



## BOARD GENDER HETEROGENEITY ON SHAREHOLDERS WEALTH

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### **Abstract**

*A constitutional review in 2010 and subsequent legislation in Kenya triggered a call for all gender representation in all spheres of life. Subsequently, a growing inclusion of gender heterogeneity in corporate boards has been experienced. This heightens the dilemma on whether gender heterogeneous firm boards maximize shareholders wealth. This article adds more insights in a Kenyan context on the link between board gender heterogeneity and shareholders wealth maximization for listed firms based on data from 2010 to 2018. These results reveal that listed firms have a higher proportion of male directors on the boards while Shannon and Blau indices reflect medium diversity in boards. Further, the results reveal that irrespective of the measure adopted, gender heterogeneity exert positive effect on the shareholders value. This implies that investors derive value from heterogeneous boards.*

*Keywords: Corporate Governance; Board Gender Heterogeneity; Shareholders wealth; Shannon index; Blau Index*

### **INTRODUCTION**

The board of directors directs a corporate strategy as well as enhances the corporate governance role in firms. In this line, the size and composition defines independence of a board which subsequently influences the effectiveness in monitoring and protecting shareholders interest (Adams and Ferreira, 2009). To this point, the composition of gender heterogeneous board has attracted an increased academia, regulators and media attention in recent years. Kenya promulgated a new constitution in 2010 and article 81 (b) states that the representation of the people shall comply with among other principles not more than two-thirds of the members

of elective public bodies being of the same gender. This led to the inclusion for all gender in many sphere in life including in corporate boards and specifically related to female representation. Srinidhi et al. (2020) indicate that inclusion of women on boards remains notably low and are the minority on most corporate boards. Meanwhile, Dobbin and Jung (2011) opine that women sitting on corporate boards is becoming popular.

Board gender is one of the aspects of gauging firm board heterogeneous save for the background, age, race, experience and ethnicity, among others. Indeed, Julizaerma and Sorib (2012) contextualize gender heterogeneity as tapping diverse characteristics and skills in men and women that are beneficial to firms. This points to a fact that board independence can be promoted where board member come from different backgrounds. On this point, Shehata (2013) argue that the entry of more women enrich independence of boards by disrupting the existing male-dominated networked boards. Campbell and Minguez-Vera (2008) opine that improved gender diversity can be attained without destroying shareholder wealth. The board heterogeneity measures in past studies include the share of female directors on the boards as well as adopting Blau and Shannon indices. Dobbin and Jung (2011) adopt log odds of women directors in the board.

An autonomous board can safeguard investors' interests through effective monitoring (Hermalin & Weisbach, 2003). Indeed, the inclusion of women in boards may bring a pool of different skill set and experiences. Dobbin and Jung (2011) opine that gender diversity can enhance efficacy and monitoring capabilities of boards. Carter et al. (2003) opine that demographic diversity of the board is one dimension of board structure that can results in improved governance. In addition, Srinidhi et al. (2020) argue that female directors act as catalysts to implement norm changes on the board which enrich governance. However, less independent boards may lead to inefficient allocation of investors' resources. Boubaker, Dang & Nguyen (2014) argue that nominating women on board may impair governance quality in case of appointment of directors who are less experienced and social club acquaintances. Meanwhile, Dobbin and Jung (2011) predict bias where institutional investors appoint female directors on boards and further argue that heterogeneity may stimulate conflict in a team.

Shareholders wealth connotes the value to investors usually based on expected futures incomes. Firms that undertake optimal investments with a board in place who set up sound governance practices and policies are able to safeguard and maximize shareholders wealth. Hermalin and Weisbach (2003) argue that board diversity trigger board actions that can maximize shareholder value. However, Gregory-Smith, Main, and O'Reilly (2014) finds no support for the argument that gender diverse boards enhance corporate performance.

The motivation for this article stems from extant literature of mixed results on the bond between gender heteronomous boards and shareholders wealth. Moreover, extending the study in the Kenyan context companies listed at the Nairobi Securities Exchange (NSE) while adopting alternative measures of gender heterogeneity deepens the knowledge base regarding boards compositions that create value to shareholders. In this case, utilizing more recent data, do heterogeneous boards enrich corporate governance practices that enhance shareholders wealth of listed firms in Kenya?

The remainder of this paper is structured as follows. Section 2 discusses theoretical and empirical literature on the relationships between gender heterogeneity and shareholder wealth maximization. Section 3 details the data and methodology framework. Section 4 describes results and discussion. Section 5 presents the conclusions and recommendations.

## LITERATURE REVIEW

The agency theory by Jensen and Meckling (1976) highlights the separation of ownership from management. The arising conflicts thereof necessitate setting up of sound governance practices and policies inform of a board of directors who engage in effective monitoring of firm executives. Moreover, Bantel and Jackson (1989) perspective concerning value adding boards contend that heterogonous groupings resolve problems better than homogenous teams since diversity in personalities enriches efficiency in management and problems solving paradigms.

A proliferation of empirical research on heterogeneous board has attempted to expound on the connection to shareholder wealth maximization. However, the discourse report mixed results of the nature of link between board diversity and shareholders wealth. To start with, Srinidhi et.al (2020) provide evidence on how female directors improve board governance of U.S listed firms for the 2004 to 2015 period. Although the study adopted a binary variable to measure the representation of female directors in regression analysis, it was reported that female directors act as process change catalysts so as to achieve significant board outputs.

Appiadjei, Ampong and Nsiah (2017) examine 34 listed companies in Ghana from 2010 to 2014 and show a positive causality between return on equity and ratio of female on the board. However, the result were gauged at 10% significant level. Moreover, Boubaker, Dang and Nguyen (2014) explored whether board gender diversity improve the performance of 105 large French firms traded on the Paris Stock Exchange from 2009 to 2011 yielding 284 firm-year observations. The study considered a dummy variable proxy to capture presence of female director as well as percentage of women on the board to operationalize board gender diversity. A two-stage least-square regression results confirmed that presence of women on boards on boards lower the performance while a dummy variable proxy for diversity indicated insignificant

effect on value. An extension in this article based on Shannon diversity utilizing recent data provide more insight.

Carter et al. (2010) disclose no evidence of a negative link between board diversity and performance by investigating 641 S&P 500 firms in the period 1998–2002. Their fixed effect regression results of 2,563 firm-years show a non-significant relationship between diversity with the Tobin Q. Moreover, the results revealed a positive and significant connection with return on assets. In an earlier research, Carter et al. (2003) investigated fortune 1000 firms and report a positive relationship between board gender diversity and Tobin's Q, on controlling for size, industry as well as other corporate governance elements.

A study by Gregory-Smith, Main and O'Reilly (2014) examine the bond between gender diversity and performance for 350 U.K. firms. The study results reflect no impact of diversity on performance in cases of gender-bias in the appointment of women and discrimination of the emolument paid. On the contrast, Campbell and Minguez-Vera (2008) using panel data methodology investigate the relationship between the gender diversity of the board and performance of 68 companies from Spain between 1995 and 2000. The diversity was pegged on the ratio of women on the board and by using the Shannon and Blau indices. The results show that board gender diversity has a positive effect on value proxied by Tobin's Q. A Kenyan context in this current article offer further insights on the gender heterogeneity-value link.

Dobbin and Jung (2011) investigate the effect of board gender composition on Tobin's q and Return on assets (ROA) of American corporations using panel data from 1996 to 2007. The study model log odds of women directors in boards to measure diversity and adopt a fixed firm effects analysis. The results indicate that inclusion of female directors do not affect ROA but have significant negative effect on Tobin's q. Incidentally, Adams and Ferreira (2009) investigated the impact of proportion of women in boards using US firms using data for the period from 1996 to 2003 on market-based and accounting measures of performance. The results show that the effect of gender diversity on performance is negative and gender quota policy initiatives do not necessarily lead to improvements in governance. Meanwhile, Hermalin and Weisbach (2003) surveys research on firm boards and report that size and composition define boards' independence. Further, the survey reveals that firms with higher proportions of external directors and smaller boards tend to make better firm decisions. Moreover, they contend that composition of boards and value are endogenous.

The empirical studies reviewed reveal a mixed results on the relationship between board gender heterogeneity and shareholders value. Moreover, different statistical methods are employed in a variety of context. To this end, the delight in this article is to enrich current findings on the role for gender diversified boards in the Kenya context where there has been a

surge in women in board in listed firms in compliance with the Kenya Constitution promulgated in 2010. Thus the null hypothesis tested: The relationship between gender heterogeneity and shareholder wealth maximization of firms listed at the Nairobi Securities Exchange is not significant.

## RESEARCH METHODOLOGY

The dataset was obtained from 56 listed companies that yielded 456 corporate-years of data. The data used in the analysis was for the period from January 2010 to December 2018. The period was chosen since year 2010 marked the transition to a new constitution in Kenya while the upper cut off of 2018 enabled to obtain current data. Data on board gender, total assets and leverage was extracted from the firms' annual reports while market capitalization was obtained from Nairobi Securities Exchange.

Gender board Heterogeneity is based on three alternatives measures from previous studies; Proportion of women in a board, Shannon index and Blau index. The proportion of women in a board is a ratio of female directors to the total board members as adopted by many previous studies (for example, Carter et al. 2003; Boubaker et al., 2014); Campbell and Minguez-Vera, 2008). Shannon (1948) index of heterogeneity is represented by the formula  $H' = -\sum \left[ \left( \frac{P_i}{N} \right) \ln \left( \frac{P_i}{N} \right) \right]$  where  $P_i$  is the relative proportion of each gender. The index account for both evenness and abundance of the members gender category in the board. Blau (1977) index of heterogeneity is based on the formula  $(1 - \sum p_i^2)$  where  $p_i$  is the proportion of each gender of board members. This index measures the distribution of male and female directors in the boards. The index value range from zero to a maximum of 0.5 that denote an equal distribution of gender in the boards. Shareholders value is based on Chung and Pruitt (1994) estimation of the market value of the firm as a ratio of the replacement (book) value to the assets. The summary measurement for all variables is displayed in Table 1.

Table 1: Variable Measurement

Variable	Abbreviation	Proxy
Shareholder worth	TQ	Market value of equity plus debt to total assets
Gender heterogeneity (1)	PWD	Proportion of women in a board
Gender heterogeneity (2)	Shannon	Shannon Diversity Index
Gender heterogeneity (3)	Blau	Blau Diversity Index
Board Size	Bsize	Logarithm of number of board members
Firm Size	Fsize	Logarithm of total assets
Leverage	Leverage	Debt/equity ratio

Hermalin and Weisbach (2003) contend that firms board composition and value are endogenous. In order to control endogeneity in line with Boubaker, Dang and Nguyen (2014); and Campbell and Minguez-Vera (2008), a two stage least squares methodology is employed. The methodology involves adoption of an instrumental variable approach that is considered to impact only on the dependent variable by way of influence through the independent variable. In consistent with Boubaker et al. (2014); and Campbell and Minguez-Vera (2008), the firm board size is treated as an instrumental variable that explains gender heterogeneity. The shareholders wealth is the dependent variable for the first equation while for the second, gender heterogeneity is the dependent variable. The equations are outlined as follows:

$$\text{Shareholders value}_{it} = \beta_{10} + \beta_{11} \text{Heterogeneity}_{it} + \beta_{12} \text{Control Variables}_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

$$\text{Heterogeneity}_{it} = \beta_{20} + \beta_{21} \text{Shareholders value}_{it} + \beta_{22} \text{Control Variables}_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

The instrument test of relevance based on F test was conducted to establish whether board size is correlated to heterogeneity index and meets the exogenous criteria. Further, in order to diagnose the robustness of the results that indicate whether the 2SLS results are different from OLS results, Wu-Hausman Chi-square test was used. Further, consistent with Boubaker et al. (2014) and Campbell and Minguez-Vera (2009), firm size and leverage are included as control variables.

## ANALYSIS AND FINDINGS

### Descriptive Statistics

Table 2: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Shareholders' Wealth	456	0.30	6.20	1.17	0.96
Board Size	456	4	14	9.05	2.47
Proportion of Women	456	0	0.60	0.19	0.13
Shannon Index	456	0	2.60	1.54	0.76
Blau Index	456	0	0.50	0.27	0.15
Assets (Sh. millions)	456	158.305	646,668.00	71,183.021	107,291.72
Leverage	456	0	1.60	0.61	0.28

The descriptive statistics summary in Table 2 shows that shareholders wealth approximation based on Tobin's Q reveal a mean value of 1.17 with a standard deviation of 0.96. The minimum and maximum value representing the shareholders wealth was 0.30 and 6.20 respectively. The mean board size is 9.05 with a minimum of four and a maximum of fourteen directors. This observation of the board members is considered as within an optimal board size.

The mean proportion of women on listed company's boards of directors denoting a measure of heterogeneity is 19 percent, a sign that female directors are few on the boards of listed corporates. Incidentally, the highest board representation by women was at 60 percent. Moreover, the results show evidence that some boards are wholly dominated by only men directors. In addition, Shannon index mean of 1.54 point to medium diversity in boards. However, the maximum index at 2.60 shows a case of skewed representation by one gender in corporate boards which signifies dominance in representation by a single gender and thus men and women do not have equal opportunity for representation on listed boards. As regards, the mean value of the Blau index was 0.27 shows a moderate heterogeneity index. The maximum of 0.5 Blau index signifies that some boards have equivalent number of women and men while an index of zero reveal boards dominated by only men directors. Further, the descriptive statistics summary show the average firm size of Sh. 71.183 billion worth of assets. The minimum and maximum sizes Sh. 158 million and Sh.646 billion respectively worth of assets that reveal a wide variation in firm sizes. The results also indicate that the mean equity to debt ratio was 0.61 which reveals a slightly more than in average financing in terms of debt by the listed firms. The minimum value of zero denotes that some firms had no debts while the maximum of 1.60 signify that the firms relied on Sh.1.6 in debt for every shilling of equity employed.

### Correlation Analysis

Table 3: Pearson's Pairwise Correlation Analysis

	Shareholders Wealth	Proportion of Women	Shannon	Blau	Board size	Firm Size	Leverage
Shareholders Wealth	1						
Proportion of women on boards	.252** .000	1					
Shannon index	.007 .878	.325** .000	1				
Blau Index	.234** .000	.947** .000	.503** .000	1			
Board size	.216** .000	.277** .000	.382** .000	.347** .000	1		
Firm Size	-.038 .422	.191** .000	.325** .000	.251** .000	.528** .000	1	
Leverage	-.065 .163	.185** .000	.257** .000	.238** .000	.231** .000	.501** .000	1

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



A summary of the bivariate correlation of the variables is illustrated in Table 3. The correlations of alternative measures of gender heterogeneity are positive and significantly related to shareholders wealth other than the Shannon index that is not significant. Incidentally, board size is positively correlated with shareholders wealth. Meanwhile, firm size and leverage are negatively associated with shareholders wealth.

### Regression Analysis

The results of 2SLS analysis of the effect of board gender heterogeneity and shareholders wealth are presented in table 4, 5 and 6 while employing the alternative measures of board gender heterogeneity. Firstly, table 4 presents the regression analysis based on the proportion of women in the board as the diversity index.

Table 4: Regression of the Proportion of women in the Board on Shareholders Wealth

Variable	Shareholders Wealth (2SLS)	Diversity Index Proportion of women
Intercept	1.4692	-0.0768
	0.05297	0.3168
Shareholders wealth		0.0282***
		4.69e-06
Proportion of women in the board	7.3058***	
	0.000536	
Board Size		0.1011***
		0.00015
Firm size	-0.04485	0.00039
	0.21085	0.92622
Leverage	-0.69157 **	
	0.006665	
Wald Test	6.718	19.88
	0.0001922	4.05E-12
R <sup>2</sup>	...	0.1107
Weak Instrument F-Test	31.83***	
Wu-Hausman Test X <sup>2</sup>	12.22***	

\*p<.05; \*\*p<.01; \*\*\*p<.001

The results in Table 4 shows the link between board heterogeneity based on Shannon index and shareholders wealth while controlling for endogeneity by adopting two stage regression. The analysis show that Wu-Hausman Chi-square test ( $X^2 = 12.22$ ,  $p = 0.00$ ) is significant and



hence failure to accept the null hypothesis indicates that the 2SLS results are different from OLS results. Moreover, the significance of the weak instrument F-test reveals that the instrumental variable explains the regressor (gender heterogeneity) and in that case, board size is a valid instrument. Furthermore, in predicting gender diversity, the board size instrumental variable exhibit significant relationship ( $\beta = 0.1011$ ,  $p = 0.00$ ). The firm size and leverage incorporated in the analysis as control variables have negative effect on shareholders wealth, though the effect of size was not significant.

In sum, from the aforementioned Table 4 results, there is support to show that the proportion of women in the board as a proxy for diversity index is directly and significantly ( $\beta = 7.3058$ ,  $p = 0.00$ ) related to shareholders wealth. This result suggest that inclusion of women directors' on the firm boards contribute towards improving the shareholders value. However, it is inconsistent with Boubaker et al., (2014) and; Adams and Ferreira (2009) who argue that women on boards proportion is negatively related to performance.

Table 5 presents the analysis based on the Shannon index in the board as the diversity index.

Table 5: Regression of the Shannon index of diversity on Shareholders Wealth

	Shareholders wealth (2SLS)	Diversity Index: Shannon
Intercept	2.98546***	-1.20251**
	0.000579	0.00627
Shareholders Wealth		0.04854
		0.16437
Diversity Index: Shannon	1.16078***	
	0.000347	
Board Size		0.88243***
		8.28e-09
Firm size	-0.12713**	0.03799
	0.009032	0.11882
Leverage	-0.63363 *	
	0.023654	
Wald Test	37.78	30.27
		2.20E-16
R <sup>2</sup>	...	0.1618
Weak Instrument F-Test	47.88***	
Wu-Hausman Test X <sup>2</sup>	24.75***	

\*p<.05; \*\*p<.01; \*\*\*p<.001

Table 5 shows the regression results for link between board heterogeneity based on Shannon index and shareholders wealth. The Wu-Hausman test for this model was significant ( $X^2= 24.75$ ,  $p = 00$ ), an indication of endogeneity bias in the OLS estimate, thus 2SLS regressions yield more precise coefficients. An increased proportion of female directors may exhibit homogeneity thus Shannon index that capture diversity based on the mix of gender is adopted in this phase of analysis. The control variables of firm size and leverage still reveal negative but statistically significant effect on shareholders wealth as compared to results in Table 4. The results indicate that the instrument relevance test of board size is statistically significant. Similarly, the coefficient obtained when predicting heterogeneity index in the first stage regression is ( $\beta = 0.88243$ ,  $p=0.00$ ) which is positive and significant.

The Shannon index coefficient of diversity show a statistically significant positive ( $\beta = 1.16078$ ,  $p=0.00$ ) effect on Shareholders value. However, the magnitude of the beta based on proportion of female directors is greater that outlined in Table 4 for Shannon index. Moreover, the results suggests that heterogeneous boards are value enhancing for listed companies in Kenya. The Shannon index coefficient of board heterogeneity is ( $\beta = 1.1607$ ,  $p =0.00$ ) and is statistically significant at the 5% level. This denotes that heterogeneous boards are associated with better shareholders value. In this case, heterogeneity in board seem to improve monitoring and efficacy of firm management. The findings is in line with Campbell and Minguez-Vera (2008) whose results show that board gender diversity improves performance for Spain companies.

Table 6 presents the analysis based on the Blau index in the board as the diversity index.

Table 6: Regression of the Blau index of diversity on Shareholders wealth

	Shareholders wealth (2SLS)	Diversity Index: Blau
Intercept	2.01011*	-0.1839*
	0.01090	0.0425
Shareholders Wealth		0.02923***
		5.77e-05
Diversity Index: Blau	5.63814***	
	0.00033	
Board Size		0.13817***
		1.07e-05
Firm size	-0.0738	0.00505
	0.05870	0.3153

Leverage	-0.7149**		Table 6...
	0.00503		
Wald Test	16.55	25.15	
	0.00087	4.58E-15	
R <sup>2</sup>	...	0.1374	
Weak Instrument F-Test	38.44***		
Wu-Hausman X <sup>2</sup>	12.69***		

\*p<.05; \*\*p<.01; \*\*\*p<.001

The results in Table 6 show the regression results for link the between alternative board heterogeneity index based on blau index and shareholders wealth. The results show that the blau diversity index coefficient for heterogeneous boards is positively related to shareholders wealth. The results are similar to results in Table 4 and 5 in terms of the relationship between alternative measures of gender heterogeneity and shareholders value. The evidence support the view that heterogeneous boards have enriching effect on the value of the listed firms. The findings is in line with Campbell and Minguez-Vera (2008) whose results show that board gender diversity based on blau index improves performance for Spain companies. In contrast to the results, Carter et al. (2010) disclose no evidence of causation for either positive or negative from board diversity to financial performance of S&P 500 firms. Board size as an instrumental variable has a positive and significant effect as a function of blau diversity index. This is in congruence with Boubaker et al., (2014) findings that big corporates with larger boards are expected to appoint women directors.

## CONCLUSIONS

Overall, the findings are considered robust since they are based on three alternatives of gender heterogeneous index. The findings reveal that irrespective of the measure for gender heterogeneity adopted, it was found to exert positive effect on the shareholders value. This implies that investors derive value by considering heterogeneous boards. In this case, heterogeneity in board seem to improve monitoring and efficacy of firm management.

In essence, policy and practitioners ought to strive to include all gender in boards so as to harness their value contribution. An all gender inclusive heterogeneous board seem to enhance value through diversity in perspectives perhaps stimulating sound corporate governance. Moreover, it provides practitioners relevance of gender heterogeneity in boards so as to harness the benefits of gender heterogeneity. The study recommends continued inclusion of all gender categories in boards so at to enhance value for shareholders. Indeed, the study

provides empirical support for Constitution enactment requiring consideration of gender quota. Further insights on value-diversity paradigm can be based on investigation relying on current data and other aspects of diversity such as background, age, race, among others.

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