ISSN (Online): 2958-3810
ISNN (Print): 2077-3420

JBAS Journal of Business and Administrative Studies

Home page: JBAS

EFFECT OF MONETARY POLICY ON FINANCIAL PERFORMANCE: DYNAMIC PANEL MODEL APPROACH: EVIDENCE FROM ETHIOPIAN BANKING INDUSTRY

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ABSTRACT

This study examines the effect of monetary policy on the financial performance of Ethiopian banking industry. The monetary policy instruments were collected from National Bank of Ethiopia and the World Bank**.** Audited financial statements from seventeen commercial banks also used in the analysis. The study covered the period of 2011-2022 by using two dependent variables of return on asset and return on equity as proxy for the financial performance of the banking industry. Two steps system generalized method of moments (SGMM) applied for the empirical analyses. The findings from the regression estimation revealed that return on asset of commercial banks positively and significantly affected by the lagged value of return on asset, deposit interest rate and capital adequacy ratio but negatively and significantly affected by reserve requirement. On other hand, return on equity positively and significantly influenced by the lagged value of return on equity and deposit interest rate. But broad money supply, treasury bill and capital adequacy ratio negatively and significantly affect the return on equity of commercial banks. The results show important policy implications for both commercial banks and regulatory authorities in general. It is advisable for commercial banks to highly work on increasing their deposit collection and improve more on their capital adequacy ratio to make the banking industry strong and competitive business. It is essential for the regulatory authority to strictly follow up for ensuring the broad money supplied to the economy is at optimum level and stable reserve requirement.

KEY WORDS

Reserve requirement; capital adequacy; lending rate; Generalized Moment Method.

1. INTRORDUCTION

Financial sector of any economy plays a very important role in the economic growth and development of a nation. It is simply a channel through which idle funds are made available to the productive sector to create job opportunities and stimulate economic prosperity (Aurangzeb, 2012). A well-structured, strong and developed financial sector is required to achieve a sustained growth (Aurangzeb, 2012).

The banking sector is an important sector in the economy as the financial needs of all the other industries are met by the financial sector mostly through the banking system. Since, the performance of the macro economy is dependent on the corresponding performance of the banking business, it has to be efficiently positioned to provide for the liquidity and credit needs of the economy because failure in this industry leads to financial and general slowdown of

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growth in the economy. The banking business play an imperative duty in the allocation of capital resources and risk sharing of future flows in economy. An efficient and effective banking industry facilitates increased growth and welfare and smooth business cycles. These functions give banks a central position within the process of saving and investment allocation. However, these functions make banks vulnerable to different sources of shocks and they have a negative effect on the economy. Monetary policy works mainly through the banking system and it needs to have proper monetary policy involving issues such as barriers to entry, market concentration, the borrower-lender relationship, deposit insurance, and the taxation of financial intermediation to improve the performance of the financial sector (Chowdhury et al., 2006), (Bassey & Ekong, 2019) and (Muritala et al., 2017).

Monetary policy constitutes the major policy thrust of the government in the realization of various macroeconomic objectives. Essentially, monetary policy is the combination of discretionary measures designed by the monetary authorities to regulate and control the money supply in an economy by the monetary authorities with a view of achieving desired macro-economic goals (Alalade et al., 2020). It is one of the macroeconomic instruments with which nations do manage their economies for the achievement of national goals like price stability, full employment and economic growth and balance of payment (Muthoka et al., 2019).

Being a major economic stabilization weapon, monetary policy involves measures taken by the central bank to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve some specified macroeconomic policy objectives and to counter all undesirable trends in the economy. In a nutshell, the aims of monetary policy are basically to control inflation, maintain healthy balance of payments position to safeguard the external value of the national currency, and promote adequate and sustainable level of economic growth and development (Akanbi & Ajagbe, 2012), (Chowdhury et al., 2006) and (Onaolapo & Habeeb, 2017). It controls the direction and movement of credit facilities in pursuance of stable price and economic growth (Loayza & Schmidt-hebbel, 2002).

From a wider perspective, monetary policy include attempts to influence the external value of a domestic currency via exchange rate management (Modugu & Dempere, 2022). The government uses monetary policies as a technique to spur economic growth (Kithandi, 2022), because it forms part of the macroeconomic environment that is very critical in enhancing the financial performance of organizations. The financial development of any economy largely depends on the short run stabilization of the monetary policy.

Financial performance, accomplishes a very substantial function in implementation of monetary policy (Ditimi et al., 2011). There is a very high degree of interdependence between monetary policy implementation and financial performance banks in an economy. Monetary policy affects the profitability of banks such that bank profits could rise or fall with an increase or reduction in the policy rates (Borio et al., 2017). Profits enable banks to effectively undertake financial intermediation in the economy by mobilizing deposits, allocation of credit and price discovery (Meshack & Nyamute, 2016). Profits add banks' capital base and liquidity buffers, which act as the banks first line of defense when domestic and exogenous shocks emerge (Mugume, 2011).

The link between monetary policy and bank profitability has gained prominence of recent, particularly after the financial crisis of 2007 in both USA and Europe. Concerns have emerged that the low interest rate monetary policy could be affecting bank profitability (Bundesbank, 2018). In the same way, concerns have emerged that introduction of inflation targeting monetary policy in developing countries could also affect bank profits (Fazio et al., 2018). When the central bank increases the interest rates, bank profitability also increases. Monetary theory shows that this link can occur through the channels of monetary policy i.e., through the credit channel, the interest rate channel and through asset and liability (Mugume, 2011). For instance, under the interest rate channel of monetary policy, the central bank sets the short-term rates such as the central bank rate which influences longer-term rates including the treasury bill rate, interbank rate and lending rate.

The profitability of banks gives an indication of the health and stability of the financial sector and is

important for economic growth (Beck et al., 2000). Their operations are guided by monetary policy actions under central bank directives (Mutwol & Kubasu, 2016). Lack of sound monetary policies in a country is likely to lead to economic problems like inflation, price instability, unemployment, exchange rate fluctuations, poverty and recession among others (Kithandi, 2022) which finally affects the financial performance of commercial banks.

The effect of monetary policy on the performance of banking business is through its instruments. Onoh (2017) asserted that the monetary policy instruments (reserve requirements, deposits, moral suasion, selective credit control, open market operations, central bank rate, interest rate, exchange rate, rediscount rate and cash reserve requirements), influence economic activities through their effects on available resources in the banking sector. When the economy experiences inflationary pressure, the central bank can use contractionary monetary policy to stabilize the price level. This may be done by increasing the required reserve ratio and discount rate. This will then reduce the amount available to commercial banks for the purpose of credit facility and cost of borrowing will increase, loans will become expensive and people will borrow less. Moreover, due to higher interest rates (deposit rate), banks' deposits become more attractive as they offer better returns on savings. As a result, people tend to save more and spend less. When cost of borrowing drops, it is easier for people to afford loans, investments will then rise in the economy (Nguyen et al., 2017).

Research shows that monetary policy directly affects the profitability of banks (Zimmermann, 2017). To make profit, commercial banks invest customers' deposits in various short-term and long-term investments. The more loans and advances they extend to borrowers, the more profit they make. When the central bank embarks on contractionary monetary policies, it reduces the available resources with the commercial banks. This reduces their ability to make profit. On the other hand, expansionary monetary policies have an opposite effect (Nguyen et al., 2017).

The purpose of monetary policy instruments is to restrict the activities and operations of banks so as to manage macroeconomic variables to achieve price stability and economic growth. However, the process of applying these monetary instruments affects bank's' profit-making abilities. But, like every other private enterprise, profit maximization is the most important objective of banks. In a competitive market situation, profit is a tool for efficient resources allocation because it is the most appropriate measure of corporate financial performance (Adesina et al., 2018).

Bank profitability is a necessary condition for the success of banks under competitive conditions as well as successful implementation of monetary policy (Abel et al., 2018). According to Chowdhury et al.(2006), for banks to be a sound banking system, they must ensure liquidity, profitability and, efficiency. Profitable banks attract capital from market investors and internally through retained earnings. Hence, adequate bank profitability contributes towards bank soundness and leads to financial stability (Altavilla et al., 2018). Short-term interest rate has a positive impact on the profitability of banks, but the relationship between the long-term interest rate and bank profitability is negative. In addition, capital adequacy ratio has a positive impact on bank profitability (Kumar et al., 2020).

The work of English (2002) showed that changes in the interest rate affect bank earnings. A study conducted by Borio et al. (2017) identified a positive and significant relationship between the short-term interest rate and bank profitability. Berument and Froyen (2015) studied when there is a significant change in policy rates and market interest rate and the result revealed a positive relationship. Madaschi and Nuevo (2017) revealed that the profitability of banks increased during the negative interest rates. Stráský and Hwang (2019) found a weak negative relationship between monetary policy and banks' profitability.

Rao and Somaiya (2006) discovered that only lending rates has a positive and significant influence on banks' profitability while bank rates, cash reserve ratio and statutory ratio have negative but significant influence on banks' profitability. This means that an increase in lending rates will increase the profitability of the banks and vice versa. Ekpung et al. (2015) showed that monetary policy had a significant effect on the banks deposit liabilities meanwhile, on individual basis, they discovered that deposit rate and minimum discount rate had a negative influence on the banks deposit

liabilities, but exchange rate had a positive and significant influence on the banks deposit liabilities in Nigeria.

Dare et al.(2017) assessed the impact of monetary policy (policy rate, cash reserve requirement and liquidity ratio) on the performance of commercial banks in Nigeria and found that cash reserve ratio and liquidity ratio showed negative and insignificant relationship with financial performance (Osakwe et al., 2021). Low interest rates tend to coincide with lower bank profitability and banks are hampered by weak macroeconomic dynamics (Altavilla et al., 2018). Bikker and Vervliet (2018) suggest that low interest rates reduce the profit margins of banks, which in turn puts pressure on their capital. There is no significant relationship between open market operations, central bank rate, Kenya bankers' reference rate and loans portfolio performance (Mutwol & Kubasu, 2016).

In Ethiopia, banking system is considered as the most important channel of implementing monetary policy. However, the banking industry in country exposed to unstable macroeconomic environment like highly volatile inflation which affects the purchasing power of the depositors, directed credit control and unstable reserve requirement, frequently increasing the capital requirement of commercial banks. But their effect on financial performance of commercial banks not clearly investigated. As it is observed from the Cepheus Research and Analytics report (2020), there was high volatility on profitability (on both ROA and ROE) of private commercial banks between 21013 to 2020, ranging from the higher 3.1% to the lower 1.7% of return on asset during the years. In this study, the effect of monetary policy instruments like required reserve ratio, deposit interest rate, the lending interest rate, treasury bill, money supply, capital adequacy ratio and liquidity ratio on profitability of commercial banks investigated. To the best of the researchers' knowledge, there was no adequate study on the area of this topic in Ethiopia. Therefore, this initiated the researchers to empirically investigate and analyze the effect of monetary policy on financial performance of commercial banks in Ethiopia.

This study is worthwhile to the regulatory body, the National Bank of Ethiopia in indicating the policy adjustments on the basis of finding in regulating the optimum money supply in the economy, having stable reserve requirement, oversee the capital adequacy of commercial banks and formulating the monetary policy that considers the dynamic business environment in which the banking industry operates in general. Commercial banks are also the beneficiary of this study in identifying the monetary policy instrument either positively or negatively influences their performance; to deal and work in harmony with the regulatory bank for minimizing the negative influence of the policy instruments. The study also contributes to the stock of knowledge being an input for the future academicians, researchers, and industry practitioners as a reference for the methodology applied, the discussion of existing knowledge and the investigated results.

2. Empirical Review

Economic theory suggests that monetary policy used to stabilize an economy. However, the ability of monetary policy targets, interest rates and money supply, to stabilize an economy depends on their capacity to achieve price stability (Ezeibekwe, 2020). Monetary policy objectives are concerned with the management of multiple monetary targets like price stability, promotion of growth, achieving full employment, smoothing the business cycle, preventing financial crises, stabilizing long-term interest rates and the real exchange rate (Khan, 2010). But the objectives are not consistent with each other because the preference of monetary policy and country priorities emphasizing on maintaining price stability or ensuring low inflation rates.

Lending Interest Rate

A study by Rao and Somaiya (2006) in India found that lending rates have a positive relationship with banks' profits which indicates that a rise in lending rates will increase the profitability of the banks. Lending rate has significant and positive effects on the performance of banks and this variable considered as true parameter of measuring bank performance (Okoye & Richard, 2013). Zaman et al (2014) in Pakistan found that monetary policy, which is represented by interest rate, has a significant inverse impact on banks' performance.

Akanbi and Ajagbe (2012) identified a negative effect of lending rate on commercial banks' net profit. In

England, Bridges et al. (2014) found that following an increase in capital requirements, banks increase lending rates and on average cut loan growth for real estate, other corporates and household secured lending, which affected profitability. Alalade et al (2020) identified that in the long run, lending rate, had no significant effect. Cavaliere et al., (2021) found to have a significant and positive effect on banks' profitability, which shows a drop in lending rates reduces the banks' profitability.

Peter (2017) in Kenya, investigated that interest rates had a positive correlation with bank profitability. Simiyu and Ngile (2015), indicated that interest rates had a negative effect on profitability of commercial banks. If a bank can lend more, the more interest income, the bank can earn and thus the higher level of profits (Oyier, 2016). The results showed that loan to deposit ratio has a significant positive effect on the financial performance of deposit money banks listed in Nigeria. Loan to asset ratio has a significant negative effect on the financial performance in Nigeria (Onuwa, 2021). Ogunbiyi and Ihejirika (2014) found no significant relationship between interest rate on the profitability of banks in Nigeria. Real interest rate is negatively and significantly associated with the performance of commercial banks (Baba & Ashogbon, 2019). The investigation of Mbabazize et al.(2020) showed that monetary policy in terms of its link to the lending rate has a significant causal effect on return on assets in Uganda.

Deposit Interest Rate

Bank deposit rate has significant relationship though inverse relationship (Agwu & Godfrey, 2020). Saving deposit rate do not cause bank performance in the short run but in the long run. Alalade et al. (2020) loans to deposit ratio had no significant effect. In the short run, variations in loans to deposit ratio had significant effect. When financial performance is measured as total credits, loans to deposit ratio had positive significant effect in the long run. Deposit interest rate expected to influence the financial performance. This is because of that higher deposit interest rate reduces the interest rate spread between interest rate and finally result to reduction in profitability of banks.

Required Reserve Ratio

Reserve requirement ratios are regulatory tool that requires banking institutions to hold a fraction of their deposits. These are normally held at the central bank in the form of cash or highly liquid sovereign paper. When applied to deposits, the regulation usually specifies the size of the requirement according to deposit type (demand or time deposit) and its currency denomination (domestic or foreign currency) (Geleta, 2014). The cash reserve ratio is directly linked to the commercial bank's profitability. Every commercial bank maintains a cash reserve ratio against their demand & time deposits. Being changes in the cash reserve ratio banks profit level may increase or decrease.

Reserve requirement provides systems for making customers' deposits accessible to them, while ensuring that banks make substantial funds for their operational activities through the discount window. Through the reserve requirement, the central bank is able to implement its monetary policies towards a stable economy (Gray, 2011), (Bianchi & Bigio, 2022) and (Robitaille, 2011). From the perspective of central banking, the reserve requirement secures banks, their customers, shareholders and the economy at large (Glocker & Towbin, 2012). Regarding the effect of reserve requirement on the financial performance, evidence showed different results. The work of Hoque et al (2020), Alalade et al (2020), Oganda et al (2018), Fredrick (2020), Kithandi (2022), indicated that reserve requirement as monetary policy tools negatively influenced the financial performance of commercial banks. Also the work of Rao and Somaiya (2006), Atlaw (2017), Cavaliere et al (2021).

Reserve requirement had a positive relation with the financial performance of commercial banks. The investigation of Nguyen et al (2017), MacCarthy (2016), Uremadu (2012), revealed that reserve ratio had a positive relationship with the financial performance of commercial banks and concluded that monetary policy always has a major impact on financial sector performance. Authors like Dare et al (2017), Alalade et al (2020), Agwu and Godfrey (2020) and Thuc (2019) showed that reserve requirement had insignificant impact on financial performance of commercial banks.

Broad Money Supply

Kimani (2013) and Otalu et al (2014) studied monetary policy and commercial banks performance

in Nigeria and Kenya respectively, with return on equity and found significant positive effect of money supply on performance of commercial banks. The investigation of Mbabazize et al. (2020) showed that money supply was insignificant in predicting bank profitability. It was observed that monetary policy rate causes bank performance in both in the short run and long run (Agwu & Godfrey, 2020). Al-Qudah and Jaradat (2013) found that growth in money supply had a positive effect on the profitability of banks. Monetary base has a significant positive impact on bank's profit at the significance (Nguyen et al., 2017). Monetary policy conducted by central banks always has a major impact on financial sector performance.

Treasury Bill Rate

Treasury bills are particularly important and popular with commercial banks. Moreover, treasury bills count as liquid assets of commercial banks while at the same time earning attractive interest rate for the holders. Mutwol and Kubasu (2016) showed no positive correlation between open market operations and loans portfolio performance. The investigation of Mbabazize et al (2020) showed that the 91-day treasury bill rate was insignificant in predicting bank profitability. Open market operations have a positive and significant influence on financial performance of commercial banks (Thuc, 2019).

Ndagire (2012) found that volume of loans and treasury bill having a positive with return on asset. Enatha (2017) found no significant effect of open market operations, on the financial performance of commercial banks and concluded that monetary policy has no significant effect on return of assets. Treasury bills had a positive correlation and yield on treasury bills revealed negative correlation with return on asset. Ogunbiyi and Ihejirika (2014) found no significant relationship between treasury bills rate and profitability of banks in Nigeria.

Liquidity Ratio

Statutory liquidity ratio refers to some percent of reserves to be maintained in the form of gold or foreign securities (Bernake, 2006). Dibeh (2008) identified that liquidity was negatively connected with profitability. Alalade et al. (2020) studied the influence of monetary policy on the financial performance of banks. The results revealed that in the long run, monetary policy variables including liquidity ratio had no significant effect. In the short run, variations in the liquidity ratio for previous years had significant effect. When financial performance is measured as total credits, the liquidity ratio had positive significant effect in the long run.

The study of Akanbi and Ajagbe (2012) examined the effect of monetary policy (represented by lending rate, cash ratio and liquidity ratio) on commercial banks' profitability and found that positive relationship exists between liquidity and net profits of the banks. Karani (2014) found a positive relationship between liquidity management and profitability of commercial banks. The study revealed that liquidity management is a good determinant of profitability of commercial banks. Okaro and Nwakoby (2016) depicted that there is negative and significant relationship between liquidity ratio and banks' profitability.

As per the study of Cavaliere et al.(2021), regulatory ratios negatively affects bank profitability. Rao and Somaiya (2006) examined the influence of monetary policy on the profitability. In public sector banks, statutory liquidity requirement is not significant to describe the link between the bank's profitability and monetary policy instruments. Ajayi and Felix (1992) investigated monetary policies do have significant and negative effects on the performance of banks.

Capital Adequacy Ratio

Dibeh (2008) found that capital adequacy positively influences the profitability of the banks. Kumar et al. (2020) studied the relationship between monetary policy and bank profitability in New Zealand and indicated that an increase in short-term rate leads to an increase in the profitability of banks. Capital adequacy ratio has a positive impact on bank profitability, while non-performing loan ratio and cost to income ratio have a negative impact on bank profitability. Gudmundson et al. (2013) found that capital adequacy ratio significantly influence the performance of commercial banks. Adequate capital stimulates the performance of banks (Akinleye & Fajuyagbe, 2019).

Pradhan and Shrestha (2017) indicated that capital adequacy ratio has a negative impact on the performance of Nepalese commercial banks. But Kamaita (2018) concluded that capital adequacy ratio

has a positive correlation with the financial performance of Kenyan banks. Okoye et al. (2018) showed that capital adequacy ratio has a positive and significant relationship with financial performance.

2. Research Methodology

The authors used unbalanced secondary data which obtained from National Bank of Ethiopia and the World Bank and audited financial statements collected from commercial banks. Descriptive technique and dynamic panel model of two-step System Generalized Method of Moments (SSGMM) applied for analysis. The model controls for endogeneity of lagged dependent variable in the dynamic panel model when there is correlation among the explanatory variables and error terms. It controls for omitted variable bias that is usually due to time-invariant heterogeneity effects and measurement errors. The two-step system GMM is augmented to the two-step difference GMM and the one-step system GMM as well as more efficient and robust to the heteroscedasticity and autocorrelation (Roodman, 2009) and (Arellano & Bond, 1991).

2.1 Model Specification: Panel Model

To test the relationship between monetary policy and bank profitability, the study formulated a linear regression model with dynamic specification, considering the dynamic nature of monetary policy variables and the tendency for bank profitability to be serially correlated (Borio et al., 2017), (Kohlscheen, 2018) and (García-Herrero et al., 2009) . The study included the lagged dependent variables and the empirical model was specified as a dynamic panel model.

$$\boldsymbol{\gamma_{it}} = \boldsymbol{\delta} + \boldsymbol{\theta y_{it-1}} + \sum_{\boldsymbol{i=1}}^{\boldsymbol{m}} \boldsymbol{\beta_1 Z_{it}} + \sum_{\boldsymbol{j=1}}^{\boldsymbol{n}} \boldsymbol{\alpha}_{\boldsymbol{j}} \boldsymbol{X_{jt}} + \boldsymbol{u_{it}} + +\varepsilon_{it}$$

Where: γ is the variable under study, the dependent variables (bank financial performance), θy_{it-1} is the lagged dependent variables, Z represents the monetary policy variables, X represents the control variables, δ is a constant term, $+\varepsilon_{it}$ is the unobserved bank specific effect, u_{it} is the idiosyncratic error and subscript, t is the time indicator.

The Generalized Method of Moments Model (GMM)

Application of difference GMM estimator yields both biased and inefficient estimate in finite samples and this is particularly acute when $time$ is short. Poor performance of difference GMM estimator in such circumstance attributed to the use of poor instruments (Blundell & Bond, 1998). System GMM is applicable when equation is expressed in level form with first differences as instruments and expressed in first differenced form with levels as instruments. The approach involves use of a greater number of moment conditions but Monte Carlo evidence suggest that when $time$ is short and the dependent variable persistent, there are gains in precision and the small sample bias is reduced (Roodman, 2009).

$$ROA_{it} = \alpha + \beta_1 ROA_{it-1} + \beta_2 LIR_t + \beta_3 DIR_t + \beta_4 RR_t + \beta_5 BMS_t + \beta_6 TB_t + \beta_7 LR_t + \beta_8 CAR_{it} + u_i + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \alpha + \beta_1 ROE_{it-1} + \beta_2 LIR_t + \beta_3 DIR_t + \beta_4 RR_t + \beta_5 BMS_t + \beta_6 TB_t + \beta_7 LR_t + \beta_8 CAR_t + u_i + \varepsilon_{it} \quad (2)$$

Where ROA_{it} refers to return on asset of i[th] bank at year t. i= 1, 2, ….. 17. t= 2011, 2012, ……2022. ROA_{it-1} is one year lag of return on asset. ROE_{it} refers to return on asset of i[th] bank at year t. i= 1, 2, ….. 17. t= 2011, 2012, ……2022. ROE_{it-1} is one year lag of return on equity. LIR_t is lending interest rate, DIR_t refers to deposit interest rate, RR_t is reserve requirement, BMS_t refers to broad money supply, TB_t indicates treasury bill, LR_t indicates liquidity ratio, CAR_{it} refers the capital adequacy ratio of commercial banks, ϵ_{it} = error term. u_i is the bank specific fixed effect, $\epsilon_{it} \sim N(0, \sigma^2)$ is the random term, u_i and ϵ_{it} are independently and identically distributed.

The dynamic panel data model includes one-year lagged value of the dependent variables as indicated in equation (1) and (2) above. The great advantages the System GMM over the Ordinary Least Square (OLS)

are efficiency in results, model specification in which the system GMM allows wider structure in speciation and structure, consistency, the use of both internal and external instruments than OLS. The system GMM solves the problem of biasedness, endogeneity, autocorrelation and heteroskedasticity among others. If equation specified as equation (1) and (2) are estimated using OLS method, it leads to biased and inconsistent estimates due to the possible correlation between the regressors and the error term. Also, if the estimation used Fixed or Random Effect models also do not result in consistent and unbiased estimates of population parameters. The use of instruments by system GMM estimation leads to unbiased, consistent and improves efficiency estimating for the population parameters. The lagged value of the dependent variables, generalized moment method uses as internal instruments, but for external instruments it uses variables other than in the equation of the system equation specifications.

Difference and system GMM estimators are the common methods of GMM estimators. According to Arellano and Bond (1991), the first difference GMM estimator is used for avoiding the individual fixed effect from the dynamic panel data model. To avoid the correlation between ΔROA_{it-1} and $\Delta\varepsilon_{it}$ as well as ΔROE_{it-1} and $\Delta\varepsilon_{it}$ they used two period and three period lagged values of the outcome variables as instrumental variables for ΔROA_{it-1} and ΔROE_{it-1} in equation #3 and #4 specified below.

$$\Delta ROA_{it} = \alpha + \beta_1\Delta ROA_{it-1} + \beta_2\Delta LIR_t + \beta_3\Delta DIR_t + \beta_4\Delta RR_t + \beta_5\Delta BMS_t + \beta_6\Delta TB_t + \beta_7\Delta LR_t + \beta_8\Delta CAR_{it} + \Delta\varepsilon_{it} \quad (3)$$

$$\Delta ROE_{it} = \alpha + \beta_1\Delta ROE_{it-1} + \beta_2\Delta LIR_t + \beta_3\Delta DIR_t + \beta_4\Delta RR_t + \beta_5\Delta BMS_t + \beta_6\Delta TB_t + \beta_7\Delta LR_t + \beta_8\Delta CAR_t + \Delta\varepsilon_{it} \quad (4)$$

The results from first difference GMM estimators may not be efficient in small sample properties. In addition, the first difference GMM estimators involves data transformation by subtracting past value of variable from its contemporary value and this will lead to loss of information (Blundell & Bond, 1998). Therefore, this study uses the system GMM which is the augmented to difference GMM estimation. The system GMM estimator helps to regain the information disregarded by the first difference GMM as it transforms the data by subtracting the average value of all future available observations of variable from its current value. The system GMM uses two equations, one at level and the second at first difference so as get additional instruments. The first difference is used as instrument for the level equation while the level value is used as instrument for the differenced equation and this leads to higher efficiency of estimates.

$$ROA_{it} = \alpha + \beta_1 ROA_{it-1} + \beta_2 LIR_t + \beta_3 DIR_t + \beta_4 RR_t + \beta_5 BMS_t + \beta_6 TB_t + \beta_7 LR_t + \beta_8 CAR_{it} + u_i + \varepsilon_{it} \quad (1)$$

$$\Delta ROA_{it} = \alpha + \beta_1\Delta ROA_{it-1} + \beta_2\Delta LIR_t + \beta_3\Delta DIR_t + \beta_4\Delta RR_t + \beta_5\Delta BMS_t + \beta_6\Delta TB_t + \beta_7\Delta LR_t + \beta_8\Delta CAR_{it} + \Delta\varepsilon_{it} \quad (3)$$

$$ROE_{it} = \alpha + \beta_1 ROE_{it-1} + \beta_2 LIR_t + \beta_3 DIR_t + \beta_4 RR_t + \beta_5 BMS_t + \beta_6 TB_t + \beta_7 LR_t + \beta_8 CAR_t + u_i + \varepsilon_{it} \quad (2)$$

$$\Delta ROE_{it} = \alpha + \beta_1\Delta ROE_{it-1} + \beta_2\Delta LIR_t + \beta_3\Delta DIR_t + \beta_4\Delta RR_t + \beta_5\Delta BMS_t + \beta_6\Delta TB_t + \beta_7\Delta LR_t + \beta_8\Delta CAR_t + \Delta\varepsilon_{it} \quad (4)$$

The system generalized moment method estimators specified as equation(1) and (3) as well as equation (2) and (4) above to be used for estimation. Thus, system GMM estimation involves the estimation of the system of equations by using two sets of instruments $Z_i = Z_D + Z_L$ where, Z_D stands for instruments for the model in the first difference while Z_L stands for instruments for the model at level (Blundell & Bond, 1998). System GMM estimator is a weighted average of the difference and the level coefficients. The first difference equation is estimated by using the lagged level value as instrumental variable while the level equation is estimated by using the lagged differences of the endogenous variables as instruments. System

GMM estimator performs better than the difference GMM estimator due to the instruments in the level equation remains good predictors for the dependent (Blundell & Bond, 1998).

Table 3.1 Variables and their Measurements

Variables	Notation	Measurement	Expected Signs
Dependent Variables			
Financial Performance	*ROA*	*Net income before tax to total asset*	
	ROE	*Net income before tax to total equity*	
The monetary policy instruments as predictor variables			
Lending Interest Rate	LIR	*Average lending interest rate in year* $_t$	Positive
Deposit Interest Rate	DIR	Average rate on deposit in year $_t$	Negative
Required Reserve Ratio	RR	Percentage basis determined by NBE	Negative
Broad Money Supply	BMS	Money supply as the ratio of M2 to GDP	Positive
Treasury Bill Rate	TB	Rate offered by the Ethiopian government for 91 days	Positive
Liquidity Ratio	LR	Percentage basis of liquidity requirement	Positive
Capital Adequacy Ratio	CAR	Total equity to total asset	Positive

Source: Literature Review (2024)

4. Results and Discussions

4.1: Summary of Descriptive Result

Table 4.1 revealed that some commercial banking business in Ethiopia incurred loss of 3.75% in their banking operation but others able to generate profit on their operation at maximum which accounted to 5.24% over the study period. However, on average the profit earned by commercial banks indicates return on asset of 2.51%. As the result points out, there was great variation on their financial performance (ranging from loss of 3.75% to profit of 5.24%).

Table 4.1: Summary of descriptive statistical result of the study variables

Variables	Mean	Std. Dev.	Min	Max
Return on Asset	0.0251	0.9400	-0.0377	0.0525
Return on Equity	0.1944	0.1141	-0.1262	0.9306
Lending Interest Rate	0.1292	0.9800	0.1188	0.1425
Deposit Interest Rate	0.0650	0.1300	0.0538	0.0800
Reserve Ratio	0.0669	0.0294	0.0500	0.1500
Broad Money Supply	0.3182	0.0245	0.2700	0.3600
Treasury Bill	2.90	3.10	1.19	10.43
Liquidity Ratio	0.1692	0.0308	0.1500	0.2500
Capital Adequacy Ratio	0.1448	0.0493	0.0419	0.3824

Source: Authors' Computation (2024)

On the other case, the return on equity for commercial banks revealed 19.44%. But there was loss of 12.62% and maximum return of 93.06% for a single bank. As it is observed from the result there was extreme variation between the maximum and minimum result in return on equity. The maximum result is because of the capital structure of commercial bank of Ethiopia (the public bank). The balance sheet of Commercial Bank of Ethiopia indicates that the total debt amount (large deposit collection) is

extremely far apart from the equity amount. On the other case, larger part of the banking industry profit goes to this bank because of its large market share and the government intervention in its operation. But the capital structure for private banks shows relatively less gap between debt and equity part in their balance sheet compared to the public bank because they have large number of shareholders. Therefore, because of less denominator, the highest observation indicated as 93.06% is due to this fact.

To support this result, the Figure 4.1 depicts how the return on asset and return on equity of commercial banks in Ethiopia were moving. It shows that large variation at an industry average for the trends of both returns for commercial banks over 24 years from 1999-2022 in Ethiopia. As the Figure 4.1 shows, there were more ups and downs in generating profit (ROA & ROE) by commercial banks. Before 2002, the data showed that an increase up to 2001 and decline for one year. Relatively from 2002 to 2008, both returns were increasing at a decreasing rate though the return on equity during this time quickly falls and recover from moving down. The good change was from 2009-2014, the trend for both were increasing though little decline observed for one year (2012-2013). From 2014 to 2021, the returns of commercial banks on their performance showed decline of below average until slight recovery in 2022 years. In general, Figure 4.1 depicts that more than average at industry level, the commercial banks' return on asset and equity shown good growth in financial performance.

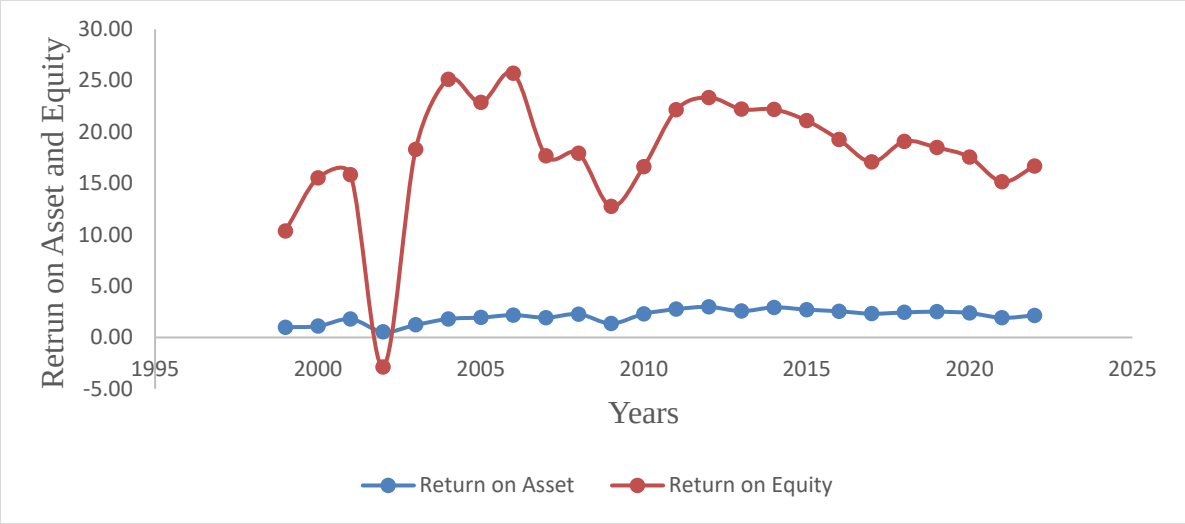

Figure 4 1: Trends of return on asset and equity of commercial banks in Ethiopia
Source: Author's Computation, (2024).

From Table 4.1 also indicates the descriptive output of lending interest rate. From the result, it is observed that the minimum and maximum lending interest rate at industry level shows 0.11875 and 0.1425 over the study year. This implies that at minimum percentage that borrowers charged by their lenders indicated 11.875% and the maximum percentage of borrowing rate that borrowers charged for getting money showed 14.25%. 12.92% shows the average rate of lending interest imposed by banking businesses as price of loan over the study year. This increase in the lending rate of commercial banking business has its own effect in discouraging investment and finally slows the profit that banks expected to earn from loan provision in long-run.

The minimum and maximum result of reserve ratio showed that 5% and 15%. The directive for National Bank of Ethiopia showed that the reserve ratio oscillated for long period of time between these two figures. The minimum reserve ratio indicated that over the study period, commercial banks directed to put at 5% of their total deposit and at another time, the monetary authority increased the required reserve to 15% in changing the reserve policy to manage the money circulation in the economy. The ranges are 5%, 7%, 10% and 15%. Currently banks are keeping their reserve with National Bank of Ethiopia at 7%. The result showed that on average it is around 6.69%. The average result depicts that for long period of time (2013- 2020) the reserve required from banks were at 5% of their total deposit. Because the average result of 6.69% is nearest to 5% than 10% and 15%. The 7% is

recently used only for third and fourth quarter of the year of 2022. This may imply that National Bank of Ethiopia did not put pressure on commercial banks for more than average period to collect money from commercial banks in the form of reserve which they collected in the form of deposit from their customers. Probably this can be for the sake of encouraging them to give more loan to the market than keeping large amount of their money with it, compared to 10% or 15%, which encourages to bring economic development further and even encourage more employability. This is because of that when reserve ratio increases, the amount of money goes to national bank will increase but it is without return and it reduces the amount to be ready for lending to investors. When reserve ratio declines, it improves money left for lending and the flow of money to economy. This has its own effect on financial performance of banks.

The other result in Table 4.1 was related to treasury bill rate of the Ethiopian government. The minimum and maximum rate that government pays during short-term borrowing for 91-days indicates 1.186241% and 10.433% respectively. It showed great difference over 12 years. What makes unique this value is 1.186241% was the rate at the beginning of the study year and 10.433% was the rate that registered at the last year of the study period though the average rate shows 2.9%. This implies that there was a sharp increase at the last three final years of the study period. Such sharp increment for the rate of short-term borrowing by the government can be to attract many investors and to compensate with such rate the rising of inflation in the country. So, for investors, this might be good to invest with the government for better return within 91 days rather than keeping their money with banks to earn 7% annual saving rate. The government also easily mobilizes money from domestic market rather than relying on the foreign debt. Such increase in treasury bill rate has its own advantage for the government and the general economy. Government can be benefited from such domestic financial resource mobilization in many ways like for financing its large budget deficit rather than borrowing money from National Bank of Ethiopia and relying on foreign debt, for curbing inflation which became the burning issue in the economy and to activate idle money through attracting giant individual and institutional investors since it is safe, liquid and default free investment.

From Table 4.1 also observed that the liquidity ratio (measured as percentage of current liability) of commercial banks. The minimum liquidity required to be maintained by each commercial banks from their current obligation showed at minimum 0.15 (15%). This was the lower bound for banks. Commercial banks those became below this lower threshold is an indication of red line in meeting their short-term obligation or they may unable to pay the money their customer's demand. Further, this is an indication of insolvency unless quick measurement taken by the monetary authority and the depositors may lose confidence on their banks and finally may lead to bank panic. The maximum liquidity threshold imposed by National Bank of Ethiopia within the study period indicated 0.25 (25%). The average liquidity required within this time interval showed 0.1692 (16.92%). The average result indicates that for long period of time in the study period, the required liquidity was 15% since the average result approaches to the minimum threshold as liquidity requirement issues in directives by the regulatory authority of National Bank of Ethiopia.

From Table 4.1, we also observe the capital adequacy ratio (measured as total equity to total asset) indicated the minimum result of 0.0419 and the maximum result of 0.3824 showing average result of 0.1448 over the study period. The mean result of the banking industry for capital adequacy ratio indicated that when compared to the 8% of Basel II accord, there was good adequacy ratio for Ethiopian commercial banks though the minimum result is below the standard.

Table 4.2: Mean values of selected variables for commercial banks (2011-2022)

Banks	Obs.	Return on Asset	Return on Equity	Capital Adequacy Ratio
Debub Global Bank	10	0.0196	0.1091	0.2016
Enat bank	9	0.0209	0.1179	0.1779
Abbay Bank	12	0.0214	0.1402	0.1735
Hibret Bank	12	0.0225	0.1910	0.1175
Oromia Bank	12	0.0231	0.1877	0.1264
Dashen Bank	12	0.0260	0.2308	0.1146
Bank of Abyssinia	12	0 .0209	0.1947	0.1095
Coop. Bank of Oromia	12	0 .0213	0.2029	0.1026
Berhan Bank	12	0 .0245	0.1493	0.1631
Awash Bank	12	0 .0284	0.2330	0.1221
Addis International Bank	11	0 .0299	0.1315	0.2388
Wegagen Bank	12	0.0252	0.1566	0.1578
Commercial Bank of Ethiopia	12	0 .0246	0.4680	0.0591
Buna Bank	12	0 .0258	0.1562	0.1727
Nib Bank	12	0 .0260	0.1696	0.1528
Lion International Bank	12	0 .0299	0.2026	0.1439
Zemen Bank	12	0 .0342	0.2247	0.1532

Source: Authors' computation (2024).

Table 4.2 indicates that the mean values of the selected variables for Ethiopian commercial banks. This helped the authors to compare commercial banks with each other in terms of their return on asset, return on equity and capital adequacy level. In terms of the return on asset, the five largest banks were Zemen Bank, Lion International Bank, Addis International Bank, Awash Bank and Dashen Bank. This comparison is only over the period covered by the authors. On the other side, Debub Global Bank registered the least average return on asset among commercial banks in Ethiopia within the interval period. Commercial Bank of Ethiopia, Awash Bank, Dashen Bank, Zemen Bank and Cooperative Bank of Oromia were the five largest banks with return on equity. Again, Debub Global Bank was also the least bank with return on equity during period. In terms of efficiency in utilizing their asset, the private banks were more efficient and registered more return than the public bank. This indicates that the method of service delivery to their customers (especially Zemen Bank) is technology based to serve its customers than branch opening which consumes more operating cost. But this does not necessarily mean that the private banks generated more profit than the public bank. What matters is the size of their investment (asset) they were holding. Commercial bank of Ethiopia has long history in banking business and large asset size than any other commercial banks. That is the reason why the return on asset become below the average result of private banks. But in terms of profit market, the large share of banking business profit goes to this public bank.

From Table 4.2, the authors also identified that Addis International Bank, Debub Global Bank and Enat Bank were the three top commercial banks with the highest capital adequacy ratio. Commercial Bank of Ethiopia was the least bank with capital adequacy ratio among all banks which was below the 8% standard requirement. This can be because of the case that commercial bank of Ethiopia had a wide range of asset but with least equity amount in its capital structure having large amount of debt. This is also the reason why the return on equity investment for commercial bank of Ethiopia became high.

Table 4.3 indicates the trends of study variables over the study period of 12 years. These variables had shown different changes. The return on asset and return on equity of commercial banks shown fluctuations. The highest return on asset for

commercial banks shown good result on average in 2012 (2.97%), 2014(2. 93%), 2011 (2.75%), 2015 (2.71%), 2013 (2.56%0 and 2016 (2.55%). In general, between 2011-2016 there were good bank performance measured by return on asset for commercial banking business in Ethiopia. Then after, the overall commercial banks' financial performance shown declining comparing their performance to the year of 2011-2016. From 2017-2022, the highest return on asset that banks registered 2.51% in 2019. For return on equity, the same conditions indicate the truth as in the case of return on asset. There was good performance between 2011-2016 and then after most of commercial bank's return on equity shown decline though it was not continuously. `

The basic reasons why the banks' financial performance was better from 2011-2016 was, there were relatively good business environment like the good performance in the country's GDP, relative political stability, stable exchange rate in the country among others. From 2016 onwards, the performance of commercial banks was not as pervious because of decline in the country's GDP, the continuous political unrests in the country, the effect of Covid-19 and the war in the northern part of the country, Tigray region among other reasons.

From monetary policy instruments perspective, from 2011-2022, lending rate changed at industry level four times (increased), deposit interest rate changed twice (increased), reserve requirement changed five times (ups and downs) with 5% reserve requirement for long period of time. Broad money supply shown fluctuations. At beginning of the study period, it was 31% but declined in the next year. Then after, for the next seven years shown relatively increasing though remained the same for 3 years in between with the same figure (31%). Later reaching the maximum point of 36%, it changed down ward continuously up to 29% in the last study period. This might be because of the actions that government takes to overcome the pressure of inflation in the country

Table 4.3: Trends of study variables (2011-2022)

Years	Observation	Return on Asset	Return on Equity	Lending Interest rate	Deposit Interest Rate	Reserve Raio	Broad Money Supply	Treasury Bill	Liquidity Ratio	Capital Adequacy Ratio
2011	14	0.0275	0.2216	0.1188	0.0538	0.1500	0.3100	1.1862	0.2500	0.1577
2012	15	0.0297	0.2336	0.1188	0.0538	0.1000	0.2700	1.3991	0.2000	0.1632
2013	16	0.0256	0.2222	0.1188	0.0538	0.0500	0.3000	1.4026	0.2000	0.1564
2014	17	0.0293	0.2220	0.1188	0.0538	0.0500	0.3100	1.2127	0.2000	0.1589
2015	17	0.0271	0.2111	0.1188	0.0538	0.0500	0.3100	1.2027	0.1500	0.1491
2016	17	0.0255	0.1926	0.1275	0.0538	0.0500	0.3100	1.1977	0.1500	0.1483
2017	17	0.0231	0.1708	0.1275	0.0538	0.0500	0.3400	1.2028	0.1500	0.1413
2018	17	0.0243	0.1908	0.1350	0.0800	0.0500	0.3600	1.2027	0.1500	0.1342
2019	17	0.0251	0.1848	0.1350	0.0800	0.0500	0.3500	1.2032	0.1500	0.1380
2020	17	0.0238	0.1756	0.1425	0.0800	0.0500	0.3300	4.2944	0.1500	0.1375
2021	17	0.0192	0.1516	0.1425	0.0800	0.1000	0.3300	8.2966	0.1500	0.1273
2022	17	0.0215	0.1670	0.1425	0.0800	0.0700	0.2900	10.433	0.1500	0.1308

Source: Authors' Computation (2024)

The other monetary policy instrument, treasury bill, shown highly fluctuation and increasing more than average ranging from 1.186% to 10.43%. The dramatic change or the turning point for highly increasing in treasury bill was between 2019 and 2020 changed from 1.2% to 4.29% respectively and reached 10.43% after two years. As the trend depicts, when treasury bill increases, the return on asset and return on equity of the commercial banks declined. This can be as explained in Table 4.1, because of the reality that

more money flows to government account for short term return and to escape from the negative real interest rate while keeping money at official deposit rate with commercial banks and tax liability even on the interest income from bank at end, which the treasury bill investment waives the income from tax for investors.

The liquidity requirement changed three times during the study period. At beginning of the study, there was high liquidity requirement of 25% of their current liability and decline a year after to 20% and to 15% after three years which is still in place from 2015 to the current period. Decline in liquidity requirement has its own advantage that banks extend more money to their customers in the form of loan. The relaxed liquidity requirement enables commercial banks to generate return on the available money because when large amount of money kept with commercial banks for the sake of avoiding insolvency or liquidity risk, there was no return on it and banks are losing return though they build great public confidence which largely affect the profit performance of banks. On the other case, care should be given to the liquidity requirement to avoid distress in commercial banks.
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Though the liquidity requirement relaxed since 2015 to 15%, the profit performance of commercial banks was not as previous from 2011 to 2016. Liquidity requirement declined but the return on asset and return on equity also declined. This may point out that for increasing the financial performance of commercial banks, liquidity may not be the major one. This is confirmed by the regression result of the dynamic panel model in case of return on asset and equity.

In general, the instability in monetary policy instruments creates changes the in the profit performance of commercial banks. The lending interest rate increased from 2016 but the financial performance of commercial banks declined., the deposit interest rate increased, still the profit declined, the treasury bill increased but the profit declined, the liquidity and the capital adequacy declined and the profit also declined. Declining in monetary policy does not mean negative. Decline in liquidity requirement is in some cases advantage to banks in generating return than keeping money in banks idle. Increase in treasury bill rate negatively affects banks by attracting money depositors or investors in short term investment than keeping their money in banks

4.2. Regression Estimation Results

The GMM model, to be used for estimation, there are requirements to be satisfied according to Arellano and Bond (1991) and Roodman (2009). The first issue is Arellano-Bond test for AR(1) in first differences should be significant at 5%; otherwise, it is unacceptable. On the other side, Arellano-Bond test for AR (2) in first differences should be insignificant at 5% to say that the model is in line with the requirement. The other requirement for the GMM model is the test for Sargan and Hansen test for over identification restriction. It should also be significant at 5% level. Hansen test of over identified restrictions should be insignificant. Taking these requirements in to account for the GMM model, all requirements are satisfied and presented in the Table 4.4 with the regression results for both regression results of return on asset and return on equity.

Table 4.4: Dynamic panel data estimation, two-step system GMM

	Return on Asset			**Return on Equity**		
	Coeff. (Corrected Std. Err.)	**t-ratio**	**Sig.**	**Coeff. (Corrected Std. Err.)**	**t-ratio**	**Sig.**
Lag of Return on Asset	**0.5363** (0.2275)	2.36	**0.031****			
Lag of Return on Equity				**0.6449** (0.1411)	4.57	**0.000 *** **
Lending Interest Rate	**-0.1272** (0.2171)	-0.59	0.566	**-1.0140** (1.4401)	-0.70	0.492
Deposit Interest Rate	**0.2435** (0.0957)	2.54	**0.022****	**1.6278** (0.7065)	2.30	**0.035 ****
Reserve Ratio	**-0.0919** (0.0518)	-1.78	**0.095***	**-0.2086** (0.3083)	-0.68	0.508
Broad Money Supply	**-0.0633** (0.0497)	-1.27	0.221	**-0.8060** (0.3610)	-2.23	**0.040****
Treasury Bill	**-0.0144** (0.0465)	-0.31	0.761	**-0.5171** (0.2809)	-1.84	**0.084 ***
Liquidity Ratio	**0.0575** (0.0504	1.14	0.271	**-0.0594** (0.2739)	-0.22	0.831
Capital Adequacy Ratio	**0.0454** (0.0166)	2.73	**0.015****	**-0.3028** (0.1619)	-1.87	**0.080 ***
_cons	**2.2292** (1.7445)	1.28	0.220	**43.0494** (14.4475)	2.98	0.009
For both models, the No. of observation, No. of groups and No. of instruments show 181,17 and 16 respectively.						
Arellano-Bond test for **AR (1)** in first differences:	z = -2.10	Pr > z = 0.036		z = -2.57	Pr > z = 0.010	
Arellano-Bond test for **AR (2)** in first differences:	z = 0.43	Pr > z = 0.668		z = - 0.23	Pr > z = 0.820	
Sargan test of overid. restrictions: **chi2(5)**	= 15.38	Prob > chi2 = 0.031		= 34.96	Prob > chi2 = 0.000	
Hansen test of overid. restrictions: **chi2(5)**	= 9.72	Prob > chi2 = 0.205		= 7.69	Prob > chi2 = 0.361	

*The numbers in the bracket under both result shows the standard error and those bolded numbers out of the bracket shows the coefficients of the variables in the study. ***, ** & * shows the significance level at 1%, 5% and 10% respectively.*

Source: Authors' Computation (2024)

As it is observed from Table 4.4, the one-year lag value of return on asset has a positive and significant effect on the subsequent return on asset of commercial banks. Being significant at 1% level of significance, it reveals that if the lag of return on asset increases by 1%, the subsequent return on asset increases by 0.54%. This implies that a rise in return on asset of last year has a strong contribution for the rise in current return on asset. This leads to the conclusion of the higher the return on asset of the preceding year, the higher the return on asset that the bank generates in the next immediate business year. On the same table, the one-year lag value of return on equity also has a positive and significant effect on the subsequent return on equity of commercial banks. Being significant at 1% level of significance, it reveals that if the lag return on equity increases by 1%, the subsequent return on equity increases by 0.65%. This implies that a rise in return on equity of last year promotes the improvement in the current return on equity.

When the one-year lag return of commercial banks promotes the growth of the current year profit, it implies that banks which generated more return, invests in more return generating investments to get either the interest income or non-interest income

which adds value to commercial banks for their proper functioning among others.

Table 4.4 also indicates that deposit interest rate has a positive and significant effect on the return on asset of commercial banks. It indicates that when the deposit interest rate increases by 1%, the financial performance of commercial banks (return on asset) increases by 0.24% revealing that the higher the deposit interest rate, the higher the financial performance of the commercial banking business. This variable also shows significant positive effect on the return on equity. The higher the deposit rate, the higher the return on equity of commercial banks. Theoretically, the deposit rate is the cost that banks pay to depositors as cost of collecting money from depositors. This expected to reduce the profit performance of the commercial banking businesses. But this result showed positive relation than negative relation. This relation can be working on the other side than like what theoretical relationship indicates. This can be at the backside of the theoretical relationship. When banks collect higher and higher deposit amount by motivating depositors through higher incentive via deposit rate, their overall performance increases in general and the financial performance of banks increases in particular considering other things remain constant. This is a real that when banks collect adequate deposit, they get chance to extend more loan to generate interest income from the loan offered to their customer assuming the cost of loan remain in normal condition. Getting more interest income increases their profit after covering cost of deposit collection.

On the other side, when banks collect more and more deposit, they get ability to invest more and more in other non-interest income to generate more benefit. Therefore, the cost paid for collecting deposit compensated and shadowed through economies of scale. If the deposit interest rate declined, commercial banks unable to attract more depositors and depositors themselves may not encouraged to take their money to banks for getting low deposit return by keeping their money with banks. Rather they may prefer other short-term investments like investment in treasury bill or using their money to purchase valuable assets specially during inflation to keep the value of their money not to lose by inflation. Therefore, based on this argument we can conclude that the higher the deposit rate, the higher the financial performance for commercial banks indicating that the cost for deposit can be overpassed by the benefit derived by getting more money from depositors. Therefore, the monetary policy highly affects the banks' financial performance via this instrument. This work is in line with the study of Alalade et al. (2020) in the short run in which variations in loans to deposit ratio had significant effect and positive effect that identified while studying the influence of monetary policy on the financial performance of banks. But in the long run, it had no significant effect. This result is contradicted with the work of Agwu and Godfrey (2020) in which bank deposit rate has significant and inverse relationship.

Table 4.4 also indicates that reserve ratio has significant and negative relationship with the return on asset of commercial banks in Ethiopia at 10% level of significance. But it is insignificant with the return on equity of commercial banks. For return on asset, it reveals that a 1% increase in reserve ratio by the monetary authority for increasing the reserve of commercial banks reduces their profit by 0.19%. This shows that reserve required at the National Bank of Ethiopia has no return being kept with the regulatory body except ensuring stability of the banking industry from shock and increasing the confidence of the depositors that they will not lose their money if something wrong like financial crisis happen in commercial banks especially in the country where there had not been deposit insurance for long period of time. The problem is that when the regulatory body increases the rate of reserve requirement, commercial banks are eroded of their cash and unable to make ready more money for lending or investing in other non-interest-bearing investments. This makes commercial banks a loser in different ways. One, in losing return by keeping their money with the regulatory authority. Two, in losing return because of inability to invest with the money. But they pay deposit cost on it to their depositors. So, commercial banks became triple loser on this variable. So, when rate of reserve requirement fluctuates, it has great power to affect the financial performance of banking business in Ethiopia.

This result is similar with the finding of Hoque et al (2020), Alalade et al., (2020), Oganda et al (2018),

Fredrick (2020), Kithandi (2022), indicating that cash reserve ratio negatively influenced the financial performance of commercial banks. Also the work of Rao and Somaiya (2006), (Atlaw, 2017), and (Cavaliere et al., 2021) supports the authors' finding. The result of the study contradict with the work of Nguyen et al (2017), MacCarthy (2016) and Uremadu (2012), in which they investigated that reserve ratio had a positive relationship with the financial performance of commercial banks and concluded that monetary policy always has a major impact on financial sector performance**.** On the other hand, the study of Dare et al (2017), and Thuc (2019) showed that reserve requirement had insignificant impact on financial performance of commercial banks. Also Agwu and Godfrey (2020) cash reserve ratio does not cause bank performance in the short run but Alalade et al., (2020) revealed that in the long run, as monetary policy variable cash reserve ratio had no significant effect.

Capital adequacy also positively and significantly influences the return on asset of commercial banks. It reveals that when banks become more financially adequate, there is higher possibility to invest either in interest bearing or non-interest-bearing income assuming the cost of doing business is in normal circumstances and commercial banks generate more profit. Banks with less capital unable to expand their investment and beat competition, as well as face risk of overcoming challenges in business environment. So, the result from Table 4.4 indicates that when capital adequacy of commercial banks increases by 1%, the financial performance of commercial banks increases by 0.05%. This result is similar with the study of Dibeh (2008), Kumar et al. (2020), Gudmundson et al. (2013), Akinleye and Fajuyagbe (2019), Kamaita (2018) and Okoye et al. (2018) showed that capital adequacy ratio has a positive and statistically significant relationship with financial performance of commercial banks.

In case of return on equity, capital adequacy has significant and negative relationship with return on equity at 10% level of significance. According to the result, when capital adequacy increases, the return on equity declines and when capital adequacy declines, the return on equity increases. Of course, the return on equity increases when the debt in the capital structure of the firm increase rather equity. The measurement for capital adequacy is dividing the total equity for the total asset. One of the ways how capital adequacy ratio increase is through increasing the fund supplied by the equity holders. The measurement for return on equity is through dividing the net income after tax for the equity mobilized from the equity holders. Therefore, when total equity increases, the return on equity declines, since the total equity become a denominator for the net income after tax. This result is similar with Pradhan and Shrestha (2017) indicated that capital adequacy ratio has a negative impact on the performance of commercial banks though it is against the result in return on asset.

Broad money supply has significant and negative relation with the return on equity of commercial banks but remain insignificant with return on asset. It shows that when large amount of money injected to the market, the return on equity declines and when large amount of money collected from the market, the financial performance through return on equity increases. An increase by 1% of money injection or release by the monetary authority to the market, the financial performance of banks (via return on equity) declines by 0.81% and vice versa. This is because of that, when large amount of money released to the market in different ways, the value of money declines because of inflation and the value addition or wealth maximization of commercial banks declines because of decline in profit performance of banking business. But when the money collected from the market either through the open market operations or credit restricts or other mechanism, the inflation declines or controlled by the monetary authority and the value of money will increase and return on equity of commercial banks will increase. This result is against with the work of Kimani (2013) and Otalu et al (2014) who studied monetary policy and commercial banks' performance (return on equity) and found significant positive effect of money supply on performance of commercial banks. The study of Agwu and Godfrey (2020), Al-Qudah and Jaradat (2013) and Nguyen et al (2017) found that growth in money supply had a positive effect on the profitability of banks. But the investigation of Mbabazize et al (2020) showed that money supply was insignificant in predicting bank profitability.

From Table 4.4, the regression result also indicates that treasury bill has negative and significant effect on the return on equity of commercial banks at 10% level of significance but not on return on asset. This shows that an increase in treasury bill rate that the government

issues to short-term investors will attract more and more of investors. When rate in treasury bill increases by 1%, return on equity of commercial banks in Ethiopia declines with 0.52%. They invest in money market investment that the government offer with two advantages, one with guaranteed investment and the other with the tax advantage. To utilize such opportunity, investors or depositors do not take their money to bank and those already deposited their money withdraw and transfer such money to government treasury accounts. Such action negatively affects commercial banks in leaving them with no or less amount of money or changing the direction of deposit. This is very common especially during inflation and when the deposit rate of banks unable to compensate the risk of inflation rate while the money is with commercial banks. This true in case of Ethiopia where the real interest rate in Ethiopia is always negative because of high inflation rate. This result is against the study result of Thuc (2019), Ndagire (2012) and Enatha (2017) in which they reported that treasury bill has a positive and significant effect on the financial performance of commercial banks. But the study of Mutwol and Kubasu (2016), Mbabazize et al (2020) and Ogunbiyi and Ihejirika (2014) showed that the 91-day treasury bill rate was insignificant in predicting bank profitability.

Conclusion and Recommendation

Strong and healthy financial system is a prerequisite for the sustainable economic growth of a given country. This study aimed to investigate the effect of monetary policy on the financial performances of Ethiopian commercial banks using panel data of seventeen (17) commercial banks (both public and private) for the period 2011 to 2022. The study employed two steps system generalized method of moments (SGMM) as an analytical model. The financial performance of commercial bank is expressed as a function of monetary policy instruments.

The descriptive result showed that there were high fluctuations in financial performance of commercial banks, high variations in capital adequacy ratio, high fluctuations in reserve requirement, slight growth in lending interest rate at industry level, high growth in broad money supply and treasury bill over the study year. The regression results for this study revealed that significant positive effect from lagged return on asset and lagged return on equity and deposit interest rate on the financial performance of commercial banks commonly. On the other hand, capital adequacy has positive and significant influence whereas reserve requirement has negative and significant influence on return on asset. On the other case, the financial performance of commercial banks measured on equity negatively and significantly influenced by broad money supply, treasury bill and capital adequacy ratio. Lending interest rate, broad money supply, liquidity ratio and treasury bill remain insignificant on return on asset. With the same point, lending interest rate, reserve ratio and liquidity ratio showed insignificant impact on return on equity of commercial banks.

From these results, the authors conclude that the financial performance of commercial banks in Ethiopia explained more with large proportion lag of return on asset, deposit interest rate, reserve ratio and capital adequacy ratio for return on asset as well as by lag of return on equity, deposit interest rate, broad money supply, treasury bill and capital adequacy ratio for return on equity.

The results show important policy implications for both commercial banks and regulatory authorities (National Bank of Ethiopia) in general. It is advisable for commercial banks to highly work on increasing their deposit collection to improve more on their capital adequacy ratio to make the banking industry strong and competitive business since the banking performance highly rely on these variables. Without adequate deposit and capital, banks can be tempted to properly perform their banking business function. It is essential for the regulatory authority to strictly follow up for ensuring the broad money injected (supplied) to the economy is at optimum level and stable reserve requirement.

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