The moderating effect of sustainability reporting on the relationship between board characteristics and firm financial performance

Shyamanthi, O.N.K.
University of Sri Jayewardenepura, Sri Lanka
nathasha.ks@gmail.com

Abstract

Purpose: This study primarily focuses on probing whether sustainability reporting has a moderating effect on the relationship between board characteristics and financial performance of Sri Lankan firms.

Design / Methodology / Approach: The study draws on data from 50 listed companies in Colombo Stock Exchange (CSE) with the highest market capitalization during the period 2016 – 2018. This study considers seven board characteristics: board size, gender diversity, board independence, CEO duality, Number of board meetings held, nationality of board members and the number of members with PhD qualifications as independent variables to measure the board characteristics. Firm financial performance is measured by market and accounting based financial performance measures; ROA and Tobin's Q. The Ordinary Least Square (OLS) regression models are applied and the moderating effect of sustainability reporting is measured using a GRI based index and PROCESS macro version 3.4 by Andrew F. Hayes.

Findings: The results reveal that the sustainability reporting moderates the relationship between board characteristics and firm financial performance. Further, the results show that the board size, nationality of board members and number of board meetings held have statistically significant negative relationships with firm financial performance. Other independent variables: gender diversity, board independence, CEO duality and board members with PhD qualifications do not show a statistically significant relationship with firm financial performance.

Practical Implications: This study contributes to the understanding of relationships between board characteristics and financial performance with the moderating impact of sustainability reporting. It provides academic evidence to policy makers in Sri Lanka for current and future governance reforms.

Originality / Value: Recent local and global financial catastrophes have stressed the significance of following corporate governance mechanism either on a mandatory basis or a voluntary basis. Further, the sustainability reporting has become a contemporary concern in global context and adoption of globally accepted standards and principles has become a current practice in Sri Lankan context. Therefore, a study carried out to examine the relationships between such sustainability reporting adoptions, present governance characteristics and firm financial performance is a timely necessity in Sri Lankan context.

Keywords: Board characteristics, Firm financial performance, Sustainability reporting

INTRODUCTION

Recent financial catastrophes, economic downfalls, and the fall of huge corporations, which were the results of accounting frauds and governance loopholes have brought corporate governance (CG) to the attention with regard to the role of the board members (Elad et al., 2018). Since the ownership

and management of the companies are separated, agency problem has been arisen and CG mechanisms have been identified and implemented in many companies around the world as a solution.

With the joint initiative of Institute of Chartered Accountants of Sri Lanka (ICASL) and CSE, CG framework has been issued and currently the code of best practices on CG 2017 is widely adopted by companies listed in CSE. There are mandatory compliance requirements stated under the Companies Act No. 07 of 2007 and listing rules of CSE related to CG. This framework specifically discusses about "Board of Directors", who are the agents of the owners of the company, having a fiduciary duty to act in the best interest of the shareholders: owners.

Since board of directors are considered as the "governing body", they are the people with primary responsibility to oversee the strategic direction, operations of the company and accountability including the financial reporting framework. Consequently, the financial performance of a company is directly affected by the decisions made by its board of directors.

Sustainability reporting is another emerging accounting reporting practice in the world. With the effect of Global Reporting Initiatives (GRI), the importance of reporting on economic, environmental, social and governance performance has become one of the latest trends even in Sri Lankan context. On the other hand, after the large corporate failures such as Enron, WorldCom, the business organizations tend to identify the significance of new emerging concepts such as CG, sustainability reporting and corporate social responsibility for the success of the business organizations.

The priority of this study is to recognise whether there is a direct relationship between characteristics of the board of directors and company financial performance and to assess the moderation effect of sustainability reporting on that identified direct relationship through a quantitative research approach. There is a dearth of both local and foreign studies that merge the relationships between board characteristics, firm financial performance with the moderating effect of the sustainability reporting. Therefore, the secondary purpose of this study is to subsidize to the existing literature by providing a study which specifically links above three variables. The following research questions are answered through the findings of the study.

1. What is the degree of board characteristics, degree of sustainability reporting in Sri Lankan context?

2. Is there a direct relationship between board characteristics and firm financial performance?

3. Is there a moderation effect of sustainability reporting on the above direct relationship between board characteristics and firm financial performance?

The scope of this study is limited to seven board characteristics as board size, gender diversity, independence of board members, CEO duality, number of board meetings, number of directors with PhD qualification and board nationality. This study basically provides information for corporate decision making with regard to board of directors and company financial performance and the outcomes of this study can be used to comprehend whether there is a positive moderating effect of sustainability reporting.

The remainder of the paper is organised as follows: in the next section, the literature relating to board characteristics and firm financial performance is discussed and the research hypotheses are developed. Subsequent to the hypothesis development, the research method, empirical model, and estimation technique are presented. In 'empirical results' section, the empirical results are discussed. In the final section, the conclusion, implications, and directions for future research are presented.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Board Size and Firm Financial Performance: According to John et al. (2015), board size can be changed from one country to another. The size of the board is not particularly mentioned in code of best practices on CG 2017. As per John et al. (2015) every board should inspect its size with a view of determining the influence on its numbers. There is no model size for a board, however the right size of a board should be driven how effectively that board is capable of operating as a team (Johl, 2006).

In a study, Coles et al. (2018) classified firms into two categories as complex firms and simple firms, where they tried to identify an ideal size of board for a company. And also they have found that the size of the board has an influence on its orientation and effectiveness. Further in studies of Jensen (1993), he has explained that the board size should be small; about seven to eight members, thereby the board can incorporate effectively and control functions efficiently, hence, improvement of performance. Moreover, it is expected that, a firm with a larger board size will be less likely to fail because of the superior accountability of directors and the broad range of opinions and external connections (Pfeffer and Salancik, 1978). This discussion leads to the first hypothesis which is stated as follows:

Hypothesis 1: Board size is positively associated with firm's financial performance

Gender Diversity and Firm Financial Performance: Theoretically; according to the resource dependence theory, it states that women on a board can encourage stakeholders of the company's diversity, enhance its legitimacy and the connection with its external environment (Luckerath-Rovers, 2013).

Fauzi and Locke (2012) say that, 'from a gender diversity standard; female directors tend to possess supplementary knowledge and perception which male directors lack'. Carter et al. (2003) in a study of Fortune; 1000 firms observed a statistically important relationship among female, minority directors and organizational performance. In another study Randøy et al. (2006) found no substantial relationship between board diversity and company performance; in relation to profitability and stock market valuation. The authors equally noted that, board diversity does not lower firm's performance except in cases where board diversity involves increasing the board size. This leads to the following hypothesis:

Hypothesis 2: Gender diversity of board is positively associated with firm's financial performance

Independence of Board of Directors and Firm Financial Performance: Generally independence status of a director can be explained as having no direct or indirect relationships with the company, which will compromise his/her decision making.

Different studies provide both positive and negative relationships between board independence and firm financial performance. In studying positive relationships, Bhagat and Bolton (2013) and Malik and Makhdoom (2016) state that independent directors have an influence on the company's financial performance, whereas Kumar and Singh (2012) and Arora and Sharma (2016) state that there are adverse relationships between outside directors and company's financial performance. Moreover, there are some researches which have not identified any direct relationship between these two variables. Haniffa and Hudaib (2006), Rodriguez-Fernandez et al. (2014) and Afrifa and Tauringana (2015) do not discover any relationship between outside directors and company performance. This empirical fragmentation of results clearly calls for further investigation into the underlying relationship, therefore the following hypothesis is derived.

Hypothesis 3: Independence of board is negatively associated with firm's financial performance

CEO Duality and Firm Financial Performance: Farma and Jensen (1983) state that, 'an effective board must be strictly independent from the CEO'. Jensen (1993) further states that the chairperson

of board and the CEO should not be the same person: emphasizing that decision management and decision control functions should be separated and independent.

It has been liable for the inefficiency in the boards of fallen huge US companies such as Enron & WorldCom (Jackling and Johl, 2009). Mahadeo et al. (2012) and Ujunwa (2012) state that there is a negative relationship between CEO duality and company financial performance. Conversely, Donaldson and Davis (1991) explains a positive relationship between CEO duality and company performance. The CMSA's guidelines state that CEO duality can increase CEO entrenchment, impair board independence and, therefore, make the board less effective in its role of monitoring (Ujunwa, 2012). Based on the above discussion the following relationship is hypothesised.

Hypothesis 4: CEO duality is positively associated with firm's financial performance

Number of Board Meetings and Firm Financial Performance: The frequency of board meetings keeps directors abreast about vital developments within the firm thereby, reducing the information asymmetry (Mangena and Tauriingana, 2008). The increased number of meetings within a given period, enables the board members to make better decisions through discussions. It helps the board in strategy formulation and evaluating management's performance (Vefeas, 1999).

During an economic crisis, companies with a poor meeting attendance significantly underperform compared to companies with good financial performance (Francis et al., 2015). Based on the findings by Ntim and Oser (2011) carried out in South Africa, there is a significant positive relationship amongst the frequency of board meetings and financial performance. On the other hand, frequent board meetings increases travel expenses, wastage of managerial time and let to an increase in director meeting expenses (Vafeas, 1999). As per their findings, directors of the board spend more time on reading and presenting reports to the other members rather than discussing important factors. In this study, the number of board meetings is considered as a sign of board diligence, and propose a positive relationship between board meeting frequency and firm performance.

Hypothesis 5: Number of board meetings is positively associated with firm's financial performance

Board Members with PhD Qualifications and Firm Financial Performance: When considering the educational qualifications of board of directors most of the researchers have discovered a positive coherence between educational qualifications and company financial performance. However, the educational qualifications in this paper explained as PhD qualifications, should be related to accounting or finance area.

Yermack (2006) states that share price movement are sensitive to qualifications of directors; predominantly in the area of finance and accounting. With the study carried out by Dalton et al. (1998), they state that there isn't any systematic relationship between educational qualifications and firm performance. On the other hand, a faultily constituted board yields to deprived CG hence, the latter generates a big hole in the earnings profile of the company Carter et al. (2003). This leads to the following hypothesis:

Hypothesis 6: Number of board members with PhD qualifications is positively associated with firm's financial performance

Board Nationality and Firm Financial Performance: Board nationality can be dignified by the number of foreign directors in a board. As Ujunwa (2012) states, participation of foreign directors in a board, helps to bring a range of experience, cultural variations and expertise from other counties. Also the mixed nationality boards enhances the outlooks of the companies and problem solving capabilities.

Ujunwa (2012) suggests that overseas directors may have a positive impact on performance. On the other hand, Jhunjhunwala and Mishra (2012) state that there is a trivial positive relationship between two variables. Hence, based on the argument of advocates of resource dependence theory that overseas directors can yield the board with relationships to overseas networks and capital (Ujunwa, 2012). Based on the above discussion, the following relationship is hypothesised:

Hypothesis 7: Board Nationality is positively associated with firm's financial performance

Sustainability Reporting and Firm Financial Performance: Stakeholders; especially shareholders, need more knowledge regarding the company's involvement in environmental and social functions (Arayssi et al.,2016). As a result of that, many of the organizations tend to publish environmental, social and governance (ESG) information voluntarily in annual reports and companies' websites. Gray et al. (1995) states that, 'sustainability reporting forms part of the discussion between a company and its stakeholders, showing firms' respect and the dedication to the society on one hand and on the other demonstrating the mutual exchange of value (Bear et al., 2010).

Studies on disclosure demonstrate that highlighting voluntary information tries to increase transparency, consequently to facilitate decisions about particular investments (Meek et al., 1995). Extended practices on disclosures encourage investors to alter stock valuation on the basis of the

readily available information, which lead to stock price improvement (Healy et al., 1999) and also reduces the information asymmetry.

Moreover, firms with higher social and environmental engagements witness relatively reduced systematic risk (Salama et al., 2011). Apart from that, a survey carried out by KPMG provides evidence that world's 250 largest companies by revenue and top 100 companies adapt sustainability reporting and provide disclosures. Therefore, it can be assumed that sustainability reporting strengthens the relationships between board characteristics and firm financial performance as the moderating variable.

Hypothesis 8: Sustainability Reporting moderates the relationship between board characteristics and firm's financial performance.

RESEARCH METHODOLOGY

Sample and Data Collection

The sample for this study is top 50 companies listed in CSE based on market capitalization as at 31th March 2019. The companies related to banking, finance and insurance sector are excluded from this population since their inherent nature and financial regulations are different from other companies. Secondary data was used as the source of data. The financial data is gathered using annual reports of selected companies for a period of 3 years from 2016 to 2018. Sustainability disclosures have been checked either from annual reports or separately published sustainability reports for the relevant period. Moreover, the data such as firm age was taken from companies' official websites or other related websites and magazines.

Variables, measurement and analysis techniques

Dependent Variables**:** In this study, company financial performance is the dependent variable and both accounting and market measurements have been used. It is a debatable selection since some of the researchers: Arayssi (2019) and Vaillant (2018) select accounting measurements over market measurements as they believe that market measurements such as Tobin's Q are based on future predictions, which can be based on manipulated forecast. On the other hand, some researchers: Parkash (2016) and Gordini (2017) prefer market measurements over accounting measurements such as ROA, since they believe that accounting measurements are based on historical data.
  - Market measurement – Tobin's Q
  - Accounting Measurement – Return on Assets (ROA)

Independent Variables**:** There are seven independent variables considered in this study, which are related to board characteristics. The measurement of these variables are explained in Table 1.

Moderating Variable**:** Sustainability reporting is used as a moderating variable to identify the moderating effect on the relationship between independent and dependent variables. It gives the opportunity to study whether that variable strengthens the direct relationship between independent and dependent variables or not.

Conceptual Framework

The conceptual framework explains the relationship between all independent, dependent and moderating variables in figure 1.
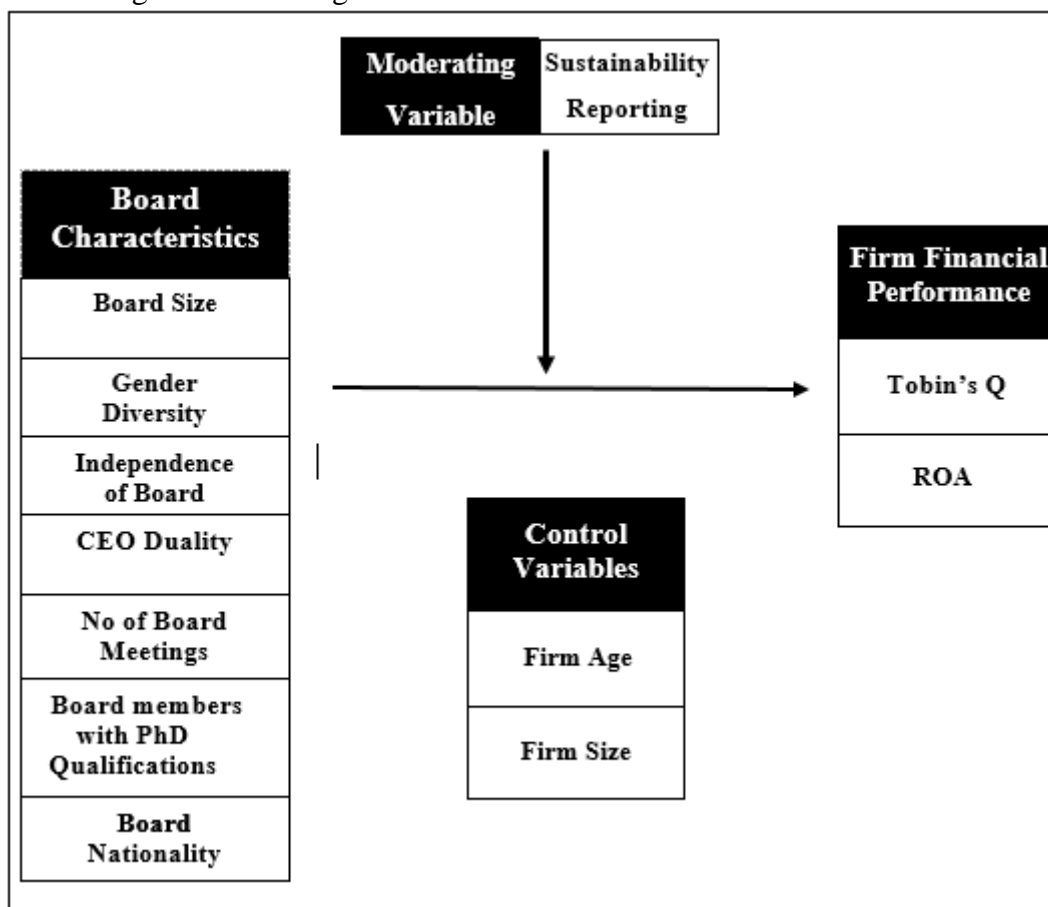

Figure 1: Conceptual Framework

Table 1: Measurement of dependent, independent, moderating and control variables

Variable Name	Mnemonics	Role	Measurement
Board Size	BD_SIZE	Independent	Number of directors in the board
Gender Diversity	GEN_DIV	Independent	Number of women presents on the board; natural logarithm is used after adding 1 to all firms to meet the statistical requirement of normal distribution
Independence of Board	INDEP	Independent	The proportion of independent non-executive directors to the total number of directors in the board
CEO Duality	CEO_DUA	Independent	This is a binary variable wherein 0 indicates that CEO & Chairman are different and 1 otherwise
Number of board meetings	BD_MEET	Independent	Number of board meeting held per year
Board members' qualifications	PHD_QUA	Independent	Number of members with PhDs present on the board; natural logarithm is used after adding 1 to all firms to meet the statistical requirement of normal distribution
Board Nationality	NATIONALI	Independent	The proportion of Sri Lankan directors to the total number of directors in the board
Return on Assets	ROA	Dependent	Ratio of EBIT / Total Assets
Tobin's Q	Tobin Q	Dependent	A modified version of original Tobin's Q approximation is used whereas the original Tobin's Q of Lindenberg and Ross (1981). The used formula for Tobin's Q approximation is; MV(CS)+BV(PS)+BV(LTD)+BV(INV)+BV(CL)-BC(CA)/BV(TA) MV = Market Value; BV = Book Value CS = Common Stocks; PS = Preferred Stocks LTD = Long Term Debt; INV = Inventory CL = Current Liabilities; CA = Current Assets TA = Total Assets
Sustainability Reporting	SUS_REP	Moderating	SR Index
Firm Size	F_SIZE	Control	Natural Logarithm of sales revenue

| Firm Age | F_AGE | Control | Natural Logarithm of number of years of firm's existence since it's year of listing |

Sustainability Reporting Index: In this study, a newly developed GRI based reporting index is used, which has been used in the study Ong et al. (2016) and Ong and Djajadikerta (2018). It is based on the sustainability disclosures made in the annual reports of the companies unlike traditional content analysis. Basically this index has been improved by integrating the GRI reporting framework with the fundamental principles stated in Clarkson et al. (2008).

An item in the research instrument is coded '1' if disclosed and '0' if it's not. Then the score of each item is added to get the ultimate score for the company. The disclosure model for the sustainability reporting is as follows.

$$\mathbf{SRI} = \sum \mathbf{d}i \ / \ \mathbf{nit} \qquad (1)$$

- di is the score granted for an item if disclosed (1) or not (0) for the firm i,
- nit is the maximum number of items that can be disclosed during the period.

To get one firm's score, the scores for each item is added and the total accumulated figure is divided by the maximum likely scores, which are multiplied by 100 to gather the percentage scores.

Analysis Techniques: The relationships between board characteristics and firm financial performance have been analysed using Ordinary Least Square Regression (OLS) models since its powerful analysis tool that can be used to analyse multiple variables simultaneously. The moderating effect of sustainability reporting is analysed using the R^2 value of regression models and PROCESS macro version 3.4 by Andrew F. Hayes.

RESULTS AND DISCUSSIONS

In this study, the stated standard regression models (equation 2 and 3) have been used to measure the direct relationship between board characteristics and firm financial performance.

$$ROA_{it} = \alpha_0 + \beta_1 BD\_SIZE_{it} + \beta_2 GEN\_DIV_{it} + \beta_3 INDEP_{it} + \beta_4 CEO\_DUA_{it} + \beta_5 BD\_MEET_{it} + \beta_6 PHD\_QUA_{it} + \beta_7 NATIONALI_{it} + \varepsilon$$

$$(2)$$

$$Tobin\ Q_{it} = \alpha_0 + \beta_1 BD\_SIZE_{it} + \beta_2 GEN\_DIV_{it} + \beta_3 INDEP_{it} + \beta_4 CEO\_DUA_{it} + \beta_5 BD\_MEET_{it} + \beta_6 PHD\_QUA_{it} + \beta_7 NATIONALI_{it} + \varepsilon$$

$$(3)$$

Regression models used to measure the moderating effect of sustainability reporting are stated in equation 4 and 5.

$$ROA_{it} = \alpha_0 + \beta_1 BD\_SIZE_{it} + \beta_2 GEN\_DIV_{it} + \beta_3 INDEP_{it} + \beta_4 CEO\_DUA_{it} + \beta_5 BD\_MEET_{it} + \beta_6 PHD\_QUA_{it} + \beta_7 NATIONALI_{it} + \beta_8 SUS\_REP_{it} + \beta_9 FIRM\_SIZE_{it} + \beta_{10} FIRM\_AGE_{it} + \varepsilon$$

(4)

$$Tobin\,Q_{it} = \alpha_0 + \beta_1 BD\_SIZE_{it} + \beta_2 GEN\_DIV_{it} + \beta_3 INDEP_{it} + \beta_4 CEO\_DUA_{it} + \beta_5 BD\_MEET_{it} + \beta_6 PHD\_QUA_{it} + \beta_7 NATIONALI_{it} + \beta_8 SUS\_REP_{it} + \beta_9 FIRM\_SIZE_{it} + \beta_{10} FIRM\_AGE_{it} + \varepsilon$$

(5)

ROA and Tobin's Q are dependent variables; α is the intercept; β explains the slope coefficients and ε represents the error component.

Assumption of normality test

The assumptions of normality test assumes that the errors of prediction are normally distributed. To test the normality of the data, Skewness/Kurtosis test has been used in this study. As per the test results shown in the Table 2, the probability of skewness is 0.7953, which indicates that skewness is asymptotically normally distributed (P value of skewness > 0.05). Further, the probability of kurtosis is shown as 0.4372, which indicates that kurtosis is also asymptotically distributed (P value of kurtosis > 0.05). Therefore, according to the results of the skewness/kurtosis normality test, it can be concluded that residuals show a normal distribution.

Table 2: Skewness/Kurtosis test for normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	------------joint------------	
				Adj chi2(2)	Prob>chi2
resid	149	0.7953	0.4372	0.68	0.7120

Assumption for the multicollinearity test

Multicollinearity is a situation, where there are strong correlations between independent variables of a study. The results of the regression analysis won't provide correct results as a result of correlation among independent variables (Palaniyappan, 2017). Therefore, the existence of multicollinearity has been examined by calculating the variance inflation factor (VIF) as per Table 3. If the VIF coefficient is less than the value 5, it is considered that there is no substantial correlation between independent variables. Therefore, the mean VIF of 1.2, which is higher than the value 1 explains that there is no multicollinearity between variables.

Table 3: Variance Inflation Factor of the explanatory variables

Variable	VIF	1/VIF
INDEP	1.36	0.737621
NATIONALI	1.30	0.770430
BD_SIZE	1.26	0.794656
CEO_DUA	1.20	0.833331
PHD_QUA	1.19	0.839491
BD_MEET	1.09	0.920310
GEN_DIV	1.08	0.921895
F_SIZE	1.19	0.843161
F_AGE	1.13	0.888779
SUS_REP	1.18	0.847893
Mean VIF	1.20	

Descriptive Analysis

The first objective of this study is to assess the level of board characteristics, financial performance and sustainability reporting. As per previous studies, central tendency measures such as mean, standard deviation, minimum values and maximum values have been used under descriptive analysis. Descriptive statistics are presented in Table 4.

Table 4: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
BD_SIZE	149	8.242	2.297	3.000	14
INDEP	149	0.472	0.154	0.142	0.833
NATIONALI	149	0.883	0.172	0.333	1.000
GEN_DIV	149	0.473	0.379	0.000	1.098
CEO_DUA	149	0.188	0.391	0.000	1.000
BD_MEET	149	5.611	2.825	1.000	15.000
PHD_QUA	149	0.323	0.397	0.000	1.386
ROA	149	0.149	0.156	-0.014	0.990
TobinQ	149	2.000	1.824	0.361	11.845
F_SIZE	149	17.036	1.156	13.451	19.205
F_AGE	149	3.939	0.829	1.791	5.164
SUS_REP	149	0.689	0.228	0.000	0.943

As independent variables, the average (mean) size of Sri Lankan boards is 8 in approximate numbers. The minimum number of board members is 3 and maximum number of board members is 14. In a previous study carried out related to Indian companies, it states that the average size of an Indian board is 6 members (Palaniyapan, 2017). Independence of the board members is 47%, which means that 47% of the total board members are independent non-executive directors in average. Further, 88% of total members are Sri Lankan in average and the minimum percentage of having Sri Lankan directors is 33% where maximum goes to 100%.

The average percentage of sustainability reporting adoption in Sri Lanka is 68% where the maximum value id 94% and the minimum is 0%. It concludes that most of the Sri Lankan companies are tend to adopt Sustainability Reporting into their reporting schemes.

The correlation of the individual variables have been tested using correlation matrix as per Table 5 with the purpose of understanding the relationship between two variables.

Table 5: Correlation Matrix

	BD_SIZE	INDEP	NATIONALI	GEN_DIV	CEO_DUA	BD_MEET	PHD_QUA	ROA	TobinQ	F_SIZE	F_AGE	SUS_REP
BD_SIZE	1											
INDEP	-.075	1										
NATIONALI	.236	.314	1									
GEN_DIV	-.177	.114	.056	1								
CEO_DUA	-.189	.198	.023	.115	1							
BD_MEET	.110	.129	.178	.041	.097	1						
PHD_QUA	.192	-.087	-.156	-.132	.058	-.022	1					
ROA	-.713	-.062	-.745	.181	.027	-.725	-.117	1				
TobinQ	-.782	-.142	-.779	.178	.005	-.711	-.049	.844	1			
F_SIZE	.004	-.336	-.162	-.011	.042	-.049	.160	-.006	.062	1		
F_AGE	.069	-.162	-.041	.096	.134	.131	-.009	.026	.122	.180	1	

SUS_REP	-.031	.174	.143	-.055	.252	.122	.192	-.045	-.060	-.034	-.048	1

As per the Table 5, board size and ROA has a correlation coefficient of -0.713 and a correlation coefficient of -0.782 between Tobin's Q and board size indicating a strong negative linear relationship. The results are consistent with Yermark (1996) and Palaniappan (2017). Therefore, the association between board size and dependent variables are considered to be statistically significant in this study. When considering the relationship between number of independent directors and financial performance, it shows a correlation coefficient of -0.062 and -0.142 with ROA and Tobin's Q respectively. As per the analysis, both relationships are considered to be statistically insignificant since it indicates a weaker negative association between two variables and it is consistent with Lipton and Lorsch (1992). The relationship between nationality of board of directors and financial performance is considered to be statistically significant since it indicates strong negative linear relationships of -0.745 and -0.779 with both ROA and Tobin's Q respectively. When considering the relationship between number of board meetings held during the period and financial performance, a correlation coefficient of -0.725 shows with ROA and -0.779 shows with Tobin Q, which demonstrates strong negative statistically significant relationship. The relationship between the gender diversity and financial performance shows a weaker positive linear relationship. Moreover, this finding is consistent with Siciliano (1996), Farrell and Hersch (2005).

Regression Results

Further analysis on identified relationships and hypothesis of the study have been carried out using Ordinary Least Square Regression (OLS) and results are shown in Table 6.

Table 6: Regression Results – Model I and II

	Model 1 - ROA			Model II - Tobin's Q		
	Coefficient	t	P	Coefficient	t	P
w_BD_SIZE	-.019	-2.20	0.019	-.202	-3.20	0.021
w_INDEP	-.036	-0.40	0.692	-.641	-.066	0.511
w_NATIONALI	-.253	-3.21	0.031	-3.67	-4.36	0.041
w_GEN_DIV	.030	0.93	0.355	.338	0.97	0.334
w_CEO_DUA	.027	0.83	0.409	.635	1.83	0.069
w_BD_MEET	-.003	-0.45	0.044	-.016	-0.32	0.046

w_PHD_QUA	-.025	-0.79	0.433	-.130	-0.39	0.701
w_F_SIZE	.015	1.32	0.189	.070	0.56	0.577
w_F_AGE	.022	1.44	0.152	.475	2.84	0.005

Table 6 shows regression results of two models. As per regression results of Model 1 under 95% of confidence level, "board size" having a *p*-value of 0.019 and *t*-value of -2.20 can be considered as an independent variable, which has a significant negative relationship with ROA. The number of Sri Lankan directors in the board: nationality having a p-value of 0.031 and a t-value of -3.21 also has a significant negative relationship with ROA of a firm. The other independent variable, which has a significant negative relationship with firm ROA is the number of board meetings during the period, having a p-value of 0.044 and a t-value of -0.45. However, other variables: board independence, gender diversity, CEO duality and number of board members with PhD qualifications do not satisfy the confidence level and not significant in determining the firm's financial performance measured by ROA.

As per the regression results of Model II, "board size" having a p-value of 0.021 and a t-value of -3.20 is deliberated as a significant variable when determining the firm's Tobin's Q. Further, "number of Sri Lankan directors in a board" having a p-value of 0.041 and a t-value of -4.36, "number of board meetings held", having a p-value of 0.046 and a t-value of -0.32 are considered as variables, which have significant negative relationships with firm's Tobin's Q. Therefore board size, number of Sri Lankan directors in a board and number of board meetings held during a period are considered as significant variables in determining the firm's financial performance in terms of Tobin's Q. However, other variables: board independence, gender diversity, CEO duality and number of board members with PhD qualifications do not satisfy the confidence level and not significant in determining the firm's financial performance measured by Tobin's Q.

The hypothesis 1 on board size and firm financial performance has been rejected and supportive to this result, there are researches, which have provided the same results. Yermack (1996) suggested that larger boards can be less effective than small boards as a result of coordination of problems and director free riding. Further, the coordinating problems outweigh the advantages of having more people on the board (Dalton et al., 2009). Jensen (1993) says that small boards are efficient in decision making due to greater level of coordination and less communication issues.

Hypothesis 7 on nationality of the board members and firm financial performance has been rejected with a significant negative relationship. Ujunwa (2012) suggests that overseas directors may have a

positive impact on performance which means that firm financial performance is positively impacted when the number of foreign directors in a board is increased. As per the resource dependency theory, diversity of the board increases when the people from different demographics are together and that would not happen when all the directors are from the same background (Hillman et al., 2002). As Siciliano (1996) states, the firm performance increases when the diversity of the board increases with the number of nationalities of board members.

Hypothesis 5 on number of board meetings and firm financial performance has been rejected showing a significant positive relationship between two variables. Jensen (1993) states that frequent board meetings increase travel expenses, wastage of managerial time and let to an increase in director meeting expenses in company while directors of the board spend more time on reading and presenting reports to the other members rather than discussing important factors (Vefeas, 1999).

Two methods have been used to understand the moderating effect of sustainability reporting on the relationship between board characteristics and firm financial performance.

Analyzing the R^2 value of model I, II, III and IV

First two models: model I and II were run without considering sustainability reporting effect and model III and IV were separately run using OLS regression with the effect of sustainability reporting. Consequently, R^2 value is considered and it is compared with model I and II to recognize the moderating effect as per Table 7.

Table 7: Regression Results – Moderating Effect of R^2

Model	R^2
Model I – ROA	0.1607
Model III – ROA with sustainability reporting	0.1740
Model II – Tobin's Q	0.2518
Model IV – Tobin's Q with sustainability reporting	0.2641

As per the R^2 summary of four models used in this study, it seems that R^2 values are increased with the inclusion of sustainability reporting as one variable. It means that sustainability reporting moderates the relationship between board characteristics and firm financial performance in both models. The results are consistent with Kim and Verrecchia (1994), Healy et al. (1999) and Jizi et al. (2016). Therefore the hypothesis 8, which is related to the moderating effect can be accepted.

ii)Analyzing the results of PROCESS macro version 3.4 by Andrew F. Hayes

PROCESS is an observed variable OLS and logistic regression path analysis modelling tool, which can be used to analyse moderation effects through SPSS. Model III and IV were used for the analysis separately and sustainability reporting was selected as the moderating variable in the PROCESS macro.

Table 8: Regression Results – Moderating Effect of PROCESS macro version 3.4

	Model III	Model IV
p-value of int_1	0.0002	0.0000
R^2 - change	7.55%	11.36%

The *p*-value of interaction (int_1) measures the statistical significance of the moderation effect in the model. As per the results in Table 8, *p*-values of both models are statistically significant under 95% of confidence level. Further, the changes in R^2 values with the inclusion of moderating variable in the models are positive and show a 7% – 12% increment. Therefore, it can be concluded that sustainability reporting has a moderation effect on both models which is statistically significant.

Other hypothesis developed on independent variables of gender diversity, independence of board of directors, CEO duality and number of board members with PhD qualifications are considered as null hypothesis since these hypothesis do not show a statistically significant relationship with the firm financial performance, which is the dependent variable. Therefore all of these hypothesis analysed with ROA and Tobin's Q are rejected and no significant relationship can be identified based on the research results.

Table 9: Hypothesis discussion

#	Hypothesis	Proposed Relationship	Hypothesis test results	
			ROA	Tobin's Q
Hypothesis 1	Board size is positively associated with firm performance	Positive and Significant	Negative and Significant	
Hypothesis 2	Gender diversity of board is positively associated with firm performance	Positive and Significant	Positive and Insignificant	
Hypothesis 3	Independence of board is positively associated with firm performance	Negative and Significant	Negative and Insignificant	

Hypothesis 4	CEO duality is positively associated with firm performance	Positive and Significant	Positive and Insignificant
Hypothesis 5	Number of board meetings is positively associated with firm performance	Positive and Significant	Negative and Significant
Hypothesis 6	Number of board members with PhD qualifications is positively associated with firm performance	Positive and Significant	Negative and Insignificant
Hypothesis 7	Board Nationality is positively associated with firm performance	Positive and Significant	Negative and Significant
Hypothesis 8	Sustainability Reporting moderates the relationship between board characteristics and firm financial performance	Positive and Significant	Positive and Significant

CONCLUSION, LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Out of the seven independent variables used as board characteristics, independence of board members, gender diversity, CEO duality and number of board members with PhD qualifications seem not to be statistically significant and they do not impact the financial performance of listed companies in Sri Lanka. However, board size, nationality of board members and number of board meetings held are statistically significant and have an impact on the financial performance of companies (ROA and Tobin's Q). Moreover, sustainability reporting moderates the relationship between board characteristics and firm financial performance.

When it comes to practical significance, the results of this study basically contribute for corporate decision making with regard to appointment of board of directors and board independence. Theoretically, the results contribute to agency theory, stakeholder theory and organization theory to understand the characteristics of the directors. It is supported that separation of ownership and management of companies may not encourage better firm performance due to agency dilemma since the both parties might have conflicting interests and the decisions made by management won't be in the best interest of the owners of the company.

This study has some limitations which should be taken into consideration in future research. Firstly, the results of this study is based on only a sample of 50 companies for 3 years of period, which excludes banking, financial and insurance companies. This could result a sampling error and future researchers are encouraged to increase the sample size and the time period. Secondly, this study has

used only secondary data, whereas it is recommended to include primary data as well. Apart from that, content analysis was used for data collection from annual reports and as a result of that, a limitation of indexes arises. When indexes such as sustainability reporting index is designed, it needs to be restricted to the extent of possibility in gaining relevant data through various disclosures in the annual reports. Moreover, future researchers are encouraged to increase the number of independent variables such as interlocking directorates and to use other additional measurement for firm financial performance. Further, there is a dearth of studies in this research area covering all of these variables and as a result of that the exposure that could have obtained from previous studies was limited and the richness of the literature review was shrinked.

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