

# Board Size and Financial Performance of Commercial Banks in Kenya

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## Abstract

Board of directors are individuals appointed to oversee the operations of the firm by shareholders. They ensure that operations of the firm are carried out in a more effective manner. Board size as part of board characteristics contributes positively to the firm's financial performance. Due to agency problems, board size had been expanded to incorporate a variety of expertise and interest groups. However, there is no one board size fit all, the size is determined by the industry and the country of operation. Begging the need for examination of the influence of board size on return on equity of commercial banks operating in Kenya. The target population was 43 commercial banks in operation in Kenya as at 31st December 2017. Secondary data on board size as independent variable and return on equity as a dependent variable for 34 commercial banks for the years 2008 to 2017 was obtained from the internet and perusal of the annual accounts of the individual commercial banks. The study adopted causal research design. Using STATA Version 13 to analyse data, the study used 2W both descriptive and inferential statistics. Based on the analysis, the study concluded that overall, board size had a negative but significant influence on return on equity on commercial banks in Kenya. The study also found that board size had a positive and significant influence on return on equity across time. However, in regard to time, board size had a negative but significant variability on return on equity across time. In the case of across banks, board size had a negative but significant influence on return on equity across banks. In consideration of the individual banks, board size had a positive and significant variability on return on equity across banks. The third aspect of groupings, board size had insignificant influence on return on equity across peer. While on individual groups, board size had a positive and significant variability on return on equity across peer. The study recommended a board size of between 6 and 10 board members to embrace a mixture which caters for various interests to facilitate better financial performance.

**Keywords:** Board Size, Return on Equity, Commercial Banks in Kenya

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## 1. Heading

The banking sector is the backbone of the economy in facilitating financing activities to all sectors. The sector facilitates growth and stability in the economy which grows faster than GDP (Tomsik, 2014). In the Kenyan perspective in the year 2016, commercial banks had a combined total assets Kshs 3.7 Trillion and total revenue Kshs 502 Billion (CBK, 2016). The banking sector is under the supervision of the Central Bank of Kenya (CBK) which is mandated to regulate the industry. Towards this end, the regulator clarified and enhanced regulatory guidance on critical areas such as corporate governance, disclosures, improved quality of assets, and integrity of ICT systems (CBK, 2016).

According to CBK (2013) shareholders are to ensure credible board members are appointed who are to add value to the bank. They should also hold the board accountable and responsible for effective and efficient corporate governance of the commercial bank. Wessels and Wansbeek, (2016) posits that corporate governance is the control, direction and exercising authority in a firm. Brown and Casey (2012) further states that corporate governance are the controls of public businesses consisting of both legal and non-legal practices and principles of running the business. Through corporate governance, the board prepares strategies, procedures, programs and policies that guide management in their day to day actions in the firm thus aligning the interests and actions of the management to that of the corporate (Blair & Knight, 2013). Studies have revealed that board characteristics have contributed positively to firm performance (Terjesen, Couto & Francisco (2015).

According to OECD, through enforcement of good corporate governance in a firms would spur economic growth

of an economy. Akpan and Amran (2014) defines board characteristics as attributes of the board. It is for this reason that several and confounding studies relating to board characteristics and financial performance have been done in Kenya and elsewhere. Previous studies on board size depict mixed findings on how board size influence financial performance of a firm. Yasser, Entebang and Mansor (2015) found an average board size of nine in Pakistan considered to be small. Ahmed and Hamdan (2015) recommends board composed of 12 members as an ideal board membership in their study on the influence of corporate governance on firm performance in Bahrain Bourse. Abdulazeez, Ndibe and Mercy (2016) examined how corporate governance influence financial performance of listed deposit money banks in Nigeria and found that larger board size influenced positively and significantly bank performance than smaller boards. On the contrary, Adebayo, Olusola and Abiodun (2013) examined the relationship between corporate governance and organizational performance in Nigerian listed organizations and concluded that board size had a negative and significant relationship with bank performance. Oyerooba, Memba and Riro (2016) evaluated how board size and firm characteristics influenced profitability of Nigerian listed firms and established that there is a significant positive relationship between the board size, firm size and return on capital employed in the Nigerian listed companies.

This study focused on the influence of board size on the return on equity of commercial banks from the perspective of firm owners who anticipate maximum return on their investments. Therefore, firm owners shall constitute the board which ensures their investment returns are achieved through recruitment, supervision and monitoring senior management actions with a view of constraining them from exercising their discretion. The board is tasked to devise policies which will attract competent brains to the firm aligning interests of management to that of the owners of the firm (Aaron, Harris, McDowell & Cline, 2014).

## **2. Review of Theory, Literature and Hypothesis Development**

Agency theory is based on the principal and agent relationship. Jensen and Meckling (1976), the proponents of agency theory, argue that agency problems stem from the corporate governance options of the shareholder (principal) and the activities of the management as the agents. According to Filatotchev and Wright (2011), agency theory is viewed as a mechanism which narrows that gap that exist between the agent and the principal. Agency theory mitigates conflicts between the agents and the principal (Fama & Jensen, 1983). The theory addresses the issues of whether the agent is acting to the best interest of the owners of the firm. This arose as the businesses expanded and investors were not able to manage the businesses which required advanced technical and skill (Yuvaraj, 2011). Consequently, investors had to appoint suitable board members to monitor and supervise their businesses on their behalf (Malaysian Corporate Governance Blueprint, 2011). As a result, the board had to execute their fiduciary duties and at the same time represent firm owners (Odudu, James & James, 2016). As the ultimate decision-making organ, board members have professional duty to manage agency problems by instituting mechanisms and appropriate monitoring systems (Ongore, K'Obonyo, Ogutu, & Bosire., 2015).

With the expansive of businesses, it has become impossible for the board members to manage the businesses (Ongore *et al.*, 2015). In the process of managing the business, the agents pursue sub-optimal decisions which take into consideration interests of their own, which have been characterized through insider dealings, adverse choices and moral hazards. Yasser, Entebang and Mansor (2015) argues that board size should be limited to a good number and have a mix which is beneficial to the firm to cater for diverse interests.

With the popularity of agency theory as corporate governance mechanism, some limitations have been cited by recent studies (Brudney, 1985) due to its inability to explain the psychological and sociological inbuilt mechanism of the agent and principal association. The onus of making day to day decisions is left to the agent who are the management. The managers who much sought for to manage the business have a conflict of interest.

Shareholders have to appoint the right size of the board which will run the business. However, studies have found conflicting findings as to the effect of board characteristics on performance of a firm. Naushad and Abdul (2015) evaluated the effect of board characteristics on bank performance in the Gulf area and found adverse association between board characteristic and bank performance. However, Adams and Mehran (2012) found a positive influence of board characteristics on bank performance. According to Adebayo, Olusola and Abiodun (2013) efficient boards need to be able to monitor effectively, give adequate advice and enhance value to the shareholder. Therefore, a positive relationship between board characteristics and financial performance of a firm is expected.

Several confounding studies relating to board size and financial performance have been carried out around the globe. Mamatzakis and Bermpei (2015) found board size to have a negative influence on firm performance. Yasser, Entebang and Mansor (2015) posit that due to agency problems, board size had been expanded to

incorporate a variety of expertise and interest groups. In the process non-value adding are incorporated into the board. However, there is no one board size fit all, the size is determined by the industry and the country of operation (Bijalwan & Madan, 2013). Abdulazeez, Ndibe and Mercy (2016) examined how corporate governance influence financial performance of listed deposit money banks in Nigeria and found that larger board size influences positively and significantly bank performance than smaller boards in Nigeria.

In the Kenyan context, Shavulimo (2014) found a positive relationship between board size and firm performance whereas Mandala, Kaijage, Aduda and Iraya (2018) found moderate ideal board size for the performance of banks in Kenya. However, CBK (2013) guides that board size should be at least five members of the board and the size should take into consideration the operations, the scope, the complexity and the size of the banking institution in order for the board to be effective.

Board size is the number of board members sitting in the board during the year. However, some scholars have advocated for smaller board size being more effective than larger board sizes (Uwuigbe & Fakile, 2012). Proponents of larger boards posit that larger board improves performance (Akshita, 2016). Large board size facilitates information gathering and informed decision making process.

Based on the above arguments, it is hypothesized that:

**H<sub>01</sub>:** Board size has no significant influence on financial performance of commercial banks in Kenya.

### 3. Methodology and Data

Causal research design was employed in the current study whereas secondary panel data was collected. Targeted population was 43 commercial banks, the study adopted a census sample technique. The purpose for using commercial banks was guided by the role played by the financial sector in any economy: resource mobilization, facilitation of payment settlements and savings depositories and it is the driving force of the economy (King & Levine, 1993). This study collected secondary data from 34 commercial banks annual accounts published in their websites, Central Bank of Kenya and Think Business Banking Survey. The study obtained 340 observations.

The independent variable of this study was board size and the dependent variable was financial performance proxied as return on equity. This was consisted with Adebayo, Olusola and Abiodun (2013). The study measured board size (BS) as the number of board members sitting in the board in a year while return on equity (ROE) was a ratio of profit before tax to equity.

The study employed bivariate fixed effect regression model of analysis within the panel data framework and the multiple regression model is of the following form:

$$y_{it} = \beta_1 x_{1,it} + \dots + \lambda_1 D_i + \lambda_2 D_{2i} + \dots + \lambda_n D_{ni} + \mu_i \dots \dots \dots 1$$

Where Y= is the dependent variable ROE.

Subscript i and t represent firm and time period respectively.

$\beta_1$  are regression coefficients.

$X_1$  = Number of board members (BS) sitting in the board within the year

$D_1$  to  $D_{ni}$  are the dummy variables where n is equivalent number of variables.

$\lambda_1$  to  $\lambda_{ni}$  is the slope

$\mu_1$  error term.

### 4. Results and Discussion

#### 4.1 Descriptive Statistics

Board size was measured as the number of board members who attended the board meetings of the commercial banks during the year under consideration (Adebayo, Olusola & Abiodun, 2013). Table 1 reveals the descriptive analysis of annual mean, standard deviation and coefficient of variation of board size across the period. The analysis involved 34 commercial banks for the years 2008-2017. This amounted to 340 data points for a panel data. Looking at the board, the results indicate that on average board size for the banks surveyed were 7.8 (say 8 board members) in 2008 with steady increase to 8.7 (say 9) board members in the year 2017. While the coefficient of variation ranges from a minimum of 0.2436 in the years 2014 and 2015 to the highest being 0.2630 in the year 2009 during the period under review. The coefficient of variation (CV) usually expressed as a percentage was calculated as standard deviation divided by the mean. Coefficient of variation is a measure of dispersion from the mean. The higher the results of the CV means the dispersion is higher from the mean. This means that the lowest was 24.36 percent in the years 2014 and 2015 while the highest was in the year 2009 at

26.30 percent. This means that in the earlier years the dispersion was higher than the latter years.

The CV obtained was lower than that of Manini and Abdillahi (2015) who found a CV of 43.50 percent in their study on the role of corporate governance mechanism and financial performance of commercial banks in Kenya. Mandala, Kaijage, Aduda and Iraya (2018) studied effects of board structure on the financial institutions in Kenya found CV of 34.18. Further afield, Bebeji, Mohammed and Tanko (2015) found a CV of 20.11 percent in their examination of the impact of board size on the performance of the Nigerian commercial bank which is lower than this study while Jackling and Johl (2009) found a CV of 27.51 percent in their investigation of the impact of board structure on corporate performance in India's top companies which is higher than this study.

Huang, Lai, McNamara and Wang (2011) who examined influence of corporate governance and efficiency in the US property liability insurance institutions evaluated influence of board size in different industries found CV of 24.47 percent. De Cabo, Gimeno, and Nieto (2012) studied impact of board size on the performance of European commercial banks found CV of 65.47 percent. CBK (2013) provides some guidelines on the commercial banks to have a minimum board membership of 5 of whom two thirds shall be independent directors. Further, the result depicted that board size deviate from the mean by 1.9767 in 2008 rising to between 2.0934 and 2.1989 in the years 2009 and 2017 respectively. This is an indication that board size does not vary much from the mean. Table 1 shows the annual mean, standard deviation and the coefficient of variation of the board size in the Kenyan commercial banks.

**Table 1: Annual Mean Board Size Across the Industry**

Year	Obs	Mean	Std. Dev.	Coefficient of Variation
2008	34	7.8235	1.9767	0.2527
2009	34	7.9706	2.0960	0.2630
2010	34	8.1471	2.1339	0.2619
2011	34	8.2647	2.0934	0.2533
2012	34	8.3529	2.1445	0.2567
2013	34	8.4118	2.1759	0.2587
2014	34	8.6765	2.1137	0.2436
2015	34	8.6765	2.1137	0.2436
2016	34	8.7353	2.1646	0.2478
2017	34	8.7941	2.1989	0.2500

The results of overall descriptive analysis for board size depict the following: overall mean 8.3853 members (say 8 members) whereas the standard deviation overall had 2.1179 while between had 2.0349 and within had 0.6742. This imply that overall variability was higher than between. Whereas, within had the least variability. This study contradicts Uwuigbe and Fakile (2012) in studying influence of corporate governance in Nigerian financial sector found a mean of 13 board members and a standard deviation of 2.48. The study also contradicts Arora and Sharma (2015), who examined influence of board characteristics on corporate performance on the Indian firms found a mean of between 4 and 5 board size. Terjesen, Couto and Francisco (2015) evaluated impact of board size on firm performance in 47 countries globally found CV of 33.54 percent. The overall had a coefficient of variation (CV) of 0.2526 which translates to 25.26 percent. This depicts the dispersion from the mean and is corroborated in table 1 above. Table 2 explains the overall descriptive analysis for the board size of the commercial banks in Kenya for the years 2008 and 2017.

**Table 2: Overall Descriptive Analysis for Board size**

		Mean	Std. Dev.	Coefficient of Variation	Obs.
Board size	Overall	8.3853	2.1179	0.2526	N = 340
	Between		2.0349		n = 34
	Within		0.6742		T = 10

The study performed further analysis on the board size against time (years). Using one-way ANOVA test to ascertain whether there existed a significant change in the annual mean of board size across time. The ANOVA statistics in table 3 reveal F statistic ratio was 0.86 and the p-value of 0.5654. Since the p-value was greater than 5 percent significance level then board size was insignificantly different over the ten-year period under study. This suggested variances in the group are equal. This finding contradict Oyewale, Oloko and Olweny (2016) found board size was significant in determining return on equity in their evaluation of the influence of board size

on the manufacturing corporations in the Nigeria Stock Exchange.

Table 3: Board Size One-way ANOVA Against Time

Source	Sum of Square	Df	Mean Squares	F	Sig.
Between groups	34.6735	9	3.8526	0.86	0.5654
Within groups	1485.8529	330	4.5026		
Total	1520.5265	339	4.4853		

Bartlett's test for equal variances:  $\chi^2(9) = 0.4991$  Prob> $\chi^2 = 1.000$

**Lowess Smooth Plot Annual Board Size**

A lowess smooth is a technique which analyses data to produce a smooth set of values from a scatter plot over the period under consideration. Lowess is an acronym for 'locally weighted least squares'. Figure 1 is Lowess smoothed plot of the mean board size with time depicting a gradual increase through the years from 2008 to 2017. The rise starts with 7.9 (say 8 board members) in the year 2008 and closes at 8.8 (say 9 board members) board members. The same was witnessed in table 3 above which revealed that it was insignificant ( $p=0.5654$ ). The rise by one board member over the years could be explained by the increased surveillance by Central Bank of Kenya. The increase is supported by f-statistics = 0.86 shown in table 3

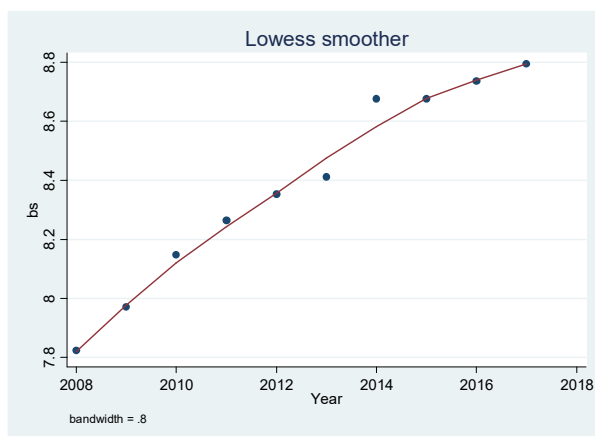


Figure 1: Lowess Smooth Plot Annual Mean Board Size.

**Average Board Size per Individual Commercial Bank**

The study carried out another analysis depicting average board size per individual bank over the period under consideration. Figure 2 reveal how the average individual board size of each bank during the ten-year period. All the large commercial banks comprising 8 banks which had an average board size ranging between 9 and 12 board size. This imply that large commercial banks met the minimum five directors as directed (CBK, 2013). The medium commercial banks are banks whose total assets were between 1 and 5 percent. Medium commercial banks had average board size ranging from 6 and 11. Therefore, medium commercial banks met the minimum of five board member as stipulated by CBK but lower than the large banks. The small commercial banks known as small banks were banks whose total assets were below 1 percent. The small banks had average board size ranging from 4 and 10 also lower than the medium banks. Most of the small banks also met the minimum board size as prescribed by the regulator (CBK, 2013). In summary there is a general decline on average board size from large banks to small banks. Figure 2 reveal at glance the average board size of sampled commercial banks over the period under study.

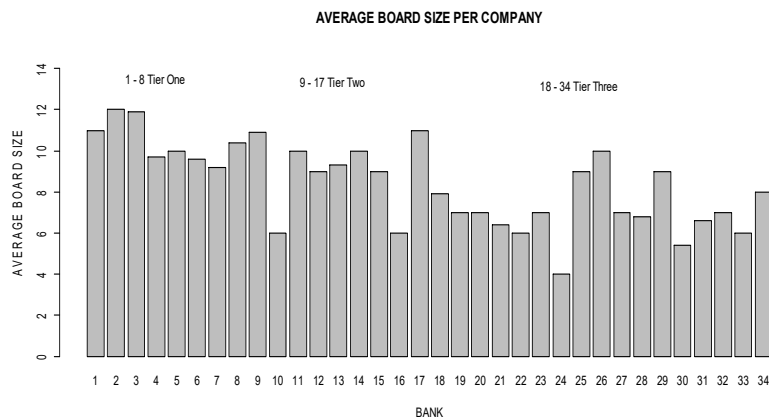


Figure 2 Average Board Size Per Bank

The study further explored the trend of the board size. Appendix I shows trend of the annual mean board size for the years 2008-2017 for each commercial bank. Some commercial banks reveal no growth on board size while others show some increment over the period under study. In summary most banks didn't reveal growth on board size. The vertical axis depicts the board size while the horizontal axis depicts the year.

In summary, the descriptive statistics as shown in table 4 show overall mean, standard deviation and the coefficient of variation for the board size and return on equity. The annual overall mean was 8.4 (say 8) for board members and return on equity a ratio of 0.1298.

**Table 4: Summary of the Descriptive Statistics of the Variables**

Year	Obs	Mean	Std. Dev.	Coefficient of Variation
BS	340	8.3853	2.1179	0.2526
ROE	340	0.1298	0.2188	1.6864

Table 5 presents overall descriptive statistics based on the study variables (board size as independent variables and ROE as a dependent variable). The table 5 shows coefficient of variation of 1.6864 which translates to 168.64 percent. The 168.64 percent coefficient of variation (CV) signified the dispersion of the panel data return on equity from the mean. The mean ROE was a ratio of 0.1298 with a standard deviation of 0.2188. The standard deviation shows that there was minimum variability from the mean. The skewness for the ROE is negative 2.160 which means that the distribution had a longer tail to the left. While kurtosis has 11.2012 which is greater than three, implying a fat tail.

#### 4.2 Normality Test

The study carried out further test to ascertain normality distribution of the data. Both skewness and Kurtosis test were carried out. Skewness ascertains the direction and extent panel data spreads from the mean. While kurtosis measures how sharp the central peak is and its height to the curve. A regression analysis for both ROE and board size were carried out to test null hypothesis that the panel data was normally distributed. The alternative hypothesis was that the panel data was not normally distributed. Table 5 shows skewness and kurtosis test reveal that probability of skewness was 0.0000 implying that the panel data was perfectly symmetrical. Kurtosis was 0.0000 which is less than 3 for a normal distribution. This imply that the data was not normally distributed. The Jarque-Bera test combines both the skewness and kurtosis results. The Jarque-Bera test results value  $prob > \chi^2$  is 0.0000 which is lower than 5 percent significant level. This imply that data distribution was not normally distributed. Table 5 Jarque-Bera test results.

**Table 5 Jarque-Bera Results.**

Variables	Obs	Skewness	Kurtosis	Prob>chi2
residual	340	0.0000	0.0000	0.0000

The study carried out Shapiro Wilk test on the panel data with the objective of determining whether or not the data is normally distributed since the sample size is less than 50 (Shapiro & Wilk, 1965). Shapiro Wilk test is also preferred due to its power properties considered best (Mendes & Pala, 2003). Usually Shapiro test is used when examining the fundamental assumptions of univariate normality. In carrying out the Shapiro test, the theoretical cumulative distribution is compared with the observed cumulative distribution data. The stated null and alternative hypothesis that the data is normally distributed against an alternative hypothesis that the data is not normally distributed

The guiding principle of failing to accept or accepting the hypothesis: when p-value exceeds 0.05,  $H_0$  is not rejected and  $H_1$  is rejected, if the p-value is less than 0.05,  $H_0$  is rejected and  $H_1$  is then accepted (Kilungu, Morck, Shleifer & Vishny 2015). The results reveal p-value <0.05, therefore we fail to accept the  $H_0$  and accept  $H_1$  that the data was not normally distributed. Table 6 Shapiro-Wilk Test results.

Table 6: Shapiro-Wilk Test for Normality

Shapiro-Wilk W Test for Normal Data					
Variable	Obs	W	V	Z	Prob>z
ROE	340	0.8409	37.8850	8.5830	0.0000
BS	340	0.9785	5.1180	3.8550	0.0001

#### 4.3 Unit Root / Stationarity Test

The study applied the panel unit root test was to determine the order of integration of the study variables. The test was carried out after the regression in order to determine whether the variables were stationary or non-stationary.

The results of the test are presented in table 7. From the result under the Levin-Lin-Chu Unit root test, Im-Pesaran-Shin and Harris-Tzavalis for ROE and BS were below 5 percent significance level. This imply rejection of null hypothesis and adopting alternative hypothesis that data was stationary across all levels.

Table 7 Unit Root / Stationarity Test Results

	Levin-Lin-Chu Unit-root test	Im-Pesaran-Shin Unit-root test	Harris-Tzavalis Unit-root test
ROE	-11.4875 0.0000	-3.2734 0.0005	-0.0188 0.0000
BS	-22.1462 0.0000	-2.5087 0.0061	0.2778 0.0563

#### 4.4 Correlation Analysis

Table 8 displays the Pearson-Wise correlation coefficient values between dependent variable (ROE) and independent variables (board size). Examination of the correlation coefficients helps in accepting or rejecting the null hypothesis that there is no correlation between the explanatory variables. The degree of the correlation between two variables ranges between +1 and -1. A correlation of +1 implies that there is perfect positive linear relationship between variables hence problem of multicollinearity (Sekran, 2003). On overall the correlations were below 1. Therefore, all the variables can be used.

**Table 8: Pearson-wise Correlation Coefficient Matrix**

	ROE	BS
ROE	1.0000	
BS	0.3293	1.0000
	0.0000	

Table 8 above show the statistical correlation among the variables. According to Hope-Hailey, Farndale and Kelliher (2010). Values of correlation which are not close to -1 or 1 are an indication that the factors are

exceedingly different measures of separate values. They further posit that the independent and the dependent variables are not correlated. Table 8 show that board size was positively correlated with ROE. The study concluded that board size had a positive relationship with ROE.

#### 4.5 Diagnostic Tests for Random Effects, Fixed Effects or Pooled OLS Models

The study applied diagnostic tests to determine the regression model of the study. Various estimation approaches were applied to the panel data, including; fixed effects model (FEM), pooled OLS and random effect model (REM). The study carried out the following panel data diagnostics tests to identify the best regression model to be adopted in the current study.

#### 4.6 Random Effect Model or Fixed Effect Model – Hausman Test

Based on the multivariate analysis results, the study tested the hypothesis  $H_0$ : Difference in coefficient not systematic and drew conclusions therefrom. To determine which model to use, Hausman test was applied to determine whether fixed effects model or random effects model was to be used (Gujarati, 2007). To choose, the appropriate model between random effect model and fixed effect model, Hausman test was done to ensure validity and reliability of the estimated model parameters.

Table 9 show the results of the Hausman test. The result show chi2 value of 16.03 and p-value of 0.0030 which is less than 5 percent significance level. We therefore reject the null hypothesis  $H_0$ : difference in coefficient not systematic in favour of the alternative hypothesis that difference in coefficient was systematic. In conclusion, the test found that there is presence of heterogeneity problem meaning that we adopt the fixed effects model and drop the random effects model. Table 9 Hausman test results model for board size.

**Table 9: Hausman Test Results for Model**

	(b) Fixed	(B) Random.	(b-B) Difference	sqrt(diag(V <sub>b</sub> -V <sub>B</sub> )) S.E.
BS	-0.0122	0.0146	-0.0267	0.0151
chi2(4) = 16.03			Prob>chi2 = 0.0030	

$H_0$ : difference in coefficients not systematic

#### 4.7 Hypothesis Testing

The study was based on the following hypothesis:

$H_{01}$ : Board Size has no Significant Influence on Financial Performance of Commercial Banks in Kenya.

The study examined the influence of board size on return on equity of commercial banks in Kenya. Bivariate fixed effect regression model was adopted to examine the influence of board size on return on equity of commercial banks in Kenya. Table 10 show board size across time had a positive and significant effect on return on equity across time ( $\beta = 0.0369$ ,  $p = 0.0000$ ). This imply that board size had a positive and significant influence on return on equity across time. This means that any additional board member will result to an increase in return on equity across time by 0.0369 units. In regard to the individual years, board size had a negative but significant heterogeneity on return on equity across time. Except years 2010 and 2011 which had no significant heterogeneity. This imply most years had a negative but significant variability on return on equity across time. This study was in support of Yasser, Entebang and Mansor (2015) who found board size had significant influence on return on equity. However, Bebeji, Mohamed and Tanko (2015) and Adebayo, Olusola and Abiodun (2013) both found board size had a negative but significant influence on return on equity across time. The fixed effect regression model on board size across time is fitted as follows:

$$Y = 0.0369(BS) - 0.1642(Y2008) - 0.1760(Y2009) - 0.1375(Y2010) - 0.1126(Y2011) - 0.1714(Y2012) - 0.1500(Y2013) - 0.1638(Y2014) - 0.1923(Y2015) - 0.2294(Y2016) - 0.2850(Y2017).....2$$

Where:

$Y_{it}$  = return on equity,

$\beta_1$  = coefficient

$X_{it}$  = board size and

$\mu_1$  = error term.



**Table 10: Fixed Effect Model on Board Size Across Time**

	Value	Std. Error	t-value	p-value
BS	0.0369	0.0079	4.6939	0.0000
Y2008	-0.1642	0.0711	-2.3098	0.0215
Y2009	-0.1760	0.0722	-2.4375	0.0153
Y2010	-0.1375	0.0734	-1.8723	0.0621
Y2011	-0.1126	0.0743	-1.5161	0.1304
Y2012	-0.1714	0.0749	-2.2883	0.0228
Y2013	-0.1500	0.0753	-1.9904	0.0474
Y2014	-0.1638	0.0772	-2.1227	0.0345
Y2015	-0.1923	0.0771	-2.4944	0.0131
Y2016	-0.2294	0.0775	-2.9613	0.0033
Y2017	-0.2850	0.0778	-3.6641	0.0003

The second fixed effect regression analysis was board size across peers. Table 11 depict the results board size had a negative and insignificant influence on return on equity across peer ( $\beta = -0.0137, p = 0.1328$ ). This means that board size had a negative and insignificant effect on return on equity across peer. This imply that there is negative and insignificant influence on board size on the return on equity across peer. This means that any additional board member will have no influence on ROE across peer. This finding was in support of Adebayo, Olusola and Abiodun (2013) who concluded that board size had a negative influence on ROE of firms listed in the Nigerian Stock Exchange. In regard to groups of commercial banks, large banks had a positive and significant variability on return on equity across peer ( $\beta = 0.5098, p = 0.0000$ ). This means that large commercial banks had a positive and significant heterogeneity on return on equity across peer. Medium banks had a positive and significant variability on return on equity across peer ( $\beta = 0.2836, p = 0.0019$ ). This means that medium banks had a positive and significant heterogeneity on return on equity across peer. Lastly, small banks had a positive but insignificant variability on return on equity across peer ( $\beta = 0.1048, p = 0.1451$ ). This means that small banks had no significant heterogeneity on return on equity cross peer. The fixed effect regression model on board size across peer is fitted as follows:

$$Y = -0.0137(BS) + 0.5098(LB) + 0.2836(MB) + 0.1048(SB) \dots \dots \dots 3$$

Where:

$Y_{it}$  = return on equity,

$\beta_1$  = coefficient

$X_{it}$  = board size and

$\mu_1$  = error term.

**Table 11: Fixed Effect Model on Board Size Across Peer**

	Value	Std. Error	t-value	p-value
BS	-0.0137	0.0091	-1.5067	0.1328
LB	0.5098	0.1012	5.0385	0.0000
MB	0.2836	0.0907	3.1281	0.0019
SB	0.1048	0.0717	1.4603	0.1451

In regard to the third analysis fixed effect regression model on board size across banks. Table 12 reveal board size had a negative but significant effect on return on equity across banks ( $\beta = -0.0413, p = 0.0015$ ). This imply board size had a negative but significant influence on return on equity across banks. This means that any additional board member will result to a decline on return on equity across banks by 0.0413 units. In regard to the effect of individual banks on return on equity, most banks had a positive and significant variability on return on equity across banks. This imply that most commercial banks had a positive and significant heterogeneity on return on equity across banks. This study was in support of Bebeji, Mohammed and Tanko (2015) who found board size had a negative but significant influence on ROE in Nigerian Stock Exchange. Table 12 fixed effect regression model on board size across banks. The fixed effect regression model on board size across banks was fitted as follows:

$$Y = -0.0413(BS) + 0.7046(B01) + 0.7393(B02) + 0.8645(B03) + 0.8319(B04) + 0.6836(B05) + 0.7591(B06) + 0.7144(B07) + 0.6180(B08) + 0.7011(B09) + 0.5434(B10) + 0.5316(B11) + 0.5885(B12) + 0.5551(B13) + 0.6686(B14) + 0.4666(B15) + 0.0065(B16) + 0.4820(B17) + 0.4742(B18) + 0.3884(B19) + 0.5514(B20) + 0.4609(B21) + 0.3093(B22) + 0.5540(B23) + 0.1163(B24) + 0.4012(B25) + 0.3842(B26) + 0.3707(B27) + 0.4113(B28) + 0.2836(B29) + 0.3205(B30) - 0.0989(B31) + 0.0512(B32) + 0.3366(B33) + 0.4293(B34) + \dots + 4$$

Where:

$Y_{it}$  = return on equity,

$\beta_1$  = coefficient

$X_{it}$  = board size and

$\mu_1$  = error term.

Table 12: Fixed Effect Model on Board Size Across Banks

	Value	Std. Error	t-value	p-value
BS	-0.0413	0.0129	-3.1976	0.0015
bank-01	0.7046	0.1434	4.9134	0.0000
bank-02	0.7393	0.1548	4.7753	0.0000
bank-03	0.8645	0.1490	5.8009	0.0000
bank-04	0.8319	0.1221	6.8116	0.0000
Bank-05	0.6836	0.1293	5.2852	0.0000
bank-06	0.7591	0.1256	6.0440	0.0000
Bank-07	0.7144	0.1191	5.9972	0.0000
bank-08	0.6180	0.1395	4.4286	0.0000
Bank-09	0.7011	0.1420	4.9356	0.0000
Bank-10	0.5434	0.0775	7.0073	0.0000
Bank-11	0.5316	0.1267	4.1946	0.0000
Bank-12	0.5885	0.1193	4.9313	0.0000
Bank-13	0.5551	0.1258	4.4137	0.0000
Bank-14	0.6686	0.1305	5.1228	0.0000
Bank-15	0.4666	0.1166	4.0006	0.0001
Bank-16	0.0065	0.0814	0.0797	0.9365
Bank-17	0.4820	0.1425	3.3823	0.0008
Bank-18	0.4742	0.1028	4.6146	0.0000
Bank-19	0.3884	0.0896	4.3327	0.0000
Bank-20	0.5514	0.0932	5.9155	0.0000
Bank-21	0.4609	0.0879	5.2433	0.0000
Bank-22	0.3093	0.0782	3.9525	0.0001
bank-23	0.5540	0.0929	5.9650	0.0000
bank-24	0.1163	0.0516	2.2542	0.0249
bank-25	0.4012	0.1163	3.4485	0.0006
Bank-26	0.3842	0.1297	2.9626	0.0033
Bank-27	0.3707	0.0937	3.9578	0.0001

	Value	Std. Error	t-value	p-value
bank-28	0.4113	0.0927	4.4353	0.0000
Bank-29	0.2836	0.1204	2.3559	0.0191
Bank-30	0.3205	0.0698	4.5930	0.0000
bank-31	-0.0989	0.0824	-1.2004	0.2309
bank-32	0.0512	0.0923	0.5553	0.5791
bank-33	0.3366	0.0806	4.1755	0.0000
bank-34	0.4293	0.1090	3.9400	0.0001

Table 13 show a summary of effect of board size across time, peer and banks. From the results, board size had a positive coefficient across time but a negative coefficient across peer and across banks. Further, board size had significant effect on return on equity across time and across banks while it had insignificant effect on return on equity across peer. In general board size had a negative but significant effect on return on equity.

**Table 13: Summary of Board Size**

		Time	Peer	Banks
BS	Coefficient	0.0369	-0.0137	-0.0413
	p-value	0.0000	0.1328	0.0015

## 5. Conclusion and Recommendation

The objective of the study was to determine the influence of board size on the return on equity of commercial banks in Kenya. Board size had a positive and significant influence on return on equity across time, negative and insignificant across peer and negative and significant across banks.

### 5.1 Conclusion

Based on the analysis, the study concluded that board size had a negative but significant influence on return on equity on commercial banks in Kenya. This result is in support of Bebeji, Mohammed and Tanko (2015) found board size had a negative but significant influence on ROA and ROE of the Nigerian firms. Also Mohamed and Atheru (2017) found board size had a negative but significant influence on financial performance of a mobile phony firm in Kenya. The results contradict Shavulimo (2014) who concluded board size had a positive influence on financial performance of the Kenyan firms.

### 5.2 Policy Recommendations

From the finding, the study recommends an optimal board size of between 6 and 10 members for better financial performance. This will reduce the problem of free rider and enhance effective monitoring and decision making and at the same time allow constitution on various board committees. In addition, an optimal board size will also bring about cohesion among the board members by ensuring quick decision-making process. There is a need for the banks and the Capital Markets Authority to consider re-evaluating the minimum board size by emphasizing on considerable number of directors so as to generate better outcomes. This should be in tandem with the structures of their day to day running of their business.

Secondly, the study recommends that the size of the board should be constituent in such a way that it in tandem with the funds set aside for board remuneration in order to ensure that the board expenses does not impact negatively on the financial performance of the bank. By nature of the banking system, the number should be able to compose different board committees who will be able to monitor effectively activities of management, firm performance and offer appropriate advice as and when required by the management. An appropriate board size will give a good face of the bank and provide confidence to the public.

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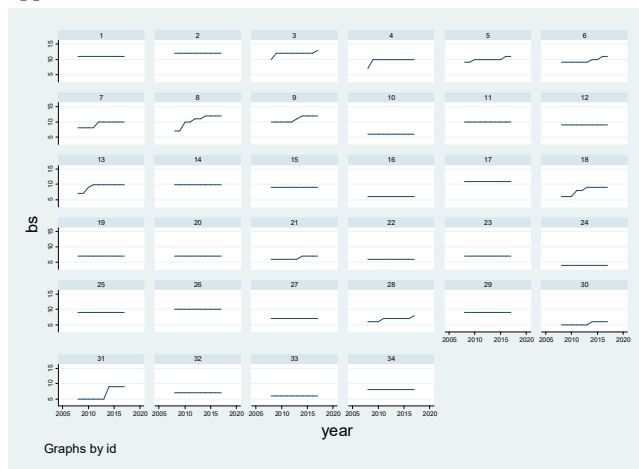
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Appendix I: Annual Commercial Banks Mean Board Size



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