Female directors on the board and efficiency of capital allocation: evidence from Colombo Stock Exchange

Shohani Upeksha Badullahewage
Department of Economics, Faculty of Humanities and Social Sciences,
University of Sri Jayewardenepura, Sri Lanka

Bharatha Prabath Parakrama Badullahewage
Department of Statistics, Faculty of Sciences, University of Colombo, Sri Lanka.

Professor. Shirantha Heenkenda
Department of Economics, Faculty of Humanities and Social Sciences,
University of Sri Jayewardenepura, Sri Lanka

Professor. Gamini Weerasinghe
Department of Economics, Faculty of Humanities and Social Sciences,
University of Sri Jayewardenepura, Sri Lanka

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Abstract: The main scope of this research project is to investigate the relationship between women on director board in Sri Lankan context and their participation impacts on the efficiency of capital allocation of corporate companies. A plenty of research in this nature have been studied in the context of developed economies. The panel data methodology was involved to find out the link between female boardroom involvement, and capital efficiency and Tobin's Q ratio and value- added growth were used as dependent variables to indicate capital efficiency. The study found a favorable relationship between the quality of investment prospects and the amount of money invested in companies run by female CEOs, while this relationship is far weaker in companies run by male CEOs.

Keywords: Allocation, Capital, efficiency, Gender, Stocks

1. Introduction

Women participation in the economy is important to enhance and contribute to rising economic potential of a country. There could be significant development achievements by ensuring women's equal participation in economic and financial spheres. The past few decades have shown a rapid increase in the involvement of women in business and finance affairs. The woman today is equally employed and has acquired knowledge about various aspects of business and finance.

Today, many countries like Norway, Spain, Iceland, Finland, Netherlands, Sweden, Poland and Canada are reported to be observing the female and male balance in board constitution (Vinnicombe, 2009). Gulamhussen and Santos, (2010) found that the gender diversity in the board of directors is advantageous to make corporate and financial decisions such as monitoring and percentage of debt to equity etc.

In Sri Lanka, the inclusion of women on the boards of Colombo Stock Exchange listed companies has been increasing in recent years and contributes significantly to increased sales, leverage, capital allocation and risk avoidance. Greater participation of women at all levels of business is central to ensuring commercial and societal development. Interestingly, women directors on the boards of companies listed on the Colombo Stock Exchange play an important role in maintaining the expected high standards of governance and leadership in the companies they represent.

Based on the research study conducted by Gulamhussen and Santos (2010), found that the gender diversity in the board of directors is advantageous to make corporate and financial decisions such as monitoring and controlling percentage of debt-to-equityetc… which are proxies to measure efficiency of capital allocations and reinvestments. Research evidences show how the efficiency of capital allocation and investments are relatively managed by top corporate insiders in relation to the nature of their gender and choices. However, there is little evidence investigating the relation between the gender of top corporate insiders and corporate choices, i.e efficiency of capital allocation.

While most studies of board gender diversification are based on data from economies in developed countries, it is widely accepted that due to individual, cultural and institutional characteristics, the caution should be exercised in generalizing the results. The cause for Sri Lanka is that the environment is preferred for homogeneous board. Although there is an increase in female representation in the workforce in Sri Lanka, the companies still have very few female representatives on boards and higher managerial positions. Women are possessing potential merits which can be improved by giving more opportunities to them in education, management, and leadership training program to enhance their skills.

When analyze the current business environment of global context mainly face Vulnerable, Uncertain, complex and ambitious environment. Many investors aware about this situation and they face unknown risk for above context (Priya, 2013). Most of Asian and European authors identified above issues regarding board gender diversity and the efficiency of capital allocation of stock market with much empirical evidences although South Asian and Sri Lanka can be seen high level gender diversity but very less amount of research published link with corporate risk taking (Priya and Nimalathsan, 2013). Especially Sri Lanka, has less number of papers and research publications emphasis above research area with clear empirical evidences (Gunasekara and Ruparathna, 2016). It means when apply for this research area into Sri Lankan context has clear literature gap under VUCA environment, it can be proved on above evidences from different authors.

The researcher focused on the question of that "does the gender affect efficiency of capital allocation of the corporate firms listed in the stock market in Sri Lanka".The main objective of the study is to analyze to analyse whether women-led firms have higher efficiency in allocation of capital investments that male-led counterparts.
This study provides a theoretical and practical perspective on the board diversity debate, helps to fill a gap in the existing literature, and contributes to the current debate on how the presence of women on boards can affect efficiency of capital allocation and corporate performance. Although this topic has been addressed in previous studies, researcher find a gap in Sri Lanka with respect to the effectiveness of capital allocation. Many studies focus on Southern European countries and some on neighboring countries, but studies focusing on Sri Lanka are lacking.

2. Literature survey

Studies at the significance of gender characteristics and funding and investment performance are normally mixed. With regard to gender, some research discovers agencies gain greater from occupying more women on excessive level control positions. Companies led through female CEOs or chairs are associated with better ROAs (Peni, 2014) that's used as a proxy to degree the efficiency of capital allocation with inside the study. Female executives are better proper to comprehending consumer needs (Brennan & McCafferty, 1997), despite the fact that no courting is located among gender and enterprise overall performance (Dezsö& Ross, 2008).

Many researches conducted panel analysis by using Tobin Q and Marginal Q values to measure the impact of gender over the efficiency of capital investments. Welbourne (1999) uses a sample of 476 public companies in 1993 to quantify the Tobin coefficient Q (market price to book value per share), comparing three years of share price growth and earnings per share growth to show the effect of women in senior management positions on short-term performance. He finds that the percentage of women in senior management is significantly correlated with the Tobin ratio (0.13, $p \leq .01$), and using three different ordinary least squares (OLS) regression analyses finds that women in senior management are positively related to the Tobin ratio ($\beta = 0.12$, $p \leq .01$), three-year stock price growth ($\beta = 0.07$, $p \leq .10$) and earnings per share ($\beta = 0.07$, $p \leq .10$). Welborn (1999) concludes that the actions of women in senior management appear to have a positive effect on company performance.

Similarly, Catalyst (2004) argues that better financial performance is observed in firms on average due to the presence of women in top management positions. It emphasizes gender diversity and financial performance, as measured by ROE and TRS, for a sample of 353 Fortune 500 firms from 1996 to 2000. Using financial performance measures, better financial performance is seen in companies with more women in senior management than in companies with lower performance. Krishnan and Parsons (2008) use Catalyst's (2004) sample of 353 Fortune 500 companies from 1996 to 2000 with 385 annual observations for boards with low and high gender diversity. They found that companies with more women in senior management are more profitable and have higher risk-adjusted post-IPO stock returns than companies with fewer women in management. They also show that earnings quality is positively related to gender diversity on company boards.

Researches conducted during past decade investigated whether gender diversity on the board of directors of companies is related to company performance as measured by return on assets and stock valuation. Jurkus, Park and Woodard (2008) used financial data from Compustat and CRSP on stock price and earnings for the periods 1995-2000 and 2002-2005 to find the relationship on mentioned aspect. Their sample consists of 668 companies with 3,180 observations. They use univariate analysis to show that a company with 10% more women on its board has, on average, 2.115% higher return on assets. However, this result is only significant for companies with only men on their boards. Companies that already have women on the board have a lower return on assets when the number of women is increased by 10%, but this still has a significant positive effect on the company's performance. In addition, Jurkus, Park and Woodard (2008) created an arbitrage portfolio consisting of buying high gender diversity stocks and selling low gender diversity stocks. They found a slightly negative return in an environment with female representation and a significantly positive effect ($\alpha = 0.0085$, $t = 2.07$) in an environment with exclusive female representation. Yurkus Park and Woodard (2008) conclude that gender diversity is positively related to both firm performance and stock valuation, but only significantly for environments with exclusive female representation. Carter, Simkins and Simpson (2002) examine the relationship between board diversity, defined as the percentage of women on the board, and company value in a sample of 637 Fortune 1000 companies. Carter, Simkins and Simpson (2002) find that companies with two or more women on the board outperform companies without women on the board in terms of Tobin's q (1.58 versus 1.03) and ROA (5.2% versus 2.5%).

In addition, using a comparative sample, they found significant differences in value, with companies with high gender diversity outperforming those with low gender diversity. Carter, Simkins and Simpson (2002) found significant positive estimates for the presence of women on the board and for the percentage of women on the board. Carter, Simkins and Simpson (2002) concluded that there was a positive relationship between the presence and percentage of women on the board and the value of the company.

Campbell and Vera (2010) use GMM regression analysis with a Tobin Q approximation to show that female board appointments and female board presence have a positive and significant effect on long-term firm value, both at the 5% level, controlling for other potential determinants of firm value. According to empirical research conducted by Ren & Wang 2011 in Chinese private companies, their analysis provides evidence of a positive relationship, clearly indicating the degree of female participation and company financial performance. According to the hypotheses, the positive relationship is also supported by the human and social capital of female managers. Man and Kong (2011) investigated a similar situation in Hong Kong to test the relationship between gender diversity on the board of directors and company financial performance. Using Tobin's Q, they examined company financial performance in a sample of 138 Hong Kong listed firms for fiscal year 2009 and, contrary to many empirical studies, found no causal relationship other than a significant negative relationship between women in senior management and financial performance.

Further research shows how CEOs' personal characteristics affect corporate decision-making without controlling for board characteristics. A firm's investment decisions and cash flows are relatively and strongly dependent on CEO beliefs (Malmendier and Tate, 2005), and personality increases the likelihood that firms will make a value-destroying acquisition (Malmendier and Tate, 2008). CEOs who have experienced depression limit debt financing in their corporate decisions (Malmendier et al., 2011), as do those who tend to avoid personal debt in mortgage transactions (Cronqvist et al., 2012). Managers with military backgrounds pursue more aggressive corporate strategies (Malmendier et al., 2011), as do CEOs who have been found to be risk-averse in psychometric tests make more corporate acquisitions (Graham et al., 2013).

Darmadi (2011) examined board diversity and financial performance of companies listed on the Indonesia Stock Exchange (IDX). His study found significant negative associations between accounting and market performance with gender diversity. However, a quantitative analysis based on Prihatiningtias' (2012) study of selected Indonesian companies showed both positive and negative effects. The results were measured by ROA and Tobin's Q, respectively. Thus, it is clear that gender diversity affects both positively and negatively the financial performance of companies.

In sum, previous studies offer few indications of the significance of gender diversification on financial performance of the corporate companies. However, the existing literature falls quick of linking gender aspects in distinctive aspects of risk-taking and capital efficiency of copporate companies in capital markets.

3. Methodology

The Redundant fixed effect method and Hausman tests were used to examine the validity of the panel regression models used in the study. The research is based on a random sample of 60 firms from various industries that are listed on the Colombo Stock Exchange. Companies from 2011 to 2019 are included in the statistics. Because the data is collected over a period of time and statistically summarized, the study is referred to as a panel or longitudinal study (Hair et al. 1998). Due to the most recent data available for the study, the years 2011 to 2019 will be chosen, and the financial and directorship data for the study will primarily be gathered from two sources: annual reports and financial statements attached to annual reports, both of which are available on the Colombo Stock Exchange web site (www.cse.com).

The panel data methodology was involved to find out the link between female boardroom involvement and capital efficiency The researcher used two methods to measure the efficiency of capital allocation. First, it is used approach proposed by Wurgler (2000), where value added growth is used as an indicator of the quality of investment opportunities. Secondly, it is looked at the extent to which investment correlates with Tobins Q, as required by theory.

To achieve an efficient allocation, capital must be invested in industries with good investment opportunities and withdrawn from industries with poor investment opportunities. Wurgler (2000) suggests that optimal investment implies more investment in growing industries and less investment in shrinking industries. He notes that since gross domestic product (GDP) is the sum of the value added of all firms in an economy, and economic growth is usually measured in terms of GDP growth, studying value added growth is a natural way to measure growth. Thus, value added growth is used as a proxy for the quality of investment opportunities.

Both regression panels use value added growth and marginal Q as dependent variables. Capital expenditure is calculated as the annual change in gross (net) fixed assets plus depreciation. Fixed capital is defined as the sum of tangible fixed assets plus intangible fixed assets plus other fixed assets. Value added is calculated as the difference between the natural logarithm of value added in year t and the natural logarithm of value added in year t - 1. Value added is defined as earnings before interest and taxes plus employee costs.

The research study used the inductive research approach to justify the relationship between the research problem and the collected data. The research study was based on the pragmatism research philosophy. The real facts and numbers for the research study were assembled using existing secondary data obtained from reliable information sources. The descriptive research design describes the study questions in great detail. The explanatory research design establishes a link between the data and the facts. The hypothesis is developed through the exploratory research design. The descriptive research design was utilized to answer the research questions and justify the research problem in this study.

Table 3.1; Explained and explanatory variables

Name of the Variable	Definition	Type of the variable	Indicator in the model
Value-added growth	difference between the natural log of value added in year t and the natural log of value added in year t-1. Value	Dependent Variable	VA_GROWTH

	added, in constant US dollars (year 2000 prices), is defined as earnings before interest and taxes plus cost of employees.		
Tobins Q		Dependent Variable	TOBINS_Q
Gender Proportion	Percentage of female in the board of directors	Independent Variable	GENDER_PROPORTION
Ln (Chair wealth)	natural logarithm of the chairman's equity wealth	Independent Variable	LN_CHAIRWEALTH
Ln (firm Size)	natural log of total assets of the firm	Independent Variable	LN_FIRMSIZE
Tangibility	calculated as the ratio of fixed to total assets	Independent Variable	TANGIBILITY
Earning per share	calculated as a company's profit divided by the outstanding shares of its common stock.	Independent Variable	EPS
Share price	Stock price determined based on trading in CSE	Independent Variable	IND_PRICE

Source: Author constructed

3.1. Explained Variables; Value added growth

Optimal allocation requires investing capital in sectors with high investment opportunities and withdrawing capital from sectors with low investment opportunities; Wurgler (2000) points out that optimal investment means increasing investment in growth sectors and reducing investment in contraction sectors. He points out that since gross domestic product (GDP) is the sum of the value added of all firms in an economy and economic growth is usually measured as GDP growth, growth in value added is a natural way to measure growth. Thus, value added growth is used as an indicator of the quality of investment opportunities.

In this section, we use this approach to assess the sensitivity of investment to value added growth. The growth rate of value added is calculated as the difference between the natural logarithm of value added in year t and the natural logarithm of value added in year t-1. Value added is defined as earnings before interest and taxes plus personnel costs at constant exchange rates (2000 prices). The abundance of data allows the estimation of value added growth at enterprise level.

3.2. Explained Variable; Tobin's Q

The study introduced some control variables, namely Tobin's coefficient q, total assets and market price per share. Several previous studies have used Tobin's q coefficient to measure firm performance (Prihatiningtias 2012; Darmadi 2011; Al-Shammari& Al-Saidi 2014). This number is usually defined as the value or market value of the firm and is calculated by dividing the book value of total debt and the value of outstanding shares by the book value of total assets. Firm size, defined as total assets, is often used as a control variable in several previous studies (Campbell &Mínguez-Vera 2008; Prihatiningtias 2012; Heenetigala 2011). These studies have shown that firm size has a positive effect on the financial performance of the firm. In this study, firm size is measured by the natural logarithm of the firm's total assets. The natural logarithm was used to normalize the data and minimize the value of variance (Prihatiningtias 2012).

The financial performance of the firm is measured by Tobin's Q approach (Q). Brav et al (2008) defined Tobin's Q as the market value of equity plus the book value of debt divided by the book value of debt plus the book value of equity. The measure of agency costs is presented as the firm's notional free cash flow Q (QFCF). Free cash flow is the cash that the firm can generate for each project with a positive net interest cost, discounted by the corresponding cost of capital. Jensen (1986) explains that when a firm generates a significant amount of free cash flow, it increases the conflict between managers and shareholders, as managers tend to invest cash instead of maximizing shareholder value. The methods adopted by McKnight and Weir (2009) and McConnell and Servaes

(1990) measure growth opportunities using Tobin's Q dummy. The value of the dummy growth variable is 1 if the firm's Tobin's Q coefficient is less than 1 (indicating

4. Analysis of results

4.1. Dependent Variable – Tobins' Q

To assess the efficiency of capital allocation, we also evaluate the extent to which investment is related to the Tobin's Q, as advocated by theory. The Tobin's q ratio, total assets and market price per share. Many prior studies have used Tobin's Q ratio to measure firm efficiency. (Prihatiningtias 2012; Darmadi 2011; Al-Shammari& Al-Saidi 2014). This measure is commonly defined as firm value or market value of the firm, and it can be calculated by summing the book value of total debt and value of total outstanding shares dividing by the book value of the total assets.

Table 4.1; Regression Output - POLS model

Dependent Variable: TOBINS_Q				
Method: Panel Least Squares				
Sample: 2011 2019				
Periods included: 9				
Cross-sections included: 60				
Total panel (balanced) observations: 540				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.137428	0.277830	7.693284	0.0000
GENDER_PROPORTION	0.687814	0.627487	1.096142	0.0275
TANGIBILITY	0.614957	0.125855	4.886231	0.0000
LN_CHAIRWEALTH	0.110965	0.093100	1.191900	0.2338
LN_FIRMSIZE	-0.268542	0.081417	-3.298339	0.0010
EPS	0.004624	0.001771	-2.610903	0.0093
IND_PRICE	0.000842	0.000174	4.827755	0.0000
R-squared	0.213231	Mean dependent var		1.106411
Adjusted R-squared	0.204374	S.D. dependent var		1.232772
S.E. of regression	1.099606	Akaike info criterion		3.040660
Sum squared resid	644.4683	Schwarz criterion		3.096291
Log likelihood	-813.9781	Hannan-Quinn criter.		3.062417
F-statistic	24.07567	Durbin-Watson stat		0.526147
Prob(F-statistic)	0.000000			

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

As per the test statistics given revealed by the Pooled OLS Model; that TOBINS_Q and Proportion of female director board participation had a significant positive relationship at the 5% significance level (prob = 0.0275). Variables TANGIBILITY, EPS and IND_PRICE indicate significant positive relationship over TOBINS_Q. However, LN_FIRMSIZE which indicates assets owed by listed company in the stock market shows a significant negative impact of the dependent variable.

The tested hypotheses for the study were;

H0: Gender diversity in the boardroom has no relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).
H1: Gender diversity in the boardroom has relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).

According to the test statistic, Ho was rejected in the pooled OLS model. Thus, it implies that there is significance impact of factor board gender diversity over the efficiency of capital allocation and investment decisions. The adjusted R-squared of the model is 0.20, indicating that the regression line fits only 20% of the sample dataset.

Which specifies that the equation is not reliable (Schwizer et al. 2012). The model was significant because the p-value in the F statistic was at a significance level of less than 5%. Also, there was autocorrelation in the model because the Durbin Watson statistics is 00.526147.

Fixed Effect model was fitted using for the afore mentioned dependent variable (TOBINS_Q) and the independent variables. The Results are given in the table 4.2.

Table 4.2; Regression Output - Fixed Effect model

Dependent Variable: TOBINS_Q				
Method: Panel Least Squares				
Sample: 2011 2019				
Periods included: 9				
Cross-sections included: 60				
Total panel (balanced) observations: 540				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.559088	0.643698	10.18970	0.0000
GENDER_PROPORTION	1.235458	0.658412	1.096457	0.0359
TANGIBILITY	1.316773	0.098341	13.38983	0.0000
LN_CHAIRWEALTH	-0.367035	0.105724	-3.471638	0.0006
LN_FIRMSIZE	-0.363276	0.116619	-3.115069	0.0020
EPS	0.003110	0.001304	-2.385952	0.0174
IND_PRICE	0.001052	0.000181	5.823498	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.760712	Mean dependent var		1.106411
Adjusted R-squared	0.728472	S.D. dependent var		1.232772
S.E. of regression	0.642378	Akaike info criterion		2.065205
Sum squared resid	196.0082	Schwarz criterion		2.581783
Log likelihood	-492.6055	Hannan-Quinn criter.		2.267238
F-statistic	23.59468	Durbin-Watson stat		1.248905
Prob(F-statistic)	0.000000			

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

The Fixed Effect Model predicts that there is significant positive relationship at the 5% significance level (prob = 0.0359) between the dependent variable TOBINS_Q and the most independent variable GENDER_PROPORTION. Similar to the Pooled OLS method, Variables such as; TANGIBILITY, EPS and IND_PRICE indicate significant positive relationship over TOBINS_Q. And also, LN_FIRMSIZE which indicates assets owed by listed company in the stock market shows a significant negative impact over the TOBINS_Q value.

The tested hypotheses for the study were;

H0: Gender diversity in the boardroom has no relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).
H1: Gender diversity in the boardroom has relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).

According to the test statistic, Ho was rejected in the fixed effect model. The adjusted R-squared of the model is 0.72, indicating that the regression line fits only 72% of the sample dataset. which specifies that the equation is highly reliable (Schwizer et al. 2012). The model was significant because the p-value in the F statistic was at a significance level of less than 5%.

According to the results revealed from then research analysis, it is evident that there is impact of factor gender diversity over the efficiency of capital allocation of the corporate firms listed in Stock Market Sri Lanka. The study

findings consisted with study conducted by Welbourne (1999) by applying a sample of 476 public firms in 1993 to quantify Tobin's Q (market price to book value per share). In that it was compared three-year stock price growth and growth in earnings per share to show the effect of women in top management position of firms during short-term performance and found that the percentage of women on top management is significantly correlated to Tobin's Q (0.13, $p \leq .01$)

Moreover, similar study conducted by Jurkus Park and Woodard (2008) found that gender diversity is positively associated with both firm performance and stock valuation, but only significant for women exclusive environments. Carter, Simkins and Simpson (2002) examined the relationship between board diversity, defined as percentage of women on the board, and firm value for a sample of 637 Fortune 1000 companies. They found that companies with two or more women on the board perform better compared to companies with no women in the board of directors as measured by Tobin's q (1.58 versus 1.03) and ROA (5.2% versus 2.5%). The research findings again consisted with another study conducted by Campbell and Vera (2010). They use da GMM regression analysis with an approximation of Tobin's Q to show that female board appointments and the presence of women on the board has a positive and significant, both at the 5% level, effect on long term firm value, controlling for other possible determinants of firm value.

However, contrary to our research findings, research carried by Darmadi (2011) significant negative associations were found between both accounting and market performance with gender diversity of the firms listed on the Indonesia Stock Exchange (IDX). In his study However, the quantitative analysis based on the study carried out by Prihatiningtias (2012) on some Indonesian firms showed both positive and negative influence. The results were measured by using ROA and Tobin's Q respectively. So, it is evident based on the empirical survey that gender diversity has both positive and negative influence on firm financial performance. Our research finding empathizes that there is positive correlation between the gender diversity and efficiency of capital allocation of the firms listed in stock market Sri Lanka.

To choose between POLS and Fixed Effect model, the Fixed/Random effect testing with Redundant fixed effects-likelihood ratio method was used and the results are as follows.

Table 4.3; Redundant fixed effects-likelihood ratio method

Equation: Untitled			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	18.479733	(59,475)	0.0000
Cross-section Chi-square	643.961177	59	0.0000

Source; Data collected form Colombo Stock Exchange during 2011 – 2019

Since both P-values for the Cross-section F and Cross-section Chi-square in the Redundant Fixed Effects Tests is less than 0.05 (the significance level.), hence we reject the null hypothesis of POLS is the best Model. We can conclude that the fixed effect model is not redundant that is to say all fixed effect coefficient together are highly significant at 5 percent, suggesting that pooled OLS hide the heterogeneity among the cross-section variable.

The best appropriate model from the Random effect and fixed models should then be determined. To do this, the Random effect model was first fitted, with the following results given in the table 4.4.

Table 4.4; Regression Output - Random Effect Model

Dependent Variable: TOBINS_Q	
Method: Panel EGLS (Cross-section random effects)	
Sample: 2011 2019	
Periods included: 9	
Cross-sections included: 60	
Total panel (balanced) observations: 540	
Swamy and Arora estimator of component variances	

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.798434	0.428694	8.860486	0.0000
GENDER_PROPORTION	1.335587	0.758412	1.087457	0.0469
TANGIBILITY	1.311441	0.094985	13.80687	0.0000
LN_CHAIRWEALTH	-0.325669	0.095975	-3.393256	0.0007
LN_FIRMSIZE	-0.093042	0.092848	-1.002098	0.3168
EPS	-0.003308	0.001275	-2.594222	0.0097
IND_PRICE	0.001082	0.000163	6.617045	0.0000
	Effects Specification			
			S.D.	Rho
Cross-section random			0.810538	0.6142
Idiosyncratic random			0.642378	0.3858
	Weighted Statistics			
R-squared	0.384302	Mean dependent var		0.282594
Adjusted R-squared	0.378537	S.D. dependent var		0.853426
S.E. of regression	0.672781	Sum squared resid		241.7065
F-statistic	66.66171	Durbin-Watson stat		1.074474
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.054397	Mean dependent var		1.106411
Sum squared resid	774.5738	Durbin-Watson stat		0.335290

Source; Data collected form Colombo Stock Exchange during 2011 – 2019

As per the test statistics given revealed by the Random Effect Model; that TOBINS_Q and Proportion of female director board participation had a significant positive relationship at the 5% significance level (prob = 0.0469). Similar to the fixed effect model, Variables TANGIBILITY, and IND_PRICE indicate significant positive relationship and LN_FIRMSIZE shows the negative impact over TOBINS_Q. However, contrary to the precious models, LN_CHAIRWEALTH also shows a significant negative impact of the dependent variable.

The tested hypotheses for the study were;

H0: Gender diversity in the boardroom has no relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).
H1: Gender diversity in the boardroom has relationship with efficiency of capital allocation of the corporate firms (As measured by Tobins Q).

According to the test statistic, Ho was rejected in the pooled OLS model. Thus, it implies that there is significance impact of factor board gender diversity over the efficiency of capital allocation and investment decisions. The adjusted R-squared of the model is 0.37, indicating that the regression line fits only 37% of the sample dataset. which specifies that the equation is not reliable (Schwizer et al. 2012). The model was significant because the p-value in the F statistic was at a significance level of less than 5%.

In order to choose the best appropriate model between the Fixed effect and Random effect Model, The Hausman Test was applied, and the results are given in the table 4.5.

Table 4.5; The Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	56.743641	5	0.0000

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

hence the p-value of the above test was less than 0.05 (significance level) we reject the null hypothesis of Random effect model is the best Model. Hence we can conclude that we don't have enough statistical evidence at 5% significance level to say that Random effect model is the most suitable model. Hence, we select the Fixed effect mdoel as the best/most suitable model to predict and model the Tobins_Q variable with the other independent variables.

in the above fixed effect model, the intercept of 6.559088 represent the average effect of all 60 cross-sections that is all 60 companies in this research. The following table gives the company/cross-section specific intercepts.

Estimated Model based on the Fixed Effect Model

TOBINS_ Q = 6.559 +1.235* GENDER_PROPORTION + 1.316 * 14.38 * TANGIBILITY – 0.363 * LN_FIRMSIZE+ 0.003 * EPS + 0.001* IND_PRICE

The variable Value-Added Growth (VA_GROWTH) was used as a other indicator to measure the efficiency of capital allocation; using panel regression analysis. First, the Pooled OLS regression was applied using the VA_GROWTH variable as the Dependent variable and Gender_Proportion, Tangibility, Ln_Firmsize, Earning per share and share price as the independent/explanatory variables.

Table 4.6; Regression Output – Pooled OLS Method

Dependent Variable: VA_GROWTH				
Method: Panel Least Squares				
Sample: 2011 2019				
Periods included: 9				
Cross-sections included: 60				
Total panel (balanced) observations: 540				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	36.39671	24.21017	-1.503364	0.0333
GENDER_PROPORTION	19.71556	54.67927	-0.360567	0.0186
TANGIBILITY	3.354414	10.96703	0.305863	0.7598
LN_CHAIRWEALTH	5.907500	8.112719	0.728178	0.4668
LN_FIRMSIZE	-1.171521	7.094717	-0.165126	0.8689
EPS	0.202141	0.154316	1.309918	0.0408
IND_PRICE	0.041619	0.015204	2.737371	0.0064
R-squared	0.459181	Mean dependent var		9.482479
Adjusted R-squared	0.448590	S.D. dependent var		98.23617
S.E. of regression	95.81982	Akaike info criterion		11.97569
Sum squared resid	4893706.	Schwarz criterion		12.03133
Log likelihood	-3226.437	Hannan-Quinn criter.		11.99745
F-statistic	5.587908	Durbin-Watson stat		2.181298
Prob(F-statistic)	0.000012			

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

As per the test statistics given revealed by the Pooled OLS Model; Variables GENDER_PROPORTION, EPS and IND_PRICE indicate significant positive relationship over VA_GROWTH. However, LN_FIRMSIZE which indicates assets owed by listed company in the stock market shows a insignificant negative impact of the dependent variable.

The results in Table 4.6, show that there is a positive and significant association between value-added growth for firms run by female directors. For example, Pooled OLS Regression shows that, for female directors, the

coefficient of the sensitivity of investment to growth opportunities is 19.71556, with a p-value of less than 0.005. In other words, these results are consistent with female directors investing more when their firm is operating in an industry with good prospects, and divesting capital (or invest less) when the prospects of their firm are poor. This result suggests that women do appear to allocate capital as efficiently as male directors. However, these findings are contradicting with survey conducted by Faccio et.al (2016); they emphasized that corporate investments are less responsive to value-added growth in firms run by female CEO. This result suggests that women do not appear to allocate capital as efficiently as male CEOs. And also, In unreported tests, they find that the results are robust to including other controls such as ownership concentration, profitability, sales growth, firm size, asset tangibility, and a private firm indicator.

The tested hypotheses for the study were;

H0: Gender diversity in the boardroom has no relationship with efficiency of capital allocation of the corporate firms (As measured by Value-added growth).
H1: Gender diversity in the boardroom has relationship with efficiency of capital allocation of the corporate firms (As measured by Value-added growth).

According to the test statistic, Ho was rejected in the pooled OLS model. Thus, it implies that there is significance impact of factor board gender diversity over the efficiency of capital allocation and investment decisions. The adjusted R-squared of the model is 0.44, indicating that the regression line fits only 44% of the sample dataset. which specifies that the equation is averagely reliable (Schwizer et al. 2012). The model was significant because the p-value in the F statistic was at a significance level of less than 5%. Also, the model is free from autocorrelation because the Durbin Watson statistics is 2.181298.

Fixed Effect model was fitted using for the fore mentioned dependent variable (VA_GROWTH) and the independent variables. The Results are given in the table 4.7.

Table 4.7; **Regression Output - Fixed Effect model**

Dependent Variable: VA_GROWTH				
Method: Panel Least Squares				
Sample: 2011 2019				
Periods included: 9				
Cross-sections included: 60				
Total panel (balanced) observations: 540				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	123.0431	95.08099	-1.294087	0.0363
GENDER_PROPORTION	20.46849	50.25461	-0.435841	0.0189
TANGIBILITY	3.444925	14.52606	0.237155	0.8126
LN_CHAIRWEALTH	1.276973	15.61652	0.081771	0.9349
LN_FIRMSIZE	11.83296	17.22587	0.686929	0.4925
EPS	0.252153	0.192546	1.309576	0.1910
IND_PRICE	0.062750	0.026696	2.350534	0.0192
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.177821	Mean dependent var		9.482479
Adjusted R-squared	0.167043	S.D. dependent var		98.23617
S.E. of regression	94.88600	Akaike info criterion		12.05572
Sum squared resid	4276593.	Schwarz criterion		12.57229
Log likelihood	-3190.043	Hannan-Quinn criter.		12.25775
F-statistic	1.605206	Durbin-Watson stat		2.494250
Prob(F-statistic)	0.003348			

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

As per the test statistics revealed by the Pooled OLS Model; Variables GENDER_PROPORTION, and IND_PRICE indicate significant positive relationship over and LN_FIRMSIZE which indicates insignificant negative impact of the dependent variable; VA_GROWTH.

The tested hypotheses for the study were;

H0: Gender diversity in the boardroom has no relationship with efficiency of capital allocation of the corporate firms (As measured by Value-added growth).
H1: Gender diversity in the boardroom has relationship with efficiency of capital allocation of the corporate firms (As measured by Value-added growth).

According to the test statistic, Ho was rejected in the Fixed Effect model. Thus, it implies that there is significance impact of factor board gender diversity over the efficiency of capital allocation and investment decisions. The adjusted R-squared of the model is 0.16, indicating that the regression line fits only 16% of the sample dataset. which specifies that the equation is not reliable (Schwizer et al. 2012).

Table 4.8; Redundant fixed effects-likelihood ratio method

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.163986	(59,475)	0.1997
Cross-section Chi-square	72.920075	59	0.1051

Source; Data collected form Colombo Stock Exchange during 2011 - 2019

Since both P-values for the Cross-section F and Cross-section Chi-square in the Redundant Fixed Effects Tests are greater than 0.05 (the significance level.), we do not reject the null hypothesis of POLS is the best Model. Hence We don't have enough statistical evidence to conclude that the fixed effect model is not redundant. Therefore, we select POLS as the best model to explain and predict VA_Growth.

Estimated Model based on the Pooled OLS Model

VA_GROWTH = 36.396 +19.715* GENDER_PROPORTION + 0.202* EPS + 0.041* IND_PRICE

The researcher applied a panel data methodology to examine the link between female boardroom participation, measured by several variables and firm value (measured by a proxy for Tobin's Q), using an event study. Some research findings based on the literature survey, demonstrate that the women's presence on director board does not, in itself, affect firm value. However, I found that the gender diversity of the board (measured by the percentage of women) has a positive impact on firm value in terms of efficiency of capital allocation.

This study provides a theoretical and practical perspective on the board diversity debate, helps to fill a gap in the existing literature, and contributes to the current debate on how the presence of women on boards can affect board effectiveness and corporate performance. Although this topic has been addressed in previous studies, researcher find a gap in Sri Lanka with respect to the effectiveness of capital allocation. Many studies focus on Southern European countries and some on neighboring countries, but studies focusing on Sri Lanka are lacking.
The results obtained are both similar and different from previous studies. The results of the hypothesis on the relationship between gender diversity and financial performance are also interesting. To surprise, as mentioned above, the gender share variable has a significant effect on Tobin's coefficient, which is consistent with other studies that show a positive and significant effect. In the context of the reviewed literature and the review of

previous results, it is not surprising that higher gender diversity on the board of directors improves the financial performance of the company. A number of arguments have been put forward highlighting the benefits of gender diversity in terms of better communication, better use of different skills and perspectives, which ultimately improves board performance and the company's financial performance.

Given the various arguments supporting greater gender diversity as a tool to improve corporate governance structures and outcomes, it is reasonable to expect that gender diversity is positive and meaningful. The fact that the number of women on the board of directors has been found to be insignificant suggests that other factors may explain the financial performance of companies. However, Blau's and Shannon's diversity measures have a positive and significant effect on Tobin's Q.

According to Jurkus et al. (2008), a company's financial performance tested by Tobin's Q and Agency cost measured as free cash flow method provide evidence on relation to proportion of female on director board. As they point out, positive effects of gender diversity prevail only in environments women works. There would be more benefiting results in firms where gender diversity is relatively scarce, and gender diversity, as Cater et al. (2003) say, would be more effective when the firms operate with weak controlling structure.

Minguez-Vera (2007) research indicated positive results which significantly link the female proportion on the board structure and Tobin's Q value of the company. found a positive significant relation with female proportion on the board and the company's Tobin's Q value. Erhardt et al. (2003) found that large US companies have positive effects on the company's two main profitability ratios (return on assets and return on investment) as considered female directors on boards percentage wise, and also recent research in the UK has found that at least one female director on board reduces company bankruptcy costs (Wilson and Altanlar 2009).

According to study of Jude (2003), the firms are observed with less performance by the representation of women on same board while the firms with all men on board do well, and in supporting to more evidence to this an index of the Cranfield School of Management shows the drop of performance in six out of top ten companies even after female board directors joined the board. The reason for the drop of performance was just appointing women to the board rather making them responsible for financial performance. Therefore, it is important to consider not only female directors' performance but also circumstances surrounding female directors' appointments.

Previous results showed that Tobin's Q score was negatively affected by the introduction of the Norwegian Gender Diversity Act, which made it mandatory to include 40% of each gender. The age and experience of board members decreased and companies performed worse on both the Tobin's Q score and the accounting score. The results suggest that board diversity has a positive and significant impact on Tobin's Q and corporate value creation. From this, I can conclude that gender diversity laws have a negative impact because companies are forced to select directors based on their gender rather than their qualifications. Therefore, I argue that it is better for a company to increase gender diversity on the board voluntarily rather than forcing it.

Thus, This study implies that the most important focus for Sri Lankan public quoted companies should be the balance between women and men rather than simply the presence of women. The researcher also points out that firm value has no influence on women's presence and on gender diversity. Thus, overall result suggests, at a minimum, that increased gender diversity can be achieved without destroying shareholder value, and that investors may in fact value the contribution given by female directors.

5. Conclusion and Policy Discussion

This study concludes that gender board diversity influences efficiency of capital allocation of the corporate firms in Sri Lanka. The variables of Tobin Q and value-added growth were used to measure efficiency of capital allocation. Based on the test statistics it was evident, gender of the board members appears to have ramifications for the capital allocation process and efficiency.

The research findings consisted with the study findings conducted by Simkins and Simpson (2002). They examined the relation between board diversity, defined as percentage of women on the board, and firm value for a sample of 637 Fortune 1000 companies. According to Carter, Simkins and Simpson (2002) the companies with two or more women on the board perform better than the companies with no women on board of directors as

measured by Tobin's Q (1.58 versus 1.03) and ROA (5.2% versus 2.5%).

Thus, the study found a favorable relationship between the quality of investment prospects and the amount of money invested in companies run by female CEOs, while this relationship is far weaker in companies run by male CEOs.

The study assumes in over -view of its whole research work that Sri Lankan listed companies would have experienced the positive impact from the gender board diversity in terms of financial performance and Efficiency of Capital Allocation. Although an increase to be seen recently in female participation in the workforce, the listed companies is still having very low female representatives on its company boards and higher managerial positions while there is potential merit in introducing more opportunities to female for education, management, and leadership training to enhance their skills.

It is suggested that providing flexible working arrangements, along with education and training, would give female more opportunities to enter board and contribute to the company. Women through education initiatives are likely to be beneficial to good governance on firms. A scheme of this nature has recently been introduced in Australia. However, Sri Lanka is country with male-dominant society, so it would be necessary to implement social programs in place to reduce the feeling of being 'female' in a social group. Such program would reduce boundary heightening and exaggeration of dominant male between male dominant group and female minority group in the workplace. The program would reduce negative workplace experiences for female groups, and then improve monitoring and reducing agency costs. The country's institutional structure also needs to be reformed and strengthened, thus reducing the high uncertainty, information asymmetric problem, political influence, and government expropriation, and paving way for female board member performance.

Finally, the study has addressed the endogeneity of gender diversity in performance regression and agency costs regression. Although a positive relationship between gender diversity in the boardroom and firm's financial performance is often cited in the previous literature and popular press, most early research studies are not sturdy in addressing the endogeneity of gender diversity. Therefore, it seems that clear attractive relationship between gender diversity on board and firm's financial performance is still unsolved.

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