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Determinants of Lending Interest Rate: Dynamic Panel Model Approach Evidence From Commercial Banks in Ethiopia

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Abstract

Abstract: Lending interest rate determines investment and the performance of the banking industry. This study examines factors that influence lending interest rate in Ethiopian commercial banks. Audited financial statements from seventeen commercial banks, National Bank of Ethiopia and the World Bank are used in the analysis. The study covers the period of 2011-2022. Two steps system generalized method of moments (SGMM) is used to conduct the empirical analyses. The findings from the regression estimation revealed that lagged value of lending interest rate, and broad money supply positively and significantly influence lending interest rate whereas bank profitability, provision for non-performing loans, required reserve ratio, GDP growth rate and treasury bill rate have negative and significant influence on lending interest rate of Ethiopian commercial banks. The results show important policy implications for both commercial banks and regulatory authorities in general. Hence, the optimum broad money supply, higher domestic output, improving investment on non-interest income and stable reserve requirements are essential for stable lending interest rate in Ethiopia.

Keywords*: banks; deposits; income; lending rate; generalized moment method;* Ethiopia

1. INTRODUCTION

Financial system is a key pillar for an economy playing critical role in reallocation of financial resources among economic agents (Mokaya, 2018). The economic growth as well as the development of a nation being channeled through the financial sector in which idle funds are made available to the productive sector. Well-structured, robust and developed financial sector is required to achieve a continuous growth (Aurangzeb, 2012) against external shock and it provides strong confidence for depositors by encouraging saving in the economy.

Efficient financial intermediation is an important factor in economic development process as it has implication for effective mobilization of investible resources (Folawewo & Tennant, 2008; Kidane, 2019). The performance of the macro economy relies on the performance of the banking sector, because the financial needs of all sectors in the economy met through this sector. It has to be efficiently positioned to provide for liquidity and credit needs of the economy. Failure in this sector leads to the financial and general slowdown in growth of economy. Therefore, it requires proper monetary policy engagements like barriers to entry, market concentration, the borrower-lender relationship and deposit insurance for financial intermediation to improve financial performance of the sector (Chowdhury et al., 2006).

Monetary policy works mainly through the banking system (Bassey & Ekong, 2019; Muritala et al., 2017), which is a important component in providing funds for economic growth through capital accumulation, technology innovations, productivity progress and enhancing sustainable economic growth (Mokaya, 2018). An well-organized and effective banking business in any economy facilitates growth, welfare and smooth business cycles. According to Maonga (2016) banks are at the center of driving economy and contribute to growth in the private sector (Andres & Vallelado, 2008; Sahile et al., 2015). Banks receive funds from the public and grant loans (Chirwa, 2001), on cost basis in the form of interest both to the depositors and from borrowers, considering time spent when the resources consumed (Sahile et al., 2015; Tarus et al., 2012).

In economic theory, interest is the price paid for money to save rather than spending and to invest in assets rather than holding cash. Rates of interest reflect the interaction between the supply of savings and the demand for capital (Patterson & Lygnerud, 1999). Lending is the most important functions, a major source of income and the most essential operations of a bank. It is clear that a

significant share of the total income of all commercial banks derives from interest on loans and advances (Chirwa & Mlachila, 2004).

Lending interest rate is very important for the growth and development of all types of entrepreneurial works (Ali et al., 2016). Banks in order to set their lending rate, first they take in to account their the rate at which they collect deposit to have a certain mark-up (Thompson, 2006). The profit margin of commercial banks can be increased through higher lending rates, but care should be taken that high lending rates results to inefficiency in the banking business (Mokaya, 2018) and harm the long-term relationship with borrowers. Charging too low loan rates has also negative implication that the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from non-performing loan portfolio (Bhattarai, 2015). Tilahun (2019) pointed out that to maximize the profit and make loan price fair and competitive, it demands paying due attention to what factors influences these all. Setting lending rate influences the financial performance from their core business as well as their financial stability and hence, that is the reason why fixing lending interest rate become one of the most important decisions made by commercial banks (Kitamura et al., 2015). This is an important concern to commercial banks, policy makers, the banking industry and the public at large. Bhattarai (2015) indicated that setting of the proper lending interest rates always becomes a core issue in commercial banking business.

To make efficient flow of resource and economic stability of a given country, lending rate has a great role. Lower lending rates in the economy help businesses to improve and grow as well as helps to expand their business at a cheaper borrowing rate since firms get a chance to easily access funds (Afzal, 2012). By bridging the gap between economic agents, banks give out loans and advances to customers to look at profitability, liquidity and solvency as the principal guide for their daily operations. The decision to lend, however, is influenced by different factors (Maonga, 2016). Monetary policy has direct relationship with the ability of commercial banks to offer new loans and the cost of credit available to borrowers (Bernanke & Blinder, 1992). Unsound monetary policies are detrimental to the banking sector especially in making loans expensive to borrowers by raising lending rates (especially tight monetary policy). According to directive of NBE (2017), National Bank of Ethiopia, sets the minimum deposit interest rate and leave the lending rate to commercial banks, with the aim of improving efficiency in the intermediation process by reducing the interest

rate margin. According to directive No. NBE/INT/12/2017 (NBE, 2017), the board of directors of each bank shall set lending rate on the basis of explicit and clear criteria. Any subsequent changes and the criteria up on which the changes are based shall be submitted to NBE in five working days.

In Ethiopia the reports of National Bank of Ethiopia from 2002/03-202021, almost for the two decades revealed that, the average lending interest rates increased by 3.75% (10.50% in 2002/03 to 14.25% in 2020/21). But as the data from Word Development Indicator (2000-2021) indicates, in most African countries lending rate was declining within 20 years against what happened in Ethiopia. Lending interest rate in Zambia declined from 38.80% in 2000 to 9.48% in 2020. Kenya's lending interest rate in declined from 22.34% in 2000 to 12.08% in 2021, Namibia's lending rate declined from 15.28% in 2000 to 6.865 in 2021, in South Africa, lending rate declined from 14.50% in 2000 to 7.04% in 2021 among others.

The other study of Bikker and Vervliet (2018) also revealed that the interest rates in major developed countries have fallen during the last two decades. As the authors identified, Reserve Bank of New Zealand further reduced interest from 8.25% in 2008 to 0.25% in 2020. Change in the interest rates causes far-reaching effects on investment (Olweny & Chiluwe, 2012). The reduction of interest rate is believed to create more competitive environment, and to attract more borrowers. In Ethiopian context, lending rate indicated an increase over the past 20 years even if it grows at slow rate of change. Banking industry in Ethiopia is still growing, but the increase in interest rate push away investors to get fund required for financing their portfolio. Hence, this demand further investigation. According to Rose (2003) there are many factors that influence lending interest rate of commercial banks.

Theoretically, the classical theory (Fisher, 1907) argues that the rate of interest is determined by the supplies of savings, which derived mainly from households, and the demand for investable capital which comes mainly from the business sector. Based on the general equilibrium theory, interest rate is determined by the intersection of the supply and demand for funds (Tarus & Manyala, 2018). The loanable funds theory considers the rate of interest as the function of savings, investment, the desire to hoard money and supply of money. Again, rational expectation theory postulates that the best estimation for future interest rates is the current spot rate and that changes in interest rates are primarily due to unexpected information and changes in economic factors (Irungu, 2013).

Empirically, the determinants of bank lending interest rate fall in to bank related, industry based and macroeconomic orieted (Bhattarai, 2015; Čihák, 2004; Gambacorta, 2004; Isaac, 2015). The study of Mensah and Abor (2014) stated that bank lending rate caused by bank size, efficiency, market structure, capital adequacy ratio, reserve requirement, inflation, volatility of interest rates and exchange rate. Tarus and Manyala (2018) showed that inflation, effectiveness of the government, rule of law and stability in politics have negative and significant effect but operating costs as well as bank concentration have a significant and a direct impact on interest rate. Georgievska et al (2010) in Greece, revealed size of a bank an inverse and significant influence on the lending rate of commercial banks.

Bhattarai (2015) in Nepalese, identified that operating costs, financial performance as well as default risk have a direct and significant influence but insignificant effect of deposit rate on commercial banks' lending interest rate. Maonga (2016) investigated that levels of capitalization, deposits mobilization and increased bank reserves significantly contribute to lowering the cost of loans. In addition, inflation and weakening of local currency in relation to other foreign currency are core in influencing the price of loan. Nampewo (2013) and Aboagye et al (2008) indicated that bank size, operating costs, liquidity risk, credit risk and other macroeconomic variables inversely associated to lending rates. Maina (2015) found that lending rate negatively influence by operating costs and inflation.

The investigation of Jefferis et al. (2020) showed that overhead costs are positively and significantly related with bank spreads. Return on assets, Herfindahl index, non-performing loans, economic growth, the exchange rate and the interest rate are explaining bank spreads. Isaac (2015) found that policy rate, exchange rate, treasury bill rate, GDP, inflation, bank size and HHI are the main factors that affect lending interest rates. Ali et al. (2016) in Pakistan, found that lending interest rate negatively and significantly influenced by deposit rate but Čihák (2004) indicated that lending interest rate directly influenced by deposit rate in in Croatia.

In Ethiopia, Asmare (2014) showed that credit risk, liquidity risk, operating cost, concentration, reserve requirement, GDP and exchange rate have significant positive influence on banks' interest rate spread but other variables like negatively and significantly affected by return on asset, non-interest income and financial development indicators even though, management quality and inflation found insignificant. Yimam (2018) showed that bank size, operating cost, and deposit rate

have a positive and significant but credit risk, bank concentration and GDP have a negative and significant effect on lending rate. However, reserve requirement and inflation are insignificant on lending rate of private commercial banks in Ethiopia.

Tilahun (2019) showed that operating costs, deposit rate, liquidity, asset size, and GDP have a positive and significant effect on lending rate but non-interest income and inflation have negative and significant effect on lending rate of Ethiopian commercial banks. Kidane (2019) identified the negative significant influence of liquidity, profitability and bank size but positive and significant effect by deposit rate, operating cost and market concentration on lending interest rate.

With regard to study conducted on determinants of lending interest rate, there are few studies done in Ethiopia by Asmare (2014), Kidane (2019), Tilahun (2019) and Yimam (2018). These authors used only few variables in their study. As empirical evidence shows, variables like profitability, non-interest income, provision for non-performing loan, the regulatory requirements of required cash reserves, treasury bills, broad money supply, and another variable political risk play a significant role in affecting the lending interest rate of commercial banks because these variables are very important in influencing the lending interest rate. The existence of these variables as empirical evidences indicated have effect on increasing or decreasing the loan rate by commercial banks while loan provision. So, it is the reason why such variables are made part of the study and they were not considered by previous researchers. As literature shows, also there were inconclusive and inconsistent results on the determinants of lending interest rate. So, it is being required to critically identify why such results occur because sometimes such issues can be because of policy differences or other regulatory effects. Therefore, this study has critical relevance in contributing to the industry practice, policy contribution both at central bank level and overall macroeconomic policy and also has significant contribution in methodology as well as to the existing knowledge that a benefit to future authors.

2. LITERATURE REVIEW

2.1 Theoretical review

The theories support the study by laying ground for the empirical review as well as for the hypothesis development to identify the relationship between variables of the study.

Classical theory of interest

The classical theory of lending rates was developed in the nineteenth and twentieth centuries by economist led by Fisher (1907). The theory argues that lending rates is determined by the intersection of demand for and supply of investment (capital). Interest is the price of investment because firms borrow money for investment since investment is dependent on interest rate.

Low lending rate encourages high investment and high interest rate leads to reduction in investment. So, investment is inversely related to interest rate. Households save their money to earn interest rate. High deposit interest rate leads to high saving and vice versa. In addition, Keynes (1937) in the classical theories considers the repayment of lending rates as benefits the savers get for postponing their consumption for greater consumption. According to this theory, higher lending rates influence the attractiveness of saving at the expense of current consumption. Hence, individuals would prefer saving with the prospects of earning which increases the supply of funds. Thus, saving is directly related to interest rate. Firms' demand for investment is fulfilled by households' saving. This shows that, saving is supply and investment is demand in financial market. Therefore, interest rate in goods market is determined at the point where both supply of saving and demand for investment crosses each other or intersect each other. Interest rate adjusts to equilibrate the goods market through saving and investment (Pal, 2018)**.** In classical theory, saving is an increasing function of rate of interest and investment is a declining function of rate of interest.

Loanable funds theory of interest

It is also called neo-classical theory of interest. Loanable funds theory is a reformulation of the classical saving and investment theory of rate of interest. It incorporates monetary factors with non-monetary factors of saving and investments. According to this theory, the rate of interest is determined by the demand for and supply of loanable funds. Classical theory considered only saving out of current income in the supply of funds while neo-classical economists considered not only saving but also bank credit, dishoarding and disinvestment. It is often referred to as real and monetary theory of interest (Pal, 2018).

Loanable fund is the amount of money offered for lending and which is demanded by borrowers for a given period of time (Jakab & Kumhof, 2015). Loanable funds theory has implication on bankers, savers and borrowers. According to the theory, this group should be well compensated at the equilibrium. Interest rate on loan should be structured in a way that every party feels

comfortable. The interest rate adjusts until the amount that firms want to invest equals the amount that households want to save. If the interest rate is too low, investors want more of the economy's output than households want to save. Equivalently, the quantity of loanable funds demanded exceeds the quantity supplied. When this happens, the interest rate rises. Conversely, if the interest rate is too high, households want to save more than firms want to invest, because the quantity of loanable funds supplied is greater than the quantity demanded, the interest rate falls. At the equilibrium interest rate, households' desire to save balance the firms' desire to invest and the quantity of loanable funds supplied equals the quantity demanded (Mankiw, 2001). The model for lending depends on the interaction between potential borrowers and savers. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment (Sia, 2015).

Keynes theory of liquidity preference

Liquidity preference is the decision about the degree of liquidity at which savings should be held. Furthermore, it is a decision concerning the stock of savings –wealth at any point in time rather than any new flow of saving alone. The rate of interest, hence, is not determined by the supply of and demand for (flows of) savings, but by the supply of and demand for assets into which holdings of stocks of wealth can be placed. In the theory of money as a store of value, money is one of these assets. The current rate of interest depends not only on the strength of the desire to hold wealth, but also on the strengths of the desire to hold it in liquid and illiquid forms respectively, coupled with the amount of the supply of wealth in one form relatively to the supply of it in the other. In an uncertain world, people seek a degree of liquidity and it is this demand for liquidity that is a major element in the determination of interest rates. This gives us the model with the rate of interest being determined by the demand for money (liquidity) and the supply of money (Tilahun, 2019).

This theory was proposed by John Keynes and it indicates that most of investors tend to prefer short term securities over long term securities (Keynes, 1937). In Keynes view, the crucial way that lending rates impact the level of cumulative output is via their influence on their scheduled investment disbursements. Dimand (2008) indicate that profit seeking organizations do their investment mainly through physical capital such as machinery and raw materials and expect to earn from them other than from cost of loan (interest) on investment financing. Lending rate has center

stage role when it comes to investment demand schedule. Keynes in the liquidity preference theory advocates for government to come up with adequate monetary policy to manage interest rates. However, Keynes believes that there are other factors that affect investment demand schedule. Therefore, monetary policy alone cannot achieve the desirable levels of investment and maintain full employment.

Loan pricing theory

According to this theory, the interest rate set on loans could increase information asymmetry problems. The theory posits that bank cannot always set high interest rates by trying to earn maximum interest income. Banks should consider the problems of adverse selection and moral hazard, since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz & Weiss, 1981). If banks set interest rates too high, they may induce adverse selection problems because high risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behavior because they are likely to take on highly risky projects (Suwanaporn, 2003).

Rational expectations theory of interest rates

This theory is based on the idea that people formulate expectations based on all the information that is available in the market. Rational expectations theory holds that the best estimation for future interest rates is the current spot rate and that changes in interest rates are primarily due to unexpected information or changes in economic factors. According to Bekaert et al (1998), if expectation of the people is that interest will rise, many people will avoid borrowing. This in turn affects bank performance due to reduced earning on interest rate. But if people expect interest rate to drop people would be willing to borrow and this will improve banks performance due to increase in interest rate earning.

2.2 Empirical review

The basic function of a bank is to transform savings into loans and Olokoyo (2011) investigated loan pricing determinants and commercial banks' lending behavior in Nigeria. The result showed that loans, deposits, investment portfolio, interest rate, minimum cash requirement ratio, liquidity ratio, foreign exchange and gross domestic product have a long run relationship among themselves. The work of Ali et al. (2016) in Pakistan, revealed that equity, loans and overhead, inflation rate

and short-term interest rate in real terms positively affect bank interest rate and the interest margin is negatively affected by non-interest earning.

Study done by Ansari (2016) indicates that non-interest income has an inverse and significant effect on loan pricing and banks decrease their lending rate when they are more reliant on fee generating products. Loan interest rates show significant positive relationship with operating cost, profitability, capital adequacy, loan maturity, asset quality, bank size and liquidity indicators. Loan interest rate also positively influenced by GDP and inflation rate. In Pakistan, Siddiqui (2012) identified that interest rate spread is significantly influenced by non-performing loans ratio. Lending rate mostly influenced by bank size, market share, deposit rates, non-performing loans, domestic policy rate and the foreign interest rate (Georgievska et al., 2010).

Tarus et al. (2012) indicated that operating expenses and credit risk have positive effect whereas growth and market concentration have negative and significant effect on net interest margin. In Ghana, the work of Uzeru (2012) identified that interest expense on deposit, policy rates, treasury bills, inflation and GDP were significantly affecting lending rates whereas operating expenses, capital and profit performance have insignificant effect. The study by Asamoah and Adu (2016) in Ghana, revealed that nominal exchange rate and monitory policy positively and significantly influenced lending interest rate in a long-run. But inflation, fiscal deficit and GDP showed negative effect on the lending interest rates. Ahokpossi (2013) in Macedonia reports that size of bank, market share and non-performing loans directly affect the lending rates. The study of Samahiya and Kaakunga (2013) in Namibia, indicated that market share on deposit and operating cost reduce net interest margin whereas liquidity increases the interest margin. But payment of tax by bank, capital and non-performing loan were insignificant to interest margin. The study of Were and Wambua (2014) showed that lending rate has a positive relationship with inflation and negative association with GDP. But exchange rate showed insignificant effect on lending rates in Kenya.

The work of Finger and Hesse (2009) also found evidences that large banks impose lower lending rate due to economies of scale. The other scholar showed that large size banks have the advantage of offering a large financial service and then raise more funds which will help them to serve their customers with low lending rate which further supports the economies of scale (Bashir, 2003). Georgievska et al. (2010) in Greece, revealed that bank size has inverse a significant effect on the bank lending interest rate. Krnic (2014) found that lending interest rate is positively and

significantly influenced by non-performing loan, treasury bills and inflation. The author also indicated that the other variables like bank size, profitability, GDP and public debt, lost power to influence the lending interest rate. Nampewo (2013) in Uganda using time series data, investigated the positive influence of GDP on lending interest rate spread whereas negative impact of non-performing loan and bank policy rate.

With the data collected from 14 Latin America countries, Gelos (2006) investigated the major positive effect of central bank rate and reserve requirements on interest rate spreads. Eita (2012) in Namibia, found that growth of economy and financial development (money supply) contributes to interest rate spread negatively. But treasury bills, bank policy rate and inflation have a positive effect on the lending rate spread. The other studies in Kenya, Tarus and Manyala (2018), interest rate spread negatively influenced in low-income countries by gross domestic product, money supply, bank size and treasury bill. Applying a panel estimation in Macedonia, Georgievska et al. (2010) identified a positive influence of non-performing loans, deposit interest rates and size of bank on leading interest rate. The study of Janda and Zetek (2014) found direct relation between GDP and lending rates but inflation has inverse relation on lending rates. The work of Kinuthia (2014) showed inflation and GDP growth rate have a negative influence on lending rates. But credit risk has positive influence on lending rates whereas operating costs negatively impact it.

The work of Khan and Khan (2010) and Afzal (2012) stated that pricing of loan influenced by banks' diversification and steady revenue sources. If bank generates income than by lending, it is considered as non-interest income and even contributes to the direction of changes in lending interest rate charged on borrowers. The study of Folawewo and Tennant (2008) revealed that the crowding out, public sector deficits, discount rate, inflation, level of money supply, and ratio of reserve requirement highly influences the lending rate spread of banks and again the level of economic development, financial development, and population size have major impact on interest rate spread. The work of Castro and Santos (2010) showed that bank size and non-performing loan have negative and significant influences on the lending rates.

Porta et al.(1997) indicated that the political environment explained by political instability and poor governance significantly influence the business environment and cost of doing business due to its inherent risk and creates uncertainty. Bad political environment (political instability and poor governance) increases operating cost of banks, creates fear and uncertainty which hinder the

possibility for investment activities. Cuadra and Sapriza (2008) further explain that unrest in political environment results to negative influence on government fiscal policies and on other important factors that influence the lending interest rate. Such factors are mostly common in Sub-Sharan African countries where conflict is usually inevitable with poor governance. Cuadra and Sapriza (2008) in their finding, higher levels of political instability and uncertainty significantly increased interest rate spread arising mostly from risk premium charged in the international credit market. The study conducted by Kuttner (2012) and McLeay et al. (2014) found that there was insignificant influence of political risk on lending interest rate.

The study of Sottilotta (2013) further indicated that commercial banks affected political risk which significantly affect the commercial banks' profitability. Its effect on profitability affects lending rates. "Political risk index is computed based on twelve items entailing social and political constructs within a country and this include the stability of the government, socioeconomic volatility, investment profile, conflict, corruption, military involvement in politics, tensions in religions, and ethnic animosity among others. A composite indicator of political risk was applied (measured on a scale of 0-100) and high values signified low political risk while low values signified high political risk" (Georgievska et al., 2010). Hence, the higher the reverse code, the higher political risk.

The study of Mutamba (2009) states that money supply is the total amount of money available in an economy over a period of time. The amount depends on the physical stock of money multiplying its velocity**.** The study of Afzal (2012) showed that financial development (M2/GDP) captures the degree of monetization in the financial system of an economy. Chikalipah (2020) found positive relationship of financial development (M_2) and insignificant in influencing the lending rate in Sub-Saharan African countries. In low-income countries, money has negative effect on interest rate spread. Perera and Wickramanayake(2016) revealed the key factors of the retail interest rate adjustment like level of financial market development, banking sector market power and central bank transparency.

3. RESEARCH METHODOLOGY

In this study the authors follow the positivist research paradigm in this study. This is because of that the positivist research paradigm is committed to value neutrality, statistical measurement, quantifiable elements and observable events to establish causal laws (Seale, 2000). The positivists

believe in the possibility of establishing cause-effect relationship to make predictions and establish scientific laws and the role of the neutral researcher is to present an objective explanation of matters of concern and predict laws as per Grix (2004). In line with the positivist philosophical framework, quantitative research approach and explanatory design applied for this study to test the relation among variables and these variable in turn measured and used to analyze statistical procedures (Creswell, 2009).

The authors used 17 commercial banks (both private and public banks) of having at least 5 years banking experience in the banking industry from 32 banks at time of the study. The reaming 15 commercial banks were new entrants and does not satisfy the inclusion criteria. The authors used unbalanced secondary data because few banks included in this study have no full data for the study period. This is due to the differences in time for joining the banking business. Audited financial statements collected from headquarters of commercial banks for 12 years (2011 -2022) and macroeconomic and other data from National Bank of Ethiopia and the World Bank. The index for political risk of Ethiopia obtained from the World Banks rating of political risks.

Descriptive statistical technique and the dynamic panel model of two-step System Generalized Method of Moments (SSGMM) applied for analysis. The two step system GMM estimates the data collected to control the persistence of bank lending rate and to address endogeneity problem. 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 (Arellano & Bond, 1991; Roodman, 2009)

3.1 The GMM model specification

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).

$$LIR_{it} = \alpha + \beta_1 LIR_{it-1} + \beta_2 ROA_{it} + \beta_3 logNII_{it} + \beta_4 PNPL_{it} + \beta_5 RR_t + \beta_6 BMS_t + \beta_7 GDP_t + \beta_8 logTB_t + \beta_9 PRI_t + u_i + \varepsilon_{it} \quad (1)$$

Where LIR_{it} refers to lending interest rate of i[th] bank at year t. i= 1, 2, ….. 17. t= 2011, 2012, ……2022. LIR_{-1} is one year lag of lending interest rate, ROA_{it} refers to return on investment, $logNII_{it}$ is the logarithm of non-interest income, $PNPL_{it}$ shows provision for non-performing loan, RR_t is reserve requirement by National Bank of Ethiopia, BMS_t refers to broad money supply, GDP_t indicates gross domestic product, $logTB_t$ is logarithm of treasury bill, PRI_t indicates political risk index, 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 number 1 above. If equation specified as equation number 1 is estimated using OLS method, it leads to biased and inconsistent estimates due to the possible correlation between the regressors and the error term. If the estimation used Fixed or Random Effect model also do not result in consistent and unbiased estimates of population parameters (Arellano & Bond, 1991). The GMM estimation permits to use more instruments and lead to unbiased, consistent and efficient estimates for the population parameters(Arellano & Bond, 1991) and also the great importance of generalized method of moments is the ability of its estimator to use internal and external instruments for improving the efficiency.

Difference and system GMM estimators are the common the common methods of GMM estimators (Arellano & Bond, 1991) and the first difference GMM estimator is used for avoiding the individual fixed effect from the dynamic panel data model. To avoid the correlation between ΔLIR_{it-1} and $\Delta\varepsilon_{it}$, they used two period and three period lagged values of the outcome variables as instrumental variables for ΔLIR_{it-1} in equation number 2 specified below.

$$\Delta LIR_{it} = \beta_0 + \beta_1 \Delta LIR_{it-1} + \beta_2 \Delta ROA_{it} + \beta_3 \Delta \boldsymbol{log} NII_{it} + \beta_4 \Delta PNPL_{it} + \beta_5 \Delta RR_t + \beta_6 \Delta BMS_t + \beta_7 \Delta GDP_t + \beta_8 \Delta logTB_t + \beta_9 \Delta PRI_t + \Delta\varepsilon_{it} \quad (2)$$

The results from first difference GMM estimators may not be efficient in small sample properties and 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 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(Blundell & Bond, 1998). 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(Blundell & Bond, 1998). The system GMM estimators specified as equation #1 and #2 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. (Arellano & Bond, 1991; Blundell & Bond, 1998). 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: Description of study variables and their measurements

Variables	Description	Measurement	Sources	Expected Signs
	Dependent variable			
LIR	Lending interest rate	Average Lending interest rate	National Bank of Ethiopia	
	Independent variables			
LIR_1	*Lag Lending Interest Rate*	One Year lag of Lending Interest Rate		+
ROA	Profitability	Net income to Total Asset	Audited Financial Statements	–
NII	Non-Interest Income	Non-Interest Income to Total Revenue		–
PNPL	Provision for NPL	Provision for Loan Loss to Total Outstanding Loan		+
RR	Reserve Required Ratio	Percentage Basis Central Bank	National Bank of Ethiopia	+
GDP	Gross Domestic Product	Real Rate of GDP		–
BMS	Broad Money Supply	The ratio of M2 to GDP		–
TB	Treasury Bill	Rate offered by the Ethiopian government. For 91 days		+
PRI	Political Risk	Political Risk Index	World Bank Index Rating	+

Source: Author's compilation from literature (2023)

4. RESULTS AND DISCUSSIONS

4.1 Descriptive statistics

From Table 4.1, it is observed that the minimum and maximum lending interest rate shows 0.11875 and 0.1425 over the range of study year. This implies that at minimum, borrowers were charged at 11.875% by commercial banks while borrowing and at maximum borrowers charged 14.255 for getting loan. The average rate of lending interest imposed by banking businesses was 12.92%.

Table 4.1 also revealed that some commercial banks in Ethiopia incurred loss of 3.75% and others generated maximum profit of 5.24% over the study period. But on average commercial banks able to generate return on investment of 2.51% on their performance. As the result points out, there was great variation on profit performance (ranging from loss of 3.75% to profit of 5.24%). To support this result, the Figure 4.1 depicts how the return on investment of commercial banks varies even at an industry average. It shows that, trends of return on investment for commercial banks over 24 years from 1999-2022 in Ethiopia.

Table 4 1: Summary statistics variables of the study

Variable	Mean	Std. Dev.	Min	Max
Lending Interest Rate	0.1292	0.0098	0.1188	0.1425
Return on Investment	0.0251	0.0094	-0.0375	0.0525
Non-Interest Income	0.4676	0.1796	0.0003	1.0605
Provision for NPL	0.0087	0.0515	0.0000	0.5192
Reserve Ratio	0.0669	0.0294	0.0500	0.1500
Broad Money Supply	0.3182	0.0244	0.2700	0.3600
Gross Domestic Product	0.0864	0.0173	0.0606	0.1139
Treasury Bill	2.9001	3.1033	1.1862	10.4330
Political Risk Index	-1.5924	0.2548	-2.0700	-1.28

Source: Author's computation, (2023)

As the Figure 4.1 shows, there were more fluctuations in generating profit (ROA) by commercial banks in Ethiopia. Before 2002, the data showed that an increase up to 2001 and decline for one year. Relatively from 2002 to 2008, the return on investment was increasing at a decreasing rate. The good change was from 2009-2014, it was increasing though little decline observed for one year (2012-2013). From 2014 to 2021, the return of commercial banks on their investment showed decline of below average until slight recovery in 2022 years. This instability in return generating has its own effect on the lending rate of commercial banks. Theoretically, they have an inverse

relation that is when return on investment increases, the lending interest rate of commercial banks decreases and vice versa. In general, Figure 4.1 depicts that at industry level, more than average, the commercial banks' return on investment shown good growth in financial performance. The regression results in Table 4.2 confirmed with this trend properly.

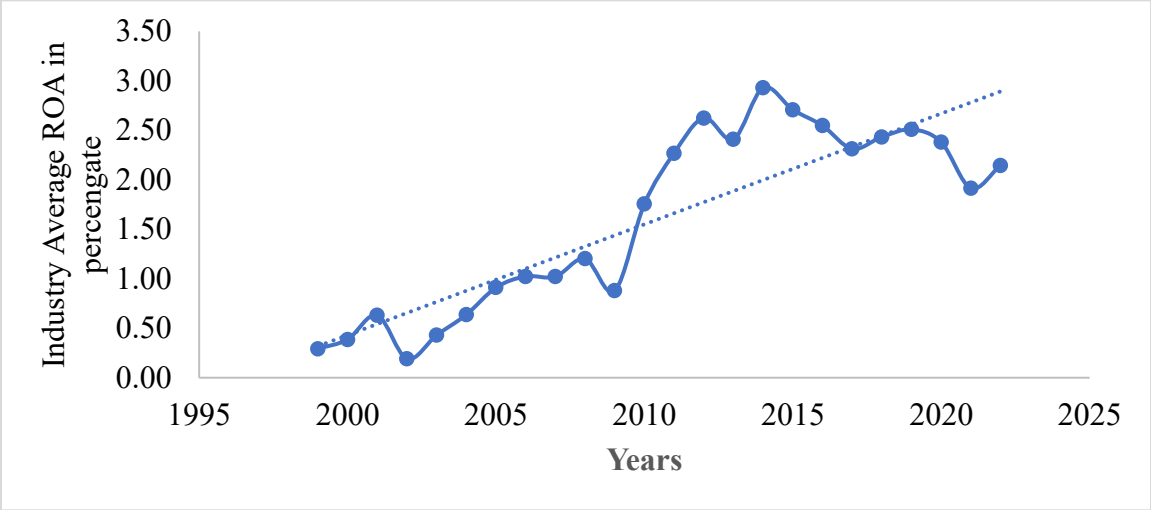

Figure 4 1: Trends of average return on investment of commercial banks in Ethiopia
Source: Author's computation, (2023)

Non-interest income measured as a share of total revenue of banks. Banks generated non-interest income out of their traditional banking services on average 46.76%. Some banks gave more attention to their secondary services to increase their revenue. This result is supported with the Figure 4.2. From 2001-2011, non-interest income of commercial banks was more than the income they generate from the interest income. As Figure 4.2 shows from 1999-2001, the income from interest was higher than the income generated from the other sources. But the interest income gradually declined and the non-interest income increased until the year of 2012. Among other reasons, probably, the attention given to non-interest income can be due to lower number of borrowers in Ethiopia from commercial banks. Later on, the interest income showed good recovery and the income from interest became above other income from 2012-2022 business year for commercial banks. One of the basic reasons why interest income recovered from decline can be due to an increase of lending interest rate gradually from 10.58% in 2003 to 14.25% in 2022.

The authors possibly reasoned outs why lending rate increased in Ethiopia when other African country's declining, on the basis of the scenario of the Ethiopian finance policy. The first possible scenario points out that the Ethiopian finance industry is locked to the foreign investor in this sector and left only for Ethiopian nationals. In addition, the diaspora Ethiopians were excluded from this

sector till 2020 and later with directive No. SBB/73/2020, (NBE, 2020), the diaspora community allowed to participate in buying share in the sector. One of the basic reasons that government reserved such sector was to encourage the domestic banking business to be strong in capital, technology, human capital and then be competitive when the foreign investors allowed invest in the banking sector. This was the great favor for them by the government and there were no strong competitors (absence of foreign banks) that challenges them to reduce loan price in the finance industry unless they compete with each other.

The second possible scenario might be due to the directives issued by National Bank of Ethiopia to the existing and newly coming banks to increase their minimum capital requirement. With the directives No. SBB/50/2011, National Bank of Ethiopia instructed the newly joining banks to come up with half billion and the existing banking business to raise their capital from 75 million to half billion. With the directive No. SBB/78/2021, National Bank of Ethiopia also brought the same instruction as previous to the new entrant and the existing banks to increase their capital to Birr 5 billion; otherwise, merging of banks proposed to enable them to meet the requirement up on maturity date. So, one of the possible ways to fulfill this requirement for operating banks is through increasing loan price they charge their borrowers to increase their interest income. Consequently, interest income increased over time as Figure 4.2 reveals since 2011. Once the foreign banks started operation in Ethiopia, such trend may not continue since charge on lending become on competitive basis to attract customers.

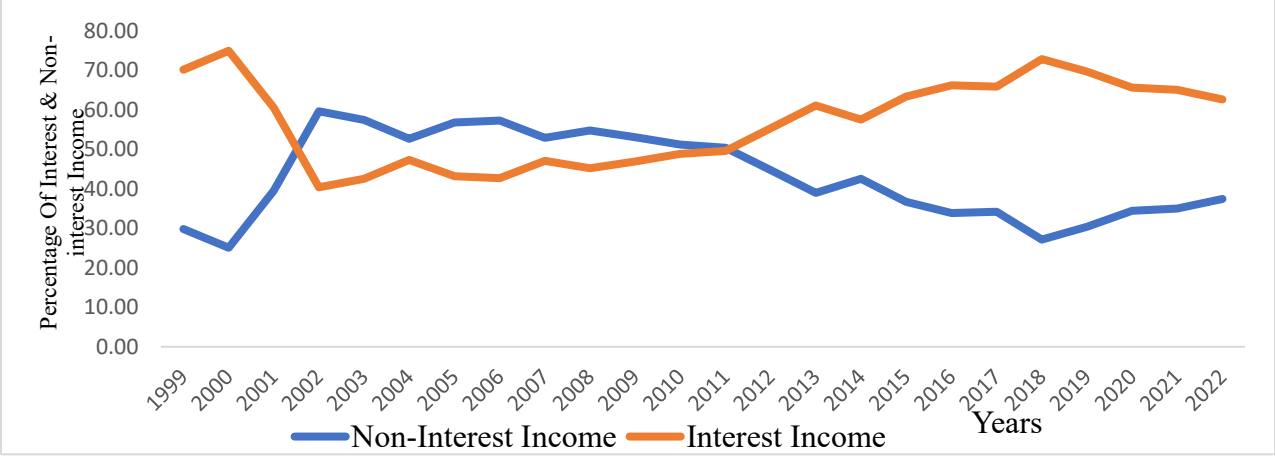

Figure 4 2: Trends in interest and non-interest income of commercial banks in Ethiopia
Source: Author's computation, (2023)

The third scenario why lending interest rate increased could be for controlling money circulation to curb inflation and stabilizing economy as monetary policy instrument. Whatever the possible scenario, increasing interest rate helped banks to generate higher income by charging higher interest rate. This is good for banks in one way. But this is a challenge to investors by making expensive cost of their investment and push away many potential private investors in Ethiopia.

The trend in Ethiopia for lending interest rate was against what other African countries practice. As the Figure 4.3 indicates, the lending interest rate of many African countries declined over the past two decades. This helps for attracting large number investors, boosts the economy and benefits commercial banks from economies of scale than charging few borrowers like the case in Ethiopia. Therefore, this gives lesson for Ethiopia for revising the monetary policy in action.

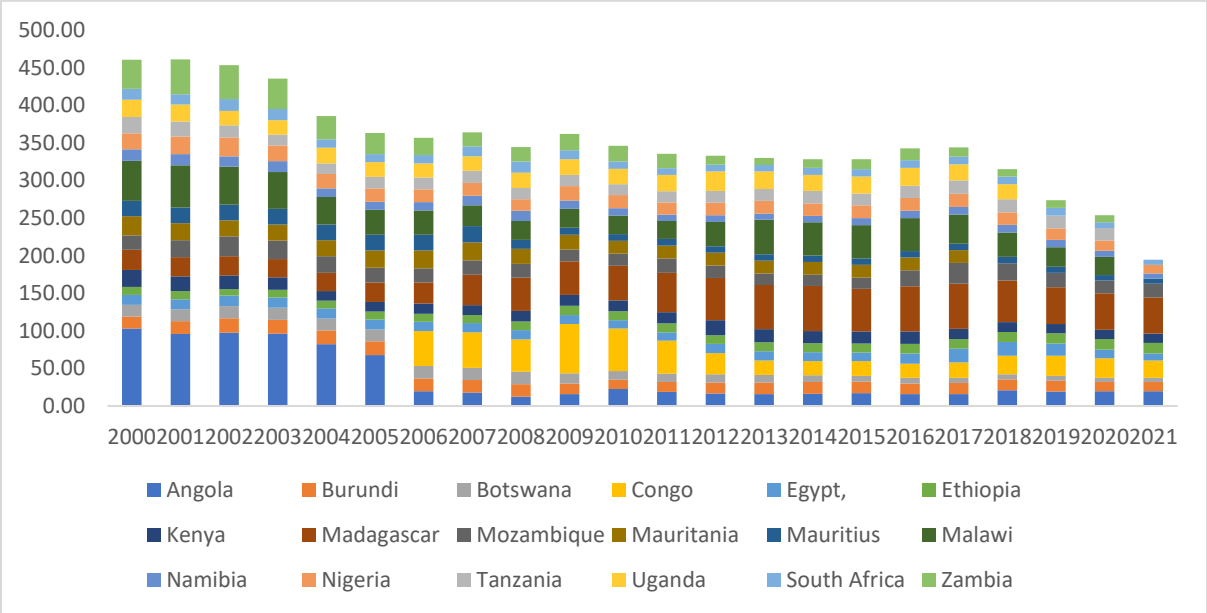

Figure 4.3: Trends in interest rate structure of selected African countries
Source: Authors' Work from Word Development Indicator Data (2000-2021)

The other result in Table 4.1 is 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 1.186% and 10.433% respectively. It showed great difference over the study period of 12 years. The rate of 1.186% 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 was 2.9%. This implies that there was a sharp increase for the last three final years of the study year. 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. Such increase in treasury bill rate has its own advantage for the government and the general economy. Government can be benefited from financial resource mobilization from domestic market in many ways like for financing its large budget deficit rather than borrowing money from National Bank of Ethiopia and relying on foreign debt and aid, 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.

For Ethiopia, Table 4.1, also indicates the political stability index and the minimum -2.07, and maximum result was -1.28 with the average point of -1.59. The result shows political stability of the country was declining more which affects the normal activities of the banking business and the general business environment. This may considerably influence the non-performing loan of commercial banks and escalates the cost of operation even sometimes loss or expropriation of cash and other properties within this violence. This brings the country at the back in the world rank for political stability especially due to the recent conflicts in Northern part of the country, Tigray region and later in some Oromia and Amhara region.

4.2. 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. Based on this, Arellano-Bond test for AR (1) in first differences with z value of -2.23 and its Pr > z is 0.026 which is less than 5%. 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 result showed that Arellano-Bond test for AR (2) with z- value of -0.23 and the Pr > z is 0.822 which is above 5% level of significance.

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. In this model, the Sargan test of overidentified restrictions with chi2(5) value of 15.91 showed Prob > chi2 is 0.007 which showed highly significant at 1%. Hansen test of over identified restrictions should be insignificant. The

result with chi2(5) is 8.83 and Prob > chi2 is 0.116. Based on this, Table 4.2 shows the estimation result of the system GMM

Table 4 2: Estimation result of System Generalized Moment Method

Lending Interest Rate	**Coef.**	**Corrected Std. Err**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Lag of Lending Interest Rate	0 .6403	0.0243	26.30	0.000*	0.5887	0.6919
Return on Investment	-0.1701	0.0638	-2.66	0.017**	-0.30548	-0.0347
Log of Non-Interest Income	0.0199	0.0294	0.68	0.507	-0.0424	0.0823
Provision for NPL	-0.0023	0.0007	-3.45	0.003*	-0.0038	-0.0009
Reserve Ratio	-0.0804	0.0064	-12.60	0.000*	-0.0939	-0.0668
Broad Money Supply	0.0286	0.0063	4.57	0.000*	0.0153	0 .0419
Gross Domestic Product	-0.3133	0.0098	-32.07	0.000*	-0.3340	-0.2926
Log of Treasury Bill	-0.0014	0.0004	-3.43	0.003*	-0.0022	-0.001
Political Risk Index	-0.0031	0.0032	-0.97	0.345	-0.0100	0.0037
_cons	7.5439	0.3010	25.06	0.000	6.906	8.1821
Number of obs. = 180	Number of groups = 17			Number of instruments = 15		
Arellano-Bond test for AR (1) in first differences: z = -2.23				Pr > z = 0.026		
Arellano-Bond test for AR (2) in first differences: z = -0.23				Pr > z = 0.822		
Sargan test of overid. restrictions: chi2(5) = 15.91				Prob > chi2 = 0.007		
Hansen test of overid. restrictions: chi2(5) = 8.83				Prob > chi2 = 0.116		

***Note**: Management efficiency* (Operating Expenses to Total Revenue) *is used as external instrumental variable. But it was not part of main regressor variables. *,**, *** indicates level of significance at 1%, 5%, 10%*

As it is observed from Table 4.2, the one-year lag value of lending interest rate has a positive and significant effect on the subsequent lending interest rate of commercial banks. Being significant at 1% level of significance, it reveals that if the lag lending interest rate increases by 1%, the subsequent lending interest rate increases by 0.64%. This implies that a rise in lending rate of last year has a significant contribution for the rise in current lending interest rate i.e., the higher the lending cost of the preceding year, the higher the interest charge while extending loan in the next immediate business year. But from borrowers' perspective, it has negative implication due to raising on cost of getting finance from commercial banks. Even though the lending interest rate in Ethiopia at an industry level slowly grows, at individual banks, this has its own contribution to change of the current lending rate. This is because, since commercial banks in Ethiopia are free in setting their lending rate as indicated in the report of World Bank Group (2019), at each bank, an increase in lending rate in the past period has an effect on the rise of the current lending rate.

Profitability is a good indicator to evaluate the financial performance of commercial banks. The result revealed that return on asset showed that negative and significant effect on lending interest rate of commercial banks. Theoretically, when commercial banks' financial performance increases, it is crystal clear that banks are not dependent only on the income they generate from extending loan. This is because banks can get freedom to generate income from other secondary services in addition to from lending services. When the income from secondary service is promising, it has its impact in reducing charges on the loan price. Banks which did not diversify their activity tend to increase their lending rate. This is because they do not want to lose their income at the expense of low lending price. On the other hand, by reducing their cost of borrowing, banks can attract more and more borrowers which encourages further investment and banks benefited from economies of scale by having large number of borrowers and generate good income from lending service. This is very important for banks. Rather than charging few borrowers with high lending rate to increase their interest income, it is better to reduce lending rate and collect more interest from large number of investors by giving due care for liquidity and non-performing loan. Therefore, the result revealed that, when return on asset of banks increases by 1%, the lending interest rate declines by 0.17%. Empirically, this finding is supported by the evidence from Asmare (2014) and Kidane (2019), Georgievska, et al. (2011), Mbao, et al. (2014), Bhattarai (2015) and Siddiqui (2012). But the result of this study is against to the work of Krnic'(2014) and Uzeru (2012) who identified that profit of banks is not significant in influencing the lending rates.

Provision for non-performing loan is measured as loan loss provisions to total loan. Timely and accurate provisions should be made to the provisions for loan losses account to accurately reflect the risk inherent in lending activities and to ensure that disclosed capital and earnings performance should be accurately reflected. An increase in the provision for loan losses implies a higher cost of bad debt write-offs. The result of this study showed that negative and significant effect of the provision for non-performing loan on the lending rate of commercial banks in Ethiopia. This reveals that the lower the provision for loan non-performing loan, the higher the lending interest rate to compensate the risk of uncollectible amounts at least by raising the loan price. When high or adequate provision captured by the lender to minimize the risk from non-performing loan, the lending interest rate declines because the provision can serve as a guarantee. This result supported by the work of Castro and Santos (2010) and Nampewo (2013), but contradicted by Georgievska, et al. (2010), Rosenberg, et al., (2013), Krnic (2014) Hossain (2010), Grenade (2007) and Cihak

(2004), even though Samahiya and Kaakunga (2013) and Georgievska, et al. (2011) indicated that lending rates are influenced to a lesser extent or no influence by non-performing loans.

The estimation results of from Table 4.2 showed the negative and significant effect of required reserve ratio on the lending interest rate in Ethiopia. This indicates that when required reserve ratio increases, the lending charge by the bank declines which is against the expectation of the authors. On the other side, the result may imply that when banks have adequate reserve with central bank, they feel confidence at cost of lender of last resort with the central bank. So, they may reduce the lending charge relatively to attract more borrowers for compensating the opportunity cost of reserve ratio with economies of scale than highly charging few borrowers especially where there is large competition in banking business. The finding of this study is against the work of Folawewo and Tennant (2008), Crowley (2007), Gelos (2006), Asmare (2014) and Mensah and Abor (2014). But Yimam (2018) showed that reserve requirement is insignificant on lending rate of banks

The level of financial development is captured by broad money supply available in an economy over a period of time. Theoretically, broad money supply and lending interest rate have a negative association. But the result of this study showed a positive and highly significant relation with the lending rate of commercial banks in Ethiopia. The flip side of this result to the economy may imply that when there is large money injection to the market, it causes rise in price, which may indicate high possibility to be a cause for high inflation. According to Monetarist Theory (Loef & Monissen, 2023)**,** the Irving Fisher equation indicates that inflation and broad money supply have positive relationship, which is in short to mean that price (inflation) is equal to broad money supply divided for gross domestic product. Because of this, rise in inflation can bring rise in price of loan that demanded by commercial banks while lending to cope up with the challenge of inflation. This finding is supported with the study of Chikalipah (2020) found positive relationship of financial development (M_2) in Sub-Saharan African countries though insignificant. On the other side, the result is in contradiction with the result by Tarus and Manyala (2018).

Economic growth affects the demand and supply for banking services (Tarus et al., 2012). The estimation results from Table 4.2 revealed that negative and significant relationship of growth domestic product and the lending interest rate of commercial banks in Ethiopia. It is significant at 1%, showing that 1% increase in gross domestic product leads to decline in lending interest rate of commercial banks by 0.31%. When there is good growth in economy, the money supply be in a

position that accommodates the demand of investors and other businessmen. Banks perform well their banking business in smooth competitive manner as well as in generating profit even out of the traditional banking business. This is through diversification of their services to their customer. Such situation diverts the focus to different income generation schemes and leads to reduction in lending rates. When there is reduction in lending interest rate, many investors motivated for borrowing for further investment and banks again generate more interest income from large number of investors through economies of scale than what they do through high interest rate. This again reduces more, the possibility of credit risk when the economy is at good position. The result of this study is line with the study of Mokaya (2018)**,** Kinuthia (2014) and (Tarus & Manyala, 2018). But this study contradicts with the work of Janda and Zetek (2014) and Georgievska *et al.,* (2010), Nampewo (2013) and Olukoya (2011) and Tilahun (2019). But Ahokpossi (2013) investigated that economic growth has positive relationship but not significant on lending rates determination.

The finding of this study shows that lending interest rate has an inverse relationship with treasury bill rate that the Ethiopian government offers for 91-days to the investors for short period of time. The result from Table 4.2 revealed that the treasury bill rate is statistically significant at 1%. This might be because of that when Ethiopian government announces treasury bill, most investors may prefer to be advantageous. Investment with government is safe, free of default risk and has tax advantage. Therefore, investors may demand such advantages rather than keeping their money with banks especially in inflationary market in which the real interest rate in Ethiopia is always negative with large magnitude. As the data from NBE over the study period shows, the treasury bill rate reached at 10.433% (maximum rate) for investment for 91-days, but the commercial banks' official saving rate is 7% annually. Because of such issues, large millions of cash (Birr) can be withdrawn from banks and invested with in liquid investment avenue. This might put pressure on the long-term lending activities of banks. The result of the study supported by Ngugi (2001) state that treasury bill rate has asymmetric response with lending rates and also Nampewo (2013) and Tarus and Manyala (2018). However, this result is against the work of Eita (2012) and Krnic (2014).

5 CONCLUSION AND POLICY IMPLICATION

Strong and healthy financial system is a prerequisite for the sustainable economic growth of a given country. This study aimed to identify the drivers of lending interest rate in Ethiopian commercial banks by using panel data of 17 commercial banks (both public and private) for the period 2011 to

2022. The authors applied quantitative approach and explanatory design methods on the basis of the positivist research paradigm. The study employed the two steps system generalized method of moments (SGMM) as an analytical model. Lending interest rate of commercial bank is expressed as a function of internal and external factors. The descriptive result showed that there was high growth in broad money supply and treasury bill over the study year. Political risk index also showed there was a decline in the political stability of the country. The regression results for this study revealed that significant positive effect from lagged lending interest rates and broad money supply on lending interest rates. Bank profitability, provision for non-performing loans, required reserve ratio, GDP growth rate and treasury bill rate have negative influence of lending interest rates. From these results, the authors conclude that the lending interest rate of commercial banks in Ethiopia explained more with large proportion of the external factors than the internal or bank specific variables. But among others, the non-interest income and the political risk index of the country have no significant influences on the lending interest rate of banks in Ethiopia.

The results show important policy implications for both commercial banks, regulatory authorities (National Bank of Ethiopia) and the government in general. Therefore, it is advisable 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 to control the lending interest rate. For commercial banks, improving their investment on non-interest income (diversification) can make reduce the burden on the borrowers and is encouraging for increasing their income. Finally for the government, ensuring higher domestic output can manage lending interest rate in Ethiopia.

Limitation of the study and suggestion for future research work

The limitation is inability of the authors to investigate how non-performing loan affects lending interest rate because, authors unable get data for NPL from both commercial banks and National bank of Ethiopia. This is because the individual banks and even National Bank of Ethiopia, who supposed to have sufficient data, consider this type of data as highly confidential and competitive advantage for each commercial bank. On the other hand, being small in number of commercial banking business restricted the number of variables to be included and this forced the authors to bypass many important variables to be part of the analysis. The number of commercial banks for almost three decades were not more than 17 banks. This restricted the number of variables to be used since the model uses instrumental variable and the number of instruments expected to be below

the number of groups. Therefore, the upcoming researchers recommended to fulfill the gap that shown in this study especially challenges related to the lending interest rate and non-performing loan of individual banks to move one step forward for new output.

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