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Corporate governance, diversification, and risk management in commercial banks of Ethiopia

[1] K Sambasiva Rao, [2] Teshome Dula Jirra

[1] Professor, Department of Commerce and Management Studies, Andhra University Visakhapatnam, Andhra Pradesh, India
[2] PhD Scholar, Department of Commerce and Management studies, Andhra University, Visakhapatnam, Andhra Pradesh, India

Abstract
This study examined the effect of corporate governance attributes and bank characteristics on liquidity risk in commercial banks of Ethiopia. Out of 18 commercial banks operating in Ethiopia, 14 banks were selected based on their age. Data of 6 year totaling 84 observation had collected from National bank and each sampled banks. We have used panel data model and based on hauseman specification test, random effect model was selected. The results of the study showed that risk committee size, bank liquidity, capital adequacy ratio, loan concentration, income diversification, bank size, and loan growth were variables which had significant effect on liquidity risk. Whereas, board size, ownership type, risk committee meeting frequency and operational efficiency of management had no significant effect on liquidity risk. Therefore, it is recommended that the commercial banks should improve loan concentration by diversifying their loan portfolio, and they should enhance income diversification by relying on non-traditional income sources, and the board sub-committee; risk committee size should be given due emphasis to enhance effective risk management in Ethiopian commercial banks.

Keywords: corporate governance, risk management, bank, Ethiopia

1. Introduction

The effect of corporate governance attributes, government regulation, and bank characteristics, on risk in banking sector is a debatable issue which is subject to in-depth investigation and can have significant policy implication. This study tries to examine the effect of corporate governance attributes, government regulation, and bank characteristics on liquidity risk in Ethiopian commercial Banks.

The modern banking system in Ethiopia was first introduced in 1905 by the Emperor Minilik II during which bank of Abyssinia was inaugurated in 1906. Bank of Abyssinia was the first indigenous bank in Africa and established by an official decree on August 29, 1931. In the earlier periods of the Ethiopian banking history, the sector was all open to foreign banks to operate and invest in Ethiopia. This resulted in the opening of Barclays bank which came with British troops in 1941. According to World Bank report (2013) [1] total bank assets constitute 25% of the total GDP in Ethiopia which clearly indicates how significant the sector is to the overall economy.

The activity of banks in the area of funds and maturity transformation is the fundament for creating liquidity risk, including so-called "bank runs" (Diamond and Dybvig 1983) [2], (Rajan and Bird 2003) [3], (Goodhart 2008) [4]. The mismatch between maturities of assets and liabilities, both on balance sheet and off balance sheet, forms a classic mismatch gap which constitutes structural risk. This risk is determined by the character of funding sources, which are short or medium-term, in comparison to long-term lending.

The Basel Committee on Banking Supervision (BCBS) issued a global regulatory framework, known as Basel III, in December 2010 to create more resilient banks and banking systems. Basel III requires that a bank meet both short-term and longer-term liquidity ratios. These ratios measure the bank's potential cash outflows against hypothetical inflows from assets considered repossess able or salable. Liquidity Coverage ratio(LCR) was recommended by Basil III to control short term liquidity, while the net stable funding ratio(NSFR) was recommended to control long-term liquidity problem in banking sector. However, those techniques are not practically implemented in Ethiopian banking sector.

Liquidity risk management in The Banking sector of Ethiopia is commonly based on management of maturity structure of asset and liability. Such approach is principally aims at safeguarding the bank ability to meet is payment obligation; funding liquidity risk. Thus, the most common techniques of measuring funding liquidity risk in Ethiopian banking sector is cash flow mis-match or liquidity gap analysis.

Corporate governance within banks facilitates the balancing of powers between the shareholders and managers. Maintaining the balance of power and control between the two has been the key challenge of corporate governance, specifically when it comes to risk taking. literature highlights three key differences that distinguish the governance of banks from other firms; (i) The broader range of stakeholder, including depositors and creditors; (ii) The opacity and complexity of banks business, (Devriese *et al*. 2004) [5], (Graham, Harvey & Rajgopal, 2005) [6]; and, (iii) The unique system of oversight in the form of bank supervisors, deposit insurers and a comprehensive body of banking laws and regulation.

Boards are at the centre of the corporate governance system of a bank, as they are the link between the three levels of parties of interest; the shareholders, the managers, and the stakeholders by ensuring proper disclosure and transparency. Board structure and their effectiveness has started to receive intensive attention of the regulators, policy creators and researchers after the 2007/2008 financial crisis, since board ineffectiveness was viewed as the major cause of the financial crisis.

November 2009, the National bank of Ethiopia Bank

supervision directorate had conducted its first bank risk management survey. The report of the survey shows that Full/part of board members in 87% of banks did not sit for training on risk management. 60% of banks' boards of directors are not provided with relevant and up-to-date economic, business and market data for informed decision-making. The survey had also reported that Credit risk, Operational risk, and liquidity risk were the prominent risk which is suspected to challenge banking industry in the long run. NBE (2009) [7].

1.1 Statement of the Problem

Liquidity risk in the narrower sense (insolvency risk), i.e. the danger that a bank will be unable to meet its present and future payment obligations completely or on time.

The type of liquidity risk involved can result in a variety of implications as to how each individual institution manages its liquidity risk. However, the available information shows that all banks generally pursue the same objectives. These are usually; to ensure solvency at all times, to optimize intergroup cash flows (pooling liquidity, thereby reducing dependency on external refinancing), and to optimize the refinancing structure. The main objective of this study was to investigate determinants of liquidity risk based on panel data taken from Ethiopian commercial banks. NBE annual report (2009)**,** Ethiopian banks face credit and operational risks more severely than other types of risks. The national bank of Ethiopia conducted a survey on 15 banks and identified the nature of risk faced the banks. For question provided to banks which three risks had most affected your banks in the last two years? According to the report credit, operational and liquidity risks were key bank risks over the last two years, and would continue to be so over the next five years. Fortune news published on January 1, 2015 indicated that almost all commercial private banks found them confronted with liquidity crises, after suffering from what is known in the finance world as "a run on a bank" phenomenon occurred. It is an unusual situation where depositors demand withdrawals in unusually huge sums, with the result threatening to stall the whole payment system of the country. Therefore, examining the factors that affect liquidity risks of the banks in Ethiopia is entirely open for future studies and identifying the factors is also very essential.

1.2 Objectives of the Study

1. To examine the effect of corporate governance attributes on liquidity risk in Commercial banks
2. To investigate the effect of loan concentration on liquidity risk in Commercial banks
3. To examine the effect of income diversification on liquidity risk in commercial banks

2. Review of Literature

Corporate governance within banks facilitates the balancing of powers between the shareholders and managers. Maintaining the balance of power and control between the two has been the key challenge of corporate governance, specifically when it comes to risk taking. This approach goes in line with the agency theory. In addition, the balance of power stems from the differences within the governance mechanisms related to investor protection in different countries. In many emerging economies, the development of financial markets and investor protection is not yet fully developed. The frameworks for accounting, transparency, and disclosure are generally weak, as is the capability of the regulators to serve as the counterbalancing influence. After the global financial crisis of 2008/9, much attention has been paid to the link between corporate governance and risk management in financial institutions. Firm boards have historically adopted various approaches. The two main approaches are having a dedicated risk committee or combining risk oversight with another function and giving it to audit committee. Aebi *et al*. (2012) [8]. Who point out that the presence of risk committee in board room indicates a stronger risk management.

Additional literature, which has built on agency theory about the direct effect of ownership concentration on bank risk, assumes that stakeholders prefer more risk to less, Nocera & Sironi, (2007) [9].

In order to obtain higher returns, managers must resort to higher risk-taking in their banking activities. Governance mechanisms work differently depending on the type of ownership structure. Nocera & Sironi (2007), in their hypotheses on the ownership–governance interaction on the large European banks, compare government owned banks (GOB); privately owned banks (POB) They find that government owned banks exhibit a lower profitability than privately owned banks.

Corporate governance literature identifies three determinants of the effectiveness in the board composition: independence (number of independent members against inside members), size (large number of board members vs. small boards), and experience (past financial expertise). Equity ownership by inside directors or managers, and lately the gender determinant (male vs. female), have been the subject of some research as well. The question remaining to be answered is how the composition of the boards of directors influences the risk taking and performance of banks. In terms of the roles and responsibilities of the board, theoretical governance literature on boards suggests that choosing appropriate board composition and size would balance the monitoring and advising the management (Raheja, 2005; Adams & Ferreira, 2007) [10, 15]

Liquidity is the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Liquidity risk is sometimes also referred to as a sub-category of market risk related to bank ability to fulfill their obligations in meeting demands from depositors for withdrawal of their deposits. (Khadijah Iskandar, 2014) [11]

In order to improve liquidity risk management practices, the Basel Committee on Banking Supervision on Jan 2013 published the Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools. Basel III was introduced with objective to ensure sound liquidity in financial institutions and prevent recurrence of the liquidity crisis. Compared to the earlier Basel I and II frameworks, Basel III proposes many additional capital, leverage and liquidity standards to strengthen the regulation, supervision and risk management of the banking sector. Two measurement for liquidity management have been introduced which is Liquidity Cover Ratio (LCR) and Net Stable Funding Ratio (NSFR).

According to (Basel III 2013), the objective of introducing the LCR is to promote short term resilience of the liquidity risk profile of banks by ensuring that bank have sufficient high quality liquidity assets can be converted to cash to survive any stress scenario lasting for 30 calendar days. For NSFR, the

main objective is to promote resilience over a longer time horizon by creating additional incentives for banks to fund their activities with more stable sources of funding ongoing basis. Normally Net Stable Funding Ratio has a time horizon is one year and has been developed to provide a sustainable maturity structure of assets and liabilities. (Khadijah Iskandar 2014) [11].

Ganic Muhamed (2014) [12] a study conducted to identify determinants of liquidity risk in banking sector of Bosenia indicates ROE and TLD are negatively related to liquidity risk. Other studies (Brokovich *et al*., 2004) [13] question the effectiveness of board of directors in reducing risk when it is small, and on a basis of arguments show the presence of a positive relationship between small size and banking risk. They believe that a large board of directors could help better assess the risk of investment projects thanks to a diversified structure and to a better expertise.

Faccio *et al.* (2011) [14] find an inverse link between firm risk and female directors, while Adams and Funk (2011) [15] show that female directors are more prone to take risks than men.

The sectoral diversification has an unclear effect on banks with moderate risk but decreases the performance of banks characterized by a high level of risk. (Acharya *et al*., 2004) [16].

The proponents of activity diversification or product mix argue that diversification provides a stable and less volatile income, economies of scope and scale, and the ability to leverage managerial efficiency across products (Choi and Kotrozo, 2006) [17].

2.1 Hypothesis Development

Based on the review of literature, the following testable hypothesis was design for this study.

- **Ho_1 :** *Board risk committee size has negative relationship with liquidity risk in commercial banks*
- **Ho_2 :** *Gender diversity in board room has negative relationship with liquidity risk in commercial banks*
- **Ho_3 :** *Board size has a positive relationship with liquidity risk in commercial banks*
- **Ho_4 :** *Frequency of risk committee meeting has negative relationship with liquidity risk in commercial banks*
- **Ho_5 :** *Income diversification has negative relationship with liquidity risk in commercial banks*
- **Ho_6 :** *Loan concentration has positive relationship with liquidity risk in banking sector*

3. Research Methodology

This study was Explanatory study in design and investigates the nature of relationships between dependent and independent variables. A quantitative method of data analysis was employed which is panel data regression analysis. Data collected was analyzed using Random effect model (GLS regression). Stata 11 was the statistical package used as a tool to analyze the data.

3.1 Sample selection

The population of the study was all commercial banks operating in Ethiopia during the year 2010-2015. There were nineteen (19) banks operating in Ethiopia, where eighteen (18) are commercial banks, and one (1) Development bank owned by government. Out of the 18 commercial banks, two banks were public owned while sixteen banks were privately owned. Out of 18 commercial banks, we have selected 14 commercial banks purposively. The selected banks were commercial banks which had served more than six year. The data source was Audited financial reports collected from national bank and sampled banks during the period 2010-2015. The collected data was analyzed using panel data model; Random effect model.

3.2 Dependent and Independent Variables

The dependent variable of this study was liquidity risk measured by using financial gap ratio introduced by Saunders and Cornet (2007) [18]. Financial gap is defined as the difference between loan and bank's core deposits. For standardization of financial gap, the variable of financial gap is divided by total asset.

The independent variables were corporate governance attributes and bank characteristics; board size, number of female directors in board room, risk committee meeting, Capital adequacy ratio, total loan to total deposit ratio, loan concentration measured by Herefendal Hershman index, and income diversification. Beside the independent variables, control variables have been introduced to explain the variation of liquidity risk in commercial banks. Therefore, by following previous studies, bank size, ownership type, loan growth, and management efficiency were control variables added in this study.

3.3 Model Specification

The research model used for this study was a random effect panel data model similar to model used by Burak Aydemir (2012) [19]. The random effect panel data model assumes that the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. It allows for time-invariant variables to play a role as explanatory variables. Therefore, this research has the following general model:

$$Yit=\alpha_i+ \Sigma\beta Xk_{it} +u_i+ \varepsilon_{it}$$

Where

Yit - the dependent variable for bank i,at time t

Xk_{it}, the independent variables

α_i - intercept for bank i

ε_{it} – is the error term

Ui-unobserved bank specific heterogeneity

On its expanded form using the study variables, this research model has the following form:

$$LR_{it}=\beta 0+\beta_1 BS_{it}+\beta_2 PFD_{it}+\beta_3 RCS_{it}+\beta_4 RCM_{it}+\beta_5 TLTD_{it+}\beta_6 CAR_{it}+\beta_7 DIVI_{it}+\beta_8 HHILn_{it+}\beta_9 OW_{it+} \beta_{10} ln_{TAit+} \beta_{11} Lg_{it}+ \beta_{12} ME_{it} +ui+\varepsilon_{it}$$

Where

LR_{it} -stands for liquidity risk of bank i at time t measured by financial gap ratio

BS- stands for board size

PFD-stands for percentage of female directors in board room

RCS- stands for risk committee size

RCM- stands for risk committee member meeting in a year

TLTD- stands for ratio of total loan to total deposit

CAR-stands for Capital adequacy ratio (a measure of external corporate governance)

DIVI-Stands for income diversification in banking sector

HHILn-Stands for sectoral concentration of loan in banking sector
OWN -stands for ownership type
LnTA-stand for bank size and expressed ass natural logarithm of total asset
LG- stands for annual growth of loan
ME-stands for operating efficiency of management
B_0 *is intercept for bank i*
$\beta 1, \beta_2 \ldots \beta 12$ are parameters estimated (coefficient of independent variables)
u_i is un observed bank specific hetrogenity
εit is the error term, i =bank, t=time

3.4 Test of Classical Linear Regression Model (CLRM) assumptions.

i) Normality test

The analysis of residuals is a technique to see if there are any obvious patterns left within the unexplained portion of the variation of the dependent variable. The emphasis is upon not missing patterns that might suggest a relationship between the independent and dependent variables. Thus, one assumption of classical linear regression model (CLRM) is testing the normal distribution of the residual part of the model; the residuals are the difference between the original data and the predicted values from the regression equation. In this study, we have conducted Shapiro-wilk test and the result showed (W=0.93482 and prob> z 0.36), implying that the residuals are normally distributed; it means that model inference is valid.

ii) Heteroscedasticity test

In this study, we have conducted the brush pagan test to cheek existence of heteroscedastic (violation of homoscedasticity). The result of the test showed a chi-square value of 0.63, therefore we fail to reject the null hypothesis; constant Variance. It indicated that there is no hetroscedasticity problem.

iii) Multicolinearity test

Although there is no one unique method of detecting multicollinearity, we have used variance inflation factor (VIF) for this particular study. The variance inflation factor was less than 10 implying that, there is no multicoliniarity problem.

iv) Model specification test

A model specification error can occur when one or more relevant variables are omitted from the model or one or more irrelevant variables are included in the model. To cheek existence of model specification error, we have conducted Ramsey reset test using power of the fitted value of liquidity risk measured by financial gap ratio. The result of the test showed that the probability value of 0.023. Thus, we fail to reject the null hypotheses; model has no omitted variable. It implies that the model was free from model specification error.

v) Model selection test

There are broadly two classes of panel data estimator approaches that can be employed in empirical research: fixed effects models and random effects models. Before running regression analyses to examine the effect of independent variables on dependent variable, we have tested whether fixed or random effect was appropriate to the specified model. Therefore; the first issue was choosing between fixed effects (FE) and a random effects (RE) model based on the Hausman test where the null hypothesis says that random effects model is appropriate than the fixed effects model. According to Chris brooks (2008) [20], if the p-value for the Hausman test is greater than 5%, indicating that the fixed effects model is not appropriate and that the random effect is to be preferred. Based on this fact, the result we have conducted houseman test and it showed p-value of 0.98, implying that random effect model was the appropriate.

4. Result and discussion

Table 1: Regression result liquidity risk as dependent variable (Random effect model, GLS regression)

	Coef.	**Std. Err.**	**Sig.**
Board size (BS)	.0036912	.0174038	0.832
Number of Female directors in Board room	.0415836	.0365473	0.255
Risk committee Meeting (RCM)	-.0013636	.0080435	0.558
Risk committee Size (RCS)	-.0812341	.0276477	0.003***
Total loan to total Deposit (TLTD)	1.387525	.3928598	0.000***
Capital Adequacy ratio(CAR)	.0226273	.0085469	0.008**
Loan concentration (HHIln)	1.193149	.3360184	0.000***
Income diversification(DIVin)	-.7722035	.4202664	0.066*
Bank size (lnTA)	.2512129	.0918451	0.006***
Ownership type(OWNR)	.0587219	.1214082	0.629
Operational efficiency of management (ME)	-.0208372	.0330768	0.529
Loan growth (LG)	-.2998632	.0988615	0.002***
cons	-2.186574	.3879277	0.000
No observation =84			
F(9, 74) = 10.95 prob>F= 0.0000***			
R-squared =0.5747	Number of observation		84
Adj.R-squared =0.5028	Number of groups		6
	Observation per group		14
Root MSE = .22338			

*Statistically significant at 10% level of significance,** statistically significant at 5% level of significance,*** statistically significant at 1% level of significance

The explanatory power of the model; R-square value is 57.47%. This implies that 57.47% of variance in liquidity risk measured by financial gap ratio was explained by the independent variables. The regression result showed that risk committee size, bank liquidity measured by total loan to total deposit, capital adequacy ratio, loan concentration, income diversification, bank size, and loan growth were variables which had significant effect on liquidity risk. whereas, board size, number of female directors in board room, ownership type, risk committee meeting frequency and operational efficiency of management were variables which had no significant effect on liquidity risk. The detail discussion of the regression result on the basis of the research hypothesis is presented here under;

Hypothesis (H1): Board risk committee size (RCS)
The result of the GLS random effect model as presented in table 2 shows that there is a significant negative relationship between risk committee size and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (RCS) is -.0812341. Therefore, *H1: there is negative relationship between risk committee size and liquidity risk is accepted.*

Hypothesis (H_2): number of female directors in board room
The result of the regression analysis as presented in table 1 shows that there is positive relationship between number of female director in board room and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (NFD) is .0415836. Therefore, *H_2: there is negative relationship between number of female directors in board room and liquidity risk is rejected.*

Hypothesis (H_3): Board size
The result of the regression analysis as presented in table 1 shows that there is a positive relationship between risk committee size and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (BS) is 0.0036912. Therefore, *H_2: there is positive relationship between risk committee size and liquidity risk is accepted.*

Hypothesis (H_4): risk committee meeting frequency
The result of the regression analysis as presented in table 2 shows that there is a negative relationship between risk committee meeting frequency and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (RCM) is -.0013636.Therefore, *H_4: there is negative relationship between risk committee meeting frequency and liquidity risk management is accepted.*

Hypothesis (H_5): income diversification
The result of the regression analysis as presented in table 1 shows that there is a significant negative relationship between income diversification and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (DIVin) is (0.77.) Therefore, *H_5: there is negative relationship between diversification and liquidity risk is accepted.*

Hypothesis (H_6): loan concentration
The result of the regression analysis as presented in table 1 shows that there is a significant positive relationship between loan concentration and liquidity risk management in Commercial banks. The regression coefficient for the predictor variable (HHIln) is 1.19.Therefore, *H_6: there is positive relationship between loan concentration and liquidity risk is accepted.*

5. Conclusion
The regression result suggest that, risk committee size, bank liquidity, loan concentration, income diversification, loan growth, and bank size had significant effect on liquidity risk. It implies that improvement of loan concentration and income diversification can enhance the liquidity problems of commercial banks in Ethiopia. Whereas, risk committee meeting frequency, operational efficiency of management, board size, and ownership type had no significant effect on banks liquidity.
The findings of this study indicated, Ethiopian commercial banks board of subcommittee, especially risk committee size play a pivotal role in effective supervision of the risk management in banking sector. Therefore, the banks should give due consideration to the size of risk committee in board room. As the size of the members of risk committee increase, there is possibility of enhancing diversity of the committee members in terms of expertise, experience, education, and skill, which could enhance bank supervision and minimize problems of liquidity.

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