ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

THE VIABILITY OF AGRICULTURAL DEVELOPMENT BANK IN ETHIOPIA

BY: ABDULKADIR NUREDDIN

ADVISOR: DR. P. LAXMIKANTHAM

A Thesis Submitted to the School of Graduate Studies, Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Masters in Accounting and Finance (MSc)

June 21, 2023

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DECLARATION

I, the undersigned, declare that this research project entitled "The Viability of Agricultural Development Banking in Ethiopia" is my original work and has not been presented for any degree in any other University and that all the sources of materials used for the thesis have been duly acknowledged.

Declared by: Abdulkadir Nureddin Ahmed

Signature: _____

Date: 30/06/2023

STATEMENT OF CERTEFICATION

This is to certify that Abdulkadir Nureddin has done a study on the topic "The Viability of Agricultural Development Bank in Ethiopia" under my supervision. This work is original and suitable for submission in partial fulfillment of the requirement for the award of the degree of Master of Science in Accounting and Finance.

P. Laxmikantham (PhD)

Signature ..... Date.....

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS

This is to certify that the thesis prepared by Abdulkadir Nureddin, entitled "The Viability of Agricultural Development Bank in Ethiopia," which is submitted in partial fulfillment of the requirement for the award of the degree of Master of Science in Accounting and Finance, complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by:

P. Laxmikantham (PhD) Signature _____ Date 12/07/23

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(Examiner)

Dabiso Alemu, PhD Signature _____ Date 05/07/23

(Examiner)

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Key words:

- Viability
- Agricultural Development Bank
- Fit-Viability Model
- Organizational Competences
- Economic Feasibility
- Technological Readiness
- Societal Factors
- Reforming

Abstract

The fundamental issue with agricultural development banks is their long-term viability. This study found that there are many viable agricultural banks worldwide. In Ethiopia, there was agricultural banking. But currently, there are none. The study identified four factors that determine the viability of an agricultural development bank: organizational competence, economic feasibility, technological readiness, and societal factors. Quantitative data was collected from central, development, and commercial banks in Ethiopia and analyzed using a statistical model. All four variables were found to significantly and positively support the dependent variable (viability). A dichotomous question further assessed the viability issues, with overwhelming responses indicating a need for reform in the current agricultural-related finances. Therefore, reforming the current commercial and development banks is recommended along with the full-fledged agricultural bank. Organizational competences for agricultural development banking can be achieved through government support, skilled manpower, diversified portfolios, corporate social responsibilities, product value chain, and security measures. It is recommended that if an agricultural development bank is implemented, all four determinant factors be considered due to their significant and positive effects. However, it should be noted that only 58.6% of the viability is explained by these four variables, with the remaining 41.4% attributed to other factors not covered in this study. The study used the Fit-Viability Model (FVM) by Liang (2007), focusing solely on the viability aspect while leaving the fit part for future research. The study only employed quantitative data and could benefit from the inclusion of qualitative data. Additionally, the Ministry of Agriculture of Ethiopia was not included in this study but will be considered in future studies as another stakeholder for the agricultural development bank.

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

The word "viability" means Gonzalez (1995) and Hans et al. (2005) the ability or capacity of something to work well. It could be a proposal, an idea, a project, or even a plan to change how a company does business. The viability study is mostly needed during development and is a required document for getting money. A viability study tries to find out if something can work or not. This type of study doesn't consider whether something can be done. Instead, it looks at whether or not it is worth doing. This study examines whether the agricultural development bank is viable or not. This means the longevity of agricultural development bank.

According to Seibel et al. (2005), agricultural development banks have a rich history, dating back over two centuries. The State Bank of India, founded in 1806, was the oldest institution, followed by Germany in 1896 and the United States in 1933. In developing countries, agricultural development banks gained prominence in the 1960s and 1970s due to international organizations like the World Bank and the United Nations Development Program focusing on rural development and poverty reduction. The concept of a development bank emerged after World War II, with the International Bank for Reconstruction and Development (IBRD) established in 1945. Today, agricultural development banks are crucial components of many countries' agricultural policies and strategies, with governments and international organizations providing funding and technical assistance.

Agricultural development banks provide loans for agricultural production, technical assistance, insurance products, and savings accounts to rural communities. Ismael (2022) highlights their primary goal is to support and promote agricultural development, increase productivity, and improve living standards. These banks offer credit, financial services, and research and development funding to accelerate rural development and aid farmers. They also foster economic growth by providing long-term loans to businesses in Ethiopia, promoting specific sectors.

Additionally, agricultural development banks are crucial for obtaining and distributing long-term funds for agricultural and industrial projects.

The viability of agricultural banks in Ethiopia is hindered by several difficulties (Abate et al. (2011)). Firstly, there is a lack of collateral among farmers and agribusinesses, making it difficult for them to access credit. Secondly, the high risk associated with agricultural lending makes it unattractive to commercial banks. Thirdly, the low level of financial literacy among farmers and agribusinesses limits their ability to effectively use financial products and services. Fourthly, inadequate infrastructure, such as roads and storage facilities, makes it difficult for farmers to transport and store their produce, reducing their bargaining power in the market. To overcome these challenges, there is a need for collaboration between the government, financial institutions, and other stakeholders to develop innovative solutions that address the specific needs of the sector. With the right policies and initiatives in place, agricultural banking can become a viable and sustainable solution to the challenges facing the sector.

This research aims to investigate the factors that affect the success of Agricultural Development Banks in Ethiopia, with a focus on organizational competences, economic feasibility, technology readiness, and societal factors, including government. The study seeks to address the research gap on the effectiveness of these banks in promoting agricultural development and reducing rural poverty in Ethiopia by providing empirical evidence on the factors that contribute to or hinder their viability. The research will use a quantitative approach with primary questionnaire data to identify the challenges faced by these kinds of banks and recommend a solution to overcome them. This study organized theoretical models used in other related fields in other countries into an Ethiopian context. This can provide insights into how agricultural development banks can be viable in Ethiopia.

1.2. Statement of the Problem

Agricultural development banks are viable in various countries, including Rabobank of the Netherlands [Jamie (2022)], Bank Rakayat of Indonesia [Seibel et al. (2005)], Agricultural Bank of China [Jiayou Zhong, (2008)], CoBank of the United States of America [Molina (2005)], Banco de la Nación in Argentina [(IMF 2021)], and Ziraat Bankası in Turkey [Berksoy, Ö. B. (2010)]. Some of these banks come from rural provinces, and now they are multi-national organizations. In Africa, multiple agricultural banks struggle to sustain themselves, such as the Agricultural Development Bank of Ghana [Adeyemo, R. (2018)], The Development Bank of South Africa [Keho, Y. (2015)], The Agricultural Bank of Namibia [Keho, Y. (2015)], and the National Agricultural Development Bank of Zimbabwe [Keho, Y. (2015)]. So why is it not viable in Ethiopia is an issue.

When it comes to the Ethiopian reality; agriculture is the backbone of Ethiopia's economy, Sisay et al. (2022) stated that; the agricultural sector provides livelihood for about 84% of the population, and according to Solomon et al. (2022), 65% of the labor. The report from the National Bank of Ethiopia for 2021–2022 shows that the agricultural sector contributes 32.4% of Ethiopia's gross domestic product (GDP), with the remaining two-thirds coming from industry and service sectors. However, the sector's quantitative figures ranged from 580 billion birr in 2016/17 to 728 billion birr in 2021/22. The growth in real GDP of the sector has been declining sharply, from 10.1% in 2016–2017 to 6.4% in 2021–2022. This shows the agricultural sector needs more attention than ever before.

However, despite the significance of the sector, access to finance remains a major challenge for smallholder farmers and agribusinesses in Ethiopia. "Banking Business Proclamation 592/2008" never mentioned the agricultural development bank, and there has also been no amendment yet for the sector. According to Abdulkadir (2023), the other document issued as a policy for entering foreign banks in August 2022 by "The Council of Ministers". In this draft policy, it is stated that there is no agricultural development bank in Ethiopia, and it is also not mentioned as a priority. Surprisingly, the draft policy mentions that the agricultural sector is a riskier area for investment. If and only if the foreign bank has a specialized bank in agricultural banking, the National Bank of Ethiopia shall allow a few percent for investments in the sector. There are 30 commercial banks in Ethiopia (NBE 2022), and all are doing the same type of business. These existing commercial

banks provide minimal agricultural credit to large agricultural businesses with commercial collateral instead of direct financing to farmers. While the existing Development Bank of Ethiopia has undergone several changes in name and focus since it was founded in 1909, recent documents show a policy to split the Development Bank of Ethiopia into an industrial and agricultural development bank, but its viability is still a major issue. Unfortunately, outdated farming techniques and dependence on seasonal rain pose ongoing challenges for the sector.

Those viable agricultural banks face a multitude of challenges that threaten their viability. Because of the significance of the sector, ignoring and closing the agricultural development bank did not change the agricultural problems. Those counties made various reforms at different times. Besides reforming, a full-fledged agricultural development bank is critical to addressing these challenges and facilitating the growth of the sector.

There are many factors affecting the viability of an agricultural development bank. Including organizational competences, economic feasibility, technological readiness, and societal factors, including governmental factors. There is a research gap for these determinant factors in this specific area and in this specific country, Ethiopia. This research problem is important because if agricultural banking is not viable, it will hinder the growth of the sector and negatively impact the livelihoods of millions of Ethiopians who depend on agriculture. Therefore, there is a need for a comprehensive study that examines the constraints on the viability of a full-fledged agricultural development bank in Ethiopia and how to mitigate them.

1.3. Research Questions

1. What is the current state of the agricultural development bank in Ethiopia?
2. What are the factors and constraints that contribute to the viability of the agricultural development bank in Ethiopia?
3. Which determinant factor for the viability of agricultural development bank is/are significant?

1.4. Objectives of the study

1.4.1. The general objective of the study

To review the current state of the agricultural development bank, identify the determinant factors, and examine their significance for the agricultural development bank in Ethiopia.

1.4.2. Specific Objectives of the Study

1. To review the current status of the agricultural development bank in Ethiopia
2. To identify factors that determine the viability of agricultural development banks in Ethiopia.
3. To examine the impact and significance of the determinant factors on the viability of agricultural development bank.

1.5. Significance of the Study

The study on the viability of an agricultural development bank in Ethiopia is important for multiple reasons. Firstly, it can give a clear view of the status of the agricultural development bank and banking in Ethiopia. Because the study identified that there is no full-fledged agricultural development bank in Ethiopia right now, in 2023, Secondly, it selected a suitable theoretical model and modified the conceptual framework for the study of agricultural development banks, specifically in Ethiopia. Because there is no such study in the Ethiopian case. Thirdly, the study analyzed and tested four determinants of the viability of agricultural development bank. These factors can be used for the implementation of the agricultural development bank. Fourthly, it can provide insights into how to make the agricultural development bank viable and sustainable in Ethiopia, which is crucial for the growth of the sector. Additionally, the government's push for reform in the banking sector and the direction to be given to the Ministry of Agriculture and Development Bank of Ethiopia make this study valuable for sectoral organizations. Fifthly, this research can fill the literature gap on the viability of agricultural banks in Ethiopia. Because there

is no research using a "fit-viability model" (Li Liang (2007)) on the area of agricultural development banks in Ethiopia.

1.6. Scope of the Study

The scope of the study includes an analysis of the current state of agricultural financing in Ethiopia, an examination of determinant factors of an agricultural development bank, and an evaluation of successful models from other countries.

However, the study may be limited by the availability of data on agricultural financing in Ethiopia as well as the political and economic context of the country. Additionally, the study may not be able to provide all types of analysis with all factors that may impact the viability of the agricultural development bank in Ethiopia. These means that the study further needs the agricultural sector as a whole, the Ministry of Agriculture, non-governmental organizations working in rural areas, microfinance institutes, and insurance companies.

The conceptual framework used is the fit-viability model, and it has vast factors. Fit is for implementation, while viability is for possibility and sustainability. So, the study only focused on the viability, and the 'fit' is left for further study. Because the topic of the study was limited to viability. Because of the research approach, the study has limited quantitative data and the page and weight limits of the study, success stories and challenges from other countries agricultural development banks are limited to a few banks. There are many successful agricultural development banks around the world.

1.7. Organization of the Thesis

The thesis is organized into five main chapters. The first chapter focuses mainly on the background, statement of the problem, objective of the study, scope and limitations of the study, and significance of the study. Relevant literatures related to the study are reviewed in Chapter Two. Chapter three, deals with research methodology, which includes a brief description of the study, data collection methods, and analytical techniques. In chapter four, the results of the study are presented, which deals with descriptive statistics and econometric models presentation and discussion. Finally, chapter five presents the summary, conclusion, and recommendations of the study. This is the end of Chapter One, and Chapter Two is next.

CHAPTER TWO

2. LITERATURE REVIEW

The objective of this literature review was to analyze the existing literature on agricultural development banks, focusing on the challenges and opportunities faced by the sector. The review followed a thematic approach, starting with the definition and types of agricultural development banks, followed by a historical overview of the sector globally and in Africa. The focus then shifted to the case of Ethiopia, examining the viability of agricultural banks and discussing practical examples from around the world. The success and challenge stories of those selected agricultural banks around the world gave us a clear picture of viability. This led to a research gap in Ethiopia. Ultimately, the review followed a "fit-viability model" theoretical framework to scan key problem areas that needed to be addressed in order to promote sustainable agricultural development and financial inclusion.

2.1. Definition, Types, and Functions of Bank

A bank is defined as ‘‘an establishment for the custody, loan, exchange, or issue of money, for the extension of credit, and for facilitating the transfer of funds. While banking is the business of banks," (Deborah K. Dilley 2008 and ION Gr. IONESCU 2012, Keyns [1936] and Adenuga [1990], World Bank [2006], Diamond [1957], Jhingan M. [2005])

The authors mentioned here above discuss different types of banks, which include central banks, commercial banks, cooperative banks, rural banks, and specialized banks such as investment banks, export-import (EXIM) banks, development banks, and agricultural development banks. The central bank is a government institution responsible for monetary control and prudential regulation. Cooperative banks provide easy credit to rural populations, while commercial banks offer services tailored to business clients and aim to earn profit through accepting profits or extending loans. Regional rural banks provide concessional credit to agriculture and rural sectors. Specialized banks have specific purposes, such as investment banks providing underwriting and securities trading services, export-import (EXIM) banks providing loans for importing and exporting goods, development banks supplying medium and long-term funds for financing economic development projects, and agricultural development banks granting loans for agricultural production and

providing technical assistance, insurance products, and savings accounts for rural communities. The aim of the agricultural development bank is to support and promote agricultural development, increase productivity, and improve the standard of living in rural areas.

2.2. History of Agricultural Development Bank

This section briefs the historical background of agricultural bank worldwide, the continent Africa and finally Ethiopia as a country.

2.2.1. Overview of Agricultural Development Bank Worldwide

Here under there are three topics are raised: The origin, the regions and the success stories of agricultural bank around the world. The African case is discussed separately next to this section.

Origin: The agricultural development banks' histories span more than two centuries. The State Bank of India, the oldest institution, was founded in 1806; the newest was founded in 1999. There was a high in the 1960s, maybe as a result of expectations for quick economic growth during the post-independence era. The desire to found agricultural banks does not appear to have diminished significantly after that peak time. (Thomas Giehler, Hans Dieter Seibel, and Stefan Karduck, 2005) In Europe, the first agricultural development bank was established in Germany in 1896, followed by similar institutions in other European countries. In the United States of America, the Federal Farm Loan Act of 1916 created a system of federal land banks and agricultural credit associations to provide credit to farmers. This system was later expanded with the establishment of the Farm Credit System in 1933. In developing countries, agricultural development banks became more prominent in the 1960s and 1970s, as international organizations such as the World Bank and the United Nations Development Program began to focus on rural development and poverty reduction.

Some authors, like Jhingan [2001], see the concept of a development bank emerging after the Second World War. Hence, it is a Post-World War II financial innovation. This is because of the need for reconstruction funds for the war torn countries, following the Great Depression in 1930. This resulted in the establishment of the International Bank for Reconstruction and Development (IBRD) in 1945. Jhingan [2001] asserts, became recognized as a worldwide institution for

development and reconstruction. This concept precipitated the establishment of quite a large number of banks around the world to coordinate the development activities of different nations. while the agricultural development bank is a bit earlier. Today, the agricultural development bank is a key component of many countries' agricultural policies and strategies. Many governments have established specialized agricultural development banks to provide financial services to farmers and rural communities, and international organizations continue to support these efforts through funding and technical assistance.

Region: This was taken from "AgriBank-Stat inventory". This inventory provides detailed information about the agricultural development bank. It has been created by the Food and Agriculture Organization FAO and the German Technical Cooperation GTZ. From Hans Dieter Seibel et al. (2005) and (Thomas Giehler, et al. (2005).

A majority of institutions (41%) are from Asia-Pacific, followed by Africa (32%), and Latin America (24%), two continents that have suffered much from the closing of agricultural banks. As banks from Latin America were less diligent in providing data, they account for only 9% of the remaining sample of banks with sufficient data, while Asia-Pacific banks account for 49% and African banks for 40%.

Continent	Number		Percent	
	All cases	Filtered	All cases	Filtered
Africa	24	23	32.0	40.4
Asia & Pacific	31	28	41.3	49.1
Latin America	18	5	24.0	8.8
others	2	1	2.7	1.8
Total	75	57	100.0	100.1*

* Error due to rounding

Source: Hans Dieter Seibel et.al. (2005)

2.2.2. Success Stories from the World (Outside Africa)

1. Rabobank (Dutch)

Rabobank is a multinational bank that specializes in providing financial services to the agricultural sector. It was established in the Netherlands in 1898 as a cooperative bank for farmers and has grown to become one of the largest agricultural banks in the world, with operations in over 40 countries. The bank's success can be attributed to its cooperative structure, which allows it to focus on the needs of its clients and make decisions that are in their best interest. This is by corporate social responsibility (CSR) by diversifying the management staff with different ethnic groups. Additionally, Rabobank is committed to sustainability and has set ambitious targets for reducing its environmental impact and supporting sustainable agriculture, weather derivatives, price hedging instruments, and corporate social responsibility. Despite challenges such as the credit crisis and reputational damage due to the Libor affair, Rabobank has taken measures to cope with these challenges, including virtualizing its products and services, increasing reservation capacity, and reinforcing its participation in society. In 2015, member representatives and bank executives decided to reshape cooperative governance while preserving its core principles and profile. Jamie Hollywood (2022) and David Subeliani et al. (2005).

2. Bank Rakyat (Indonesia)

Seibel, Hans Dieter (2000) gave the title "How an Agricultural Development Bank Revolutionized Rural Finance: The Case of Bank Rakyat Indonesia? The article discusses how Bank Rakayat Indonesia (BRI), a government-owned agricultural development bank, transformed into a profitable financial intermediary and microfinance provider in a deregulated policy environment. BRI utilized government funding and a World Bank loan to replace external loans with savings deposits as its primary source of funds. The bank has played a crucial role in supporting the growth and development of the agricultural sector in Indonesia by providing tailored financial products and services, investing in infrastructure and capacity building, and promoting rural development. BRI's focus on agricultural finance has been a key factor in its success, offering loans for working capital, investment, livestock, and crop production. The bank has helped increase access to finance for farmers and agricultural businesses, leading to improved productivity, increased incomes, and economic growth. Additionally, BRI has contributed to rural development by investing in infrastructure projects such as roads, irrigation systems, and storage facilities. Overall, BRI is an

example of how an agricultural development bank can revolutionize rural finance and support economic growth and development. Hans Dieter Seibel et al. (2005)

3. Agricultural Bank of China

The Agricultural Bank of China is a state-owned bank that provides financial services to the agricultural sector. It offers a range of loan products, financial services, and infrastructure investments to support rural development and agricultural production in China. ABC has played a crucial role in providing credit to small-scale farmers at affordable interest rates, offering financial services such as savings accounts, insurance, and remittances, fostering innovation in agriculture through research and development funding, and maintaining corporate social responsibility. Additionally, ABC has helped build farmers' capacity by providing training and technical assistance and establishing farmer groups and cooperatives to improve their access to markets. Unlike BRI, ABC has also operated as a commercial bank since 1979, which has allowed it to expand its operations beyond rural areas and contribute to China's economic growth while still fulfilling its policy mission of supporting rural development. Jiayou Zhong, (2008), ABC-CSR (20202)

4. CoBank (United States of America)

CoBank is a cooperative bank in the US that specializes in providing financial services to the agricultural sector. It was established in 1916 with the goal of supporting rural communities and agriculture. With over $140 billion in assets, CoBank is one of the largest and most successful agricultural banks in the country, operating in all 50 states. CoBank's success can be attributed to its cooperative structure, which allows it to focus on serving rural communities and agriculture, its specialized expertise in agricultural lending, its investment in technology and innovation, and its commitment to corporate social responsibility and sustainability. These factors have enabled CoBank to effectively serve the unique needs of rural businesses and contribute to economic growth and development in the US. Francisco Sanz Molina (2005)

5. Banco de la Nación Argentina

Banco de la Nación Argentina is a government-owned financial institution in Argentina that specializes in providing financial services to the agricultural sector. It has a vast network of over 600 branches throughout the country and is considered one of the most successful agricultural

banks in South America. Banco de la Nación Argentina has been operating since 1891 and has become one of the largest and most prosperous banks in the country. Its success can be attributed to several factors, including strong government support, an extensive branch network, a diversified portfolio of financial products, a focus on innovation and technology, robust risk management practices, and a commitment to social responsibility. These factors have enabled Banco de la Nación Argentina to cater to a wide range of customers, including those in remote and underserved areas, and contribute to the economic growth and development of the country. (IMF 2021)

6. Ziraat Bankası (Turkey)

Ziraat Bankası is a Turkish government-owned bank that specializes in providing financial services to the agricultural sector. It has a vast network of over 1,500 branches across Turkey and other countries in the region, and it is considered one of the most successful agricultural banks in Europe and Asia. Ziraat Bankası has been operating since 1863 and is a state-owned bank in Turkey. The success of Ziraat Bankası can be attributed to several factors, including strong government support, an extensive branch network, a diversified portfolio of financial products, a focus on innovation and technology, robust risk management practices, and a commitment to social responsibility. These factors have enabled Ziraat Bankası to cater to a wide range of customers, including those in remote and underserved areas, and contribute to the economic growth and development of the country. This is the end of success stories of some of agricultural development banks around the world, and next is the agricultural development bank in Africa. (Berksoy, Ö. B. (2010))

Summary for this section

Table 1: Key Viability Focuses On Successful Agricultural Development Banks

Name Banks	Key Viability Focuses
Rabobank (Dutch)	Cooperative structure, focus on the interests of the clients, sustainability, technology usage, technical assistance, reshaping cooperative governance and managing diversity, weather derivatives, price hedging instruments.
Bank Rakyat (Indonesia)	Government policy support, societal acceptance, building infrastructure for farmers, storage, and value chains.
Agricultural Bank of China	Affordable interest rate, fostering innovation through research, technical assistance, establishing farmers' groups, hedging instruments, strengthening itself by expanding to cities and international services, Corporate Social Responsibility
CoBank (United States of America)	Focusing on specialization, cooperative structure, social responsibility, investment in new technologies, and innovation.
Banco de la Nación Argentina	Strong government support, extensive branch support, diversified portfolio, innovation and technology risk management, and social responsibility.
Ziraat Bankası (Turkey)	Strong government support, extensive branch support, a diverse portfolio, innovation and technology risk management, and social responsibility.

2.2.3. Agricultural Development Bank in Africa

This section outlines general overview of agricultural development bank in Africa, some specific African countries empirical literature reviews and finally the success and challenge stories of selected agricultural bank.

2.2.3.1.General Overview to Africa

Anyanwu, C. M. (2004), Governments and financial institutions in Africa have recognized the importance of agricultural development bank in promoting economic growth and development in the region. The primary goal of these banks is to provide affordable and appropriate financial services to smallholder farmers and rural communities. To achieve this, specialized agricultural development banks have been established in many African countries, offering a range of financial products and services such as credit, savings, insurance, and advisory services. However, agricultural development banks in Africa face several challenges (Salami and Arawomo (2013), including limited infrastructure, high risk, limited collateral, and low financial literacy. To address these challenges, innovative lending approaches such as group lending and value chain financing have been developed, along with investments in infrastructure and financial education programs to improve access to financial services in rural areas.

Several studies, such as Ansari, Gerasim, and Mahdavinia (2009) and Salami et al. (2010), have highlighted the importance of a strong agricultural sector in Africa for creating jobs, feeding the population, earning foreign currency, and providing raw materials for industries. However, obstacles such as lack of access to land and modern technology, low investment or credit, poor governance, and high interest rates charged by commercial banks hinder credit to the agriculture sector. Addressing these issues is crucial to overcome the challenges of low agricultural credit in Africa and promote sustainable economic growth and development.

2.2.3.2. Challenges and Success Stories from Africa

Here some selected banks with challenges and success stories. But need to do more.

1. Agricultural Development Bank of Ghana

The Agricultural Development Bank of Ghana was established in 1965 to provide financial services to the agricultural sector. However, the bank faces challenges such as a limited capital base, high non-performing loans, and limited reach. Despite these challenges, the bank has been successful in supporting agriculture by providing financing, insurance, and advisory services. It has been innovative in introducing new products and services, expanding its operations, and

forming partnerships with other institutions. Overall, the bank's efforts have helped to improve food security and rural livelihoods in Ghana. Adeleke, R. A., & Adeyemo, R. (2018).

2. Development Bank of Southern Africa

The Development Bank of Southern Africa (DBSA) is a South African financial institution that provides funding to various sectors, including agriculture, with the aim of promoting economic development and growth in the region. However, the bank faces several challenges, such as a limited capital base, political instability in some countries, and high non-performing loans. Despite these challenges, the DBSA has been successful in supporting infrastructure development, introducing innovative products and services, forming partnerships with other institutions, and financing impactful projects in the region. Overall, the bank's proactive approach to development financing has improved the lives of people in Southern Africa. Nkamleu, G. B., & Keho, Y. (2015)

3. Agricultural Bank of Namibia

The Agricultural Bank of Namibia is a state-owned institution that provides financing and advisory services to farmers and agribusinesses in Namibia, with a focus on promoting sustainable agricultural practices. However, the bank faces challenges such as limited access to capital, high non-performing loans, and limited outreach to rural farmers. Despite these challenges, the bank has been successful in supporting agriculture in Namibia by introducing innovative products such as the "AgriPlus" loan facility and forming partnerships with other institutions to improve its capacity to finance agricultural projects. Additionally, the bank has financed many impactful projects in the agriculture sector, including livestock farming, crop production, and irrigation infrastructure development. Overall, the Agricultural Bank of Namibia has been proactive and innovative in its approach to financing agriculture, which has helped to improve the livelihoods of farmers and other agricultural stakeholders in the country. Nkamleu, G. B., & Keho, Y. (2015).

4. National Agricultural Development Bank of Zimbabwe

The National Agricultural Development Bank of Zimbabwe is a financial institution that provides loans, insurance, and advisory services to the agricultural sector in order to improve food security and rural livelihoods. However, the bank has faced challenges such as high levels of non-performing loans, limited access to capital, and political instability in the country. Despite these

challenges, the bank has been successful in supporting agriculture in Zimbabwe through its provision of financing and advisory services to farmers and other agricultural stakeholders. The bank has also introduced innovative products such as the "AgriPlus" loan facility, which supports value chain development in agriculture. Additionally, the bank has formed partnerships with other institutions to improve its capacity to finance agricultural projects in the country. The bank has financed many impactful projects in the agriculture sector, including livestock farming, crop production, and irrigation infrastructure development. Overall, the National Agricultural Development Bank of Zimbabwe has been proactive and innovative in its approach to financing agriculture, which has helped to improve the livelihoods of farmers and other agricultural stakeholders in the country. Moyo, S., & Chikodzi, D. (2018).

5. Agricultural Credit Guarantee Scheme Fund of Nigeria

The Agricultural Credit Guarantee Scheme Fund (ACGSF) is a government agency in Nigeria that aims to promote agricultural development by providing credit guarantees to farmers and agribusinesses. Despite facing various challenges such as insufficient funding, poor loan recovery, limited outreach, and low awareness, the ACGSF has been successful in enhancing agricultural production, generating employment, improving financial access, and reducing risk for lenders. In general, agricultural banks like the ACGSF play a crucial role in supporting the agricultural sector in Africa by offering essential financial services and expertise to farmers and agribusinesses, which can help to boost food security, rural livelihoods, and economic growth in the region. This study [Ajayi, O. V., & Olaniyan, D. A. (2015), Omotesho, O. A., & Adewumi, M. O. (2017)]. investigates the link between agricultural development banks and agricultural productivity in Nigeria, highlighting the potential of these institutions to facilitate access to credit, technical assistance, and other forms of support for smallholder farmers. However, the authors also acknowledge that there are still obstacles that must be overcome to enhance the effectiveness of these organizations.

2.2.4. Agricultural Development Bank in Ethiopia

According to Gebremedhin and Swinton (2003), the financial industry in Ethiopia comprises various types of banks and non-bank institutions, including commercial banks, development banks, specialized financial institutions, cooperatives, and insurance firms. The organizational

structure, management, ownership, and performance of these institutions have changed over time under different governments. The Development Bank of Ethiopia has attempted to establish agricultural banks, but currently, there are plans to split them into different developmental banks. However, Moges and Belay (2014) highlighted that agricultural financing in Ethiopia faces several challenges, including lack of access to finance, low financial literacy, limited infrastructure, high risk, limited collateral, and climate change. Assefa (2013) and Adugna and Mehretu (2017) recommended that, addressing these challenges will require innovative approaches from banks and policymakers, as well as investments in infrastructure and financial education programs. The next section briefed the Development Bank of Ethiopia, the Ethiopian Agricultural Bank, and agricultural financing by commercial banks.

The government has implemented various policies and programs to support smallholder farmers, increase productivity, and promote agribusiness. According to Seifu et al. (2019) one of the government's initiatives is the Agricultural Transformation Agency (ATA), which aims to boost agricultural productivity and commercialization through innovation, technology transfer, and market linkages. The ATA has partnered with various stakeholders, including the private sector, to provide technical assistance and financial support to farmers and agribusinesses. Another initiative Minten et al. (20202) is the Agricultural Commercialization Clusters (ACCs), which are designed to promote value chain development and link smallholder farmers to markets. The ACCs provide infrastructure, training, and market information to farmers and agribusinesses, enabling them to produce high-quality products and access better markets.

2.2.4.1. Development Bank and Its Function in Ethiopia

The Development Bank of Ethiopia (DBE) has been instrumental in financing development projects across various sectors in Ethiopia since its establishment in 1909 as the Agricultural and Industrial Bank of Ethiopia. The DBE has supported the agricultural, industrial, transport, and energy sectors, and has undergone several reforms to improve its performance. Studies, such as one by Gebrehiwot and Kifle (2013), have demonstrated the positive impact of DBE credit on small-scale agribusinesses' performance and employment generation. Another study by Assefa (2006) evaluated the DBE's role in financing renewable energy projects in Ethiopia, concluding that the bank was crucial in supporting the growth of the renewable energy sector. Despite its

achievements, the DBE still faces challenges, including improving its governance and risk management systems, expanding its outreach to underserved areas and sectors, and enhancing its financial sustainability.

It has changed its name several times, or about seven times, starting from the year 1945 up to 1994.

From 1945 to 1949, the agricultural bank of Ethiopia

1949–1951: agricultural and commercial bank of Ethiopia

1951–1964: Development Bank of Ethiopia

1964–1970 Investment Bank of Ethiopia

1970–1979: agricultural and development bank of Ethiopia

1979–1994, agricultural and industrial development bank of Ethiopia

1994 to present (2023) the Development Bank of Ethiopia.

According to Assefa (2006), specifically; the Agricultural Bank of Ethiopia was established in 1945 with the mission of providing loans to small landowners whose farms were destroyed during the Italian occupation. Its mission included transforming subsistence agriculture into a profitable industry through better tools and equipment, credit policies, tax policies, land reform, and agricultural services. The development of subsistence agriculture was to occur through better equipment and methods, credit and price policies, and land reform. The DBE was to issue credit for agricultural equipment and tools indirectly through farmers' cooperatives or the Grain Corporation, and credit was only given in exchange for commodities and services to guarantee productive use. These methods were expected to enhance output and facilitate the commercialization of peasant agriculture. However, the Agricultural Bank of Ethiopia also faced challenges such as limited access to credit and infrastructure, a lack of modern technology, and poor governance.

2.2.4.2. Agricultural Finance by Commercial Banks

The Commercial Bank of Ethiopia (CBE) is partnering with the government to provide agricultural finance products and services to smallholder farmers, cooperatives, and agribusinesses in Ethiopia.

CBE offers agricultural input loans, commercial farming loans, and cotton farm loans against the Development Bank of Ethiopia's guarantee to finance working capital requirements. Private commercial banks in Ethiopia have also been working with the government to support the country's agricultural sector, although challenges remain in providing credit to underserved communities in remote or rural areas due to limited infrastructure, information asymmetry, and high transaction costs. Private commercial banks may need to work with microfinance institutions and develop innovative financial products to reach these communities. The financing situation by private commercial banks in Ethiopia is almost nonexistent, with only 1% of credit allocated by 16 private banks. This vulnerability in funding sources is concerning given agriculture's significant role in Ethiopia's exports (World Bank, 2016; Gebrehiwot, 2018; Tadesse & Fufa, 2019, Abdulkadir Nureddin 2022).

PRIVATE COMMERCIAL BANKS (ETH)

SUMMARY BY LOAN (FINANCING)

AS OF 30 JUNE 2021

#	NAME OF BANKS	OTHERS	Agro.	HOTEL	Transp.	Staff	Personal	IFB	IMPORT	Bldg & Const.	Manuf.	EXPORT	Domestic Trade	TOTAL OUTSTNDG
1	Abay Bank S.C.		**124,166**	436,466	1,127,024				4,277,587	3,274,453	1,588,643	4,277,587	5,056,475	**20,162,400**
2	Addis International Bank		**4,885**		29,490	29,197	19,350		292,627	844,673	543,431	1,849,762	919,649	**4,533,064**
3	Awash International Bank		**338,670**		2,250,100	2,708,137	6,244,374	2,120,280	10,190,725	18,091,986	10,470,171	17,625,711	17,499,132	**87,539,286**
4	Bank of Abyssinia		**2,742,179**		1,516,613		2,019,007	382,738	4,065,756	8,504,387	13,928,759	27,156,717	16,260,503	**76,576,659**
5	Berhan International Bank		**69,493**	417,496	365,516	1,202,324	1,364,992		1,366,483	4,047,912	2,008,330	1,137,112	5,842,370	**17,822,028**
6	Bunna International Bank		**60,604**		664,619	844,193			4,804,385	3,148,266	946,595	4,804,385	3,019,178	**18,292,224**
7	Cooperative Bank of Oromia		**505,233**			1,928,373		7,816,229	1,930,830	2,124,341	9,088,737	11,927,928	19,181,708	**54,503,379**
8	Dashen Bank	1,105,763	**381,071**	415,388	1,518,366	2,860,817	4,186,537	2,256,056	2,404,352	8,366,417	14,452,596	8,355,219	17,945,763	**64,248,345**
9	Debub Global Bank		**20,717**		96,404	258,203	86,239		782,833	958,687	659,223	3,179,395	2,334,426	**8,376,127**
10	Enat Bank		**98,441**		521,480	289,977	65,439		774,530	1,749,696	1,443,020	2,873,081	1,266,482	**9,082,146**
11	Hibret Bank		**106,432**	1,335,571	883,722	1,458,619	336,010	1,012,511	7,337,514	4,662,611	7,038,842	5,523,635	6,187,134	**35,882,601**
12	Lion International Bank		**139,787**	913,075	272,276	373,144			4,287,199	2,016,651	1,218,920	8,268,772	5,438,175	**22,927,999**
13	Nib International Bank	212,192	**186,990**	4,232,510	755,075		665,752	-	3,912,069	6,367,280	5,919,780	6,160,726	6,072,472	**34,484,846**
14	Oromia International Bank	92,273	**290,130**	1,415,178	320,102	2,149,051	134,808	3,542,349	1,839,061	1,752,911	2,429,502	4,684,710	7,101,806	**25,751,881**
15	Wegagen Bank				1,109,082	1,185,967		361,866	3,542,099	3,921,198	4,009,083	7,756,109	5,406,287	**27,291,691**
16	Zemen Bank		**196,522**	2,023,316	132,475	490,185	779,448		1,102,619	1,174,283	3,217,011	2,349,766	2,791,463	**14,257,088**
	TOTAL	**1,410,228**	**5,265,320**	**11,189,000**	**11,562,344**	**15,778,187**	**15,901,956**	**17,492,029**	**52,910,668**	**71,005,752**	**78,962,643**	**117,930,614**	**122,323,023**	**521,731,764**
	PERCENTAGE	**0.27%**	**1.01%**	**2.14%**	**2.22%**	**3.02%**	**3.05%**	**3.35%**	**10.14%**	**13.61%**	**15.13%**	**22.60%**	**23.45%**	**100%**

Figure 2.1 (source): Translated from Amharic book "Ma-genzeb from Gensis to Today" (Abdulkarir Nureddin (2023)

2.3. The Viability Issues

The main problem of agricultural development banks is their lack of viability, mostly reflected by the decline in the real value of their loanable funds, because of inflation, poor loan collection, and operational losses. As a result, these banks have lost support from their clientele, international donors, and governments. Viability requires reaching larger numbers of customers with a wider range of financial services, including deposit facilities; increasing the volume of purchasing power transferred from surplus to deficit units through market oriented intermediation; improving the quality of the services provided and guaranteeing permanent access to the services of these

institutions; and lowering transaction costs for all market participants. Viability requires policy changes, institutional strengthening, and technological innovation.

2.3.1. Reforming

Three Choices: Ignore them? close them? or reform them?

These choices are presented by Hans Dieter Seibel, Thorsten Giehler, and Stefan Karduck (2005). Obviously, the best choice is to reform them. But let's see all three.

Ignoring: The current approach of donors to ignore Agricultural Development Bank and exclude them from development plans is prevalent. Some donors continue to offer credit lines to non-viable Agricultural Development Banks, which only perpetuates the problem. In certain areas, governments invest significant amounts of money into state-owned development banks through credit subsidies, rescheduling, debt forgiveness, interest rate exemptions, and recapitalization. However, this approach ignores the negative impact on institutional sustainability, outreach to rural communities, including the poor, and growth in the rural economy. This has created a culture of poor practices in rural finance.

Closing: Closing the Agricultural Development Bank is a strategy particularly widespread in Latin America and Africa. In many countries, this has resulted in a situation where agricultural credit has all but dried up; local financial institutions, frequently barred by obstructive legislation, have been slow in moving into the void; and large segments of the rural population are left without any, or with very inadequate, financial services.

Reforming: The traditional approach to Agricultural Development Banks in Latin America and Africa is to ignore them, which perpetuates the problem of non-viable banks receiving credit lines. Some governments invest in state-owned development banks, but this can negatively impact institutional sustainability and outreach to rural communities. This leads to scarce agricultural credit and inadequate financial services for rural residents. The authors propose reforming underperforming Agricultural Development Banks to create self-reliant, sustainable financial intermediaries that can mobilize domestic resources, provide positive real returns to depositors,

and increase outreach and quality of services. Mobilizing savings deposits as the main source of funds and introducing market rates of interest could solve credit bias and financial repression problems. Successful reforms have been implemented in some countries under a conducive policy environment, so it is important not to give up on agricultural banks without examining their flaws and potential for reform. Since around 2000, there has been a new interest in the reform issue: cautious and gradual, but continual. Several multilateral, bilateral, and international organizations have been involved: FAO, IFAD, the World Bank, GTZ, a CGAP Working Group on Agricultural Development Bank Reform, and, with support from IFAD and GTZ, the regional agricultural credit associations AFRACA, APRACA, and NENARACA (CGAP, 2004, AFRACA, 2004).

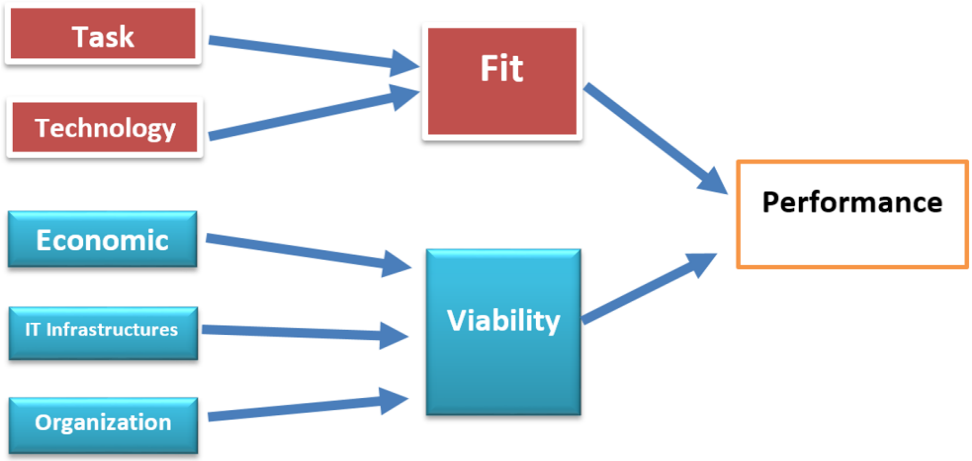
2.3.2. The Era of Advanced Technology

The agricultural sector relies heavily on financial services provided by agricultural development banks. Ogunleye et al. (2020) stated that with the advancement of technology, these banks have been able to improve their services and reduce costs. Kumbhar and Kumbhar (2017) noted that mobile banking has made it easier for farmers to access financial services from anywhere, while digital platforms provide them with information on weather patterns and crop prices. Automation of processes such as loan processing has also made it possible for banks to serve more clients efficiently. However, there are challenges, such as cybersecurity risks, that need to be addressed. By embracing technology and investing in measures to mitigate risks, agricultural banks can enhance financial inclusion and improve the productivity and income of farmers and rural communities.

Conclusion to this section: In conclusion, technology has had a significant impact on agricultural development banking, including mobile banking, digital platforms providing agricultural information, and automation of processes. However, there are also challenges, such as cybersecurity risks, that need to be addressed. Agricultural banks need to embrace technology while also investing in measures to mitigate risks. The integration of technology in agricultural banking has the potential to enhance financial inclusion and improve the productivity and income of farmers and rural communities. Many challenges will be answered via technology.

2.4. Theoretical Framework

The researcher has identified several theoretical frameworks that could guide the study on the viability of agricultural development banks in Ethiopia. These include the Technology Adoption Theory, Rogers (2003) which emphasizes the factors that influence the adoption of innovation; the Stakeholder Theory, which focuses Freeman (1984) on effective collaboration with stakeholders; the Institutional Theory, Scott (2014) which highlights the role of norms, values, and regulations; the Financial Inclusion Theory, Kabeer (2012) which suggests that promoting financial inclusion can enhance the viability of financial institutions; and the Sustainable Development Theory, Sachs (2015) which links the viability of institutions to sustainable development outcomes. The selection of the most appropriate framework will depend on the specific research questions and objectives of the study. Finally, Liang's Fit-Viability Theory (FVT) has been widely cited and applied in the field of strategic management and can offer guidance on the implementation of new technological systems in organizations. The FVT suggests that the decision to adopt a technology is based on two factors: fitn and viability. Kwanya, 2014; Liang et al., 2007; Ossai & Wickramasinghe, 2021



Source: Liang and Wei (2007)

2.5. Conceptual Framework of the Study and Development of Hypotheses.

The main objective of this study is to investigate how various factors are involved for the full-fledged agricultural development bank. This can be best achieved by 'Fit-Viability Model (FVM)' which has the following constructs that agricultural development bank to be implemented. Because this is not adopting the new technology and the sustainable development matter is well-known.

This is the viability issue. But the model is a bit modified for this study. Table 2 summarized the framework followed by details and hypotheses.

Table 2 Independent constructs of the dependent variable (Viability)

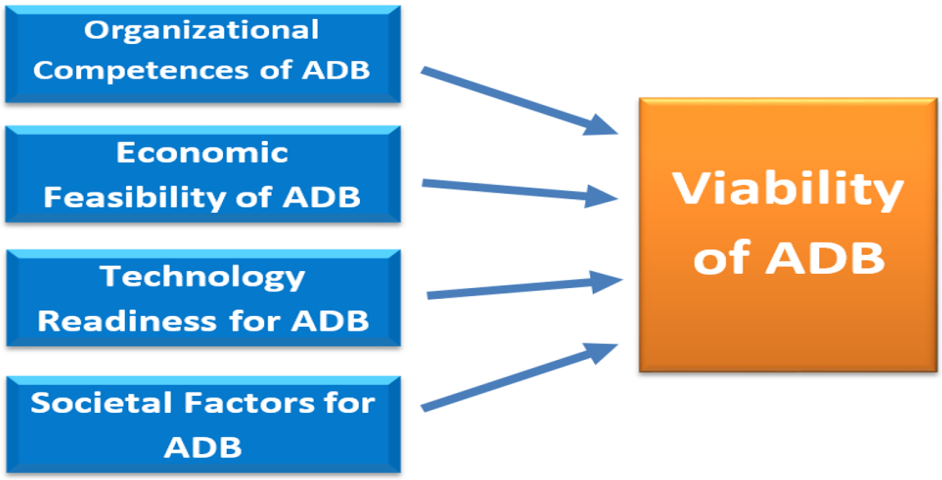
DETERMINANTS OF THE VIABILITY OF AGRICULTURAL DEVELOPMENT BANK			
DIMENSION		**DEFINITION**	**SOURCE**
Organizational Competence			
	Competency	The organizaional competence is gearing up the viability of ADB's implementation and/or running the solution.	R.T. Mercuri (2004), H. Zafar, S. Sneha (2012); R. Ramanujam, D.M. Rousseau (2006); E. Turban, T.-P. Liang, S.P.J. Wu (2011)
	Management support	Limitation of ADB viability due to a lack of support from top management (Here National Bank of Ethiopia).	
	Corporate Social Responsibility	Limitation of ADB viability due to lack corporate social responsibility.	
Economic Feasibility			
	Project-related costs	Limitation of ADB viability due to exceeding explicit costs and/or opportunity costs for implementing the solution.	Liang et.al. (2007); Espadanal, (2012); Gupta et.al., (2013); Tehrani (2013); E. Turban, T.-P. Liang, S.P.J. Wu (2011)
	Usage-related costs	Limitation of ADB viability due to a projected increase of fixed and/or variable costs for running the solution.	
	Sustainability	Lack of Sustainable economic ground limits the viability of ADB	
Technological Readiness			
	Infrastructure	Limitation of ADB viability due to inapt infrastructurs, hardware components and sortware software components.	E. Turban, T.-P. Liang, S.P.J. Wu (2011); J.G. Anderson (2007); (Bennett and Savani, 2011; Espadanal, 2012; Killaly, 2011; Liang et al., 2007); Winter (2011)
	Integration	Necessary technical requirements, Internet connection, computational capabilities	
	Security	Limitation of ADB viability due to inappropriate measures against cybercrime and hacking.	
Societal Factors (Including Governmental Factors)			
	Political will	Limitation of ADB viability due to missing incentives and intentions to support the solution.	Porter and Millar (1985); Armbrust et al. (2010); Oliveira and Martins (2010); Low et al. (2011); Singh et al. (2007); E. Turban, T.-P. Liang, S.P.J. Wu (2011); J.G. Anderson (2007)
	Competitive pressure	Limitation of ADB viability due to rivalry of other commercial banks	
	Readiness of society	Limitation of ADB viability due to low willingness of technology adoption.	

Source: Own compilation from different authors

Tobias Mettler (2015) well modified and articulated the Fit-Viability Model for Health Information Technology (HIT) and this study on the Viability of Agricultural Bank followed suit. Viability and fit constructs are crucial in understanding the adoption and long-term productivity gains of an institution in this case Agricultural Development Bank. Viability sets the economical technological, societal, and organizational margins for the Agricultural Development Bank implementation, while fit defines the technical, economic, and socio-cultural effectiveness that is obtained from the Agricultural Development Bank implementation. Different authors have different conceptions of viability and fit, but in this study, viability was understood as a concept that sets margins for Agricultural Development Bank feasibility; while fit defines the effectiveness

obtained from Agricultural Development Bank implementation. Viability is for how possible and sustainable the Agricultural Development Bank; while fit is how effectively implement.

This study "Anticipating Mismatches of Agricultural Development Bank Viability: Developing and modifying a Viability-Fit Model for Agricultural Development Bank Services" provides an in-depth discussion of the four different viability constraints, including technological, economic, organizational, and societal viability. Tobias Mettler (2015)



Source: The customized Liang (2007) FV-Model with Tobias (2015) and Seok (2019) studies.

Organizational Competence: constraints relate to legal and privacy limitations, such as negligence of national privacy policies and laws, deficient competencies for implementing and running the solution, and a lack of support or lack of follow-up from top management leading to poor organizational viability. [R.T. Mercuri (2004), H. Zafar, S. Sneha (2012); R. Ramanujam, D.M. Rousseau (2006); E. Turban, T.-P. Liang, S.P.J. Wu (2011)]

Hypothesis 1: *Organizational Competences have a significant and positive influence on viability of Agricultural Development Bank.*

Economic Feasibility: constraints include cost-related limitations, both in the project phase, including one-time licensing and acquisition costs for software and hardware, internal and external personnel costs, strong concentration of valuable manpower for one particular project, loss of alternative technological options, or depreciation of certain infrastructural components and future

usage phase including additional fixed costs such as running and maintaining an advanced infrastructure, support service, etc., and potential increases of variable costs such as augmented training necessities or recurring licensing and other external servicing fees. The cost-benefit or economic output is also and asset. [Liang et.al. (2007); Espadanal, (2012); Gupta et.al., (2013); Tehrani (2013); E. Turban, T.-P. Liang, S.P.J. Wu (2011)]

Hypothesis 2*: Economic feasibility have a significant and positive influence on Viability of Agricultural Development Bank.*

Technological Readiness: includes constraints related to the inapt hardware components, functional, data, and representational constraints of software components, missing coupling/decoupling mechanisms with existing architecture, and inappropriate measures against cybercrime and hacking. [E. Turban, T.-P. Liang, S.P.J. Wu (2011); J.G. Anderson (2007); (Bennett and Savani, 2011; Espadanal, 2012; Killaly, 2011; Liang et al., 2007); Winter (2011)]

Societal Factors: constraints focus on readiness of society and political will underlying acceptance of new technology in affected society. The lack of readiness may intensify the absent political will targeting the use of technology-enabled forms of agro-services provision as compared to traditional service delivery. Rivalry from the existing commercial banks is another constraint. [Porter and Millar (1985); Armbrust et al. (2010); Oliveira and Martins (2010); Low et al. (2011); Singh et al. (2007); E. Turban, T.-P. Liang, S.P.J. Wu (2011); J.G. Anderson (2007)]

Hypothesis 3*: Technological readiness have a significant and positive influence on Viability of Agricultural Development Bank.*

In conclusion, the Viability-Fit model for Agricultural Development Bank services assumes that viability and fit constructs are crucial in understanding the adoption and long-term productivity gains of Agricultural Development Banking (ADB) investments. Understanding the four different types of viability constraints (organizational, economic, technological, and societal) can help to identify the constraints to Agricultural Development Bank adoption and inform the decisions around Agricultural Development Bank implementations.

Hypothesis 4*: Societal factors have a significant and positive influence on Viability of Agricultural Development Bank.*

2.6. Research Gap

The literature review reveals that Agricultural Development Banks have been successful in many countries, but there is a lack of empirical evidence on their effectiveness in Ethiopia. Studies have been conducted on the challenges faced by these banks and the need for reform, but there is a need for more research to examine their impact on rural poverty reduction and sustainable development. Strategies to overcome the challenges faced by Agricultural Development Banks in Ethiopia, such as inadequate funding, weak institutional capacity, and limited outreach to small-scale farmers, need to be identified. Despite the crucial role played by Agricultural Development Banks in promoting agricultural development and rural poverty reduction in Ethiopia, there is a significant research gap on their viability. This study aims to address the research gap by conducting a quantitative research method with primary questionnaire data to examine the factors that influence the viability of Agricultural Development Banks in Ethiopia. The study organized theoretical models used in other related fields in other countries into an Ethiopian context, providing insights into how agricultural development banks can be viable in Ethiopia. Economic feasibility, technology readiness, societal factors, and organizational competences are all important factors that influence the viability of Agricultural Development Banks in Ethiopia.

Summary of chapter two: The objective of this literature review was to analyze the existing literature on agricultural development banks, focusing on the challenges and opportunities faced by the sector. The review followed a thematic approach, beginning with the definition and types of agricultural development banks and a historical overview of the sector globally and in Africa. It focused on Ethiopia, examined the viability of agricultural banks, and discussed practical examples from around the world. The review followed a "fit-viability model" theoretical framework to scan key problem areas to promote sustainable agricultural development and financial inclusion. The next is chapter three for research methodology.

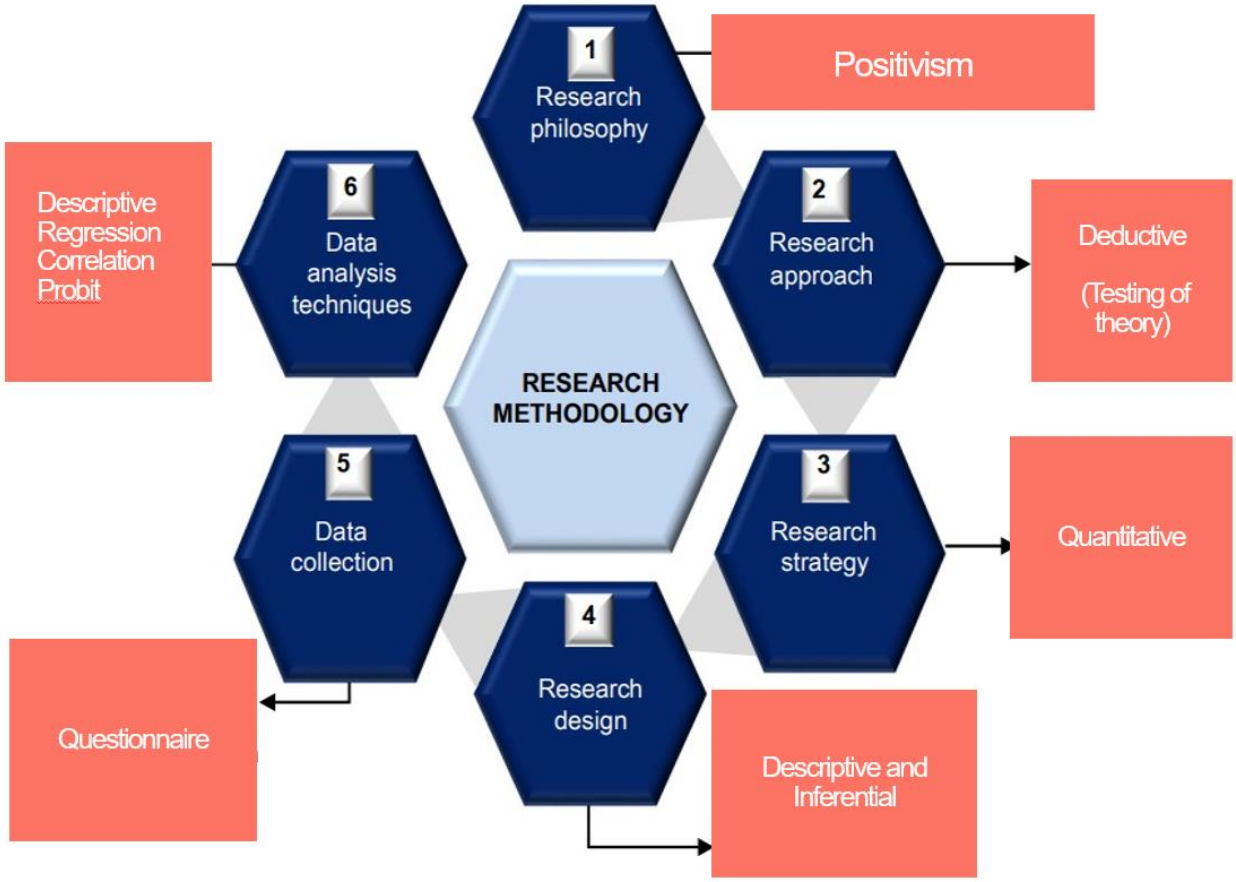
CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

The methodology chapter explains how the research approach was selected for this study, starting with defining the research philosophy and approaches. It also discusses different research strategies and the reasons for choosing a particular method. The summary is indicated by the following table and the details of each item was elaborated just after the table.

Table 3: Research Methodology Summary



3.2. Research Philosophy

The philosophy of research concerns how a phenomenon is perceived and how data is collected, analyzed, and applied. This study subscribes to the belief that reality exists objectively and can be

observed through empirical research, using theories and concepts as a starting point. The theory of viability is included in the conceptual framework to observe relationships among variables. Various variables are tested for statistical significance, making this study primarily quantitative (Grey, 2014). Therefore, the study follows a positivist philosophy and utilizes a quantitative research design (Mason, 2014).

3.3. Research Approach

The first objective, mainly based on the literature review and some points from the questionnaire. For the second and third objectives, this study examined the relationship between four different kinds of viability factors (organizational, economic, technological, and societal) and viability as a dependent variable. For that purpose, it predominately uses quantitative research. Quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The final written report has a set structure consisting of an introduction, literature and theory, methods, results, and discussion (Creswell, 2009).

3.4. Research Strategy

According to Saunders et al. (2009), research strategy is the overall plan that a researcher uses to answer their research questions. Bryman (2008) also defines research strategy as a general approach to conducting research. There are three common types of research strategies: quantitative, qualitative, and mixed methods. In this study, a quantitative approach was used because it allowed for objective data collection, standardized procedures, and researcher control. This approach was chosen because it was deemed the most effective way to achieve the study's objectives. The advantages of using a quantitative approach include cost efficiency, flexibility, anonymity, and time-saving. Additionally, this approach is preferred by the researcher because it produces unbiased results and ensures greater accuracy and objectivity. The use of mathematical and statistical methods in quantitative research also enables easy summarization of large volumes of data and comparisons across different categories (Galt et al., 2008).

3.5. Research Design

In his work, Yin (2009) defines research design as a comprehensive plan for collecting data in an empirical research project. In this particular study, both descriptive and inferential methods of data analysis were used to detect the access and relationship between variables. Descriptive statistics such as average, mean, standard deviation, percentage, ratio, and tables have been employed. The descriptive statistics are essentially used to explain the sample value without inferring the population parameters. The inferential analysis in turn used to infer about the effects of determinant factors on the viability of agricultural development banks. Inferential statistics such as the Independent Sample T-test, ANOVA, Pearson correlation, regression analysis, and for binary (dichotomous) questionnaires, probit analysis have been used in the study.

To gather feedback and opinions from participants, which were then analyzed to understand the types of participants within the research area. The use of this design was justified as it took into account present perspectives and existing connections, as well as the scrutiny of variables included in the research. The primary purpose of using the descriptive research design was to transform information and data into a statistical format. To ensure the formality of responses, a structured questionnaire was used for data collection. The beta value (β) was utilized as a measure of how strongly the individual independent variable influenced the dependent variable, as has been done in previous research such as Jafari et al. (2010).

3.6. Data Collection

Data collection is the process of obtaining data for research (Driscoll et al., 2007). There are many methods of collecting primary data, but the choice of the method to use is influenced by the nature of the problem and the availability of time and money (Cooper & Schindler, 2008). In this study, different methods and tools were utilized to collect primary and secondary data, as follows:

3.6.1. Primary and Secondary Data

The primary data was collected by means of a questionnaire that was derived from previous research and was adapted to suit the case of the current research. The questionnaire was developed

and piloted before distribution in order to validate the content of the questionnaire in terms of logic, accuracy, validity, and reliability. The final version of the questionnaire was distributed to all participants. The data was collected over a period of two weeks in end of April and beginning of May 2023. The secondary data sources are mainly used for research objective one. That was assessing about the current status agricultural development bank in Ethiopia. Those are journals articles, bulletins of the specified organizations, audit reports, government laws and regulations, Constitution of Federal Democratic Republic of Ethiopia and statistical reports.

3.6.2. Developing the questionnaire

A questionnaire is a procedure for getting data from the participants by utilizing a sequence of questions pertaining to the specific subject matter. A questionnaire was designed and prepared for this study based on the proposed study model, which was derived from the measurement instruments used in the previous research and from the definitions provided in the literature of information systems. Likert five-point scale that comprises the following options: "Strongly agree, Agree, Neutral, Disagree, Strongly Disagree".

Questionnaires and items were adapted from previously published research papers to align with the current research paper. In this study, closed-ended questionnaires were used, as they were considered to be the best method to enable the researcher to meet the research objectives. Closed-ended questions have the advantage over open-ended ones in that they are quicker and easier to answer. The advantage of this type of questionnaire is that it is more objective and easy to code and analyze using statistical packages such as Statistical Software Package for Social Sciences (SPSS). Generally, questionnaires are cost effective and easy to complete. They speed up the process of collecting data and save time compared to other methods such as interviews, focus groups, and observations. The final version of the questionnaire is included in the appendix. The references of the questionnaire items are the same as those indicated at the conceptual framework in chapter two.

3.6.3. Research Sample and Data Collection

According to Cramer and Howitt (2004), a sample is a set of entities drawn from a population with the aim of estimating the characteristics of the population. In this research, sampling was adopted because it is cost effective, has greater accuracy of results, and speeds up data collection. The sample size was determined using the following formula and assumptions. As per the formula, the sample size would be the maximum or largest; we could use P = 0.5 and 1-P = 0.5. Based on this assumption, the proportion of employees who are experts in all kinds of bank products (P) is equal to the proportion of employees who have no knowledge of all kinds of bank products (1-P) =0.5. In an optimum allocation for a fixed sample size, the standard error of a proportion that will take care of the possible variability for any given value of n is obtained when P, the proportion, is between 0.03 and 0.08 (Cochran (2002)). The value arrived at is 0.5, which is within the range given by Cochran. A 95 percent level of confidence with a critical value of Z = 1.96 in a normal probability table and 0.05 precision, including the design effect assumed to be 1.2; was taken to tolerate the error in the design of the study. The sample size is calculated as follows:

To get the population proportion from population (See appendix B)

$$\text{Unlimited population: } n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Where;

z is the z score
ε is the margin of error
N is the population size
p̂ is the population proportion
n' is the sample size with finite population

$$n = \frac{1.96^2 \times 0.5\ (1 - 0.5)}{} = 150.06250$$

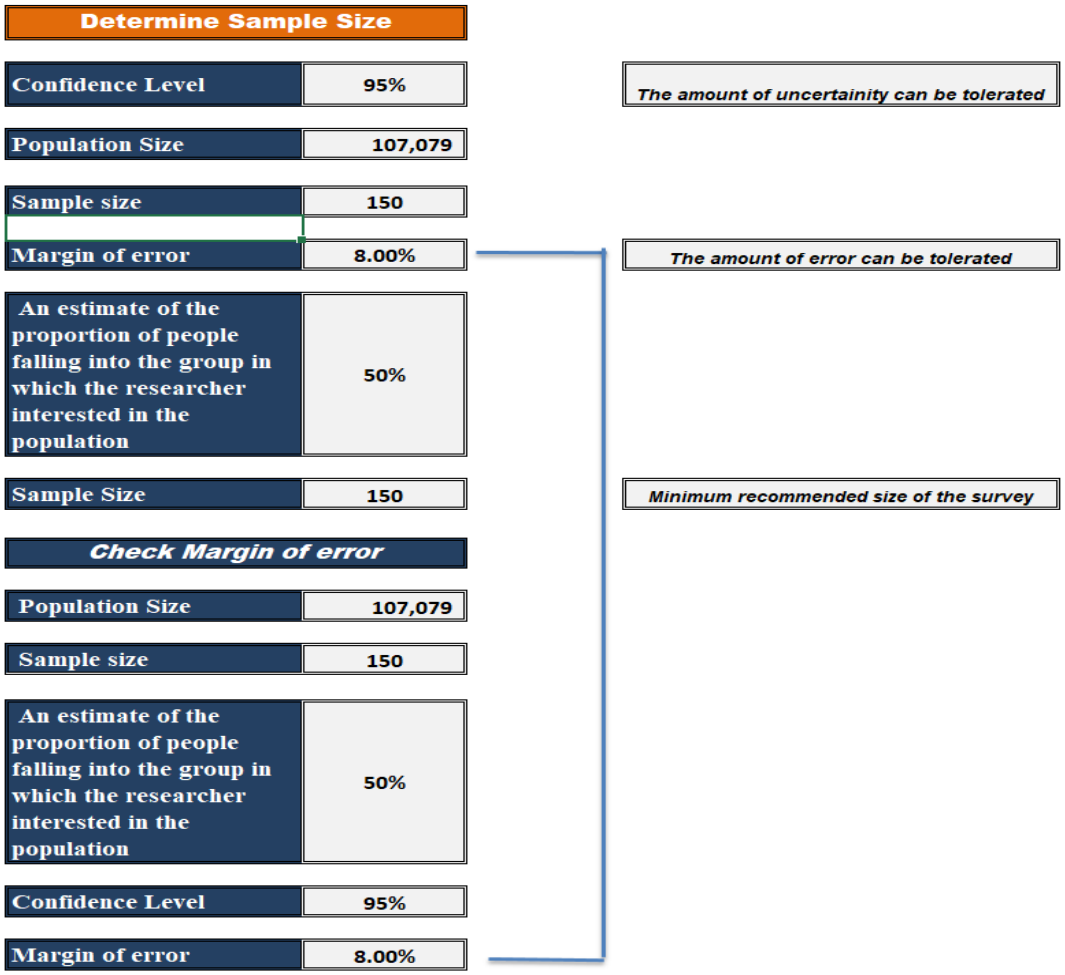
Then calculate to the known total population 107,079 with an intended population proportions and the margin error is 0.08. Cochran (2002).

$$\text{Finite population: } n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2 N}}$$

Substitute n = 150.06250 (infinite) to the finite population samples.

$$1 + \frac{1.96^2 \times 0.5\ (1- 0.5)}{0.08^2 \times 107{,}079} = 1.0014 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \underline{n' = 149.85}$$

Table 4 Computation of sample size



150 research questionnaires were distributed to private and government commercial banks, the Development Bank of Ethiopia, and the National Bank of Ethiopia. The NBE 2022 shows there are 30 commercial banks in service. Amazingly, all commercial banks areas of service are closely similar. The sampling technique was focused on the earlier and well-known 16 private commercial banks and the government-owned Commercial Bank of Ethiopia. Because this researcher has a published book on the services of those commercial banks and their breakdown report cited in the literature review section of this study, out of 131 questionnaires collected, 127 were usable for data analysis. The questionnaires were distributed by hardcopy, and for some respondents' convenience, an electronic way was used. According to Joseph Carvalho (1984) table, 125 is a medium sample and can be used for analysis. The population details are appended at the end of this research.

3.7. Ethical Considerations

Informed consent is a critical aspect of ethical research. It involves providing participants with information about the study, including its purpose, procedures, potential risks and benefits, and their right to withdraw at any time. Researchers must ensure that participants fully understand this information before they agree to participate. Informed consent is especially important in studies involving vulnerable populations, such as children or individuals with mental or cognitive impairments.

Confidentiality and privacy are also crucial ethical considerations in research. Researchers must take steps to protect participants' personal information, ensuring that it is kept confidential and only used for research purposes. This includes using secure data storage systems, de-identifying data, and obtaining necessary permissions before sharing information with others. Beneficence is another key ethical principle in research. It involves maximizing potential benefits and minimizing potential harm to participants. Researchers must carefully consider the potential risks and benefits of their study and take steps to minimize any harm that may occur. This includes monitoring participants for adverse effects and taking appropriate action if necessary. Respect for people is another important ethical principle in research. This involves treating participants with dignity and respect, recognizing their autonomy and right to make decisions about their participation in the study. Researchers must ensure that participants are not coerced or pressured into participating and that they have the opportunity to ask questions and have their concerns addressed.

Finally, animal welfare is a critical consideration in research involving animals. Researchers must ensure that animals are treated humanely and that their suffering is minimized as much as possible. This includes providing appropriate housing, care, and veterinary treatment, as well as using alternative methods whenever possible to reduce the number of animals used in research.

In conclusion, ethical considerations are essential in research, and researchers must carefully consider these principles when designing and conducting studies. Failure to adhere to ethical principles can have serious consequences, both for participants and for the credibility of the research itself. By upholding ethical standards, researchers can ensure that their studies are conducted in a responsible and respectful manner, benefiting both participants and society as a whole.

3.8. Statistical Analysis Tools and Statistical Tests

The researcher has used both descriptive and inferential statistical analysis with quantitative data. To examine research hypotheses and to answer research questions, the researcher has applied the following statistical tools and methods:

1. Statistical software package for social science (SPSS)
2. The reliability test was carried out using Cronbach's Alphas (CA).
3. Data screening for regression model assumptions: linearity, collinearity, heteroscedasticity, normality and outliers.
4. Percentages of the demographic information results, (Section A of the questionnaire) using figures were presented. Subsequent to that, the hypotheses of the research study were tested using the regression analysis technique.
5. Econometric regression model.

3.9. Econometric Model Selection

To achieve the paper's objective, the study primarily relied on structured questionnaires. The benefits of using this data and identifying the determinant variable were examined through descriptive statistics, correlations, regression analysis, and inferential statistics. The correlation matrix was used to investigate the connection between the dependent and explanatory variables. In this study, besides the Likert scale analysis, the dependent variable was a binary variable that took on values of 0 or 1. As a result, a "probit regression model" was used as the fitted model for this research. The Z-statistic was utilized to determine the significance of each independent and control variable's influence on viability. The general model for this study, as mostly found in the existing literature, is represented by;

$Zi,t = \alpha + \beta\ Xi,t + ei,t$ The subscript 'i' represents the cross-sectional dimension, and 't' denotes the time-series dimension. The left-hand variable 'yi,t" represents the dependent variable in the model, which is viability. 'xi,t' Contains the set of independent variables in the estimation model, is taken to be constant over time 't' and specific to the individual cross-sectional unit 'i'. If 'α' is taken to be the same across units, then probit model regression provides a consistent and efficient

estimate of ‘α’ and ‘β’. In light of the model, the structured questioner data constructed by taking the independent variable that determines "viability" was analyzed using the ordinal and probit regression models. The regression model underlying the response variable ‘Zi’ in this study is defined by the regression relationship of explanatory variables: organizational competences, economic feasibility, technological readiness, and societal factors on the dependent variable (viability), substituted and shown here below.

$$VIA = \beta 0 + \beta 1ORC + \beta ECF + \beta TER + \beta SOF + \varepsilon + ni$$

Where VIA = the viability

β = vector of unknown parameters

ORC = Organizational Competences

ECF = Economic Feasibility

TER = Technology Readiness

SOF = Societal Factors

ε = Error Term

ni = unobservable heterogeneity.

β1, β2, β3, β4 = slope of each independent variable and their measure to what extent affect the dependent variable, i.e., viability in this case.

3.10. Definition of Variables

The dependent variable in this research “Viability”, and it is measured by four different and non-identical independent variables (organizational competences, economic feasibility, technological readiness and societal factors). Viability was checked by a 5 Likert scale questions for those independent variables. The study also included a dichotomous question; for the dependent variable (viability) as dummy variable as 1 and the closing, ignoring and reforming as measuring variables.

Viability: The ability of something to be successful or effective in achieving its intended purpose or to continue to exist or function under certain conditions.

Organizational Competences: refer to the skills, abilities, and resources that an organization possesses to achieve its goals and objectives.

Economic Feasibility: refers to the ability of a project or investment to generate enough profit or revenue to justify its costs and expenses.

Technological Readiness: refers to the level of development and availability of technology necessary to implement a project or investment successfully.

Societal Factors: refer to the various social, cultural, and political aspects of a society that can affect the success of a project or investment. Political will specifically refers to the willingness of government leaders to support and prioritize a particular initiative.

Summary of chapter three: The methodology chapter explained how the research approach was selected for this study, starting with defining the research philosophy and approaches. It also discussed different research strategies and the reasons for choosing a particular method. The research philosophy for the research is positivism, and the research approach is to check the relationship between four determinant variables and one dependent variable with quantitative data. This is the end of chapter three, and the next is chapter four for results and dissertations.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

This chapter presents analysis of the results findings and corresponding discussions, consolidated based on the survey questionnaire in relation to the research questions that were presented in Chapter 1. To do the data analysis, the Statistical Package for Social Science (SPSS) version 25 was utilized for quantitative data. The initial portion, included the preliminary analysis, and then the statistical result was extracted and reported in the finding part. Finally, the discussion on the findings was elaborated on. Because, before analyzing, data screening is mandatory and done. The data were checked by many methods, and unusable data were dropped from analysis.

4.1. Preliminary Data Presentation

In this section, the preliminary analysis was conducted. The response rate of the questionnaire is the first, and the reality tests of the questionnaire items were checked by data analysis software. Those checked data were further screened by ordinary least squares assumptions.

4.1.1. Response Rate

Privitera (2013) dictates that, the response rate is the proportion of survey takers who complete a survey out of all those who were invited to participate. For this particular study, the response rate was calculated based on the number of questionnaires distributed, with 150 questionnaires distributed and 131 responses received. Of those, two questionnaires were unusable, leaving 129 usable questionnaires for data analysis. This represents a response rate of 86% (129/150 * 100). But of those 129 usable questionnaires, two were outliers and discarded from analysis. As indicated in the following table, 127 (84.67% of 150 questionnaires) were considered acceptable response rates according to Mugenda and Mugenda's (2012) recommendation that a response rate of 50% is adequate for analysis and reporting, while a rate of 60% is generally good, and a rate above 70% is excellent.

Kothari (2011) also suggests that a response rate above 70% is very good. Manfred et al. (2016) caution that a response rate below 30% may raise doubts about the validity, methods, and results of a study. In this case, the response rate of 82% exceeded the proposed threshold, indicating that it was adequate and increasing confidence in generalizing the findings of the study. Additionally, the sample size of 150 participants was manageable given time and resource constraints and provided a critical analysis of the study's contents.

Table 5: Number of usable responses (n = 127)

Sample Size	Returned Questionnaires	Number of Useable % Responses	% of Usable Responses
150	131	127	84.67%

4.1.2. Reliability Test Results

Privitera (2013) explains that reliability refers to the consistency of a measurement instrument, specifically the degree of similarity in results across different situations or repeated testing. Internal consistency, which assesses the consistency of results across items within a test, is commonly evaluated using Cronbach's Alpha. These measures are particularly useful for surveys with multiple Likert-type questions. In this study, both measures were used to assess construct reliability for multiple variables. The recommended minimum value for both measures is 0.70, and all constructs in this study met this requirement, (organizational competences = 0.883, economic feasibility = 0.701, technological readiness 751 and societal factors = 0.717); with no constructs needing to be dropped. Cronbach's Alpha values for all variables is 0.908.

Table 6: Reliability test of the questionnaire items

Dimensions	No. Of Items	Cronbach's alpha
Organizational Competences	3	**0.883**
Economic Feasibility	3	**0.701**
Technology Readiness	3	**0.751**
Societal Factors	3	**0.712**
Viability	3	**0.717**
Overall	15	**0.908**

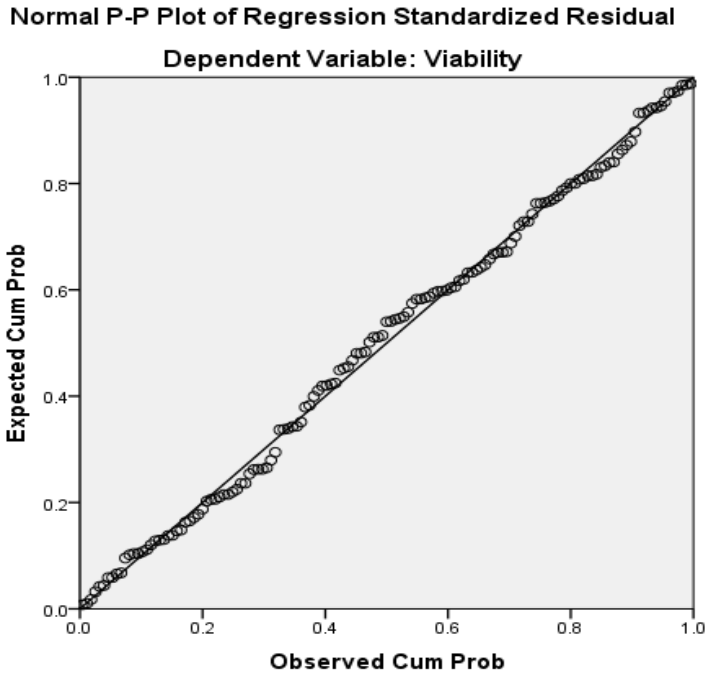
Extracted from SPSS analyzing of data for this study (2023)

4.1.3. Data Screening with Ordinary Least Square (OLS) Assumptions

The ordinary least squares (OLS) method can be defined as a linear regression technique that is used to estimate the unknown parameters in a model. The method relies on minimizing the sum of squared residuals between the actual (observed) values of the dependent variable and the predicted values from the model.

4.1.3.1. Linearity

This assumption is one of the most fundamental assumptions of linear regression and states that the relationship between the independent and dependent variables is linear. This means that the change in the dependent variable is proportional to the change in the independent variable. The linearity assumption can be checked by creating a scatter plot of the data and visually inspecting it. (Montgomery et al., 2012)



The above table shows the data are plotted against the theoretical normal distribution in such a way that the points are formed an approximate straight line.

4.1.3.2. Independence

This assumption states that the observations in the dataset are independent of each other. This means that the value of one observation does not depend on the value of another observation. Independence can be checked by examining the data collection process and ensuring that there is no systematic relationship between observations. (Kutner et al., 2005). The Durbin-Watson statistic in SPSS is a measure of autocorrelation in the residuals of a regression analysis. The value of the statistic ranges from 0 to 4, with a value of 2 indicating no autocorrelation. Between 1.50 and 2.50 is recommended. A value less than 2 suggests positive autocorrelation, while a value greater than 2 suggests negative autocorrelation.

Table 7: The Durbin Watson statistics for independence check

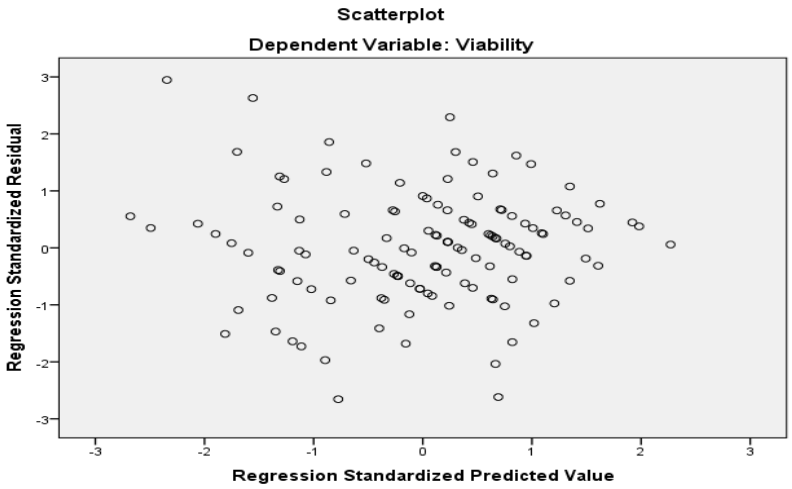
Model Summary[b]					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	**.754[a]**	**0.568**	**0.554**	**0.5305**	**2.051**
a. Predictors: (Constant), Technology Readiness, Organizational Competences, Societal Factors, Economic Feasibility					
b. Dependent Variable: Viability					

(Source: Own report from statistical analysis software 2023)

According to the above output from SPSS, the Durbin-Watson statistic is reported along with its significance level of 1.991. There is no relationship between the residual value and the independent variables. If the significance level is less than 0.05, there is evidence of autocorrelation in the residuals. This means that the assumptions of the regression model have been violated, and the results may not be reliable. If autocorrelation is present, it may be necessary to use a different statistical method or to include additional variables in the model to account for the autocorrelation. Alternatively, the data may need to be transformed or adjusted to reduce the autocorrelation.

4.1.3.3. Homoscedasticity

This assumption states that the variance of the residuals is constant across all levels of the independent variables. Homoscedasticity means that the variability of the errors is consistent across all levels of the independent variable. Homoscedasticity can be checked by creating a scatter plot of the residuals and visually inspecting it. (Gujarati, 2003) Based on the table and the scatterplot, it appears that the spots are diffused and do not form a clear, specific pattern. So it can be concluded that the regression model does not have a heteroscedasticity problem.



4.1.3.4. Normality

This assumption states that the residuals are normally distributed. Normality means that the errors are distributed symmetrically around zero and follow a normal distribution. Normality can be checked in many ways, including by creating a histogram or a normal probability plot of the residuals. (Field, 2013) The other way to check normality is as stated by Kline (2005): to meet the requirement for univariate or multivariate normality in a structural equation model, all measurement variables must follow a normal distribution. Failure to meet this requirement makes it impossible to conduct accurate statistical verification. Even minor deviations from normality in skewness and kurtosis can result in rejection of normality, so it is better to assess the absolute value rather than rely solely on statistical verification. If skewness exceeds an absolute value of 3 and kurtosis surpasses 8 or 10, it is considered a severe issue. The table displays the results of the accumulated measurement variables, which show that skewness is below an absolute value of 0.456 and kurtosis is below an absolute value of 0.619. This indicates that the basic assumption of univariate or multivariate normality has been met and can be analyzed.

Table 8: Data normality check by skewness and kurtosis

Descriptive Statistics					
	N	Mean	Std. Deviation	Skewness	Kurtosis
Organizational Competences	127	2.761	1.0087	-0.091	-0.619
Economic Feasibility	127	3.383	0.7969	-0.456	0.152
Technology Readiness	127	3.333	0.8759	-0.325	-0.319
Societal Factors	127	3.451	0.8331	-0.372	-0.126
Viability	127	3.178	0.7944	-0.384	0.291
Valid N (listwise)					

(Source: Own report from statistical analysis software 2023)

The other way to check is "The Shapiro-Wilk Residual". The result obtained from the Shapiro Wilk test indicates that all the variables had a P-value greater than 0.05. This means the variables involved in the study followed a normal distribution; therefore, it can be concluded that the residual value is normally distributed and the regression analysis procedure has been fulfilled. The result obtained from the data analysis, the Shapiro Wilk Unstandardized Residual is 0.217 (greater than 0.05), and normality is satisfied.

Table 9: Normality check by Shapiro-Wilk statistics.

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	**0.045**	**127**	**.200***	**0.986**	**127**	**0.217**
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

(Source: Own report from statistical analysis software 2023)

4.1.3.5. Multi-collinearity Checking

This assumption states that the independent variables are not highly correlated with each other. Multi-collinearity means that two or more independent variables are highly correlated, which can lead to unstable estimates of the regression coefficients. Multi-collinearity can be checked by calculating the correlation matrix of the independent variables. (Hair et al., 2010)

Table 10: Multi-collinearity check by 'Tolerance' and 'VIF' statistics

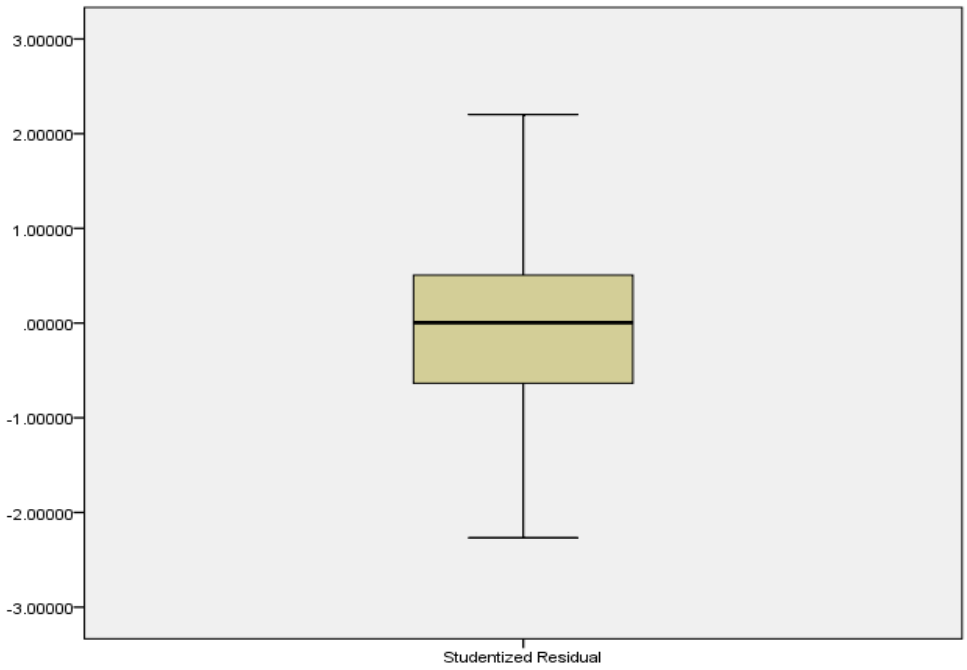
Coefficients[a]		
Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Organizational Competences	**0.691**	**1.447**
Economic Feasibility	**0.518**	**1.93**
Societal Factors	**0.463**	**2.158**
Technology Readiness	**0.46**	**2.174**
a. Dependent Variable: Viability		

(Source: Own report from statistical analysis software 2023)

All the VIF column values are less than 10, and the tolerance values are greater than 10%, respectively. This shows that there are no multi-collinearity influences between the explanatory (independent) variables. So, if there is a null hypothesis, it is to be rejected.

4.1.3.6. Outliers Screening

This assumption states that there are no extreme values in the data that disproportionately influence the regression results. Outliers can be identified by creating a scatter plot of the data and visually inspecting it, or by using statistical tests such as Cook's distance or leverage values. (Fox, 1997).



The original raw data had 2 outliers out of 129 usable questionnaires, which were excluded from this analysis. 127 questionnaires are used for analysis. According to the final data set, there is no 'asterisk' or 'circle' on either end of the box plot, which means it is free from any outliers. The data screening was concluded here, and next is the demographic analysis section.

4.2. Research Findings and Corresponding Analysis

The research finding is reporting what the collected data showed by using data processing statistical software (SPSS). The first section is for demographic information. The second section is used for research purposes and to ensure that the research question is answered and the objectives are met. The correlation, the regression, and the dichotomous analysis were reported. The questionnaire was formulated with both Likert scale and dichotomous questions.

4.2.1. Demographic Summary On Respondents

In this section, the questionnaire focused on the biographical details of the respondents; like gender, age group, educational level, years of experience in those institutions, and area of work. The following section presents the demographic results.

Table 11: Demographic summary of the respondents

No.	Variable	Values	Frequency	Percent
1	Age Group	Less than 20 Years	0	0%
		21-30	28	22%
		31-40	35	28%
		41-50	41	32%
		Above 50 Years	23	18%
2	Gender	Male	73	57%
		Female	54	43%
3	Educational Level	Diploma	13	10%
		1st Degree	57	45%
		2nd Degree	51	40%
		PHD	6	5%
4	Total years of Experience	1 to 5	27	21%
		6 to 10	28	22%
		11 to 15	19	15%
		16 to 20	17	13%
		More than 20	36	28%
5	Job Position	Junior Officer	27	21%
		Senior Officer	48	38%
		Principal Officer	28	22%
		Bureau/Office/Branch Manager	17	13%
		Director/District Manager	6	5%
		Vice President	1	1%
		Presidint	0	0%

4.2.1.1. Age Groups

The table shows the age distribution of the 127 respondents who participated in this research. The majority of the respondents fall within the age range of 31 to 50 years, which accounted for 60% of the sample. 27 respondents (22%) were between the ages of 21 and 30 years, while 35 respondents (28%) were between the ages of 31 and 40 years. Additionally, 41 respondents (32%) were between the ages of 41 and 50 years, and 23 respondents (18%) were above the age of 50. Out of 127 respondents, 73, or 57%, were males, and 54, or 43%, were females.

These results suggest that the sample was diverse in terms of age, with a relatively even distribution across the different age groups. However, it is noteworthy that the largest proportion of respondents fell within the middle-aged category, highlighting the importance of considering this demographic when conducting research in this field. Overall, these findings provide valuable insights into the age distribution of the sample and can inform future research studies in this area.

4.2.1.2. Educational Level

The educational level of the 127 respondents who participated in this research on the viability of agricultural banks in Ethiopia. The findings revealed that the majority of the respondents held a first degree, accounting for 45% of the sample. The data showed that 13 respondents (10%) held a diploma, 51 respondents (40%) held a second degree, and 6 respondents (5%) held a PhD.

These results suggest that the sample was diverse in terms of educational level, with a relatively even distribution across the different categories. It is noteworthy that a significant proportion of the respondents held advanced degrees, indicating that the sample was highly educated. This finding may have important implications for the interpretation of the data, as highly educated individuals may have different perspectives and experiences related to agricultural banking than those with lower levels of education. Overall, these findings provide valuable insights into the educational background of the sample and can inform future research studies in this area. Further research may be necessary to explore how educational level influences attitudes and behaviours related to agricultural banking in Ethiopia.

4.2.1.3. Job Position of Respondents

The job positions of 127 respondents who participated in research on the viability of agricultural banks in Ethiopia. The findings revealed that the majority of the respondents held senior officer positions, accounting for 38% of the sample. Further analysis of the data showed that 27 respondents (21%) held junior officer positions, 28 respondents (22%) held principal officer positions, 17 respondents (13%) were branch managers, and 1 respondent held a vice president position.

These results suggest that the sample was diverse in terms of job positions, with a relatively even distribution across the different categories. It is noteworthy that a significant proportion of the respondents held senior officer positions, indicating that the sample was comprised of experienced individuals with knowledge and expertise related to agricultural banking. This finding may have important implications for the interpretation of the data, as individuals in senior positions may have different perspectives and experiences related to agricultural banking than those in junior positions. Overall, these findings provide valuable insights into the job positions of the sample and can inform future research studies in this area. Further research may be necessary to explore how job position influences attitudes and behaviors related to agricultural banking in Ethiopia.

4.2.2. Correlation Results and Analysis Between Independent Variables

In this section, the correlation between the dependent and explanatory variables is discussed. A correlation matrix is used to ensure the correlation among the explanatory variables.

Cooper and Schindler (2009) suggested that a correlation coefficient above 0.8 between explanatory variables is a sign of a multi-collinearity problem. Malhotra, (2007) argued that the correlation coefficient can be used at 0.75. The result of the correlation analysis shows that all the independent variables used in the empirical analysis have a correlation coefficient of less than 0.75. This indicates that the researcher can use all six variables. A correlation coefficient is a statistical measure of the degree to which changes to the value of one explanatory variable predict changes to the value of another explanatory variable.

According to Kothari (2004), correlation (r) is a measure of the association between two variables. Positive values of r indicate a positive correlation, meaning that changes in both variables occur in the same direction. On the other hand, negative values of r indicate a negative correlation, meaning that changes in the two variables occur in opposite directions. A zero value of r indicates no association between the two variables.

When r equals (+) 1, it indicates perfect positive correlation, and when it is (-) 1, it indicates perfect negative correlation. Similarly, Cohen (1998), cited by Warokka et al. (2012), interpreted the coefficient of correlation between 0 and 1 as follows: a correlation coefficient (r) ranging from 0.10 to 0.29 may indicate a low degree of correlation; a r ranging from 0.30 to 0.49 may be considered a moderate degree of correlation; and a r ranging from 0.50 to 1.00 may be regarded as a high degree of correlation.

The table illustrates the correlation between the dependent variable (viability) and the independent variables (organizational competencies, economic feasibility, technology readiness, and societal factors). As it was tested in a two-tailed Pearson's correlation analysis, the association between each dependent and independent variable is described in the table.

Table 12: Correlation analysis of dependents and independent variables

Correlations					
	Viability	Organizational Competences	Economic Feasibility	Technology Readiness	Societal Factors
Viability	**1**				
Organizational Competences	**.576****	**1**			
Economic Feasibility	**.586****	**.409****	**1**		
Technology Readiness	**.660****	**.536****	**.603****	**1**	
Societal Factors	**.626****	**.454****	**.653****	**.655****	**1**
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: Own reporting from the analysis software (2023)

To discuss the correlation matrix, keep in mind that the correlation coefficient (r) ranging from 0.10 to 0.29 may be regarded as indicating a low degree of correlation, r ranging from 0.30 to 0.49 may be considered a moderate degree of correlation, and r ranging from 0.50 to 1.00 may be regarded as a high degree of correlation. When r = 0, there is no correlation at all. [Kothari (2004) and Warokka (2012)]. In the Pearson correlation matrix, at a significant confidence level of 0.01,

Viability shows a high degree of correlation with organizational competencies (r = 0.576), economic feasibility (r = 0.586), technology readiness (r = 626), and societal factors (r = 0.626). A high degree of correlation means r > 0.5–1.0. This is just a mutual correlation between variables.

The correlation between organizational competencies and two variables fell to a moderate degree (r is between 0.3 and 0.49% with a significant level of 0.01): economic feasibility (r = 0.409), and societal factors (r = 0.454). But organizational competencies with economic feasibility have a high rate of correlation (r = 0.536).

The third column, economic feasibility, has a strong correlation to the corresponding two variables. Hence, economic feasibility is associated with technology readiness (r = 603) and societal factors (r = 653).

Finally, technology readiness with societal factors is (r = 0.655) and showed a high correlation as well. The correlation matrix shows only mutually moving in the same direction, different directions, or remaining uncorrelated. The regression analysis is different and shows the impact of one variable on another. So, next is the regression analysis section.

4.2.3. Regression Results and Analysis

The study employed linear regression models. This model captured the effects of viability constructs on the Viability Agricultural Development Bank by breaking into two parts. The first part of the model mainly focused on analyzing the aggregate variables (Organizational Competences, economic feasibility, technology readiness and societal factors). The second part of the model on the other hand, focuses on the disaggregated impacts of those explanatory variables on the dependent variable (viability). To this end, the equation used in the study;

$VIA = \beta 0 + \beta 1ORC + \beta ECF + \beta TER + \beta SOF + \varepsilon + ni$

Where,

VIA = The Viability

β = Vector of Unknown Parameters

ORC = Organizational Competences

ECF = Economic Feasibility

TER = Technology Readiness

SOF = Societal Factors

ε = Error Term

ni = Unobservable heterogeneity.

β1, β2, β3, β4 = slope of each independent variables and their measure by what extent affect the dependent variable, i.e Viability in this case.

The Problem:

To investigate the effect of organizational competences, economic feasibility, technology readiness, and societal factors on the viability of the Agricultural Development Bank in Ethiopia.

H1: There is a significant and positive impact of organizational competences on the viability of the Agricultural Development Bank.

H2: There is a significant and positive impact of economic feasibility on the viability of the Agricultural Development Bank.

H3: There is a significant and positive impact of technological readiness on the viability of the Agricultural Development Bank.

H4: There is a significant and positive impact of societal factors on the viability of the Agricultural Development Bank.

4.2.3.1. The Aggregate Regression Result and Analysis

The model summary in SPSS provides information on the overall fit of the regression model. It includes the R-squared value, which represents the proportion of variance in the dependent variable that is explained by the independent variables in the model. The adjusted R-squared value takes into account the number of independent variables in the model and adjusts the R-squared value accordingly. This helps to prevent overfitting of the model. The F-statistic and its associated significance level are also reported in the model summary. The F-statistic tests the overall significance of the regression model, and a significant result indicates that at least one of the independent variables is related to the dependent variable. The standard error of the estimate is another important measure reported in the model summary. It represents the average distance between the observed values of the dependent variable and the predicted values from the regression model. A smaller standard error of the estimate indicates a better fit of the model to the data.

Table 13: Aggregate model summary of the determinant factors on viability

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.754[a]	0.568	0.554	0.5303	2.051
a. Predictors: (Constant), Technology Readiness, Organizational Competences, s **b. Societal Factors, Economic Feasibility**					
b. Dependent Variable: Viability					

Source: Own reporting from the analysis software (2023)

According to the table, 58.6% of the Viability of Agricultural Development Bank could be attributed to the combined effect of the predictor variables. However, 41.4% of the variance is explained by other factors not covered in this study.

ANOVA results show that the level of significance is below 0.01. This indicates the model is reliable and best fitted at all conventional levels of significance.

Table 14: Aggregate Anova summary of the determinant factors on viability

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	45.171	4	11.293	40.121	.000b
Residual	34.339	122	.281		
Total	79.510	126			
a. Dependent Variable: Viability					
b. Predictors: (Constant), Technology Readiness, Organizational Competences, Societal Factors, Economic Feasibility					

Source: Own reporting from the analysis software (2023)

The dependent variable (viability) was regressed on predicting variables (Organizational Competences, economic feasibility, technology readiness, and societal factors). The independent variables significantly predict the viability of the Agricultural Development Bank, $F(4,122) = 40.121$, $P<0.001$, which indicates that the four factors under study have a significant impact on the viability of the Agricultural Development Bank. Moreover, the $R^2 = 0.586$ explained before depicts that the model explains 58.6% of the variance in viability of the Agricultural Development Bank predicted by the listed five factors.

4.2.3.2. The Disaggregate Regression Result and Analysis

Additionally, to the aggregate analysis above, coefficients were further assessed to ascertain the influence of each of the factors on the criterion variable (Viability).

H1 evaluates whether Organizational Competences (ORC) significantly and positively affect viability. The result revealed that Organizational Competences has significant and positive impact on the viability of Agricultural Development Bank ($B = 0.205$, $t = 3.639$, $P = 0.000$). Hence, H1 supported the hypothesis.

H2 (economic feasibility = ECF), the data analysis showed a significant and positive impact on the viability of Agricultural Development Bank ($B = 0.173$, $t = 2.106$, $P = 0.037$).

H3, the third hypothesis (technological readiness), has a significant and positive impact on the viability of Agricultural Development Bank (B = 0.250, t = 3.155, P = 0.002). Technological readiness (H3) supported the viability of Agricultural Development Bank.

Finally, H4 (societal factors) has a significant and positive impact on the viability of Agricultural Development Bank (B = 0.204, t = 2.437, P = 0.016). Hence, H4 is also supported. According to Jafer et al. (2016) and Montgomery and Ranger (1999), since the P-value is < 0.05 and the absolute value of the t-value is ≥ 1.96, the independent variable has significant impact on the dependent variable.

Table 15: The disaggregate analysis summary of the determinant factors on viability

Hypothesis	Regression Weights	B	T	P-value	Hypothesis Supported/Rejected
Constant	VIA	0.488	2.144	0.034	
H1	ORC → VIA	0.205	3.639	0.000	Supported
H2	ECF → VIA	0.173	2.106	0.037	Supported
H3	TER → VIA	0.250	3.155	0.002	Supported
H4	SOF → VIA	0.204	2.437	0.016	Supported
R^2	0.586				
F(4,122)	40.121				

Note: P < 0.05, ORC: Organizational Competences, TEC: ECF: Economic feasibility, TER: Technology readiness and SOF: Societal factors.

Source: Own reporting from the analysis software (2023)

In regression analysis, this study investigated the relationship between Viability of Agricultural Development Bank and its constructs. To this end, the effects of each construct factor (Organizational Competences, economic feasibility, technology readiness, and societal factors) on each dimension of viability have been regressed using a linear regression model. Then, the effects

of viability (independent variable) have been regressed by using the weighted values of aggregate level of factors as dependent variable.

This provided a regression coefficient (beta value), which indicated the effects, direction, and degree of contribution made by each independent variable to the dependent variable. R- square (coefficient of determination) tells how much variation is taking place in the dependent variable (viability) due to the variation in the independent variable (Organizational Competences, economic feasibility, technology readiness, and societal factors). The p-value indicates the statistical significance of the relationship between the dependent and independent variables. The model's adequacy and fitness were checked before running the regression analysis.

The B value on viability in ascending order is, economic feasibility (B = 0.356), technology readiness (B = 0.290), societal factors (B = 245), technology readiness (B = 210 and Organizational Competences, (B = 0.202), with a P-value <0.005.

Recall our regression coefficient formula:

$VIA = \beta 0 + \beta 1ORC + \beta ECF + \beta TER + \beta SOF + \varepsilon + ni$

Where: VIA = The Viability, β = Vector of Unknown Parameters, ORC = Organizational Competences, ECF = Economic Feasibility, TER = Technology Readiness, SOF = Societal Factors, ε = Error Term, ni = Unobservable Heterogeneity β1, β2, β3, β4 = slope of each independent variable and their measure by what extent affect the dependent variable, i.e viability in this case.

The variable with the highest beta value contributes the most to explaining the dependent variable's variance, which is controlled by all other variables in the model. As shown in the B column under the unstandardized coefficient (ignoring the negative sign with a descending value). Economic feasibility (B = 0.356), technology readiness (B = 0.290), societal factors (B = 245), technology readiness (B = 210), and Organizational Competences, (B = 0.202).

Substituting the regression coefficients, we can specify our model as;

$VIA = 0.587 + (.202ORC) + 0.210TEC + (0.356ECF) + 0.290TER + (-0.245GOV) + \varepsilon + ni$

To summarize this regression section as well as the chapter, the model summary shows that 58.6% of the Viability of Agricultural Development Bank could be attributed to the combined effect of the predictor variables. However, 41.4% of the variance is explained by other factors not covered in this study.

Earlier research by Mhonto Mhonto (2020), Seok-Keun Yoo (2019) showed that societal factors had a very strong influence on viability. This implies that higher results from higher societal factors positively affect viability. Therefore, excellent government policy in Ethiopia leads to the viability of the Agricultural Development Bank. This result is also supported by the findings of Liang and Wei (2004), who found support for the relationship between social factors and viability in assessing m-commerce applications.

The implementation of Agricultural Development Banks takes into account organizational viability constraints, according to Liang and Wei (2007). They argue that a user's willingness and ability are the main factors determining organizational viability, while Liang, Huang, Yeh, and Lin (2007) emphasize the importance of user satisfaction and system usage for success. Tobias Mettler (2015), on the study "Anticipating mismatches of HIT investments: Developing a viability-fit model for e-health services," said that while user satisfaction is important, we believe that it is a consequence of Agricultural Development Bank implementation rather than a determinant. We prefer to focus on factors that directly affect technology adoption decisions at the enterprise level, such as legal restrictions, organizational competency levels, and government support. The success of an implementation often depends on these factors, including government support for the objectives of the implementation of the project under study, here the Agricultural Development Bank.

4.2.4. The General and Viability Issue Results and Analysis

The following are six questions about general background information and the viability attitude questions and responses from 127 usable questionnaires.

1. **Have you ever heard of Agricultural Development Bank in Ethiopia?**

Table 16: The descriptive statistics of respondent of dichotomous question 1

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	49	38.6	38.6	38.6
	Yes	78	61.4	61.4	100.0
	Total	127	100.0	100.0	

Source: Own reporting from the analysis software (2023)

The results of the questionnaire on the Agricultural Development Bank in Ethiopia indicate that a significant proportion of respondents have heard about these institutions, with 61.4% (out of 127) reporting some level of awareness. However, there is also a sizeable group of respondents, representing 38.6% of the total, who have no information about the agricultural development bank. This finding suggests that there is a need for greater awareness-raising efforts around the role and function of these banks, particularly among those who are currently unfamiliar with them. By increasing public understanding of the purpose and potential benefits of agricultural development banks, we can help build support for these institutions and ensure that they receive the resources and support they need to be effective.

At the same time, it is important to acknowledge that there may be barriers to accessing information about the agricultural development bank, particularly for those living in rural or remote areas. Efforts to improve communication and outreach strategies will therefore be crucial in ensuring that all stakeholders have access to the information they need to make informed decisions about the future of these institutions. Overall, the results of the questionnaire suggest that while there is some level of awareness about the agricultural development bank in Ethiopia, there is also a need for further education and outreach efforts to ensure that all stakeholders are informed and engaged in discussions around the future of these institutions.

2. Is there still a need for an agricultural development bank in Ethiopia?

Table 17: The descriptive statistics of respondent of dichotomous question 2

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	14	11.0	11.0	11.0
	Yes	113	89.0	89.0	100.0
	Total	127	100.0	100.0	

Source: Own reporting from the analysis software (2023)

The overwhelming majority (85% out of 127) of respondents to the questionnaire on the agricultural development bank in Ethiopia believe that there is still a need for these institutions in the country. This finding suggests that many people recognize the important role that agricultural development banks can play in supporting the growth and development of the agricultural sector, which is a key driver of the Ethiopian economy. Those who answered yes may have cited a range of reasons for their support of agricultural development bank, including the need for access to credit and other financial services, the importance of supporting smallholder farmers and rural communities, and the potential for these institutions to promote sustainable and inclusive economic growth.

On the other hand, those who answered no may have expressed skepticism about the effectiveness of agricultural development bank or may have argued that other approaches or institutions could better meet the needs of farmers and rural communities. Regardless of their specific reasons for their responses, it is clear that there is still a significant level of support for the agricultural development bank in Ethiopia. This suggests that policymakers and other stakeholders should continue to prioritize these institutions and work to ensure that they are well-resourced and effectively managed in order to maximize their impact on the country's agricultural sector and overall economic development.

3. Do you believe existing commercial banks be able to provide loans to farmers and agricultural businesses in Ethiopia?

Table 18: The descriptive statistics of respondent of dichotomous question 3

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	15.0	15.0	15.0
	Yes	108	85.0	85.0	100.0
	Total	127	100.0	100.0	

Source: Own reporting from the analysis software (2023)

The existing commercial banks can provide loans to agribusinesses and farmers. They are the only source of finance for agribusinesses and have a century long experience in bank business. But why they are reluctant to provide loans to the agricultural sector is a huge question to be addressed by other researchers.

According to this survey, 85% of respondents believe that existing commercial banks in Ethiopia should be able to provide loans to farmers and agricultural businesses. This is a positive sign, as it indicates that there is a widespread belief that the banking sector can play a crucial role in supporting the growth of the agricultural sector. However, the remaining 15% who do not believe that commercial banks can provide loans to farmers and agricultural businesses highlight a significant challenge. It suggests that there may be a lack of trust or confidence in the bank sector's ability to understand and meet the needs of the agricultural sector. To address this challenge, commercial banks need to develop specialized products and services tailored to the unique needs of farmers and agricultural businesses. This could include flexible repayment terms, lower interest rates, and collateral requirements that take into account the nature of agricultural assets.

Furthermore, there is a need for increased collaboration between commercial banks, government agencies, and other stakeholders in the agricultural sector. This could involve providing training and capacity building programs to commercial bank staff on the intricacies of lending to the agricultural sector. In conclusion, while there is a widespread belief that existing commercial banks in Ethiopia can provide loans to farmers and agricultural businesses, there is still work to be done to ensure that these loans are accessible, affordable, and meet the needs of the sector. By

developing specialized products and services and increasing collaboration with stakeholders, commercial banks can play a critical role in supporting the growth of Ethiopia's agricultural sector.

4. Would an agricultural development bank be able to contribute to the overall economic development of Ethiopia?

Table 19: The descriptive statistics of respondent of dichotomous question 4

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	12	9.4	9.4	9.4
	Yes	115	90.6	90.6	100.0
	Total	127	100.0	100.0	

Source: Own reporting from the analysis software (2023)

The overwhelming majority of respondents believe that an agricultural development bank would be able to contribute to the overall economic development of Ethiopia. This is a positive sign, as it indicates that there is recognition of the importance of the agricultural sector and the potential role that a specialized bank could play in supporting its growth.

An agricultural development bank could provide targeted financial products and services to farmers and agricultural businesses, including loans with flexible repayment terms, lower interest rates, and collateral requirements that take into account the nature of agricultural assets. This could help overcome some of the challenges faced by farmers and agricultural businesses in accessing finance. Furthermore, an agricultural development bank could provide technical assistance and capacity building programs to help farmers and agricultural businesses improve their productivity and profitability. This could include training on best practises in farming, marketing, and value chain development. Overall, an agricultural development bank could be a valuable tool in supporting the growth and development of Ethiopia's agricultural sector, which is a key driver of the country's economy. By providing targeted financial products and services and technical assistance, an agricultural development bank could help to unlock the potential of this sector and contribute to overall economic development.

5. Do you believe that agricultural development banks be viable easily?

Table 20: The descriptive statistics of respondent of dichotomous question 5

Descriptive Statistics					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	116	91.3	91.3	91.3
	Yes	11	8.7	8.7	100.0
	Total	127	100.0	100.0	

Source: Own reporting from the analysis software (2023)

The responses to the questionnaire indicate that there is some skepticism about the viability of agricultural development banks. However, it is important to note that the majority of respondents (91.3%) believe that such banks would not be easily viable. There are likely several reasons for this skepticism. For one, agricultural development banks may face challenges in attracting sufficient capital to fund their operations, as investors may view them as risky or unprofitable. Additionally, there may be concerns about the ability of these banks to effectively manage risk, given the inherent uncertainties and variability of the agricultural sector.

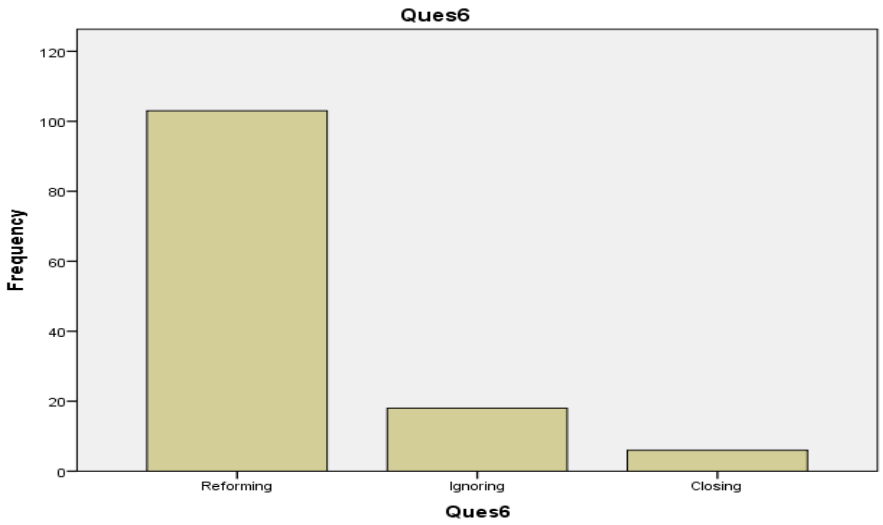
Despite these challenges, it is important to recognize the potential benefits of agricultural development banks. As noted above, such banks could provide targeted financial products and services to farmers and agricultural businesses, as well as technical assistance and capacity building programs. These services could help overcome some of the barriers that currently prevent farmers and agricultural businesses from accessing finance and improving their productivity and profitability. Ultimately, the success of agricultural development banks will depend on a range of factors, including their ability to attract capital, manage risk effectively, and provide high-quality services to their clients. However, given the importance of the agricultural sector to Ethiopia's economy, it is worth exploring the potential of these institutions as a tool for supporting its growth and development.

6. What is your opinion on Agricultural Development Bank?

Table 21: The descriptive statistics of respondent of dichotomous question 6

Ques6 * Close_Ignor_Reform Cross tabulation						
		Reform	Ignore	Close	Total	Percentage
Ques6	Reform	103			103	81.10%
	Ignore		18		18	14.17%
	Close			6	6	4.73%
Total		103	18	6	127	100%

Source: Own reporting from the analysis software (2023)



Source: Own reporting from the analysis software (2023)

The responses to the questionnaire on Agricultural Development Bank indicate that the majority of respondents (81.1%) believe that these banks need to be reformed. This suggests that there is a recognition of the potential benefits of such institutions, but also an acknowledgement that there are challenges that need to be addressed. It is not clear from the responses what specific reforms respondents would like to see implemented. However, it is likely that these would involve measures to improve the viability and effectiveness of agricultural development banks, such as increasing their access to capital, improving their risk management practices, and enhancing their

capacity to provide high-quality services to farmers and agricultural businesses. The fact that only a small percentage of respondents (4.7%) believe that agricultural development banks should be closed suggests that there is a recognition of the importance of these institutions in supporting the growth and development of the agricultural sector. However, it is important to note that this view may be influenced by a range of factors, including the perceived benefits of these banks and the role that they play in supporting rural livelihoods.

Overall, the responses to the questionnaire suggest that there is a need for further discussion and debate around the future of agricultural development bank in Ethiopia. While there may be challenges to overcome, it is clear that these institutions have the potential to play an important role in supporting the growth and development of the agricultural sector, and improving the livelihoods of farmers and rural communities.

7. Subjective Questions for Question: Can you mention any challenges that can be faced by agricultural development banks?

Technical appraisal capacity, risk mitigation mechanisms such as crop, ranch, riot insurance, collateral management, project/loan follow-up, land holding policy, conflicts, natural disaster, hesitation of investors to invest in agriculture due to agricultural challenge, lack of adequate infrastructure in agriculture, backwardness of the farmers in Ethiopia, there is no title deed for the landholders (farmers) for the land they have. These are summarized findings for this question and discussed in the next section.

4.2.5. The Secondary Data Results

When come to the secondary data; Federal Negarit Gazeta (2008), the "Banking Business Proclamation 592/2008" never mentioned the agricultural development bank in Ethiopia. It is all about commercial banks. The draft policy document issued by the Councils of Ministers of Ethiopia affirmed; there is no agricultural development bank in Ethiopia. Abdulkadir (2023). The secondary data was detailed on the introduction, the statement of the problem and the literature review section of this study.

4.3. Discussions of the Results

The earlier parts of this chapter dealt with the presentation of statistical data and its corresponding meanings. In this section, the findings were discussed as determinants of the viability of agricultural banking. We learned from the data, there are four determinant factors for viability.

4.3.1. Organizational Competence

As shown in the finding and data analysis parts, organization competence showed a significant and positive impact on the viability of Agricultural Development Bank. Its B-value is 20.5%, its significance P-value is 0.034 (less than 0.05), and its correlation coefficient is 57.6%.

Organizational competence has three sub-factors. Competency, management support and corporate social responsibility. Competency in skilled manpower, competency in specialized banking products, and competency in technology usage being important for sustainability. Management support is linked to stakeholder support; like National Bank of Ethiopia. Corporate social responsibility was highlighted as an important factor for promoting sustainable agriculture and reducing poverty. Corporate social responsibilities focus on the interests of clients, sustainability development, technical assistance to clients, ethnic diversity of the management team, weather derivatives products, and price hedging instruments were identified as important for organizational competence. Here are some examples from other countries indicated in literature review of this study.

Other countries agricultural banks are viable due to the following: cooperative structure, focus on the interests of the clients, sustainability development, technology usage, technical assistance to the clients (customers), ethnic diversity of the management team, weather derivatives products, and price hedging instruments. Price hedging instruments are some of the fundamental methods for organizational competence and sustainability. This kind of competitiveness is practiced by Rabobank of the Netherlands and Agricultural Bank of China (ABC). They invest in many hedging instruments not only in their respective countries but also as international competitors. The same is for Banco de la Nación Argentina, which focuses on diversified portfolios. Besides these competence factors, the CoBank of the United States of America, focus of specializations in banking products.

The other organizational competence is through quality management and stakeholder support. In this case, the Nation Bank of Ethiopia, the Development Bank of Ethiopia, and the Ministry of Agriculture, should play the viability role. In respect of skilled manpower, these organizations are at the forefront. The Ministry of Innovation and Science has its own part in the viability processes.

To raise one challenge; the high risk associated with agricultural lending, due to factors such as weather variability, pests, and diseases. This can make it difficult for banks to assess the creditworthiness of farmers and manage their loan portfolios effectively.

Corporate social responsibility (CSR) is one of the organizations competence and sustainability factors. It is a concept that refers to the responsibility of an organization to contribute to sustainable development by taking into account the social, economic, and environmental impacts of their operations. In the context of agricultural development banks, CSR can involve a range of activities that aim to promote sustainable agriculture, support rural communities, and reduce poverty.

The Agricultural Bank of China and Rabobank of the Netherlands are good examples of corporate social responsibility for viability. (ABC-CRS (2020), David Subeliani et al. (2005). Some examples of CSR activities that agricultural development banks can undertake include:

Providing loans and financial services to small-scale farmers and rural communities: Agricultural development banks can prioritize lending to small-scale farmers and rural communities, who often have limited access to credit and financial services. This can help to support local livelihoods and promote sustainable agriculture.

Supporting sustainable agriculture practices: Agricultural development banks can provide technical assistance and training to farmers on sustainable agriculture practices, such as agroforestry, conservation agriculture, and integrated pest management. This can help improve agricultural productivity while minimizing negative environmental impacts.

Investing in renewable energy and climate-smart agriculture: Agricultural development banks can invest in renewable energy technologies, such as solar-powered irrigation systems, and promote climate-smart agriculture practices that help to mitigate the impacts of climate change.

Engaging in community development initiatives: Agricultural development banks can support community development initiatives, such as building schools, health clinics, and other

infrastructure in rural areas. This can help improve the quality of life for rural communities and promote social inclusion.

Overall, CSR can be an important tool for agricultural development banks to promote sustainable agriculture and support rural communities. By prioritizing social and environmental responsibility alongside financial sustainability, these institutions can contribute to a more equitable and sustainable future for all.

4.3.2. Economic Feasibility

As shown in the finding and data analyzing part, economic feasibility showed a significant and positive impact on the viability of Agricultural Development Bank. Its B-value is 17.3%, its significance P-value is 0.000 (less than 0.05), and its correlation coefficient is 58.6%. Costs include infrastructure, tax cuts, interest rate reductions, subsidies, and creating sustainable grounds. Creating sustainable ground will affect other banking sectors by imposing agricultural banking activities or restricting limited financing area.

According to this study, economic feasibility has three stages: project related, usage-related, and the sustainable economic ground of agricultural development banking. The project-related costs are the implicit, explicit, and opportunity costs of agricultural development banking. The cost benefit ratio will be assessed here. As indicated in the literature review, for the past sixty years, the government has attempted to open an agricultural development bank. But the challenge is still there. The Development Bank of Ethiopia is still struggling to maintain and sustain its agricultural bank. For the last sixty years, it has changed its name many times. Now it is just "Development Bank. It is one of the major sources of agricultural financing. But is mixed with different developmental activities.

One of the main challenges raised in different literature is that the clients are scattered in rural areas with poor infrastructure, where most farmers live and work. This makes it difficult for farmers to access credit and other financial services, which can limit their ability to invest in their farms and increase productivity. So this needs huge investments in infrastructure.

The implementation and usage costs are not limited to implicit and explicit costs. There are huge opportunity costs like low interest rates, tax exemptions and/or reductions, subsidies, and

enforcement against other sectors. Other commercial banks may be forced to engage in agricultural banking activities.

One of the main problems with agricultural development banks is their ability to remain financially sustainable. This is due to inflation, poor loan collection, and high operating costs, which have caused a decrease in the value of their loanable money. As a result, these banks have lost support from clients, donors, and governments. To be viable, these institutions need to offer a wider range of financial services, including deposit facilities, increase purchasing power through market-oriented intermediation, improve service quality, and reduce transaction costs. Technological advancements (one factor of the study) can help viability. Environmental and policy changes, institutional strengthening, and technological innovation are also required.

4.3.3. Technological Readiness

As shown in the finding and data analysis part, technological readiness showed a significant and positive impact on the viability of Agricultural Development Bank. Its B-value is 25%, its significance P-value is 0.037 (less than 0.05), and its correlation coefficient is 66%.

In many literatures and the conceptual framework of this study; technological reediness was classified into three sub-sections. These are the infrastructure, the integration, and the security aspects. Banking technological infrastructures refer to the underlying systems, hardware, and software that enable banks to provide financial services to their customers. This includes core banking systems, payment processing systems, customer relationship management tools, and other digital platforms like mobile banking suitable to farmers. One of the main challenges of agricultural development banking in Ethiopia is the lack of infrastructure and financial institutions in rural areas, where most farmers live and work. Advances in technology, such as mobile banking, are a blessing.

This can help overcome this challenge by providing farmers with access to financial services through their mobile phones. Mobile banking can also help banks assess the creditworthiness of farmers by using alternative data sources, and can help improve agricultural productivity and reduce the risk of crop failure by providing farmers with access to weather information, market prices, and other relevant data. They can send photos of the crops to agro-health centers.

Technology can help farmers make more informed decisions about when to plant, what to plant, and when to harvest. Drones can assist with branch activities. The agricultural development bank and other stakeholders can cooperate via technology.

Integration refers to the ability of different systems and technologies to work together seamlessly. In the context of banking, this can involve integrating various software applications, databases, and communication channels to provide a unified and efficient customer experience. The integration of technology in agricultural development banking has the potential to revolutionize the way farmers access financial services and manage their farms. Agricultural development banks can use technology to streamline loan applications, disburse funds quickly, and track the progress of farmers' projects. One example of technology integration in agricultural development banking is the use of mobile banking. Farmers can use their mobile phones to access their accounts, make transactions, and receive alerts about loan payments. This makes it easier for farmers in remote areas to access financial services and manage their finances. Another example is the use of data analytics and remote sensing technologies to assess the creditworthiness of farmers. By analyzing data on weather patterns, soil quality, and crop yields, agricultural development banks can make more informed lending decisions and reduce the risk of loan defaults.

The integration of technology in agricultural development banking can also improve the efficiency of loan disbursement and repayment. Digital payment systems can be used to transfer funds directly to farmers' accounts, reducing the need for physical cash transactions. This can save time and reduce the risk of fraud and theft, and help banks manage their loan portfolios more effectively and reduce the risk associated with agricultural lending.

Security in banking refers to the measures taken to protect sensitive customer data and financial transactions from unauthorized access, theft, or fraud. This can include encryption, authentication protocols, firewalls, and other security measures designed to safeguard customer information and prevent cyber-attacks.

Overall, the integration of technology in agricultural development banking has the potential to improve access to financial services for farmers, increase agricultural productivity, and promote sustainable farming practices. However, it is important to ensure that these technologies are

accessible to all farmers, including those in remote areas, and that they are used in a responsible and ethical manner.

In conclusion, technology can play a vital role in overcoming some of the challenges associated with agricultural development banking in Ethiopia. By leveraging advances in mobile banking, data analytics, and other technologies, agricultural development banks can provide farmers with access to credit and other financial services, improve their productivity, and reduce their vulnerability to weather variability and other risks. Those are technological features and uses. But do we have enough infrastructure in rural areas; is a major question.

4.3.4. Societal Factors

As shown in the finding and data analyzing part, economic feasibility showed a significant and positive impact on the viability of Agricultural Development Bank. Its B-value is 20.5%, its significance P-value is 0.016 (less than 0.05), and its correlation coefficient is 62.6%.

This is the fourth determinant of viability is societal factors. It has three components. Political will, competitive pressure, and the readiness of society.

Political will: is crucial for the development of agricultural banking, as it requires government support and commitment to create policies and regulations that promote financial inclusion and innovation in the sector. The governments need to establish a regulatory framework that ensures that agricultural development banks operate in a transparent and accountable manner. This political will include at least clear land holding policies, provide adequate funding and establishing protective guidelines for lending practices.

The land holding policy: has a significant impact on agricultural development banks, as it affects the number of farmers who can access loans. There are several policies that can be implemented to promote agricultural development through land ownership. Land is exclusively the property of the state and the peoples of Ethiopia. The Ethiopian Constitution (1995) Article 40 of the constitution deals with right to property and provides details about land rights in Ethiopia. Specifically, Article 40 (3) addresses the core question of who owns land in Ethiopia. It states that: “the right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the Nations,

Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange". Because of the ownership of the land, the farmers cannot use their land as a collateral. Clear and secure land titles offer assurance to farmers and the bank to offer agricultural finance. Overall, these policies can support agricultural development banking by increasing landownership for farmers, improving access to resources and financing, and promoting efficient agricultural production.

Providing adequate funding: Governments can allocate sufficient funds to agricultural development banks to ensure that they have the resources they need to provide loans and other financial services to farmers. This can include providing grants or low-interest loans to the banks themselves, as well as providing subsidies or guarantees to farmers who borrow from the banks.

Strong government policies: agricultural development banks are financial institutions that provide loans and other financial services to farmers and rural communities. It is the responsibility of the government. The fund provided by those collateral-based private banks that shown by Abdulkadir (2022); is even not enough to write. That means 1% loan cap from 16 private banks shows that prompt action to intervene by government. Strong government policies can help or can force the existing commercial banks to deliver agricultural development banking services at least as a segment or financial inclusion to promote agricultural development, reducing poverty in rural areas, as corporate social responsibility and sustainable development.

The strength of all agricultural development banks mentioned as examples in the literature review of this study is due to strong government policies. The political will is for the government's readiness to implement agricultural development banking. The strength of Bank Rakyat (Indonesia) and Ziraat Bankası (Turkey) is strong government policies.

The Ethiopian government has prioritized agricultural development as a key strategy for poverty reduction and economic growth. The government has implemented various policies and programs to support smallholder farmers, increase productivity, and promote agribusiness. One of the government's initiatives is the Agricultural Transformation Agency (ATA), which aims to boost agricultural productivity and commercialization through innovation, technology transfer, and market linkages. The ATA has partnered with various stakeholders, including the private sector, to provide technical assistance and financial support to farmers and agribusinesses. Another

initiative is the Agricultural Commercialization Clusters (ACCs), which are designed to promote value chain development and link smallholder farmers to markets. The ACCs provide infrastructure, training, and market information to farmers and agribusinesses, enabling them to produce high-quality products and access better markets.

Competitive pressures can drive agricultural banks to improve their services and products, such as offering tailored loans and financing options for farmers. This can also encourage new entrants into the market, increasing competition and driving innovation. To protect competitive rivalry pressure from different banks against agricultural development banks, several measures can be taken, including: Promoting transparency: Transparency in the lending, interest rates, and loan terms of agricultural development banks can promote trust among farmers and reduce the risk of anti-competitive behavior. Encouraging innovation: Encouraging innovation among agricultural development banks through the use of technology and new products can also promote competition by providing farmers with new options for financing and resources. Implementing regulations: Regulations that promote fair competition among banks, such as limits on market share or restrictions on cross-subsidization, can prevent one bank from dominating the market and help ensure that farmers have access to a variety of financing options. Promoting collaboration: Collaboration between agricultural development banks can promote healthy competition by sharing best practices and promoting innovation in the industry.

Readiness of society: the other main constricting influence is thus the readiness of society itself to adopt a new technology or a new kind of product as Liang and Wei (2007) and Tobias Mettler pointed out: "the maturity of the general environment". The lack of readiness may additionally be intensified by an absence of political will to equalize the use of technology-enabled forms of agricultural service provision as compared to traditional agricultural service delivery.

Overall, the study suggests that organizational competence, economic feasibility, technological readiness, and societal factors are all important for the viability of agricultural development banks. By addressing these factors, these banks can better serve the needs of small-scale farmers and rural communities, promoting sustainable agriculture and reducing poverty

4.4. Reforming

The survey made by this study raised the fate of Agricultural Development Banks. 81.1% of the respondents are in favor of reforming, and the remaining 19% are in favor of closing and reforming mechanisms. Many literatures also favored reforming. The paper prepared by Giehler et al. (2005), and Alan Doran et al (2009) "Reforming Agricultural Development Banks," discussed the issue of whether to ignore, close, or reform remaining agricultural development banks. The history of agricultural development banks dates back to the 19th century, but most have turned out to be failures, with many technically bankrupt and generating losses that are a drain on public resources. However, the paper suggests taking a fresh look at agricultural development banks due to their vast outreach, the lack of alternatives available, and the potential for profitable enterprises. The paper proposes a planning framework for policymakers and advocates for agricultural development bank reform, transforming them into self-reliant, sustainable financial intermediaries that mobilize domestic resources, cover their costs, and increase their outreach to all segments of the rural population, including the poor. The paper also suggests that donors and governments should not ignore or close agricultural development banks without due diligence, taking into account potential flaws in their past designs. The concluding recommendation is to close or reform agricultural development banks, but not to ignore them, as agricultural development bank reform deserves priority in the fight against poverty.

According to the document, the reforming mechanisms or determinants of Agricultural Development Banks include mobilizing savings deposits as the main source of funds introducing market rates of interest finding alternatives to government ownership or other solutions to political interference engaging in a policy dialogue and adjusting the legal and policy framework adjusting to prudential regulation by the Central Bank and diversifying into non-agricultural lending corporate culture emphasizing cost-effectiveness, productivity, and efficiency decentralization and expansion of branch networks operating as profit centers individual lending through joint liability groups, as a financial technology attuned to local culture rural savings mobilization and improvements in portfolio quality to create depositor confidence. The document also suggests that a planning framework for policymakers and cooperation between donors and agricultural bank associations is essential to agree on a conceptual framework, division of labor, and steps to be

followed in the reform process. This is end of chapter four and the next is chapter five for summary, conclusions and recommendations.

When Reforming Agricultural Development Bank (Banks): The following will need special attention. These are focus areas raised by Development Bank of Ethiopia Respondents.

a. **Technical appraisal capacity**: Agricultural development banks need to hire qualified and experienced staff, provide regular training and development programs, develop partnerships with agricultural research institutions, using technology to improve appraisal processes, and establish a technical advisory committee to provide guidance on technical appraisal processes and ensure lending decisions are based on sound technical analysis. These measures to include hiring qualified and experienced staff, providing regular training and development programs, developing partnerships with agricultural research institutions, using digital solutions such as satellite imagery, remote sensing, and mobile data collection tools, and establishing a technical advisory committee to provide guidance on technical appraisal processes and ensure lending decisions are based on sound technical analysis.

b. **Risk mitigation mechanisms** such as crop, ranch, riot insurance, etc.: Agricultural development banks need to offer risk mitigation mechanisms such as crop insurance, livestock insurance, and riot insurance to protect farmers from unexpected losses and reduce the risk of loan defaults. They need also conduct regular monitoring and evaluation of their technical appraisal processes, develop a comprehensive database of farmers, crops, livestock, and other relevant information, provide technical assistance to farmers, and foster partnerships with other stakeholders to leverage their expertise and resources in technical appraisal processes and develop innovative financing products that meet the needs of farmers. This will help reduce the risk of loan defaults and ensure that lending decisions are based on accurate and up-to-date information.

c. **Collateral management**: Agricultural development banks need to establish clear collateral management policies that are transparent and fair to farmers. They should provide training to their staff on collateral management, conduct regular inspections of collateral, implement a collateral registry, and offer alternative collateral options such as crop liens, warehouse receipts, and livestock mortgages to farmers who may not have traditional forms of collateral. These policies should include guidelines for the valuation of collateral, types

of collateral that are acceptable, and procedures for the disposal of collateral in the event of default. Additionally, they should provide training to their staff on collateral management, conduct regular inspections of collateral, implement a collateral registry, and offer alternative collateral options to farmers who may not have traditional forms of collateral.

d. **Project/loan follow-up:** Agricultural development banks need to monitor the utilization of loans provided to farmers to ensure that they are being used for the intended purpose. They should conduct regular site visits to assess their progress and provide support as needed. They should also provide technical assistance to borrowers to help them improve their farming practices and increase their productivity. They should also offer financial counseling to borrowers to help them manage their finances effectively and avoid default. Finally, they should evaluate the performance of their loans on a regular basis to identify any issues or trends that need to be addressed.

e. **Land holding policy:** The land holding policy has a significant impact on the operations of agricultural development banks. If the land holding policy is unfavorable, it may limit the number of farmers who can access loans from these banks. If the land holding policy is favorable to small-scale farmers, agricultural development banks can provide loans to a larger number of farmers, which will help to increase productivity and improve food security. Therefore, it is essential for agricultural development banks to monitor the land holding policy and advocate for policies that promote equal access to credit for all farmers. This will help to ensure that the loans provided by these banks are utilized effectively and contribute to the growth and development of the agricultural sector.

f. **Conflicts:** Civil wars and conflicts can have a devastating impact on agricultural development banking, as they can disrupt the economy and adversely affect farmers and their ability to access financing and resources. These effects include displacement of farmers, destruction of infrastructure, increase in risk, and political instability. This can lead to a decrease in financing options and agricultural productivity, and it is important for governments and international organizations to work towards conflict prevention and resolution to protect the agricultural sector's development.

g. **Natural disaster:** Natural disasters can have a profound impact on agricultural development banking, as they can disrupt the agricultural sector and make it difficult for farmers to access financing. These effects include destruction of crops and infrastructure, reduction in agricultural productivity, increase in credit risk, and increase in food prices. It is important for governments and international organizations to work towards disaster preparedness, early warning systems, and timely relief to protect the agricultural sector's development. This can lead to a decrease in financing options and agricultural productivity, leading to a decline in the demand for financing services.

Summary of chapter four: The chapter presented an analysis of the results and findings with corresponding discussions, consolidated based on the survey questionnaire in relation to the research questions that were presented in Chapter 1. The data was analyzed by Statistical Package for Social Science (SPSS) version 25, which was utilized for quantitative data. The initial portion included the preliminary analysis, and then the statistical result was extracted and reported in the finding part. Finally, the discussion on the findings was elaborated on. Because, before analyzing, data screening is mandatory and done. The data were checked by many methods, and unusable data were dropped from analysis. The regression analysis showed all four dependent variables (organizational competences, economic feasibility, technological readiness, and societal factors) had a significant and positive impact on the dependent variable (viability). This is the end of chapter four, and the next is chapter five's summary, conclusion, and recommendations.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary of Findings

According to a report from the National Bank of Ethiopia for 2021–2022, the agricultural sector contributes 32.4% of Ethiopia's GDP, with the remaining two-thirds coming from industry and service sectors. The agricultural development bank in Ethiopia has been a priority for the government for many years, providing a range of financial products and services, including loans, savings accounts, insurance, and advisory services. It also supports smallholder farmers through its microfinance program, which provides small loans to rural entrepreneurs.

Agricultural Development Banks have several functions, Gebrehiwot, A. (2018) such as providing credit to small-scale farmers at affordable interest rates, offering financial services such as savings accounts and insurance, promoting innovation in agriculture through funding research and development, building the capacity of farmers through training and technical assistance, and contributing to rural development by investing in infrastructure projects.

This paper uses quantitative data from commercial, development, and central banks in Ethiopia and a modified framework from the "Fit-Viability Model." Four determinant variables (organizational competencies, economic feasibility, technology readiness, and societal factors) were regressed on the dependent variable (viability), and all variables were positively supported.

The establishment of a full-fledged Agricultural Development Bank can facilitate the growth of the sector and improve the livelihoods of millions of Ethiopians. However, there is limited research on the viability of such banks in Ethiopia. This study investigates the factors that influence the viability of Agricultural Development Banks in Ethiopia. Here are three objectives and three research questions addressed in this study.

The first research objective is about assessing the current state and status of agricultural development banking. The summary of the findings is presented in the following table.

Table 22: Summary of findings - 1

Key Issues	Summary
Research objective 1:	To review the current status of the agricultural development bank in Ethiopia.
Research question 1:	What is the current state of the agricultural development bank in Ethiopia?
Result of the study	The viability of agricultural development banks in Ethiopia has faced challenges such as inflation, poor loan collection, and inadequate infrastructures. The commercial banks provide agricultural finance products and services. The Agricultural Development Bank in Ethiopia was established in 1945 to provide financial services to farmers and agricultural businesses. This was changing the name and function of "The Development Bank of Ethiopia (DBE) which established to finance development projects since 1909. But later changed its name and function many times and now it remains as Development Bank of Ethiopia. Federal Negarit Gazeta (2008), the "Banking Business Proclamation 592/2008" never mentioned the agricultural development bank in Ethiopia. It is all about commercial banks. The draft policy document issued by the Councils of Ministers of Ethiopia affirmed; there is no agricultural development bank in Ethiopia. Abdulkadir (2023).
Achievement of the objective	Assessing the current status and the history of agricultural banking. The government has tried many times and is still struggling to open a full-fledged agricultural development bank. **But the research identified that there is no full-fledged agricultural bank in Ethiopia right now, in 2023.**

The second research objective

Table 23: Summary of findings - 2

<table>
<tr><th>Key Issues</th><th>Summary</th></tr>
<tr><td>General Research objective 2:</td><td>To identify the factors that influence the viability of agricultural development banks in Ethiopia</td></tr>
<tr><td>Research question 2:</td><td>What are the factors and constraints that contribute to the viability of the agricultural development bank in Ethiopia?</td></tr>
<tr><td>Result of the Study</td><td>Conceptual Framework: From the Liang (2007) Fit-Viability-Model, identified four determinant factors by using Tobias (2015) and Seok (2019) modified conceptual framework. Then customized to agricultural development bank in Ethiopia
<table>
<tr><th>DIMENSION</th><th>DEFINITION</th></tr>
<tr><td colspan="2">1. ORGANIZATIONAL COMPETENCE</td></tr>
<tr><td>Competency</td><td>Gearing up the viability of ADB's implementation and/or running the solution.</td></tr>
<tr><td>Management support</td><td>Support from top management (Here National Bank of Ethiopia).</td></tr>
<tr><td>Corporate Social Responsibility</td><td>A company be socially accountable to itself, its stakeholders, and the public</td></tr>
<tr><td colspan="2">2. ECONOMIC FEASIBILITY</td></tr>
<tr><td>Project-related costs</td><td>Explicit, implicit and opportunity costs for implementing the solution</td></tr>
<tr><td>Usage-related costs</td><td>Explicit, implicit and opportunity costs for running</td></tr>
<tr><td>Sustainability</td><td>Sustainable economic ground</td></tr>
<tr><td colspan="2">3. TECHNOLOGICAL READINESS</td></tr>
<tr><td>Infrastructure</td><td>Well-fit infrastructures, hardware components and software components.</td></tr>
<tr><td>Integration</td><td>Necessary technical requirements, Internet connection, computational capabilities</td></tr>
<tr><td>Security</td><td>Appropriate measures against cybercrime and hacking.</td></tr>
<tr><td colspan="2">4. SOCIETAL FACTOR</td></tr>
<tr><td>Political will</td><td>Incentives and intentions to support the solution.</td></tr>
<tr><td>Competitive pressure</td><td>Rivalry of other commercial banks</td></tr>
<tr><td>Readiness of society</td><td>Willingness of technology adoption.</td></tr>
</table></td></tr>
<tr><td>Achievement of the objective</td><td>If and when full-fledged agricultural development bank is implemented, all independent factors can be used.</td></tr>
</table>

The second research objective is about the factors and constraints that contribute to the viability of the agricultural development bank in Ethiopia. The main aim of this research is to explore the determinants of the viability of Agricultural Development Banks in Ethiopia, pin-pointed organizational competences, economic feasibility, technology readiness, and societal factors (including the government's role). The study used a Fit-Viability Model, but focused on the viability wing and the 'fit' wing is left to further study. Because fit is for the implementation stage model. This model later modified by Tobias (2015) and Seok (2019). This study customized for agricultural development bank.

Research Objective Three:

Chapter four (the findings and the analysis part) is focused on this question. The study uses both descriptive and inferential methods of data analysis, where descriptive statistics such as average, mean, standard deviation, percentage, ratio, and tables are used to describe the sample value, while inferential statistics like the T-test, ANOVA, Pearson correlation, regression analysis, and Probit analysis are used to infer the effect of determinant factors on the viability of Agricultural Development Banks. For data collection, a structured questionnaire was designed and prepared using a Likert five-point scale, and closed-ended questions were used as well as also dichotomous questions to meet the research objectives and analyze the data using statistical packages. For this particular study, the response rate was calculated based on the number of questionnaires distributed, with 150 questionnaires distributed and 131 responses received. Of those, 127 (84.67% of 150 questionnaires) were usable. The paper discusses reliability in measurement instruments, which refers to consistency of results across different situations or repeated testing.

Table 24: Summary of findings - 3

Key Issues	Summary
Research objective 3:	To examine the impact and significance of the determinant factors on the viability of agricultural development bank.
Research question2	Which determinant factor for the viability of agricultural development bank is/are significant?
Result of the Study	**a) The Disaggregate Analysis (Descending Beta Order)** ▪ Technology readiness → Viability (B = 0.250), 0.000 significance and positive effect ▪ Organizational competences → Viability (B = 0.205), 0.037 significance and positive effect ▪ Societal Factors → Viability (B = 204), 0.016 significance and positive effect ▪ Economic Feasibility → Viability (B = 0.173), 0.002 significance and positive value. **b) Aggregate regression analysis:** ▪ 58.6% of the viability of the agricultural development bank could be attributed to the combined effect of the predictor variables (Organizational competences, economic feasibility, technological readiness and societal factors. ▪ 41.4% of the variance is explained by other factors not covered in this study. **c)** Closing or ignoring the agricultural development banking is not a solution, rather it needs reforming the current commercial and development banking by forcing them to do agricultural development banking services at least as windows or segments.
Achievement of the objective	If and when full-fledged agricultural development bank is implemented, all independent factors can be used. Because, all are demonstrated a significant and positive effects. But the aggregate analysis shows only 58.6% is from those four independent variables and 41.4% to be other factors not covered by this study. Major determinant factors for the viability of agricultural development bank are identified and analyzed. Reforming of the current commercial and development banks are recommended.

5.2. Conclusions

The viability of agricultural development banks is a fundamental issue due to inflation, poor loan collection, and operational overheads. To improve their viability, banks should serve a larger number of customers with a wider range of financial services, including deposit facilities, increase the amount of purchasing power transferred, improve the quality of services offered and reduce transaction costs. Viability requires environment and policy changes, institutional strengthening, and technological innovation. This paper uses quantitative data from commercial, development, and central banks in Ethiopia and a modified framework from the "Fit-Viability Model." Four determinant variables (organizational competencies, economic feasibility, technology readiness, and societal factors) were regressed on the dependent variable (viability), and all variables were positively supported. It is recommended that commercial banks have an agricultural banking segment, and the Development Bank of Ethiopia should promote full-fledged agricultural development banking. Agricultural Development Banking organizational competencies can be achieved through strong government backing, competent skilled manpower, investing in different portfolios, corporate social responsibilities, the value chain of the product, and good security measurements.

5.3. Recommendations

Based on the findings of this study, the following recommendations are made to further enhance the viability of agricultural banks in Ethiopia:

1. Ethiopia's economy relies heavily on agriculture, which generates significant employment and contributes to one-third of the GDP. However, there is no full-fledged agricultural development bank in Ethiopia. To address this, it is recommended to open a full-fledged bank. There are successful agricultural development banks include Rabobank of Dutch, Bank Rakayat of Indonesia, Agricultural Bank of China, CoBank of United States of America, Banco de la Nación of Argentina, and Ziraat Bankası of Turkey. Agricultural development banks in African countries like Ghana, Southern Africa, Namibia, Zimbabwe, and Nigeria can also provide valuable lessons for Ethiopia's agricultural development banks and finance.

2. When studying agricultural development banks, using the fit-viability model can ease the viability constructs and determinants. The four viability determinants used in this study (organizational competences, economic feasibility, technological readiness, and societal factors) have significant and positive impacts. So these are new contributions to the viability of agricultural development banks in Ethiopia and shall be used as determinant factors.

3. Organizational competence in agricultural development banks is achieved through various factors, including investing in portfolios, competent staff, corporate social responsibility, agricultural product value chain, and technical assistance. Economic feasibility requires a sufficient budget for initiation, implementation, and sustainability. Agricultural banks should invest in modern banking technology to improve operations and service delivery to rural areas. Expanding their reach by establishing branches in rural areas and increasing mobile banking usage will make financial services more accessible. The Ethiopian government should create an enabling environment for the agricultural sector and financial institutions, promoting access to credit, land tenure security, and agricultural extension services. Agricultural banks should make their services more affordable by reducing interest rates and fees, making them more accessible and improving productivity. Collaborating with government agencies, NGOs, and private sector actors can help address challenges and enhance the effectiveness of their services, leveraging resources and expertise to achieve shared goals.

4. Reform: Agricultural banks including the existing commercial and development bank should undergo reform to improve their governance, risk management, and financial sustainability. This includes ope strengthening their internal controls, improving their loan recovery mechanisms, and diversifying their funding sources. By implementing these recommendations, agricultural banks in Ethiopia can become viable, competitive, efficient, and sustainable. This will contribute to the overall development of the agricultural sector and help improve the livelihoods of farmers and rural communities

5.4. Suggestions for future study

1. The model used a Fit-Viability Model (FVM); but focused on the viability part. The fit part is out of the scope of this study and left to further study.
2. The Study Gap: The model output summary showed that 58.6% of the viability of agricultural development bank could be attributed to the combined effect of the predictor variables. However, 41.4% of the variance is explained by other factors not covered in this study.
3. The study was conducted by quantitative data. Adding qualitative data can add some values on this study.
4. Ministry of Agriculture of Ethiopia is not included in the study. This is another Stakeholder for agricultural development bank and shall be included in future studies.

End of the paper.

References

Abate, T., Shiferaw, B., Gebeyehu, S., Amsalu, B., Negash, K., Assefa, K., ... & Hagmann, J. (2011). A systems and partnership approach to agricultural research for development: Lessons from Ethiopia. Outlook on agriculture, 40(3), 213-220.

Abdulkadir Nureddin (2023), Me-genzeb: From Evolution to Current, 3S printing press, Addis Ababa, Ethiopia.

Adeleke Salami and Damilola Arawomo, (2013), Working Paper 192 - Empirical Analysis of Agricultural Credit in Africa: Any Role for Institutional Factors, Working Paper Series, African Development Bank.

Adenuga, A. O., Mohammed, J. A., Laniyan, C. V., Akintola, A. A., & Asuzu, O. C. (2021). Measuring the impact of loan-to-deposit ratio (LDR) on Banks' liquidity in Nigeria. Economic and Financial Review, 59(2), 43-59.

Ajayi, M. A., Nageri, K. I., & Akolo, C. S. (2017). Impact of agricultural financing policy and deposit money bank loan on agricultural sector productivity in Nigeria. Amity Journal of Agribusiness, 2(1), 1-11.

Akintola–Arikewe, J. O. (1990), "Central Development Bank and Ethiopian Manufacturing: The Role of NIDB in Regional Development Perspective". University of Lagos Press, Lagos.

Alan Doran, Ntongi McFadyen, Dr Robert C. Vogel, The Missing Middle in Agricultural Finance Relieving the capital constraint on smallholder groups and other agricultural SMEs, Oxfam GB Research Report, December 2009

Ansari, Y., Gerasim, D., & Mahdavinia, M. (2011). Investigation of factor affecting efficiency and effectiveness of agricultural facilities from viewpoint of farmers and credit experts in 2009, Iran. African Journal of Agricultural Research, 6(15), 3619-3622.

Anyanwu, C. M. (2004), "Microfinance Institutions in Ethiopia: Policy, Practice, and Potential." A Paper presented at the G. 24 Workshop on "Constraints to Growth in Sub-Sahara Africa," Pretoria, South Africa, 12-16.

Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., ... & Zaharia, M. (2010). A view of cloud computing. Communications of the ACM, 53(4), 50-58.

Aspachs, O., E. Nier and M. Tiersset (2005), "Liquidity, Bank Regulation and the Macro Economy": Evidence on Bank Liquidity Holdings from a Panel of UK–Resident Banks, rtf 05 Aspachs Nier Tiesset, pdf–Adobe Reader.

Assefa Admassie (2006), The Implications of Asset Ownership on Child Work in Rural Ethiopia, the Ethiopian Journal of Economics, Vol. 11 Number 2, Pp 25-58.

Assefa Admassie (2013), the Political Economy of Food Prices: the Case of Ethiopia, WIDER Working Paper, Number 1

Assefa Admassie, Degnet Abebaw and Andinet Delelgn, (2009) Impact Evaluation of the Ethiopian Health Services Extension Program: a Non Experimental Approach, GDN Working Paper, Number 22.

Assefa, T. (2016). Financial sector liberalization in Ethiopia: resistance, justification and its credibility.

Berger, P. W., & Cerutti, E. (1980). THE MANAGEMENT OF ONLINE REFERENCE SEARCH SERVICE IN FEDERAL LIBRARIES. Science & Technology Libraries, 1(1), 81-107.

Berksoy, Ö. B. (2010). A study on the relationships among corporate identity and interior space bank cases: Garanti Bank and Ziraat Bank (Doctoral dissertation).

Boucher, Steve, and Catherine Guirkinger. "Risk, wealth, and sectoral choice in rural credit markets." American Journal of Agricultural Economics 89.4 (2007): 991-1004.

Capital Plus (2004), "The Challenge of Development in Development Finance Institutions", Development Finance Forum, Chicago.

Carvalho, J. (1984). Archival application of mathematical sampling techniques. Records management quarterly, 18(1), 18-63.

Charitonenko, S. (2005), "The Ethiopian Legal and Regulatory Framework for Microfinance: Strength, Weaknesses and Recent Developments," Micro Finance Regulation and Supervision Centre, Lagos.

Chikodzi, D., & Mufori, R. C. (2018). Wetland fragmentation and key drivers: a case of Murewa District of Zimbabwe. J Environ Sci Toxicol Food Technol, 12(9), 49-61.

Deborah K. Dilley, ESSENTIALS of Bank, John Wiley & Sons, Inc., Hoboken, New Jersey, 2008.

Diamond, W. (1957), "Development Banks," The John Hopkins Press, Baltimore.

Dilley, D. K. (2012). Essentials of banking. John Wiley & Sons.

Ding, H., Wu, Y., Zhang, W., Zhong, J., Lou, Q., Yang, P., & Fang, Y. (2017). Occurrence, distribution, and risk assessment of antibiotics in the surface water of Poyang Lake, the largest freshwater lake in China. Chemosphere, 184, 137-147.

Espadanal, M., & Oliveira, T. (2012). Cloud computing adoption by firms.

Essien, I. E. (2001), "The Role of Development Finance Institutions (DFIs) in the Financing of Small Scale Industries (SSIs)," Central Bank of Ethiopia Bullion Vol. 25, No3, pp. 3– 6.

Field, A. (2013). Discovering statistics using IBM SPSS statistics. Sage publications.

Fox, J. (1997). Applied regression analysis, linear models, and related methods (Vol. 505). Sage publications.

Garson, J.; K. ElAlaoui; T. Malzy; T. Widezynski; J. P. Haezebrouck (2006), "Rethinking National Development Banks," Bred Gestion, Paris.

Gebrehiwot, A. (2018). Agricultural finance in Ethiopia: An overview of existing practices and challenges. Ethiopian Journal of Economics, 27(1), 1-23.

Gebremedhin, B., & Swinton, S. M. (2003). Investment in soil conservation in northern Ethiopia: the role of land tenure security and public programs. Agricultural economics, 29(1), 69-84.

Gibson, H. and E. Tsakalotos (1994), The Scope and Limits of Financial Liberalisation in Developing Countries: A Critical Survey", The Journal of Development Studies, April, 30/3.

Giehler, Thorsten; Seibel, Hans Dieter; Karduck, Stefan (2005) : Reforming Agricultural Development Banks, Working Paper, No. 2005,7, Universität zu Köln, Arbeitsstelle für Entwicklungsländerforschung (AEF), Köln

Gonzalez-Vega, C., & Graham, D. H. (1995). State-owned agricultural development banks: Lessons and opportunities for microfinance. GEMINI.

Gujarati, D. N. (2003). Basic econometrics (Vol. 4). McGraw-Hill.

Gupta, S. P. (2002), "Statistical Methods," Sultan Chand & Sons, New Delhi.

Hair Jr, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). Multivariate data analysis (Vol. 7). Pearson.

Hannah E. Payne, Bobbi Gray , Siena F. Davis , Arindam Das , Manisha Kabra , Benjamin T. Crookston: Factors associated with food insecurity among women and children in rural Rajasthan,

Hans Dieter Seibel Thorsten Giehler Stefan Karduck, Reforming Agricultural Development Banks, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH Postfach 5180, 65726 Eschborn, 2005

Hans Dieter Seibel, Agricultural Development Banks Close Them or Reform Them?, IMF Publications, 1990.

Hollywood, J. (2022). Understanding the role of banks in overcoming financial barriers to agroecological transitions from a systems thinking perspective (Master's thesis).

Hornby, A. S. and A. P. Cowrie (1963), "Oxford Advanced Learner's Dictionary," Oxford University Press, London.

Inanga, E. L. and C. A. Ajayi (2001), "Accountancy," The CIBN Press Limited, Lagos.

India; Journal of Gender, Agriculture and Food Security Vol 1, Issue 3, pp 23-39, 2016"

Ismael Hussein Malela, Financing Pattern of the Development Bank of Ethiopia (DBE). International Journal of Finance and Bank Research. Vol. 8, No. 1, 2022, pp. 1-5. doi: 10.11648/j.ijfbr.20220801.11

Jhingan, M. L. (2005), "The Economics of Development and Planning (38th Edition)," Nisha Enterprises, Delhi.

Kabir Hassan, M., Sanchez, B., & Ngene, G. (2012). Scales and technical efficiencies in Middle East and North African (MENA) micro financial institutions. International Journal of Islamic and Middle Eastern Finance and Management, 5(2), 157-170.

Keynes, J. M. (1936), "The General Theory of Employment, Interest, and Money", Macmillan Cambridge University Press, for Royal Economic Society, London.

Kirui, O. K., Kornher, L., & Bekchanov, M. (2023). Productivity growth and the role of mechanisation in African agriculture. Agrekon, 62(1), 80-97.

Kotwal, R. S., Montgomery, H. R., Miles, E. A., Conklin, C. C., Hall, M. T., & McChrystal, S. A. (2017). Leadership and a casualty response system for eliminating preventable death. Journal of trauma and acute care surgery, 82(6S), S9-S15.

Kumbhar, A. (2017). Overview of ISM bands and Software-defined Radio Experimentation. Wireless Personal Communications, 97(3), 3743-3756.

Kumbhar, V. M., & Kumbhar, M. V. (2017). Impact of mobile bank on financial inclusion in rural India. International Journal of Applied Business and Economic Research, 15(16), 469-479.

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). Applied linear statistical models (Vol. 5). McGraw-Hill/Irwin.

Liang, T. P., Huang, C. W., Yeh, Y. H., & Lin, B. (2007). Adoption of mobile technology in business: a fit-viability model. Industrial management & data systems, 107(8), 1154-1169.

Long, M. (1983), "Review of Financial Sector Work", Mimeo Financial Development Unit, World Bank, Washington D.C.

Malela, I. H. (2022). Financing Pattern of the Development Bank of Ethiopia (DBE).

Mercuri, R. T. (2004). The HIPAA-potamus in health care data security. Communications of the ACM, 47(7), 25-28.

Mettler, T. (2016). Anticipating mismatches of HIT investments: Developing a viability-fit model for e-health services. International journal of medical informatics, 85(1), 104-115.

Mihretu, Y., Weyessa, G., & Adugna, D. (2014). Variability and association of quantitative characters among okra (Abelmoschus esculentus (L.) Moench) collection in south western Ethiopia. Journal of Biological Sciences, 14(5), 336-342.

Moges Belay, A., Moges Kasie, F., Helo, P., Takala, J., & J. Powell, D. (2014). Adoption of quality management practices: An investigation of its relationship with labor productivity for labor-intensive manufacturing companies. Benchmarking: An International Journal, 21(1), 77-100.

Mohammed, F., Ibrahim, O., & Ithnin, N. (2016). Factors influencing cloud computing adoption for e-government implementation in developing countries: Instrument development. Journal of Systems and Information Technology, 18(3), 297-327.

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2012). Introduction to linear regression analysis (Vol. 821). John Wiley & Sons.

Musa, F. I. (2005), "Modeling the Dividend Behavioural Pattern of Corporate Firms in Ethiopia," Unpublished Doctoral Dissertation, Ahmadu Bello University, Zaria.

Myers, S. C. (1997), "Determinants of Corporate Borrowing," Journal of Financial Economics, No. 5, 147

National Bank of Ethiopia Annual bulletin 30 June 2022

Nkamleu, G. B. (2004). Productivity growth, technical progress and efficiency change in African agriculture. African Development Review, 16(1), 203-222.

Nnanna, O. J.; A. Englama and F. O. Odoko (2004), Financial Markets in Ethiopia, Central Bank of Ethiopia, Abuja.

Ofek, E. (1993), “Capital Structure and Firm Response to Poor Performance: An Empirical Analysis”, Journal of Financial Economics, No. 34, 3–30.

Ogunleye, O. O., Adekanye, F., Adeleke, A. Q., & Oyetade, A. O. (2020). Impact of technology on agricultural financing in Nigeria. Journal of Agricultural Extension and Rural Development, 12(1), 1-9.

Ovwielefuoma, G. (1993), “Financial Management and Investment Decisions in Ethiopia,” Investors Press Ethiopia Limited, Ikeja.

Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage.

Proclamation of the Constitution of the Federal, Democratic Republic of Ethiopia, Federal Negarit Gazeta 21 August 1995.

R.B. Cooper, R.W. Zmud, Information technology implementation research: A technological diffusion approach, Management Science, 36 (1990)

Raimi, A., Adeleke, R., & Roopnarain, A. (2017). Soil fertility challenges and Biofertiliser as a viable alternative for increasing smallholder farmer crop productivity in sub-Saharan Africa. Cogent Food & Agriculture, 3(1), 1400933.

Rajan, R. G. (1992), “Insiders and Outsiders: The Choice between Informed and Arm’s Length Debt”, Journal of Finance, No. 47, 1367–1400.

Ramanujam, R., & Rousseau, D. M. (2006). The challenges are organizational not just clinical. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 27(7), 811-827.

Rodrigues, J. M., Girardier, M., Fetter, R. B., Freeman, J. L., Mullin, R., & Valois, J. (1984). Evaluating the Productivity of Hospitals Using US DRGS as a Case Mix Measure on a French Data Base. In Medical Informatics Europe 84: Proceedings, Brussels, Belgium September 10–13, 1984 (pp. 479-484). Springer Berlin Heidelberg.

Rogers, E. M. (2010). Diffusion of innovations. Simon and Schuster.

S. Aier, R. Winter, Virtual decoupling for IT/business alignment - Conceptual foundations, architecture design and implementation example, Business & Information Systems Engineering, 1 (2009)

Salami, A., and Arawomo, D.F.; (2013), Empirical Analysis of Agricultural Credit in Africa: Any Role for Institutional Factors?, Working Paper Series N° 192 African Development Bank, Tunis, Tunisia.

Sanz Molina, F. (2015). Corporate social responsibility and the financial regulatory reform: the case study of CoBank, ACB (Doctoral dissertation, Universitat Politècnica de València).

Seifu, H., Timbula, M. A., & Negash, E. (2019). Effect of knowledge management on organizational performance in Addis Ababa, Ethiopia: A case study in Ethiopian agricultural trans-formation agency (ata). International Journal of Commerce and Finance, 5(2), 97-105.

Yoo, S. K., & Kim, B. Y. (2019). The effective factors of cloud computing adoption success in organization. The Journal of Asian Finance, Economics and Business, 6(1), 217-229.

Shaw, E. (1973), "Financial Deepening in Economic Development," Oxford University Press, New York.

Shekhar, K. C. and L. Shekhar (1998), "Bank Theory and Practice (18th Revised and Enlarged Edition)," Vikas Publishing House PVT Limited, New Delhi.

Shelagh Heffernan, Modern Bank, John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England, 2005

Sisay Debebe, Endale Gebre, and Tadesse Kuma, Yield Gaps and Technical Inefficiency Factors for Major Cereal Crops in Ethiopia: Panel Stochastic Frontier Approach, Ethiopian Journal of Economics, Volume 31 Number.

Solomon Tsehay, Zewdie Adane and Adem Feto (2022), Agriculture-Industry Linkages for Employment and Economic Transformation in Ethiopia, Ethiopian Journal of Economics, Volume 31 Number.

Subeliani, D., & Tsogas, G. (2005). Managing diversity in the Netherlands: a case study of Rabobank. The international journal of human resource management, 16(5), 831-851.

Tadesse, G., & Fufa, B. (2019). The role of private commercial banks in agricultural finance: The case of Ethiopia. Journal of Economics and Sustainable Development, 10(13), 1-9.

Thorsten, B.; C. Robert and J. Afelkhena (2006), "Bank Privatisation and Performance: Evidence from Ethiopia", World Bank, Washington.

Warokka, A., Gallato, C. G., Thamendren, A., & Moorthy, L. (2012). Organizational justice in performance appraisal system and work performance: evidence from an emerging market. Journal of Human Resources Management Research, 2012, 1.

Wooldridge, J. M. (2013). Introductory econometrics: A modern approach. Nelson Education.

World Bank. (2017). Digital financial services for agriculture: Opportunities and challenges. Retrieved from Yaron, J. (1992), "Assessing Development Finance Institution: A Public Interest Analysis", Discussion Paper No. 174, World Bank, Washington D.C.

Appendix A: Questionnaire

The Viability of Agricultural Development Banking in Ethiopia

Dear Respondents,

Thank you for your patience in reading this invitation letter. This questionnaire is from Abdulkadir Nureddin (MSc student at Addis Ababa University) and the research working is under the supervision of Dr. Laxmikantham P. This questionnaire is prepared to collect data from National Bank of Ethiopia, Development Bank of Ethiopia, government and private commercial banks to undertake thesis paper for partial fulfillment of MSc in Accounting and Finance on the title, The Viability of Agricultural Development Banking in Ethiopia.

The information that you provide will be used only for the analysis of the study which I am conducting as partial fulfillment of the MSc in Accounting and Finance. I kindly request you to respond freely and honestly as your response has great value in assessing "The Viability of Agricultural Development Banking in Ethiopia". I assure you that all your responses will be kept strictly confidential and used only for academic purpose.

Thank you, for your cooperation and response in advance.

If you have any further queries or concerns, please conORCt me directly via the email address:

Abdulkadir Nureddin

Email: izzmak@yahoo.com

Mobile Phone: +251 941 959595 (Telegram, WhatsApp)

General Direction: You are not required to write your name

➢ Please put (√) mark in the box that best describes your response. If it is softcopy, you can mark (X) on the provided spaces or either marks as your writing machine's convenience.

➢ Write your opinion on the blank space provided and for some items you can use extra pages if the space provided is not sufficient.

Part-I: General Information of Respondents

(You can underline your responses for each questions).

1. Age: <20 □ 21-30 □ 31-40 □ 41-50 □ >50 □

2. Gender: Male □ Female □

3. Educational level: Diploma □ 1st Degree □ 2nd Degree □ PhD □

4. Years of service in the bank: 1-5 □ 6-10 □ 11-15 □ 16-20 □ >20 □

5. Job position: S/Branch Mgr.□ Sr. Officer□ Principal Officer□ Bureau/Office/Branch Mgr.□ Director/ District Mgr.□ V/President □ President □

➢ Please specify your Job position if other: …….

➢ Working unit of the respondent: …….

Part-II: Background Information About Agricultural Development Banking

(Underline one of your choice for each questions)

1. Have you ever heard of Agricultural Development Banking in Ethiopia?
   a. Yes
   b. No

2. Is there still a need for an agricultural development bank in Ethiopia?
   a. Yes
   b. No

3. Do you believe existing commercial banks be able to provide loans to farmers and agricultural businesses in Ethiopia?
   a. Yes
   b. No

4. Would an agricultural development bank be able to contribute to the overall economic development of Ethiopia?
   a. Yes
   b. No

5. Do you believe that agricultural development banks be viable easily?
   a. Yes
   b. No
6. What is your opinion on ADB?
   a. Closing
   b. Ignoring
   c. Reforming

7. Can you mention any challenges that can be faced by agricultural development banks?

   a.
   b.

c.

Part III: The constructs of the combination of task-technology fit and fit-viability model

Please write **(X)** mark that reflects the extent to which you agree with the following statements.

S/No	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A.	**Organizational Characteristic**					
1.	Full-fledged Agricultural Development Banking can makes easier agricultural finance, which current banking does not cover, increase agricultural productivity and organizational competences					
2.	Competent skilled manpower is on factor for the full-fledged agricultural development banks and need extensive support from National Bank of Ethiopia and Development Bank of Ethiopia					
3.	Lack of Corporate social responsibility and value chains of the agricultural product can affect the viability of Agricultural Development Bank					
B.	**Economic Feasibility**					
4.	The government, the donors and other stakeholders are willing to provide adequate budget for establishment of full-fledged Agricultural Development Banking					
5.	The implementation, maintenance and usage costs maybe not less than the initial costs.					
6.	The cost employed can bring substantial benefit					
C.	**Technology Readiness**					
7.	Telecommunication network is needed throughout the country to apply the Agricultural Development Bank					
8.	Agricultural Development Banks required technology, can easily be integrated into existing					

	technology infrastructure and can get skilled manpower.					
9.	Data security is another vital factor for the viability of Agricultural Development Banking					
D.	**Societal Factors (Including Governmental Factors)**					
10.	The government has policies and initiatives for encouraging organizations to adopt Agricultural Development Banking					
11.	The governmental and other banks can be forced to provide Agricultural Development Banking Services.					
12.	The society can cooperate to the adoption of Agricultural Development Banking					
E.	**Viability**					
13.	Viability can be achieved by at least on economic feasibility, maturity of the IT infrastructure, and government support to Agricultural Development Banking					
14.	Using the Agricultural Development Banking increases agricultural productivity					
15.	Is it recommended to use full-fledged Agricultural Development Banking approaches in the country?					

APPENDIX B: Sectoral Contribution Of Agriculture To Gdp (Nbe:30 June 2022)

(In Billions of Birr)

Items		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Sector	Agriculture	580.4	600.9	623.8	650.3	686.4	728.4
	Industry	413.8	464.4	526.2	576.9	618.8	649.2
	Services	619.3	673.9	745.7	786.9	836.2	899.8
Total		1,613.5	1,739.3	1895.7	2,014.1	2,141.4	2,277.4
Less FISIM		17.0	19.8	21.0	24.5	27.2	28.8
Real GDP		1,596.5	1,719.5	1,874.7	1,989.6	2,114.2	2,248.6
Growth in Real GDP		10.1	7.7	9.0	6.1	6.3	6.4
Per capita GDP (USD) (Nominal)		876	883	985	1,080	1,092	1,218
Growth rate in Per capita GDP		7.5	0.9	11.6	9.6	1.1	11.6
Mid-year population(in millions)		93.4	95.5	97.6	99.7	101.9	104.1
Share in GDP (in %)	Agriculture	36.3	34.9	33.3	32.7	32.5	32.4
	Industry	25.9	27.0	28.1	29.0	29.3	28.9
	Services	38.8	39.2	39.8	39.5	39.6	40.0
Agriculture	Absolute Growth	6.7	3.5	3.8	4.3	5.5	6.1
	Contribution to GDP growth	2.5	1.3	1.3	1.4	1.8	2.0

APPENDIX C: Number of Employees for annual report of the banks (June 2021)

TYPES	LIST OF BANKS	EMPLOYEES (Annual Report)
16 Private Commercial Banks	Abay Bank S.C.	5,307
	Addis International Bank	789
	Awash International Bank	12,188
	Bank of Abyssinia	8,146
	Berhan International Bank	5,283
	Bunna International Bank	2,491
	Cooperative Bank of Oromia	5,174
	Dashen Bank	10,492
	Debub Global Bank	2,027
	Enat Bank	800
	Hibret Bank	4,706
	Lion International Bank	2,852
	Nib International Bank	7,382
	Oromia International Bank	6,418
	Wegagen Bank	3,485
	Zemen Bank	1,151
Government Banks	Development Bank of Ethiopia	1,847
	National Bank of Ethiopia	3,633
	Commercial Bank of Ethiopia	22,908
Total Employees		**107,079**