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Board structure and bank performance: Evidence from Ethiopia

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Alem Gebremedhin Berhe^{1*}

Abstract: This study aims to examine whether board structure (board size, board composition, CEO duality, and board gender diversity) is associated with bank performance. To do so, the study makes use of panel data of 14 commercial banks in Ethiopia covering a 9-year period during 2011–2019 which results in 126 bankyear observations. The findings of the study show that board composition (BCOMP) and board gender diversity (FDIRS) have positive and significant impacts on bank performance. This implies that the increase in the proportion of independent directors and female board members in the board room increases bank performance. On the other hand, the results reveal that board size (BSIZE) and CEO duality (DUAL) decrease bank performance: Both of these variables have significantly negative effects on bank performance. This means that bank performance decreases as the number of board of directors increases. Also, bank performance decreases when a single individual is jointly responsible for the CEO position with the board of directors as well as board chairperson responsibilities. The results suggest that the board has a considerable role in the Ethiopian bank governance. Hence, the results could benefit policy experts and regulators to formulate policies on recuperating board governance.

Subjects: Economics; Finance; Business, Management and Accounting; Industry & Industrial Studies

Keywords: board structure; bank performance; panel data regression; GMM estimation; Ethiopia

1. Introduction

Following the recent global financial crisis, corporate governance for the banking systems has received due attention (for example, Liang et al., 2013; Pathan & Faff, 2013). Ineffective corporate governance may be attributed to bank failures, which can pose significant public costs (Pathan & Faff, 2013) and consequences for their potential impact on payment systems, liquidity crisis, and other macroeconomic implications such as contagion risk (Fama, 1985). As a result, banks, all over the world, are considered as the institutions that are highly regulated to safeguard depositors' funds as well as to evade negative externalities from systemic risk (Flannery & Hankins, 2013). On the other hand, effective corporate governance can result in realizing and sustaining the trust and confidence of the public for the banking firms as well as improving the efficient allotment of resources across the economy (Basel Committee For Banking Supervision, 2006; Caprio & Levine, 2002). While the board of directors is the most important, there are various performers, having different roles and responsibilities, in the corporate governance. The role of the board of directors is critical for the banks to reach effective governance (Monks & Minow, 2004). Academicians and





other concerned parties have given due attention to the structure of the board of directors as a corporate governance mechanism in recent years. This is because there are conflicting views in the theory regarding the effect of board structure on the firms' performance on the one hand and the empirical finding is mixed (for example, Babatunde & Olaniran, 2009; Pathan & Faff, 2013; Tanna et al., 2011). The effect of board structure on the bank performance is not that well known given that the majority of empirical studies do not include financial institutions in their samples though the corporate governance is an overworked area (Adams & Mehran, 2012). Most of the researches were conducted aiming to identify the banking sectors unique characteristics as well as the significance of corporate governance for the banks (for example, Adams & Mehran, 2003; Barth, 2006; Levine, 2004; Zulkafli & Samad, 2007). Besides, even most of the existing studies on the issue are conducted in the developed economies: board structure-performance relationship is almost unknown in the developing countries like Ethiopia (for example, Dahawy, 2007; Liang et al., 2013; Okpara, 2010). In Ethiopia, prior research on the issue of interest is only conducted by Fanta et al. (2013) by using panel data of 9 commercial banks over the period of 2005–2011. The results exhibited that board size and audit committee were found to have negative and significant effects on bank performance, whereas bank size as well as capital adequacy ratio affect the bank performance positively and significantly. This indicates that the gap in the Ethiopian bank's corporate governance literature is very huge. Thus, the researcher is motivated to provide empirical confirmation in this area.

This study provides empirical confirmation about the board structure—bank performance relationships. To do so, this study makes use of 14 banks from 2011 to 2020. The banking sector accounts for more than 85% of the total assets in the financial system of Ethiopia (Belda, 2016). The impact of a comprehensive set of board characteristics (board size, board composition, CEO duality, and board diversity) has been estimated in this study, and hence new findings have been reported regarding the effectiveness of board structure on the performance of Ethiopian banks. The results reveal that board size, board composition, CEO duality, and board diversity all have statistically significant effects on the performance of the Ethiopian banks.

The present study contributes to the bank's corporate governance literature in the subsequent aspect. First, the literature on banks' board structure is extended to the developing nation as the focus of majority of the prior researches, which evidence the momentous role of board governance on the bank performance, was on the developed and other emerging economies (for example, Denis and McConnell, 2003; Macey and O'Hara, 2003; Adams et al., 2010; Adams & Mehran, 2012; Liang et al., 2013; Pathan & Faff, 2013). Second, this study is vital as the available literature on the issue of interest is mixed (for example, Sierra et al., 2006; Andres & Vallelado, 2008). While Sierra et al. (2006) suggests that bank performance is directly related with the board's strength, Andres and Vallelado (2008) reported that board size has no effect on the bank performance. Third, this study tries to give a more comprehensive representation of board structure along with its effect in the performance of Ethiopian banks. In the organization's internal governance system, the board of directors is the summit body (Hermalin & Weisbach, 2003; Liang et al., 2013). So, like in any other part of the world, having a successful board is assumed to be very important for the effectiveness of the banks in Ethiopia. Finally, this study is the first to investigate the effect of board composition, CEO duality and gender diversity on the performance of banks in Ethiopia. Existing reports about the effect of board composition, CEO duality and gender diversity on the performance of banks are inconclusive (e.g., Adams and Ferreira, 2009; Bhagat & Black, 2002; Brickley et al., 1997; Farrell & Hersch, 2005; Goyal & Park, 2002; Yermack, 1996). The results would be important to regulators and policymakers concerning the effectiveness of the board structure on the bank performance.

The rest of this paper is structured as follows: The following section presents a review of the literature about board size, composition, CEO duality and gender diversity and hence hypotheses development. Section 3 discusses the data and research methodology. Section 4 deals with

presenting and discussing the empirical results, while Section 5 presents conclusion, implication, and scope for future work.

2. Review of related literature and hypothesis development

Prior studies have used different proxies for the board governance mechanisms to investigate their effectiveness on the performance of a bank. Board size, composition, CEO duality, and gender diversity are among the most commonly used in the literature. Nonetheless, the findings are not conclusive as shown below.

2.1. Board size and firm performance

Jensen (1993) advises limiting the number of board members to less than eight as large boards are less effective and are easier for the CEO to control. Different researchers have confirmed that the relationship between board size and firm value is the opposite (for example, Adusei, 2011; Chang & Dutta, 2012; Cheng, 2008; Hermalin & Weisbach, 2003; Mak & Kusnadi, 2005) because there is a difficulty with the larger boards to convey their idea in the board meetings due to time limitation (Lipton and Lorsch, 1992). Yermack (1996) and Eisenberg et al. (1998) also explain that the board size-performance relationship is negative though it depends on the organization's economic milieu (Coles et al., 2008). Further, Pathan and Faff (2013), Liang et al. (2013), Kao et al. (2019), and Yihun et al. (2019), and Babić et al. (2020), and (Kefiyalew & Dagnachew, 2020) confirmed that the impact of board size on firm's performance is negative and significant. In their study, conducted on 58 European banks, Staikouras et al. (2007) suggested that board size related with bank performance negatively. In addition, Pathan et al. (2007) from their study on board size-performance relationship in Thai banks reported that board size affects bank performance negatively and significantly. Bebeji et al. (2015) also reported that board size is negatively correlated with bank performance. However, other studies evidenced that the performance of the firm is directly related to board size, which implies larger boards can result in higher firm performance as they are crucial to assist in managerial admin as well as to attract extra gualified personnel to counsel the managers (Liang et al., 2013). In their study, Dalton et al. (1999), Coles et al. (2008), Sheikh et al. (2013), and R. K. Mishra and Kapil (2018) suggested that the board size-performance relation is direct or positive. Given that the previous empirical results do not imply a lucid conclusion for the board size-performance nexus, this analysis will be accustomed to the Ethiopian corporate governance environment. So, if small boards, among other things, used to reduce the bill incurred for every board member and then leads to improve bank performance, which is one of the commonly known problems for the firms in a feeble corporate governance background (Babić et al., 2020; Kefiyalew & Dagnachew, 2020; Yihun et al., 2019), the researcher can reasonably assume that commercial banks in Ethiopia may benefit a lot from having an optimal level of board size. Therefore, the first hypothesis (H₁) related to board size can be put as follows:

H1: Board size has a negative and significant effect on the performance of commercial banks in Ethiopia.

2.2. Board composition and firm performance

The board of directors for a firm has to have a significant number of independent directors (Liang et al., 2013) as it is a central subject in corporate governance. As per Fama and Jensen (1983), independent directors are those who are expected to play a significant role at the board level and be the change agents of corporate governance. However, the corporate governance literature provides no conclusive results about the effectiveness of board independence on firm performance (for example, Bhagat & Black, 2002; Coles et al., 2008; Hermalin & Weisbach, 2003; Yermack, 1996). The findings of Agrawal and Knoeber (1996), Subrahmanyam et al. (1997), Bhagat and Black (2002), Anderson et al. (2004), Singh & Gaur (2009), Nguyen and Nielsen (2010), Fauzi and Locke (2012), Pathan and Faff (2013), and Yasser et al. (2017) evidenced that the existence of independent board of directors decreases the firm's performance, while Rosenstein and Wyatt (1990), C.S.

Mishra and Nielsen (2000), Rosenstein and Klein (2002), Ashbaugh-Skaife et al. (2006a), Krivogorsky (2006), Busta (2007), Jermias (2007), Cornett et al. (2009), and Jackling and Johl (2009), and Bebeji et al. (2015), and Kao et al. (2019), and Babić et al. (2020) showed as the board independence-firm performance relationship is positive. Given the prior empirical results are mixed on the board composition—firm performance link, this analysis will be adjusted by the Ethiopian CG surroundings. Hence, the researcher argues that if board composition (i.e., existence of independent directors in the board room) help firms to minimize cost of debt financing (Anderson et al., 2004), and cost of equity (Ashbaugh-Skaife et al., 2006b), boost credit rating (Ashbaugh-Skaife et al., 2006a), advance earnings quality and give like-minded reimbursement inducements to managers (Cornett et al., 2009), it could be expected that commercial banks in Ethiopia will perform better as the proportion of independent directors in the board room increases. Accordingly, the second hypothesis (H_2) is stated in the following manner:

H2: Board composition has a positive and significant effect on the performance of commercial banks in Ethiopia

2.3. Board CEO duality and firm performance

In the corporate governance literature, CEO duality refers to the issue that merges features of the CEO position with the board of directors as well as board chairperson responsibilities (Lee & Isa, 2015), which it gives more power to the individual and hence decisions can be against the interests of the minority stockholders (Jensen, 1993). As in Conyon and Peck (1998), the chairperson is more importantly responsible for hiring, firing and compensating the CEO. The independence of the board decreases with CEO duality (Yermack, 1996). In the study conducted on the US banks, Pi and Timme (1993) explained that CEO duality had a negative effect on banks' cost-efficiency and return on assets. Problems can happen to make decisions when the chairperson-CEO responsibilities are separated (Adams et al., 2005; Liang et al., 2013) since they may not have the same opinion regarding strategies (Lee & Isa, 2015; Liang et al., 2013). Agoraki et al. (2010) reported that bank efficiency is to be negatively related with managerial power. Duality is negatively related with firm value (for example, Brown & Caylor, 2005; D.A. Carter et al., 2003; Kao et al., 2019). Grove et al. (2011) and Mahmood and Abbas (2011) also suggested that CEO duality is inversely related to bank performance. On the other hand, Goval and Park (2002), Sheikh et al. (2013), Azeez (2015), and R. K. Mishra and Kapil (2018) evidenced that CEO duality increases performance as turnover is lower, while Bektas and Kaymak (2009), Arouri et al. (2011), and Pandya (2011) reported that the effect of duality on the banks performance is insignificant.

This coefficient is expected to be negative, and the hypothesis (H₃) is formulated as follows:

H3: CEO duality has a negative and significant effect on the performance of commercial banks in Ethiopia.

2.4. Board gender diversity and firm performance

While none of the corporate governance theories confirms the existence of a direct relationship between gender diversity and firm performance (D. A. Carter et al., 2010), the board gender diversity concept has been given further consideration in the banking and finance literature (for example, Adams and Ferreira, 2009; D.A. Carter et al., 2003; Farrell & Hersch, 2005; Gul et al., 2011). The representation of females in the boardroom has gradually amplified in due course (Pathan & Faff, 2013). In the USA, for example, the mean proportion of female board members has raised from 5.6% during 1990 (Farrell & Hersch, 2005) to 15.2% during 2010 (Catalyst, 2010), which corroborates with the notion that the existence of female directors matters firm value (R. Adams & Funk, 2012). The board's problem-solving as well as decision-making capacity can be enhanced when female directors are represented due to their diligent and

superior communication skills (for example, Byron & Post, 2016; D.A. Carter et al., 2003; Eagly & Carli, 2003; García-Meca et al., 2015; Ntim, 2015; Pathan & Faff, 2013; Robinson & Dechant, 1997; Shukla et al., 2021; Skała & Weill, 2018; Yihun et al., 2019). Nevertheless, past studies have shown mixed results about the effectiveness of board gender diversity on firm performance (for example, Adams and Ferreira, 2009; Farrell & Hersch, 2005; Gul et al., 2011). So, given these mixed results on the board gender diversity—firm performance relationship, this paper would be attuned using the Ethiopian corporate governance milieu. Hence, the researcher argues that if the board's problem-solving as well as decision-making capacity can be enhanced when female directors are represented due to their diligent and superior communication skills and give better supervising capability, which is highly important for firms operating in countries like Ethiopia where governance practices are immature (Adams & Mehran, 2012; Byron & Post, 2016; García-Meca et al., 2015; Gul et al., 2011; Ntim, 2015; Pathan & Faff, 2013; Shukla et al., 2021; Skała & Weill, 2018; Yihun et al., 2019), it could be likely that more board gender diversity results in high performance for the Ethiopian commercial banks. Therefore, the fourth hypothesis (H₄) is stated as follows:

H4: Board gender diversity has a positive and significant effect of on the performance of commercial banks in Ethiopia

3. Data and methodology

3.1. Data collection and sampling

This study consists of a balanced panel data set of 14 commercial banks in Ethiopia in the 2011 to 2020 period, which results in 126 bank-year observations. The year 2011-2020 is selected for this study since the government of Ethiopia has intervened two consecutive development plans, which are GTP I (2011-2015) and GTP II (2016-2020). However, due to data missing, the year 2020 is excluded from the study and hence the study covers the 2011-2019 periods. In the year 2019, there are 17 commercial banks operating in Ethiopia, of which one is public owned commercial bank, while the rest are privately owned commercial banks. Nonetheless, three of the 17 commercial banks operating in the country are expelled from the study because of data unavailability. Accordinaly, the study is conducted based on secondary data collected from the remaining 14 commercial banks (see, Table 1). During 2019, the banks under study accounted for more than 75% of the total assets of the commercial banks in the banking industry, with the total assets of the banks under study stand at birr 722.68 billion. The data on the board structure variables (particularly board size, board composition, gender diversity, CEO duality) and bank performance (Tobin's Q) variables are hand collected from the annual financial reports of the individual commercial banks over the study period. Besides, the data for the controlling variables except for GDP growth (it is collected from WB database) are obtained from the bank's annual reports.

3.2. Variables selection

To meet the objective of this study, the variables used in the regression model are classified into two categories as dependent variable (performance measure) as well as the explanatory and control variables (board characteristics and other control variables) that affect the bank's performance. A brief review of these variables is presented as follows.

3.2.1. Dependent variable

In line with prior studies (for example, Mohan & Ruggiero, 2007; Nguyen et al., 2015; Pathan & Faff, 2013; Reddy et al., 2008), Tobin's Q ratio is used to measure the bank performance in this study. It is a market-based measure of firm's performance (Nguyen et al., 2015). Tobin's Q ratio value greater than one exhibits that firm is better able to utilize its resources, which results in good growth prospects and vice versa (for example, Campbell & Mínguez-Vera, 2008; Rose, 2007). Tobin's Q ratio is measured as the sum of the bank's market value of

Table 1. List number of b	of commercial banks in oranches in 2018/19	Ethiopia along with	their year of es	tablishment and
Sr.No	Bank Name	Establishment	Branches	Ownership
1	Abay Bank	2010	162	Private
2	Addis International Bank*	2011	59	Private
3	Awash International Bank	1994	368	Private
4	Bank of Abyssinia	1996	284	Private
5	Berhan International Bank	2010	168	Private
6	Bunna International Bank	2009	176	Private
7	Commercial Bank of Ethiopia	1963	1482	Public
8	Cooperative Bank of Oromia	2005	332	Private
9	Dashen Bank	2003	381	Private
10	Debub Global Bank*	2012	43	Private
11	Enat Bank*	2012	40	Private
12	Lion International Bank	2006	210	Private
13	Nib International Bank	1999	228	Private
14	Oromia International Bank	2008	260	Private
15	United Bank	1998	233	Private
16	Wegagen Bank	1997	292	Private
17	Zemen Bank	2009	25	Private
	Total		4757	

Source: National Bank of Ethiopia (2018/19)

Note: The banks with * are those that aren't included in the study

equity added to the book value of debit divided by the book value of total assets (e.g., Chen et al., 2006; D.A. Carter et al., 2003; García-Meca et al., 2015; Nguyen et al., 2014, 2015; Pathan & Faff, 2013).

3.2.2. Explanatory as well as control variables

Following prior studies (for example, Liang et al., 2013; Nguyen et al., 2015; Pathan & Faff, 2013), this research employed four measures of board structure: board size (BSIZE), board composition (BCOMP), CEO duality (DUAL), and gender diversity (FDIRs). Board size (BSIZE) is measured as the total number of directors on the board. Board composition (BCOMP) is the proportion of independent directors on the board, which are individuals with no connection to the company other than a seat on the board. CEO duality (DUAL) refers to the situation when a bank's chief executive officer also serves as chairperson of the board of directors (Jizi et al., 2013). It is a dummy variable equal to one (1) if CEO is also the board's chairperson or Zero (0) otherwise. In addition, gender diversity (FDIRs) is the proportion of females having sittings on the board of directors (Srinidhi et al., 2011).

In addition, in line with earlier studies (for example, Andres & Vallelado, 2008; Cornett et al., 2009; Singh & Gaur, 2009; Adams & Mehran, 2012; Liang et al., 2013; Pathan & Faff, 2013; Sheikh et al., 2013; Nguyen et al., 2015; Arora & Bodhanwala, 2018), this study includes another four variables to control for leverage (Lev), capitalization (CapRatio), bank size (InTA), and GDP growth (Gdpgrow). Leverage (Lev) is measured as the ratio of the bank's total liabilities to its total assets.

Table 2. Variables and definiti	Table 2. Variables and definition					
Variables	Abbreviation	Definition				
Panel A: Dependent variable						
Tobin's Q ratio	Q	The sum of the bank's market value of equity added to the book value of debit divided by the book value of total assets. To be used as aregressant, Tobin's Q ratio values are converted into logarithmic (natural) form.				
Panel B: Board structure variables						
Board Size	BSIZE	The number of directors on the board				
Board Composition	BCOMP	The proportion of independent directors on the board				
CEO Duality	DUAL	Dummy variable equal one if CEO is also the board's chairperson or Zero otherwise				
Female Directors	FDIRS	The proportion of females having sittings on the board of directors				
Panel C: Other control variables						
Capitalization	CAPRATIO	The percentage of bank's total equity to its total assets				
GDP Growth	GDPGROW	Measured by the year wise percentage growth rate of GDP computed at market prices				
Leverage	LEV	The ratio of bank's total liabilities to its total assets				
Bank Size	LnTA	The natural logarithm of the bank's total assets				

Capitalization (CapRatio) refers to the bank's total equity as a proportion of its total assets. Bank size (InTA) is considered as the natural logarithm of the bank's total assets (Caiazza et al., 2018). GDP growth (Gdpgrow) is unhurried by the year-wise percentage growth rate of GDP computed at market prices.

Table 2 presents the definition and abbreviation of the variables employed in this study.

3.3. Econometric models specification

Using Tobin's Q (Q) as a dependent variable, this study uses panel regression to investigate the relationship between board structure and bank performance. The general model is stated as:

$$Q_{it} = \alpha + \sum_{i} \beta j \text{ board variables}_{i, t}^{J} + k \text{ control variables}_{i, t} + \varepsilon_{i, t}$$
(1)

Where Q_{it} , refers to the performance measure of bank *i* in year *t*; *i* go from bank 1 to bank 14 and *t* refers to the years from 2011 to 2019. The β parameters refer to the coefficients of the various board structure variables (BSIZE, BCOMP, DUAL and FDIRS) on bank performance (Q).

Pooled, fixed and random effects models are employed to estimate the regression model. Further, this study makes use of the Hausman test to decide on the fitting model between the fixed as well as the random effect guesstimates. Fixed effects model is preferred to the random effects model when p-value < 0.05% (Pasiouras & Kosmidou, 2007). In addition, the fixed effect method is preferable to the random effect method when the null hypothesis is rejected (or when the prob. < 0.05).

Ho: the random effect is appropriate Ha: the random effect is not appropriate

Thus, the fixed effects model is found to be more appropriate than the random effects model in this study since the p-value is less than 0.05% (see the results in Table 6). A GMM estimator is also used in this study to report the potential associations between the explanatory variables (Athanasoglou et al., 2008).

Therefore, the study uses the following panel data method adopted from Wintoki et al. (2012) to check for any endogeneity problem that occurs whenever the endogeneity assumption is not met (Shukla et al., 2021).

$$Q_{it} = \alpha + \varphi Q_{i,t-1} + \sum_{j=1}^{4} (BOARD)_{i,t} \beta_j + \sum_{j=1}^{4} (CONTROL)_{i,t} \zeta_j + u_i + \varepsilon_{i,t}$$
(2)

Where $Q_{i,t-1}$ stands for the one period lagged bank performance, whereas α , β , and ζ represent for the parameter to be guesstimated. U is the unobserved fixed effect for bank i while ε denotes the remaining disturbance term. The board includes the four variables BSIZE, BCOMP, DUAL and FDIRS, whereas the control encompasses CAPRATIO, GDPGROW, LEV and LnTA (see Figure 1).

4. Data analysis and results

4.1. Descriptive statistics

Table 3 reports the descriptive statistics of the dependent and independent variables (both the board structure and the control variables) used in this paper. The results indicate that the Q values varied from the minimum of 0.780 to the maximum of 1.201 with mean and standard deviation values of 0.971 and 0.065, respectively. The mean Q value of 0.971 (<1) implies that the book value of the banks under study dominates their market value over the whole study period. Alternatively, this Q value may reflect the dissimilarity of the Ethiopian commercial banks over the 2011 to 2019 period. In addition, the broad structure variables reveal that the average value of BSIZE is 9.554 with a minimum and maximum of 6 and 13, respectively. The mean value of BSIZE (9.554) for the banks under study is less than those of board bank size in other countries (e.g., 13.7 directors in Liang et al., 2013 using a sample of 50 main banks in China in the 2003 to 2010 period; 17.97 directors in Adams and Mehran, 2008 with a sample of more than 30 US banks over the period of 1986-1999; 15.78 directors in; Andres & Vallelado, 2008 by a sample of 69 banks in OECD countries during 1996-2006). On average, the board of directors in Ethiopian banks have 99.8% of the directors who are independent (with no connection to the bank other than a seat on the board), 15.8% of the commercial banks in Ethiopia have a duality problem (the chief executive officer also serves as chairperson of the board), and 14.4% of the bank boards in Ethiopia are female directors. Moreover, the average value of CAPRATIO is 13.6%, which is greater than that required by the National Bank of Ethiopia (NBE), i.e., the bank regulator in Ethiopia. As per the NBE, wellcapitalized banks have a capital ratio, CAPRATIO, of at least 8%. Hence, the results show that the banks in the study on average are well capitalized. The mean value of LEV is 86.4%, while the average value of LnTA is birr 9.451.



Figure 1. Board structure and control variables.

Source: Developed based on literature

Table 3. Descriptive statistics								
	Obs	Mean	Max	Min	Sd			
Q	126	0.971	1.201	0.789	0.065			
BCOMP	126	0.998	1.000	0.917	0.007			
BSIZE	126	9.554	13.000	6.000	1.582			
CAPRATIO	126	0.136	0.346	0.026	0.044			
DUAL	126	0.158	1.000	0.000	0.366			
FDIRS	126	0.144	0.300	0.000	0.096			
GDPGROW	126	9.534	11.200	6.800	1.250			
LEV	126	0.864	0.973	0.654	0.043			
LnTA	126	9.451	13.810	6.125	1.413			

This table describes the summary statistics of the sample variables. Abbreviation is as defined in Table 2. Source: Own computation

Table 4. Unit root test							
Variables	Levin, Lin & Chu t*	I'm, Pesaran and Shin W—test	ADF–Fisher Chi— square	PP–Fisher Chi– square			
Panel A: Dependent	variable (bank perfor	mance)					
Q	0.000	0.107	0.075	0.000			
Panel B: Independent variables (bank structure variables)							
BCOMP	0.000	0.000	0.000	0.000			
BSIZE	0.000	0.000	0.000	0.000			
DUAL	0.000	0.000	0.000	0.000			
FDIRS	0.000	0.000	0.000	0.000			
Panel C: Independent variables (control variables)							
CAPRATIO	0.000	0.000	0.000	0.000			
GDPGROW	0.000	0.000	0.000	0.000			
LEV	0.000	0.000	0.000	0.000			
LnTA	0.000	0.000	0.000	0.000			

Source: Own computation

4.2. Unit root test

Table 4 reports the results of the unit root test of the variables under study. In a panel data analysis checking for stationarity of the data, which is confirmed via unit root test, is an indispensable step. In this study, the stationarity of the variables is checked by using Levin, Lin & Chu t, I'm, Pesaran and Shin W-stat, ADF—Fisher Chi-square and PP—Fisher Chi-square tests. The null hypothesis (H_0) is that the sample variables have unit root problems in the 1st difference. The results exhibit that the variables do not have unit root at 1% level and are better. Thus, the null hypothesis (H_0) is rejected. This implies that the sample variables are free of unit root problems or the data is robust to the use of panel regression model.

4.3. Correlation matrix and multicollinearity diagnostics

Table 5 presents Pearson's correlation matrix between the sample variables. Hence, the results reveal that all the explanatory variables except for GDPGROW and LEV are found to have significant correlation with the dependent variable or regressant. Also, the results show that FDIRES is related significantly with all other board structure variables (BCOMP, BSIZE, and DUAL). Except for DUAL, the other board structure variables (BCOMP, BSIZE, and FDIRES) are found to have significant relationship with bank size (LnTA). Moreover, the results exhibit that there is no multicollinearity problem in this study as the utmost correlation (significant)

Table 5. Col	rrelation analysi	S							
	σ	BCOMP	BSIZE	DUAL	FDIRES	CAPRATIO	GDPGROW	LEV	LnTA
Ø	1.00								
BCOMP	-0.148	1.00							
BSIZE	-0.165	-0.139	1.00						
DUAL	-0.120	-0.206	0.081	1.00					
FDIRES	0.141	-0.003	0.126	0.096	1.00				
CAPRATIO	0.215	0.067	0.071	-0.049	0.227	1.00			
GDPGROW	0.172	-0.120	-0.161	0.014	-0.040	0.212	1.00		
LEV	-0.095	0.051	-0.057	0.058	0.221	-0.382	-0.239	1.00	
LnTA	0.204	0.037	0.002	0.082	0.264	-0.737	-0.379	0.480	1.00
Note: Bold text Source: Own co	t designates signific omputation	ance at 1% level or m	nore. Abbreviation is	as defined in Table 2	5				

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between the explanatory variables incorporated in the regression model is 0.480 (between LnTA and LEV). In a multivariate analysis, multicollinearity cannot be a severe problem if the correlation coefficients with the explanatory variables do not surpass 0.800 (Damodar, 2004). The unreported VIF values (from the multicollinearity diagnostics) also indicate that multi-collinearity is not a problem for this study provided the maximum VIF value is 1.250.

4.4. Regression analysis

In this section, bank performance measured by Tobin's Q ratio (Q) is regressed against a vector of explanatory variables. To do so, panel data regression is used to estimate the effects of the explanatory variables on Q following Wintoki et al. (2012) as shown in Table 6. The performance variable (Q) is regressed on the board structure variables (BCOMP, BSIZE, DUAL and FDIRS) and the control variables (namely CAPRATIO, GDPGROW, LEV and LnTA) first. Next, regression is made on the board structure variables only. The findings presented in Table A1 (see Appendix A) reveal that the guesstimated coefficients on the board structure variables remain unchanged. This indicates that the results stay put robust even after domineering for the possible effect of the control variables on bank performance.

From Table 6 for Q, the results (from the fixed effect model) reveal that the Adjusted R-square value is 0.75. This means that variations in the explanatory variables explain % of the changes in the regressant variable (bank performance) proxied by Q.

Moreover, the findings of the study show that all the board structure variables have significant effect on the bank's performance (Q). Concerning board composition and female directors, the coefficient of BCOMP (0.034) and FDIRS (0.181) is positive and significant. On the other hand, the coefficient of board size (BSIZE) and CEO duality (DUAL) are found to be negative and statistically significant.

Table 6. Model estimation results summary							
Variables	Poo	oled	Fixed		Ran	dom	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	
C	-0.160	0.835	0.225	0.727	0.102	0.870	
Board structur	re variables						
BCOMP	0.113	0.042	0.034	0.002	0.046	0.020	
BSIZE	0.004	0.076	-0.001	0.038	0.002	0.011	
DUAL	0.002	0.069	-0.001	0.034	0.001	0.057	
FDIRS	-0.048	0.023	0.181	0.001	0.102	0.022	
Control variab	les						
CAPRATIO	1.892	0.000	1.512	0.001	1.667	0.000	
GDPGROW	-0.003	0.036	0.003	0.003	0.001	0.061	
LEV	0.958	0.214	0.463	0.300	0.622	0.146	
LnTA	-0.008	0.109	-0.006	0.242	0.002	0.646	
R-squared		0.578		0.791		0.507	
Adjusted R-squared		0.548		0.748		0.473	
F-statistic		19.549		18.269		14.693	
Prob (F-statistic)		0.000		0.000		0.000	
Hausman test	0.003						

Abbreviation is as defined in Table 2. Source: Own computation The results exhibit that board size (BSIZE) is found to have a negative and significant effect of the bank's performance. This supports the hypothesis (H₁) that BSIZE diminishes bank performance (Q) and thus accepts H₁. The board becomes inefficient as the number of boards of directors increases (for example, El-Chaarani, 2014; Liang et al., 2013). As the board size decreases, board members are expected to be affianced as well as busier, resulting in more efficiency as well as swiftness. Also, lessening the board size means reducing the bill incurred for every board member, which leads to high bank performance (Kefiyalew & Dagnachew, 2020). The negative significant effect supports the findings of prior studies (for example, Babić et al., 2020; Bebeji et al., 2015; Hermalin & Weisbach, 2003; Liang et al., 2013; Pathan & Faff, 2013; Pathan et al., 2007; Staikouras et al., 2007; Yermack, 1996) who confirmed that BSIZE impacts bank performance indirectly. In contrast, the result contradicts with the findings of Dalton et al. (1999) and Coles et al. (2008) who suggested that the board size-bank performance relationship is direct or positive.

The positive and significant effects of BCOMP on the bank performance supports the hypothesis (H_2) that board composition increases bank performance, hence decision is to accept H_2 . The positive impact of BCOMP on bank performance agrees with prior studies (for example, Andres & Vallelado, 2008; Ashbaugh-Skaife et al., 2006a; Babić et al., 2020; Bebeji et al., 2015; Busta, 2007; C. S. Mishra & Nielsen, 2000; Cornett et al., 2009; Klein, 2002; Krivogorsky, 2006; Liang et al., 2013; Rosenstein & Wyatt, 1990) who reported that the increase in the proportion of independent directors in the board room boosts bank performance. Alternatively, the result is incoherent with the findings of other prior researchers (for example, Bhagat & Black, 2002; Coles et al., 2008; Pathan & Faff, 2013; Yermack, 1996) who argued that BCOMP lessens bank performance.

With regard to CEO duality (DUAL), as envisaged, the coefficient (-0.001) is negative and significant. This supports the hypothesis (H₃) that duality reduces bank performance thus accept H₃. This result accords with the findings of former studies (for example, Agoraki et al., 2010; Brown & Caylor, 2005; D.A. Carter et al., 2003; Pi & Timme, 1993) who reported that DUAL affects bank performance negatively and significantly, while it is inconsistent with the findings of other prior studies (for example, Goyal & Park, 2002) who confirmed that DUAL increases performance.

The coefficient (0.181) of female directors (FDIRS) is found to be positive and significant on bank performance. The positive significant effect supports the hypothesis (H₄) hence accept H₄. This result corroborates with the findings of earlier studies (for example, Adams and Ferreira, 2009; D.A. Carter et al., 2003; Nguyen et al., 2015; Reddy et al., 2008; Shukla et al., 2021) but contradicts to the findings of Rose (2007) who argues that the increase in the proportion of female board members decreases the bank performance.)

Regarding the control variables, the regression analysis provides for some important clues although no directional prediction is made on them. The estimated coefficient (1.512) of capitalization (CAPRATIO) is found to be positive and statistically significant, implying that banks work better whenever they are highly capitalized. The positive and statistically significant coefficient (0.003) of GDP growth (GDPGROW) also indicates that banks perform better when the economy grows. The findings of the study also exhibit that the coefficient of leverage (0.463) and bank size (-0.006) are found to be statistically insignificant and that LEV and LnTA do not affect the performance of Ethiopian banks.

4.5. GMM Estimation

Table 7 presents the GMM estimation results. Accordingly, the findings of the study indicate that all the board structure variables are found to be significantly related with the bank performance (Q). BCOMP and FDIRS have significantly positive impacts on bank performance as BSIZE and DUAL exhibit a negative significant impact on the performance of the banks under study. On the other hand, regarding the control variables, the results reveal that CAPRATIO and GDPGROW exhibit positive significant relationship with bank performance (Q), while LEV shows significantly negative

Table 7. Summary of GMM estimation results					
Variables	Coeff.	Prob.			
Lag Q	0.423	0.000			
Board structure variables					
BCOMP	0.329	0.007			
BSIZE	-0.173	0.029			
DUAL	-0.029	0.042			
FDIRS	0.032	0.017			
Control variables					
CAPRATIO	0.962	0.010			
GDPGROW	0.087	0.009			
LEV	-0.005	0.018			
LnTA	0.387	0.079			
Number of Observations	126				
AR(1) test stat	0.000				
AR(2) test stat	0.260				
F	16.874				
Prob > F	0.000				

Abbreviation is as defined in Table 2.

Source: Own computation

relationship with bank performance. However, the findings of the study indicate that bank size (LnTA) is insignificantly related to bank performance.

The estimated coefficient (-0.173) of BSIZE supports for the hypothesis (H₁) that large board diminishes bank performance (Q) thus accepting H₁. The board becomes inefficient as the number of boards of directors increases (for example, El-Chaarani, 2014; Liang et al., 2013). This result supports the findings of prior studies (for example, Bebeji et al., 2015; Hermalin & Weisbach, 2003; Kao et al., 2019; Kefiyalew & Dagnachew, 2020; Liang et al., 2013; Pathan & Faff, 2013; Pathan et al., 2007; Staikouras et al., 2007; Yermack, 1996) who confirmed that BSIZE impacts bank performance indirectly, while it contradicts with the findings of Dalton et al. (1999), Coles et al. (2008), Sheikh et al. (2013), and R. K. Mishra and Kapil (2018) who suggested that the board size-bank performance relation is direct or positive.

Moreover, the results show that BCOMP is related to the bank performance (Q) positively and significantly which accords to the hypothesis (H₂) that board composition increases bank performance hence decision is to accept H₂. The result is consistent with the findings of prior studies (for example, Andres & Vallelado, 2008; Ashbaugh-Skaife et al., 2006a; Bebeji et al., 2015; Busta, 2007; C.S. Mishra & Nielsen, 2000; Cornett et al., 2009; Jackling & Johl, 2009; Jermias, 2007; Kao et al., 2019; Klein, 2002; Krivogorsky, 2006; Liang et al., 2013; Rosenstein & Wyatt, 1990) who reported that board composition boosts bank performance, while it is inconsistent with other prior studies (for example, Yermack, 1996; Bhagat & Black, 2002; Coles et al., 2008; Singh & Gaur, 2009; Pathan & Faff, 2013) who argued that BCOMP decreases bank performance.

Relating to CEO duality (DUAL), as expected, the coefficient (-0.029) is negative and significant. This suggests that bank performance decreases when a single individual is jointly responsible for the CEO position with the board of directors as well as board chairperson responsibilities. This result supports the main hypothesis (H₃) that duality reduces bank performance and thus accept H₃. This result is consistent with the findings of former studies (for example, Agoraki et al., 2010; Brown & Caylor, 2005; D.A. Carter et al., 2003; Kao et al., 2019; Pi & Timme, 1993) who reported that DUAL effects bank performance negatively and significantly, while it is inconsistent with the

findings of other prior studies (for example, Azeez, 2015; Goyal & Park, 2002; R. K. Mishra & Kapil, 2018; Sheikh et al., 2013) who confirmed that DUAL increases performance.

The coefficient (0.181) of female directors (FDIRS) is found to be positive and significant on bank performance. This means that when the percentage of FDIRS in the board of directors increases by 1%, the expected Q value shall increase, on average, by 18.1%, other things remaining constant. The positive significant effect supports the hypothesis (H₄) and hence accept H₄. The result corroborates with the findings of previous studies (for example, D.A. Carter et al., 2003; Campbell & Minguez-Vera, 2008; Reddy et al., 2008; Adams and Ferreira, 2009; Dezsö & Ross, 2012; Nguyen et al., 2015; Ntim, 2015) but contradicts to the findings of Rose (2007) who argues that the increase in the proportion of female board members decreases the bank performance. Likewise, the results are inconsistent with the findings of D. A. Carter et al. (2010) who reported that the percentage increase in female directors did not have any significant effect on the bank performance.

In relation to the control variables, the regression result shows that only LnTA has statistically insignificant relation with Q. CAPRATIO and GDPGROW are found to have positive and statistically significant relations with Q, while the estimated coefficient of LEV (-0.005) is found to be significantly negative. The positive coefficient (0.962) on CAPRATIO, albeit no directional prophecy is made on it, signifies that highly capitalized banks can work better. Also, the positive coefficient (0.087) on GDPGROW indicates that banks perform better when there is economic growth. However, the negative significance coefficient (-0.005) on LEV reveals that bank performance reduces when banks are highly risky.

5. Conclusion, implications, and scope for future work

This study investigates the relationship between board structure and bank performance in the context of Ethiopia. Specifically, the current research focuses on the effect of commonly used board structure variables (namely board size, board composition, CEO duality, and board gender diversity) on the performance of the banks under study proxied by the market performance measure of Tobin's Q ratio (Q). To do so, the study makes use of panel data relating to 14 banks in Ethiopia over the period of 9 years (2011 to 2019), which gives rise to 126 bank-year observations, using panel data regression and GMM estimation method. The data on the board structure variables (board size, board composition, gender diversity and CEO duality) and bank performance (Tobin's Q) variables are hand collected from the annual reports of the banks under study over the study period. In addition, the data for the controlling variables except for GDP growth (which is collected from WB database) are obtained from the bank's annual reports.

The findings of the study evidenced that board structure influences bank performance, which supports the main predictions of the paper. In particular, the findings of the study support the hypothesis (H_1) that board size diminishes bank performance. The results also report that there is a positive and statistically significant effect of board composition on bank performance, which supports the hypothesis (H_2), whereas CEO duality is found to relate negatively and significantly with bank performance (H_3). Moreover, the results reveal that board gender diversity (existence of female directors on the board of Ethiopian banks) affects positively and significantly the bank performance (H_4).

The findings of this study have noteworthy implications. Firstly, the negative relationship between board size and bank performance is harmonious with the regulatory shift of decreasing the number of board of directors. Bank performance enhances with small boards, and the board becomes inefficient as the number increases as there is difficulty with the larger boards to convey their idea in the board meetings due to time limitations. Secondly, the positive relationship between board composition as well as bank performance implies that the insertion of independent directors in the board might increase the efficiency and effectiveness of the board and then lead to higher bank performance. Theoretically, the findings are harmonious with the view of transaction cost theory, which endeavours to stance the bank as an institution consisting of people with diverse views and

objectives. Third, the negative impact of CEO duality on the bank performance signifies that bank performance decreases when a single individual is jointly responsible for the CEO position with the board of directors as well as board chairperson responsibilities. CEO duality gives more power to one person in the board and hence decisions can be made against the interests of the minority stockholders. Finally, the findings present confirmation of the positive relationship between gender diversity and bank performance, which means that the inclusion of female directors in the boardroom enhances bank performance. This finding is consistent with the view of agency theory and resource dependency theory. Generally, the results of this study accord with the idea that there is a strong association between board structure and bank performance. Hence, the results could benefit policy experts and regulators who formulate policies on recuperating board governance. For example, the incorporation of female directors as well as independent directors could add to the effectiveness of the board and hence boost up the bank performance. Conversely, banks with large boards and CEO duality perform less. Banks should have an optimum number of board members with the best experience in the banking industry to conduct adequate as well as swift decisions and better supervise executives so that reduction of the bill incurred for every board member can result in high bank performance. So, the National Bank of Ethiopia has to allow the banks to decide freely about the number of their board members. In addition, regulatory bodies need to always consider the important conditions for a person to be a board member in a bank for the market to be more reasonable and then lead to more competition among the proficient directors. Finally, this paper suggests that the National Bank of Ethiopia should improve its policy concerning corporate governance by giving a due attention to the momentous factors under the present research in order to improve the performance of the Ethiopian commercial banks.

The study has some limitations which can be reasons for future researches. First, data is mainly gathered from the bank's annual financial reports where the report may fail to show the true performance of the bank since accounting standards are not strong in developing nations like Ethiopia. Secondly, the study is limited to using only one performance measure (Tobin's Q ratio) that it can be extended in the future by using other performance measurements such as ROA and ROE. Thirdly, the study contains only four board structure variables where future researches could deem other board structure variables such as board meetings, board age, board tenure, etc. to better investigate the board structure—bank performance relationship. Finally, the current research can be extended by examining the impact of board structure on bank performance on the basis of bank size as well as age.

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Appendix A

Table A1. Model estimation results summary (without control variables)						
Variables	Po	oled	Fixed		Random	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
С	-0.281	0.694	0.431	0.570	0.185	0.492
Board structu	re variables					•
BCOMP	0.151	0.038	0.064	0.008	0.102	0.016
BSIZE	0.016	0.068	-0.011	0.024	0.039	0.022
DUAL	0.009	0.059	-0.030	0.041	0.009	0.067
FDIRS	-0.148	0.033	0.280	0.000	0.118	0.013
R-squared		0.451		0.632		0.419
Adjusted R-squared		0.428		0.601		0.396
F-statistic		15.317		13.408		11.908
Prob (F-statistic)		0.000		0.000		0.000
Hausman test	0.002	·	·	·	·	



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