | .000 | | .008 | .017 |
| BOARDCOM | Pearson Correlation | -.414* | .440** | 1 | .029 |
| | Sig. (2-tailed) | .014 | .008 | | .870 |
| DUALITY | Pearson Correlation | -.376* | .401* | .029 | 1 |
| | Sig. (2-tailed) | .026 | .017 | .870 | |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=35

The table depicts the results from correlation analysis of the independent variables. The variable independent director qualification is removed as it is a constant variable. The relationship among the variables is mention bellow table:

| Relationship | Findings |
|---|---|
| Between Board size and Gender diversity | Negative and significant |
| Between Board size and Board composition | Negative and moderate |
| Between Board size and CEO Duality | Negative and moderate |
| Between Gender diversity and Board composition | Positive and moderate |
| Between Gender diversity and CEO Duality | Positive and moderate |
| Between Board composition and CEO Duality | Positive and significant |

## VII. Findings of the reasearch

Findings are the principle outcome of a research. Generally, it refers to the totality of outcomes, rather than the conclusions or recommendations drawn from them. At a glance the major findings of this study are given below:

i. Pharmaceutical companies' financial performance can be significantly driven by corporate board diversity mechanisms.

ii. Board diversity has positive impact 38.3% on ROE and 44.8% on NAVPS i.e. significant but ROA is explained by only 6.2% i.e. insignificant.
iii. The predictor or independent variables board size, board composition and CEO duality have positive relationship and gender diversity has negative relationship with ROE and ROA but all independent variables without dummy variable have positive relationship with NAVPS.
iv. The VIF value for the independent variables is less than 10 and that indicates estimated result of econometric model for ROE, ROA and NAVPS with respect to independent variables is free from multicollinearity.
v. Board size and gender diversity have significantly negative relationship to each other, alsoboard size has negative and moderate relationshipon board composition and CEO duality.
vi. Gender diversity has positive and moderate relationship on board composition and CEO duality.
vii. Board composition and CEO duality have positive and significant relationship to each other.

## VIII. Recommendations

i. To increase the shareholder's value, companies should focus on board diversity mechanisms as it has influence on firms' financial performance significantly.
ii. Board size has significant impact on firm financial performance so pharmaceutical companies should especially consider about board size.
iii. The results suggest that a higher proportion of female board of directors leads to lower firm financial performance. So, the board of directors should include trained and mature female directors.
iv. Minimum and qualified number of independent directors should have in board prescribed by Bangladesh Securities and Exchange Commission (BSEC)guidelinesand if possible the qualified independent director be appointed from foreign environment.
**v.** One director holding two positions is called CEO duality. So the companiesshouldnot appoint the CEO from the director.

## IX. Conclusion

This study examined the relationship between board diversity, in terms of board size, gender diversity, independent director, CEO duality and qualification of independent directors and the firm financial performance measured by return on assets, return on equity and net asset value. The relationship is tested with data from 2012 to 2017 of seven DSE listed pharmaceutical companies. The research found that pharmaceutical companies' financial performance (dependent variables) is significantly or insignificantly influenced by corporate board diversity (independent variables).So, diversified board is an important tool for companies to increase the shareholders' value as the research result is consistent with prior research.

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