
THE RELATIONSHIP BETWEEN CHIEF EXECUTIVE OFFICER DUALITY AND BANK EFFICIENCY: EVIDENCE FROM AFRICAN BANKING SECTOR

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Abstract: This paper investigates the relationship between CEO duality (one person serving the role of both Chief Executive Officer and chairman of the board) and bank efficiency using Data Envelopment Analysis (DEA). The present study adds to the existing literature by employing panel data of large commercial banks of Africa from 2016-2019. The paper concludes that CEO duality contributes positively to the bank efficiency of the selected commercial banks in Africa. This finding reveals that dual role has a positive and significant influence towards efficiency in commercial banks.

Keywords: CEO duality, bank efficiency, Data envelopment analysis, Africa.

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1. Introduction

The banking system can be subject to circumstances of disadvantageous external, macroeconomic, or adverse, internal management nature, as well as to a combination of these (Zahariev et al., 2020). In fact, the failure of various governance mechanisms has often been cited among the key

causes of the crisis Minton et al. (2014). Over the years, the issues of corporate governance have attracted much research attention because of their potential performance consequences for firms both in developed and developing economies (Puni & Anlesinya, 2020). Actually, since corporate governance represents a central issue for the modern banking industry (Adams & Mehran, 2003; Mülbert, 2010), the corporate governance mechanisms have been issued by authoritative national and international bodies because they seems to have a positive impact on the various risks that the firm faces (Birgach et al., 2020).

These mechanisms include the board structure (board size, board composition, board independence, frequency of board meetings, CEO duality) and the ownership structure. In fact, the two most important and widely topics researched in corporate governance are corporate boards and CEO and top management team problems. Specifically, the concept of CEO duality is one of the most important mechanisms that brought the attention of regulators. It refers to the board leadership structure in terms of whether the CEO and the chairman is the same person or not.

In summary, the purpose of this empirical study is to measure the effect of CEO duality (CEO being also the chairman of board of directors) on bank efficiency. For this purpose, we used data of 78 banks from 2016 to 2019. The rest of the paper is organized as follows. Section 2 reviews existing evidence on the research question. Section 3 describes data and methodology. Section 4 analyses the empirical results. Finally, section 5 concludes the paper.

2. Literature Review

2.1. Review of Theoretical Literature

The existing literature on CEO duality is based on two opposing theories on whether it is more beneficial to have the same person in the role of CEO and Chairman of the board or not.

Agency theory:

The Agency theory supports the idea of separation between the Chief Executive Officer and board chairperson that generally align managers' interests with shareholders' interests, avoid entrenchment (Titova, 2016) and seeks to reduce agency costs for the firm. This separation increases board independence from management resulting in better performance due to better monitoring and overseeing (M. C. Jensen, 1993).

In addition, the agency theory argues that a dual appointment of the CEO and the chairman may lead to excessive power concentration in the hands

of one person who is both CEO and chairperson of the board (Jensen, 1993), and this may negatively affect financial performance. Consequently, firms with CEO non-duality structure leads to better financial performance compared to those relying upon CEO duality structure (Fama & Jensen, 1983; C. Jensen & Meckling, 1976; M. C. Jensen, 1993; Yermack, 1996).

Hypothesis 1: CEO duality is negatively associated with bank efficiency.

Stewardship theory:

In contrast to agency theory, stewardship theory supports CEO duality structure and argue that the manager wants to be a good steward for the firm (Donaldson & Davis, 1991). Also, the theory supports a positive managerial attitude and motivation which is alternative to agency theory. Here, CEO duality provides a unified leadership of the firm that facilitates greater understanding and knowledge.

Therefore, the benefits of powerful leadership and unity of command that duality does engender may contribute to improving the firm's financial performance (Donaldson & Davis, 1991; Ramdani & Witteloostuijn, 2010). Besides, inside managers have more strategic information regarding the firm compared to both independent and outside members of the board. Under this hypothesis, the CEO will do what is best for the firm and the CEO duality will positively influence firm performance (Finkelstein & D'aveni, 1994).

Hypothesis 2: CEO duality is positively associated with bank performance.

2.2. Review of Empirical Literature

This section consists of literature review concerning the relation between CEO duality and firm performance. When analyzed in general, the results of the studies may be categorized in three groups. CEO duality has a positive effect on firm performance; CEO duality has a negative effect on firm performance; there is no relationship between CEO duality and firm performance.

Peng et al. (2007) studied the relation between CEO duality and firm performance of 403 publicly listed firms in China during 1992-1996. They found that duality has a positive effect on company performance, bringing stronger support for stewardship theory. Also, Ramdani & Witteloostuijn (2010) studied the effect of independent member of board of directors and duality on performance of companies operating in Indonesia, Malaysia, South Korea and Thailand. They found that a positive relation exists between duality and company performance.

In contrast, Ujunwa (2012) has found a negative relation between duality and company performance for 122 companies selected in Nigeria from 1991 to 2008. Also, Chen et al. (2005) studied the partnership structure, company performance and dividend policies in companies operating in Hong Kong and found a negative relation between duality and Tobin Q (for large companies). However, no relation has been found between duality and ROA or ROE.

In a different study, Chen et al. (2008) found no significant relation has been found between duality and company performance. On the case of Nigeria, Ehikioya (2009) analyzed the structure of corporation governance and company performance in developing economies. The empirical results of the research show a negative but not statistically significant relation between duality and company performance indicators (ROA, ROE, price-earnings ratio, Tobin's Q). More recently, Okoro Blessing et al. (2018) used the dataset of twenty-two deposit money banks listed on the Nigerian Stock Exchange as at March (2016) for the period of sixteen years from 2000 to 2016. He found that on the average, the duality of the CEO has no significant effect on the profitability of money deposit banks.

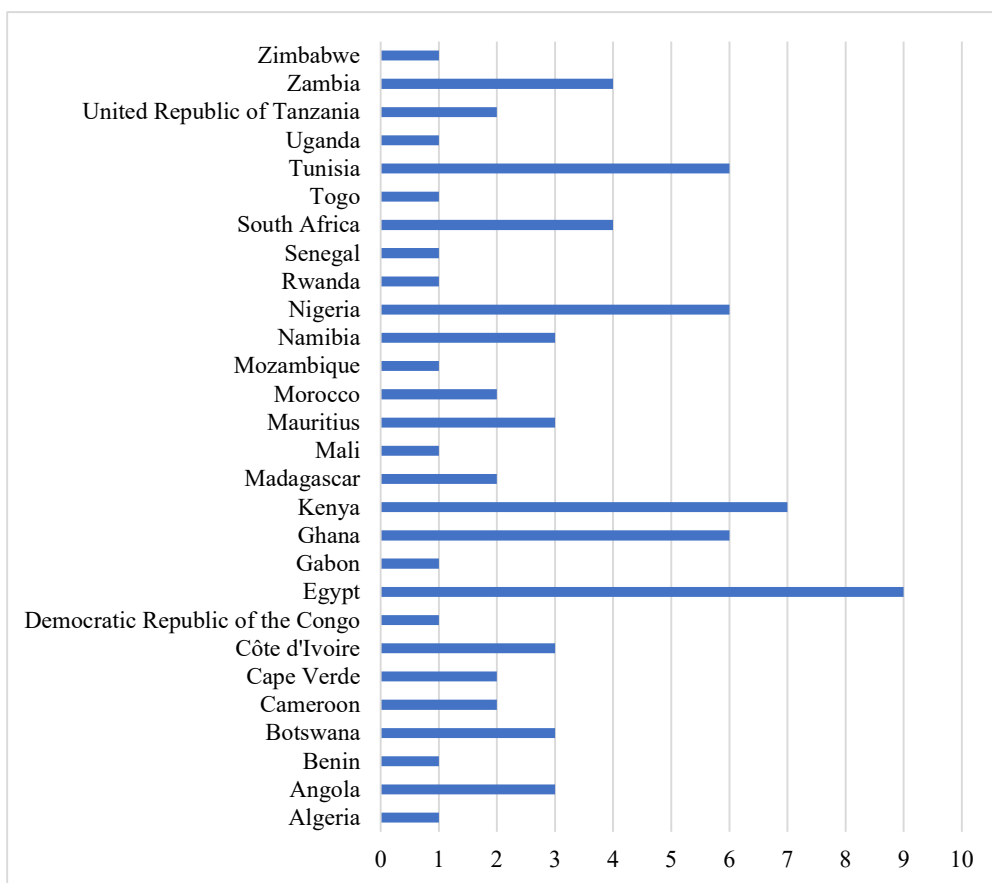
3. Data and Methodology

3.1. Population and sampling

The quantitative research method and panel design were used in this study. In fact, board composition data were collected from corporate governance disclosure of individual commercial banks in Africa. Secondary, financial data for banks in Africa over the period 2016 to 2019 were obtained from *Bureau van Dijk's BankFocus disk*.

We construct our sample using three criteria: (1) First, we exclude companies with no recent financial data and public authorities/States/ Governments. Further, (2) we purge the sample of banks which we do not classify as commercial banks. Lastly, (3) we exclude banks with inputs and outputs with negative or missing values. At the end, our final sample consists 78 commercial banks operating in all regions of Africa.

Figure 1 show the sample distribution by country.



Source: Authors

Figure 1. *Sample distribution of commercial banks by country*

3.2. Empirical model

Independent variable

In this study, the independent variable is CEO duality. We define this variable as a dummy variable indicating value of 1 when both the Chief Executive Officer of the firm and chairman of the board is the same person and 0 otherwise (Boyd, 1995; Peng et al., 2007).

Dependent variables: Technical efficiency (TE)

In this paper, the dependent variable corresponds to bank efficiency estimated via the Data Envelopment Analysis (DEA). Specifically, this study focuses on technical efficiency.

Following Adeabah et al. (2018), we apply an output oriented Variable Return to Scale model proposed by Banker et al. (1984). The primal version of

Banker et al. (1984) (BCC) model that estimates technical efficiency score for each decision making unit (DMU₀) is:

$$\text{Maximise } (TE_0 = \theta_0 + \varepsilon \sum_{j=1}^m e_j + \varepsilon \sum_{i=1}^h s_i)$$

s. t.

$$\sum_{k=1}^n \delta_k y_{ik} = \theta y_{i0} + s_i$$

$$\forall i = 1, 2, \dots, h$$

$$\sum_{k=1}^n \delta_k X_{jk} = X_{j0} + e_j$$

$$\forall j = 1, 2, \dots, m$$

$$\sum_{k=1}^n \delta_k = 1$$

$$\forall k = 1, 2, \dots, n$$

$$s_i, e_j, \delta_k \geq 0$$

Where TE_0 = the technical efficiency score of the DMU_0 under analysis; θ_0 = amount of possible argumentation to output level y_0 while maintaining the same level of inputs; ε = non-Archimedean infinitesimal to impede DMUs from giving zero weights to factors that manage poorly; n = number of DMUs under analysis; h = number of outputs; m = number of inputs; y_{ik} the value of output i for DMU_k ; x_{jk} = the value of input j for DMU_k ; s_i = shortage in output production for the specific output i ; and e_j = excessive use of input j .

VRS is such a frontier scale in DEA that supports measuring the efficiency of an increase or decrease in input or output (Cooper et al., 2011). VRS exhibits increasing and decreasing returns to scale, while CRS express only the constant returns to scale. For this study, we combine the approach VRS with an output-oriented model. Therefore, we used Win4DEAP software package to estimate the technical efficiency.

Control Variables

Finally, the empirical model of the study includes nine control variables that may influence bank efficiency; which comprise of five measures of corporate governance (i.e., board size, board composition, meetings and committees), three bank characteristics (i.e., bank size, equity, loans) and one macroeconomic variable (i.e., GDP).

In such studies, the analysis is performed in two steps: first, we calculate the efficiency scores using the DEA. Second, these scores are regressed against a set of independent variables which are potentially related to efficiency.

Therefore, the complete empirical model is as follows:

$$TE_{i,t} = \beta_0 + \beta_1 Dual_{i,t} + \beta_2 BSize_{i,t} + \beta_3 Indep_{i,t} + \beta_4 Female_{i,t} \\ + \beta_5 Meet_{i,t} + \beta_6 Comit_{i,t} + \beta_7 BKSize_{i,t} + \beta_8 Capital_{i,t} \\ + \beta_9 Loans_{i,t} + \beta_{10} GDP_{i,t} + \varepsilon_{i,t} \\ i = 1, \dots, 78 ; t = 2016, \dots, 2019$$

Where :

- TE: Efficiency measured by Data Envelopment Analysis (DEA)
- Dual: Dummy variable showing 1 if chairman is also the CEO, 0 otherwise
- BdSize: represents the total administrators constituting the board. According to Adams & Mehran (2012), board size exerts a positive effect on bank performance.
- Indep: Proportion of independent directors on the board (Mishra & Nielsen, 2000; Pathan & Faff, 2013)
- Female: Proportion of female directors on the board (Adusei, 2019; Cabo et al., 2012; Campbell & Mínguez-Vera, 2008)
- Meet: Number of meetings (Brick & Chidambaran, 2010; Vafeas, 1999)
- Comit: number of board committees (Adams & Mehran, 2003)
- Bksize: represents the log of total assets at fiscal year. In fact, Bokpin (2013) postulates that bank size has a significant influence on bank efficiency.
- Capital: The ratio of equity to total assets is used as a measure of bank capital. This widely used proxy captures the bank's financial cushion to absorb loan losses (Berger & DeYoung, 1997; Fiordelisi et al., 2011).
- Loans: represents the ratio of loans to total assets (García-Meca et al., 2015)
- GDP: Gross Domestic Product define the macroeconomic conditions susceptible to affect the bank efficiency (Adusei, 2019)

Table 1 presents a description of all the variables used in the study.

4. Data analysis and results

Data were analyzed using STATA to examine the effect of CEO duality on bank efficiency from 2016 to 2019.

4.1. Descriptive statistics

Table 1 reports the summary of descriptive statistics based on panel data of the sample banks from the year 2016 to 2019.

Tableau 1

Definition of variables

Variables	Definition
Dependent variable	
TE	Bank technical efficiency
Independent (explanatory) variables	
Dual	Dummy variable showing 1 if chairman is also the CEO, 0 otherwise
Control variables	
BDSIZE	Natural logarithm of board size
Indep	Proportion of independent directors on the board
Female	Proportion of female directors on the board
Meet	Number of meetings
Comit	Number of board committees
BKSIZE	Natural logarithm of total assets
Capital	Capitalization ratio, measured as the ratio of equity to total assets.
Loans	Ratio of loans to total assets
GDP	Gross Domestic Product

Tableau 2

Summary Statistics of Independent Variables (2016 – 2019)

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
TE	312	0.84	0.89	0.18	0.32	1.00
Dual	306	0.07	0.00	0.25	0.00	1.00
BDSIZE	303	2.23	2.20	0.30	1.39	3.04
Indep	219	0.36	0.33	0.25	0.00	1.00
Female	302	0.19	0.18	0.14	0.00	0.67
Meet	195	6.35	5.00	3.00	3.00	21.00
Comit	244	4.64	4.00	1.94	1.00	12.00
Capital	310	10.99	10.79	7.22	-95.16	22.83
Loans	312	0.48	0.49	0.17	0.05	0.84
GDP	304	24.83	24.78	1.20	22.52	26.83

Note: For a definition of the variables, see Table 1.

Regarding the variable CEO duality, 7% of the CEO is also the chairman of the board. However, 93% has a separation between the function of the CEO and chairman. For the control variables, the number of the board of directors varies from 4 to 21 directors. Moreover, an average board in the African banks is comprised of 10 directors and, as indicated, the number of independent administrators varies from 0% to 100%, with a mean of 36%. Also, the proportion of female on the board of directors varies between 0% and 67% with a mean of 19%. In fact, on average, only 19% of the seats are held by women in the African boards of directors. Thus, the presence of the female on the board of directors still low in the African banks.

In addition, the average Equity to Asset ratio arises at 10.99 (the median is 10.79), Loan to Asset ratio stands at 48 % and the median accounts for 49 %, the mean value of the bank size which is the natural logarithm of the total assets is 14.90, the mean value of the GDP is 24.83. The number of committees varies from 1 to 12, with a mean of 5 committees. Finally, the average number of board meetings per year for our sample is 6.35.

4.2. Correlation analysis

Table 3 provides the correlation matrix for the variables included in the paper. In addition, we calculated the variance inflation factor (VIF) statistics for the previous regression model to quantify the severity of multicollinearity in our model. As a result, the test does not suggest that any variables should be dropped from our regression as the VIF statistics are within the specified range.

Tableau 3

Correlation matrix

	Dual	BDSIZE	Indep	Female	Meet	Comit	Capital	Loans	GP D
Dual	1,0000								
BDSIZE	0,0056	1,0000							
Indep	-0,2440	-0,0665	1,0000						
Female	-0,2196	0,1602	0,1403	1,0000					
Meet	0,0163	0,2004	0,1609	-0,0679	1,0000				
Comit	0,0372	0,5089	0,1539	0,0913	0,4054	1,0000			
Capital	-0,0362	-0,0468	0,0730	-0,0061	-0,1310	-0,0026	1,0000		
Loans	0,0843	0,1262	0,3564	-0,0788	0,0283	0,2663	0,0179	1,0000	
GDP	0,1249	0,5540	-0,3207	0,2003	0,0711	0,2994	-0,0854	-0,2209	1,0000

Source: Author's Computation

4.3. Hausman test

In order to choose the reliable estimation between the fixed and the random effect estimation, the Hausman test is used.

Tableau 4

Hausman Test of FEM and REM

Ho: difference in coefficients not systematic		
Test-estimate	Chi-square statistics	Probability
$\chi^2(8) = (b-B)'[(V_b - V_B)^{-1}](b-B)$	15.0700	0.0579

Source: Author's Computation. b = consistent under Ho and Ha; obtained from xtreg B = inconsistent under Ha, efficient under Ho; obtained from xtreg

From the table above, chi-square value of 15.07 and the P-value provided by the Hausman test 0.0579 (more than 0.05), shows that there is enough evidence to accept the null hypothesis. This implies that there is correlation between the random effects incorporated into the composite error term and one or more of the independent variables. Thus, the REM estimation becomes the best model that is most efficient, consistent and preferred, while FEM estimation is considered inefficient.

First-stage results: Technical efficiency (TE)

We obtained the efficiency scores of each bank by implementing the output-oriented model. The results show that the estimated efficiency scores average 0.84 (i.e., 84 per cent). The explicit implication is that banks averagely have the potential to augment output levels (i.e., interest income and non-interest income) by about 0.16 (16 per cent) while maintaining the same level of inputs (i.e., interest income, customers' deposit and deposits from banks) to be technically efficient. Additionally, it can be observed that out of 78 banks, 50 banks are efficient at least once in the observation period (2016-2019). Also, only 11 banks are efficient in all the observation period.

The main results are presented in Table 5. Firstly, we find that CEO duality has a significantly positive association with technical efficiency. This implies that CEO duality as a corporate governance mechanism is a determinant of bank efficiency. Our result is consistent with Peng et al. (2007) and Belkhir (2009). Therefore, this result confirms the *hypothesis 2* and support the hypothesis of Boyd (1995), who asserts that one person assuming the role of both CEO and chairman will have more extensive knowledge of the organization and will also be more committed and that a single leader will increase responsiveness to changes and will also make the leader more

accountable. Moreover, the CEO duality may place the CEO in a powerful position in directing the company operations and allows him to make faster decisions (Finkelstein & Hambrick, 1996) and may be able to coordinate and manage board actions and set strategies more quickly especially in tough conditions such crisis and thus improve efficiency.

Second-stage results: effect of CEO duality on bank efficiency

Tableau 5

<i>GLS regression results</i>	
	TE
Dual	0.155* (2.06)
BDSIZE	-0.0365 (-0.66)
Indep	0.111 (1.78)
Female	0.255* (2.34)
Meet	-0.00364 (-0.74)
Comit	0.0168* (2.06)
Capital	0.00313** (2.77)
Loans	-0.131 (-1.35)
GDP	0.0472** (2.95)
_cons	-0.366 (-0.98)
N	157
R-sq:	0.4784

Notes: t statistics in parentheses * p<0.05, ** p<0.01, *** p<0.001

As it concerns the control variables, the results show a positive and statistically significant influence of the proposition of female on bank efficiency in Africa. Thus, our findings are consistent with Carter et al. (2003) and Pathan & Faff (2013) and support the hypothesis of the Agency Theory that suggest that gender diversity on the board of directors can provide better corporate governance (Adams & Ferreira, 2009; Terjesen et al., 2009). Also, as female directors are considered as hard-working person and have better communication skills which enable them to add value in the firm by improving the decision-making ability and the problem solving of the board (Belhaj & Mateus, 2016). Thus, women directors can enhance the monitoring and control, and it is more likely that they are included in corporate governance committees (Adams & Ferreira, 2009). Therefore, gender diversity has important implications from an economic point of view. The representation of women on the board affects the governance of the firm, and thus, it may influence the firm value and firm efficiency (Shrader et al., 1997; Welbourne, 2007).

Also, as indicated in Table 5, number of board committees has a positive effect on bank efficiency. This result is consistent with Anderson et al. (2004), Beasley (1996), Hadani et al. (2011), who find that board committees play an effective monitoring role. Specifically, the presence of monitoring committees (audit, nomination, and compensation committees) is positively associated with the benefits of monitoring (John & Senbet, 1998). This can be explained by the objectivity, independence, expertise and effectiveness of the boards that board committees can improve as subordinate board structures. They may enhance the responsibility and effectiveness of the board by alleviating communication and coordination problems and lead to more efficient decision-making by dividing tasks among board members (Reeb & Upadhyay, 2010).

In addition, our findings suggests that an increase in bank capital increases technical efficiency in commercial banks in Africa. This result is consistent with the conventional view which asserts that high levels of capitalization will reduce risk by placing banks in a better position to absorb losses. Also, well capitalized banks have usually lower costs of funding to support due to lower bankruptcy costs so if banks are faced with lower profitability, they may reduce buffer capital and utilize those funds to diversify into riskier but more profitable sources of income to reduce future costs of funding (Pennathur et al., 2012). In the same way, banks which pay less interest due to strong capital structure can benefit from competition advantage then increase performance (Al-Tarawneh et al., 2016) suggesting that the increase of equity to total assets is beneficial to enhance the stability of commercial banks.

5. Conclusion

This paper has investigated the influence of CEO duality on the efficiency of banks in Africa. Using a sample of 78 large African commercial banks during 2016-2019, a panel data analysis has provided empirical evidence on the influence that CEO duality has on firm performance.

This study brings support to the theoretical underpinning of the powerful and unified leadership derived from stewardship theory, which supports the idea of the CEO duality, for a positive managerial attitude and motivation, resulting in better firm's financial performance (Donaldson & Davis, 1991). To our knowledge, this is the first study which relates CEO duality with bank efficiency for different countries in Africa.

Therefore, the results in this research have implications for theoretical understanding and join the debate between the agency and stewardship theories. However, our paper presents some limitations due to unavailability of the data. Therefore, further research should extend to the study of the influence of CEO duality for a longer period of time and a bigger sample of study.

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