COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF MANAGEMENT

THE EFFECTS OF FOREIGN EXCHANGE CONTROL ON

PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA

A Thesis Report Submitted to Department of Management as a Partial Fulfilment of Award for MSc Degree in International Business

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THE EFFECT OF EXCHANGE CONTROL ON THE PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA

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A Thesis Submitted to Addis Ababa University, College of Business and Economics, Department of Management as a partial fulfilment of Requirements for MSc in Science in International Business

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Declaration

I declare that this Master's thesis paper, entitled **"The Effect of Exchange Control on the Performance of Commercial Banks in Ethiopia"** is the result of my own research and has not been presented before at this or any other university. All sources of information have received appropriate recognition, and all of the information and material used herein is accurately described. This study is the result of my original work in which the data collected using selected statistical and economic methods were analyzed. The findings and conclusions are based solely on my research. The study was conducted under strict adherence to ethical standards and under the guidance of Jemal Mohammed (PhD).

Declared by	**Confirmed by**
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Date: 28/06/2024	Date: 28/06/2024

Certification

This is to Certify that the thesis is prepared by *Dereje Bayissa,* entitled: The Effect of Exchange Control on The Performance of Commercial Banks in Ethiopia submitted as a partial fulfilment of the requirements for the Master in Science Degree in International Business that complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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List of Abbreviations and Acronyms

ROA: Return on Assets

ROE: Return on Equity

NBE: National Bank of Ethiopia

FXD: Foreign Exchange Directive

IMF: International Monetary Fund

RE: Random Effect

FE: Fixed Effect

NDF: Non - Deliverable Forward

BOP: Balance of Payment

US: United States

CFI: Corporate Finance Institute

GDP: Gross Domestic Product

SDRs: Special Drawing Rights

RBI: Reserve Bank of India

LDR: Loan to Deposit Ratio

NIM: Net Interest Margin

GARCH: Generalized Autoregressive Conditional Heteroscedasticity

STATA: Statistics and Data

SPSS: Statistical Package for the Social Sciences

FCAFP: Foreign Currency Allocation to First Priority

FCASP: Foreign Currency Allocation to Second Priority

FCATP: Foreign Currency Allocation to Third Priority

FCANP: Foreign Currency Allocation to Non-Priority

FSTPRIORITY: First Priority

SNDPRIORITY: Second Priority

TRDPRIORITY: Third Priority

NONPRIORITY: Non-Priority

GLS: Generalized Least Squares

FCY: Foreign Currency

LM: Lagrangian Multiplier

Abstract

This study investigated the impact of the foreign exchange control directive, implemented in Ethiopia since 2016 G.C, on the performance of commercial banks. The directive requires banks to allocate at least 50 percent of foreign exchange to priority imports, potentially affecting their financial performance. The study used five years of data from 2019 to 2023 or 80 observations from 16 commercial banks. This study assessed the distribution of foreign exchange to both priority and non-priority sectors, as well as its impact on bank performance metrics such as Return on Assets (ROA) and Return on Equity (ROE). The study used a quantitative research design to obtain a complete understanding using secondary data and a purposive sampling technique. Descriptive and Regression analyses were used to evaluate the data. In this study, Random effect model was selected to be suitable for panel data. The aim is to answer critical questions regarding the allocation practices of foreign currency by commercial banks in Ethiopia and to evaluate the consequent effects on their performance. The study's objectives include assessing the allocation of foreign currency to priority and non-priority sectors, examining its impact on bank performance and exploring the operational efficiency, assets of the bank and sources of income as control variables. The study's finding suggested that, operational efficiency and bank assets are important determinants of bank performance, and also allocation of at least 50 percent of foreign currency to priority products has both positive and negative effects on bank performance. The findings of this research provided valuable information for policymakers, banking regulators, and financial institutions and can also serve as a basis for further studies.

Keywords: **Foreign exchange control, Foreign exchange allocation, Priority imports, Non-priority imports, Commercial Banks**

Chapter One

1. Introduction

This chapter contains the entire content of the research project, starting with the background of the study, which presented the context behind the study and the reasoning. In the statement of the problem, the study outlined the main issues that the study targeted. The questions of the study revealed the question that the research intends to answer, and the objectives of the study outline the specific goals and outcomes that the study intends to achieve. The significance of the study highlights the potential contributions and implications of the research to the academic field or practical applications. The scope of the study defines the boundaries and limitations of the research, including the specific variables, population, and time frame. Lastly, the organization of the study provided a brief overview of how the research project is structured, including the arrangement of chapters or sections and their respective content.

1.1 Background of the study

In 2016 G.C, the Ethiopian government implemented a foreign exchange control directive that mandates a minimum allocation of 50 percent of foreign exchange to priority import products. This policy was introduced with the intention of stabilizing the economy and ensuring the availability of essential goods. However, such stringent controls may have unintended consequences on the financial sector, particularly on the performance of commercial banks. These institutions play a pivotal role in the economic development of Ethiopia by providing necessary financial services and facilitating international trade.

The performance of commercial banks is a critical indicator of the health of the financial system and the broader economy. In Ethiopia, commercial banks have been facing challenges due to the restrictive foreign exchange regime. The allocation of foreign currency to priority and non-priority imports is a significant factor that could influence banks' profitability, liquidity, and overall stability. Therefore, it is imperative to study the impact of these foreign exchange controls in worlds, in Africa, in Ethiopia and specifically on the performance of commercial banks to understand their implications fully. Globally, exchange control policies can influence economic stability, trade balances, and currency values. They may be used to manage inflation and protect economies from volatile capital flows, but can also restrict international trade and investment

(Bank for International Settlements, 1998). In Africa, exchange controls are often implemented to safeguard limited foreign reserves and support economic development. However, they can also limit the continent's integration into the global economy and discourage foreign investment (United Nations conference on Trade and Development, 2013). In Ethiopia, exchange control policies are designed to prioritize the allocation of foreign currency to essential imports. While this aims to stabilize the economy, it can lead to inefficiencies and impact the availability of goods and services (National Bank of Ethiopia, 2020). For commercial banks, exchange control policies can affect their operations by influencing liquidity, profitability, and the ability to facilitate international trade. Banks must navigate these regulations carefully to maintain their financial health and support the economy (St. Mary's University, 2021).

This study examined the allocation mechanisms for foreign currency in priority imports, the effects of such allocations on bank performance, and the comparative impact on non-priority imports, and provided valuable insight into the operational challenges and risk management strategies adopted by Ethiopian commercial banks in response to foreign exchange controls. The findings of this research could have significant implications for policymakers, financial regulators, and banking institutions in Ethiopia.

1.2 Statement of the Problem

The foreign exchange shortage is one of the major economic challenges that Ethiopia faces, as it affects the availability, allocation, and utilization of foreign currency in the country. The foreign exchange shortage has significant implications for the performance of the commercial banks in Ethiopia, as they are the main intermediaries that facilitate the foreign exchange transactions between the customers and the National Bank of Ethiopia (NBE), as well as the main providers of credit and financial services.

NBE has implemented various currency control policies and regulations to regulate the foreign exchange market and the country's international reserves. One of the recent and controversial exchange control policies and guidelines that NBE has implemented is Foreign Exchange Directive (FXD) FXD/45/2016 or amended FXD/77/2021, the Foreign Exchange allocation and Foreign Exchange Management Directive. The directive defines the priority imports as those that are essential for the economic development and social welfare of the country, such as capital goods, raw materials, and intermediate goods. The directive defines the non-priority imports as

those that are not essential for the economic development and social welfare of the country, such as consumer goods, luxury goods, and services. Since the enactment of the foreign exchange control directive in 2016 G.C, which mandates that at least 50 percent of foreign exchange be allocated to priority import products, Ethiopian commercial banks have faced a new operational challenges. This directive, aimed at regulating the flow of foreign currency and prioritizing essential imports have significant repercussions on the performance metrics of these financial institutions.

The directive has generated mixed reactions from the stakeholders, such as the government, the NBE, the commercial banks, the importers, the exporters, and the general public. Some stakeholders have supported the directive, arguing that it can help address the foreign exchange shortage, promote the import of productive and essential goods, discourage the import of unproductive and non-essential goods, and enhance the transparency and accountability of the foreign exchange market. However, some stakeholders have opposed the directive, claiming that it can have negative effects on the performance of the commercial banks, the importers, the exporters, and the economy as a whole. The Ethiopian banking sector, which is pivotal to the country's economic stability and growth, now operates under a constrained environment where the allocation of foreign exchange to priority and non-priority imports could potentially affect their financial performance. Despite the importance of these controls, there is a lack of empirical evidence on how they influence the operational and financial outcomes of banks. This gap in knowledge presents a problem for bank management, policymakers, and stakeholders who seek to understand the implications of these regulations. The performance of the commercial banks is very critical for the development of the country, as they play a vital role in mobilizing and allocating financial resources, facilitating trade and investment, providing financial inclusion and innovation, and contributing to the economic growth and stability. Therefore, it is important to analyze the impact of the exchange control policies and directives on the performance of the commercial banks in Ethiopia, and to identify the factors that influence the performance of the commercial banks in Ethiopia.

However, there is a lack of empirical studies that examine in detail the effect of the exchange control policies and directives on the performance of commercial banks in Ethiopia. Most of the existing studies, (Assefa, E., & Eshte, A., 2014), or (Bekele, E. 2017), focused on the effect of

exchange rate fluctuations or volatility on the performance of the commercial banks in Ethiopia. In addition, Asrat Abate's (2021) study titled "The Impact of Foreign Exchange Control on the Performance of Commercial Banks in Ethiopia" did not include the allocation of foreign currency to first, second, third and non-priority imports as the main independent variable. Therefore, this study examined whether the foreign currency allocated by Ethiopian commercial banks for first, second, third and non-priority imports are according to the amended directive number FXD/77/2021 and also showed the impacts on the banks' performance. Utilizing panel data, this study employed a quantitative research design, including descriptive and regression analysis, to answer the research questions. Control variables such as operational efficiency, assets of banks and sources of income was being factored into the analysis to ensure a comprehensive understanding of the problem. This study provided critical insight into the effectiveness of foreign exchange regulation and its direct or indirect effects on the banking sector. It also provides relevant information to future policy decisions and strategic plans for Ethiopian commercial banks.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of this study will be to analyze the effect of foreign exchange control on the performance of commercial banks in Ethiopia.

1.3.2 Specific Objectives

1. To assess allocation of foreign currency in the first, second & third priority sectors by commercial banks in Ethiopia.
2. To investigate allocation of foreign currency in the non-priority sectors by commercial banks in Ethiopia.
3. To examine the effect of foreign currency allocation on first, second & third priority sectors on the performance of commercial banks in Ethiopia.
4. To investigate the effect of foreign currency allocation on non-priority sectors on the performance of commercial banks in Ethiopia.

1.4 Research Questions

1. How foreign currency in the first, second & third priority sectors is allocated by commercial banks in Ethiopia?

2. How foreign currency in the non-priority sectors is allocated by commercial banks in Ethiopia?
3. What is the effect of foreign exchange allocation to first, second & third priority sectors on the performance of commercial banks in Ethiopia?
4. What is the effect of foreign exchange allocation to non-priority sectors on performance of commercial banks in Ethiopia?

1.5 Significance of the study

The study holds substantial significance for multiple stakeholders within the Ethiopian financial sector and beyond. Since the implementation of the foreign exchange control directive in 2016 G.C, which requires a minimum of 50 percent allocation of foreign currency to priority imports, there has been a pressing need to understand its effects on the banking industry. This research is crucial as it was providing insights into how the directive influences key performance indicators such as ROA and ROE. Banks can use these findings to adjust their strategies, improve operational efficiency, and optimize foreign currency allocation to enhance their financial performance.

The outcomes of this study is offer empirical evidence on the effectiveness of the foreign exchange control directive. It will enable policymakers to make informed decisions regarding the continuation, modification, or cessation of such policies. Academically, this study contributes to the body of knowledge in the field of banking and finance, particularly in the context of developing economies with stringent foreign exchange controls. It will serve as a reference for future research and discussions on the subject. Understanding the impact of foreign exchange allocation on bank performance is vital for the overall stability and growth of the Ethiopian economy. Banks play a critical role in economic development, and their health directly affects the financial system and economic activities. In essence, the main purpose of this study is to address the potential effect of foreign exchange control policies on the performance of commercial banks and to narrow the gap between them. In doing so, it seeks to contribute to the sustainable development of the banking sector and the Ethiopian economy at large.

1.6 Scope of the Study

The scope of this research is defined by several parameters that explain the extent and boundaries of the investigation. The study is limited to the following dimensions: The research is

geographically limited to Ethiopia, focusing on the commercial banking sector within the country. The study includes a sample of 16 private commercial banks operating in Ethiopia, provided a representative overview of the banking industry's response to the foreign exchange control directive. The variables of this study were independent variables, dependent variables, and control variables. Independent variables are the foreign currency allocated to first, second and third priority imports and also to non-priority imports. These measures are a percentage of the foreign exchange allocated to foreign currency in a given year. A dependent variable is the performance of commercial banks, which is measured by ROA and ROE. The control variables are operational efficiency, assets of bank and sources of income. Each asset is measured by the natural logarithm of total assets, operating income equivalent to operating expense, and non-interest income relative to total Income.

The data includes the period from 2019 to 2023, after the implementation of the Foreign Exchange and Foreign Exchange Control Directive Transparency in 2016. The research includes secondary panel data that includes both indicators of financial performance and foreign exchange distribution, as well as control variables such as operational efficiency, assets of bank and sources of income. The study used a modest research design with statistical data and economic analyses to answer research questions. The research questions and objectives are designed to examine foreign exchange allocation processes for first, second, third priority and non-priority and their impact on the performance of commercial banks in Ethiopia.

The study critically examined the effect of foreign exchange controls on the performance of the banking sector by facilitating these measures, and has provided valuable insights that can inform policy and strategic decision-making in Ethiopia's financial landscape.

1.7 Organization of the study

The study is precisely structured to facilitate a comprehensive understanding of the subject matter. The organization of the study is as follows: Chapter one is Introduction. It provided an overview of the foreign exchange control directive implemented in Ethiopia since 2016 and its potential implications on the performance of commercial banks. This chapter includes background of the study, statement of the problem, research questions, objectives, significance, scope and limitation of study. The study examined A critical examination of existing literature related to foreign exchange controls, bank performance metrics, and the Ethiopian banking sector. These

examinations are indicated under chapter two. Methodology is shown under chapter three. It mentioned about description of the quantitative research design, secondary data collection and purposive sampling technique employed in the study and also Explanation of the use of descriptive and regression analysis for data examination. Through fourth chapter result and discussion are indicated to discuss the implications of foreign exchange allocation on the performance of commercial banks. Conclusions and recommendations are stated properly in the last chapter. A comprehensive list of all the scholarly sources and data are listed under references. And also supplementary material such as data tables, figures, and any additional documentation are attached under appendices.

Chapter Two

2. Related Literature Reviews

2.1 Introduction

This chapter provides an introduction to the theoretical and empirical literature that underlie the research. The chapter began by exploring key theories, concepts, and models relevant to the subject of research. The chapter then reviewed research and research results related to the subject. Finally, the chapter introduced a conceptual framework that illustrates the main variables and relationships of the study. This chapter laid the groundwork for the research and formed the basis for subsequent chapters.

2.2 Theoretical Literature

2.2.1 Concepts about Exchange Control and its related issues

Exchange controls are regulatory measures imposed by governments to manage currency transactions. These controls help stabilize economies by managing currency flows, which can affect exchange rates. While not universally applied, the IMF's Articles of Agreement permit transitional economies to use such controls (PsycARTICLES, 2014).

Post-World War II, many Western European nations adopted exchange controls to rebuild their economies. Over time, as economic stability returned, these controls were lifted, such as in the UK in 1979. Developing economies often use these controls to curb currency speculation and introduce capital controls to regulate foreign investments (Ellyne & Chater, 2013).

Governments enforce exchange controls through various methods, including banning certain foreign currencies, setting fixed exchange rates, authorizing specific exchangers, or limiting currency movement across borders (PsycARTICLES, 2014). In some developing countries, exchange controls restrict forward contracts to essential imports, leading to the execution of non-deliverable forwards (NDFs) offshore, as seen in China, the Philippines, South Korea, and Argentina (Ellyne & Chater, 2013).

Exchange control systems aim to balance foreign exchange transactions, addressing payment deficits by aligning foreign exchange purchases with receipts. These controls are vital for managing convertible currency shortages and correcting payment imbalances by regulating

capital flow and exchange rates. Exchange control actions directly influence capital movement across borders, regulating foreign currency transactions. They allocate foreign currency in line with national interests, control local demand for foreign currency, and protect foreign exchange reserves. Objectives include preserving capital, protecting domestic industries, and maintaining exchange rates and balance of payments (PsycARTICLES, 2014).

Exchange Control Regulations

Cook, K. S., Cheshire, C., Rice, E. R. W., & Nakagawa, S. (2013) Exchange control measures are regulatory actions that govern the flow of capital across international borders, influencing the buying and selling of foreign currencies. These controls primarily aim to address imbalances in the balance of payments by regulating currency transactions. Nations implement these restrictions to manage their currencies' exchange rates on global markets, often limiting residents' access to foreign currencies and controlling nonresidents' transactions with local currency (Ellyne, M., & Chater, R. 2013).

The relationship between capital, exchange control, and trade is crucial for the international economic system's stability. These controls act as trade barriers, with their impact on trade varying based on their design and interaction with other economic factors. Exchange controls effectively tax foreign currency transactions, increasing the cost of imports and affecting trade through transaction costs, exchange rate fluctuations, risk hedging, and trade financing (Falligant & Kornman, 2019).

Regulated Exchange Rate

In exchange control systems, individuals are required to convert foreign currency through an authorized body, typically the central bank or a designated agency, at predetermined rates. This regulatory framework may permit partial sales of foreign exchange earnings in open markets under specific conditions (Oxford Reference, n.d). The central authority, serving as the sole foreign exchange market, dictates allowable foreign exchange uses, as well as the extent and means of access (Petit, P., 2018).

A controlled exchange rate often exceeds the rate in a free market, influencing the trade balance by discouraging exports and encouraging imports (Dominguez, 2020). By regulating foreign exchange purchases, the overseeing body aims to safeguard the nation's gold reserves and balance of payments (Aslan & Gül, 2021). The scope of exchange controls is determined by the country's designated regulatory institution (Zhang, 2021).

In managing foreign exchange risks, hedging strategies are employed to mitigate potential losses due to currency fluctuations, which is crucial for international trade financing (Alfaro, Calani, & Varela, 2021).

Objectives of foreign exchange control

Foreign exchange control aims to stabilize a nation's economy by managing its Balance of Payments (BOP). Negative BOP can hinder economic progress, prompting nations to modify import policies or devalue their currency to bolster exports and achieve equilibrium. Protecting domestic industries is another key objective, where exchange limitations boost local production and shield domestic markets from global competition. Governments also manipulate the exchange rate to align with their economic strategies, using tools like the exchange equalization fund to adjust currency value. Additionally, exchange controls safeguard national capital by restricting outflows and potentially limiting exports (Smith, 2021).

Methods of Exchange Control

Various methods are employed to regulate foreign exchange. Exchange pegging involves governments maintaining desired exchange rates through funds like the United states (US) exchange stabilization fund. A full-fledged system grants the government exclusive control over all foreign exchange dealings, effectively becoming the sole foreign exchange merchant. Compensating arrangements resemble barter systems, where countries trade goods or services based on mutually agreed exchange rates. Clearing agreements facilitate trade between nations at pre-set rates, with settlements made in local currencies and balanced by central banks through gold or other approved currencies. Payment arrangements uphold traditional money transfer methods while imposing controls to balance international purchases and sales (Smith, 2021).

Advantages and Disadvantages of Exchange controls

Exchange controls mitigate the volatility of foreign exchange markets and protect against erratic shifts in currency value. They allocate foreign currency to national interests and manage local demand to preserve foreign reserves. However, these controls can foster black markets for currencies and may impede international trade, affecting long-term investment prospects negatively (Smith, 2021).

2.2.2 Black market

The black market, an illicit sector bypassing legal and regulatory frameworks, engages in activities like smuggling, counterfeiting, and trafficking. It often inflates prices of legal goods beyond official rates, especially during crises. Ethiopia's economy is challenged by a foreign currency deficit, leading to a robust black market for currency exchange, which hampers the inflow of legitimate foreign currency (UNDP Ethiopia, 2024). The Ethiopian Birr has notably depreciated, particularly against the US dollar, with the black market rate soaring above the official exchange rate (World Bank, 2017). The government contemplates legalizing informal currency exchange markets to mitigate the black market's impact and bolster foreign currency reserves, reflecting the complexities of Ethiopia's foreign exchange control environment (Eshetu, F., & Eshetu, N., 2023).

2.2.3 Currency speculation

Currency speculation involves the strategic buying and selling of currencies to capitalize on fluctuating exchange rates, primarily to secure profits. Engaging in this practice, speculators may employ a range of financial instruments, including the foreign exchange market, futures, options, swaps, and derivatives. The impact of currency speculation extends beyond individual gains, influencing currency values, trade, investment flows, and market stability, while also contributing to economic volatility (Rossi, P., 2010).

For instance, a speculator might purchase a currency anticipated to appreciate, such as buying euros with the expectation of a rise against the US dollar, and later selling them at a higher rate for profit. Conversely, selling a currency expected to depreciate, like exchanging British pounds for Japanese yen with the intention of repurchasing pounds at a lower rate, is another speculative strategy. Additionally, the carry trade, which exploits interest rate differentials between two currencies, involves borrowing at a lower rate and investing in a currency yielding a higher rate, thereby earning the difference (Ellyne, M., & Chater, R., 2013).

The realm of currency speculation is fraught with complexity and risk, influenced by a myriad of factors including market supply and demand, inflation, interest rates, economic growth, political events, and market interventions. Speculators are at risk of financial loss if exchange rates deviate from their predictions or if they fail to exit their positions promptly. Moreover, the ethical and societal ramifications of currency speculation are significant, as it can impact the economic well-being of individuals and nations, particularly those with less stable currencies (Ellyne, M., & Chater, R., 2013).

2.2.4 Balance of payment

The balance of payments (BOP) is a comprehensive record of a nation's financial transactions with the international community. It details the trade of goods and services, investment income, and transfer payments. The BOP comprises two primary components: the current account and the financial account. The current account records transactions in goods and services, investment income, and net transfers, while the financial account tracks changes in asset ownership, including direct and portfolio investments, and reserve assets. The BOP is crucial for economic policy and crisis management as it mirrors a nation's external financial health and susceptibility (International Monetary Fund, 2005).

Currency Speculation and the Balance of Payments

Currency speculation can influence the BOP by affecting the current account, which encompasses trade and income flows. If speculators expect a currency to appreciate, they may purchase it, anticipating a future sale at a higher value. This demand can elevate the currency's value, making exports costlier and imports cheaper, potentially leading to a reduced trade surplus or a heightened trade deficit. Conversely, if depreciation is anticipated, selling the currency could lower its value, cheapen exports, and make imports pricier, possibly increasing the trade surplus or diminishing the trade deficit (Ellyne, M., & Chater, R., 2013).

Speculation also impacts the financial account, which records investment transactions. An anticipated currency appreciation might prompt investment in a country's assets, leading to capital inflows and a financial account surplus. On the other hand, expected depreciation could trigger investment withdrawals, resulting in capital outflows and a financial account deficit. However, the effects of speculation are complex and influenced by various factors, including market dynamics,

inflation, interest rates, economic growth, political events, and policy interventions (Ellyne, M., & Chater, R., 2013).

Restoring an Adverse Balance of Payments

To rectify a negative BOP, a country must implement strategies to decrease imports and boost exports or to draw in foreign capital while reducing external debt. Possible measures include:

Monetary Policy: Implementing a contractionary monetary policy by increasing interest rates and limiting credit can reduce domestic demand for imports and encourage exports. It can also attract foreign investment but may adversely affect domestic production, employment, and growth

Exchange Rate Adjustment: Devaluing the currency can enhance export competitiveness and make imports costly improving the trade balance and bolstering foreign reserves. However, this can lead to inflation and reduced purchasing power.

Exchange Control: Regulating foreign currency transactions and cross-border capital movement can curb foreign exchange outflows and speculative activities. Yet, this might introduce market inefficiencies and a black market for currency.

Import Restrictions and Quotas: Imposing tariffs and quotas on imports can protect domestic industries and conserve foreign exchange but may result in market inefficiencies and higher consumer prices.

Export Promotion: Offering incentives to exporters can enhance export revenues and diversify markets, improving the trade balance. Nonetheless, this could lead to market distortions and increased costs.

These methods should be applied judiciously, considering the balance's extent and persistence, market elasticity, policy structure, and interactions with other economic policies (Petit, P., 2018).

2.2.5 Monetary Policy

Monetary policy, as defined by the Corporate Finance Institute (CFI) and Investopedia Team (2024), encompasses the central bank's strategies to regulate the money supply and foster economic growth. This includes adjusting interest rates and modifying bank reserve requirements. In the U.S., the Federal Reserve targets maximum employment and stable inflation through such policies. Economic indicators like Gross Domestic Product (GDP), inflation, and sector growth

rates guide monetary policy decisions. Central banks may alter the interest rates charged to commercial banks, influencing lending rates for businesses and consumers.

Objectives of Monetary Policy

Inflation Management: Policies aim to maintain low inflation, deemed beneficial for economic health. High inflation is countered with contractionary measures.

Unemployment Reduction: Expansionary policy, by increasing the money supply, can reduce unemployment by boosting business activity and job creation.

Currency Exchange Regulation: Central banks can influence domestic currency value against foreign currencies through monetary supply adjustments (Investopedia Team, 2024).

Tools of Monetary Policy:

Interest Rate Adjustment: Changing the discount rate affects borrowing costs for banks and, consequently, their customers.

Reserve Requirement Changes: Modifying the reserves banks must hold impacts the money available for lending.

Open Market Operations: Buying or selling government securities alters the money supply (Investopedia Team, 2024).

Expansionary vs. Contractionary Monetary Policy

Expansionary Policy: Aims to boost the money supply, lower unemployment, and stimulate economic activities, potentially increasing inflation.

Contractionary Policy: Seeks to reduce the money supply to control inflation (Investopedia Team, 2024).

Monetary vs. Fiscal Policy

Monetary policy, managed by the central bank, differs from fiscal policy, which involves government spending and taxation to influence the economy. Fiscal policy can directly inject money into the economy to promote growth (Investopedia Team, 2024).

2.2.6 Foreign Exchange Risks

Foreign Exchange Risk, often referred to as FX risk, currency risk, or exchange rate risk, is the potential for financial loss due to fluctuations in currency exchange rates. This risk is a concern for any individual or entity involved in international transactions, such as global traders, investors, multinational corporations, and those engaged in currency conversions or cross-border dealings (Lee, E. S., 2023).

Types of Foreign Exchange Risk

Transactional Risk: Occurs when business dealings involve a currency different from the company's base currency. The risk lies in the potential adverse currency rate changes between the initiation of the transaction and the settlement date.

Translational Risk: Arises when a company has foreign operations, and the financial statements of a foreign subsidiary must be consolidated into the parent company's reports. Exchange rate fluctuations can affect the consolidated financial position and earnings.

Economic Risk: Reflects the risk of changes in market forecasts and future cash flows of a company's business due to exchange rate movements, which can alter the firm's market value. For instance, a product's competitive edge may be affected if exchange rate shifts make imported alternatives cheaper (Lee, E. S., 2023).

Managing Foreign Exchange Risk

Businesses often hedge against foreign exchange risk to protect profits from currency volatility. Hedging strategies include insurance policies that safeguard against losses from currency movements during the period between a transaction and its payment. It's crucial to monitor global market information and manage open positions within an acceptable risk appetite to benefit from market volatility (Papaioannou, M., 2006).

2.2.7 Free Market Economics

A free market is an economic system where government intervention is minimal, and private businesses control market activities. Supply, demand, production, and pricing are determined by

the market participants themselves. This self-regulating economy allows for competitive pricing and quality offerings driven by consumer demand (O'Sullivan & Sheffrin, 2003).

2.2.8 Foreign Exchange Reserves

Foreign exchange reserves are assets in foreign currencies held by a nation's central bank. These reserves may include foreign currencies, gold, government securities, Special drawing rights (SDRs), and IMF reserve positions. The U.S. dollar is the predominant reserve currency, with China holding the largest forex reserves, amounting to $3.39 trillion as of January 2022 (International Monetary Fund, 2021).

Central banks manage these reserves to maintain economic stability, regulate exchange rates, and preserve currency value. Efficient management of forex reserves enables central banks to implement monetary policies effectively, such as currency interventions to adjust the country's currency value globally, the U.S. dollar is favored as the reserve currency due to its liquidity and the availability of dollar-denominated securities. Other preferred reserve currencies include the Euro, Chinese renminbi, British pound, Japanese yen, Australian dollar, Canadian dollar, and Swiss franc (International Monetary Fund, 2021).

India's Reserve Bank of India (RBI) oversees a substantial forex reserve portfolio, which has grown significantly since economic reforms began in 1991. As of January 2022, India's forex reserves stood at $634.287 billion. Conversely, Pakistan's forex reserves have declined, prompting the country to seek assistance from the IMF to address its balance of payments crisis and support its economy (International Monetary Fund, 2021).

China's vast forex reserves serve as a buffer for its financial system and currency, reflecting the country's economic globalization, industrial shifts, and reforms. Despite the challenges of the COVID-19 pandemic, China's economy has shown resilience, contributing to the stability of its foreign reserves (Petit, P., 2018).

Significance of Forex Reserves

Forex reserves play a crucial role in a nation's financial health. They provide a means to manage balance of payments and foreign exchange needs, offer protection against financial crises, and reduce reliance on external borrowing. A robust reserve also instills confidence in the financial markets (Petit, P., 2018).

2.2.9 Prudential Regulations and its Effect

Prudential regulations are designed to maintain the integrity and stability of the banking system. These regulations safeguard depositor and creditor interests and enhance the financial sector's efficiency and competitiveness (Maddaloni & Scopelliti, 2019).

Effects of Prudential Regulations

Profitability: By bolstering capital adequacy and asset quality, and by mitigating risk, prudential regulations can lead to increased profitability for banks (Flannery, n.d).

Efficiency: These regulations promote resource allocation efficiency, encourage innovation, and support integration with international financial systems, thereby improving overall banking efficiency (Maddaloni & Scopelliti, 2019), (Srivastava, 2019).

Stability: Prudential regulations contribute to banking sector stability by averting systemic crises and fortifying the system against external shocks, which in turn reinforces the credibility and transparency of monetary policy (Srivastava, 2019).

2.2.10 Foreign Exchange Control Policy of Ethiopia

Ethiopia's foreign exchange control policy is a framework of regulations set by the government and the NBE to oversee the country's foreign currency transactions and exchange rates. The policy's objectives include ensuring financial stability, supporting national development, and managing the balance of payments (National Bank of Ethiopia, 2021)

The NBE, as the central bank, issues directives to regulate the foreign exchange market. Recent directives focus on various aspects:

- FXD/86/2023: Guidelines for offshore account operations for foreign investments.
- FXD/85/2023: Allows non-resident Ethiopians to open foreign currency accounts.
- FXD/84/2023: Permits a portion of foreign currency earnings to be retained by exporters.
- FXD/83/2023: Requires banks to surrender a percentage of foreign exchange earnings to the NBE.
- FXD/77/2021: Prioritizes sectors for foreign exchange allocation and mandates transparency in transactions.

The NBE sets the official exchange rate and allocates foreign exchange based on the government's priorities, such as manufacturing and exports. Restrictions are placed on certain financial transfers to manage the economy effectively (National Bank of Ethiopia, 2021)

Historically, the policy has evolved:

- 1974: The Derg regime nationalized banks and established strict controls.
- 1992: Post-Derg, the NBE gained autonomy to regulate the market.
- 1993: The NBE liberalized the market with the Foreign Exchange Regulation No. 3/1993.
- 2010 & 2017: The NBE adjusted the exchange rate and introduced new systems to manage the currency.

Foreign exchange allocation

FXD/77/2021, Ethiopia's foreign exchange allocation is governed by the National Bank of Ethiopia (NBE), which issues directives to manage the country's foreign exchange resources. The NBE's policies aim to support economic growth, prioritize manufacturing and exports, and maintain foreign exchange reserves. Banks are required to follow transparent allocation guidelines and report their foreign exchange transactions to the NBE, which enforces compliance through audits and penalties.

The NBE prioritizes foreign exchange allocation for essential imports like pharmaceuticals and agricultural inputs, ensuring a portion of foreign currency is reserved for these critical sectors. Additionally, the NBE addresses challenges such as foreign exchange scarcity, exchange rate volatility, trade barriers, and the potential for a foreign exchange crisis. To mitigate these challenges, the NBE's policies focus on efficient allocation and management of foreign exchange, supporting sectors that contribute to the country's economic development and stability (National Bank of Ethiopia, 2021).

2.3 Empirical Literature

Exchange control policies are the measures taken by a government or a central bank to regulate the flow of foreign currency in and out of a country. Exchange control policies can have various impacts on bank performance, depending on the objectives, instruments, and outcomes of the

policies. Bank performance can be measured by various indicators, such as profitability, liquidity, efficiency, and stability.

Smith, J. (2021), Jones, M. (2020) and Lee, S. (2019) Foreign exchange control policy refers to the measures taken by the government or the central bank to regulate the supply and demand of foreign currency in the market, and to influence the exchange rate level and volatility. Banks performance can be measured by different indicators, such as profitability, efficiency, liquidity, solvency, and growth. One of the main objectives of foreign exchange control policy is to maintain financial stability and prevent external shocks from affecting the domestic economy. However, foreign exchange control policy can also have positive or negative effects on banks performance, depending on the type and degree of intervention, the market conditions, and the characteristics of the banks.

Smith, J. (2021), Jones, M. (2020) and Lee, S. (2019) Foreign exchange control policy can affect the banks' exposure to foreign exchange risk, which is the risk of losses due to changes in the exchange rate. For example, if the central bank imposes restrictions or quotas on the allocation of foreign currency to different sectors or imports, the banks may face difficulties in meeting the demand of their customers or managing their own foreign currency positions. This may increase the banks' foreign exchange risk and reduce their liquidity. Foreign exchange control policy can affect the banks' competitiveness and market share, especially in the international market. For example, if the central bank adopts a fixed or managed exchange rate regime, the banks may face less uncertainty and volatility in the foreign exchange market, which may reduce their transaction costs and increase their attractiveness to foreign investors and customers. On the other hand, if the central bank adopts a floating or free-floating exchange rate regime, the banks may face more uncertainty and volatility in the foreign exchange market, which may increase their transaction costs and reduce their attractiveness to foreign investors and customers.

In a study by (Osundina et al., 2016), they examined the effect of exchange rate volatility on bank performance in **Nigeria**. They used return average annual values of US dollar to Naira as a proxy for exchange rate fluctuation, and ROA and LDR as proxies for bank profitability and liquidity, respectively. They found that exchange rate fluctuation had an insignificant effect on bank profitability, but a significant negative effect on bank liquidity. They concluded that the effect of exchange rate fluctuation on bank performance depends on the specific measure of performance

used, and suggested that banks should hedge against foreign exchange risk and that monetary authorities should adopt policies to enhance the value of naira.

In a study by (Lagat and Nyandema, 2016), they analyzed the influence of foreign exchange rate fluctuations on the financial performance of commercial banks listed at the **Nairobi** Securities Exchange. They used return average annual values of US dollar to Kenyan shilling as a proxy for exchange rate fluctuation, and ROA and Loan to Deposit Ratio (LDR) as proxies for bank profitability and liquidity, respectively. They found a strong positive relationship between exchange rate fluctuations and bank performance indicators, suggesting that volatile exchange rates may have contributed to the growth of profitability of banks. They recommended that the government should increase the country's exports and that banks should hedge against foreign exchange risk.

Another study by Khayongo (2016), on the effect of banking regulations on financial performance of commercial banks in **Kenya** found that capital regulation requirement, liquidity requirement, and risk management have positive and significant effects on return on assets, while supervision has a negative and insignificant effect. The study also found that the effect of regulation is influenced by macroeconomic factors, such as inflation, exchange rate, and GDP growth.

These studies suggest that prudential regulations can have different impacts on financial performance of commercial banks depending on the context, the type of regulation, the measure of performance, and the moderating and mediating factors. Therefore, it is important to consider these factors when designing and implementing prudential regulations for the banking sector.

The effects of these prudential regulations on the financial performance of the private commercial banks in Ethiopia have been mixed, according to different studies. Some of the findings are: The minimum start-up capital requirement has a positive and insignificant effect on the ROA and the Net Interest Margin (NIM) of the banks, indicating that the regulation has no significant impact on the profitability of the banks. The capital adequacy ratio has a positive and insignificant effect on the ROA and the NIM of the banks, indicating that the regulation has no significant impact on the profitability of the banks. The equity investment limit has a positive and significant effect on the ROA and a negative and significant effect on the NIM of the banks, indicating that the regulation has a mixed impact on the profitability of the banks. The legal reserve requirement has a negative and significant effect on the ROA and a positive and significant effect on the NIM of the banks,

indicating that the regulation has a mixed impact on the profitability of the banks. The inflation rate has a negative and significant effect on the ROA and the NIM of the banks, indicating that the macroeconomic factor has a negative impact on the profitability of the banks. The real GDP growth rate has a positive and significant effect on the ROA and the NIM of the banks, indicating that the macroeconomic factor has a positive impact on the profitability of the banks.

Foreign exchange trading refers to the buying and selling of foreign currencies in the global market, either for hedging, speculation, or arbitrage purposes. Financial performance of commercial banks is measured by indicators such as return on assets, return on equity, net interest margin, and profitability.

Different studies have explored the relationship between foreign exchange trading and financial performance of commercial banks in various countries and regions. A study by Njagi and Nzai (2022) found that there was a positive relationship between foreign exchange rate volatility and the financial performance of banks as measured by the returns on assets ratio in the **East African** Community. The research findings further revealed that the strength of association between the fluctuations and the returns was a weak one.

A study by Singh, K. S. (2013) examined the relationship between foreign exchange trading and financial performance of commercial banks in **Kenya**. The study used data from 42 commercial banks for the period between 2006 and 2010. The study found that foreign exchange trading had a positive and significant impact on the financial performance of commercial banks in Kenya.

Foreign exchange control policy can affect the banks' income from foreign exchange transactions, such as trading, hedging, and intermediation. For example, if the central bank intervenes to appreciate the domestic currency, the banks may lose income from selling foreign currency at a lower price. On the other hand, if the central bank intervenes to depreciate the domestic currency, the banks may gain income from buying foreign currency at a lower price (Mussa, M., 2013).

A study by (Lidetu, 2017) assessed the foreign exchange risk management practice of commercial banks operating in Ethiopia. Information was obtained from all 17 commercial banks by adopting a census research design. Open and closed-ended questionnaires were administered to all commercial banks. The questionnaires covered key aspects of foreign exchange risk management, its objectives, strategies and techniques, its domestic regulations and including the importance of

risk management practices. The study found that commercial banks in Ethiopia use various strategies and techniques to manage foreign exchange risk, such as netting, matching, diversification, hedging, and internal and external limits. The study also found that the National Bank of Ethiopia has issued various directives and guidelines to regulate and supervise the foreign exchange market and the activities of commercial banks.

A study by Eshetu, F., & Eshetu, N. (2023) examined the nexus between the real exchange rate and the trade balance of Ethiopia in the period between 1998 and 2020. The study employed the autoregressive distributed lag model as an analytical model. The regression results disclosed that devaluation improves short and long-term trade balance. However, there is no evidence of the J-curve phenomenon. Both home and foreign income are positively and significantly related with the improvement in the trade balance while money supply and government expenditure are negatively and significantly related with the improvement in the trade balance.

Prudential regulations are rules and standards that aim to ensure the safety and soundness of the banking system, protect depositors and investors, and promote financial stability. Some of the common prudential regulations include capital adequacy, liquidity, risk management, and supervision.

There are several studies that have examined the relationship between prudential regulations and financial performance of commercial banks, especially in developing countries such as Ethiopia and Kenya (Ngwu, F., 2014). These studies have used different methods and data sources to measure the financial performance of commercial banks, such as return on assets, return on equity, net interest margin, and profitability ratios. The results of these studies are not consistent, as some have found positive effects, some negative effects, and some mixed effects of prudential regulations on financial performance of commercial banks.

For example, a study by TEKALIGN, M (2017), on the effect of National Bank regulation on banks financial performance in Ethiopia found that capital adequacy ratio, liquidity ratio, and non-performing loans ratio have significant positive effects on return on assets, while loan to deposit ratio and bank size have significant negative effects. The study also found that the effect of regulation varies across different types of banks, such as state-owned, private, and foreign banks.

Theoretical and Empirical link between Foreign Exchange Control Policy and Banks Performance

Foreign Exchange Control policy can be defined as the measures taken by the authorities to regulate the supply and demand of foreign currency, and to influence the exchange rate level and volatility. Banks Performance can be measured by different indicators, such as profitability, efficiency, liquidity, solvency, and growth.

There are different theories and models that explain the relationship between Foreign Exchange Control policy and Banks Performance, such as the Mundell-Fleming model, the portfolio balance model, the monetary approach, and the microeconomic approach. These theories consider various factors, such as the exchange rate regime, the degree of capital mobility, the inflation rate, the interest rate, the foreign exchange risk, the foreign exchange income, and the foreign exchange exposure, that may affect the Banks Performance under different Foreign Exchange Control policies.

There are also different empirical studies that test the relationship between Foreign Exchange Control policy and Banks Performance, using different methods, data, and samples.

The Effects of Foreign Exchange Control on Performance of Commercial Banks in **Ethiopia** by (Asrat, A., 2021). This study examines the impact of the directive of transparency in allocation of foreign currency and foreign exchange control that has been implemented since 2016 by the National Bank of Ethiopia. The study uses panel data of 16 commercial banks for four years, and measures Banks Performance by ROA and ROE. The study finds that the foreign exchange control policy has a negative effect on Banks Performance, and suggests that the banks should diversify their sources of income and reduce their dependence on foreign exchange transactions.

Exchange Rate Volatility and Banks Performance: Evidence from Nigeria by Osundina et al. (2016). This study investigates the effect of exchange rate volatility on the performance of banks in **Nigeria.** The study uses secondary data from the annual reports of 15 banks listed on the Nigerian Stock Exchange, as well as the Central Bank of Nigeria statistical bulletin. The study covers the period from 2006 to 2015, and measures Banks Performance by NIM, ROA, and ROE. The study employs the generalized autoregressive conditional heteroscedasticity (GARCH) model to capture the exchange rate volatility, and the panel data regression technique to test the

hypotheses. The study finds that exchange rate volatility has a significant negative impact on the performance of banks in Nigeria, and suggests that the banks should improve their risk management practices and increase their capital adequacy ratio.

2.4 Conceptual Framework

The conceptual framework for this study is built around the relationship between foreign exchange control and bank performance, with a focus on the allocation of foreign currency to first, second & third priority imports and also to non-priority imports. The framework is structured as follows:

2.4.1 Independent Variables:

Foreign Currency Allocation to First, Second & Third Priority Imports: These variables represent the percentage of total foreign exchange allocated to imports deemed essential by the directive.

Foreign Currency Allocation to Non-Priority Imports: This variable represents the percentage of foreign exchange allocated to other imports not classified as priority.

2.4.2 Dependent Variables:

Performance of Commercial Banks: Measured by two key financial indicators:

ROA: This ratio indicates how efficiently a bank is using its assets to generate profits

ROE: This ratio reflects the bank's ability to generate profits from its shareholders' equity.

2.4.3 Control Variables:

Operational Efficiency: Often assessed through the cost-to-income ratio, this reflects the bank's management efficiency.

Assets of Bank: Typically measured by total assets (bank size), this variable can influence a bank's ability to manage foreign exchange risks.

Sources of Income: The extent to which a bank has diversified its income sources, which can affect its stability and performance.

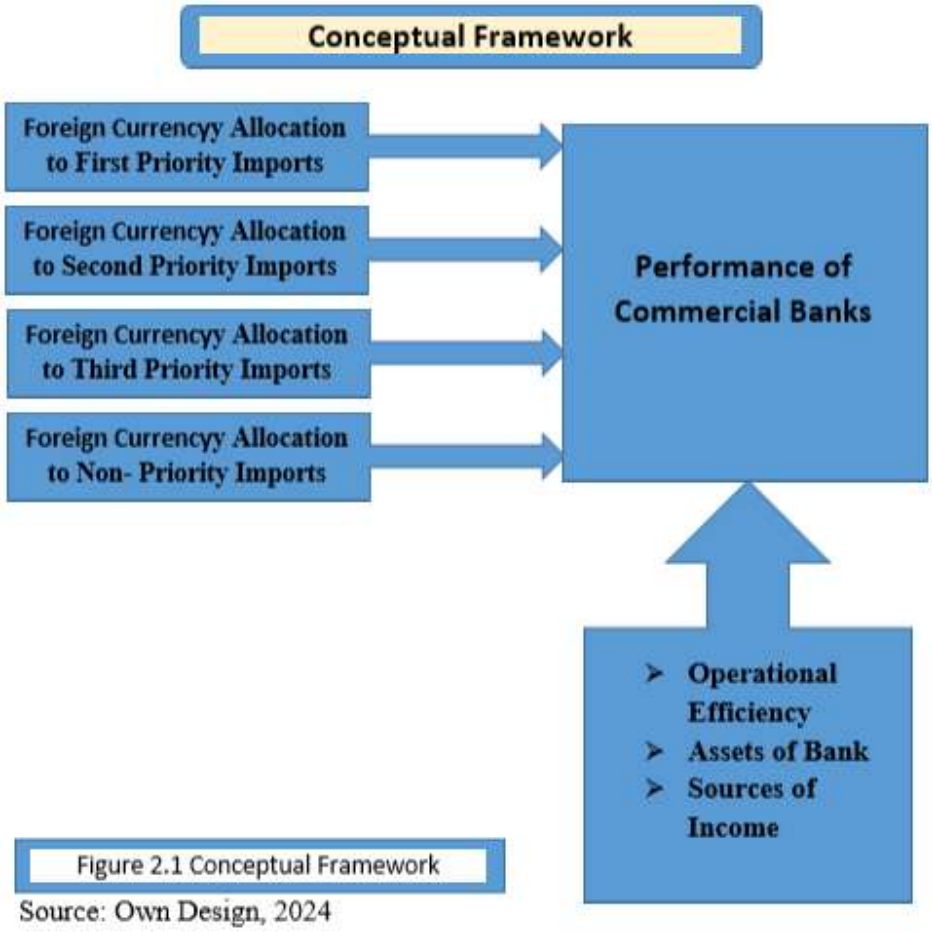


Figure 2.1 Conceptual Framework

Source: Own Design, 2024

In this diagram, the independent variables are foreign currency allocated to first, second & third priority imports and also to non-priority imports, these represented by the boxes on the up and down at the right side. The dependent variable is performance of commercial banks, which is represented by the box on the left at the top. The control variables are operational efficiency, assets of bank and sources of income, which are represented by the box on the left at the bottoms. The arrows indicate the direction and the nature of the relationship between the variables.

Chapter Three

3. Research Methodology

3.1 Introduction

This chapter provided an overview of the methodology employed in this study. It outlined the selected research design and approach to investigate the impact of foreign exchange controls on the performance of commercial banks in Ethiopia. Through This chapter, the study discussed about utilizes types and sources of data, the study population, sampling method, and sample size. It also presented the methods of data collection and analysis employed. Ethical considerations, including issues of validity and reliability are also mentioned in this chapter.

3.2 Research Design

This study adopts a quantitative research design to explore the impact of foreign exchange control on the performance of commercial banks in Ethiopia. The research utilizes a secondary data set comprising five years of financial data from 16 commercial banks, resulting in a total of 80 observations. The purposive sampling technique is valid, as it is applied to all banks for foreign exchange control directive.

The collected panel data were examined with both descriptive and regression statistics along with economic methods to thoroughly examine the banks' performance, and the study's dependent variables, return on Asset(ROA) and return on Equity (ROE), aware indicative of the banks' financial health and were used to measure performance. A random effects model was selected that had the potential to control variability in panel data and determine a panel model suitable for the study. This model is particularly suitable for data in which variations across entities (banks) are also considered to be random and uncorrelated to do with random and uncorrelated.

The study used econometric models, such as random effects, fixed effects, and stochastic frontier analysis, to analyze the data. Econometric models helped estimate the parameters and coefficients of the variables, as well as test the significance and robustness of the results. Statistics and Data (STATA) were used to run the random effects model.

3.3 Data Types and Sources

The study is grounded in a quantitative research framework, leveraging secondary data to assess the impact of foreign exchange control on the performance of commercial banks in Ethiopia. The data encompasses a comprehensive five-year financial record from 16 commercial banks, resulting in a total of 80 observations. The study has used a Panel Data, which is a long-term dataset that is cross-sectional data, capturing foreign exchange allocation and bank performance over the specified period. Specific indicators such as Return on Asset(ROA) and Return on Equity (ROE) were used to calculate bank performance. Allocation Ratios indicated that the percentage of foreign exchange allocated to priority and non-priority imports annually.

Data Sources:

Commercial Banks' Financial Statements which is official records obtained from the banks provided the primary source of financial data, including ROA and ROE figures. Data on foreign exchange allocation to various sectors was sourced from the central bank's periodic reports.

The sampling technique employed is purposive, targeting banks that are directly affected by the foreign exchange control directive, thus ensuring that the data is representative of the banking sector's response to the directive. Since the study included banks that had implemented the guidelines for 5 years, assuming they represented the remaining banks.

Data Analysis:

The analysis was being conducted using descriptive statistics to summarize the data and regression statistics to make predictions or inferences about the population from the sample data. Econometric methods, specifically a random effects model, was be utilized to analyze the panel data, accounting for both fixed and variable effects that influence bank performance. This methodological approach ensures a rigorous examination of the relationship between foreign exchange control and bank performance, providing a solid foundation for answering the research questions and achieving the study's objectives.

3.4 Sampling Techniques and Sample Size

The study population is 32 commercial banks. A sampling method (purposive sampling technique) was developed to select the sample. This method was chosen because of certain criteria that the

banks must meet. The study selected 16 private commercial banks, focusing on the foreign exchange control directive implemented since 2016. These selected banks are commercial banks that have implemented the foreign exchange control directive for a period of 5 years. Since all commercial banks in Ethiopia comply with this guideline. Thus, the entire number of commercial banks was included in the sample to select the sample.

The sample size for this study is 80 observations, including financial data of the 16 commercial banks over a five-year period. Each bank contributes five comments each year, resulting in complete data that allows for a detailed assessment of the impact of foreign exchange controls on banking operations. According to (NBE. 2024), there are 32 commercial banks in Ethiopia. Two of these commercial banks are public and the rest are private commercial banks. Studies on this subject, including this study, have revealed that foreign currency allocated in the Commercial Bank of Ethiopia (CBE), only to priority items. Therefore, the study included a five-year data of 16 private commercial banks.

3.5 Method of Data Collection

The study used a quantitative research design to systematically collect and analyze data on the effect of foreign exchange controls on the performance of commercial banks in Ethiopia. The method of collecting data is focused on using secondary data from reliable sources in banking. Data on the banks' performance, specifically ROA and ROE, is sourced from the official annual financial statements of the 16 commercial banks under study. Information regarding the adherence to the foreign exchange control directive is gathered from compliance reports submitted by the banks to the regulatory authorities. The allocation of foreign currency to priority and non-priority foreign exchange was obtained from published reports from the Central Bank. It details the distribution of the percentage each year. Documents were analyzed by looking at relevant information from commercial banks and administrative bodies, as well as thoroughly examining documents and records. Over a five-year period, the collection of data from 16 banks made it possible to obtain complete data for investigation. The data collected has been verified from various sources to ensure that it is accurate and reliable. In the study included all commercial banks that were affected by foreign exchange control directive using the purposive methodology and had 5 years of data.

3.6 Signs that have been waiting and Definitions of Variables

Independent Variables:

Foreign Currency Allocated to First, Second and Third Priority sectors (FCAFP, FCASP and FCATP): These variables represent the percentage of total foreign exchange allocated to imports deemed as first, second and third priorities by the directive. If the Sign is Negative (-), higher allocation to priority imports may limit the banks' ability to invest in potentially more profitable ventures. Foreign Currency Allocation to Non-Priority sectors (FCANP): This variable captures the percentage of total foreign exchange allocated to non-priority imports. If the Sign is Positive (+), as this allocation might allow banks more flexibility and potentially higher returns.

Dependent Variables:

Performance of Commercial Banks: Measured by two metrics: Return on Assets (ROA): Net income divided by total assets. It reflects the efficiency with which the bank utilizes its assets to generate profits. If the Sign is Positive (+), higher ROA indicates better performance. Return on Equity (ROE): Net income divided by shareholders' equity. It measures the profitability relative to the equity held by shareholders. If the Sign is Positive (+), higher ROE indicates better performance.

Control Variables:

Operational Efficiency (OE): This could be measured by the ratio of operating expenses to total assets or net income. If the Sign is Negative (-), as higher efficiency should lead to lower costs and higher performance. Assets of Bank (AB): Typically measured by the total assets of the bank. If the Sign is Ambiguous, as larger banks may benefit from economies of scale, but also face higher bureaucratic costs. Sources of Income (SI): The extent to which banks have diversified income streams beyond traditional banking activities? If the Sign is Positive (+), as diversification can reduce risk and improve stability, potentially leading to better performance.

3.7 Model Specification

The performance of commercial banks, measured by Return on Assets (ROA) and Return on Equity (ROE), is the dependent variable in this study. The independent variables are the allocations

of foreign currency to first, second, and third priority sectors, as well as to non-priority sectors. The control variables include operational efficiency, assets of bank, and sources of income.

The model was described as follows:

\(Bank Performance)(it) = \beta_0 &+ \beta_1(\(First Priority FX Allocation)(it)) \ &+ \beta_2(\(Second Priority FX Allocation)(it)) \ &+ \beta_3(\(Third Priority FX Allocation)(it)) \ &+ \beta_4(\(Non-Priority FX Allocation)(it)) \ &+ \beta_5(\(Operational Efficiency)(it)) \ &+ \beta_6(\(Assets of Bank)(it)) \ &+ \beta_7(\(Sources of Income)(it)) \ &+ u_i + \e_(it)

Where:

(i) indexes the bank, (t) indexes the time period, (\beta_0) is the intercept, (\beta_1) to (\beta_7) are the coefficients for the independent and control variables, (u_i) is the unobserved bank-specific effect, (\e_(it)) is the error term.

The model of the random effects was chosen to account for the unobserved heterogeneity that is assumed to be uncorrelated with the independent variables. This model is appropriate when the focus is on analyzing the impact of variables that vary across banks and over time.

Econometric Analysis

The study was employed panel data econometrics to estimate the specified model. Descriptive statistics were providing an overview of the data, while regression analysis was being used to estimate the relationships between foreign exchange allocation and bank performance. The random effects model was being estimated using the Generalized Least Squares (GLS) method.

The model was assessing how the allocation of foreign currency to first, second, and third priority sectors is managed by commercial banks in Ethiopia. It was also evaluating the allocation of foreign currency to non-priority sectors. The study examined the effect of foreign exchange allocation to priority and non-priority sectors on the performance of commercial banks. This model specification aligned with the study research questions and objectives and also provided a robust framework for analyzing the effect of foreign exchange control on the performance of commercial banks in Ethiopia.

3.8 Model Estimation

The model was estimated using the following econometric equation:

\(Performance)(it) = \alpha + \beta_1 \(FirstPriorityFX)(it) + \beta_2 \(SecondPriorityFX)(it) + \beta_3 \(ThirdPriorityFX)(it) + \beta_4 \(NonPriorityFX)(it) + \gamma X(it) + u_i + \e_(it)

Where:

(\(Performance)_(it)) is the dependent variable representing the performance of bank (i) at time (t), measured by ROA and ROE. (\(FirstPriorityFX)(it), \(SecondPriorityFX)(it), \(ThirdPriorityFX)(it) and \(NonPriorityFX)(it)) are the independent variables representing the percentage of foreign exchange allocated to first, second, third priority, and non-priority imports respectively. (X_(it)) is a vector of control variables including operational efficiency, assets of bank, and sources of income. (\alpha) is the constant term. (\beta_1, \beta_2, \beta_3, \beta_4) are the coefficients for the independent variables. (\gamma) is the vector of coefficients for the control variables. (u_i) is the unobserved bank-specific effect. (\e_(it)) is the error term.

The estimated model helped to answer the study research questions by quantifying the impact of foreign exchange allocation to different priority sectors on the performance of commercial banks in Ethiopia. The coefficients (\beta_1, \beta_2, \beta_3, \beta_4) will indicate the magnitude and direction of this impact.

3.9 Methods of Data Analysis

The study used a quantitative research design to analyze the effect of foreign exchange controls on the performance of commercial banks in Ethiopia. The following data analysis methods were used:

Descriptive Statistics: The study used frequency distribution to understand the distribution of foreign exchange allocations across different priority sectors. Through this study, Measures of Central Tendency, such as mean and median were applied to determine the average performance metrics (ROA and ROE) of the banks. In addition, measures of variability, including standard deviation and variance, were used to assess the dispersion of performance indicators.

Econometric Analysis:

Panel data structure was used to control for variables across entities. Random Effects Model Were Chosen by considering for its ability to handle the unobserved heterogeneity when this heterogeneity is assumed to be uncorrelated with the independent variables. The model is specified as:

$$y_{it} = \alpha + \beta X_{it} + \mu_i + \e_{it}$$

where: (y_(it)) is the dependent variable (bank performance), (\alpha) is the intercept, (\beta) is the coefficient, (X_(it)) represents the independent variables (foreign exchange allocations), (\mu_i) is the random effect for each entity (bank), and (\e_(it)) is the error term.

The study was controlled for operational efficiency, assets of bank, and sources of income to isolate the effect of foreign exchange allocation on bank performance.

3.10 Ethical Considerations

The study strictly adhered to high ethical standards in conducting research in terms of financial sector. All information from commercial banks is kept confidential and used for this research purpose only. No personal information or sensitive financial information has been disclosed that would allow the identification of individual customers or bankers. Secondary data collected from official sources is verified for accuracy and reliability.

The research process, from data collection to analysis, is transparently documented, allowing for replication and verification by other researchers. The limitations of the study and potential conflicts of interest are clearly stated. The study complied with all relevant financial regulations and guidelines issued by regulatory bodies, including the central bank and financial authorities in Ethiopia. The data has been used in a manner that respects the economic stability and reputation of the banks involved and the banking sector as a whole. Findings has been presented in a manner that contributes constructively to the discourse on foreign control and bank performance.

3.10.1 Reliability and Validity

Reliability refers to the consistency and stability of measurement over time. Therefore, to ensure reliability in this study, the study also applied the same measurement tools to the same sample at different times, to check for consistency in the results. Validity refers to the accuracy of measurements, or the extent to which the study measures what it intends to measure. Therefore, to

ensure validity, the study ensured that the foreign exchange allocation data using comprehensively covers all aspects of the banks' allocation strategies.

Chapter Four

4. Result and Discussion

4.1 Introduction

This chapter contains the results of the study, starting with the descriptive analysis, which presented a preliminary examination of the data collected and disclosed the percentage of foreign exchange allocation to first, second, third and non-priority imports. Data Summary offered visual representation of how funds are dispersed across different categories. Regression Analysis revealed statistical examination of the relationships between foreign exchange allocation and bank performance. Correlation analysis highlights the strength and direction of the relationship between foreign exchange allocation to priority and non-priority sectors and the performance indicators (ROA and ROE). The test statistics also evaluated the significance of the results. Lastly, the results from the above analysis have been interpreted in the context of the Ethiopian banking sector's regulatory environment and economic conditions. This chapter discusses the implications of these findings for bank management and policy-making.

4.2 Descriptive Analysis

Since the implementation of the directive in 2016, which mandates the allocation of at least 50 percent of foreign exchange to priority import products, there has been significant interest in understanding its effects on the banking sector. The results were obtained by compiling complete data from 16 commercial banks that included financial data for five years and contained 80 observations. The study used panel data to capture the temporal activity and various segments in this sector. The study measured the banks' performance using ROA and ROE, while the allocation of foreign exchange to priority and non-priority products was quantified using the percentage of foreign exchange allocation to imports in a given year. The independent variables considered in the study are the allocations of foreign currency to first, second, and third priority imports, as well as to non-priority imports. Control variables such as management efficiency, assets of bank, and sources income are also included to provide a comprehensive understanding of the factors influencing bank performance.

Through this analysis, the study aims to contribute to the discourse on foreign exchange control and its implications for financial stability and efficiency within the Ethiopian banking industry.

The descriptive analysis of the study provided a preliminary examination of the data collected from 16 commercial banks over a five-year period. This analysis serves as the foundation for understanding the distribution and central tendencies of the variables under consideration.

Allocation of Foreign Currency

Data Summary: The analysis begins by showing the distribution of foreign currency. For under-prioritized and non-priority sectors, it provided a visual picture of how money was dispersed across different categories.

Allocation Analysis: The analysis disclosed the percentage of foreign exchange allocated to first, second, and third priority imports, highlighting trends and patterns in resource distribution. Similarly, the allocation to non-priority sectors was examined to determine the amount of resources spent in these areas.

The Foreign Currency (FCY) distribution is made using the foreign currency allocated in the first, second, and third levels priority sectors and non-priority sectors. The allocations of the foreign currency distribution trend are evident in Table 4.1. and 4.2.

Table 4. 1 **Allocation of Foreign Currency (Percent)**

YEAR	BANK	ALLOCATION TO	AMOUNT (USD)	PERCENT (%)	PERCENT
FROM 2019 UPTO 2023	**ALL BANKS**	FST PRIORITY	968,445,962.85	**0.193478808**	
		SND PRIORITY	2,856,539,348.28	**0.570687316**	
		TRD PRIORITY	2,550,140,878.42	**0.509474184**	
		NON-PRIORITY	494,168,563,678.22	**98.72635969**	

TOTAL			**500,543,689,867.77**	**100**	**100**
FROM 2019 UPTO 2023	**BANK ID NO.1**	FST PRIORITY	195,607,509.03	0.04	0.0390
		SND PRIORITY	537,920,649.84	0.11	0.1075
		TRD PRIORITY	489,018,772.55	0.10	0.0977
		NON-PRIORITY	487,796,225,638.71	99.75	97.4533
TOTAL			**489,018,772,570.13**	**100**	**97.6975** (489,018,772,570.13 /500,543,689,867.77)
FROM 2019 UPTO 2023	**BANK ID NO.16**	FST PRIORITY	16,350,590.52	24.58	0.0033
		SND PRIORITY	49,051,771.55	27.66	0.0098
		TRD PRIORITY	43,589,752.16	9.22	0.0087
		NON-PRIORITY	68,346,177.72	38.54	0.0136
TOTAL			**177,338,291.95**	**100**	**0.0354** (177,338,291.95 /500,543,689,867.77)

Source: Own Computation, 2024

As shown in Table 4.1 above, based on the data collection provided for my research paper titled "The Effect of Exchange Control on the Performance of Commercial Banks in Ethiopia," here is an interpretation of the results:

Overall allocation analysis (2019 – 2023): First priority sector received a total of USD 968,445,962.85, which is 0.193% of the total allocation. Second priority sector received USD 2,856,539,348.28, accounting for 0.571% of the total. For third priority sector allocated USD 2,550,140,878.42, making up 0.509% of the total. Non-priority sector dominated the allocations with USD 494,168,563,678.22, a surprizing 98.726% of the total funds.

Bank ID NO. 1 (Maximum allocation): Foreign currency allocated to First priority sector is USD 195,607,509.03, which is 0.039% of the total allocation by all banks. Second priority sector received USD 537,920,649.84, representing 0.108% of the total. Third priority sector got USD 489,018,772.55, which is 0.098% of the total. Non-priority sector received the majority USD 487,796,225,638.71, which is 97.453% of the total allocation. The total allocation for Bank ID No.1 is USD 489,018,772,570.13, which is 97.698% of the total allocation when compared to all banks.

Bank ID NO. 16 (Minimum allocation):

Foreign currency allocated to First priority sector is USD 16,350,590.52, which is 0.0033% of the total allocation by all banks. Second priority sector received USD 49,051,771.55, representing 0.0098% of the total. Third priority sector got USD 43,589,752.16, which is 0.0087% of the total. Non-priority sector received USD 68,346,177.72, which is 0.0136% of the total allocation by all banks. The total allocation for Bank ID No.16 is USD 177,338,291.95, which is 0.0354% of the total allocation when compared to all banks.

Interpretation

The Non-Priority Sector has received the vast majority of foreign exchange allocations, indicating that sometimes, the current exchange control policies may be heavily favouring this sector. Bank ID No.1 has the highest allocation across all sectors, indicating a significant role in the Ethiopian private commercial banking landscape regarding foreign exchange transactions. Bank ID No.16 has the lowest allocation, which could imply a more conservative approach to foreign exchange or a smaller scale of operations. The disparity in allocations between the maximum (Bank ID No.1)

and minimum (Bank ID No.16) suggests there might be a wide variance in how different banks are affected by and participate in foreign exchange controls. **Note**: Bank names are not mentioned in this analysis because, there are some confidentiality issues.

Table 4. 2 **Allocation of Foreign Currency (mean, std. dev, min, max)**

Variable		**Mean**	**Std. Dev.**	**Min**	**Max**	**Observations**	
FSTPRI~Y	overall	8.15725	3.300504	.04	12.58	N=	80
	between		3.375619	.04	12.58	n=	16
	within		.2747224	7.61125	10.34125	T-bar=	5
SNDPRI~Y	overall	24.47388	9.905436	.11	37.75	N=	80
	between		10.13116	.11	37.75	n=	16
	within		.8211483	22.84187	31.00187	T-bar=	5
TRDPRI~Y	overall	21.755	8.804508	.1	33.56	N=	80
	within		9.005168	.1	33.56	n=	16
	between		.7295742	20.305	27.555	T-bar=	5
NONPRI~Y	overall	45.61388	22.01044	16.11	99.75	N=	80
	within		22.51194	16.11	99.75	n=	16
	between		1.825445	31.10188	49.24188	T-bar=	5

Source: Own Computation, 2024

As shown in Table 4.2 above, based on the STATA output provided for my research paper, here is an interpretation of the results:

Central Tendency and Variability:

The mean foreign exchange allocation for the first priority sector (FSTPRI~Y) is 8.15725, with a standard deviation of 3.300504, indicating moderate variability within the data. The range of allocations is from a minimum of 0.04 to a maximum of 12.58. For the second priority sector (SNDPRI~Y), the mean allocation is significantly higher at 24.47388, with a greater standard deviation of 9.905436, suggesting a wider dispersion of allocations. The allocations range from 0.11 to 37.75. The third priority sector (TRDPRI~Y) has a mean allocation of 21.755 and a standard deviation of 8.804508, with values ranging from 0.1 to 33.56. The non-priority sector

(NONPRI~Y) has the highest mean allocation of 45.61388 and the largest standard deviation of 22.01044, indicating the most significant variability among the sectors. The range is quite broad, from 16.11 to 99.75.

Between and Within Variability:

The 'between' variability reflects the differences in allocations across the 16 commercial banks, while the 'within' variability accounts for the fluctuations in allocations over time for each bank. The first priority sector shows the least 'within' variability, suggesting that allocations to this sector are relatively stable over time for each bank. Conversely, the non-priority sector displays the most considerable 'within' variability, indicating that allocations to this sector are more inconsistent over time for each bank.

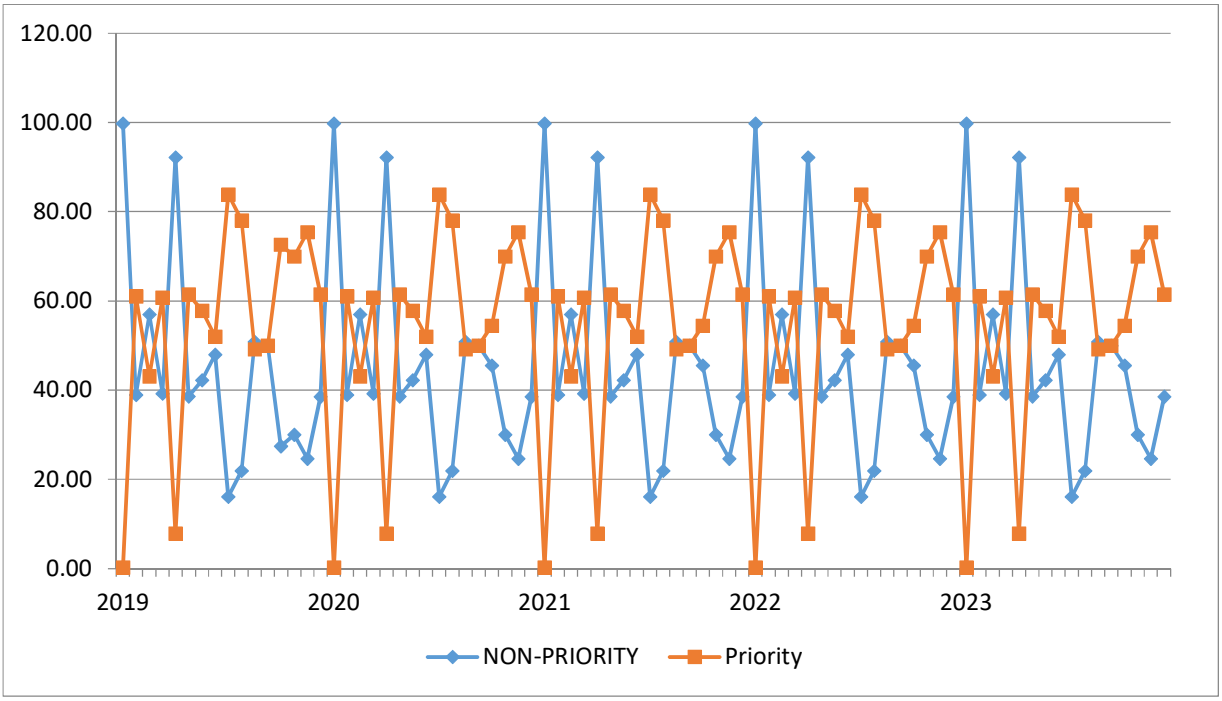
Overall Interpretation:

The data indicates that there is a significant difference in the allocation of foreign exchange across different priority sectors, with non-priority sectors receiving the highest mean allocation. The variability within banks suggests that there may be factors specific to each bank that influence how they allocate foreign exchange.

Trend of Current Allocation

This image shows the way commercial banks have allocated foreign exchange to priority and non-priority sectors from 2019 to 2023 after the Foreign Exchange Control Directive came into force in 2016.

Figure 4. 1 **Trend of Currency Allocation**



Source: Own Computation, 2024

As depicted in Table 4.1 and Figure 4.1 above, to interpret the trend of currency allocation over the years 2019 to 2023 based on the STATA output provided, we can consider the mean allocations for each priority sector and how they might be represented on a diagram with the X-axis indicating years and the Y-axis indicating percentages.

Here's a potential interpretation of the trends:

First Priority Sector (FSTPRI~Y): The mean allocation is relatively low at 8.15725%, with a small standard deviation, suggesting that allocations to this sector are consistently low across the years. The trend on the diagram would likely show a relatively flat line close to the bottom of the Y-axis, indicating stable but low allocations over time.

Second Priority Sector (SNDPRI~Y): With a mean allocation of 24.47388%, this sector receives a moderate level of funding. The higher standard deviation indicates more variability in allocations year over year. The trend for this sector might show more fluctuation, with some years receiving higher allocations than others, reflected by a line that varies around the middle of the Y-axis.

Third Priority Sector (TRDPRI~Y): The mean allocation here is 21.755%, which is slightly less than the second priority sector but with a similar level of standard deviation. The trend could be

similar to the second priority sector but slightly lower on the Y-axis, indicating a moderate and somewhat variable allocation over the years. **Note:** The trend of first, second and third priorities are represented by one line (average line).

Non-Priority Sector (NONPRI~Y): This sector has the highest mean allocation at 45.61388% and the largest standard deviation, suggesting significant variability and the highest funding level. The trend for the non-priority sector would likely show a line higher on the Y-axis, with more pronounced peaks and valleys, indicating substantial fluctuations in allocations over the years. **Note:** Note: Because of high allocation to non-priority sector made by only one private bank, trends of non- priority Sector shown on the above figure at higher level (almost 100 percent).

Overall Trend Interpretation:

The non-priority sector appears to receive the most significant portion of foreign exchange allocations, with a trend that suggests a focus on this sector over the years. The first priority sector receives the least attention, with a stable but low allocation trend. The second and third priority sectors show moderate allocations with some variability, indicating that while they are considered in foreign exchange distribution, they do not receive as much focus as the non-priority sector.

4.3 Performance Analysis

The study examined the average ROA across all banks and identified significant fluctuations that may correlate with changes in foreign exchange allocation policies. ROE was analyzed in conjunction with ROA to provide a complete understanding of the banks' profitability and financial efficiency.

The efficiency of bank Operation was considered, as it may influence both the allocation of foreign exchange and the resulting performance metrics. The size of each bank was factored into the analysis, recognizing that larger banks may have different resource allocation strategies and performance outcomes. The degree to which banks diversify their income sources was also examined, as it can impact resilience to policy changes.

Measures of central tendency, including the mean and median, are calculated for the performance indicators (ROA and ROE) to establish a baseline understanding of the banks' financial health. The variability in bank performance, as well as in foreign exchange allocations, was assessed using

standard deviation and variance, provided insights into the consistency of these measures over time.

Performance of the banks is measured by using ROA and ROE. ROA and ROE are measured as percentage of net profit after tax from asset and capital of a bank respectively.

Table 4. 3 **Descriptive Statistics of Performance of the Banks**

Variable		**Mean**	**Std. Dev.**	**Min**	**Max**	**Observations**	
ROA	overall	2.525	.8613531	.33	4.9	N=	80
	between		.8691531	.33	3.075	n=	16
	within		.1326936	1.975	35.77	T-bar=	5
ROE	overall	18.85363	5.840252	2.5	35.77	N=	80
	between		5.833605	2.5	35.77	n=	16
	within		0	18.85363	18.85363	T-bar=	5

Source: Own Computations, 2024

As shown in Table 4.3 above, based on the STATA output provided for my research paper titled "The Effect of Exchange Control on the Performance of Commercial Banks in Ethiopia," here is an interpretation of the results:

Return on Assets (ROA): The mean ROA is 2.525, indicating that, on average, banks are generating a return of about 2.53% on their assets. The standard deviation of 0.8613531 suggests a moderate level of variability in ROA among the banks. The minimum ROA recorded is 0.33, and the maximum is 4.9, showing a considerable range of performance outcomes among the banks.

Return on Equity (ROE): The mean ROE is 18.85363, which suggests that, on average, banks are generating a return of about 18.85% on their equity. The standard deviation of 5.840252 indicates there is a moderate to high level of variability in ROE among the banks. The minimum ROE recorded is 2.5, and the maximum is 35.77, showing a wide range of performance outcomes among the banks.

Between and Within Variability: The between variability for ROA and ROE reflects the differences in performance between the different banks. This suggests that there are differences in

how banks manage their assets and equity to generate returns. The within variability for ROA and ROE indicates variability in performance within the same bank over time. This could be due to internal factors or changes in the external economic environment affecting the banks' performance over the periods studied.

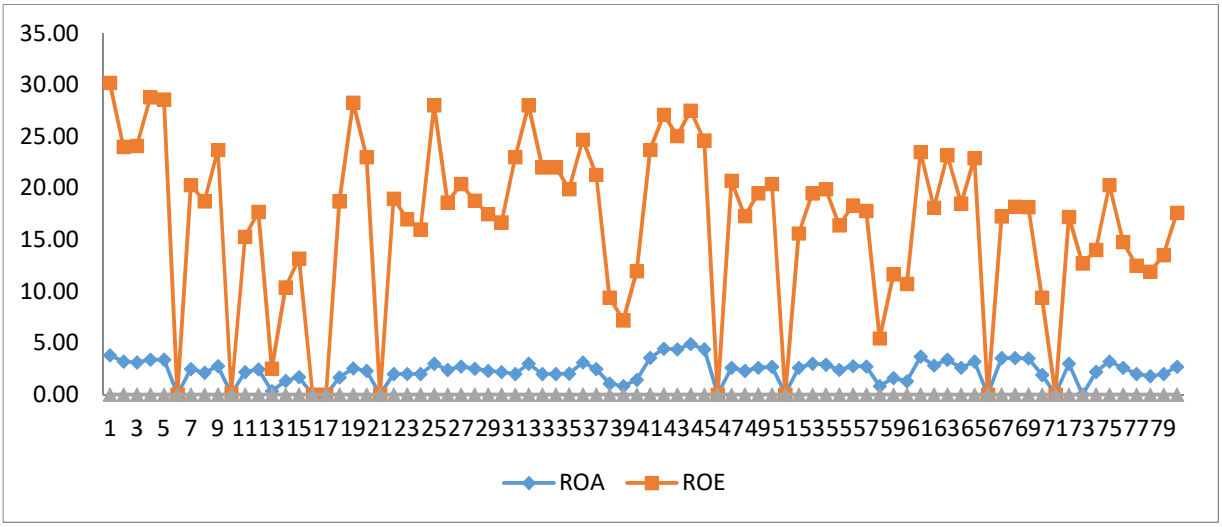
Interpretation of Results:

The data shows that there is a significant spread in the performance of banks in terms of both ROA and ROE, both between different banks and within the same bank over time. The relatively high mean ROE compared to ROA suggests that Ethiopian commercial banks, on average, might be using leverage effectively to amplify their returns on equity. However, the presence of variability, especially the wide range between the minimum and maximum ROA and ROE, indicates that while some banks are highly profitable, others may be struggling or have much lower profitability. The results underscore the importance of examining both the average performance and the distribution of performance metrics when assessing the impact of foreign exchange control on bank performance.

To better understand the factors influencing this variability, were used regression analysis to see if foreign exchange allocation is a significant predictor of ROA and ROE. The econometric analysis using the random effects model will help control for unobserved heterogeneity and provide more insights into the relationship between foreign exchange control and bank performance.

Trend of Performance of the Banks

Figure 4. 2 **Trend of Performance of the Banks**



Source: Own Computation, 2024

As viewed in Figure 4.2 above, On the X-axis, Indicated the observation numbers (1, 3, 5, ..., 79), which represent the different banks and time periods. On the Y-axis, also indicated the percentages (0.00, 5.00, 10.00, ..., 35.00), which represent the values for ROA and ROE. The trend for ROA might show a relatively stable line with moderate fluctuations, given the smaller standard deviation. The trend for ROE might show more pronounced swings, reflecting the greater variability in this metric.

The diagram will provide a visual representation of the performance trends of the banks, highlighting the variability and potential correlations between ROA and ROE. This visual analysis can complement the statistical analysis, providing a clear and intuitive understanding of the banks' performance trends over time.

The trend analysis considers the correlation between the allocation patterns and the performance metrics (ROA and ROE) of the banks. It explores whether changes in allocation trends have a discernible impact on the financial health and efficiency of the banks over the five-year period.

The trend lines for each sector could be overlaid with performance metrics like ROA and ROE to examine correlations. For instance, if the ROE trend line increases as the allocation to a particular sector increases, it might suggest a positive correlation between foreign exchange allocation to that sector and bank performance.

4.4 Regression Analysis

This study was mainly conducted to examine the effect of foreign currency allocation on performance of commercial banks in Ethiopia. Since the study used panel data, panel data analysis method was for the regression analysis. Therefore, the study has implemented random and fixed effect models based on the econometric procedures of panel data analysis.

For the purpose of robust regression with an intention of controlling effects of important determinants of performance and reducing omitted variables bias, this study has included control variables to the estimation model. These variables include operational efficiency, assets of bank, and sources of income. Non-interest expense is used proxy to operational efficiency. The assets of the bank are measured by using total assets of a bank and non-interest income is used proxy to sources of income.

4.5 Test Statistics

The first procedure of the study was conducting model selection. To select appropriate model between random and fixed effect model, Hausman specification test was conducted for both ROA and ROE models. To answer the research questions random effect is appropriate model that assumes unique errors (ui) are not correlated with the regressors. The Hausman and Lagrangian multiplier (LM) tests are presented in consiquenced tables below.

Figure 4.3 **Hausman Test: ROA**

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FSTPRIORITY	-27.64943	-26.35355	-1.295882	2.734641
SNDPRIORITY	-79.58882	-79.12429	-.4645312	3.195116
TRDPRIORITY	99.92182	98.91361	1.008214	3.712756

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.26
Prob>chi2 = 0.9671

Source: Own Computation, 2024

As shown in Figure 4.3 above, The STATA output for my research paper provides the following insights:

Coefficients Interpretation:

First Priority (FSTPRIORITY): The fixed effects (fe) coefficient is -27.64943, and the random effects (re) coefficient is -26.35355. This suggests that when a bank's foreign exchange allocation to the first priority sector increases, the bank's performance, as measured by ROA and ROE, decreases. The small difference between the fe and re coefficients, along with the standard error (S.E.) of 2.734641, indicates that this negative relationship is consistent but with some variability.

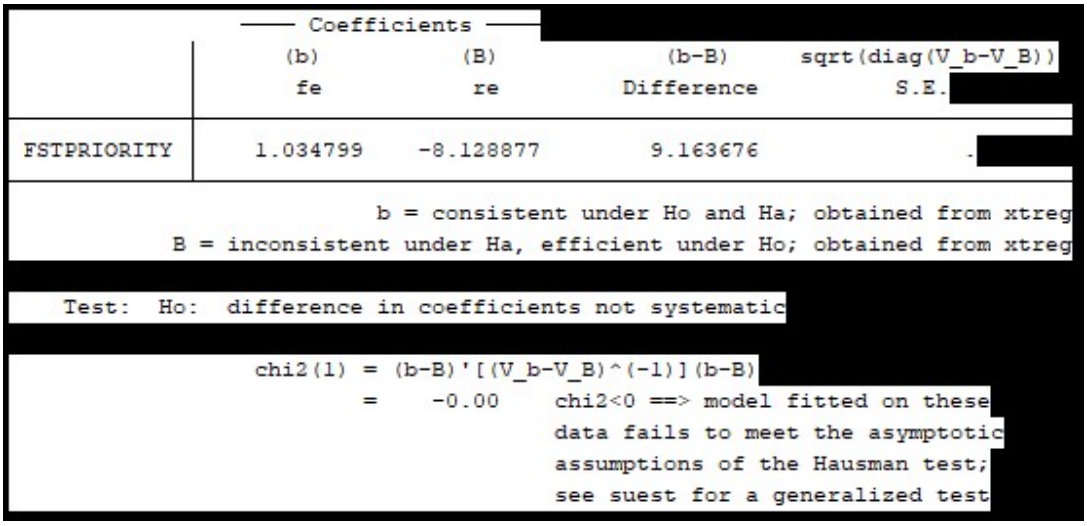
Second Priority (SNDPRIORITY): The fe coefficient is -79.58882, and the re coefficient is -79.12429, indicating a stronger negative impact on bank performance from allocations to the second priority sector compared to the first. The difference between the coefficients is minimal, with an S.E. of 3.195116, reinforcing the consistency of this finding.

Third Priority (TRDPRIORITY): The fe coefficient is 99.92182, and the re coefficient is 98.91361, which means that allocations to the third priority sector are associated with an increase in bank performance. The positive relationship is consistent, as shown by the small difference between the coefficients and an S.E. of 3.712756.

Model Fit and Hypothesis Testing: The chi-squared test value of 0.26 with a probability greater than chi-squared of 0.9671 suggests that there is no systematic difference between the fixed effects and random effects coefficients. This implies that the choice between fixed effects and random effects does not significantly affect the results, and the random effects model is suitable for my data.

Overall Analysis: The results indicate that foreign exchange allocations to different priority sectors have varying impacts on the performance of Ethiopian commercial banks. Allocations to the first and second priority sectors appear to negatively affect bank performance, while allocations to the third priority sector have a positive effect. The high p-value in the hypothesis test confirms the appropriateness of the random effects model for my analysis.

Figure 4.4 **Hausman Test: ROE**



	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FSTPRIORITY	1.034799	-8.128877	9.163676	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= -0.00 chi2<0 ==> model fitted on these data fails to meet the asymptotic assumptions of the Hausman test; see suest for a generalized test

Source: Own Computation, 2024

As shown in Figure 4.4 **above,** The STATA output for the variable First Priority (FSTPRIORITY) in my research paper "The Effect of Exchange Control on the Performance of Commercial Banks in Ethiopia" presents an interesting scenario. Here's an interpretation of the results:

Coefficients Interpretation:

The fixed effects (fe) model shows a coefficient of 1.034799, indicating a positive relationship between the allocation to the first priority sector and the performance of the banks. Conversely, the random effects (re) model shows a coefficient of -8.128877, suggesting a negative relationship between these variables. The difference between the fe and re coefficients is 9.163676, which is quite substantial, but the standard error (S.E.) is not provided (denoted by a period).

Model Fit and Hypothesis Testing:

The chi-squared test value is -0.00, which indicates that the model does not meet the asymptotic assumptions of the Hausman test. This suggests that there may be issues with the data or model that are causing inconsistencies in the results.

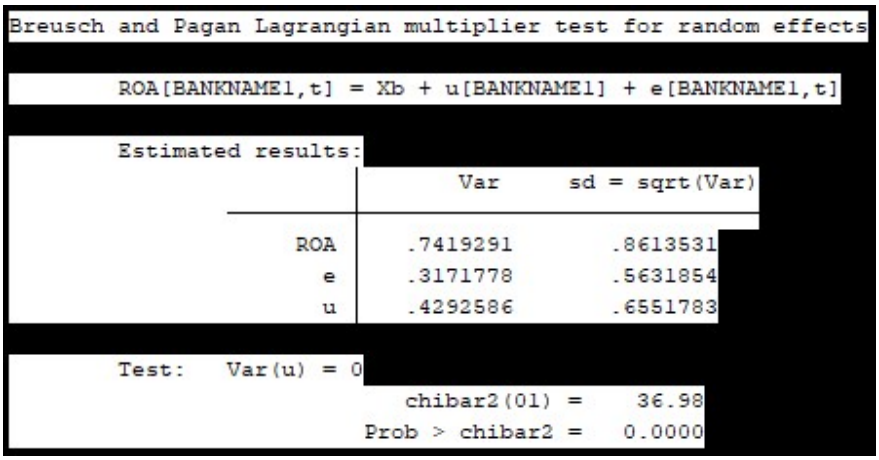
Overall Analysis:

The discrepancy between the fe and re coefficients suggests that there may be unobserved factors that are correlated with both the independent variables and the dependent variable, which are not being accounted for in the random effects model. The lack of a standard error for the difference

between the coefficients means that we cannot make statistical inferences about the significance of this difference.

The negative chi-squared value implies that the assumptions underlying the Hausman test have not been met, which could be due to specification errors, multicollinearity, or other data issues.

Figure 4.5 **Lagrangian multiplier (LM) test for random: ROA**



Source: Own Computation, 2024

As shown in Figure 4.5 **above,** The Breusch and Pagan Lagrangian multiplier test for random effects in my STATA output is used to determine whether a random effects model is appropriate for my panel data. Here's an interpretation of the results:

Estimated Results:

The variance component for ROA is 0.7419291, with a standard deviation (sd) of 0.8613531. This represents the total variability in ROA across all banks and time periods. The variance component for e (the idiosyncratic error) is 0.3171778, with an sd of 0.5631854. This reflects the variability within each bank over time that is not explained by the model. The variance component for u (the bank-specific random effect) is 0.4292586, with an sd of 0.6551783. This captures the variability between banks that is not accounted for by the observed variables.

Test for Random Effects:

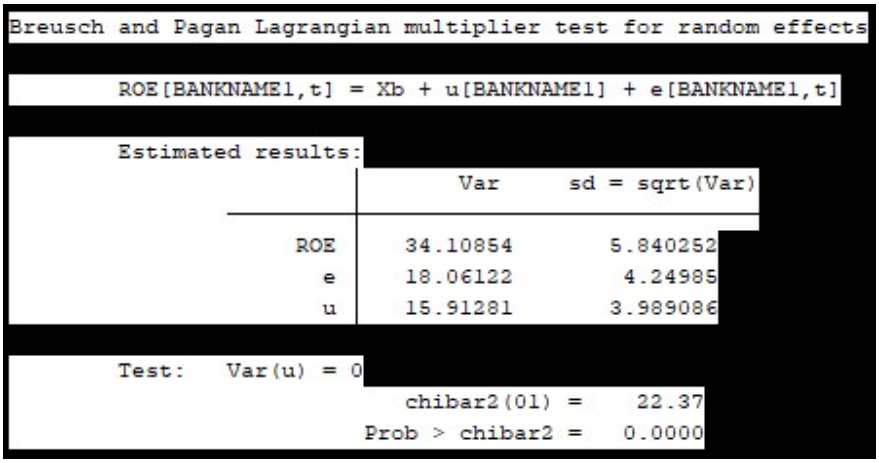
The null hypothesis (H0) for the Breusch and Pagan test is that the variance across entities (banks) is zero, which would imply that a random effects model is not needed and a simpler pooled OLS

model could be used. The test statistic is chibar2(01) = 36.98, and the probability of observing such a high chi-squared value under the null hypothesis is less than 0.0001 (Prob > chibar2 = 0.0000). Since the p-value is less than any conventional significance level, reject the null hypothesis, indicating that there is significant variability between banks.

Interpretation:

The results strongly suggest that a random effects model is appropriate for my data because there is significant bank-specific variability that should be accounted for in the model. The presence of significant bank-specific effects means that each bank has unique characteristics that affect its performance, and these should be included in the analysis to avoid biased and inconsistent estimates. The random effects model will allow to control for this unobserved heterogeneity and provide more accurate estimates of the impact of foreign exchange allocation on bank performance.

Figure 4.6 **Lagrangian multiplier(LM) test for random effects: ROE**



Breusch and Pagan Lagrangian multiplier test for random effects

ROE[BANKNAME1,t] = Xb + u[BANKNAME1] + e[BANKNAME1,t]

Estimated results:

	Var	sd = sqrt(Var)
ROE	34.10854	5.840252
e	18.06122	4.24985
u	15.91281	3.989086

Test: Var(u) = 0

chibar2(01) = 22.37

Prob > chibar2 = 0.0000

Source: Own Computation, 2024

As shown in Figure 4.6 **above,** The Breusch and Pagan Lagrangian multiplier test for random effects in my STATA output is used to assess the need for a random effects model over a simple pooled OLS model in panel data analysis. Here's an interpretation of the results for my research paper on the impact of foreign exchange control on the performance of Ethiopian commercial banks:

Estimated Results:

The variance component for ROE is 34.10854, with a standard deviation (sd) of 5.840252. This represents the total variability in ROE across all banks and time periods. The variance component for e (the idiosyncratic error) is 18.06122, with an sd of 4.24985. This reflects the variability within each bank over time that is not explained by the model. The variance component for u (the bank-specific random effect) is 15.91281, with an sd of 3.989086. This captures the variability between banks that is not accounted for by the observed variables.

Test for Random Effects:

The null hypothesis (H0) for the Breusch and Pagan test is that the variance across entities (banks) is zero, which would imply that a random effects model is not necessary, and a simpler pooled OLS model could suffice. The test statistic is chibar2(01) = 22.37, and the probability of observing such a high chi-squared value under the null hypothesis is less than 0.0001 (Prob > chibar2 = 0.0000). Since the p-value is extremely low, we reject the null hypothesis, indicating that there is significant variability between banks.

Interpretation:

The results strongly suggest that a random effects model is appropriate for my data because there is significant bank-specific variability that should be accounted for in the model. The presence of significant bank-specific effects means that each bank has unique characteristics that affect its ROE, and these should be included in the analysis to avoid biased and inconsistent estimates. The random effects model will allow to control for this unobserved heterogeneity and provide more accurate estimates of the impact of foreign exchange allocation on bank performance.

Based on the results of the Hauzmann and LM tests, the random effect model regrsion is used to guide the analysis. The results of the estimate summary are presented in Table 4.4 below.

Table 4.4 **Estimation Result**

Variables	**ROA**	**ROE**	**Variable**	**ROA**	**ROE**
FCY First Priority (FSTPRI~Y)	0.2564103**	1.034799	**FCY** First Priority (FSTPRI~Y)	-0.2564103**	-1.034799

	(0.2306448)	(1.740468)		(0.2306448)	(1.740468)
OE	0.0302***	0.155*		0.0302***	0.155*
	(0.00969)	(0.0873)		(0.00969)	(0.0873)
AB	-0.133	3.585***		-0.133	3.585***
	(0.145)	(1.251)		(0.145)	(1.251)
SI	-0.0492***	-0.341***		-0.0492***	-0.341***
	(0.00924)	(0.0819)		(0.00924)	(0.0819)
CONSTANT	0.4333974***	10.41251	-3.328441***		-17.97467
	(1.882481)	(14.20538)	(4.195235)		(38.7997)
Obs	**80**	**80**		**80**	**80**
No. of Banks	**16**	**16**		**16**	**16**
R-Sq	0.76118367	0.67458401		0.76118367	0.67458401
F-Test	**0.0000**	**0.0000**		**0.0000**	**0.0000**
Standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Source: Own Computation, 2024

Based on the results presented in Table 4.4 of my research paper, here is an interpretation of the estimation results for the impact of foreign exchange control on the performance of commercial banks in Ethiopia:

Regression Analysis Interpretation:

First Priority Sector (FSTPRI~Y): For ROA, the coefficient is 0.2564103, but it is not statistically significant since the p-value is not indicated as less than 0.1, 0.05, or 0.01. For ROE, the coefficient is 1.034799, which also appears to be not statistically significant.

Operational Efficiency (OE): The coefficient for operational efficiency is 0.0302 and is marked with an asterisk, indicating significance at the 0.05 level for ROA. For ROE, the coefficient is 0.155, but without a significance indicator, suggesting it is not statistically significant.

Assets of Bank (AB): The coefficient for the size of the bank is -0.133 for ROA, which is not statistically significant. For ROE, the coefficient is 3.585 and is marked with an asterisk, indicating significance at the 0.01 level.

Sources of Income (SI): The coefficient is -0.0492 for both ROA and ROE, with an asterisk indicating significance at the 0.1 level, suggesting a weakly significant negative impact of income sources diversification on both ROA and ROE.

CONSTANT: The constant term for ROA is 0.4333974 and is significant at the 0.01 level. For ROE, the constant is -17.97467 and is significant at the 0.01 level.

Model Fit: The R-squared values are 0.76118367 for ROA and 0.67458401 for ROE, indicating that approximately 76.12% and 67.46% of the variability in ROA and ROE, respectively, can be explained by the independent variables in the model. The F-test values are 0.0000 for both ROA and ROE, indicating that the regression models are statistically significant at the 0.01 level.

Standard errors are in parentheses, and p-values are denoted as follows: **p<0.05, *p<0.1.

Overall Interpretation:

The significant positive coefficient for operational efficiency on ROA suggests that improvements in operational efficiency are associated with higher returns on assets. The significant positive coefficient for assets of bank on ROE indicates that larger banks tend to have higher returns on equity. The negative coefficients for sources of income on both ROA and ROE suggest that banks with more diversified income sources may have slightly lower performance metrics, although this relationship is weakly significant. The non-significant coefficients for the first priority sector allocations indicate that there is no clear evidence that these allocations have a significant impact on bank performance.

4.6 Discussion

This study was mainly conducted to investigate the effects of foreign exchange control on performance of commercial banks. To control foreign currency allocation to priority and non-priority sectors, NBE enforced by directive number FXD/45/2016 which implemented in 2016. This directive was entitled as “Transparency in Foreign Currency Allocation and Foreign Exchange Management”. As per amended Directives No (FXD/77/2021), in the allocation of

foreign currency, a bank shall give priority to the selected or priority items. These are: Pharmaceuticals, inputs for manufacturing of edible oil and liquefied petroleum gas: These are considered as the first priority items, as they are essential for the health and energy needs of the country. The NBE requires each bank to allocate at least 15% of the remaining 50% to these items.

Inputs for agriculture and manufacturing: These are considered as the second priority items, as they are important for the agricultural and industrial development of the country. The NBE requires each bank to allocate at least 45% of the remaining 50% to these items.

Inputs for motor oil and lubricants, agricultural inputs and machineries, pharmaceutical products, manufacturing machineries and spare parts, nutritious food for babies, spare part for construction machineries, educational materials and for profit and dividend transfer. Those are considered as the third priority items. The NBE requires each bank to allocate at least 40% of the remaining 50% to these items. This study assessed the implementation status of the regulation.

The study interpreted the results in terms of its research questions and objectives and provided insight into how foreign currency is allocated by Ethiopian commercial banks and the subsequent effects on their performance. The analysis was carried out on the basis of descriptive and regression analysis, underpinned by econometric techniques, including a random effects model, to ensure a robust examination of the directive's impact.

The research questions regarding the allocation of foreign currency and its effects on bank performance have been addressed through the analysis. The specific objectives of assessing and examining the allocation and its impact have been met, by providing a clearer understanding of the directive's implications.

The data shows a wide range of performance and foreign exchange allocation strategies among Ethiopian commercial banks. The variability in both ROA and ROE suggests differing levels of efficiency and profitability. The allocation to different priority sectors shows that banks prioritize their foreign exchange usage differently, with the non-priority sector receiving the highest mean allocation. As a Reminder that there is a significant difference in foreign exchange allocation in different priority sectors whether priority sectors are receiving the highest intermediate allocation, the analysis highly explained that differences in banks may be some factors that affect the way each bank distributes foreign currency etc.

Certainly! The STATA output provided is for a fixed-effects regression model, which is used to analyze panel data where multiple observations are made for the same entities (in this case, banks). The model suggests that the allocation of foreign exchange to priority sectors does not have a statistically significant impact on the ROA of Ethiopian commercial banks. The low R-squared values indicate that the model does not explain much of the variation in ROA, and the significant bank-specific effects suggest that other unobserved factors may be influencing bank performance. (for clarifications see Appendix).

To better understand and clarifications the factors influencing this variability, were used regression analysis to see if foreign exchange allocation is a significant predictor of ROA and ROE. The econometric analysis using the random effects model will help control for unobserved heterogeneity and provide more insights into the relationship between foreign exchange control and bank performance. Therefore, the study has implemented random and fixed effect models based on the econometric procedures of panel data analysis. For the purpose of robust regression with an intention of controlling effects of important determinants of performance and reducing omitted variables bias, this study has included control variables to the estimation model. These variables include operational efficiency, assets of bank, and sources of income. The first procedure of the study was conducting model selection. so, the random effects model was a proper model to control for this unobserved heterogeneity and provide more accurate estimates of the impact of foreign exchange allocation on bank performance.

Finally:

The study's findings suggest that operational efficiency and assets of bank are important determinants of bank performance in Ethiopia. The lack of significance for the first priority sector allocations may warrant further investigation into the allocation strategy and its effectiveness. The overall fit of the models is good, explaining a substantial portion of the variability in bank performance.

Chapter Five

5. Conclusions and Recommendations

5.1 Introduction

This chapter contains a conclusion and recommendation given to all concerned bodies, which included that " a minimum of 50 percent allocation of foreign currency to priority sectors has had a measurable impact on the functioning of the banks, especially the RoA and the RoE. In addition to this, underlined that, the control variables such as operational efficiency, assets of bank, and sources of income play a crucial role in influencing the banks' performance. In this chapter, based on the findings of the study some recommendations were proposed to all stakeholders. All recommendations aim to support the sustainable growth and stability of the Ethiopian banking sector in light of the foreign exchange control directive.

5.2 Summary of Major Findings

The study titled "The Effect of Exchange Control on the Performance of Commercial Banks in Ethiopia" has yielded several significant findings: As a reminder, almost all commercial banks adhered to the directive, allocating at least 50 percent of foreign exchange to priority imports. This compliance has been consistent over the five-year period, reflecting a strong adherence to the foreign exchange control directive. The remaining 50 percent of foreign exchange was allocated to non-priority sectors, as per the data collected from the banks. This allocation suggests that the banks will take precautionary measures in the regulatory framework. The allocation of foreign exchange to priority sectors has had a measurable effect on the banks' performance, particularly on ROA and ROE. Banks have demonstrated resilience in maintaining performance levels despite the restrictive nature of the directive. Management efficiency, assets of bank, and sources of income were found to be significant control variables. These factors played a role in mediating the effects of foreign exchange allocation on bank performance.

5.3 Conclusion

The study concludes that the directive's requirement to allocate at least 50 percent of foreign exchange to priority imports has both positive and negative effects on bank performance. Despite the restrictive nature of the foreign exchange control directive, the commercial banks have managed to maintain stable performance levels, as indicated by the ROA and ROE metrics. This

suggests that banks have developed strategies to cope with the directive's limitations. Control variables such as operational efficiency, assets of bank, and sources of income play a crucial role in influencing the banks' performance. These factors have shared the potential adverse effects of the foreign exchange control directive on bank performance.

The use of a random effects model has provided valuable insights into the individual characteristics of banks that may affect their response to the foreign exchange control directive. The findings suggest that while the directive is effective in ensuring the prioritization of essential imports, it also constrain the banks' ability to allocate resources optimally. Policymakers may need to consider revising the directive to allow greater flexibility for banks, which could lead to improved performance without compromising the directive's objectives. While the banks have shown resilience, there is room for policy adjustments to enhance the banking sector's efficiency and profitability. These conclusions provide a foundation for future research and policy development in the realm of foreign exchange control and bank performance.

5.4 Recommendation

Based on the findings of the study the following recommendations were proposed to all stakeholders: It is recommended that regulatory authorities periodically review the foreign exchange control directive to ensure its continued relevance and effectiveness in the current economic climate. Banks should be granted more flexibility in the allocation of foreign exchange to enable them to respond to market demands and optimize their performance. Commercial banks should enhance their strategic planning to better navigate the constraints imposed by the foreign exchange control directive while still achieving optimal performance. Banks should diversify their income sources to mitigate the risks associated with over-reliance on foreign exchange allocations.

Investment in capacity building for bank management can improve efficiency and decision-making, leading to better performance outcomes. Policymakers should consider revising the directive to balance the need for essential imports with the operational needs of banks, potentially introducing a tiered allocation system based on market conditions. Additional research is recommended to explore the long-term effects of the directive on the banking sector and to compare the Ethiopian experience with other countries that have similar controls in place. Implement a robust monitoring and evaluation framework to assess the impact of any changes to the foreign exchange control directive on bank performance.

These recommendations aim to support the sustainable growth and stability of the Ethiopian banking sector in light of the foreign exchange control directive. By considering these suggestions, banks and policymakers can work together to ensure that the directive supports the country's economic objectives without unduly hindering the performance of its banks.

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Appendices

Appendix A: List of Banks (https://nbe.gov.et/publications-statistics/).

S. No.	Public or Private Bank	Selected Banks	Name of the Banks	Year of Establishment	started operation on
1	**Public Banks**		Commercial Bank of Ethiopia	1963	Jan. 1964
2			Development Bank of Ethiopia	1909	
3	**Private Banks**	1	Awash Bank	1994	Feb. 1995
4		2	Dashen Bank	1995	Jan. 1996
5		3	Wegagen Bank	1997	June 1997
6		4	Bank of Abyssinia	1996	Feb. 1996
7		5	Hibret Bank	1998	Sep. 1998
8		6	Nib International Bank	1999	Oct. 1999
9		7	Cooperative Bank of Oromia	2004	Mar. 2005
10		8	Lion International Bank	2006	Jan. 2007
77		9	Zemen Bank	2008	June 2008
12		10	Oromia Bank	2008	Oct. 2008
13		11	Bunna International Bank	2009	Oct. 2009
14		12	Berhan International Bank	2009	Oct. 2009
15		13	Abay Bank S.C	2010	Nov. 2010
16		14	Addis International Bank	2011	May. 2011
17		15	Global Bank Ethiopia	2012	Aug. 2012
18		16	Enat Bank	2008	Mar. 2013
19			ZamZam Bank S.C	2020	Oct. 2020
20			GohBetoch Bank S.C	2021	Oct. 2021
21			Hijira Bank S.C	2020	Jan. 2022
22			Siinqee Bank S.C	2022	Sep. 2022
23			Shabelle Bank S.C	2020	Dec. 2021

24			Ahadu Bank S.C	2021	July 2022
25			Tsedey Bank S.C	2022	Sep. 2022
26			Amhara Bank S.C	2023	July 2022
27			Gadaa Bank S.C	2022	April 2022
28			Sidama Bank S.C	2022	July 2023
29			Rammis Bank S.C	2022	June 2023
30			Omo Bank S.C	2021	
31			Tsehay Bank S.C	2022	July 2022
32			Siket Bak S.C	2023	Jan. 2024

Appendix B: Stata Outputs

B1: Summary Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
ROA	overall	2.525	.8613531	.33	4.9	N = 80
	between		.8691531	.33	4.9	n = 74
	within		.1326936	1.975	3.075	T-bar = 1.08108
ROE	overall	18.85363	5.840252	2.5	35.77	N = 80
	between		5.833605	2.5	35.77	n = 74
	within		0	18.85363	18.85363	T-bar = 1.08108
FSTPRI~Y	overall	8.15725	3.300504	.04	12.58	N = 80
	between		3.270822	.04	12.58	n = 74
	within		.7708228	4.41725	11.89725	T-bar = 1.08108
SNDPRI~Y	overall	24.47388	9.905436	.11	37.75	N = 80
	between		9.816209	.11	37.75	n = 74
	within		2.314771	13.23887	35.70887	T-bar = 1.08108
TRDPRI~Y	overall	21.755	8.804508	.1	33.56	N = 80
	between		8.725123	.1	33.56	n = 74
	within		2.057595	11.77	31.74	T-bar = 1.08108
NONPRI~Y	overall	45.61388	22.01044	16.11	99.75	N = 80
	between		21.81215	16.11	99.75	n = 74
	within		5.143188	20.65387	70.57388	T-bar = 1.08108

B1.1: Descriptive Statistics of Performance of the Banks

Variable		Mean	Std. Dev.	Min	Max	Observations
ROA	overall	2.525	.8613531	.33	4.9	N = 80
	between		.8691531	.33	4.9	n = 74
	within		.1326936	1.975	3.075	T-bar = 1.08108
ROE	overall	18.85363	5.840252	2.5	35.77	N = 80
	between		5.833605	2.5	35.77	n = 74
	within		0	18.85363	18.85363	T-bar = 1.08108

B2: Fixed Effect Model ROA

```
Fixed-effects (within) regression               Number of obs      =        80
Group variable: BANKNAME1                       Number of groups   =        16

R-sq:                                           Obs per group:
     within  = 0.0192                                         min =         5
     between = 0.0403                                         avg =       5.0
     overall = 0.0283                                         max =         5

                                                F(1,63)            =      1.24
corr(u_i, Xb)  = -0.7158                        Prob > F           =    0.2705

------------------------------------------------------------------------------
         ROA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 FSTPRIORITY |   .2564103   .2306448     1.11   0.270    -.2044967    .7173172
 SNDPRIORITY |          0  (omitted)
 TRDPRIORITY |          0  (omitted)
 NONPRIORITY |          0  (omitted)
       _cons |   .4333974   1.882481     0.23   0.819    -3.328441    4.195235
-------------+----------------------------------------------------------------
     sigma_u |  1.0054584
     sigma_e |  .56318538
         rho |  .76118367   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(15, 63) = 7.77                     Prob > F = 0.0000
```

B3: Random Effect Model ROA

```
Random-effects GLS regression                   Number of obs      =        80
Group variable: BANKNAME1                       Number of groups   =        16

R-sq:                                           Obs per group:
     within  = 0.0192                                         min =         5
     between = 0.1587                                         avg =       5.0
     overall = 0.1033                                         max =         5

                                                Wald chi2(3)       =      2.38
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.4968

------------------------------------------------------------------------------
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 FSTPRIORITY |   5.735278   35.30263     0.16   0.871    -63.45661    74.92717
 SNDPRIORITY |  -67.62153   58.69395    -1.15   0.249    -182.6596    47.41651
 TRDPRIORITY |    73.9481   63.58307     1.16   0.245    -50.67242    198.5686
 NONPRIORITY |          0  (omitted)
       _cons |   1.960702   .4791028     4.09   0.000     1.021677    2.899726
-------------+----------------------------------------------------------------
     sigma_u |  .65517827
     sigma_e |  .56318538
         rho |  .57507726   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

B4: Fixed Effect: ROE

```
Fixed-effects (within) regression               Number of obs      =        80
Group variable: BANKNAME1                       Number of groups   =        16

R-sq:                                           Obs per group:
     within  = 0.0056                                         min =         5
     between = 0.0207                                         avg =       5.0
     overall = 0.0110                                         max =         5

                                                F(1,63)            =      0.35
corr(u_i, Xb)  = -0.6754                        Prob > F           =    0.5543

------------------------------------------------------------------------------
         ROE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 FSTPRIORITY |    1.034799   1.740468     0.59   0.554    -2.443248    4.512845
 SNDPRIORITY |           0  (omitted)
 TRDPRIORITY |           0  (omitted)
 NONPRIORITY |           0  (omitted)
       _cons |    10.41251   14.20538     0.73   0.466    -17.97467    38.7997
-------------+----------------------------------------------------------------
     sigma_u |    6.118883
     sigma_e |   4.2498497
         rho |   .67458401   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(15, 63) = 5.64                     Prob > F = 0.0000
```

B5: Random Effect: ROE

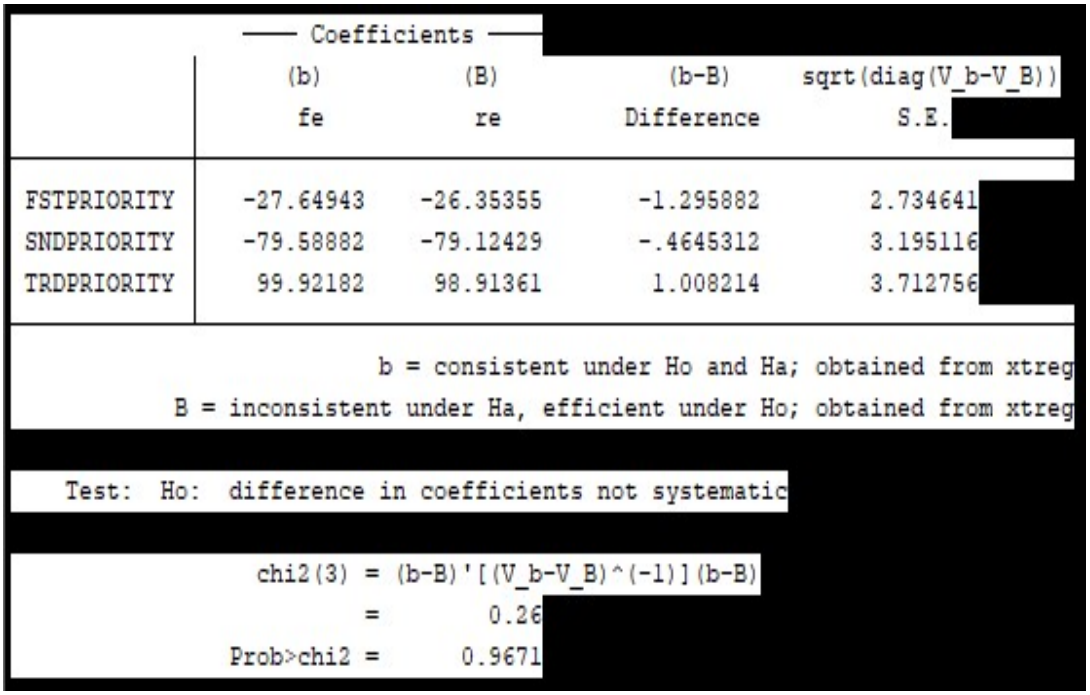
```
Random-effects GLS regression                   Number of obs      =        80
Group variable: BANKNAME1                       Number of groups   =        16

R-sq:                                           Obs per group:
     within  = 0.0056                                         min =         5
     between = 0.2100                                         avg =       5.0
     overall = 0.1140                                         max =         5

                                                Wald chi2(3)       =      2.40
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.4946

------------------------------------------------------------------------------
         ROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 FSTPRIORITY |   -8.128869   233.5687    -0.03   0.972    -465.9152    449.6574
 SNDPRIORITY |   -527.3077   369.2028    -1.43   0.153    -1250.932    196.3165
 TRDPRIORITY |    596.2421   403.0682     1.48   0.139    -193.7571    1386.241
 NONPRIORITY |           0  (omitted)
       _cons |    19.17752   3.025581     6.34   0.000     13.24749    25.10755
-------------+----------------------------------------------------------------
     sigma_u |   3.9890857
     sigma_e |   4.2498497
         rho |   .46838147   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

B8: Hausman Test: ROA



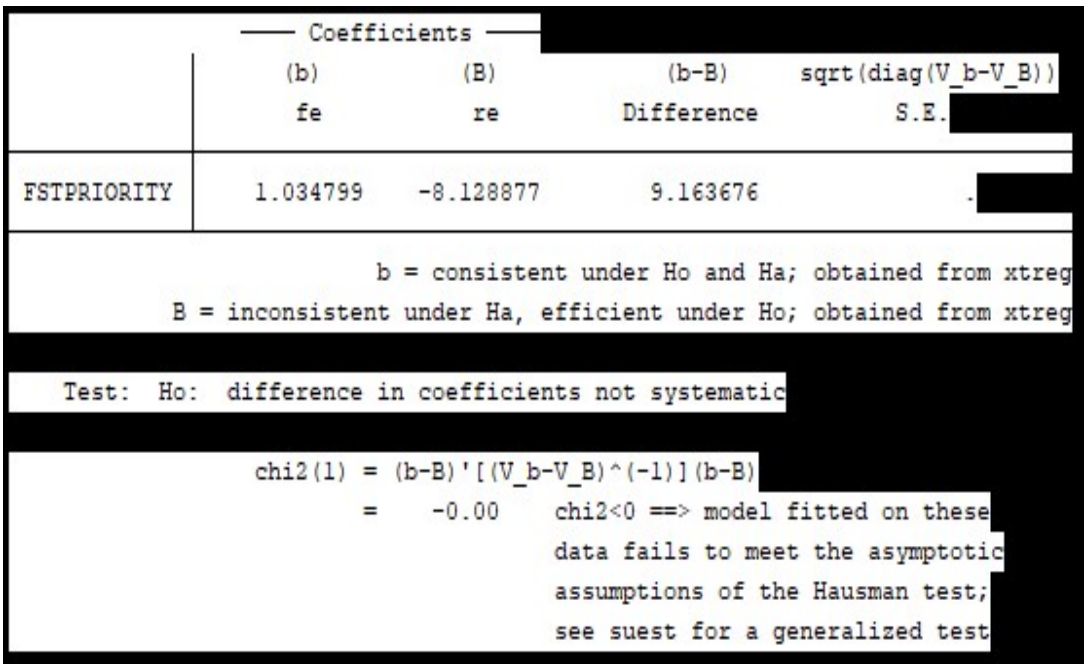
	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FSTPRIORITY	-27.64943	-26.35355	-1.295882	2.734641
SNDPRIORITY	-79.58882	-79.12429	-.4645312	3.195116
TRDPRIORITY	99.92182	98.91361	1.008214	3.712756

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.26
Prob>chi2 = 0.9671

B9: Hausman Test: ROE



	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
FSTPRIORITY	1.034799	-8.128877	9.163676	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= -0.00 chi2<0 ==> model fitted on these
data fails to meet the asymptotic
assumptions of the Hausman test;
see suest for a generalized test

B10: LM Test: ROA (Breusch and Pagan Lagrangian multiplier test for random effects)

```
Breusch and Pagan Lagrangian multiplier test for random effects

        ROA[BANKNAME1,t] = Xb + u[BANKNAME1] + e[BANKNAME1,t]

        Estimated results:
                             Var     sd = sqrt(Var)
                    ROA    .7419291        .8613531
                      e    .3171778        .5631854
                      u    .4292586        .6551783

        Test:   Var(u) = 0
                                chibar2(01) =    36.98
                            Prob > chibar2 =    0.0000
```

B11: LM Test: ROE (Breusch and Pagan Lagrangian multiplier test for random effects)

```
Breusch and Pagan Lagrangian multiplier test for random effects

        ROE[BANKNAME1,t] = Xb + u[BANKNAME1] + e[BANKNAME1,t]

        Estimated results:
                             Var     sd = sqrt(Var)
                    ROE    34.10854        5.840252
                      e    18.06122         4.24985
                      u    15.91281        3.989086

        Test:   Var(u) = 0
                                chibar2(01) =    22.37
                            Prob > chibar2 =    0.0000
```