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Determinants of Commercial Banks Liquidity in Ethiopia

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Abstract

Liquidity creation is the main concerns of commercial banks because banks are mainly involved in deposit mobilizing and lending which have direct impact on their liquidity. The main objective of this study is to examine determinants of Ethiopia commercial banks liquidity. In order to achieve aforementioned objective of the study, quantitative and explanatory research design were adopted. The data covers the period from 2000-2019 for the sample of selected seven commercial banks among seventeen commercial banks based on year of establishment. Secondary data were collected from the selected seven commercial banks using purposive sampling technique. The fixed effect panel data regression technique was used by econometric package Eviews 9. The findings of the study showed that, nonperforming loan, exchange rate fluctuation, loan growth, interest rate spread and bank size have statistically significant negative impact on commercial banks liquidity. On the contrary, banks should not only be concerned with internal policy rather, they have to consider both internal and external factors to improve operational efficiency and optimize their liquidity position. On the other side the policy maker, national Bank of Ethiopia has to consider the existing economic conditions and promote favorable environment to the development of the financial sector.

Key words: Ethiopian commercial banks, Fixed effect regression, Liquidity, Purposive sampling.

1. Introduction

Liquidity refers to the ability to meet financial obligations as they come due, without incurring intolerable losses. It can also be defined as the ability of a financial institution to meet all legitimate demands for funds. Hence, liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans. Thus, banks to hold optimum level of liquidity which can make best use of income and allow them to meet their obligation. According to Aspachs, Nier.,&Tiesset, (2005), during global financial crisis, many banks struggled to maintain adequate liquidity. In order to sustain the financial system, unprecedented levels of liquidity support were required from central banks Cernohorska, (2010) even with extensive support, a number of banks failed, and forced into mergers or required resolution (Teply, 2011). However, as was pointed out by (Douglas & Philip, 1983) one of the key reasons why banks are fragile, is their role in transforming maturity and providing insurance as regards to depositors. Generally, banks strive to strike a balance between profitability and liquidity because the provision of sufficient liquidity to customers at all times is an essential feature of banking (Niresh, 2012).

2. Materials and Methods

2.1. Statement of the Problem

In Ethiopia, the banking sector has been playing important role in the economic development of the country. When banks control the financial sector, procedure of financial intermediation in the country depends seriously on them. NBE has required banks to have their own liquidity policy Tafesse, (2016) which enforces banks to monitor their funding structure and their ability to handle short term liquidity problems and provide an improved means of measuring the current and forthcoming liquidness risk related with their forthcoming liquidness situation. Therefore, keeping the optimal level of liquidity condition is of highest importance. However, the question comes next in mind is that, what are the factors that determine bank's optimum liquidity level (Tekle, 2019).

Liquidity problems have been affecting the banking industry since mid-November of 2019. The liquidity crisis has caused malfunctions in the inter-bank payment procedure at the central bank and complex the withdrawing of great amounts of money from banks. To alleviate the problem, National Bank of Ethiopia (NBE) has recently availed 14.5 billion Ethiopian Birr in loans to banks. Furthermore, the regulator demanded commercial banks submit details on their loans and cash flows. Slight liquidity difficulties infrequently occur in the industry because of cyclical influences. What makes this time different is the severity of the problem, pushing the regulator to demand the detailed lending activities of the banks.

During 2018 and 2019, liquid assets (cash on hand and disbursement accounts with National Bank of Ethiopia) that vigorously used for everyday tasks of banks, significantly worsened. They went down to 7.6% from 14.3% of deposits due to a surge in lending activities. The reduction of the balance of payment and settlement accounts was also sharp enough to have gotten the attention of the bank executives and the regulator, plummeting to 1.7% from 5.9% of deposits. The deterioration was not an inaccessible case of a few banks, but it occurred across the banking industry. The reduction in the liquidity position could be detected early June 2019. When financial activity decelerated down, and the request for cash reduced during June and September always. After October when economic activities picked up and demand for cash began to increase (for instance, the money supply outside banks increased by 16.4% between the first and third quarters of the 2018/19 fiscal year, similar to the same period in the preceding year) due to seasonal factors such as the harvest of crops, payment of taxes and dividends, the liquidity problem started to emerge (NBE, Annual Report of National Bank of Ethiopia, 2019)

As far as researchers' knowledge is concerned, Ayano, (2016), Yimer, (2016), Engida, (2015), Fola, (2015), and Tesfaye, (2016) have found that capital adequacy, bank size, non-performing loans and advances, interest rate margin, interest rate on loans and advances, money market interest rate, real GDP growth rate and general inflation rate had statistically insignificant impact on liquidity. Yimer, (2016) also analyzed the determinant factors of liquidity both for industry specific and macroeconomic variables from year 2000 to 2015 for the sampled commercial banks which stated that, from the bank specific factors banks size, loan growth, non performing and profitability have a significant impact on banks liquidity and among the macro economic variables only inflation had statically significant impact on liquidity it would have been better if the study considers the other macroeconomics factors. They overlooked unemployment rate impact and failed considering industry specific separately from macroeconomic determinants influence on Commercial Banks' liquidity.

Therefore, as described in the above paragraph, the existing local studies did not considered the asset quality, exchange rate fluctuations (birr to dollar) and interest rate spread which have direct impact on banks liquidity positions. Hence, this study will fill the gap by enumerating the three major factors of liquidity i.e. bank specific, industry specific and macroeconomic factors in seven commercial banks which have 20 years of operational experience from 2000 to 2019

2.2. Literature Review

Liquidity has been defined by authors in different scenario; it is an ability of a financial institution to meet all legitimate demands for funds (Yeager & Seit, 1989). According to Ally, (2013) liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. There should be capability of liquidity bases compared to current and upcoming requirements, and accessibility of resources readily convertible to cash without excessive cost. Duttweiler, (2009) emphasizes that, the liquidity expresses the degree to which a bank is capable of fulfilling its respective obligations. And also Liquid assets are those that can be converted to cash quickly if needed to meet financial obligations; examples of liquid assets generally include cash, deposit in central bank or to other banks and government debt.

Banks, intentionally or not, fail to sustain adequate positions of liquid assets in their portfolios are expected to make a fear or a loss of self-assurance among depositors over the safety of their deposits, and this fear is contagious Schwartz, (1963), it spreads among the banks through deposits withdrawals or through correspondent relations. Moreover, literature proposes that commercial banks are greatly leveraged financial institutions and susceptible to runs of deposits, they should be discouraged from taking unnecessary risks in their lending and investing activities. Excessive risk takings, in turn, produce substantial increases in holdings of illiquid assets in the banks' portfolios. Inevitably, aggressive behavior of the unhampered banks adversely affects the level of liquid assets. These

behavioral changes in the commercial banking sector during the instable periods eventually cause a fear to emerge among depositors over the safety of their money (Civelek, 1987). (George & John, 1974), argued that the problem of bank liquidity is essentially that of being able to raise sufficient amounts of cash quickly and easily at going market rates of interest (Leykun, 2016). They recommended reserves of short-range resources as traditional sources of liquidity which can be run off when credit is required and the ability to acquisition funds directly in the money market (liability liquidity). In addition, inflationary demand has caused asset liquidity to fall sharply in recent years as banks have run down their cash assets to make way for less liquid but more profitable business loans liability liquidity - a bank's unused borrowing capacity or its ability to tap the market for additional funds - is more difficult to evaluate. If it is presumed that banks, like other borrowers, tend to wear out their welcome the more they borrow, then higher levels of actual borrowing would tend, ceteris paribus, to reduce liability liquidity. Said, & Tumin, (2011) suggested revising the determinant factors of the liquidity of banks is an essential subject matter which could help in banks' appreciation of the contemporary conditions of the banking industry and the critical factors to be considered in fashioning out plans and policies towards improvement, profitability and growth. Before, liquidity risk was not the main focus of banking regulation. However, the 2007-2009 financial crises showed how rapidly market condition can change exposing several liquidity risks in institution, many times unrelated to capital level. Until February 2008, Basel Committee , (1998) had set out regulatory standards for the management of both Credit and market risks in the Basel I Accord and that for operational risk in the Basel II Accord in 2004, regulatory standards for liquidity risk were seldom mentioned.

Yoram & Jacob, (2008) indicated that there has been extensive academic and regulatory discussion on major banking risks including credit risk, market risk and operational risk while little attention has however been paid to liquidity risk that has also become one of the major risks faced by banks and other financial institution in recent years. Now, there is wide agreement that insufficient liquidity buffers were a root cause of this crisis and on-going disruption of the world financial system, making the importance of liquidity risk analysis and administration a vital concern for the years to come. The fundamental role of banks in the maturity transformation of short-term deposit into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution-specific nature and that which affects market as a whole. Liquidity creation itself is seen as the primary source of economic welfare contribution by banks but also as their primary source of risk (Bryant, 1980); (Douglas & Philip, 1983); & (Charles W. & Charles M., 1991). Therefore, virtually every financial transaction or commitment has implication for a bank's liquidity. Globally, the adequacy of liquidity plays very crucial roles in the successful functioning of all business firms. However, the issue of liquidity though important to other business, is most paramount to banking institution and that explains why banks showcase cash and other liquid securities in their balance sheet statement annually. Unlike other conventional firms, bank assets are arranged in terms of the most liquid assets beginning with cash. With respect to finance and financial institution, liquidity may be defined as the bank's ability to meet maturing obligation without incurring unacceptable losses.

In order to avoid liquidity crisis, management of business and financial institution in particular need to have a well-defined policy and established procedures for measuring, monitoring, and managing liquidity (Longworth, 2010). It is obvious that liquidity and liquidity risk is essential subject, consequently banks and their regulators are powerful to retain a control on liquidity position of banks. Liquidity in general is vulnerable and could be drained suddenly from a bank. Shortage in liquidity of a bank could spread out to other banks as by way of interbank transactions and create systemic risk. Shock in the financial market could spur spiral liquidity that deplete the liquidity in the market and create a financial crisis. Historically, banking crisis usually emerges from liquidity crisis that form banks default for the majority of their liabilities. According to Goodhart, (1987) there is no difference between illiquid bank and insolvent bank. Essentially, banks which need liquidity from the lender of the last resort could be suspected in the process of insolvency. Accordingly, banking industry in Ethiopia has its own unique features that distinguish them from other countries financial market. One of the feature is the regulation of the country is not allowed foreign nations or organization to fully or partially acquire share of Ethiopian banks. The Ethiopia financial sector is largely bank-based as the secondary market is still not established in the country and as such the process of financial intermediation in the country depends heavily on banks. In fact banking industry in Ethiopia is now acting as a linking that holds the country's economy together. Hence, keeping their optimal liquidity for banks in Ethiopia is very important to meet the demand by their present and potential customers.

2.2.1. ***Determinants of Banks Liquidity Position***

Theoretically factors affecting bank liquidity are mainly divided into two categories, such as internal and external variables. The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. Such factors include bank profitability, bank capital adequacy, bank size, asset quality, growth of loan and the like. The external or macro determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and liquidity positions of institutions. The macroeconomic factors that can affect bank liquidity include GDP, interest rate margin and inflation rate, reserve requirement among others.

2.2.1.1. ***Internal Factors of the Banks Liquidity Position and Hypothesis***

Internal factors of liquidity positions are factors which can be managed and controlled by the bank itself. There are different bank specific (internal) determinants which influence bank's liquid asset. Profitability and bank liquidity: Profitability accounts for the impact of better financial soundness on bank risk bearing capacity and on their ability to perform liquidity transformation (Christian, Sascha, Andreas & Marcel, 2008). A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system Panayiotis, Sophocles & Manthos, 2005). One of the highest yielding assets of a bank is loans and advances that provide the largest portion of operating revenue. In this respect, banks are faced with liquidity risk since loans and advances are funds from deposit of customers. The higher the volume of loans and advances extended to customers, the higher the interest income and highest profit potentials for banks but it affects liquidity of the bank. Therefore, banks required to strike equilibrium between profitability and liquidity. The association between profitability and liquidity differs amongst different literatures. According to Bourke, (1989), banks holding more liquid assets advantage from a greater insight in funding markets, dropping their financing charges and increasing profitability. On the other hand, the studies made by Philip & John, 1992) & (John, Philip & John, 2004), argued that holding liquid asset imposes an opportunity cost on the bank and have an inverse relationship with profitability. Further, (Stewart& Raghuram, 1998) emphasized the adverse effect of increased liquidity for financial institutions stating that, "although more liquid assets increase the ability to raise cash on short notice, they also reduce management's ability to commit credibly to an investment strategy that protects investors" which, finally, can result in reduction of the "firm's capacity to raise external finance" in some cases. Thus, this indicates the negative relationship between bank profitability and liquidity. Trade-offs which commonly occur between return and liquidity risk are demonstrated by observing that a shift from short term securities to long term securities or loans raises a banks return but also increases its liquidity risks. As a result of the two opposing views, the management of banks faced with the dilemma of liquidity and profitability.

Non-performing loans and bank liquidity: Non-performing loans are loans and advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment term of the loan or advance is in question (NBE, Annual Report, 2008). According to Awan, (2009), they are loans which a bank client fails to meet his/her promised duties on either principal or interest payments above the arranged repayment dates. Therefore, NPLs are loans that have negative effect to banks. Growth of NPL portfolios meaningfully contributed to financial suffering in the banking industry. The banking systems play the central role of mobilizing and allocating resources in the market by channeling fund from surplus economic units to deficit economic units. This activity of transforming short term deposit to long term loans and advances will generate most profits for banks. Though, it contains high risk and ultimately if not administered appropriately will leads to high amount of NPLs. an enlarged NPL reflects worsened asset quality, credit risk and its inefficiency in the allocation of resources. According to Adriaan & Cornelis, (2001) though NPLs may affect all sectors, the most serious impact is on financial institutions which tend to have large loan portfolios. On the other hand, large volume of non-performing loans portfolio will affect the ability of banks to provide credit and leads to loss of confidence and liquidity problems. Therefore, the amount of non-performing loans has a negative impact on bank's liquidity.

$$\text{NPL ratio} = \frac{\text{NPLs}}{\text{Gross Loan Outstanding}}$$

H1*: Non-performing Loans of the bank has negative impact on banks liquidity*

Capital adequacy and bank liquidity: Capital can be defined as common stock plus surplus fund plus undivided profits plus reserves for contingencies and other capital reserves. Besides, bank loan loss reserves that assist as a buffer for absorbing losses can be included as bank's capital (Patheja, 1994). According to Fakhri, (2013), bank's capital plays a very important role in maintaining safety and solidarity of banks and the security of banking systems in general as it signifies the buffer gate which avoids any unanticipated loss that banks might face. The recent theories suggest that, bank capital may also affect banks" ability to create liquidity. These theories produce opposing predictions on the relationship between capital and liquidity creation. Under the first view, the "financial fragility-

crowding out" theories predicts that, higher capital reduces liquidity creation and lower capital tends to favors liquidity creation (Douglas & Raghuram, 2001). They stated that, depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposits. However, this fee differs according to the borrowers" capability of repayment. For those with higher risk borrowing but are reluctant to incur higher cost, will provoke depositors to withdraw their funds. Furthermore, John G., Phil & John O., (2004) show that a higher capital ratio may reduce liquidity creation through another effect: "the crowding out of deposits". They consider that deposits are more effective liquidity hedges for agents than investments in bank equity.

$$\text{Capital adequacy} = \frac{\text{Total capital}}{\text{Total Risk Weighted Assets}}$$

H2*: Capital Adequacy has a significant positive effect on bank liquidity*

Deposit growth and bank liquidity: Moussa, (2015) found an insignificant effect of deposits on bank liquidity. (Clemens, Iman & Robert, 2013), and Anil, (2002) argued that as demand deposits increase, liquidity asset holdings also increase. (Guillermo & Ingela, 1999) Provided empirical insights into liquid assets held by Mexican banks and summarized 10 predictions based on various theories and applied panel data estimates from January 1997 to March 1999. They assumed that at a given level of deposits, if there is more risk for borrowers as in the case of economic recession, liquid assets should also be increased by banks. Pilbeam, (2005) Studied emerging economies for the period of 1994 to 2004 and found that as the deposit rate increases bank liquidity decreases.

H3*: Deposit Growth of the bank has positive impact on banks liquidity*

Loan Growth and Bank Liquidity: The loans and advances portfolio is the largest asset and the predominate source of revenue of banks. According to Ouglas & Raghuram, (2005), lending is the principal business activity for banks. Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. The amount of liquidity held by banks is heavily influenced by loan demand and it is the base for loan growth (Pilbeam, 2005). If demand for loans is weak, then the bank tends to hold more liquid assets whereas, if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Therefore, loan growth has negative relationship with bank liquidity.

H4*: Loan Growth of the bank has negative impact on banks liquidity*

Bank size and bank liquidity: The size of the bank also plays a role on how the banks will not only perform but also in attaining dominance in the banking industry (Naveed, 2011)**.** Large banks may exploit economies of scale and this enables them acquire more client and undertaking in more transactions which translate to more returns. Additionally, the large banks tend to be more trusted by the customers and this implies more clients will opt to invest in them as opposed to the smaller ones. Also, in case risk occurs, the larger banks are in a position to mitigate it and be affected minimally whereas the smaller banks will be highly prone to dissolution and insolvency. This has seen most small banks to endeavor to expand their business and market values. Therefore asset size a positive impact on the liquidity of commercial banks.

H5*: Size of the bank has positive impact on banks liquidity*.

Asset Quality: Asset quality is one of the most importance elements in determining the overall financial health of bank. Asset quality based on loan used to determine the performance of banks based on how well a manager control its loan. Loan is the one of the main sources of income for banking sector. Because it generates significance return from interest of loans, due to this fact banks should performance a better asset quality control to achieve their objective (Tobias & Themba, 2011). To compute the asset quality of commercial banks utilized the following formula.

$$\text{Asset Quality} = \frac{\text{Loan Loss Provision}}{\text{Total Loans}}$$

H6*: Asset quality has positive impact on commercial banks liquidity.*

2.2.1.2. ***External Factors Affects Banks Liquidity Position***

The external or macro factors are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and liquidity positions of institutions.

Reserve requirement: These costs in our case will be calculated as the proportion of required reserves put in the national bank to total assets. A positive correlation with the dependent variable is expected, because a higher level of reserves (remunerated in lower interest rates) will affect the banks behavior to setting higher loan rates for compensating the missing profit of investing these funds. Few studies have observed the influence of funding cost and funding sources on bank liquidity (Desquilbet, 2008). (Guillermo & Ingela, 1999), and Munteanu, (2012) further explained that if refinancing cost increased, banks tended to invest more in liquid assets. This means that if

liability cost increases, then banks, instead of relying on interbank market, tend to rely more on liquid assets that act as a source of liquidity.

H7*: reserve requirement of the bank has negative impact on banks liquidity*

GDP growth and bank liquidity: Gross Domestic Product (GDP) is one of the macroeconomic factors that affect liquidity of banks. A major recession or crises in business operations reduces borrowers‟ capability to service obligations which increases banks‟ NPLs and eventually banks insolvency (Michael & Ricardo, 1998). During economic boom, the demand for differentiated financial products is higher and may improve bank's ability to expand its loans and securities at higher rate and thus reduce liquidity. The other study made by Painceira, (2010) stated that, banks liquidity fondness is low in the course of economic boom where banks confidentiality expects to profit by expanding loan able fund to sustain economic boom while restricted loanable fund during economic downturn to prioritize liquidity. In line with this argument the loanable fund theory of interest states that, the supply for loan increases when the economy is at boom or going out of recession (Pilbeam, 2005). Aspachs, .,Nier,,&Tiesset, (2005), has also inferred that, banks prioritize liquidity when the economy plummets, during risk lending opportunities, while neglecting liquidity during economic boom when lending opportunities may be favorable. On the other hand, the studies made by Michael, Barry, Daniela & Maria, (2001), suggested that during recession, it is likely for an increase in the number of loan default. This causes depositors to perceive high solvency risk and immediately tend to withdraw deposits held at financial institutions.

H8*: GDP of the bank has Positive impact on banks liquidity*

Inflation and bank liquidity: Inflation reflects a situation where the demand for goods and services exceeds their supply in the economy. Existing monetary theories agree that, inflation increases the opportunity cost of holding liquidity and thus distorts the allocation of resources which require liquidity in transaction. There are theories which emphasize the importance of informational asymmetries in credit markets and demonstrate how increases in the rate of inflation adversely affect credit market frictions with negative repercussions for financial sector performance and therefore long-run real activity (Elisabeth & Bruce, 1999). The feature of these theories is that, there is an informational friction whose severity is endogenous. Given this feature, an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns worse the credit market frictions which leads to the rationing of credit, hence credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. Further, the amount of liquid assets held banks will rise with the rise in inflation. High inflation rate and sudden changes of inflation have a negative impact on real interest rates and bank's capital. In this respect, the bank's non-performing loans will expand, collateral security values deteriorate and value of loan repayments on banks loans declines. This way, it has been found that inflation rate significantly determines bank liquidity (Heffernan, 2005)

H9: *inflation rate of the bank has negative impact on banks liquidity.*

Exchange rates fluctuation and bank liquidity: The value of a local currency against a unit of the foreign currency is termed as the exchange rate. The exchange rate is not fixed asset tends to vary based on the particular currencies and also the particular time or period. Certain currencies will have a higher value than others, but when the value decreases it is termed as to depreciate. There are many factors that result in changes in the exchange rates and this includes mainly the balance between demand and supply in the foreign market. These changes occur spontaneously and always seem almost difficult to predict. The changes result in the organizations performance and liquidity as well. This is however limited largely to those organization undertaking mainly in international transactions or currencies as the locally based ones will be impacted minimally (Carolyn & Daniel, 2016) As such high exchange rates will make most foreign investors shun from making any transactions at that particular time. The banks will be affected in the similar way as depreciation in the local currency will mean reduced transactions such as savings and borrowing resulting in reduced returns and it has negatively affect liquidity of commercial banks.

H10: *Foreign exchange Rate fluctuation of the bank has negative impact on banks liquidity.*

Interest rate spread and bank liquidity: The interest rates comprise the amount charged by the banks during lending. This varies with the type of bank and the amount being borrowed (Lucchetta., Gianni & Marcella, 2010). High interest rates tend to discourage people from borrowing and opting to invest more while low interest rates tend to encourage more loans being acquired. This may be exploited by the regulatory bodies when they want to either increase or decrease cash inflow by the banks. In a similar way, the interest rates may also determine the currency values. The interest rates are directly proportional to the demand in that increase in demand will tend to increase the value of the currency which implies that liquidity of commercial bank depends on the spread of interest rate.

H11: *Interest Rate Spread of the bank has negative impact on banks liquidity.*

2.3. Conceptual Framework

The conceptual framework

Based on the hypotheses that developed from the literature part and the following conceptual frame work was developed that helps clearly to demonstrate the variables used in the study and in what way they are associated. It depicts internal and external variables that determine commercial banks liquidity.

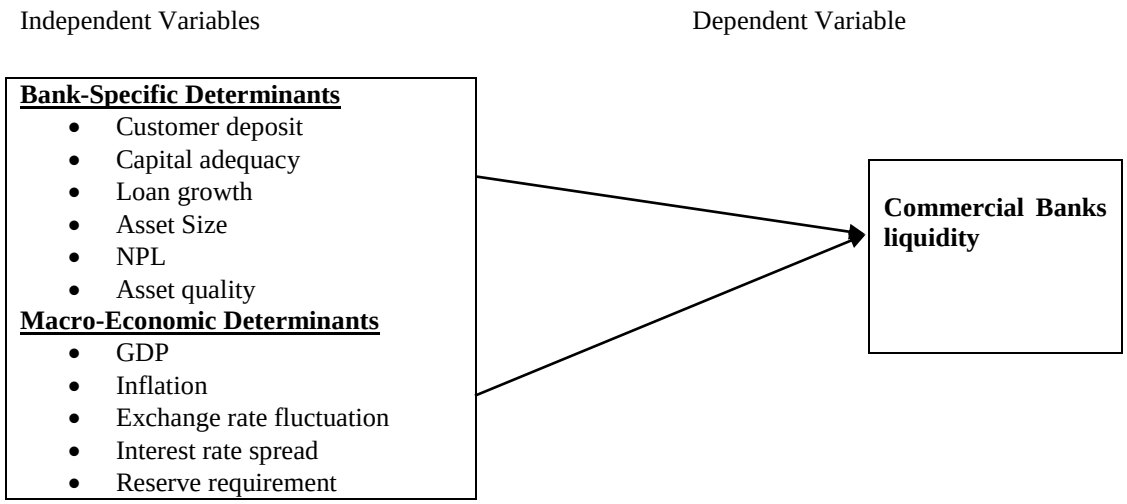

Figure 1: Conceptual Framework

Source: Developed based on literatures in the study.

2.4. Research Methodology

The objective of this study is to examine the determinants that affect the liquidity of commercial banks in Ethiopia. To achieve objective of the study explanatory research design was employed investigate the cause and effect associations' liquidity of bank and determinants of banks liquidity.

Data for banks specific determinants of liquidity were collected from audited financial statements (Balance Sheet and Profit and Loss Statement) of selected commercial banks included in the sample; while for external determinants of commercial banks liquidity were collected from (NBE, Annual Report of National Bank of Ethiopia, 2019). Data collected from 2000 to 2019 on annual base and the figures for the variables were on June 30th of each year. According to NBE, (2019) report there are sixteen privately owned commercial banks and one publicly owned commercial banks. One public owned bank and sixteen private banks, among these banks seven banks were selected based on their establishment. Accordingly, only commercial banks who have twenty years audited annual financial statements were included in the study.

2.5. Result and Discussion

2.5.1. ***Correlation between Variables***

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. The values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a positive linear sense; while a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense. A correlation coefficient

of 0, on the other hand indicates that there is no linear relationship between two variables (Brooks, 2008). The correlation matrix in table 1 below, predicts the likely relationship among variables in the study. Cooper & Schindler, (2009) state that, all correlation coefficient variables which have more than 0.8 should be corrected because of multicolinearity problem. Therefore, in this study there is no explanatory variable which is more than 0.75 correlation coefficients. So, there is no multicolinearity problem.

Table 1: Correlation Matrix of the Dependent and Independent Variables

	LIQ	NPL	RR	USD-BIRR	LG	IRS	INF	GDP	CD	CAR	BS	AQ
LIQ	1	0.159	0.056	-0.651	-0.047	-0.479	-0.1496	-0.385	0.099	-0.040	-0.572	-0.333
NPL		1	-0.011	-0.06	-0.184	-0.051	-0.064	0.0197	0.023	-0.277	0.105	-0.117
RR			1	-0.024	-0.028	-0.014	-0.054	0.048	-0.066	-0.010	0.004	0.048
USD-BIRR				1	-0.164	0.586	0.0902	0.240	-0.175	0.221	0.607	0.462
LG					1	-0.282	-0.208	-0.161	-0.053	0.186	-0.411	-0.11
IRS						1	0.1942	0.258	-0.144	0.025	0.757	0.236
INF							1	0.272	-0.017	0.061	0.271	0.039
GDP								1	0.026	0.024	0.346	0.238
CD									1	-0.265	0.020	-0.094
CAR										1	0.308	0.153
BS											1	0.292
AQ												1

Source: own computation from NBE via Eview.9, 2021

Table 1 indicates that there was a negative correlation between liquidity and all explanatory variables, except NPL and RR. A correlation coefficient indicates that the independent variables are perfectly related in a Negative linear sense with liquidity, exchange rate (birr to dollar) had the highest negative correlation coefficient with liquidity of -0.65.This indicates correlation coefficient of independent variables is perfectly related in a negative linear sense with liquidity.

The above correlation analysis shows only the direction and degree of associations between variables, it does not allow the researchers to make cause and effect inferences regarding the relationship between the identified variables, is simply stated that there is evidence for a linear relationship between the two variables and that movements in variables are on average related to an extent given by the correlation coefficient. Thus, in examining the effects of selected independent variables on bank liquidity, the econometric regression analysis which is discussed in the forthcoming section of the paper gives assurance to overcome the shortcomings of correlation analysis.

2.5.2. ***Regression Analysis***

A regression analyses were done to know the relationship between liquidity measures and those independent variables, Bank Size (BS), Capital Adequacy (CAR), Asset quality (AQ),Non- Performing Loan (NPL),customers deposit(CD), loan Growth (LG), GDP Growth rate (GDP), Inflation (INF), Foreign Exchange rate Fluctuation (FERF) ,reserve requirement(RR) and Interest Rate spread (IRS). The regression result was presented as follow:

Table 2 Regression results for determinants of commercial banks liquidity

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.477285	0.042245	11.29795	0.0000
NPL	-0.502503	0.114265	4.397717	0.0000*
RR	0.002843	0.002440	1.165102	0.2461
USD_BIRR	-0.003136	0.001047	-2.996629	0.0033*
LG	-0.065153	0.015660	-4.160504	0.0001*
IRS	-0.516555	0.303451	1.702271	0.0911***
INF	0.022713	0.040157	0.565614	0.5726
GDP	-0.306252	0.114674	-2.670626	0.1286
CD	0.188084	0.199535	0.942609	0.3477
CAR	0.030776	0.114981	0.267663	0.7894
BS	-0.030056	0.006365	-4.721815	0.0000*
AQ	0.299585	0.417146	0.718178	0.4740

R-squared	0.640855	Mean dependent var.	0.208116
Adjusted R-squared	0.609991	S.D. dependent var.	0.072761
S.E. of regression	0.045440	Akaike info criterion	-3.263047
Sum squared resid.	0.264289	Schwarz criterion	-3.010907
Log likelihood	240.4133	Hannan-Quinn criter.	-3.160585
F-statistic	20.76379	Durbin-Watson stat	1.263912
Prob.(F-statistic)	0.000000		

***, ** , and *****denote significance at **1%, 5%, and 10%** levels, respectively.

Source: Eview 9 Result.

According to table 2 fixed effect regression results, adjusted R^2 has the value of 64% which revealed that the explanatory power of the model was good. The value (i.e. 64%) could be interpreted as; the variations of liquidity in Ethiopian commercial banks 64% were explained by, NPL, USD_BIRR, LG, IRS, INF, GDP, CAR, CD, BS, RR and AQ whereas the rest 36% variation of liquidity in Ethiopian commercial banks were explained by neither External nor internal variables used in this study rather it goes to the error term. Generally, the value of adjusted R2 in this study indicated good model specification. Also, the overall test of significant F statistics shows that the model was good enough fitted and statistically significant at 1% level (i.e. p-value = 0.000). In general, the above table 2 indicated that; out of the total eleven explanatory variables of the study four of them were statistically significant at 1% level (i.e. NPL, LG, BS, and USD-BIRR) while IRS were significant at 10% level. The rest one variable INF, RR, CD, CAR and AQ had no statistically significant effect on liquidity of Ethiopian commercial banks for the period of 2000-2019. Exchange rate fluctuation (USD to BIRR), and IRS was the only macroeconomic variable that significantly affected liquidity, but the rest four variables were go to bank specific variables; and industry this indicated that most statistically significant variables that affected liquidity of Ethiopian commercial banks were from bank specific factors. The model is well fitted at 5%percent significant level.

LIQ = 0.47C-0.50NPL + 0.002RR – 0.003USD TO BIRR -0.06LG + 0.51IRS + 0.02INF – 0.30GDP + 0.188CD + 0.03CAR -0.03BS + 0.29AQ.

Non-performing loan (NPL) is measured by the ratio of provision for non-performing loans to total loans and advances. The regression result found to be negative and statistically significant effect on liquidity. The coefficient value of the variable is -0.50 which indicates a unit increase in NPL results in a 0.48 unit decrease in liquidity of Ethiopian commercial banks Significant at 1% p-value. This result is consistent with (Angela Roman & Alina Camelia Sargu, 2015), which stated that, the banks operating in the Czech Republic registered an increase of their impaired loans ratio during the analyzed period results and decrease in liquidity because the new regulations adopted by the Czech Republic National Bank demanded a decrease of the overall banks liquidity level for the banks that registered a deterioration of their loans portfolio, this also determines the positive and statistically significant link

between the liquidity indicator and NPL. Again, In the case of the Lithuanian banks, the increase of the impaired loans ratio had a tremendous impact on their overall liquidity. In order to avoid the collapse of the banking system the Lithuanian National Banks has undertaken a series of reforms, among which an increase of the minimum liquidity level that banks must maintain. So, as banks registered an increase of their impaired loans ratio the Central Bank required an even higher level of liquidity, thus the positive and statistically significant link between the liquidity indicator and the impaired loans ratio is valid. Since, the commercial banks in Ethiopia are highly regulated by the central bank (NBE) they are very strict in NPL management. Therefore, whenever their NPL is higher they have to offset with additional loan and advance and in order to avail new loan they have to increase their liquidity otherwise, increase in amount of nonperforming loans (NPL) leads the banking sector to efficiency problem and the banking system into failure, as per the finding of this study NPL has negative and statistically significant impact on the liquidity position of selected Ethiopian commercial banks. Therefore, the hypothesis stating NPL has negative and significant impact on bank liquidity shouldn't be rejected.

As it is evident in the table 2, the coefficient of the loan growth was negative and statistically significant even at 1 percent. The result shows that a one unit increase in loan growth, results in a -0.06 unit decrease in banks' liquidity which means that the growth of loan negatively affect the liquidity of the commercial banks in Ethiopia. This finding was consistent with the findings of (Fola, 2015). The negative impact of loan growth on banks liquidity was in line with the hypothesis which is based on the argument of taking loans as illiquid assets of banks. According to this argument when the amount of loans provided by banks increase, the amount of illiquid assets in the total assets portfolio of banks increase and lead to the reduction in the level of liquid assets held by banks. Therefore, this finding reveal that larger amount of loans was provided from periodic deposits with affecting the amount of liquid assets held by the commercial banks in Ethiopia. Therefore, the hypothesis stating negative and significant relationship between loan growth and banks liquidity should be accepted.

In this study natural logarithm of total asset was used as a proxy of bank size, used to know the effect of bank size on liquidity of Ethiopian commercial banks. Bank size found to be a negative and statistically significant at 1 percent level of significance with a p value of 0.0000. The coefficient value of -0.03 indicates that one unit increases in the liquidity results a 0.03 unit decrease in liquidity of Ethiopian commercial banks, holding other variables constant. This finding was consistent with the findings of (Malik & Rafique, 2013) and (Chagwiza, 2014). Moreover, the result of this study about Banks liquidity and Bank size are also relevant with the empirical findings of Vodova, (2011) and Guillermo & Ingela, (1999) in which bank size has a significant negative relationship with liquidity. Hence on the basis of this hypothesis large banks tend to hold less liquid assets and invest in riskier assets through implicit guarantee. In case of liquidity shortage, large banks access to Lender of the Last Resort (Central Bank) for advances to overcome the liquidity shortage while central bank also provide loan to small banks but on small scale and higher interest rate. Therefore, the hypotheses stated; there was negative and statistically significant relationship between bank size and liquidity failed to accept.

The results show also the negative impact of the interest rate spread, which is increase in interest rate spread, stimulates the bank to focus more on lending activity and as a result, the share of liquid assets is decreasing. The model coefficient obtained of -0.51which implies that a 1 unit increase in interest rate spread results in a 0.51 (P-value, 0.09) unit increase in banks liquidity of commercial banks and statistical significant at 10 percent. Monetary policy interest rate can be considered a measure of a bank's ability to provide loans to customers (Lucchetta Nicolò & Marcella, 2010) & (Tekle, 2019). Therefore, the hypothesis stating interest rate spread has negative and significant impact on liquidity of commercial banks accept.

Concerning to foreign exchange rate fluctuations and bank's liquidity the model coefficient obtained of -0.003. which implies that a 1 unit increase in foreign exchange rate (Ethiopia Birr changes against the United States Dollar) results in a -0.003 (P-value, 0.003) unit decrease in bank liquidity of commercial banks and statistical significant at 1 percent level .the find same (Tekle, 2019). This implies that increases in the exchange rate will highly affect foreign currency generation. Thus it is directly related with liquidity of commercial banks.

3. Conclusion and Recommendation

3.1. Conclusions

The findings of the study showed that Non-Performing Loan (NPL) , exchange rate fluctuation (USD to BIRR), loan growth (LG), interest rate spread(IRS),and bank size (BS), Were the significant drivers of liquidity in Ethiopian commercials banks during 2000 to 2019. Hence, focusing and taking the necessary action on these indicators could reduce the probability of liquidity in Ethiopian commercial banks. Based on the findings of the study the following Conclusions are forwarded:

- Non-performing loans has negatively and statistically significant influence at 1% confidence level on CBs‟ liquidity in Ethiopia. NPL and liquidity have direct negatively relationship by revealing that when CBs have massive NPL amount, they may refrain from spreading loans and advances to borrowers and hold more low return liquidity with high opportunities costs. When NPL is enormous, it shows illiquidity, efficiency problems and liquidity position reduction of CBs which in turn lead to bank run and banking industry and financial system failure. It can be conclude that decrease in NPL will significantly influence CBs, banking industry and financial system.
- Foreign exchange Rate fluctuations (Ethiopia Birr changes against the United States Dollar). There are many factors that result in changes in the exchange rates and this includes mainly the balance between demand and supply in the foreign market which affects liquidity of Ethiopian commercial banks. It can be conclude that decrease in Foreign exchange Rate fluctuations was significantly influence CBs, banking industry and financial system.
- Commercial banks shall give due attention to aggressive deposit mobilization so as to maintain the optimum level of loan growth as it negatively affects liquidity.
- Interest Rate Spread has negatively and statistically significant influence at 5% confidence level on CBs‟ liquidity in Ethiopia. This shows interest rate on loans and advances (IRLA) and CBs‟ liquidity have negative relationship by implying that decrease of the former significantly decrease the later. When CBs decrease IRLA, borrowers may not be willing to borrow loans and advances from them. As a result loans and advances deliver will decrease and hence, they will hold high opportunity cost and low return assets more liquidity. Hence, it can be concluded that decrease in IRLA significantly decrease CBs‟ liquidity holding.
- Bank Size has negative and statistically significant influence at 1% confidence level on CBs‟ liquidity in Ethiopia. This reveals existence of opposite association among BSIZE and CBs‟ liquidity in Ethiopia subject to “too big to fail” hypothesis. Big CBs consider themselves as big and failed holding enough liquid assets. They are encouraged by inherent guarantee access advantages like easy deposit mobilization, money market financing and invest in short term risky assets to reduce funding cost and liquidity risks. Thus, it can be concluded the “too big to fail” concept may push CBs for moral hazard behavior and unnecessary liquidity shortage exposures.

3.2. Recommendations

The empirical findings of the research have prompted the researcher to suggest the following policy recommendations:

- Non-performing loans does influence position of the banks, the study recommends that the management of the commercial banks should assess their clients and advance their loans to them according to the creditworthy of their clients, as non-performing loans can decrease the level of interest rates and consequently financial performance and liquidity.
- Big banks needs to manage their liquidity position and shall give due attention on resource mobilization and liquidity management.
- Commercial banks shall give due attention to aggressive deposit mobilization so as to maintain the optimum level of loan growth as it negatively affects liquidity.
- While issuing new directives or amending the existing policies, NBE shall take into account that the increase of capital and statutory reserve requirements policy has stood pressure on the banks liquidity. Since both capital and reserve requirement have negative and significant impact on banks liquidity.
- External Factors have influence on liquidity of Ethiopian banks so all commercial banks in Ethiopia cannot ignore the macroeconomic indicators while targeting to improve their liquidity position. Thus, banks in Ethiopia should not only be concerned about internal structures, policies and procedures, but they must consider both the internal environment and the macroeconomic environment together in developing their strategies to efficiently manage their liquidity position.
- National Bank of Ethiopia at the regulatory or supervisory level, the result of the study will assist policy makers to understand the impact of the policies regarding market environment for commercial banks and help them to contribute their role as a financial intermediaries.

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