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**COLLEGE OF BUSINESS AND ECONOMICS**

**DEPARTMENT OF ECONOMICS**

**The Impact of Financial Inclusion on Bank Performance in Ethiopia: A panel data analysis**

**A RESEARCH SUBMITTED TO ADDIS ABABA UNIVERSITY FACULTY OF BUSINESS AND ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF SCIENCE DEGREE IN FINANCIAL ECONOMICS.**

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**Addis Ababa, Ethiopia**

## DECLARATION

I, Alie Fentaw, declare that this research paper entitled “**The Impact of Financial Inclusion on Bank Performance in Ethiopia: Panel Data Analysis**” is my original work Submitted for the award of the fulfillment of the requirement for the degree of Master of Science in financial economics at Addis Ababa University. It has not been submitted to any college, institution, or university other than Addis Ababa University for academic purposes, and all resources used have been duly acknowledged.

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# CERTIFICATE OF APPROVAL

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This Is to Certify That The Research Thesis Presented By Alie Fentaw, Titled: **The Impact of Financial Inclusion on Bank Performance in Ethiopia: Panel Data Analysis** In partial fulfillment of the requirement for the Degree of Master of Science (MSc) in Financial Economics compile with the regulation of the university and confirms to the acceptable standards concerning the originality and the quality.

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## **List Acronyms**

FI: Financial Inclusion

IFI: Financial Inclusion Index

BP: Bank Performance

BPI: Bank Performance Index

ROA: Return on Asset

ROE: Return on Equity

NIM: Net interest margin

PCA: Principal Component Analysis

GLS: Generalized Least Square

GDP: Gross Domestic Product

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## Abstract

*This study examines the relationship between financial inclusion and banking performance in Ethiopia, using data of 10 banks from 2012 to 2022. The study employs the panel data model to assess the impact of financial inclusion on bank performance. The Regression analysis was conducted after carrying out the Housman test to determine the suitability of either the fixed effect or random effect model after developing the bank performance index and financial inclusion index using principal component analysis (PCA). The results show that financial inclusion negatively affects bank performance and profitability, as measured by the bank performance index. The research has shown bank-specific factors, such as net loan-to-asset ratio, are insignificant to banking performance.*

*Additionally, the deposit has a positive significance for banking performance in the study of selected ten banks in Ethiopia. Inflation and GDP growth rate significantly impact banking performance. The emphasis on increasing the availability of financial services underscores the importance of establishing a robust infrastructure that can cater to the diverse needs of customers across various regions. By expanding physical branches, developing digital banking solutions, and implementing innovative delivery channels, banks can ensure that their services are easily accessible to a wider audience.*

*Finally, the authors suggest the crucial need for banks to collectively prioritize accessibility, utilization, and availability to boost not only their profitability but also their essential role in catalyzing sustainable economic growth and cultivating a more inclusive financial landscape in Ethiopia. This strategic alignment between financial institutions and economic development goals signifies a pivotal stride towards strengthening the nation's economic foundation as a whole.*

**Key Words:** Financial Inclusion, bank performance, return on asset, return on equity, net interest margin, principal component analysis (PCA), Gross Domestic Product (GDP)

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

Financial Inclusion is considered one of the most known methods that can help to improve individuals' standard of living. According to the World Bank, financial inclusion means that and business and household have access to financial product and services that meet their needs that they can afford and are provided responsibly and sustainably (WB, 2022). This means financial inclusion occurs when consumers and businesses have available and affordable access to financial services such as savings, payments, loans and other services. Financial inclusion refers to the availability and use of basic financial product and services by individuals and businesses, especially those who have no background in or have been excluded from the mainstream banking and financial system (WB, 2022).

Aportela (1999) describes that having a bank account and using services of bank increases savings. His study indicates that access to financial services increases savings rates by at least three to five percentage points. A financial account or simple savings product could enable women to make decisions within the household Ashraf and Yin (2010). Dupas and Robinson (2009) indicate that getting an account or simply saving through engagement can facilitate consumption and finance entrepreneurs' productive investments. Several studies have shown that a formal account offers numerous benefits for individuals and businesses. Singer, Demirguc-Kunt, and Oudheusden (2015) also describe that became account holder and access to savings and payment methods can increase savings, empower entrepreneurs, and stimulate productive business and enhance consumption. Zinman and Karlan (2010) found that access to credit has significant positive effects on improving consumption, employment, and income and on some aspects of mental health and prospects.

Empirical evidences shows that increased in financial inclusiveness increases financial stability by contribute to economic growth, financial performance and banking system achievements. The government gains a lot of advantages from the rise in primary economic activity; which

ultimately reduces economic inequality at the macroeconomic level (Chikalipah. Financial development through financial inclusion can reduce income inequality and improve the development of low-income people (Beck et al., 2007). Financial system inclusiveness promotes change and eliminates poverty traps (Li, 2018). The integration within the financial system plays a crucial role in fostering economic advancement, diminishing poverty and inequality, and actively bolstering financial progress. An investigation conducted by Anarfo and colleagues in 2019 underscores the significance of financial inclusion alongside the advancement of the financial industry. A robust financial system alleviates credit restrictions for enterprises, guarantees regular functionality, and furnishes avenues for funding various investments.

The society participates and invests in their education with financial resources, supports projects and encourages skills and development of entrepreneur (Demirgüç-Kunt, 2017). Economies with poor connectivity or access to finance will experience rapid growth (Beck et al., 2007). Income can also boost the economy by stimulating businesses, for example G. Reduce corruption. Cash flow, like mobile banking, helps reduce fraud, especially because the process is simple. Financial intermediaries, like banks, are also subject to strict regulations in providing documentation and detecting illegal transactions by recording customer transactions (Ajide, 2020).

Financial inclusiveness is also vital in women's empowerment and financial stability (Swamy, 2014). Ethiopia, located in SSA, is also unusual. In microfinance, financial institutions such as insurance companies and banking sector are expanding their services and outreaches. Recently, financial inclusion has been gaining momentum worldwide and Ethiopia is taking it as one of the pillars of financial performance improvement. Although progress has been made in the development of the financial sector through the spread of financial technology (mobile banking, internet banking, electronic money and electronic payment systems) and the establishment of financial institutions across the country, the financial system is quite complex and concentrated in cities. Progressive development of the financial system contributes to improving the quality of the enterprise. It is very difficult to do business in Ethiopia, and it is also very difficult for companies to get loans (Desalegin and Yemataw 2017).

## 1.2 Statement of the problem

Financial inclusiveness is becoming increasingly important in Ethiopia, where approximately 84% of country total populations are living in rural areas and engaged in agriculture and related activities (Girma 2012). Ethiopia has high banking concentration in rural areas, resulting in one of the lowest income rates in sub-Saharan Africa, where only fourteen percent of people have access to credit. Most financial service providers, especially banks, focus on cities and neighborhoods with limited infrastructure, making rural areas inappropriate. Most of all, different research indicates that financial product and services from formal institutions, depends on how these services are managed and monitored (Yetman and Mehrotra, 2015). Moosa (2017) defines financial inclusion as the increasing importance of financial markets, financial incentives, financial institutions, and financial elites in the functioning of the economy and governance institutions at both national and regional levels. In Ethiopia, just forty five percent of people have access to bank accounts, and just thirty percent of adults save money through official organizations. A 10% of the population has restricted access to consumer loans and credit, and there is a tiny insurance market with few product possibilities. Additionally, financial institutions need more expansion and a more significant concentration for the wellbeing of majority (WB, 2021). The population-to-bank branch ratio is recorded, with 34.1 percent of banks in Addis Ababa. Public banks own 51 percent of banking capital and thirty percent of bank branches (National Bank of Ethiopia, 2020).

Financial inclusion has many benefits, including access to financial services, as it provides opportunities to start new businesses and increase the income of poor households, which has a positive impact on GDP and productivity (Duvendack and Mader, 2020; Kuada, 2019). ). The Consultative Group for the Protection of the Poor (CGAP) has identified financial service availability as an important factor in the Sustainable Development Goals (Klapper, 2016). Therefore, governments are encouraging banks to take proactive measures, especially in emerging markets. Banks play an important role in the development of financial services. Although this strategy requires an initial investment, it also provides high returns as banks reach new customers within their communities. Financial inclusion has been a topic of increasing importance globally, particularly in Ethiopia, where access to financial services remains a challenge for many individuals and businesses. While the impact of financial inclusion on bank

performance has been studied in various contexts, there is a need to specifically examine this relationship within the Ethiopia context. Understanding how improved financial inclusion practices affect the performance of banks in Ethiopia is crucial for policymakers, regulators, and financial institutions to enhance their strategies and offerings to better serve the diverse and evolving financial needs for population in Ethiopia. This research aims to address the gap in existing literature by investigating the specific impact of financial inclusion on bank performance in Ethiopia, thereby contributing to a deeper understanding of the dynamics at play in this unique and rapidly evolving financial landscape of the country.

### **1.3 Research questions**

The research problems mentioned above entail the need for the research questions that must be analyzed and addressed are as follows:

- i. What is the impact of financial inclusion on banking performance in Ethiopia?
- ii. How to address the impact of financial inclusions on bank performance?

### **1.4 Objective of the study**

#### **1.4.1 General Objective of the study**

The primary objective of this study is to analyze the impact of financial inclusions on banking performance and explore its implications for Ethiopian commercial banks.

#### **1.4.2 Specific objective of the study**

In particular, the research will address the following topics:

- a) To analyze the impact of financial inclusion on banking performance.
- b) To analyze dimensions of financial inclusion which affects bank performance?

### **1.5 Research hypothesis**

Based on the empirical literature on the relationship between financial inclusion and banks performance, the hypothesis will have built around the specific objectives and assess the following relationships.

- i. Financial inclusion significantly and positively affects banking performance (Safwat Muhammad, M., & Moaz. ,2022); Khatib, S. F., Hendrawaty, E., Bazhair, A. H., Rahma, I. A. A., & Al Amosh, H. , 2022). Thus, we hypothesize that the impact of financial inclusion on banking performance is significant and positive. On the other hand, deposit to GDP ratio has a significant effect on banking performance. And, we hypothesize net loan and advances has a significant effect on banking performance. Then we hypothesize inflation rate and GDP growth rate have significant effect on banks performance.

## **1.6 Significance of the study**

With a focus on Ethiopia, the study explores the factors that determine financial inclusion for banks' performance, the impact of financial inclusion on banking performance, and the identification and analysis of financial inclusion's various dimensions. The study's output is educating policymakers and financial organizations about the major factors that facilitate for inclusive in financial services and affect performance of banking sector. The study's findings will provide insights into how financial inclusiveness can enhance the financial performance of commercial banks in Ethiopia. The study's recommendations could be used to inform banking sector higher officials and other stakeholders on the importance of promoting financial inclusiveness.

Additionally, since this study would offer the required knowledge on the various opportunities and possibilities for boosting financial inclusion by affecting financial service provider facilities, it would be helpful to financial intermediaries and collaborators. This study can offer baseline data on the current state of financial inclusion and financial services' contribution to upcoming studies.

## **1.7 Limitations of the study**

The study's findings may need to be more generalizable to another newly joined financial service provider in Ethiopia. From financial institutions, the study is limited to the banking sector; this limitation is attributable to time and budget constraints. The study's reliance on secondary data sources since 2012 of 10 banks may limit the scope of the study's findings. The study's inability to have enough time to conduct this study may hurt examining the impact of financial inclusion on banking performance. The current study relied on panel data that provided a picture of a particular period between 2012 and 2022 using secondary data. People's opinions and perceptions are not included, which may limit the inquiry to understand the impact and determinants of financial inclusiveness on the banking sector's economic performance.

## **1.8 Organization of the study**

The research paper was organized into five chapters. The first chapter deals with the introductory part of the research and it includes background of the study, statement of the problem, research questions, objective of the study, significance of the study, the limitations of the study, and the organization of the study. The second chapter reviews literature related to the study. This chapter will discuss and analyze relevant theoretical and empirical studies of each topic to capture emerging themes and compare them with those studied previously. The third chapter was discussing the methods and design of the research & data analysis. The fourth chapter presents results and discussions, and chapter five was concluding with a summary and conclusion of the study and recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Theoretical Literature Review**

##### **2.1.1 Concepts of financial inclusion**

By means of financial inclusion, individuals and businesses can access affordable financial products that address their needs in transactions, payments, savings, credit or insurance - all while maintaining responsible and sustainable practices (World Bank 2022). As a result, in addition to stability and promoting economic growth, many nations have made outreach—or reaching the unbanked and under-banked population—a critical financial policy goal (Ndii 2009). According to Siddaraju (2012), banking services are inherently public goods; hence, the main goal of public policy must be to make banking and payment services available to everyone without exception. Financial inclusion involves the implementation of a program that provides financial services to all segments of society at varying prices and with accessibility. Over time, specific population segments have been excluded from the official financial sector's offers due to their income and volatility levels, gender, activity types, geographic location, or degree of financial literacy. It is, therefore, imperative to use the unrealized potential of those people, organizations, and companies who cannot access the formal financial sectors' services and products.

Additionally, they must be investigated to strengthen their ability, maintain their physical and human capital, inform them of the various sources of income, and control the hazards related to their means of subsistence (Triki and Faye, 2013). In Ethiopia, the 10-year Development Plan (Planning and Development Commission of the Government of Ethiopia, 2021) integrated the principles of financial inclusion with the goals of poverty reduction and overall economic expansion. This economic plan is known as Vision 2021-2030. In response to this effort, Ethiopian banks opened their doors and developed goods and services for the unbanked population. Another important structural change and reform implemented by the National Bank of Ethiopia is the second national strategic plan for financial inclusion, which the Ethiopian government has also unveiled.

### **2.1.2 Financial Intermediation Theory**

Raymond Goldsmith's (1969) work is the basis of financial intermediation theory. Goldsmith provided various facts about the financial system and economic growth throughout his work. It has been noted that as a nation develops economically, the financial system grows faster than its wealth. The allocation of saving and investing among the various economic sectors determines the size of a nation's financial system (Goldsmith, 1969). Contemporary society continues to value the role of financial intermediation in the development of the economy (Scholtens & Van Wensveen, 2003). Both theoretical and empirical studies have demonstrated the significance of financial intermediation in the economy's expansion. Low income and asset levels among some members of society are established in the study as one of the causes of financial exclusion. With the help of financial intermediation, capital is efficiently allocated within the economy to promote economic growth. Limited knowledge of specific financial aspects is another factor cited contributing to financial exclusion. Information is made available to capital owners and borrowers through financial intermediation. The process of financial intermediation brings together surplus and deficit units in an environment unfamiliar to them (Mandell, 2008).

According to Scholtens and Wensveen (2003), banks guarantee financial inclusion through financial intermediation. The importance of financial inclusion to researchers, stakeholders, and policymakers has grown, particularly in developing countries. However, only 20% of adults in the most underdeveloped countries have access to a formal transaction account, and 65% still need to save money through a formal financial institution (Pazarbasioglu et al., 2020). Thus, as a potential strategy for fostering economic growth and development, financial inclusivity has attracted much attention in recent years. Financial inclusion means making all societal groups, especially the underprivileged and unbanked, eligible for affordable and accessible financial services. This is crucial to increase financial stability, combat poverty, and support economic growth (World Bank 2022).

### **2.1.3 Bank Led Theory**

In 2010, the International Monetary Fund developed the bank-led theory. The bank-led theory was developed due to various bank initiatives to create fresh approaches to connecting with clients via agents. Since it eliminates the need for expensive banking infrastructure, these strategies benefit customers who live in rural or remote areas (IMF, 2020). According to the model, a financial institution with a license to operate in a nation, usually a bank uses retail agents to provide financial services. The banks develop the financial products and services before giving them to the retail representatives who deal with all customer interactions. Banks are the ultimate providers of financial services, and clients must keep an account with the primary bank.

The bank-led theory is crucial to this study because it serves as the foundation for agency banking, a vital component of financial inclusion. The bank-led theory comes to mind when considering using agents and expanding ATMs and mobile banking services (Kendell, 2016). The analysis of the theory explains why banks have continued to use the components listed under the variables as ways to improve financial inclusion. Even though the theory is the foundation of agency banking, it has yet to be able to predict how the practice will pan out in terms of returns to the banks and the customers. Straightforwardly, the bank-led theory has shown how the agency banking process works professionally (Santos, 2001).

### **2.1.4 Financial Performance Theory**

Considering the current state of the economy and the high volatility of stock price indices, a company's financial performance has become a necessary component of establishing an organization's values and boosting shareholder wealth. A company's main objective from the perspective of its shareholders is to maximize profits and raise shareholder value. Regarding the organization's long-term growth and success, Shah and Sengupta (2014) argue that measuring the business's financial performance is paramount. Even though assessing a company's ability to use its critical assets through financial performance is a subjective, Mutua (2013) claim it is still essential. Measuring financial performance is a tool for comparing the outcomes of various companies competing in the same industry and gauging a company's financial stability.

### **2.1.5 Financial Inclusiveness and Financial Performance**

Sarma (2008) and Arora (2010) developed an index of financial inclusion to measure financial inclusion in terms of the role of banking sectors. Several studies have indicated the relationship between financial inclusion and financial achievement, and most have found a positive relationship. For example, Demirg-Kunt and Klapper (2012) found that financial inclusion promotes economic growth and development, which increases banks' financial performance. Similarly, Akinboade et al. (2017) found that financial inclusion positively affects the financial performance of banks in Nigeria. However, some studies have found mixed results. For example, Arun and Turner (2009) found that the relationship between financial inclusivity and bank profitability is complex and depends on factors such as the market competition level and the regulatory environment. Becket et al. (2011) used panel methods to examine the relationship between financial inclusivity and financial performance in African countries. They found that financial inclusivity positively impacts banks' financial performance. Studies like, Shihadeh et al. (2018) have looked at how banks might improve their performance through financial inclusion measured by increasing lending, opening additional branches and ATMs, and developing new services. It uses data from 13 banks in Jordan from 2009 to 2014 to analyse the relationship between financial inclusion and bank performance in Jordan. Gross income and return on assets were used to measure performance.

Panel methods benefit this study by involving data analysis over time and across entities. Studies conducted by (Khan, 2011 and Barik and Pradhan, 2021) found that lending to those previously excluded from the formal banking sector revealed new customers needed to be more creditworthy and a threat to the stability of the economy represented by banks. Another body of research postulates that financial inclusion and financial stability are related and that there are synergies between the two (Kumar et al., 2021). Similarly, some studies have found that financial inclusion and financial performance are related and synergies between the two (Shihadeh, 2020; Jajah et al., 2020). On the other hand, (Ikram & Lohdi, 2015; Bhattacharyya et al., 2019 and Estu et al., 2019) found an insignificant association between financial inclusion and financial performance. This has produced two different schools of thought, one claiming the effect of financial inclusion stability and the other claiming the result of financial inclusion instability. Yet, rising financial inclusion indicates that the same established intermediaries handle more financial transactions. The costs to society of particular institutional faults might

increase due to this greater engagement in the financial markets. This might increase the likelihood of social and moral hazard, threatening the financial system's stability.

More financial intermediaries would be desirable from this point of view if they were backed by robust governance and a framework for financial regulation and monitoring. Alternatively, the expansion of regional institutions, such as rural banks or cooperatives, increases the risks to the financial system and makes it more susceptible to disasters and downturns. In Ethiopia, the concept of financial inclusion has been combined with the goals of poverty reduction and overall economic growth as envisioned in Vision 2021-2030, the economic blueprint of the country's home-grown development plan called the Ten Development Plan (Planning of the Government of Ethiopia and Development Commission, 2021). Ethiopian banks have opened their doors and created products and services for the unbanked population in response to the effort. The Ethiopian government also unveiled the Second National Strategy Plan for Financial Inclusion, another significant reform and structural shift carried out by the National Bank of Ethiopia.

#### **2.1.6 Banking Industry in Ethiopia**

On February 15, 1906, Emperor Menelik II inaugurated the First Bank of Abyssinia, Ethiopia's first official bank. These private bank shares were sold in Vienna, New York, Paris, London, Addis Ababa and elsewhere. Emperor Haile Selassie made changes to the banking system in 1931. Following the collapse of the Bank of Abyssinia, the state-owned Bank of Ethiopia took control of the bank's assets, personnel and management. Bank of Ethiopia serves national and commercial banks. The financial sector expanded during the five years of Italian occupation (1936-1941). Italian banks were fully involved. Many banks were open for business at that time. British planning during the Second World War played a key role in helping Ethiopia achieve independence from Italian rule. Barclays Bank was established and operated here between 1941 and 1943 (Geda, 2008). The National Bank of Ethiopia (NBE), founded in 1942, was split into the Central Bank of Ethiopia, the Central Bank and the Commercial Bank of Ethiopia (CBE) in 1963. Using a gradualist approach, the Ethiopian government opened up private banks and insurance companies in addition to state-run ones. Before complete liberalization, local competitiveness and liberalization were increasing in the foreign exchange market. Restricting the industry to local investors, strengthening the regulatory and supervisory capacities of the NBE, allowing banks to operate independently, and growing the interbank money market are

some of the directives and legislation that have been enacted since 1992 (Geda, 2008) Ethiopia's banking and finance sector has been almost entirely closed to foreigners.

However, the situation is expected to change as the Ethiopian government plans to introduce a series of reforms that will open the sector to international competition to attract foreign capital to improve and increase the country's competitiveness and contribute to its economic growth. The chances will be great. Currently, 30 banks operate nationwide, with 8,250 branches serving nearly 115 million people (NBE, 2021). The National Bank of Ethiopia (NBE) Quarterly Bulletin, released in October 2022, reported deposits of over \$30 billion and loans of over \$25 billion. The banking system's total capital is estimated at \$3.2 billion.

### **2.1.7 Banks Performance Measurement**

Commercial banks should aim for the best financial results possible. In the literature on bank performance, profitability measures have been closely correlated with bank performance. A thorough and widely used performance indicator for financial institutions like banks is needed. Instead, several scholars have tried using economic data to determine empirical parameters that affect bank performance. Studies used return on assets, return on equity, and net interest margin to gauge bank performance (Munyambonera, 2013).

#### **2.1.7.1 Return on asset**

The bank's Return on Asset (ROA), or the amount of money it makes for each Birr it has in assets, shows how well it can turn its assets into profits. Off-balance-sheet activities could distort this figure. The most significant indicator of a bank's effectiveness and operational performance is the ratio of returns generated from its assets (Tan & Floros, 2012). ROA was used in empirical studies to gauge banks' performance (e.g., Tan & Floros, 2012; Munyambonera, 2013; Isayas, 2022).

#### **2.1.7.2 Return on equity**

Return on equity, as the name suggests, is a metric that compares an organization's profit to the amount of stock contributed by its owners (Tan & Floros, 2012). However, ROE needs to consider the extra risk of using higher leverage. Although ROE is frequently used in academic research, it rarely indicates genuine profitability (Ghazouani & Moussa, 2013). To gauge bank

profitability, the empirical study used ROE (e.g., Tan & Floros, 2012; Munyambonera, 2013; Singh & Sharma, 2016; Rahman et al., 2015).

### **2.1.7.3 Net interest margin**

Banks Net Interest Margin (NIM) measures financial performance and efficiency (Okoth & Gemechu, 2013). A bank is secure and profitable when its NIM is high. The NIM variable highlights the revenue produced by interest-related activities. It determines the difference between the interest paid on borrowed money and the interest income from banks on the value of their (interest-earning) assets (Tan & Floros, 2012).

Using the average amount of assets on which earned income is generated over that period, NIM calculates the difference between the interest income the bank receives on loans and securities and the interest cost of its borrowed money. A more considerable net interest margin increases the bank's earnings and stability.

### **2.1.8 Dimensions and indicators of financial inclusion**

Although not conclusive, some studies suggest that measuring financial inclusion should consider as many dimensions as possible to represent financial inclusion. In addition, by including the four main financial services outlined by the World Bank (ie, banking, credit, savings and insurance), the inclusiveness of the index can be improved. Financial inclusion is measured in three dimensions: (i) access to financial services, (ii) use of financial services, and (iii) availability of products and services. The core set, which covers several key indicators of access and use, has been expanded to include G20 financial inclusion indicators, which cover three dimensions and provide a deeper insight into aspects of access and usage and availability, including measures for mobile financial services in the development sector.

Beck, DemirgucKunt, & Martinez Peria (2007) measure banking sector outreach and investigate its determinants. They report data on the following eight indicators of financial inclusion corresponding to the year 2012-2022:

- a) Number of bank branches per 1,000 sqkm.
- b) Number of bank branches per 100,000 Adults.
- c) Number of bank ATMs per 1,000 sqm
- d) Number of bank ATMs per 100,000 Adults.
- e) Number of deposit account per 1000 Adults
- f) Internet banking users per 1000 adults.
- g) Mobile Banking User per 1000 Adults.
- h) Loan and advances per GDP Ratio.

## **2.2 Empirical Literature Review**

The main role of financial institutions in promoting financial inclusion has been showed in existing works (Ajide et. 2020; Eldomiaty et al., 2020; P. Muriu, 2020; Nguyen and Ha, 2021). This shows that the type of institutions involved in transmitting financial products to consumers and businesses units must be considered. Institutional quality (infrastructure factors), despite its importance in promoting financial inclusion and supply and demand factors, has yet to be further investigated in the literature, i.e., Demand, supply, and infrastructure factors were identified simultaneously in a single study. This study also examined the factors that hinder the use of financial services in Africa and which need to be adequately investigated in the African literature. This therefore demonstrates the lack of knowledge on the factors affecting financial inclusion on the African continent and hence this study demonstrates that the demand, market and infrastructure will be consistent and contribute to the inclusion of African Families in the financial Sector and identifying barriers to accessing financial services. This will then provide comprehensive information to determine what influences the decision to participate in the financial system in Africa and what hinders participation in the financial sector, reflecting the development of standard literature.

Financial inclusion indices are used to measure a country's financial inclusion level. Several indices have been developed to measure financial inclusion, including the Global Findex database and the World Bank's Financial Inclusion Index. These indices use various indicators,

such as access to financial services and formal financial services, to measure financial inclusion. Several studies have used financial inclusivity indices to examine the relationship between financial inclusivity and financial performance. Empirically, the literature is rich in explaining the connection between financial inclusion and economic growth. Several studies have reported a positive relationship (Chatterjee, (2020); Sharma (2016), Inoue & Hamori (2016), Le et al. (2019), Orlando et al (2020), Nizam et al. (2020), Sethi & Acharya, (2018), Siddik et al. (2019), Singh & Stakic, (2020)), but (Rodríguez et al. (2021), Shen et al. (2021), Nkwede (2015) found a counter-example about the negative impact of financial inclusion on economic growth.

In particular, Inoue and Hamori (2016) examined the effect of access to finance on economic growth in thirty seven sub-Saharan African countries from 2004–2012, the Number of commercial bank branches, and real GDP per capita. In addition, financial inclusion has positively and significantly affected economic growth in sub-Saharan Africa. Also, Thomas et al. (2017) found the relationship between financial availability and economic growth in 8 South Asian countries from 2007 to 2015. The GMM estimators showed that increased financial availability led to increased income. And also, an increase in indicators of access to finance had a more significant impact on economic growth in low-income countries than in middle-income countries. Along the same lines, Kim et al. (2017) examined the relationship between financial inclusion and economic growth in 55 Organization of Islamic Cooperation (OIC) countries, using dynamic panel estimation, panel vector auto regression (VAR) method, impulse-response functions (IRFs), and panel-granger -Causality tests. The results of dynamic panel estimates show that financial inclusion positively impacts economic growth. Malinda and Maya (2018) used a pooled regression model, a vector error correction model, and Granger causality tests to investigate the relationships between financial inclusion and economic development in eleven countries from 2007 to 2016. The result indicates that financial inclusion and economic growth had positive long-term relationships.

On the other side, Rodríguez al. (2021) examined the relationships between financial inclusion and economic growth in seventy one countries using a range of data from 2007 to 2016. They applied ordinary least squares, the generalized method of moments with two-way fixed effects, and Granger causality methods to test their developed hypotheses. They found a negative association between financial inclusion and economic growth, emphasizing that financial

inclusion negatively affects growth and a statistically significant causal relationship between them. Meanwhile, Shen et al. (2021) used datasets from the WDI (World Development Indicators) and the IMF (International Monetary Fund) to examine the impact of the Financial Inclusion Index on economic growth in 105 countries. The authors used geospatial techniques to analyze the relationships between digital financial inclusion, growth, and control variables. They found that digital financial inclusion has a significant positive impact on countries' economic growth.

The majority of studies on financial inclusion in Ethiopia attempted to examine the determinants of financial inclusion from a national perspective (Alemu, 2014; Gashaw and Gebe, 2017; Tekeste and Hossein, 2020; Desalegn and Yemataw, 2021; Andualem and Rao, 2017); and also some papers tried to actors that influence financial inclusion in some specific areas like Afar region (Esmael & Mohammad, 2021), Silte Zone (Abdurahman Awel, 2022), East Gojjam (Beza et al., 2020) and Jima Zone (Mekuanint et al., 2019). In particular, a study by Desalegn and Yemataw (2017) examined factors that influence and hinder financial inclusion using data from the Ethiopian Social and Economic Survey (ESS 2015). The findings showed a link between higher levels of financial and higher levels of education, gender and age. Moreover, they found that barriers to accessing financial accounts in Ethiopia are often arbitrary (distance from financial institutions) and voluntary (lack of money and insecurity). Similarly, Abdu and Adem (2021) examined the determinants of financial inclusion in the Afar region of Ethiopia using cross-sectional data collected from households in the Afar region. Their research showed that 68 percent of households are financially inactive, and while income affects income, age is also related. It was also stated that the main obstacles to consumer financial inclusion are the need for large amounts of money, access to bank branches and ATMs, and trust in financial institutions.

### **2.3 Research Gap**

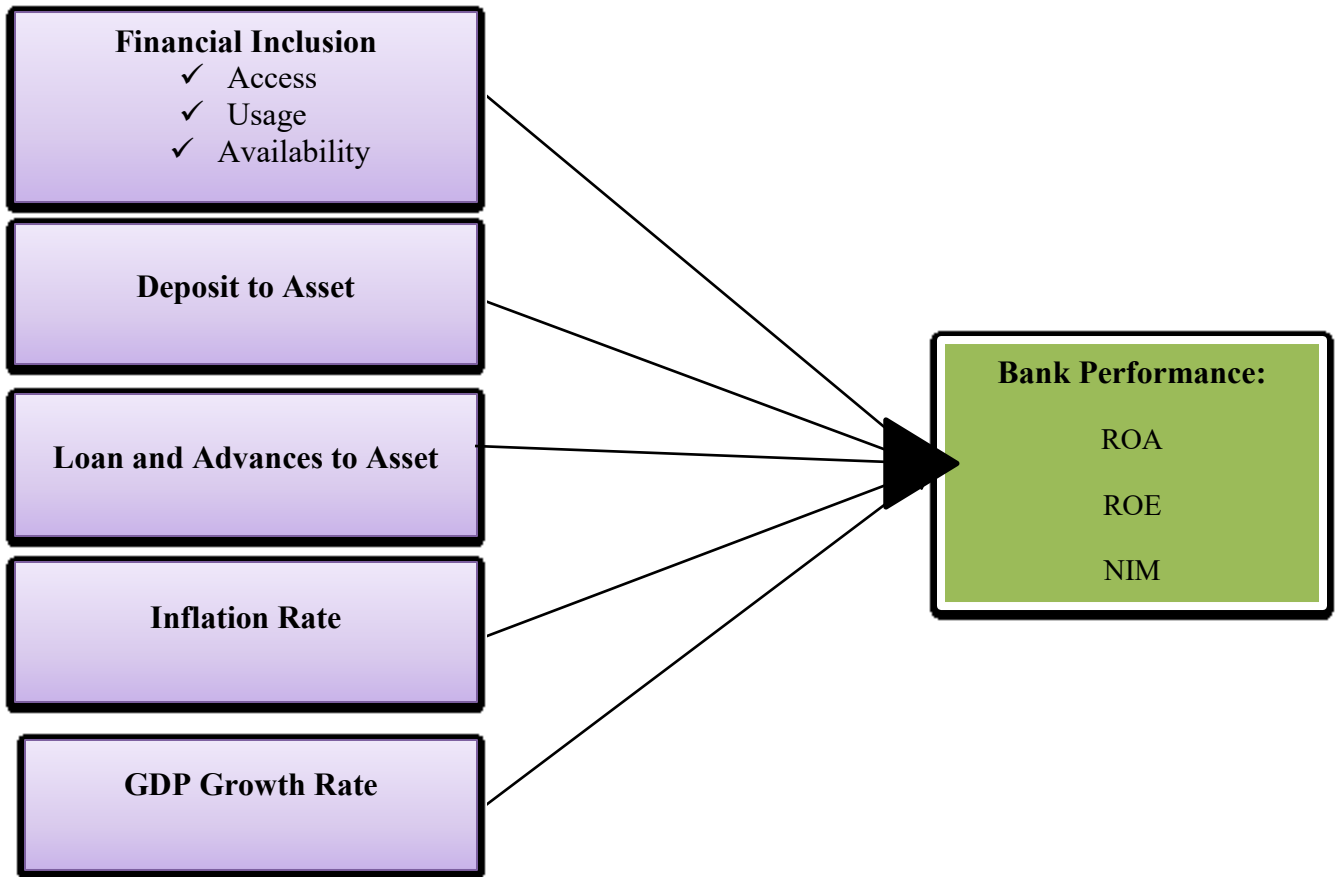
The influence of the financial inclusion rate variables used here on the profitability of baked goods has yet to be investigated. Previous study has targets on the determinants of bank performance and has yet to consider financial inclusiveness as a factor. In this study, understanding the role of all financial inclusion factors would promote banking sectors to provide the highest quality financial services at a reasonable price and contribute to the goal of

financial investment and development of financial institutions in the country. Finally, Ethiopia, a developing country, is an appropriate case for study because financial inclusion can be essential in addressing pressing problems and issues including, unemployment, poverty, low economic growth, economic and social difficulties, and inequality among consumers. And also, factors of financial intermediaries can increase financial stability. Mobile money accounts have, therefore, become an essential option for financial transactions for many families in developing countries. However, this factor still needs to be considered when calculating the FI index in previous studies. Therefore, it is believed that creating a new FI index that includes monetary indicators for mobile phones will fill the research gap.

Many studies have attempted to establish an appropriate measure of financial inclusion by creating a financial inclusion index, documented by the three components of the banking sector - the dimensions of accessibility, penetration, and usage. The index was designed according to the methodology used by the United Nations Development Program (UNDP) to create the Human Development Index (HDI). A limitation of this research method is that selected components are assigned equal weights or weights are assigned arbitrarily. This means that the weighting is done based on the author's academic intuition or experience and that all components or indicators are assumed to have the same impact on financial inclusion. Due to this limitation, our study uses the principal component analysis (PCA) method to construct the financial inclusion index and determine the appropriate weights.

Therefore, the study was to identify and discuss the impact of financial inclusion on banking performance in Ethiopia. Related theoretical and empirical evidence is assessed to determine critical indicators and matters of financial inclusion on banking performance. The study's contributions will be on the following standpoints: First, since the country is known to be plagued by institutional problems, the relationship between FI and economic growth will be examined in the context of three broad governance dimensions. These are availability, accessibility, and usage. And then, for robustness purposes, the study employs seven alternative measures of financial inclusion.

## 2.4. Conceptual framework



Source: Ditta, A. S. A., & Saputra, A. (2020) and own construction (by taking the theoretical and empirical review).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1. Introduction**

The general objective of the research was to determine the effect of financial inclusion on bank performance in Ethiopia. Therefore, this chapter presents the methodology used to achieve the study objectives. This chapter also focuses on the research method and design used in the study and the empirical framework used. The chapter also presented the data type and sources. Lastly, the section mentioned the model specifications of the study.

#### **3.2. Research methods**

This study uses a quantitative research methods designed to test theories, find evidence, reveal relationships between variables, and forecast results. According to Muzata (2017), quantitative research aims to demonstrate knowledge through scientific methods rather than feelings, opinions, values, and subjective interpretations. The study examines how descriptive factors influence the dependent variable using Generalized Least Squares (GLS) panel model estimation.

#### **3.3. Research Design**

Since the study aims to examine how financial inclusion variables occur and affect bank performance, a diagnostic research design was used to ascertain the consequences of financial inclusion on banking performance. The research topics and objectives stated in the first chapter were addressed through quantitative panel data series relevant to each variable in the study. For every variable in the analysis, annual data from 2012/13–2022/23 of selected 10 banks in Ethiopia were used.

#### **3.4. Data**

The study used secondary data to investigate how financial inclusion affects bank performance in Ethiopia by selecting 10 Commercial banks. The selection criterion for the study was data accessibility and their seniority in the financial sector of the country.

The study uses annual secondary data from 2012/13-2022/23, and banking sector-audited banking sector performance reports are a valuable source of data. The study also uses data from internationally reputable organizations such as the National Bank of Ethiopia, World Development Indicators, and World Bank. The starting year was chosen because the measurement of most of the variables used in the study started in 2012/13, especially those used in the measurement of the financial inclusion variable; this necessitates the choice of the study period. Inclusion is understood as any process that makes financial services widely available, accessible, and affordable to all segment of the population. Therefore, the study uses eight possible indicators and measurement for express financial inclusion. These are namely: Automated Teller Machines (ATMs) per 100,000 Adults; Bank Branches per 100,000 Adults, ATMs per 1000km<sup>2</sup>, branches per1000km<sup>2</sup>, Internet banking users per 1000 Adults; mobile banking users per 1000 Adults, Deposit account per 100 Adults, and Net Loan and advance per GDP.

### **3.5. Description of Variables**

#### **3.5.1. Dependent variable**

In this study, bank performance serves as the dependent variable. According to the point of references used in previous studies (Alkhazali et al. 2021; Bekhet, Alsmadi, and Khudari 2020; Le and Ngo 2020; Yakubu 2019; Yakubu, Kapusuzoglu, and Ceylan 2021; Yakubu and Bunyaminu 2022; Yao, Haris, and Tariq 2018), such study measures bank Performance through return on assets, return on equity and net interest margin. Return on assets (ROA) is measured by dividing net income by banks' total assets. Return on equity (ROE) is the ratio of net income to shareholders' equity. Net interest margin is measured by dividing net income by banks earning asset. The study measures bank performance by taking the principal component of those performance indicators of bank.

$$\text{Bank Performance (BP)} = f(\text{ROA, ROE, NIM})$$

Where, **BP** is the composite index for bank performance.

### 3.5.2. Independent and control variables

The independent variable of the study is financial inclusion. The study measures financial inclusion by taking the principal component of dimensions of financial inclusion. These dimensions include:

- **Availability:** Number of branches per 1,000 sqkm, number of branches per 100,000 Adults, number of ATMs per 1,000 sqkm and ATMs per 100,000 Adults.
- **Access:** Internet banking users per 1000 adults and mobile Banking User per 1000 Adults.
- **Usage:** Number of deposit account per 100 adults and Loan and advances per GDP Ratio.

$$\text{Financial Inclusion (IFI)} = f(\text{Availability, Access, Usage})$$

Where, IFI is the composite index for financial inclusion.

In addition to financial inclusion, the study controls for the impact of deposit to GDP, loan and advances to asset, GDP Growth rate and inflation. Deposit to GDP (%) is measured by dividing total deposit of the bank by gross domestic product of the country. Loan to asset (%) measured by dividing net loan and advances of the bank by its total asset. Gross domestic product growth rate is measured annual percentage of growth. Inflation measured consumer prices (annual percentages).

### 3.6. Model specification

For a description of the model, the research adopts Khatib, S. F., Hendrawaty, E., Bazhair, A. H., Rahma, I. A. A., & Al Amosh, H. (2022) with some revision and modification.

**And, defined as:**

$$BP = \beta_0 + \beta_1IFI_{it} + \beta_2DEPA_{it} + \beta_3LAA_{it} + \beta_4INR + \beta_5GDPG_{it} + \mu_{it} \text{ ----- (1)}$$

Where BP is a measure of Bank performance includes ROA, ROE, and NIM in bank I at time t;  $\beta_0$  the constant intercept; IFI includes financial inclusion indicators. And DEPG (Deposit to GDP), LAA (Net Loan and advances to Asset), INR (Inflation Rate), GDPG (Gross Domestic Product Growth rate) are control variables of the study; ( $\beta_0$ -  $\beta_5$ ) are function coefficient; and  $\mu_{it}$  is the error term. Generalized Least Squares (GLS) panel model estimation is used in the study to examine how explanatory factors affect the dependent variable.

The Generalized Least Squares (GLS) estimation with predetermined variables has been implemented. The researcher uses GLS due to its flexible and efficient tool for handling panel data analysis, as it accounts for the specific characteristics of panel data and provides more accurate parameter estimates (Park, H. M., 2011; Schmidt, P., & Sickles, R. C., 1984). GLS addresses these challenges by assuming a specific covariance structure for the error terms in the regression model. It incorporates estimating the error covariance matrix, allowing for heteroscedasticity and correlation among the error terms.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1. Introduction

This chapter examines the impact of financial inclusion on banking performance. For an 11-years period, the empirical research incorporates yearly data from 10 banks on various performance indicators (2012-2022). In this chapter, the research presents descriptive statistics of variables; diagnostic testing and estimated model's findings are presented and analyzed.

#### 4.2. Descriptive Analysis

Summary statistics in Table 4.1 shows that the mean Bank performance is 0.318 with a standard deviation of 0.157. This indicates that, on average, bank performance is around 0.318. The standard deviation is approximately 0.157, which suggests that the data points are somewhat dispersed around the mean. The minimum value is 0 for Bank1 in 2020, indicating the lowest level of bank performance, and the maximum value is 0.998 for bank4 in 2022, representing the highest level of bank performance as per the bank performance index results. The mean of financial inclusion is approximately 0.145. It indicates that, on average, the extent of financial inclusion is around 0.145. The standard deviation is approximately 0.193, suggesting the data points are relatively dispersed. The minimum value is 0, Bank10 financial inclusion status in the 2012/13 fiscal year. It indicates the lowest financial inclusion, while the maximum value is 0.998, which is the financial inclusion performance of the Bank4 in the 2022/23 fiscal year. Due to expanding its accessibility by opening new branch and increasing digitalization system to users, commercial banks represent the highest financial inclusion of the study period.

The mean deposit-to-GDP ratio is approximately 2.680, indicating that the average rate of deposit to GDP is around 2.68. The standard deviation of deposit to GDP is approximately 5.615, which suggests that the data points have a relatively large dispersion. The minimum value of the deposit-to-GDP ratio is 0.1, which is Bank3 in the 2012/13 fiscal year, indicating a low deposit-to-GDP ratio.

The maximum value of the deposit to GDP ratio was 27.22 Bank4 in the 2018/19 fiscal year, representing the highest deposit GDP ratio of the study period. From the result, we can understand that, Bank4 highly mobilized deposits in 2018 and can deliver credit services to the unbanked private sector.

The mean of net loans and bank advances (% of Assets) during the study period was 53.098 with a standard deviation of 12.355. The minimum net loans and advances by banks (% of the assets) are 25.65, while the maximum net loans and advances by banks (% of the assets) are 77.31. The maximum net loans and advances by banks (% of Assets) during the study period was the Bank2 in 2022/23, while the minimum was that of the Bank4 in 2021. From the result, we can understand that the Bank2 has injected loans into different sectors to profit by collecting interest and other service charges. On the other hand, the Bank4 has acquired assets and invested in building.

The mean inflation rate is 15.96, with a standard deviation of 8.738. The minimum inflation rate was 6.63, while the maximum was 33.89. The maximum inflation rate during the study period was in Ethiopia in 2022/23, while the minimum inflation happened in Ethiopia in 2016. This means the general price level is declining and consumer prices are lower. The higher inflation in recent years was associated with the conflict and civil war unrest in the country and Government policies, such as excessive borrowing, deficit spending, price controls, and finances by printing money, leading to high inflation. The mean GDP growth rate is 8.279, with a standard deviation 1.905. Ethiopia's maximum GDP growth rate was 10.58 in 2013, while the minimum GDP growth rate was 5.32 in 2022. A high GDP indicates a robust and expanding economy, which usually leads to increased business activities, higher consumer spending, and a favorable economic environment. For banks, a high GDP increases loan demand, lowers credit risk, and gives Opportunities for fee-based services. At the same time, a low GDP growth rate indicates a slower pace of economic expansion, reduced demand for loans, and pressure on profitability.

**Table: 4. 1. Descriptive Statistics**

<b>Variables</b>	<b>Observations</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Minimum</b>	<b>Maximum</b>
BP(Bank Performance)	110	0.318	0.157	0.000	0.998
IFI(Financial Inclusion)	110	0.139	0.185	0.000	0.998
Deposit to GDP Ratio	110	2.680	5.615	0.100	27.220
Net loan to asset ratio	110	53.098	12.355	25.650	77.310
Inflation rate	110	15.961	8.738	6.630	33.890
GDP growth rate	110	8.279	1.905	5.320	10.580

**Source:** Authors on computation using NBE and Banks annual report 2022/23

### **4.3 Bank Performance Index (BPI)**

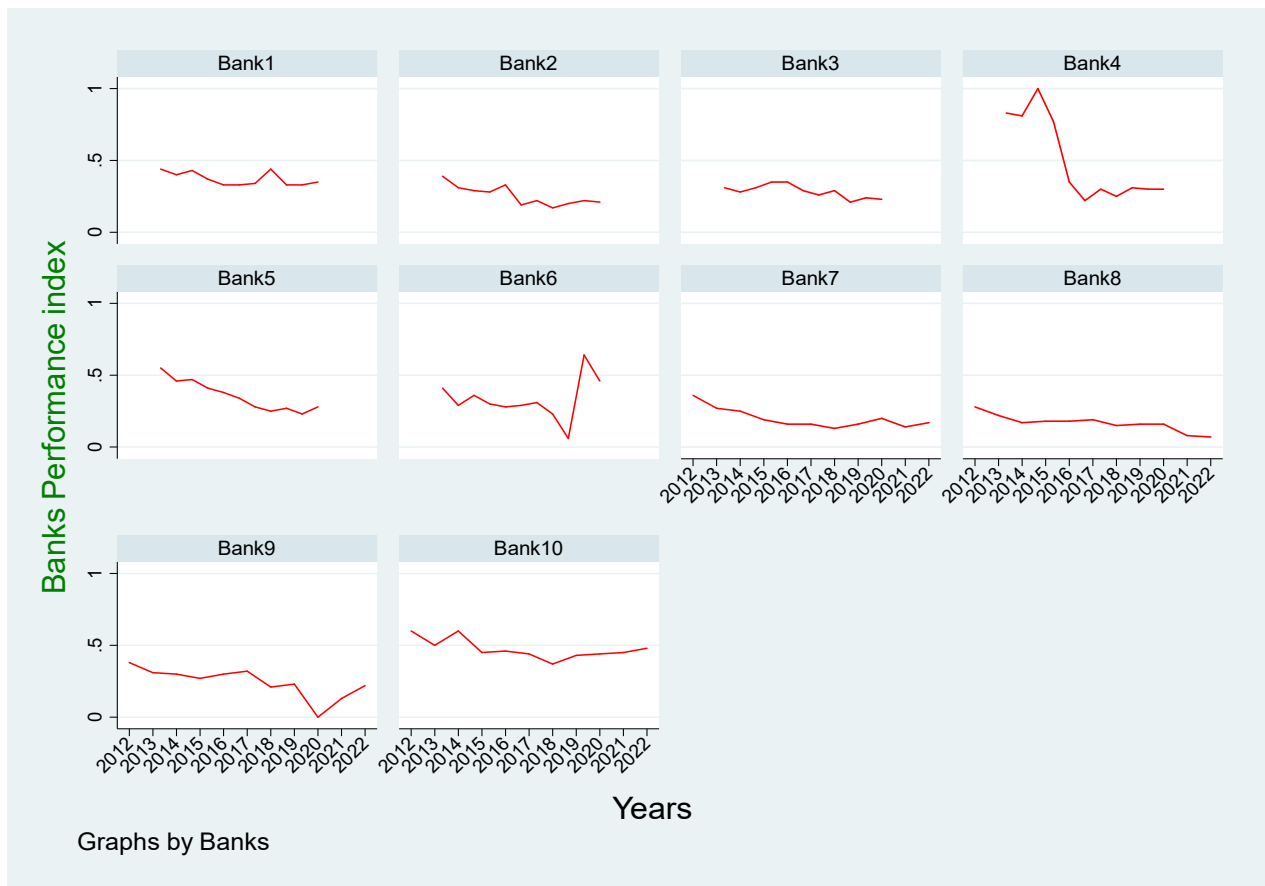
Principal component analysis is used to build a Bank performance measurement indicator. This method calculates the newly obtained variables obtained as line connecting of the original variables. These new variables are called principal components by Popa, Bogdan, V., & Simut, R. (2021). Initial principal component analysis (PCA) reveals significant differences from the original variables. The method will have the particularities of being applied to a panel dataset. According to the standard methods proposed by Freudenberg (2003) and OECD (2008), standardization transforms indicators on a standard scale, with a mean of 0 and a standard deviation. By focusing on criteria using PCA (Sha'ban, M., Girardone, C.), we can create an aggregate representation of bank performance.

The Bank performance index is formulated by using indicators of Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM) within a Principal Component Analysis (PCA) model. PCA is a statistical technique used to reduce the dimensionality of a dataset and identify the underlying factors or components that explain the most significant variation in the data. Based on Figure 4.1 below, in the 2012/13 fiscal year, Bank4 performed at a higher level than the others. While Bank8 is the listed performer in the 2012/13 fiscal year, it shows that the bank's return on asset, return on equity, and net interest margin are the lowest among the other banks listed in the study. In 2013/14, the Bank4 had the highest performance while the Bank8 had the lowest. And also in 2014/15, Bank8 was the lowest and Bank4 was the highest

compared to others commercial banks. In 2015/16, the highest was Bank4, while the lowest was Bank8. In 2016/17, Bank5 performed highly, while Bank7 was the lowest performer.

Bank10 performance in 2017/18 was the highest from the selected banks of the study, while Bank7 was the lowest performer during this fiscal year. 2019/20, the performance of Bank1 was high compared to other banks in the study, while Bank7 and Bank8 had the lowest performance. In 2020/21, Bank10 performed better than others, while Bank9 was the least. Bank6 showed the best performance in 2021/22, while Bank8 was the lowest performer compared to the other banks used for the study. Bank10 showed the best performance in 2022/23, while Bank8 was the lowest performer compared to the other banks used for the study.

**Figure 4.1: Banks performance index**



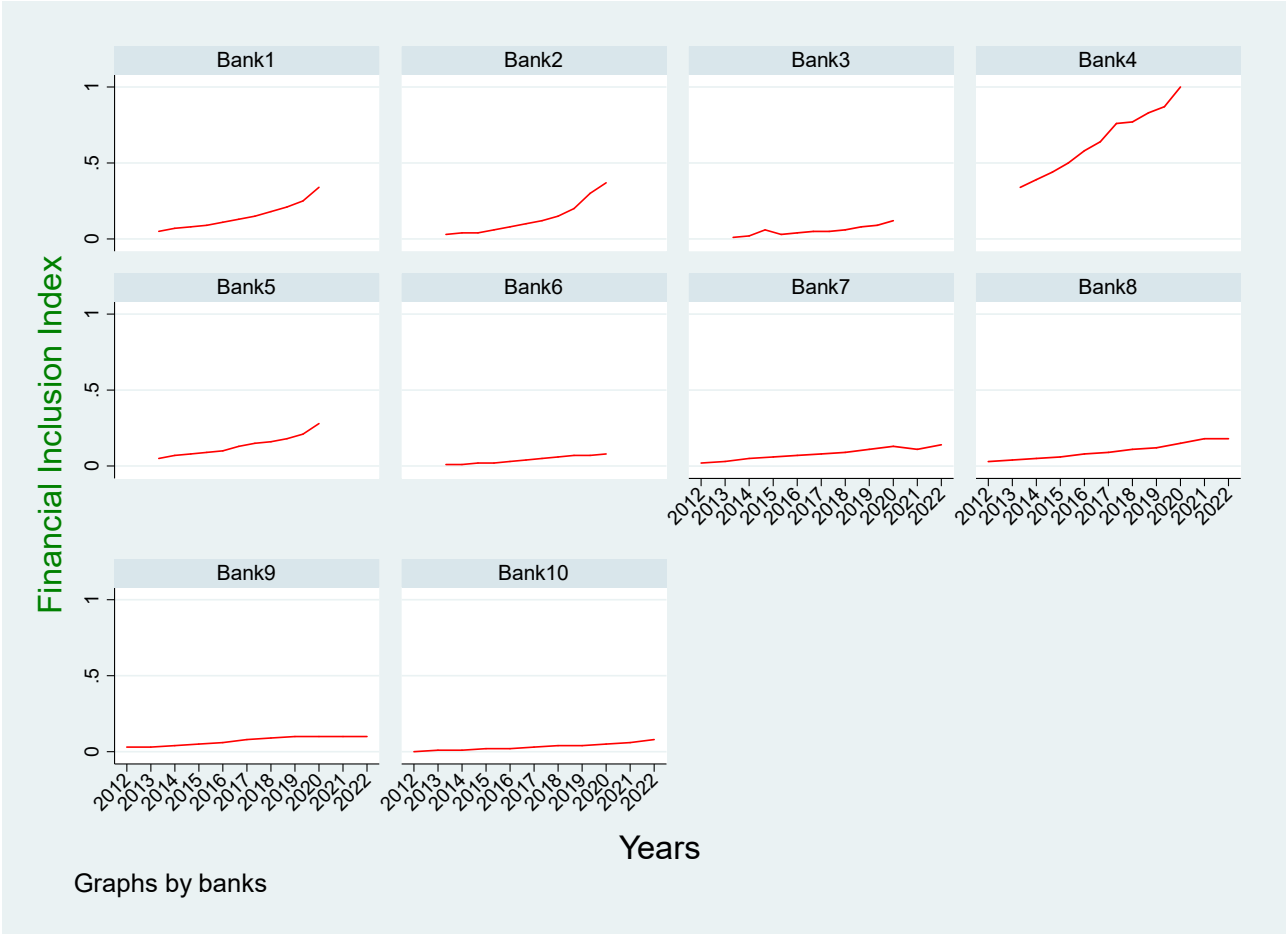
**Source:** Authors on computation using NBE and Banks annual report 2022/23.

#### **4.4 Financial inclusion index for selected Ethiopian banks**

In computing our index of financial inclusion index, we will use PCA. This technique calculates newly variables obtained as linear combinations of the original variables. These new variables are called principal components by Popa, Bogdan, V., & Simut, R. (2021). The first principal component (PC) recovers the most significant differences from the original variables. The method will have the particularities of being applied to a panel dataset. Based on financial inclusion indicators, we use access, availability, and usage as dimensions of our financial inclusion index.

Based on the below Figure 4.2, IFI values for selected banks in Ethiopia are shown from 2012-2022/23. The data show that various banks have varying degrees of financial inclusiveness in terms of usage, accessibility and availability by navigating the country's financial ecosystem and transformation; based on the result, financial inclusion ranging from 0.000 (for Bank10 in 2012) to 0.998 (for Bank4) in 2022/23 fiscal year. These also show that, with a few exceptions, banks with high asset levels typically have high IFI values. Only Bank4 was deemed financially inclusive from the sample of 10 commercial banks in Ethiopia. As per the result, Bank4 has relative financial inclusiveness from other listed banks of the study regarding accessibility, availability, and usage for its stakeholders all over the country. Four banks (Bank1, Bank2, Bank5, and Bank8) fall into the medium-IFI classifications, and they highly participate in the financial inclusion system to serve the unbanked populations by facilitating inclusion mechanisms from time to time. While the remaining five banks are underperformers in terms of financial inclusion, they have progressed from year to year compared to other banks. Those five banks' progression is visual from year to year, showing that their financial inclusiveness operations are in a good development trend. When we look at the general level of financial inclusiveness, the trend has increased dramatically.

**Figure 4.2: Financial Inclusion Index**



Source: Authors on computation using NBE and Banks annual report 2022/23.

## 4.5 Regression Diagnostic Test Results.

### 4.5.1 Hausman Test

This study used a panel data model to investigate the impact of financial inclusion on the Bank's performance. Before estimating the models, the researchers had to decide whether to use a fixed or random effects approach. To do so, the researcher performed the Hausman test. The results of this test, shown in Table 4.2, revealed that the preferred model for the study was a random effects approach because the chi-square statistic is positive 43.95 and the p-value (Prob>chi2) is reported as 0.0000, suggesting strong evidence against the null hypothesis of no systematic difference in coefficients.

H0: The difference in coefficients is not systematic or significant.

Ha: difference in coefficients between is systematic or significant

**Table 4.2: Model Identification**

	$(b-B)'[(V_b - V_B)^{-1}](b-B)$	Prob>chi2
<b>Hausman Test</b>	<b>43.95</b>	<b>0.0000</b>

### 4.5.2 Heteroskedasticity and autocorrelation Test

Heteroskedasticity occurs when the variance of the error term in a regression model is not constant across observations, which can cause problems in accurately estimating the standard errors of the coefficients. In panel data, heteroskedasticity can occur when there are differences in the variability of the error term across periods or between different cross-sectional units. One way to test for heteroskedasticity in panel data is to use the White or Modified Wald tests.

According to the Hausman test in Table 4.2 above, using random effects in a panel data analysis is better. However, the random effects model exhibits heteroscedasticity and autocorrelation problems. Therefore, the other post-estimation tests and regression results should be based on generalized least squares (GLS). GLS is a method that accounts for both heteroscedasticity and autocorrelation simultaneously. It involves estimating the model with appropriate weighting matrices that reflect the covariance structure of the errors. Therefore, the researcher roused the

standard error to detect and correct heteroskedasticity in the data. This is because heteroskedasticity can lead to biased estimates and incorrect conclusions.

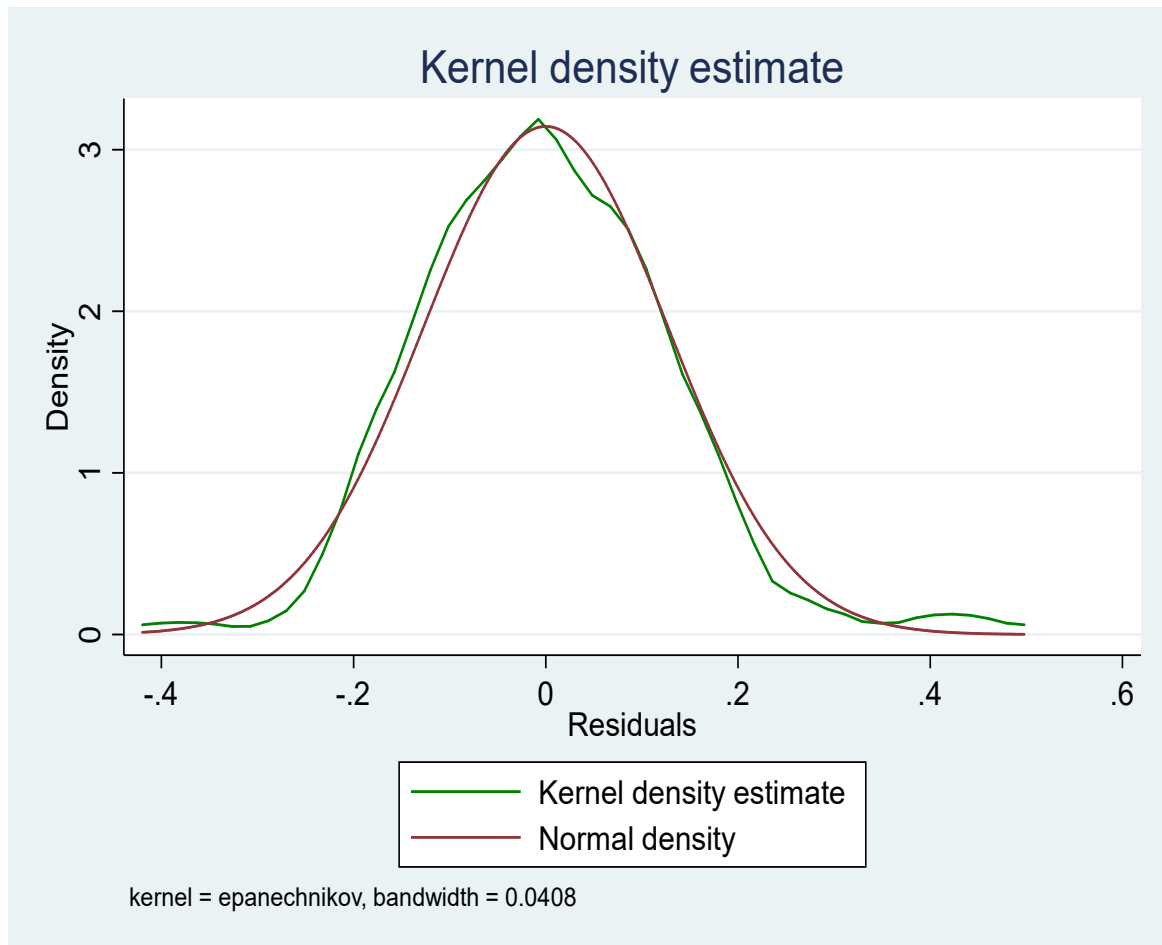
The result indicates that the variability of the dependent variable is assumed to be the same across all panels or groups in the data, and it is homoscedastic. This implies that the assumption of equal variance holds, and the model does not explicitly account for heteroscedasticity. Also, the statement "no autocorrelation" indicates that the residuals of the regression model do not exhibit any significant serial correlation or autocorrelation. Autocorrelation occurs when the error terms in a time-series regression are correlated with each other over time. The Wald chi-square test assesses the overall significance of the model by testing the joint significance of all the independent variables. In this case, the test statistic is reported as Wald chi2 (5) = 58.31, indicating that the model, as a whole, is statistically significant—the associated p-value associated with the chi-square statistic.

A p-value less than the chosen significance level (usually 0.05) indicates that the regression model's coefficients are statistically significant. As per the result, the p-value is very low (0.000), suggesting by rejecting the null hypothesis of no relationship between the independent and dependent variable.

### **4.5.3 Normality test**

A normality test is a statistical test used to assess whether a data set follows a normal distribution, also known as a Gaussian distribution. The normal distribution is characterized by a symmetric bell-shaped curve, with most data points concentrated around the mean. In Figure 4.3, the kernel density plot is based on the Epanechnikov kernel with a bandwidth of 0.0408. It shows a symmetric and bell-shaped distribution, suggesting that the data may follow a normal or approximately normal distribution.

**Figure: 4.3. Normality test**



**Source:** Authors on computation using NBE and Banks annual report 2022/23.

## 4.6 Regression Result

**Table: 4.3. Regression result of the impact of financial inclusion on bank performance**

Bank Performance	Coefficients	Standard Deviations	Z	P>z
IFI(Financial Inclusion)	-0.514	0.144	-3.57	0.000***
Deposit to GDP Ratio	0.020	0.005	4.4	0.000***
Net Loan and Advance to Asset Ratio	-0.003	0.002	-1.67	0.096
Inflation rate	0.009	0.003	3.37	0.001***
GDP Growth Rate	0.029	0.016	1.84	0.065
_cons	0.114	0.236	0.48	0.630

Observation=110, Number of banks=10; \*\*\* $p \leq 0.001$ , \*\*  $p \leq 0.01$ , \*  $p \leq 0.05$

Based on the results in Table 4.3, the first variable Financial Inclusion is significant and negatively related to the bank performance, with a coefficient of -0.514 ( $p < 0.001$ ). This shows that a one-unit increase in financial inclusion is associated with a decrease of approximately 0.514 in the bank performance of the dependent variable in the study. Still, the coefficient is statistically significant ( $p < 0.001$ ). This finding rejects the previous studies, such as Beck et al. (2007) and Demirguc-Kunt & Klapper (2012), which suggest that financial inclusion and bank performance are positively related and financial inclusion prompts economic growth and banks performance. And, supports research by Yakubu, I. N., & Musah, A. (2024) it shows that in the post global financial crisis, financial inclusion negatively influences bank profitability in Sub-Saharan Africa. Financial inclusion often requires banks to expand their outreach and provide services to previously unbanked or under-banked populations. This expansion can involve setting up branches or agents in remote areas, implementing technology infrastructure, and developing new products tailored to the needs of underserved customers.

These efforts can increase banks' operational costs, potentially impacting their profitability. Financial inclusion initiatives often involve providing lower-cost or subsidized financial products and services to low-income individuals and marginalized communities. These products may have lower profit margins compared to traditional banking offerings. As a result, banks may experience reduced profitability or a lower return on investment for their inclusive product lines, and it reduces net income in general and return on asset, return on equity, and net interest margin of the bank in particular. To be easily accessible, used, and available, banks extend their credit

services to individuals or businesses with limited credit histories or collateral. This can increase banks' credit risks, as they may encounter a higher proportion of borrowers with limited repayment capacity or higher default rates. Higher credit risks can lead to increased provisioning for bad loans, impacting banks' profitability and overall performance.

Another way financial inclusion can negatively affect banks' performance is that increased efforts may intensify competition among banks, especially in underserved markets. This could result in pricing pressures and reduced margins as banks compete for market share, ultimately impacting their profitability. The benefits and rewards of financial inclusion may not be immediately realized and could take time to materialize in the short run. So, banks may incur costs associated with expanding access to financial services without seeing significant performance improvements. And also, low levels of literacy can affect financial inclusion by limiting individuals to participate more effectively in the formal financial system. This, in turn, can affect bank performance.

The second variable, deposit to gross domestic product, has a significant and positive relation with bank performance related to return on asset, equity, and net interest margin with coefficient and significance levels of 0.020 and 0.000, respectively. This shows that a 1% increase in deposit to GDP corresponds to an increase of approximately 0.020% in the bank performance. Banks with more deposits relative to their loan portfolio can rely on these funds to finance their lending activities and other operations. This stability in funding reduces the reliance on short-term and potentially volatile funding sources, such as interbank borrowing or market-based financing. Consequently, banks with a higher deposit-to-GDP ratio will likely have a more stable and sustainable funding base, positively impacting their performance. The finding supports previous studies, such as Okun, D. M. (2012) which shows that there is positive and significance relationship between deposit ratio and bank performance. Deposits provide a stable source of funds for banks, allowing them to meet the demands of depositors for withdrawals and fulfill their obligations. Banks use deposit funds to make loans, invest, and earn interest income, which contributes to their overall profitability and performance of commercial banks. According to the study of Tuyishime, R., Memba, F., & Mbera, Z. (2015), Deposit is an important tool used by commercial banks to increase their profits by encouraging deposits from their customers in the form of loans that earn interest for commercial banks.

The third variable, net loan and advance to asset ratio has a negative and insignificant relation to bank performance, and the coefficient is not statistically significant  $-0.003$  ( $p = 0.096$ ). The coefficient suggests that a 1% increase in the loan-to-asset ratio is associated with a decrease of approximately 0.003% in the bank's performance. It shows that banks with higher loan-to-asset ratios may not necessarily experience lower profitability, which contradicts some previous studies by Berger and DeYoung (1997) and DeYoung and Roland (2001). A higher ratio indicates a more extensive loan exposure in asset portfolio of banks. If loans and advances quality is poor, characterized by a higher default rate or non-performing loans, it can hurt the bank's performance. Banks with a higher net loan and advance-to-asset ratio may face increased credit risk, leading to higher loan loss provisions, reduced profitability, and potentially lower overall performance. Banks with a higher net loan and advances to asset ratio may be more exposed to interest rate risk. When interest rates rise, banks' profitability can be negatively affected if the interest earned on loans does not adjust proportionately to the increased cost of funds. Additionally, intense competition in the loan market can lead to margin compression, where banks have to offer lower interest rates on loans to remain competitive.

The fourth variable of the study, the inflation rate, has a positive and significant impact on banks' performance as of return on asset, return on equity, and net interest margin with a coefficient of 0.009 ( $P=0.001$ ). It indicates that a 1% increase in inflation rate corresponds to an increase of approximately 0.009% in the banking performance. This finding is consistent with studies such as Maria, M. B., & Hussain, F. (2023), which showed a positive relationship between inflation rate and bank profitability. Inflation can affect borrowers' ability to repay loans. And also the above result supports studies of Tan, Y., & Floros, C. (2012), which shows a positive relationship between bank profitability, productivity, banking sector growth and inflation. During periods of high inflation, borrowers' incomes may increase, allowing them to repay their loans more quickly. As a result, banks may experience lower default rates and better loan portfolio performance. This improvement in loan quality can positively impact a bank's performance metrics, such as lower provisions for loan losses, reduced credit costs, and improved asset quality.

The fifth variable, gross domestic product growth rate, has positive and not statistically significant but marginally significant relations with banks performance with a coefficient of 0.029 (P=0.065). The result shows that a 1% increase in GDP Growth Rate is associated with an increase of approximately 0.029% in the bank's performance. Economic growth can also impact the quality of banks' loan portfolios. Studies such as Mulugeta Admasu(2021) shows that GDP growth rate are insignificant and negative relationship to financial performance and bank stability. But, the results above shows that marginally significance GDP growth rate on bank performance. During periods of robust economic expansion, businesses may experience improved cash flows and profitability, reducing the likelihood of loan defaults. This, in turn, leads to lower non-performing loan (NPL) ratios for banks and improved asset quality. Commercial banks may experience increased lending volumes, positively impacting their revenue. However, the relationship can be insignificant due to other factors influencing bank performance, such as a decrease in credit quality, interest rate fluctuations, and operational inefficiency.

## CHAPTER FIVE

### SUMMARY OF THE STUDY, CONCLUSION AND RECOMMENDATIONS

#### 5.1. Summary and Conclusion of the Study

The study's overall goal was to assess the interplay of financial inclusion on bank performance in Ethiopia. The researcher used panel data models to analyze this problem for collections of ten banks based on their formation and seniority in the country's financial ecosystem. The analysis relied on secondary data from the National Bank of Ethiopia, the bank's annual report, and the World Bank's World Development Indicators and International Financial Statistics. The study spans eleven years, from 2012 to 2022. However, due to the lack of data for several banks and years, the study is limited to 10 banks for the empirical analysis

The study had five specific objectives: To study and analyze the effect of financial inclusiveness on banking performance. The second objective was to research and analyze the impact of Deposits per GDP on the banking performance of ten banks in Ethiopia. The third objective was to study and analyze the effects of Net loans and advances on banking performance and financial inclusion. The fourth objective was to Study and analyze the impact of the Inflation rate on banking performance, and the fifth was to study and analyze the impact of GDP on the banking performance of ten commercial banks in Ethiopia.

The first objective sought to establish a significant relationship between financial inclusion and bank performance in Ethiopia. The results indicated that financial inclusion negatively affects banks' performance. Banks' performance decreased when financial inclusion increased from year to year based on the results from the selected banks of the study. And, it shows that financial inclusion has a stabilization role on the financial market with moderating banks performance. The result related to the effect of deposit to GDP on bank performance indicated that deposit to GDP directly affects bank performance, with a one-unit increase in deposit to GDP corresponding to an increase of approximately 0.020 in the bank performance. The study shows that net loans and advances to total asset ratio insignificantly affects bank performance as measured by the bank performance index with a coefficient of -0.003(P=0.096).

Based on the result, the inflation rate has a positive and significant impact on banks' performance of return on asset, return on equity, and net interest margin with a coefficient of 0.009 ( $P=0.001$ ), indicating that a one-unit increase in inflation rate corresponds to an increase of approximately 0.009% in the banking performance of commercial banks in Ethiopia. Gross Domestic Product (GDP) has a positive and significant relationship with bank performance in 10% significance level. A unit increase in the GDP growth rate is associated with a rise of 0.029 bank performance.

## **5.2. Recommendations**

Based on the study's results, some recommendations can be made for Ethiopian banks in general and ten selected commercial banks in particular.

- Given the negative impact of financial inclusion on bank performance, Ethiopian banks should focus on expanding their financial inclusion initiatives by navigating profitability indicators and consider launching new products or services that cater to under-banked segments of the population, such as agent banking, or microfinance services which increases the performance of the bank in terms of Return on the asset, return on equity, net interest margin and should consider other measurement...
- The study shows that deposits significantly impact bank performance. Banks must focus on attracting and retaining depositors by offering competitive interest rates, convenient banking channels, and excellent customer service. They could consider launching new deposit products or services that meet the needs of different market segments, considering the Ethiopian financial inclusion strategy.
- The study shows that net loans and advances to asset ratio have a negative and marginal significance but are insignificant at the 5% substantial label. The GLS model measures this impact on bank performance. So, banks need to maintain a healthy balance between their loan portfolio & their assets and consider tightening their credit standards & conducting regular assessments of their loan portfolio to ensure that it remains within acceptable and impactful levels.
- The research also suggests that banks need to recruit more user-friendly products, consider cost-effectiveness, use innovative ways to overcome competitive financial constraints and achieve profitability by generating revenue.

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## APPENDICES

### Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
BPIndex	110	.3175455	.1569502	0	1
IFI	110	.1385455	.1854518	0	1
depositper~p	110	2.680091	5.614722	.1	27.22
loantoasse~o	110	53.09782	12.35483	25.65	77.31
inflationr~e	110	15.96091	8.738385	6.63	33.89
GDPGrowthR~e	110	8.279091	1.905037	5.32	10.58

### Banks performance index

Banks	Year										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<i>Bank1</i>	0.440	0.40	0.430	0.370	0.330	0.33	0.340	0.440	0.330	0.330	0.350
<i>Bank2</i>	0.390	0.31	0.290	0.280	0.330	0.19	0.220	0.170	0.200	0.220	0.210
<i>Bank3</i>	0.310	0.28	0.310	0.350	0.350	0.29	0.260	0.290	0.210	0.240	0.230
<i>Bank4</i>	0.830	0.81	1.000	0.770	0.350	0.22	0.300	0.250	0.310	0.300	0.300
<i>Bank5</i>	0.550	0.46	0.470	0.410	0.380	0.34	0.280	0.250	0.270	0.230	0.280
<i>Bank6</i>	0.410	0.29	0.360	0.300	0.280	0.29	0.310	0.230	0.060	0.640	0.460
<i>Bank7</i>	0.360	0.27	0.250	0.190	0.160	0.16	0.130	0.160	0.200	0.140	0.170
<i>Bank8</i>	0.280	0.22	0.170	0.180	0.180	0.19	0.150	0.160	0.160	0.080	0.070
<i>Bank9</i>	0.380	0.31	0.300	0.270	0.300	0.32	0.210	0.230	0.000	0.130	0.220
<i>Bank10</i>	0.600	0.50	0.600	0.450	0.460	0.44	0.370	0.430	0.440	0.450	0.480

## Financial Inclusion Index

Year											
<b>Banks</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>Bank1</b>	0.040	0.05	0.070	0.080	0.100	0.12	0.130	0.180	0.210	0.260	0.370
<b>Bank2</b>	0.010	0.02	0.030	0.050	0.060	0.08	0.100	0.140	0.170	0.310	0.370
<b>Bank3</b>	0.010	0.05	0.070	0.030	0.040	0.06	0.060	0.080	0.110	0.100	0.180
<b>Bank4</b>	0.280	0.33	0.380	0.440	0.520	0.56	0.700	0.740	0.800	0.900	0.999
<b>Bank5</b>	0.040	0.06	0.070	0.070	0.090	0.12	0.130	0.140	0.150	0.200	0.270
<b>Bank6</b>	0.010	0.01	0.020	0.020	0.030	0.04	0.060	0.070	0.080	0.100	0.100
<b>Bank7</b>	0.020	0.02	0.020	0.030	0.050	0.06	0.070	0.080	0.100	0.110	0.140
<b>Bank8</b>	0.020	0.03	0.040	0.040	0.060	0.06	0.080	0.100	0.120	0.140	0.180
<b>Bank9</b>	0.030	0.03	0.040	0.050	0.070	0.09	0.110	0.130	0.140	0.150	0.170
<b>Bank10</b>	0.000	0.01	0.010	0.020	0.030	0.04	0.040	0.050	0.050	0.060	0.080

**Regression of dependent and independent variables**

BPIndex	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
IFI	-.513878	.1439477	-3.57	0.000	-.7960103	-.2317457
depositpergdp	.0199378	.0045323	4.40	0.000	.0110547	.028821
loantoassetratio	-.0030453	.0018272	-1.67	0.096	-.0066265	.000536
inflationrate	.0089289	.0026461	3.37	0.001	.0037426	.0141151
GDPGrowthRate	.0291028	.0157822	1.84	0.065	-.0018297	.0600352
_cons	.1135467	.2356198	0.48	0.630	-.3482596	.5753531

## Heteroskedasticity and autocorrelation Test

Kurtosis_e	.000869	.0002904	2.99	0.003	.0002999	.0014382
Skewness_u	-.0000603	.0001996	-0.30	0.763	-.0004516	.000331
Kurtosis_u	-.0000402	.0000304	-1.32	0.187	-.0000999	.0000195

Joint test for Normality on e:           chi2(2) = 10.35       Prob > chi2 = 0.0057  
 Joint test for Normality on u:         chi2(2) = 1.83       Prob > chi2 = 0.3996

. xtgls BPIndex IFI depositpergdp loantoassetratio inflationrate GDPGrowthRate

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares  
 Panels: homoskedastic  
 Correlation: no autocorrelation

Estimated covariances	=	1	Number of obs	=	110
Estimated autocorrelations	=	0	Number of groups	=	10
Estimated coefficients	=	6	Time periods	=	11
			Wald chi2(5)	=	58.31
Log likelihood	=	71.51212	Prob > chi2	=	0.0000

BPIndex	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
IFI	-.513878	.1439477	-3.57	0.000	-.7960103	-.2317457
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GDPGrowthRate	.0291028	.0157822	1.84	0.065	-.0018297	.0600352
_cons	.1135467	.2356198	0.48	0.630	-.3482596	.5753531

## Fixed Effect Regression

```

Fixed-effects (within) regression
Group variable: bank1

R-sq:
  within = 0.5622
  between = 0.3221
  overall = 0.0344

Number of obs   =   110
Number of groups =    10

Obs per group:
  min =   11
  avg =  11.0
  max =   11

F(5, 95) = 24.39
Prob > F = 0.0000

corr(u_i, Nb) = -0.9203
  
```

BPIndex	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IFI	-.8865148	.1191782	-7.44	0.000	-1.123114	-.6499161
depositpergdp	-.0204666	.0068054	-3.01	0.003	-.033977	-.0069562
loantoassetratio	.002476	.0014605	1.70	0.093	-.0004234	.0053755
inflationrate	.0068476	.0017782	3.85	0.000	.0033173	.0103779
GDPGrowthRate	.03169	.0114381	2.77	0.007	.0089825	.0543974
_cons	-.0079099	.1770885	-0.04	0.964	-.359475	.3436552
sigma_u	.35742738					
sigma_e	.08312513					
rho	.94868873	(fraction of variance due to u_i)				

F test that all u\_i=0: F(9, 95) = 17.66 Prob > F = 0.0000

## Random- effect Regression

```

Random-effects GLS regression
Group variable: bank1

R-sq:
  within = 0.4260
  between = 0.1683
  overall = 0.1488

Number of obs   =   110
Number of groups =    10

Obs per group:
  min =   11
  avg =  11.0
  max =   11

Wald chi2(5) = 63.74
Prob > chi2 = 0.0000

corr(u_i, X) = 0 (assumed)
  
```

BPIndex	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
IFI	-.5659006	.1247445	-4.54	0.000	-.8103953	-.3214059
depositpergdp	.0129252	.0048809	2.65	0.008	.0033588	.0224915
loantoassetratio	.0000308	.0016465	0.02	0.985	-.0031963	.003258
inflationrate	.00875	.0020641	4.24	0.000	.0047045	.0127955
GDPGrowthRate	.0391987	.0132321	2.96	0.003	.0132644	.0651331
_cons	-.1045167	.2063247	-0.51	0.612	-.5089057	.2998724
sigma_u	.07738997					
sigma_e	.08312513					
rho	.46431578	(fraction of variance due to u_i)				

## Hausman Test

inflationrate	.00875	.0020641	4.24	0.000	.0047045	.0127955
GDPGrowthRate	.0391987	.0132321	2.96	0.003	.0132644	.0651331
_cons	-.1045167	.2063247	-0.51	0.612	-.5089057	.2988724
sigma_u	.07738997					
sigma_e	.08312513					
rho	.46431578	(fraction of variance due to u_i)				

. estimate store random

. hausman fix random

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fix	(B) random		
IFI	-.8865148	-.5659006	-.3206142	.
depositper-p	-.0204666	.0129252	-.0333918	.0047424
loantocase-o	.002476	.0000308	.0024452	.
inflationr=s	.0068476	.00875	-.0019024	.
GDPGrowthR=s	.03169	.0391987	-.0075088	.

b = consistent under H<sub>0</sub> and H<sub>a</sub>; obtained from xtreg  
 B = inconsistent under H<sub>a</sub>, efficient under H<sub>0</sub>; obtained from xtreg

Test: H<sub>0</sub>: difference in coefficients not systematic

chi2(5) = (b-B)'[(V\_b-V\_B)<sup>-1</sup>](b-B)  
 = 43.95  
 Prob>chi2 = 0.0000  
 (V\_b-V\_B is not positive definite)

## Skewness/Kurtosis tests for Normality

Variables	Observations	Pr(Skewness)	Pr(Kurtosis)	adj_chi2(2)	Prob>chi2
BPI	110	0.000	0.000	32.830	0.000
IFI	110	0.000	0.000	59.770	0.000
Deposit to GDP	110	0.000	0.000	60.080	0.000
Loan to Asset	110	0.763	0.130	2.440	0.295
Inflation Rate	110	0.004	0.030	11.020	0.004
GDP Growth Rate	110	0.135	0.000	.	0.000

**Cross-sectional time-series FGLS regression**

BPIndex	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Depositpergdp	.02	.004	4.73	0	.012	.029	***
Loantoassetratio	-.003	.002	-1.90	.057	-.007	0	*
Inflationrate	.008	.003	3.15	.002	.003	.013	***
GDPGrowthRate	.025	.016	1.59	.112	-.006	.056	
AVLIABLITY	-.539	.134	-4.02	0	-.801	-.276	***
Constant	.186	.236	0.79	.43	-.277	.649	
Mean dependent var		0.318	SD dependent var			0.157	
Number of obs		110	Chi-square			63.002	
Prob > chi2		1.000	Akaike crit. (AIC)			-134.051	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

**Cross-sectional time-series FGLS regression**

BPIndex	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Depositpergdp	.009	.003	2.67	.007	.002	.015	***
Loantoassetratio	-.002	.002	-0.85	.394	-.005	.002	
Inflationrate	.01	.003	3.35	.001	.004	.016	***
GDPGrowthRate	.046	.016	2.95	.003	.015	.077	***
ACCESS	-.148	.102	-1.45	.148	-.349	.053	
Constant	-.14	.233	-0.60	.547	-.596	.316	
Mean dependent var		0.318	SD dependent var			0.157	
Number of obs		110	Chi-square			43.699	
Prob > chi2		1.000	Akaike crit. (AIC)			-121.036	

**Cross-sectional time-series FGLS regression**

BPIndex	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Depositpergdp	-5.629	4.511	-1.25	.212	-14.47	3.212	
Loantoassetratio	-.001	.002	-0.80	.424	-.005	.002	
Inflationrate	.008	.003	2.76	.006	.002	.013	***
GDPGrowthRate	.048	.015	3.12	.002	.018	.078	***
USAGE	5.637	4.511	1.25	.011	-3.204	14.477	
Constant	-.148	.233	-0.64	.525	-.605	.309	
Mean dependent var		0.318	SD dependent var			0.157	
Number of obs		110	Chi-square			42.974	
Prob > chi2		1.000	Akaike crit. (AIC)			-120.517	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$