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DETERMINANTS OF TAX REVENUE (FROM 1992-2022) IN ETHIOPIA

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Table of Contents

Content **Page**

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABREVIATION

AGRI = agriculture sector share to total GDP

ARDL= Autoregressive Distribution Lag

CSA=Central Statistical Agency

ECM=error correlation model

EEA = Ethiopian economic association

EIA = Ethiopian investment agency

EPC=Ethiopian plan commission

ERCA =Ethiopian revenue and custom authority

FDI = foreign direct investment as percentage of GDP

GDP=gross domestic product

INFLN = annual inflation rate

MAF = manufacturing in GDP

MOFED =Ministry of finance and economic development

NBE=National Bank of Ethiopia

NGDP = Nominal GDP

OPPS = trade openness as measured by share of export and import to GDP

PPP =purchasing power parity

WAEMU =West African economic and monetary union

WDI =World Bank (world development indicators)

Abstract

The purpose of this study is examining the Determinant of tax revenue in Ethiopia. And it uses time series regression analysis and quantitative research methods; study employs the autoregressive distributed lag (ARDL) error correction model (ECM) regression to analyze the relation between tax revenue and various economic factories in Ethiopia for the period 1992–2022. The findings from the unit root tests revealed are stationary. The ARDL-bound tests confirmed the existence of a co-integration relationship among the variables. The Johansen co-integration of long-run results showed a significant relationship between inflation, nominal GDP, and foreign direct investment. And the same variables are insignificant: trade openness, manufacturing, agriculture. And also the short-run results indicated a significant negative relationship between trade, nominal GDP, agriculture, and tax revenue. In the short run, foreign direct investment has no statistically significant short-run relationship with tax revenue. The diagnostic result show free serial correlation and hetroskedasticity whilst the model's linearity assumption is supported by the RESET test result, validating the model's suitability for analyzing variable relationships. The residuals of the model are normally distributed, affirming the model's reliability in predicting tax revenue, and both the CUSUM and CUSUM squares stability tests indicate that the model is stable over time, reinforcing the dependability of the model's prediction. The model demonstrates a highly good fit with an R-squared value. The error correction term is highly significant, confirming the existence of a long-run relationship among variables. The study provides valuable insights for policymakers to develop effective economic policies aimed at enhancing tax revenue generation while ensuring economic stability and growth in Ethiopia.

Key words; Tax Revenue in Ethiopia, ARDL, ECM, co-integration

1. INTRODUCTION

1.1. Background of the Study

Tax revenue is the backbone of any government's budget, providing essential resources for public services, infrastructure development, and social programs. In developing countries like Ethiopia, where international aid is often volatile and private sector investment limited, maximizing domestic resource mobilization through efficient tax collection is crucial for achieving sustainable development goals. For this reason, it is claimed that taxes and tax systems are the essential building blocks of a nation, this is especially true for developing or transitional countries like Ethiopia (Mebratu, 2016).

Ethiopia's tax income, expressed as a percentage of GDP, was last estimated by the World Bank to be less than 23%, a figure even lower than the sub-Saharan norm of 26% of GDP. Consequently, Ethiopia has consistently experienced a budget deficit as government expenditure has surpassed revenue. To mitigate this issue, the government heavily relies on levying taxes both direct and indirect as significant and indispensable sources of funding for the general populace. Nevertheless, as noted by Tadege (2015), several factors impede the efficacy of the tax system. These include taxpayers' misunderstanding of the tax code, their inability to fulfill tax obligations, and tensions between taxpayers and tax officials. These factors contribute to an unfavorable perception of the tax system among taxpayers, thereby hindering the collection of the full amount of taxes owed.

Ethiopia has experienced a consistent growth trajectory in its economy since 2005. In the year 2000, the agricultural sector accounted for 54% of the GDP, while the service sector contributed 35%. The remaining 11% came from the industrial sector. However, in 2019, the service sector's contribution to GDP increased to 40%, while the agricultural sector's contribution decreased to 33%. The fast-growing industrial sector contributed 27% (Ketema, 2021). This growth can be attributed to substantial public investment in infrastructure, as well as the strong performance of the service and construction sectors (Moller, 2015, Shiferaw, 2017).

According to a working paper by (UNDP, 2016), tax collection in Ethiopia has been significant, with an average annual collection rate of 30% over the past twelve years. The tax collection increased from ETB 12.4 billion in 2005 to ETB 165.3 billion in 2015. The World Bank

microdata (Bank, 2021) also reveals that the total amount of tax collected in 2001 was 5.541 billion ETB, which significantly increased to 179.251 billion ETB in 2019. Additionally, Ethiopia's real GDP has grown from 8.08 billion USD in 2000 to 96.1 billion USD in 2018 (NBE, 2020). These figures suggest that the growth of the economy and the implementation of tax administration reforms since 1993 have played a role in the increase in nominal tax collection (Geda, 2005, Harris, 2021, UNDP, 2016). However, it is challenging to determine the exact extent to which tax policy and tax administration reforms have contributed to the increase in nominal tax collection.

In lower-income nations like Ethiopia, mobilizing more financial resources involves a number of intricate and confusing issues. Tax collection, however, is hindered by an inefficient institutional framework, corruption, and an opaque political system on one hand, and a high level of informality combined with low awareness of tax payment within the business community on the other (Epaphra and Massawe, 2017; Gnangon, 2020).

The primary source of funding for the state's budget is thought to be taxes. The state uses taxes as a key tool to manage the macroeconomic environment, encourage investment, prevent inflation, safeguard domestic industry, manage production and consumption, and redistribute wealth and income within the community (Nguyen, 2022). In addition to being a significant source of funding for the state budget, taxes also have an impact on social stability, equitable distribution, and economic growth (Minh Ha, 2022). Taxes: A nation's ability to grow economically depends on its ability to sustainably fund social, health, educational, and infrastructure initiatives that help the nation achieve its objectives. As a result, one of the main topics of discussion in state affairs should be taxes. The percentage of tax revenue is a metric used to assess tax performance. Tax income to the GDP (gross domestic product) of a nation. International transactions between nations are one of the many factors influencing tax revenue (Nugraha, 2023).

The majority of developed and developing countries must increase their tax revenues in order to fight poverty and fund public services. The reason for the lower tax ratio in developing nations could be attributed to either a smaller tax base or a lack of tax compliance on the part of the countries, which could be caused by low tax rates or excessive tax evasion and avoidance. To finance public utilities, infrastructure, and health care, and education, sufficient tax revenue must

be raised (Kaldor, 1963, IMF, 2011). Governments would be forced to borrow money in the absence of it, which increases the national debt and may eventually cause a fiscal crisis if debt levels become uncontrollable in relation to GDP and countries find it difficult to make repayments (Piancastelli, 2021).

By any measure, Africa still has the regrettable distinction of being the world's poorest continent. This problem appears to be more severe in Sub-Saharan Africa and is not what the nations and continent that fought for independence following World War II had in mind. As per the World (Bank, 2021), Zimbabwe had the highest poverty headcount ratio (34.2 percent) in 2017 purchasing power parity (PPP) terms, with an average daily income of $2.15. Other Sub-Saharan African countries like Lesotho and São Tomé and Príncipe followed. Alternatively put, the gross domestic product (GDP) per capita in Sub-Saharan Africa in constant 2015 US dollars was roughly $1650 in 2017. This contrasts with $1705 for South Asia, $8620 for Latin America and the Caribbean, and $10545 is the global average (Bank, 2021).

Sub-Saharan Africa's development has thus been deemed inadequate from that perspective. These nations must act quickly to close two critical gaps the infrastructure gap and the human capital gap in order to achieve both a sustained acceleration of GDP growth and a subsequent decline in poverty (Graham, 2020). Significant financial resources will be needed to successfully close these gaps. Fiscal policies, which include tax policies, offer governments one of the most practical means of raising money in the majority of developing nations. By funding improved healthcare, education, sanitation, and social safety nets for the poorest citizens, new revenues that are raised fairly and used effectively can improve citizens' quality of life (Graham, 2020).

This paper examines the main determinants of Ethiopian government tax revenue performances; the main factors include Nominal GDP, Trade Openness, Inflation Rate, Foreign Direct Investment, GDP Shares of Manufacturing and Agriculture, The paper suggests identifying the causes of decreased tax revenue generation and strengthening the tax system to ensure the collection of potential revenue from the rapidly expanding economy.

1.2. Statement of the Problem

Governments are paying more attention to finding stable and sustainable forms of development finance as a result of the global economic crisis and the unpredictability and volatility of aid flows Also, an unnecessary dependence on foreign funding can eventually result in issues with

debt sustainability, which together force developing nations to rely largely on domestic revenue The global economic crisis, has caused governments to pay more emphasis to finding secure and sustainable sources of development finance, according to (Bhushan, 2012). Furthermore, an over-reliance on foreign funding source could eventually result in issues with the sustainability of debt. Developing nations will therefore need to rely heavily on domestic revenue mobilization (Gupta, 2007). An increase in tax revenue is one method of mobilizing domestic resources.

mobilization (Tsaurai, 2021). Tax revenue collection is one method used to mobilize domestic resources (Gobachew, 2018). This study uses the OLS approach to identify multiple variables regression models in order to determine Ethiopia's tax revenue drivers. Approach was used on the time series data set spanning the years 1999/2000 through 2015/2016. The results show that the percentage of GDP devoted to the industry sector, per capita income, and trade openness as indicated by the GDP share of import and export, all significantly increase tax revenue. In contrast, the percentage of GDP devoted to the agriculture sector and the annual rate of inflation, on the other hand, significantly decrease tax revenue.

Taxation is the primary source of government revenue for stabilizing the economy, with a growing interest in developing nations over the past 20 years (Tesfaye, 2015). Issues include inadequate administration, insufficient revenue collection, tax structures that don't consider equity, a lack of government, and unstable economic conditions. Tax administration has limited ability to oversee taxpayer compliance in many of Africa's least developed nations (United Nations, 2014). From 3.6% of GDP in 1990 to 8.3% in 1994, tax revenue in Sierra Leone has generally increased over time. However, due to political conflict, the country experienced a decline from 1994 to 1999. Following the end of the civil war, investment and economic activity increased, resulting in a rise in tax receipts to 9.1% in 2001. Tax revenue gradually increased, reaching an average of 9.8% between 2009 and 2012; however, there was a downward trend between 2013 and 2014 due to the spread of the Ebola virus and mine closures. After recovering, tax revenue collection increased to 12% of GDP from 2015 to 2018. Furthermore, relying too much on this kind of funding source could eventually result in debt (Neog, 2020).

In comparison to its tax capacity, Ethiopia's total tax revenue as a percentage of GDP is extremely low. The international Monetary Fund (2013) reports that the average tax revenue from international transactions between 1999/2000 and 2011/12 was 4.8% of GDP. According to

the same report, average SSA spending accounted for 4.79% of GDP, while income tax took up 3.7% of GDP. In contrast, the average SSA tax rate was 7.2%, and the national tax rate on goods and services was 2.4% of GDP. Even in comparison to its neighbors, Tanzania (6.23%), Kenya (8.5%), and Uganda (6.89%) have higher GDPs. This demonstrates that Ethiopia's tax revenue as a percentage of GDP is still lower than both its potential revenue and the sub-Saharan standard.

Ethiopia has undertaken a number of initiatives to achieve the best fiscal policies possible, with a focus on the role that taxes play as a tool for economic development (Alemayehu, 2005). Despite these efforts, the nation's economy is heavily dependent on grants and loans (24% of GDP) to meet its investment needs. Moreover, the average GDP share of tax revenue, total revenue, and grants for the years 2001 to 2010 was 11.2 percent and 19.6 percent, respectively (B., 2015). This suggests that the nation n's tax revenue is not very high.

Tax revenue plays a crucial role in fostering economic development, and various socioeconomic and political factors influence how well it functions. Furthermore, a variety of socioeconomic and political factors influence the ability to raise sufficient economic revenue, and these factors may have positive or negative effects on tax revenue. Thus, determining the variables influencing tax revenue is necessary before looking at how tax revenue affects economic performance. Consequently, recognizing the reasons behind the low tax revenue level offers corrective measures to address ongoing issues with tax revenue.

Since most empirical studies conducted to investigate the determinants of tax revenue primarily rely on cross-sectional and panel data sets, it is rare to find country-specific time series studies on the subject(Gupta, 2007);(Ghani, 2012))(Leothold, 1991, Mahdavi, 2008). Country-level time series analysis is more appealing because it is difficult to discern the country-specific behavior of tax revenue determinants in panel data sets. Furthermore, as the aforementioned studies demonstrated, different countries have different factors affecting tax revenue, which makes a country-level analysis of tax revenue necessary. There aren't many studies, as far as the researcher is aware, on the factors influencing Ethiopia's tax revenue. Ethiopia's tax revenue performance is a topic that has received very little attention. Since most empirical studies conducted to investigate the determinants of tax revenue primarily rely on cross-sectional and panel data sets, it is rare to find country-specific time series studies on the subject (Gupta, 2007); Ghani, 2012)(Leothold, 1991, Mahdavi, 2008). Country-level time series analysis is more

appealing because it is difficult to discern the country-specific behavior of tax revenue determinants in panel data sets.

Furthermore, as the previously mentioned research has shown the majority of research uses panel and cross-sectional data sets, several nations display distinct aspects affecting tax revenue. This calls for an examination of the dynamics of tax revenue at the national level. There are currently very few studies on the determinants of tax revenue in Ethiopia. Furthermore, therefore, we need to conduct more country-level time series analyses in ARDL model to identify the specific factors influencing Ethiopian tax revenue and Create possible measures for fixing frequent problems. However, the study looks at tax revenue as a dependent variable and tax revenue as defined by the percentage of taxes collected in the year and nominal GDP, trade openness, inflation rate, foreign direct investment, share of agriculture in GDP, and share of manufacturing in GDP as independent variables over the past 30 years.

1.3. Objectives

1.3.1. General Objective of the Study

To examine the determinant of tax revenue between 1992 up to 2022 G.C in Ethiopia.

1.3.2. Specific Objectives of the Study

The following are the specific objectives of the study.

- To analyze the statistical significance of Nominal GDP on tax revenue in Ethiopia.
- To assess the statistical significance of Trade openness on the tax revenue in Ethiopia.
- To analyze of the statistical significance of the inflation rate on tax revenue in Ethiopia.
- To analyze the statistical significance of foreign direct investment on tax revenue in Ethiopia.
- To analyze the statistical significance of the share of agriculture in GDP on tax revenue in Ethiopia.
- To analyze the statistical significance of the share of manufacturing in GDP on tax revenue in Ethiopia.

Hypotheses of the Study

The followings are the specifics research hypotheses, which the study aims to prove using statistical significance tests.

(1). H1: There is a statistical significant and positive the effects of Nominal GDP on tax revenue of Ethiopia

(2). H1: Trade openness statistical significantly and positively effects of the tax revenue of Ethiopia; and

(3). H1: Inflation rate negatively effects of the tax revenue on Ethiopia.

(4). H1: Foreign direct investment (FDI) statistical significantly and positively affects the tax revenue of Ethiopia

(5). H1: share of agriculture in GDP statistical significantly and positively affects the tax revenue of Ethiopia

(6). H1: the share of manufacturing in GDP statistical significantly and positively affects the tax revenue of Ethiopia

These hypotheses can be tested using empirical data on tax revenue Nominal GDP, Trade Openness, inflation rate, foreign direct investment, Share of Agriculture in GDP, and Share of Manufacturing in GDP.

1.4. Significance of the Study

Policymakers benefit from the study's ability to clarify the factors influencing Ethiopia's tax revenue performance. In this regard, the study's conclusions and suggestions assist relevant government parties, including the Ethiopian Revenue and Customs Authority and the National Planning Commission, in understanding and prioritizing necessary measures.

The study's conclusions can primarily help the Ethiopian Revenue and Customs Authority (ERCA).The study on factors influencing Ethiopian tax revenue is crucial due to ERCA's role in tax administration, policy creation, and revenue collection. We expect the findings to enhance Ethiopia's revenue collection and tax administration efficiency. The Ministry of Finance and Economic Cooperation also benefits from the analysis of the factors influencing Ethiopia's tax income. The study reveals the critical role played by MoFEC in international collaboration, macroeconomic stability, budget management, revenue mobilization, and fiscal policymaking.

The MoFEC's efforts to strengthen Ethiopia's fiscal capability, advance sustainable economic development, and improve the quality of life of its population can be guided by the findings.

The importance of MNPC in development planning, resource allocation, policy coordination, monitoring and evaluation, and international collaboration is evident in the study on the factors influencing tax revenue in Ethiopia. The study's conclusions can help MNPC in its efforts to create and carry out development plans that encourage sustainable development, inclusive growth, and the eradication of poverty in Ethiopia. Furthermore, this study can serve as a starting point for additional investigations by other scholars into the specific factors that influence tax revenue in the nation. Lastly, the study may serve as a springboard for additional research projects involving the researcher.

1.5. Scope of the study

The study's main objective has been to investigate Ethiopia's tax revenue determinants by comparing sixth independent variables to the country's tax collection over the previous 30 years. Macro variable data covering the time series from 1992 to 2022 was used in the study. Six variables are thought to be explanatory factors for tax revenue performance in the study. This study aimed to minimize redundancy and duplication of work by excluding variables that were previously examined in Ethiopian cases. Nominal GDP, Trade Openness, Inflation Rate, Foreign Direct Investment, Shares of Manufacturing and Agriculture GDP.

1.6: Limitation of Study

In the course of conducting the study, several major limitations were experienced. The primary challenge experienced was difficulty accessing statistical data from government offices. This is preventing the research process significantly. The researcher faced obstacles in obtaining crucial statistical data, with inconsistent availability of variables in annual reports and government offices lacking recorded data, among other issues.

Additionally, there was a scarcity of prior studies conducted on the topic in the Ethiopian context. This lack of existing research requested challenges in establishing an outline for the study and also resulted in the below result.

1.7. Organization of the study

The study is presented in five chapters. The First chapter deals with introductory part of the paper including background of the study, statement of the problems, objectives of the study, research questions, significance of the study, and other sub-sections. The second chapter reviews related and relevant literature. In the third chapter, the research methodology and design including the research approach, the source, and techniques of data collection, model specification, and method of analysis is explained. Subsequently, the fourth chapter discusses the results and analysis of the findings of the study. Finally, the fifth chapter presents the conclusions and recommendations based on findings.

2. REVIEW OF RELATED LITERATURE

2.1. Over view

This chapter provides a comprehensive synthesis of the relevant literature on the factors influencing tax revenue. There are three sections to the review. The theoretical review is presented in the first section, and the review of empirical studies is presented in the second section. The theories developed in accordance with the theoretical and empirical literature are illustrated in the third section. The fourth and final section provides closing thoughts and identifies the research gap.

2.2. Theoretical review

2.1.1. Meaning and concepts of Tax

(Ajay & Edewusi, 2019) Taxes are a mandatory payment that is made without receiving any specific benefit in exchange for the tax document. The purpose of taxes is to force households to give up their purchasing power to the government. In order to build a nation, taxes are regarded as indispensable (Ojong, 2016). Despite playing a fundamental role in the economy, it is the most important source of domestic revenue generation. Most of the time, tax income is regarded as a significant source of funding for governments in both developed and developing nations (Abdenur, 2017). Generally speaking, governments use tax money to fund social welfare programs, invest in institutional and physical infrastructure, and provide public goods. Additionally, tax revenue assists the government with planning, implementing the development agenda, promoting the development of the private sector, fulfilling governmental duties, and acting as a reliable channel to improve the efficient allocation of resources.

2.1.2: Method for Estimating Tax Revenue

The Gross Domestic Product (GDP) serves as the primary benchmark in much of the research concerning factors influencing tax income and is utilized for estimating tax revenue. Studies by (Asher, 1989))(Ole, 1995, Wawire, 2017, Wilford, 1954), This method involves segregating data on changes in discretionary revenue using government-supplied data, reflecting only what collections would have been if the base-year structure had remained constant throughout the entire sample period identified several drawbacks associated with the proportional adjustment method. Firstly, there exists a dearth of information concerning income receipts directly and immediately linked to voluntary alterations in tax law. Furthermore, the method's reliance on budget forecasts for the discretionary implications of tax revenue often diverges significantly

from actual revenue receipts. (Leothold, 1991) and Chipeta (1998) highlight that the method hinges on the assumption that discretionary changes are more or less progressive than the tax structure they amend. However, this assumption may not always hold true due to the method's aggregative nature. Consequently, multiple researchers have explored various methodologies to address these challenges.

2.2. Types of Taxes

Ad valorem taxation, bank taxes, capital gains taxes, consumption taxes, currency transaction taxes, excise, financial activities taxes, income taxes, poll taxes, property taxes, social security taxes, sales taxes, tariffs, transfer taxes, value-added tax (goods and services tax), and wealth (net worth) To achieve developmental goals, apply various tax types and adjust tax rates. This is done in order to redistribute resources among individuals or classes in the population or to divide the tax burden among those engaging in taxable activities, like business.

A country's tax structure frequently reflects the values of the ruling class as well as the values of the community. As stated by Omoruyi (2003), a tax system may be more of a reflection of the values of those in power in nations where the general public has little to no influence over it. The source Tax revenue received from the general public is always more than what the government can use. The difference is known as the compliance cost, and it includes the salary of employees hired to handle tax collection with the intention of allocating the funds to a particular project.

Different countries have very different approaches to revenue collection and very different taxation philosophies (Heady, Johansson, Arnold, Brys, & Vartia, 2008). Make the case that the various ways in which government spending is allocated have distinct effects on growth, and that the same can be said for the methods used to raise tax revenue. While tax rates have remained relatively constant in some countries over the past few decades, they have increased significantly in others. Regarding the causal relationship between government revenues and expenditures, there are three main theories.

The first of these is the fiscal synchronization hypothesis, which holds that government revenue and expenditure are decided upon at the same time. This hypothesis implies that there is a feedback causal relationship between revenue and expenditure, according to (Vamvoukas, 1997). In this theory, it is said that the public weighs the costs and benefits of government services to

decide how much money should be spent and taxed. For the United States of America, (Olaoye, 2021)have put forth arguments in support of this theory.

The tax-and-spend hypothesis is the primary name for the second hypothesis. This method emphasizes that all spending plans must be increased in proportion to tax revenue, meaning that as taxes rise, so doe's government spending, and spending must therefore follow revenue. Therefore, the level of government spending is determined by the available tax revenue. The argument put forth here is that tax increases encourage an increase in government spending. Recognizing taxes is recommended by (Friedman, 1982) as a solution to budget deficits because taxes positively influence government spending. Friedman contends that tax cuts increase deficits, which ought to persuade policymakers to cut back on spending.

The same is true for (Buchanan, 1978), who argue that taxes drive government spending but that the inverse relationship. According to their perspective, the public believes that the cost of government programs has decreased as a result of tax cuts. They are therefore pressing the government for more initiatives, which, if approved, will rise overall government spending. As a result of declining tax revenue and rising government spending, higher budget deficits will eventually be realized. Therefore, they see raising taxes as the solution to budget deficits.

The third theory holds that expenditure by the government truly drives revenue. This theory, which was put forth Peacock and Wiseman (1961) and others like Barro (1979), is based on their observation that any significant external disruptions, such as wars, other unstable political environments, or natural disasters, cause a rise in government spending and, consequently, tax revenues. This article suggests cutting government spending as a way to address budget deficit issues. (Jones, 1991) conducted empirical research on the United States of America (USA) to bolster this theory. They looked at this relationship between 1792 and 1860. Their findings provide short-term support for the spend-and-tax hypothesis as well as evidence for the existence of bidirectional causality between revenue and expenses. While (Vamvoukas, 1997)concludes that his research appears to support the fiscal synchronization hypothesis, he also finds that the spend-and-tax hypothesis is true in the short run in the case of Greece.

The application of taxation and spending by the government to affect the economy is known as fiscal policy. The other primary form of macroeconomic policy, monetary policy, which aims to stabilize the economy by regulating interest rates and the money supply, can be contrasted with fiscal policy. Taxation and government spending are the two primary tools of fiscal policy. It is the complementary tactic to monetary policy that a central bank uses to affect the amount of money in circulation in a country. To put it another way, fiscal policy is the process of using the public budget to affect economic activity. Governments do spend money on many different things, including the police and military, healthcare and education services, and transfer payments like welfare benefits. The funding of this expenditure can be obtained through various means, including borrowing from domestic or foreign sources, selling fixed assets, depleting fiscal reserves, printing money, and other means, all aimed at attaining the economic goals of price stability, full employment, and economic growth.

Nonetheless, Keynesian economics indicates that the most effective ways to boost aggregate demand are by rising government spending and lowering tax rates. It is typically employed during recessions or periods of low economic activity as a crucial instrument for establishing the groundwork for robust economic expansion and pursuing full employment According to the Keynesian theorist, cutting expenditure from the economy lowers aggregate demand, contracts the economy, and stabilizes prices. Economists disagree on how effective fiscal stimulus is. The main focus of the argument is crowding out, a phenomenon whereby government borrowing raises interest rates, offsetting the impact of spending simulation. When there is a budget deficit, the government must raise money through public borrowing (the issuance of government bonds), foreign borrowing, or debt monetization.

2.3. 1. Direct and Indirect Taxation

The majority of the revenue structure is composed of direct and indirect taxes.

2.3.1.1. Direct Taxation

Direct taxation refers to taxes levied directly on individuals or entities and cannot be transferred to another party. These taxes are based on the ability to pay and include income tax, property tax, and wealth tax. Direct taxes are usually progressive, meaning that they increase as the taxpayer's income or wealth increases. The burden of direct taxes falls directly on the taxpayer.

2.3.1.2. Indirect Taxation

Indirect taxation is a type of tax levied on goods and services rather than individuals or entities directly. Examples include value-added tax (VAT), sales tax, excise duty, and customs duties. These taxes are passed on to the end consumer through higher prices and can be regressive, taking a larger proportion of income from lower-income individuals. Indirect taxes are often avoidable as they are not deducted from wages. Both types of taxes have advantages and disadvantages.

2.4. Principles of a Good Tax System

The reduction of 'take home' pay due to an increase in income tax in comparison to unemployment benefits is one way that direct taxation affects the incentive to work. Upon conversely, individuals with comparable wealth and income levels may pay different amounts under indirect taxation due to minor variations in their circumstances (Fjeldstad & Rakner, 2016).

According to .(PLC., 2008)), a good tax system should adhere to the following common principles: Effective: A tax system should generate sufficient revenue to support government initiatives without unduly burdening the economy, especially the taxpayer, so as to prevent it from becoming a deterrent to performance (work returns, savings, and internal and external investment). Comprehensible: The system shouldn't be so complicated or unfair that it is difficult for the average person to understand. This will reduce expenses and unhappiness. 14 Benefit Principle: Individuals who utilize a publicly Nonetheless, there can be, and frequently are, philosophical disagreements between this and principle.

2.5. History of taxation in Ethiopia

An overview of Ethiopia's tax structure and tax reform After World War II, between 1942 and 1944, Ethiopia's tax system underwent its first significant overhaul, with the years 1947 to 1952 constituting its second stage. Most of these adjustments were optional, including modifications to property taxes (land and cattle). In the middle of the 1950s, broad-based taxes on goods and services were also implemented.

The rate and structure of taxes, particularly on income, were also altered later in the decade and in the early 1960s. The post-revolutionary era (1974–1991) saw a number of important changes to the rates and structures of all taxes, especially between 1976 and 1979. These included introducing capital and surplus transfers from nationalized firms, expanding the base for land

taxation, these included introducing capital and surplus transfers from nationalized firms, expanding the base for land taxation, and making a few small adjustments to other taxes.

Leaving aside this brief description of the evolution of the tax system before the 1991/2 reform, the subsequent taxing system in Ethiopia can be divided into three broad categories: (i) taxes on income and profits; (ii) taxes on goods and services; and (iii) taxes on international trade. Most of these taxes have been reformed and amended in the last decade following the general 1992 liberalization (or reform) policy. Some institutional reforms aimed at enhancing the government's capacity to raise tax revenue have also been made.

During the imperial and revolutionary eras, resources were distributed differently among the various economic sectors. Approximately 36% of the yearly budget was allocated by the government to internal order maintenance and national defenses. Tax yields stagnated towards the end of the imperial period, while the budgets of the various ministries increased steadily. There was little chance to raise taxes on personal or agricultural income because most people were subsistence farmers. Because of this, the imperial government relied on sales, excise, and customs as indirect taxes to fund its operations. For example, taxes on foreign trade made up approximately one-third of all government revenues, excluding foreign grants, and nearly two-fifths of tax revenues in the early 1970s. When direct taxes made up less than one-third of tax revenues, taxes on foreign trade accounted for nearly two-fifths of tax revenues and roughly one-third of all government revenues, excluding foreign grants.

In 1976, the revolutionary government introduced a new tax on income from agricultural activities and replaced the taxes on rural land and agricultural income with a rural land-use fee. By giving peasant associations, who were compensated with a small portion of revenues, the authority to collect the fee and tax on agriculture, the government was able to partially alleviate the problem of unpaid taxes during the imperial period. Tax revenues stayed constant at roughly 15% of GDP in 1988–1989, despite a notable increase in total revenue to roughly 24% of GDP in that same year. Total revenue and tax revenue as a percentage of GDP in 1974–1975 were 13 and 11%, respectively. Even after the tax structure was altered in 1976, the government still thought that the agricultural income tax was underpaid, primarily as a result of low appraisals from peasant organizations like the Ethiopian Chamber of Commerce and Ethiopian Business Development Services Network (ECC, 2005).

Taxes were imposed by the government. All exports were subject to a 2% tax in 1987, with coffee subject to an additional export duty and surtax. Customs charges and a general import transaction tax of 19% were included in the import taxes. The government exempted capital goods from all import taxes as part of a policy to encourage new capital investment. Taxes on imports ranged from 0 to 35 percent for intermediate goods, 0 to 100 percent for consumer goods, and 200 percent flat for luxury items. Elevated tariffs on specific luxury and consumer goods fostered a thriving black market where the smuggling of some imports most notably alcohol and electronics played a significant role. Even though tax collection methods weren't very successful, the government continued to closely monitor capital and ongoing spending. To make sure that the expenditure complied with budgetary authorizations, the Ministry of Finance oversaw purchases and accomplished audits of ministries.

The federal government and national revenue have both increased as a result of the various tariff and tax reform initiatives. Federal revenue increased to Birr 6.7 billion in 2002/2003 from Birr 2.54 billion in 1993/94, according to Ministry of Revenue reports. As a result, federal revenue as a percentage of GDP increased from 8.97% in 1993/94 to 11.87% in 2002/03. The slight increase in direct and indirect taxes, particularly foreign trade taxes, is the main cause of the revenue increase. In addition, the national tax revenue as a share of GDP grew from 10.9 in 1993–1994 to 15.1% in 2002–2003. The overall budget deficit, with and without grants, has been rising in spite of the numerous reforms and revenue increases. As an illustration, the overall budget deficit (excluding grants) as a percentage of GDP grew from 5.2% in 1996–1997 to 14.5% in 2002–2003. This demonstrates that Ethiopia has performed poorly in revenue collection when compared to other Sub-Saharan African nations, where revenue collection accounts for over 23% of GDP.

2.6. Determinants of Tax Revenue

The several elements that affect the amount of money governments collect through taxes are referred to as determinants of tax revenue. Government income is largely derived from tax revenue, which is used to pay for a range of governmental programs and expenses.(Mebratu, 2016)) defines revenue as the sum of money that local, state, and federal governments collect from people and organizations in order to pay for their expenses. According to Fave & Dabari (2017), as referenced in Agumas, A.L. (2016), taxes are the main source of funding for modern governments, usually accounting for 90% or more of their revenue. Taxes are mandatory

payments that the government imposes on the capital, earnings, and outlays of its constituents. Numerous scholarly investigation, underscore the pivotal factors that impact tax income. These factors include trade openness, inflation rate, foreign direct investment, Nominal GDP, the share of manufacturing and agriculture in GDP, and the share of trade in GDP (Saptono[1], 2021).

2.6.1. Foreign Direct investment (FDI)

Governments are increasingly using tax incentives to attract foreign investment, which can include tax reductions, exemptions, and special tax allowances. These incentives aim to promote foreign direct investment inflows, leading to job creation, technology transfer, and economic growth. However, they can also discourage the development of competitive markets and sound policies. The indirect effect of FDI inflows on government public revenue could be significant, as it could generate higher total government public revenue if its indirect effect outweighs its direct effect. This indirect effect could occur through job creation, which can increase income tax revenue and indirect tax revenue, particularly through VAT and excise tax revenue. If these individuals increase their domestic consumption, this can also translate into higher tariff revenue for the government (Kimm Gnangnon, 2017).

2.6.2. Nominal GDP

The entire value of goods and services produced inside a nation's borders during a certain time period is referred to as nominal GDP; this value is usually expressed in current prices without accounting for inflation. It functions as a thorough indication of the output and activity of a country’s economy, taking into account net exports, government expenditure, investment, and consumption. The federal tax system is inherently compromised. GDP changes are frequently used as a framework for analyzing how effective these concessions are. The fluctuations in GDP growth enable the comparison of dynamic economic development trends across various economies and nations. In turn, GDP level is determined by the attitude of the authorities toward redistribution of GDP through the budget, the current tax structure, and the degree of economic growth of the state (Levišauskaitė, 2003).The World Bank states that tax collections that account for more than 15% of a nation's GDP are essential for both economic expansion and the eradication of poverty. Attaining sustainable economic development and making investments in the future are made possible by the tax levels in place. (WB) Tax policy ought to advance both societal progress and economic expansion. If not, the issue of economic expansion will resurface. This is a crucial issue for several low-income nations. These nations' governments are able to

stabilize the public finances and boost the GDP to some extent. However, such expansion results in a decline in GDP and a shortage of financial resources if it is accompanied by population poverty that cannot match the equivalent consumer demand 2020; Fedosov, Tymchenko, & Silchenko).

2.6.3 Share of Agriculture in GDP

Agricultural In Ethiopia, income tax is one of the main payments made by rural landowners (SAMANTARA, 2021). (Tanzi, 1992) asserts that agriculture is seen as a prominent aspect of the economic structure and that the economic structure of the nation is one of the elements that might be anticipated to affect the amount of taxation. However, (Stotsky, 1997)forwarded the information that small farmers are notoriously difficult to tax and that a large portion of agriculture is typically subsistence, which does not generate large taxable surpluses since many nations are unwilling to tax the primary foods used for subsistence. For developing countries, the share of agriculture may have a significant impact on the tax share. A vital sector for both personal and commercial needs, agriculture has made a substantial contribution to developing nations like Nigeria's GDP. The industry has demonstrated a positive effect on tax revenue efforts despite declining productivity. Its GDP contribution increased from 40.9% in 1985 to 41% in 2000. But as of right now, it makes up less than 30% of the GDP. Numerous cross-national studies have discovered a negative correlation between tax revenue efforts and the GDP share of agriculture. Trade liberalization and tax revenue performance, for instance, negatively impacted tax performance in Uganda. On the other hand, some researchers have discovered a benefit for tax revenue efforts. (Mahdavi, 2008) found a small but positive correlation between Pakistan and the GDP share of agriculture in 43 developing nations. Murunga, Muritthi, and Kiiru (2016) discovered a positive correlation between Kenya's tax revenue effort and the sector's GDP share. (Ahsan, 2005)found a significant and positive coefficient for the GDP share of agriculture (Ikhatua, 2019).

2.6.4. Share of Manufacturing in GDP

Manufacturing sectors play a significant role in the growth of the national economy as a whole. In many nations, the town's primary employer is the manufacturing sector. In the majority of developed nations, the manufacturing sector is the primary driver of rapid growth. (Marcel Behunet al., 2018)..An economy's manufacturing sector, which includes industries that process and manufacture goods to create new commodities or value addition, is essential. However,

because of the economy's reliance on imports, productivity levels have decreased recently. The GDP share of the manufacturing sector has varied over time, reaching a high of 9.8% in 2014. Studies have indicated that the manufacturing sector's GDP share is positively correlated with tax revenue effort, contrary to the expected negative relationship between the manufacturing sector and tax revenue performance. For instance, the tax revenue of Uganda and the East African Community demonstrated a positive correlation between manufacturing and tax revenue. Nonetheless, Teera and Hudson's 2004 study discovered that the manufacturing sector's share The term "manufacturing industry" describes industries that produce goods and services, develop new products, or add value to already-existing products by modifying them mechanically or chemically. The majority of developing nations had low levels of productivity. This is typically caused by insufficient availability and quality of the resources and factors that boost productivity. Productivity in and of itself can reveal information about an economy's strength. (Ikhatua, 2019).

A nation's manufacturing sector plays a vital role in its development by producing economic outputs. It entails the mechanical or chemical conversion of raw materials into new products, frequently with the aid of machinery or manual labor. Due to low resource availability and quality, manufacturing a vital engine for long-term growth and development—often experiences low productivity in developing nations (National Planning Commission, 2015). In his study (Tesfaye, 2015) suggested that manufacturing enterprises are easier to tax than agricultural enterprises since business owners typically keep better books of accounts and records. Manufacturing can generate larger surpluses if production is efficient. Therefore the variable is positively related to the tax ratio.

2.6.5 Inflation rate

An economy experiences inflation when general prices for goods and services increase steadily over time, forcing consumers to pay more for the same goods and services. There is no consensus on what causes inflation, but theories like demand-pull inflation, cost-push inflation, and monetarist inflation have been advanced. Whereas cost-push inflation contends that rising production costs, such as those associated with labor, materials, and salaries, are the cause of inflation, demand-pull inflation links inflation to rising consumer demand for goods and services. According to monetarist inflation theory, inflation results from a rise in the money supply. On the other hand, empirical research has yielded conflicting results about the reasons behind

inflation. The money supply and interest rate were cited in some studies as the primary drivers, while others have been (AL-Mutairi, 2020)

2.6.6. Trade openness

Trade openness, determined by the percentage of GDP attributed to foreign trade, can significantly impact tax receipts and serve as a gauge of economic liberalization. Compared to domestic operations, foreign trade is more taxable due to specific factors. The foreign trade sector often represents the most lucrative economic activity in developing nations. Designated points of entry and departure into the nation exist, leading import and export shares to play a significant role in tax receipt determination. A nation's level of exports and imports divided by its GDP is termed its openness, illustrating how opening a nation to foreign trade influences tax revenue performance. (Gnangnon, 2019b). To create a primary budget surplus for debt repayment, a nation may opt to raise import tariffs or other taxes. Debt is another factor found to significantly impact revenue performance. The distinction between utilizing loans for productive purposes versus solely covering current consumption expenses appears crucial. Despite shifts towards trade openness, trade tariffs remain a major source of government revenue in many developing and emerging market economies. For instance, trade taxes continue to contribute an average of nearly 25% of all government income in Sub-Saharan Africa and 15% of all government revenues in developing Asia and the Pacific(Harrison, 1996).Theoretical view of Trade openness indirectly impacts imports and revenue performance due to price fluctuations induced by liberalization. A reduction in import tariffs affects these outcomes based on the price elasticity of supply and demand for import alternatives. If demand for imports is inelastic, import volumes and revenue performance should remain consistent, while if the market for imports is elastic, variations in import volumes and revenue performance may lead to an increase.

2.7. Empirical Literature review

Numerous empirical investigations have examined Determinant of tax revenue at the both developing and developed countries. It runs counter to (Pratomo, 2020) research, which finds that rising FDI positively correlates with overall tax revenue in developing nations as well as with corporate, personal, and value-added taxes. It is evident that, whereas brownfield FDI tends to reduce revenue, Greenfield FDI increases tax revenue.

(Takayama, 2023) According to research, countries in Latin America and the Caribbean are more likely to accept brownfield foreign direct investment (FDI) due to the belief that FDI reduces tax revenue. Since 2015, Chinese investment in these regions has increased significantly (Abdenur, 2017). Trade openness appears to have a positive impact on tax revenue, according to partial tests Brun & Gnangnon (2019). Another study by (Kwaku, 2018) examined the effect of trade openness on trade tax revenue in Ghana. The findings show that trade openness benefits tax revenue in the long and short terms in the international trade sector (import/export taxes, import/export duties).

(Gobachew, 2018). This study uses the OLS approach to identify multiple variables regression models in order to determine Ethiopia's tax revenue drivers. Approach was used on the time series data set spanning the years 1999/2000 through 2015/2016. The results show that the percentage of GDP devoted to the industry sector, per capita income, and trade openness as indicated by the GDP share of import and export, all significantly increase tax revenue. In contrast, the percentage of GDP devoted to the agriculture sector and the annual rate of inflation, on the other hand, significantly decrease tax revenue.

According to Eddine Salhi and El Aboudi's research (2021), partial tests on foreign debt showed that government-borne foreign debt had a positive effect on tax revenue. Implementing debt proposals to accumulate economic growth is not the best course of action, as lowering high debt levels will improve the nation's economy from its initial coefficient value of -3.1239 to 0.1301 after moderation (Chien, 2022).

Over the course of 40 years (1976–2015), (Castañeda Rodríguez, 2018) looked at an unbalanced panel dataset containing a sizable sample of developed and developing nations to identify the long-term variables (economic, social, political, and cultural aspects) that influence taxes and account for variations in tax performance. The results show that taxation demonstrates path dependence based on the importance of lags, taking into consideration the total tax burden and revenue from consumption and income taxes, as well as a progressiveness index.

A study by (Babatunde, 2017)looked at the connection between taxation and economic growth in Africa between 2004 and 2013. The pre estimation test was conducted using descriptive statistics and the unit root test, which demonstrated the normality of the GDP and taxation variables and stable. However, the findings of this study indicate that tax revenue is positively related to GDP and promotes economic growth in Africa.

Right now Tax revenue has a positive effect on economic growth, but developing countries face significant challenges in raising budget revenues to achieve development goals when opening their economies to international trade (Mahdavi, 2008). When medium- and long-term trade liberalization is implemented, the reduction of foreign trade taxes has an additional impact on these countries' high reliance on state budget revenues, the majority of which come from tax revenues (Weisbrot & Baker, 2003). Foreign trade tax revenues may be further eroded by the unavoidable process of trade liberalization through multilateral or bilateral trade agreements. Trade openness, also known as trade policy liberalization, has been shown in numerous studies (Khattry & Rao, 2002; Khattry, 2003) (Cagé, Gnangnon, 2019b) to have a detrimental effect on budget revenues, including tax revenues in developing nations. Therefore, policymakers in developing countries are undertaking tax reforms to help reduce the dependence of the tax structure on foreign trade revenue in the medium and long term on domestic consumption tax (Brun & Chambas, 2015)(Gnangnon, 2019b). The term income neutral tax reform refers to a combination of a consumption tax increase and a proportionate tariff reduction. As a result, resources in the manufacturing sector will be allocated more effectively, which will eventually result in welfare benefits based on higher production efficiency that support economic growth.

The study uses the Political Risk Service International Country Risk Guide data to analyze Nigeria's governance risk from 1984 to 2017. The study uses twelve variables to determine the country's governance risk, which are then adapted into the World Bank's six governance indicators. The study measures political stability and the absence of violence or terrorism by combining government stability, internal conflicts, external conflicts, and ethnic tensions.

(Elbahnasawy, 2020) provides factual data regarding the connections between political climate, government tax initiatives, and revenue. The results demonstrate the relationship between political stability, democratic authority structures, rising tax efforts, and non-hydrocarbon revenue. When democracy is well established, its long-term benefits are greatest. Furthermore, the non-hydrocarbon tax offset from hydrocarbon revenue is less than previously reported in the literature when political structural factors are included. Political unrest has an impact on the relationship between hydrocarbon and non-hydrocarbon revenue streams. Consequently, the results hold up against multiple estimation techniques, revenue measures, and political unpredictability.

(Kobyagda, 2019) investigated the macroeconomic factors of tax revenue mobilization in the nations of the West African Economic and Monetary Union (WAEMU). Investigations were conducted into the effects on tax revenue of GDP per capita, openness, agriculture's added value to GDP, and money supply in relation to GDP. Their findings show that while tax revenues are positively correlated with GDP per capita, trade openness and agricultural added value have a significant negative correlation with tax revenues. Macroeconomic factors of tax revenue mobilization in the nations of the West African Economic and Monetary Union (WAEMU). Investigations were conducted into the effects on tax revenue of GDP per capita, openness, agriculture's added value to GDP, and money supply in relation to GDP. Their findings show that while tax revenues are positively correlated with GDP per capita, trade openness and agricultural added value have a significant negative correlation with tax revenues.

Although (Cagé, 2008)found results to the contrary, (Gnangnon, 2019a) demonstrated that greater trade liberalization in developing countries not only changes the tax system but also has a positive impact on tax revenue, ultimately aiding in the development of the economy. This study's investigation into the relationship between trade openness, tax revenue, and economic growth in developing nations was prompted by the study's inconsistent findings. In addition, the nature of taxes can help predict growth patterns (Li & Lin, 2023; Myles, 2000; Romer & Romer, 2010). One of the best ways to mobilize a nation's internal resources and a requirement for establishing an atmosphere that fosters economic growth is a well-functioning tax system and development (Xing, 2012).

The relationship between tax revenue (VAT, PPT, CIT, and CED) and economic development in Nigeria was investigated by Asaolu et al. (2018). We collected and used Auto Regressive Distributed Lag (ARDL) as an estimate approach on data from 1994 to 2015. while post-estimations were completed According to the study, there was no significant correlation identified between PPT and economic growth, while there was a negative but significant association established between CIT and economic growth, VAT, and CED.

(Karagöz, 2013) used the Johansen co integration technique to study the factors influencing tax revenue in Turkey from 1970 to 2010, with a focus on the sectorial mix of the economy. The study used a linear model to measure tax revenue as a ratio to GDP. The estimation results show that tax revenue is significantly impacted by the shares of both industries and agriculture in GDP.

While the industrial share of GDP positively affects tax revenue to GDP share by 18.6%, agriculture has a negative long-term impact on it (-43.7%).

(Okonkwo, 2018) used the Ordinarily Least Squares (OLS) method to study the factors influencing taxation in Nigeria between 1980 and 2014. The study found that the primary factors influencing taxation in Nigeria were inflation, money supply, interest rates, and income. The report suggests that in order to maintain the nation's tax revenue, the government should improve its procedures for collecting taxes and regularly update its tax laws.

Ethiopia has conducted some research on the variables influencing the ratio of tax revenue to GDP. (Gobachew, 2018)found that the annual rate of inflation and the share of the agriculture sector in GDP have a negative effect on tax revenue, while the trade openness reflected in the percentage of imports and exports to GDP, per capita income, and the industry sector share to GDP have a significant positive impact on tax revenue. (Daba, 2014) conducted a second study in Ethiopia, examining the country's buoyancies and domestic revenue from 1974–1975 to 2012–2013. A double-log regression model was utilized for the analysis, which was then separated into three categories: the first category covered the entire study period (from 1974/75 to 2012/13) and the second category was the entire Dreg era (1974/75–1992) study period. It addresses the EPRDF era's tax demand and the need for floating-rate tax revenue (1992/93–2012/13). The study's findings indicate that the GDP under the EPRDF regime was comparatively stable when compared to the Derg era and that total tax revenue prior to the general tax policy reform was lower than it was afterwards. Every tax category is smaller than the GDP, and the majority of tax income comes from indirect taxes. The study comes to the conclusion that neither of the two political systems' overall tax structures has been able to increase domestic tax revenue in particular or tax collection in general. Manufacture coefficient positive not statically significance Mohammed (2022)

The inverse of GDP per capita was strongly and negatively correlated with the level of taxation, whereas population density, monetization, and the inflation rate continued to be negatively correlated. Using time series econometric techniques, (Chaudhry, 2010)sought to empirically analyze the factors contributing to Pakistan's low tax revenue over the years 1973–2009. (Islam, 2017) found that the tax-to-GDP ratio is positively and significantly impacted by trade openness,

capital inflow, and per capita income. The tax base and the tax-to-GDP ratio are correlated, with the ratio increasing as the tax base grew examined by Javid & Arif (2012). While trade to GDP (trade openness), debt to GDP, and institutional quality have a positive impact on tax revenue, the GDP, population growth, the share of GDP from agriculture, and inflation have a negative impact.

2.8. Research Gap

Empirical studies have explored the determinant of tax revenues, which are crucial for economic development. Socio-economic and political factors influence the efficiency of generating adequate fiscal revenue, which can have both positive and negative effects on tax revenue. Understanding these factors can help correct low levels of tax revenue. However, same studies rely on cross-sectional and panel data sets, making country-level time series analysis more appealing. Factors affecting tax revenue vary across countries, necessitating the need for country-level analysis of tax revenue.

To the knowledge of the researcher, a study on the determinants tax revenue in Ethiopia is scant. Only a same has been dealt with the issue of tax revenue performance in Ethiopia. Few studies (Gobachew, 2018). This study uses the OLS approach to identify multiple variables regression models in order to determine Ethiopia's tax revenue drivers. Approach was used on the time series data set spanning the years 1999/2000 through 2015/2016. The results show that the percentage of GDP devoted to the industry sector, per capita income, and trade openness as indicated by the GDP share of import and export, all significantly increase tax revenue. In contrast, the percentage of GDP devoted to the agriculture sector and the annual rate of inflation, on the other hand, significantly decrease tax revenue. However, the study conducted by offers valuable insights into the drivers of tax revenue in Ethiopia, it is crucial to interpret the findings cautiously in light of the limitations inherent in employing similar methodologies, such as the ARDL model. Additionally, extending the time horizon to capture long-term trends accurately would enhance the robustness of the analysis. By adopting these approaches, researchers can contribute to a more comprehensive understanding of the determinants of tax revenue in Ethiopia, thereby informing evidence-based policy interventions.

And also the literature like studies by Workneh (2015), Anwar (2014), (Belay, 2015), (Tesfaye, 2015), (Alemayehu, 2005), and (B., 2015) have attempted to investigate the determinants of tax

performance of Ethiopia using different variables. (Alemayehu, 2005) have studied the tax performance of Ethiopian government. However, they studied only the tax performance of Ethiopia across regimes, they did not try to show what specific factors contribute to the tax revenue generation of Ethiopia. On the other hand, (B., 2015)investigated the determinants of tax buoyancy (the ratio of percentage change of tax revenue to percentage change of GDP); the study did not attempt to search for determinants that would affect tax revenue generation in Ethiopia. (Belay, 2015) and (Tesfaye, 2015) conducted a study to determine tax revenue performance in the country taking various variables. These studies incorporated sectorial variables like, agriculture value added share of GDP and industrial share of GDP.

However, they did not include policy variables like inflation, investment contribution to GDP others. On the contrary, international organizations and scholars (Organization for Economic Cooperation and Development, 2014; Aloo, 2012; According to (Wawire, 2017) and Gupta (2007), the inclusion of policy variables is crucial for comprehensive studies. This research delves into the determinants of tax revenue in Ethiopia, emphasizing policy variables and their influence, distinguishing itself through its innovative econometric approach. Unlike prior investigations, this study abstains from macroeconomic variables, instead concentrating on the intricacies of tax collection challenges, particularly within the Ethiopian Revenue and Customs Authority. It underscores the significance of comprehending how policy variables directly affect tax revenue performance, thereby offering a nuanced perspective on the subject.

To summarize, the previously mentioned research has shown the majority of research uses panel and cross-sectional data sets, several nations display distinct aspects affecting tax revenue. This calls for an examination of the dynamics of tax revenue at the national level. There are currently very few studies on the determinants of tax revenue in Ethiopia. Furthermore, therefore, we need to conduct more country-level time series analyses in ARDL model to identify the specific factors influencing Ethiopian tax revenue and Create possible measures for fixing frequent problems. However, the study looks at tax revenue as a dependent variable and tax revenue as defined by the percentage of taxes collected in the year and nominal GDP, trade openness, inflation rate, foreign direct investment, share of agriculture in GDP, and share of manufacturing in GDP as independent variables over the past 30 years.

2.9. Conceptual framework

The conceptual framework that follows has been created to guide this specific paper based on various pieces of literature. Openness, share of manufacturing in GDP, agriculture's, Nominal GDP, and foreign direct investment were found to have positive effects on tax revenue, while inflation that had negative effects, according to the literature

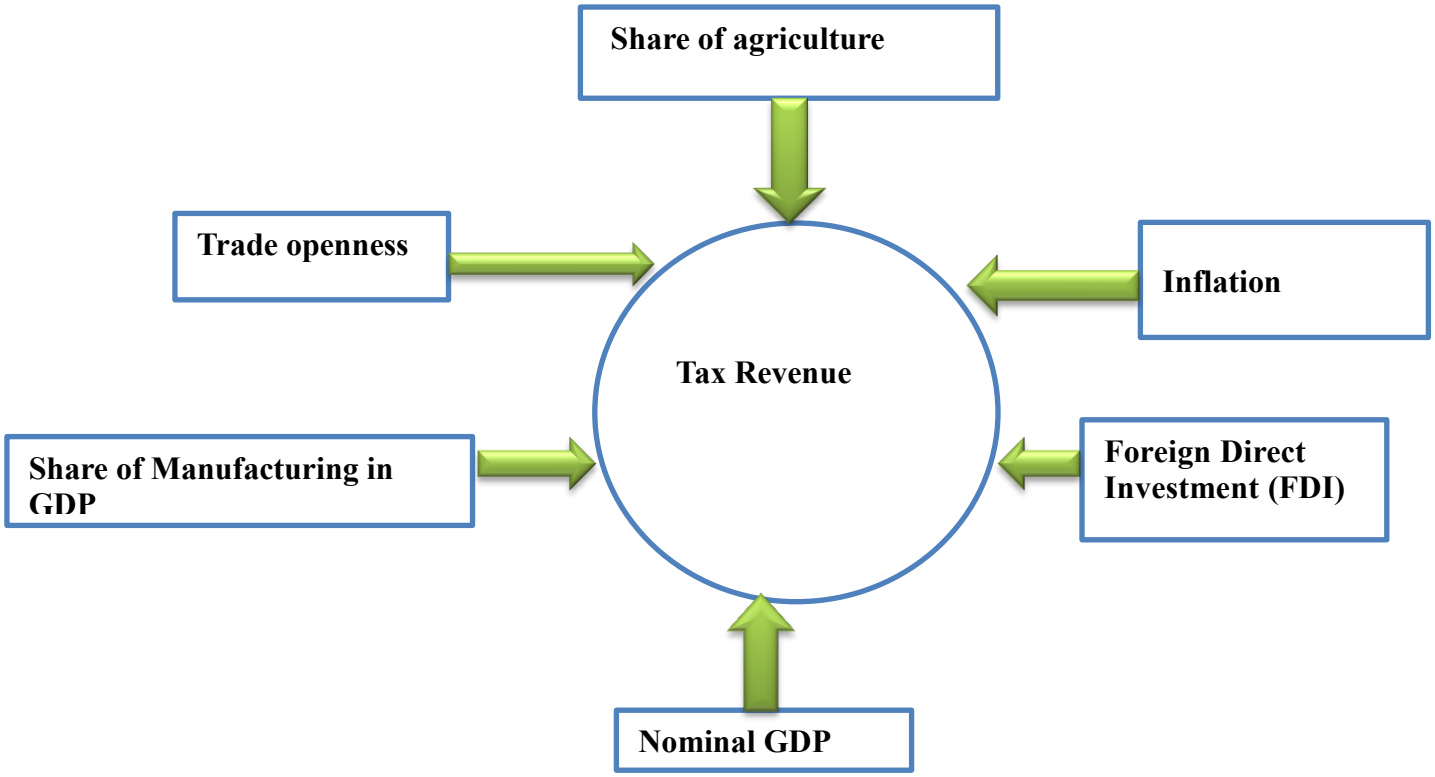


Figure 1: conceptual frame work of determinant of tax revenue in Ethiopia between 1992 up to 2022 G.C.

3. METHODS

3.1 Research approach

The objective and the research questions that were aimed at being answered influenced the selection of the research methodologies in this study. (Creswell, 2003) identified three primary categories of research approaches: mixed, qualitative, and quantitative. According to (Kothari, 2004), the quantitative approach gathers data via an organized empirical investigation, and statistics and mathematics are used to quantify the findings. When conducting quantitative research, it is feasible to examine and compare multiple determinants. By conducting an empirical analysis and testing, it is possible to determine whether any relationships exist between the determinants and the research conclusions. In this work, the relationships between the dependent variable (tax revenue) and the independent variables trade openness, inflation rate, foreign direct investment, Nominal GDP, share of GDP from manufacturing and agriculture were investigated.

So, a quantitative approach is more appropriate to meet the purpose of this. However, in order to determine how much tax revenue could increase in the event that those independent variables changed, a quantitative approach was employed. It is feasible to compare various numerical measures using the quantitative method.

3.2. Research Design

According to (Chandran, 2004), a research design is a configuration of parameters for data collection and analysis that balances procedural economy with the research's objectives. It relates to the various factors that a researcher ought to take into account and follow when conducting research. The purpose of the study, the types of data required, the sources of the data, and financial considerations are some of the factors that influence the choice of research design.

This study used a causal study research design. The goal of a causal research design is to measure the degree of the relationship between variables and establish a ‘‘cause and effect’’ relationship between one or more variables and other variables. This involves structuring the problem under investigation. It makes an effort to investigate cause and effect relationships in situations where the causes are fixed and cannot be changed. It makes use of what already exists and explains why by going backward. We should anticipate a change in the dependent variable if

one or more of the independent variables change. This study uses a causal research design because it determines Ethiopia's tax revenue

3.3. Type of Data, Source of Data and Collection Techniques

In order to reduce the possibility of drawing conclusions that aren't relevant, Koul (2006) states that employing suitable data collection techniques aids researchers in combining the advantages and improving some of the shortcomings of any source of data. He goes on to say that reputable and reliable research shows that studies carried out with the right data collection methods have higher credibility and are more valuable.

The researcher used secondary data to improve the quality of the data. Primary and secondary data can be distinguished based on the sources and methods used to collect them. He go by saying that primary data is data collected by using techniques like interviews, questionnaires and tests. Conversely, secondary data pertains to previously organized documents. In this study, the factors influencing Ethiopia's tax revenue were examined using time series data covering the years 1992 to 2022. The availability of data determined the time choice. The Ministry of Finance and Economic Development (MoFED), Ethiopian Revenue and Custom Authority (ERCA), National Bank of Ethiopia (NBE), Ethiopian Investment Agency (EIA), Ethiopia plain commission (EPC), Ethiopian statically services (ESS), and the Ethiopian Economic Association (EEA) database, as well as the World Bank (World Development indicators (WDI) were among the various local and international organizations from which the secondary data was collected.

3.4. Variable definition and measurement

The study has operationalized both the dependent and independent variables of the study in line with the literature. The following summary is the discussion on the definitions and measurement of variables.

Dependent Variable:

Determinant of Revenue: It comes from a variety of sources, including payroll taxes, social security contributions, income and profit taxes, payroll taxes, taxes on the transfer and ownership of property, and others, and is referred to as tax revenue. It represents the portion of a nation's output that the government receives in tax revenue and is commonly expressed as a percentage of GDP. The same definition is applied in this study, which calculates tax revenue as a

percentage of GDP based on the entire tax revenue. There are multiple methods to quantify tax revenue, such as the total tax revenue, tax revenue as a percentage of GDP, and tax revenue specific to a given tax type.

Independent Variables:

(1). Agriculture share to GDP

The Industrial Revolution and technological advancements have significantly impacted agricultural labor productivity, leading to intensification of farming, specialization, commercialization, and rural structural diversification (Bustos, 2020). This shift in productivity results in resource flows and reallocation across regions and sectors, causing structural changes in the economy. Factors like institutions, policy, and investment can catalyze rural transformation. As markets and trade grow, farmers are motivated to produce surplus crops, promoting farming specialization and labor force migration. Agro-food transformation is an integrated system consisting of agriculture, commercialization, productivity, and off-farm centers (Huang, 2021).A key component of tracking development, evaluating the effectiveness of rural policy, and performing cross-regional comparisons is quantifying rural transformation. Creating an index, or indices, to represent the state of rural transformation is the conventional approach to measuring.

(2). Foreign Direct investment (FDI)

FDI's impact on tax revenues has through corporation taxes, income taxes, personal income taxes, royalties, and indirectly through VAT, FDI can raise tax revenues. Productivity gains by FDI-affected businesses can result in higher industrial and commercial profits. It is essential to examine the relationship between FDI, in particular, and internal revenue mobilization from external sources of funding. It is difficult to measure foreign direct investment (FDI) in developing nations accurately because there are few trustworthy measurements available. The most widely used metric, as indicated by the balance of payments, is the inflows of investment to obtain long-term capital, short-term capital, and lasting management interest. To determine FDI's significance in the regional economy, one can look at the GDP-to-FDI ratio,

(3). Nominal GDP;

Nominal GDP, which represents the entire market value of all finished products and services produced inside a nation's borders during a certain time period, is a measure of a nation's economic output without accounting for inflation. Price level fluctuations, such as inflation or deflation, are not taken into consideration. Real GDP is sometimes used to more properly depict a nation's economic performance since it corrects nominal GDP for inflation or deflation. Recognizing and addressing the causes of GDP discrepancies is essential. If a small number of people profit from a rise in GDP, this indicates that measurements of society's performance that are in line with general conceptions of well-being should receive more attention (Sen Gupta, 2007).

(4).The share of manufacturing:

It is an indicator of a country's competitiveness and industrial development. Manufacturing is the process of utilizing machinery, labor, chemicals, and tools to transform raw materials into finished goods. Although it is essential for long-term, sustainable economic growth, it is dependent on both internal and external influences, which cause the economic cycle to fluctuate. (Behun, 2018)Small businesses dominate Ethiopia's manufacturing sector (Dinh, 2012), in part because of policy recommendations that focus on micro and small businesses as well as the unorganized sector. Using a variety of ratios, including GDP, economists and government statisticians assess the contribution of manufacturing to the economy. Every year, the Institute for Supply Management (ISM) releases the ISM Manufacturing Report, which is a survey of manufacturing companies used to estimate employment, inventories, and new orders per month. This report may serve as a predictor of the state of the economy and the future of the stock market (Taques, 2021).

(5). **Inflation**

Increased public spending has led to fiscal deficits in many countries, increasing the ratio of public debt to GDP There has been no unanimity among scholars regarding conceptualization while some consider it as a phenomenon of rising prices, others considers it as a monetary phenomenon. Maintaining stable level of inflation rate has become one of the prime macroeconomic objectives of National Bank of Ethiopia in recent years since inflationary

pressure has increased onward of 2003. The impact and magnitude of inflationary pressure also varies across regions in the country. As high and persistent inflation introduces uncertainties into the economy and may lead to slowdown of economic growth by discouraging domestic as well as foreign investments most importantly affecting the consumption pattern and saving by reducing real income. Thus, factors contributing for this inflationary pressure should be properly identified and needs to be tackled Gezahegn, B. (2017). One of the most widely used indicators of inflation and deflation is the CPI. The producer price index (PPI), which tracks changes in the prices received by American producers of goods and services, is not the same as the CPI report in terms of survey methodology, price samples, and index weights(Shapiro, 1996).

(6). Trade openness

Trade has a major role in growth and income because it creates channels for the transfer of welfare. Trade integration promotes competitiveness and economies of scale, which lead to the efficient distribution of resources and the transfer of knowledge and technology. This results in improved efficiency and technological advancement. Divergent opinions have been observed in empirical research examining the question of whether trade openness improves a nation's economy. While many economists now hold protectionist views, proponents of trade liberalization contend that there is a positive correlation between liberalization and economic growth (HADJOU, 2020). An indicator of a nation's economic activity is trade openness, which is commonly calculated as the ratio of total trade to GDP. It can be quantified through metrics such as GDP ratios of imports and exports, the quantity of trade agreements signed, tariffs, and other obstacles to trade. An increased an economy that depends more on foreign trade for growth and development is one that has a higher ratio (Leamer, 1988).

3.5: Data and empirical model estimation

The study Uses time series data from the National Bank Ethiopia, Ethiopian plain commission, Ethiopian Static Service, Minster of Tax Revenue, Minister of Finance, World Bank that spans the years 1992 to 2022. In order to analyze Determinant of Tax Revenue in Ethiopia makes use of Share of Agriculture, Share of Manufacture, Nominal GDP, Trade Openness, Foreign Direct Investment and Inflation as the independent variables indicated in the following tax function

LNTR = LN (FDI, NGDP, $AGRI$, MAF, INFLN, $OPPS$)……. (3.1)

Table 1: Data sources and Description for determinants of tax revenue in Ethiopia, 1992-2022 G.C

Variables	***Expectation***	***Measure***	***Expectation Sign***
Tax Revenue	Total Tax Revenue to GDP ratio	Percentage of Total Tax Revenue to GDP	Dependent Variable
Trade openness	Import and Export as Percentage of GDP	Import + Export/GDP	+
Share of Agriculture	Agriculture Value Added as percentage of GPD.	Agriculture Value Added percentage of GPD.	+
Inflation	Annually inflation rate as Deflator of GDP	Annually inflation rate	-
Nominal GDP	Level of economic growth	Measured by current GDP	+
Share of Manufacture	In term of Revenue, production Volume % Work Forces that is employed in Manufacture sector ,% of GDP	Share of Taxes Paid by Manufacture(%)=(Tax Revenue From Manufacturer/Total Tax Revenue for Government)*100	+
Foreign Direct Investment	Percentage Investment to GDP	Percentage Investment to GDP	+

Source: Researcher

To test of impact Tax Revenue in Ethiopia makes use of Share of Agriculture, Share of Manufacture, Nominal GDP, Trade Openness, Foreign Direct Investment and Inflation, we apply the model follow;

TR = LN (FDI, NGDP, $AGRI$, MAF, NIFLN, $OPPS$)

LNTRt = + β0 +β1 LNFDIt + β2 LNNGDPt + β3 LN$AGRIt$ + β4 LNMAFt + β5LN NIFLN t + β6LN $OPPSt$ +εt,

Where, α is intercept term and β1, β2, β3 …..……. β6, are coefficients,

TR is tax revenue as percentage of GDP.

Where,

LNFDI = LN of Foreign direct investment as percentage of GDP

LNNGDP = LN of Nominal GDP

LNAGRI = LN of Agriculture sector share to total GDP

LN MAF = LN of Manufacturing in GDP

LNINFLN = LN of Annual inflation rate

LNOPPS = LN of trade openness as measured by share of export and import to GDP

εi is an error term that captures other unobservable factors
t = refers to the period
β0_4 = refers to the constants

Since all of the model's variables are converted to logarithmic form, the tax revenue model uses the log-linear form of the model rather than the linear form. This is because the log linear model yields consistent and trustworthy estimates and is favored over the linear model in terms of helping to regulate the amount of data (Gebeyehu, 2013). Additionally, the log linear model yields superior results compared to the linear version of the model; in other words, logs are employed in economics because the predicted coefficients in log regressions make sense. Log regressions contain coefficients that measure elasticity, a concept that economists frequently use in their thinking. Seeing it as a percentage change rather than a marginal effect aids in interpretation (Benoit, 2011).

3.6: unit root Test

When estimating the autoregressive distributed lag (ARDL) model, unit root tests are run. In the case where it was found that the variables are stationary, this is done to determine the degree of variable integration and prevent issues with misleading regressions. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (pp) unit toot tests, which were put out by Philip and Perron (1988) and Dickey and to (Pesaran, 1999)say the P-value of the test was less than 5%; hence, we reject the null hypothesis (Ho) of the unit root (stationary) at 5% level of significance. The

purpose of this study is to identify the long-term characteristics of the model‘s variable choices. When a time series is determined to be stable, it indicates that its variance, mean, and covariance do not change over time, indicating that the analysis’s outcome is stable to use for predicting future economic activity. To choose the ideal number of lags for the estimation, the study additionally makes use of the VAR lags criteria.

3.6.1. The Optimal Lag Selection

Process The sensitivity of the to the number of lags in the model suggests that, generally speaking, too few lags lead to the null hypotheses being rejected too easily, while too many lags reduce the test's power (Verbeek, 2004). Consequently, choosing an optimal lag length helps prevent the loss of initial values. As all lag selection criteria (i.e., LR, FPE, AIC, SIC, and HQ) suggest an optimal lag of selection criteria at the 5% level of significance and higher number of LogL, and also small number of AIC, SIC, and HQ criteria of to selection of lag.

3.7. Diagnostic Test

3.7.1. Serial Correlation:

To identify serial correlation in the model, In order to guarantee the independence of residuals across time in regression analysis, testing for serial correlation such as the Breusch-Godfrey Serial Correlation LM test and other suitable tests are essential. The assumption of errors, which is required for reliable statistical inferences, is destroyed by serial correlation. These tests help researchers find and fix problems with serial correlation, which enhances the correctness of their studies and the dependability of their regression models.

3.7.2: Heteroskedasticity:

To determine whether or not the estimated model satisfies the homoscedasticity requirement, the research will apply the Breusch-Pagan-Godfrey test. Heteroskedasticity tests are crucial diagnostic instruments in regression analysis to ensure the reliability of the model's underlying assumptions. They help with detecting homoscedasticity breaches, which can result in skewed parameter estimations and inaccurate statistical conclusions. Researchers can detect and handle heteroskedasticity by utilizing tests like Breusch-Pagan, Godfrey, Harvey, Glesjer, and ARCH, which increases the dependability of regression analysis results.

3.7.3: Normality test:

To ensure that the estimated model's residuals are regularly distributed and that the normality rule of linear models is not broken. The residuals were examined for normalcy using the (Jarque, 1987) normality test. If the residuals are regularly distributed, the histogram should have a bell shape and the statistic shouldn't be significant. This indicates that in order to accept the null hypothesis of normality at the 5% level, the p-value shown at the bottom of the normality test must be greater than 0.05.

3.7.4: Stability test:

To make sure the model under evaluation is stable, a stability test is run. Utilizing methods suggested by (Brown, 1975), the stability of the model was examined in this work utilizing Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Square Recursive Residuals (CUSAR) (CUSUMSQ). The model is deemed stable when a blue line doesn't cross or departs from a red line. The CUSUM and CUSUMSQ blue lines in both techniques lie between the two red lines at a 5% ` level, suggesting that the long- and short-term coefficients are stable.

3.7. Johansen Co-Integration Analysis

Since it allows the testing of many co-integrating vectors, the Johansen approach is preferred to the Engle-Granger method for co-integration testing (Verbeek, 2004). According to theories, econometric analysis is illogical when non-stationary variables are included. The lone exception is known as co-integrating regression, which occurs when a non-stationary variable is regressed over another non-stationary variable and produces a stationary series. For r = 0, 1, 2... K-1, the test compares the alternative hypothesis of k co-integrating vectors, where k is the number of endogenous variables, to the null hypothesis of r co-integrating vectors. The alternative hypothesis of r+1 co-integrating vectors is tested against the null hypothesis of r co-integrating vectors using the highest Eigenvalue. As a result, the maximum Eigen value test and the trace test in this study both show the existence of one co-integrating vector at the 5% critical threshold. This is due to the fact that the null of at most one co-integrating equation was not rejected by either test. Thus, the system contains a unique co-integrating vector. Table 5 displays the outcome. Johansen co-integrating coefficients are used to justify one co-integrating equation; as a result, only the first row of beta (b) coefficients in table 6 and the first column of

alpha (α) coefficients are significant. Economic pressures exist when the variables deviate from long-run equilibrium, and the adjustment coefficients reflect these forces, pushing the model back to long-term balance. The size of the coefficient determines the rate of adjustment toward equilibrium. Although a positive value suggests a departure from the long-run equilibrium, the negative coefficients indicate convergence. The basic equation that captures Johansen’s co-integration test is given below (Johansen, 1991, 1995):

$Zt=AZ^*t\text{-}1 + \ldots\ldots\ldots\ldots\ldots AnZn^*t\text{-}n + Bxt + \in t$

3.8: ARDL- error correction model and short run relationship

The ARDL-ECM model is used in the study to identify the short-run correlations between the variables after the long-run linkages between tax revenue, Nominal GDp, trade openness, foreign direct investment, inflation, manufacturing, and agriculture are confirmed using the ARDL-bounding tests for co-integration. By using an easy linear transformation, the Johancen co-integration long-run estimate models may be used to develop a short-run dynamic error correction model. The ARDL-ECM model can be seen in equations 3.10 to 3.16 below. The error correction term, ECTt-1, should be negative and statistically significant. The short-run variables are indicated by Δ, while the coefficient of the speed of adjustment to the long-run equilibrium is shown by λ.

$\Delta LNTRt=\beta 01+\sum p\ i=1\ k11\ \ \Delta LNTRt\text{-}i + \sum q\ i=1\ k21\ \Delta LNOPPSt\text{-}1 + \sum q\ i=1\ k31\ \Delta LNNIFNt\text{-}1 + \sum q\ i\text{-}1\ k41\ \ \Delta LNNDt\text{-}1 +\sum q\ i\text{-}1\ k51\ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k61\ \Delta LNFDIt\text{-}1 + \sum q\ i=1\ k71\ \Delta LNAGIt\text{-}1 +\lambda ECTt\text{-}1+ \varepsilon t$ …………………………………… (3.10)

$\Delta LNOPPSt=\beta 02+\sum p\ i=1\ k12\ \ \Delta LNOPPSt\text{-}i + \sum q\ i=1\ k22\ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k32\ \ \Delta LNNIFNt\text{-}1 + \sum q\ i\text{-}1\ k42\ \ \Delta LNNDt\text{-}1 +\sum q\ i\text{-}1\ k52\ \ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k62\ \ \Delta LNFDIt\text{-}1 + \sum q\ i=1\ k72\ \Delta LNAGIt\text{-}1 +\lambda ECTt\text{-}1+ \varepsilon t$ …………………………………… (3.11)

$\Delta LNNFLNt=\beta 03+\sum p\ i=1\ k13\ \Delta LNNIFNt\text{-}i + \sum q\ i=1\ k23\ \ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k33\ \Delta LNOPPSt\text{-}1 + \sum q\ i\text{-}1\ k43\ \ \Delta LNNDt\text{-}1 +\sum q\ i\text{-}1\ k53\ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k63\ \Delta LNFDIt\text{-}1 + \sum q\ i=1\ k73\ \Delta LNAGIt\text{-}1 +\lambda ECTt\text{-}1+ \varepsilon t$ …………………………………… (3.12)

$\Delta LNNDt=\beta 04+\sum p\ i=1\ k14\ \Delta LNNDt\text{-}i + \sum q\ i=1\ k24\ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k34\ \Delta LNOPPSt\text{-}1 + \sum q\ i\text{-}1\ k44\ \Delta LNNIFNt\text{-}1 + \sum q\ i\text{-}1\ k54\ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k64\ \Delta LNFDIt\text{-}1 + \sum q\ i=1\ k74\ \Delta LNAGIt\text{-}1 + \lambda ECTt\text{-}1 + \varepsilon t$ …… (3.12)

$\Delta LNMAFt=\beta 05+\sum p\ i=1\ k15\ \Delta LNMAFt\text{-}i + \sum q\ i=1\ k25\ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k35\ \Delta LNOPPSt\text{-}1 + \sum q\ i\text{-}1\ k45\ \Delta LNNIFNt\text{-}1 + \sum q\ i\text{-}1\ k51\ \Delta LNNDt\text{-}1 + \sum q\ i=1\ k61\ \Delta LNFDIt\text{-}1 + \sum q\ i=1\ k71\ \Delta LNAGIt\text{-}1 + \lambda ECTt\text{-}1 + \varepsilon t$ …… (3.14)

$\Delta LNFDIt=\beta 06+\sum p\ i=1\ k16\ \Delta\ LNFDIt\text{-}i + \sum q\ i=1\ k26\ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k36\ \Delta\ LNOPPSt\text{-}1 + \sum q\ i\text{-}1\ k46\ LNIFNt\text{-}1 + \sum q\ i\text{-}1\ k56\ LNNDt\text{-}1 + \sum q\ i=1\ k66\ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k76\ \Delta LNAGIt\text{-}1 + \lambda ECTt\text{-}1 + \varepsilon t$…… (3.15)

$\Delta LNAGIt=\beta 07+\sum p\ i=1\ k17\ \Delta LNAGIt\text{-}i + \sum q\ i=1\ k27\ \Delta LNTRt\text{-}1 + \sum q\ i=1\ k37\ \Delta LNOPPSt\text{-}1 + \sum q\ i\text{-}1\ k47\ \Delta LNNIFNt\text{-}1 + \sum q\ i\text{-}1\ k57\ \Delta LNNDt\text{-}1 + \sum q\ i=1\ k67\ \Delta LNMAFt\text{-}1 + \sum q\ i=1\ k77\ \Delta LNFDIt\text{-}1 + \lambda ECTt\text{-}1 + \varepsilon t$ …… (3.16)

4. Result and Discussion

Introduction

In the introduction phase, various statistical tests are applied to ensure the robustness of the analysis. Firstly, unit root tests are employed to confirm the stationary of the variables. Following this, ARDL-bound tests are utilized to examine the presence of co-integration among the variables. The Length Criterion test is then conducted to determine the appropriate lag number, and subsequently, the Johansen co-integration of long-run test along with Johansen Normalization Restriction are applied to assess the coefficients of variables in the long run. Moreover, short-run tests are carried out to further investigate the relationships between variables.

Furthermore, diagnostic tests are performed to address potential issues within the model. These include serial correlation tests to detect any serial correlation present, and heteroskedasticity tests to identify its presence within the model. The RESET test is employed to validate the linearity assumption of the model and ensure its suitability for analyzing variable relationships. Additionally, a Histogram Normality test is conducted to evaluate the normal distribution of model residuals, thus affirming the reliability of the model in predicting tax revenue. Lastly, both the CUSUM and CUSUM squares stability tests are executed to assess the stability of the model over time, thereby reinforcing the dependability of its predictions.

4.1. Unity root test

According to (Pesaran, 1999), a correlation analysis can be adapted for the Dickey- fuller tests. The research ran the unit root test as indicated in table 2. The Dickey- fuller unit root test. Findings indicate all variable are stationary at first difference. Still, it is found that at first difference. To determine a long run link between (among variable), when integrated at I (1).therefore johansen co-integration can be applied to test presence of long run co-iterating relationship among variable. VECM is best suitable method for analyzing correlation between variable(Granger, 1988).This indicates that the ARDL model may be used to analyze the factors influencing taxes in Ethiopia from 1992 to 2022. It can be estimated if the variables are stationary at first difference. In order to determine the ideal number of lags to use in the model, the study continues to use the optimal lag length criterion, as indicated in Table 3 below.

Table 2: Result of Dickey- fuller Unit root test for determinant of tax revenue in Ethiopia, 1996- 2022 G.C.

Dickey- fuller						
		Critical Value			P-value	Order
VARIABLE	Test of statics	1%	5%	10%		
TR	(3.176)	(3.723)	(2.989)	(2.625)	0.0214	I(1)
OPPSS	(3.611)	(3.723)	(2.989)	(2.625)	0.0056	I(1)
NIFN	(10.341)	(3.723)	(2.989)	(2.625)	0.0000	I(1)
NGDP	(5.713)	(3.723)	(2.989)	(2.625)	0.0000	I(1)
MAF	(5.318)	(3.723)	(2.989)	(2.625)	0.0000	I(1)
FDI	(5.747)	(3.723)	(2.989)	(2.625)	0.0000	I(1)
AGI	(4.018)	(3.723)	(2.989)	(2.625)	0.0013	I(1)

Source: Researcher's STATA version 14.2

4.2. Lag Length Criterion Test

The unit root test uses Dickey- fuller were shown as a stationary at first difference. The ideal or suggested number of lags to use in research is determined by applying the optimal lag length criterion, as indicated in Table 3. While the finding has the highest logL, it indicates the best fit among the two. And also the results of the lowest FPE, AIC, and SC indicated that just two lags. Therefore the research will use two lags, as indicated by the majority of the criteria. Therefore the study continues to perform residual diagnostics, as indicated below in Tables 4 and 5and figures 2, 3 and 4 respectively.

Table 3: Lag Length Criterion Test for determinant of tax revenue in Ethiopia, 1996- 2022 G.C

Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-11.1946	NA	1.08e-05	8.427215	8.757252	8.530578
1	81.82359	285.3367*	4.40e-10	-1.780937	0.859358*	-0.954030
2	144.7141	60.72189	3.31e-10*	-2.738905*	2.211649	-1.188453*

Source: Eviews Version 10 output

4.3. Diagnostic tests

Heteroskedasticity Test

The findings indicate all four residual Diagnosis tests that are Breusch-Pagan-Godfrey (0.2196), Harvey (0.0961), Glesjer (0.1697), and ARCH (0.1589). the result indicate the P-value is greater

than 5% (0.05). The findings the result indicate the all P-value is greater than 5%. We cannot reject the null hypothesis (Ho). The result show there is no problem of hetroskedesticity and model is having a correct function form.

Table 3: Results of Heteroskedasticity Test

TEST	PROBABILITY	DECISION
Breusch-Pagan-Godfrey	0.2196	Fail to reject Ho
Harvey	0.0961	Fail to reject Ho
Glesjer	0.1697	Fail to reject Ho
ARCH	0.1589	Fail to reject Ho

Source: Eviews Version 10 output

Serial Correlation Test

In the results of the Breusch-Pagan-Godfrey serial correlation LM test, the probability value is greater than 5% ChiSquare of 0.9125, therefore failing to reject the null hypothesis (Ho) and no serial correlation. Serial correlation up to 2 lag was used in the study. Therefore, we can conclude that there is no serial correlation in the residual form the model uses in the study.

Table 4: Serial Correlation Test

Breusch-Pagan-Godfrey serial correlation LM Test			
F-statics	0.034945	Prob.F(2,11)	0.9658
Obs*R-squared	0.183090	Prob.Chi-square(2)	0.9125

Source: Eviews Version 10 output

Ramsey RESET Test

The flinging in Table 10, from the Ramsey test, the F-statistical probability of 0.2320, which is greater than 5%(0.05), indicates that the null hypothesis cannot be rejected, and we are therefore able to derive the conclusion that the model was well chosen to analyze the relationship between the variable for the research period and the linearity of the data

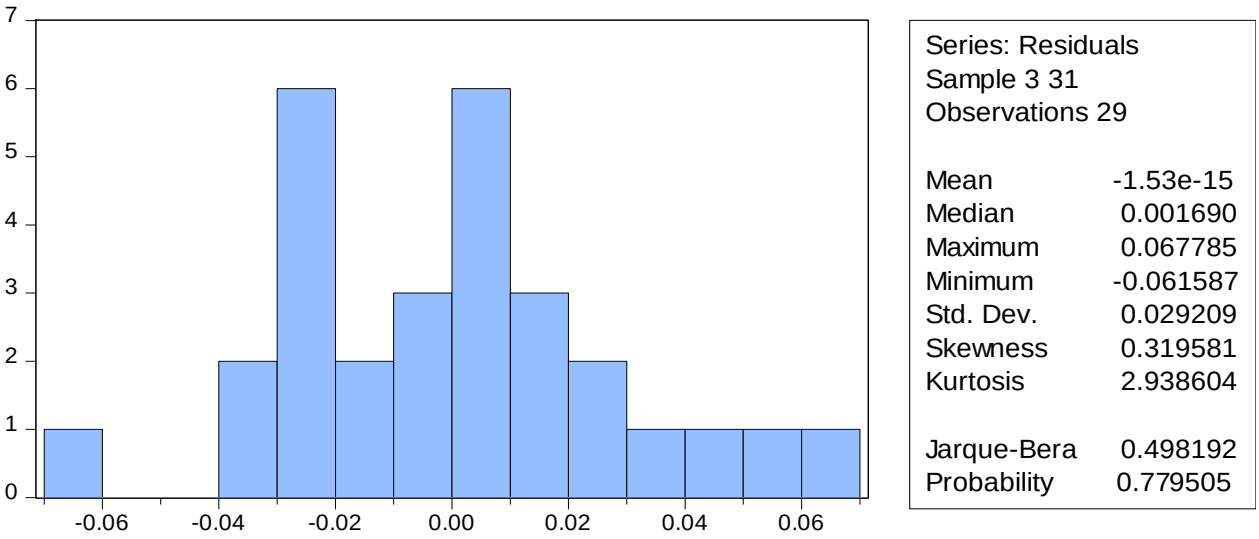
Table 5: Ramsey RESET Test

	Value	Df	Probability
t-statics	1.258978	12	0.2320
F-statics	1.585026	(1,12)	0.2320

Source: Eviews Version 10 output

Results of Histogram Normality

As seen in figure 2, the study conducted the Jarque-Berra histogram normality test that is mentioned in Section 3 of the study. With a P-value of 0.779505 and a Jarque-Berra of 0.498192, approximately five, the null hypothesis (Ho), according to which the residuals of the model are normal, cannot be rejected. As a result, we may conclude that the residuals are in fact normally distributed, which is in keeping with the linear model's prediction. Then, CUSM stability tests are still being conducted, as indicated in Figures 2 and 3 below.

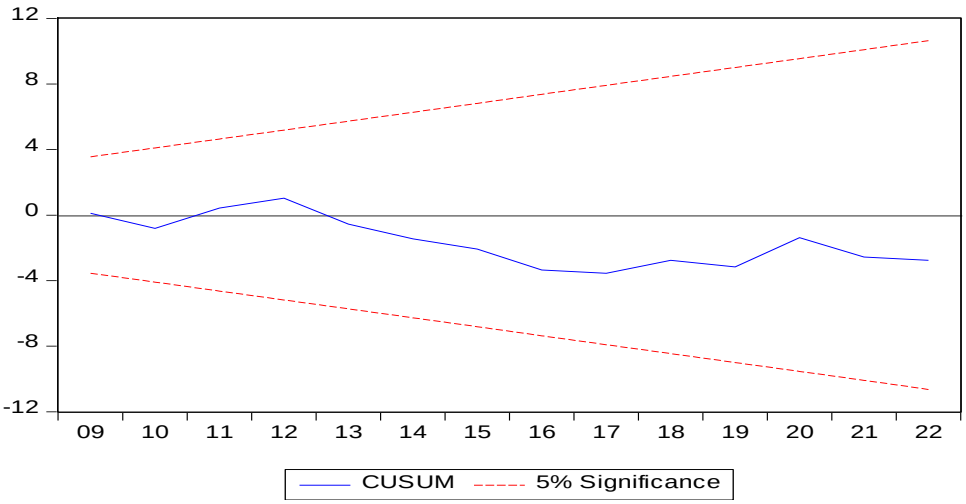


Source: Eviews Version 10 output

Figure 2: Results of Histogram Normality Test

4.4. Stability tests

The study shows that the CUSUM stability test, as indicated in Figure 3, indicates that the model is stable, as indicated by the blue line lying in the 5% essential (critical) region. The trends of the blue line in figure 3 indicate that the residual is stable for the time observed since it turns upwards and downwards without crossing 5% (red line). This essentially verifies the stability and dependability of the model we selected for the purpose of the study.

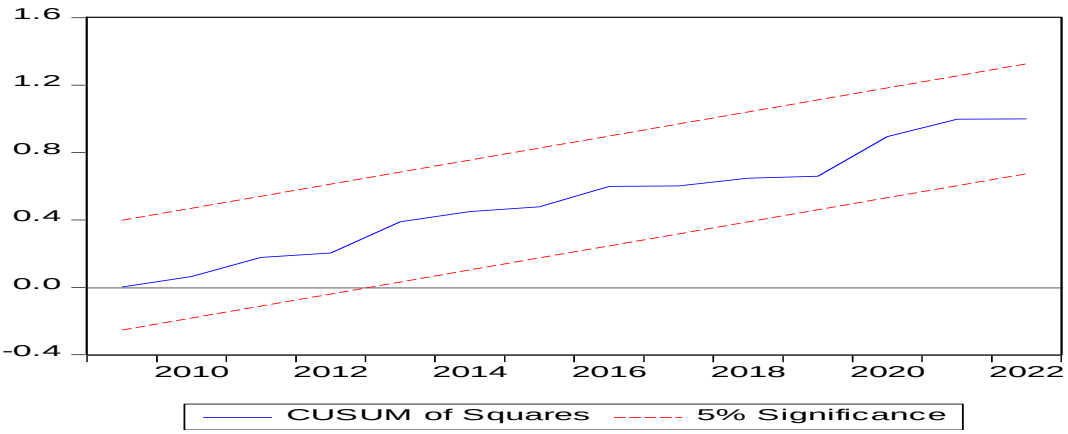


Source: Eviews Version 10 output

.Figure 3: Results of Cusum Test

Results of Cusum Squares

The Sam test in the CUSUM analysis, study shows the CUSUM squares stability test, as indicated in Figure 4, which indicates that the model is stable, as indicated by the blue line lying in the 5% essential (critical) region. The trends of the blue line in figure 4 indicate that the residual is stable for the time observed since it turns upwards and downwards without crossing 5% (red line). This essentially verifies the stability and dependability of the model we selected for the purpose of the study. The ARDL bound tests are still being operated on as part of the study to look for a co-integration link between the variables, as Table 6 below illustrates.



Source: Eviews Version 10 output

Figure 4: Results of Cusum Squares

4.5. Results of ARDL Bound Test to Co-integration

Determining the optimal lags selection criteria to make use of in the model. The tables' 4 show presence of the long-term relationships among the variables. The tests of the ARDL F-Bound and t-Bound tests. The F-Bound test as F-statics of 9.953725 is greater than the I(0) and I(1) critical values for F-statics are provided at different significance levels at 1%, 5%, and 10%, which confirms that we reject the null hypothesis (Ho there being no long-run.in fact there is a long-term relationship among the variables in the model. It means that the study will estimate long-run relational relationships and confirm the co-integration. The study therefore continues to estimate the long-run relationship

The t-Bounds test has a t-statistic (10.09130) is greater than the I(0) and I(1) critical values for t-statics the difference significance value at 1%, 5%, and 10% levels of significance, which confirms the rejection of the null hypothesis (Ho) there being no long-run.in fact there is a long-term relationship among the variables in the model. It means that the study will estimate both the short-run and long-run relational relationships and confirm the co-integration. The study therefore continues to estimate the long-run relationship as given in Table 7 below:

Table 6: Results of ARDL Bound Test to Co-integration for determinant of tax revenue in Ethiopia, 1996- 2022

F-Bound Test		**Null Hypothesis: relationship No level**		
Test statistics	Value	Significance	I(0)	I(0)
F-Statistics	9.9537256	10%	2.53	3.59
		5%	2.87	4
K	6	1%	3.6	4.9
t-Bound Test		**Null Hypothesis: relationship No level**		
Test statistics	Value	Significance	I(0)	I(0)
	-10.09130	10%	-3.13	-4.37
		5%	-3.41	4.69
		1%	-3.97	-5.31

Source: Eviews Version 10 output

4.6. Results of Johansen- Test for Co-integration

The decision criterion for rejecting the null hypothesis is based on the value of trace statics being lower than the 5% critical value of the test result. Even if the variables are far from each other in the short run, they tend to come back to the long-run trend. The results of the Johansen co-integration test are presented in Table 5, providing information on variables, trend specifications, and the number of lags included in the model. This table also displays the potential number of co-integration equations. The first null hypothesis, with a rank (r) of zero, is rejected at the 5% significance level because the trace statics value of 208.4276 exceeds the 5% critical value of 124.24. Similarly, the second null hypothesis, with a rank (r) of one, is rejected as the trace statics value of 133.9913 exceeds the 5% critical value of 94.15. Then the third null hypothesis, with a rank (r) of two, is also rejected as the trace statics value of 78.1207 is greater than the 5% critical value of 68.52.

However, the third null hypothesis at rank (r) is not rejected since the trace statics value of 40.4789 is lower than the 5% critical value of 47.21. Table 5 indicates multiple co-integrations among the variables, as the trace statistics fall below the 5% critical value for ranks (r) three, four, five, and six. The asterisk (*) in addition to the trace static at rank (r) indicates the co-integration equation determined by Johansen's multiple trace static procedure. The null hypothesis of no co-integration among the series is rejected at a 5% significance level, suggesting a co-integration relationship between nominal GDP, trade openness, inflation rate, foreign direct investment, and the GDP shares of agriculture and manufacturing. Following the establishment of co-integration, the Vector Error Correction Model (VECM) emerged as the most suitable econometric tool for analyzing causality between the variable

Table7: Results of Johansen- Test for Co-integration for determinant of tax revenue in Ethiopia, 1996- 2022 G.C

Rank(r)	Parms	LL	Eigenvalue	Trace statics	5% critical value
0	56	40.500339	-	208.4276	124.24
1	69	77.718462	0.92322	133.9913	94.15
2	80	105.65377	0.85435	78.1207	68.52
3	89	124.47467	0.72692	40.4789*	47.21
4	96	132.36745	0.41977	24.6933	29.68
5	101	138.12743	0.32783	13.1734	15.41
6	104	142.81784	0.27637	3.7923	3.76
7	105	144.71412	0.12259	-	-

Source: Researcher's STATA version 14.2

4.7. Results of Johansen Normalization Restriction (The Long Run Result)

Table **6** shows the signs, directions, and estimation of coefficients of the independent variables on the dependent variable in the long run. Once again, the coefficients of the independent variables were found to be more statistically significant in the long run. To derive the co-integration equation from Table **6**, the identification coefficients serve as the dependent variable, with economic growth (LNTR) being constrained, as indicated by p-values less than 5%.

However, given that the results are normalized on LNTR, the signs of the long-run coefficients are revised to facilitate accurate and meaningful interpretation. In order to interpret, the coefficients are adjusted in the long run, as demonstrated in equations (5) to (6). This adjustment ensures precise and meaningful interpretation of outcomes and indicates strong support from a co-integration equation, allowing for the error correlation term into the stationary series in the equation.

ECTTt-1= [1.00LNTR*t-1 + 2.526LNAGRI*t-1 + 1.818LNFDI*t-1 - 2.560LNMAF*t-1 - 0.951LNNIFN*t-1 - 1.503LNOPPS*t-1 - 0.315LNNGDP*t-1 + 0.204] (5)

To normalize equation (5) to a stationary series equation, the value (1) in the second column and third row on Table 7 is moved to the LHS to change the estimation signs, as shown in equation (6).

LNTR (t-1) = 0.204 - 2.526LNAGRI*t-1 - 1.818LNFDI*t-1 + 2.560LNMAF*t-1 + 0.951LNNIFN*t-1 + 1.503LNOPPS*t-1 + 0.315LNNGDP*t-1 +ECT*t-1(6)

The equation (6) can be explained as a one-percentage-point increase in manufacturing, inflation, trade openness, and nominal GDP will cause an increase of one percentage point in tax revenue of (0.95), (0.638), (1.503), and (00.315), respectively. At the same time, a one percentage point increase in agriculture and foreign investment will cause a decrease of one percentage point in tax revenue of (2.526) and (1.818), respectively.

- Agriculture has a negative and statistically insignificant long-run effect on tax revenue in Ethiopia. A1% increase in agriculture results in a decrease in tax revenue by approximately 2.53. Holding other variables constant. The finding is the same as in the studies of (Gobachew, 2018), which found that the sharing of the agriculture sector in GDP has a negative effect on tax revenue.
- Foreign direct investment also has a negative and statistically significant long-run effect on tax revenue in Ethiopia. 1% increase in foreign direct investment decreases tax revenue by approximately 1.82, holding other variables constant. The finding is the same as in the studies of (Takayama, 2023) and other positive and significant findings of (Pratomo, 2020).
- Manufacturing has a positive and statistically insignificant long-run effect on tax revenue in Ethiopia. A1% manufacturing increase, tax revenue increased by approximately 2.56. Holding other variables constant. The finding is the same as in the studies of Rehman, (2022) the study affirms a positive and significant relation among domestic private investment.
- Inflation has a positive and statistically significant long-run effect on tax revenue in Ethiopia. A1% increase in inflation leads to an increase in tax revenue of approximately 0.95. Holding other variables constant. The finding is the same as in the studies of Andrejoyvska (2023). The finding represents that inflation has a detrimental effect on the

level of tax in Ethiopia and calls for the government, minister of finance, and policymakers to revise policies on inflation when it comes to tax.

- Trade openness has a positive and statistically insignificant long-run effect on tax revenue in Ethiopia. A1% increase in trade openness leads to an increase in tax revenue of approximately 1.50. Holding other variables constant. The finding is the same as in the studies of trade openness, which appears to have a positive impact on tax revenue, according to the partial test (Gnangnon, 2019a). Another study by (Kwaku, 2018) examined the effects of trade openness on tax revenue in Ghana. The findings show that trade-offs benefit tax revenue in the long run.
- Nominal GDP has a positive and statistically significant long-run effect on tax revenue in Ethiopia. A 1% increase in nominal GDP leads to an increase in tax revenue of approximately 0.32. Holding other variables constant. The finding is the same as in the studies by (Babatunde, 2017). We looked at the connection between taxation and economic growth in Africa between 2004 and 2013. However, the findings of this study indicate that tax revenue is positively related to GDP and promotes economic growth in Africa.

The overall result provides insights into the long-run relationship between the independent variable and the dependent variable. The coefficients of the independent variables, crucial for understanding dynamics, are found to be statistically significant. Utilizing these coefficients, a co-integration equation is derived, indicating the impact of the various factors on tax revenue in Ethiopia. While manufacturing, inflation, trade openness, and nominal GDP show a positive effect on tax revenue, otherwise, agriculture and foreign investment will have a negative impact on tax revenue. The findings offer valuable guidance for policymakers, aiding in the formulation of effective fiscal strategies tailored to Ethiopia's economic context. Because the lag length criteria are stationary and bound test co-integration, the study continues to estimate the short-run relationship as shown in Table 9.

Table 8: Results of Johansen Normalization Restriction (The Long Run Result)

Beta	Coef	Std.Err.	z-statics	p>/z/	{95% conf.	Interval
-cel	.					
LNTR	1	-	-	-	-	-
LNAGRI	-2.526248	3.196262	-0.79	0.429	-8.790806	3.73831
LNFDI	-1.81831	0.1853311	-9.81	0.000	-2.181553	-1.455068
LNMAF	2.560452	1.904065	1.34	0.179	-1.171447	6.292351
LNNFLN	0.9506134	0.2085491	4.56	0.000	0.5418647	1.359362
LOPPS	1.502745	1.359287	1.11	0.269	-1.161408	4.166899
LNNGDP	0.3153653	0.1134771	2.78	0.005	0.0929543	0.5377763
Con	-0.2041675	-	-	-	-	-

Source: Researcher's STATA version 14.2

4.8. ARDL ECM Regression

From Table 7, there is a Negative, statistically significant short-run relationship between tax revenue and taxation in Ethiopia. A1% increase in tax revenue in the short run in Ethiopia will significantly cause taxation to decline by 0.31%, or a majority. This form of tax revenue is suitable for the expansion of taxation in Ethiopia. It means that current policies on tax revenue are suitable for taxation. These results make tax sense, as we expect a decline in tax revenue. Therefore, policymakers and the government must revise tax policies if they want to generate suitable tax revenue in Ethiopia. These results are reliable with the similarly conducted studies by Ta Hakim (2012), Adefolake (2022), and Abd Hakim (2022).

Furthermore, there is positively, a statistically significant short-run relationship between trade and tax revenue in Ethiopia. A1% increase in trade in the short run in Ethiopia will significantly increase trade by 0.19%, or a majority. This form of trade is suitable for the expansion of tax revenue in Ethiopia. It means that current policies on trade are suitable for tax revenue. These results make trade sense, as we expect them to increase trade. These results are reliable with a similar study (Nguyen, 2022).

Even though there is positive, a statistically significant short-run relationship between Nominal GDP and tax revenue in Ethiopia. A1% increase in Nominal GDP in the short run in Ethiopia

will significantly increase Nominal GDP by 0.53%, or a majority. This form of Nominal GDP is suitable for the expansion of tax revenue in Ethiopia. These results make Nominal GDP sense, as we expect that it will increase Nominal GDP. These results are reliable with a similar study(Mahdavi, 2008).

On the other hand, there is negatively, a statistically significant short-run relationship between the Nominal GDP and tax revenue in Ethiopia, A1% increase in Nominal GDP in the short run in Ethiopia will significantly cause taxation to decline by 0.27%, a majority. This form of Nominal GDP is not suitable for the expansion of tax revenue in Ethiopia. Therefore, policymakers and the government must revise NBE policies if they want to generate suitable tax revenue in Ethiopia. These results are consistent with the similarly conducted study (Jones, 2017).

Even so, foreign direct investment has no statistical significance. These results are consistent with the similarly conducted study by (Takayama, 2023). Moreover, there is positively, a statistically significant short-run relationship between agriculture and tax revenue in Ethiopia. A1% increase Agriculture in short run in Ethiopia, it will significantly in Agriculture increase 0.5%, consequently a majority. This form of agriculture is suitable for the expansion of tax revenue in Ethiopia. It means that current policies on agriculture are suitable for tax revenue. These results make agriculture sense, as we expect that it will increase agriculture. These results are reliable with a similar study Parry (1999).

However, there is positively, a statistically significant short-run relationship between agriculture and tax revenue in Ethiopia. A1% increase in agriculture in the short run in Ethiopia will significantly impact taxation declines of 0.53%, which is a majority. This form of agriculture is suitable for the expansion of tax revenue in Ethiopia. It means that current policies on agriculture are suitable for tax revenue. These results make tax sense, as we expect a decline in agriculture. Therefore, policymakers and the government must revise the Agriculture Department if they want to generate suitable tax revenue in Ethiopia. These results are reliable with the similarly conducted study (Kobyagda, 2019)

The result in Table 7 below shows an error correlation term of except negative sign ECM is highly significant this confirms the existence long run relation among the variables with their various significant lags. The coefficient of ECM = -0.043, imply that deviation from long-run in tax revenue are corrected annually 43% by the following year. That is statistically significant

with a P-value of 0.0000, which is less than 5%.Hence; the independent variables jointly explained the dependent variable at 5%.The R-squared value of 0.909 indicates suitable goodness of fit, Meaning 91% of the results in the model are explained by the model while 9% of the results are explained by the error term. This also implies a long run causal relationship. The adjusted R-squared is 0.866, meaning that 87% of the results are adjusted for the degree of freedom. The Durbin-Watson static has a value of 2.724345.

Table9: Results of ARDL ECM Regression

Model Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.869262	0.293979	-9.760078	0.0000
@TREND	4.45E-05	0.000931	0.047724	0.9627
D(LNTR(-1))	-0.308705	0.108258	-2.851558	0.0136
D(LNOPPS)	0.191940	0.085765	2.237973	0.0434
D(LNNDP)	0.052827	0.006821	7.745078	0.0000
D(LNNDP(-1))	-0.026551	0.005741	-4.624583	0.0005
D(LNFDI)	-0.013876	0.008908	-1.557757	0.1433
D(LNAGRI)	0.496592	0.133855	3.709919	0.0026
D(LNAGRI(-1))	-0.524750	0.132566	-3.958407	0.0016
CointEq(-1)*	-0.043176	0.004279	-10.09130	0.0000
R-squared	0.909081		Durbin-Watson stat	2.724345
Adjusted Rsquared	0.866014			
Prob(F-statistic)	0.000000			

Source: Eviews Version 12 output

5. Summary of Major Findings, conclusion and Recommendation

5.1. Summer of the finding:

From the above, the founding researcher stated the following summarized findings:

- Agriculture has a negative effect on tax revenue in Ethiopia. An increase in agriculture results in a decrease in tax revenue. But this has the same conflicting result among scholars: the same positive relationship and another negative relationship.
- Foreign direct investment also has a negative and statistically significant long-run effect on tax revenue in Ethiopia. An increase in foreign direct investment decreases tax revenue. But this has many conflicting results among scholars; many say positive relationships and others say negative relationships.
- Manufacturing has a highly positive effect on tax revenue in Ethiopia. Manufacturing increase and also tax revenue increase.
- Inflation has a positive and statistically significant long-run effect on tax revenue in Ethiopia. An increase in inflation leads to an increase in tax revenue. As the above finding revealed, tax revenue and inflation have a positive relationship in Ethiopia. It means tax revenue collection in Ethiopia comes more from consumption products. So, demand increases from time to time, regardless of its price. The other reason stated in the study was that fiscal policy used tax imposition for inflation-control purposes. As a result, tax revenue collection increased as inflation increased in Ethiopia.
- Trade openness has a positive effect on tax revenue in Ethiopia. An increase in trade openness leads to an increase in tax revenue for the country.
- The final finding of this study Nominal GDP has a positive and statistically significant effect on tax revenue in Ethiopia. An increase in nominal GDP leads to an increase in tax revenue in the country. It has been supported by different scholars as it has such a relationship.

5.2. Conclusion

The purpose of this study is to examine the factories that influence the tax revenue performance of the Federal Government of Ethiopia. And it uses time-series regression analysis and quantitative research methods. and also employed the ARDL approach to investigate the factors influencing tax revenue in Ethiopia from 1992 to 2022. The findings from the unit root tests

revealed are stationary. The ARDL-bound tests confirmed the existence of a co-integration relationship among the variables. The Johansen co-integration of long-run results showed a significant relationship between inflation, nominal GDP, and foreign direct investment. And the same variables are insignificant: trade openness, manufacturing, agriculture, and tax revenue in Ethiopia. The short-run results indicated a significant negative relationship between trade, nominal GDP, agriculture, and tax revenue. In the short run, foreign direct investment has no statistically significant short-run relationship with tax revenue. The model's linearity assumption is supported by the RESET test result, validating the model's suitability for analyzing variable relationships. The residuals of the model are normally distributed, affirming the model's reliability in predicting tax revenue, and both the CUSUM and CUSUM squares stability tests indicate that the model is stable over time, reinforcing the dependability of the model's prediction. The error correction term is highly significant, confirming the existence of a long-run relationship among variables. The model demonstrates a good fit with an R-squared value of 0.909. Overall, the study provides valuable insights for policymakers to develop effective economic policies aimed at enhancing tax revenue generation while ensuring economic stability and growth in Ethiopia.

5.3. Recommendation:

The government uses tax revenue to fund social services and economic development without impacting other variables, political issues, or cultural issues. While there are other ways to finance the government, such as printing money or collecting taxes through other means, these methods often result in other problems. The most effective way to find the government is through tax revenue because it does not affect any social variables in the nation.

- According to this research, agriculture has a negative effect on tax revenue in Ethiopia. However, the government and revenue authority can create a sustainable and equitable tax system for the agricultural sector by reviewing policies, diversifying revenue sources, promoting tax compliance, investing in infrastructure, collaborating with stockholders, and establishing monitoring mechanisms. This measure will ensure effective taxable income capture; reduce reliance on a single sector, and support agriculture growth and development.

- According to this research, foreign direct investment also has a negative effect on tax revenue in Ethiopia. However, the revenue authority can increase tax revenue by promoting foreign direct investment (FDI) through effective tax policies and processes and by collaborating with stockholders. By collaborating with foreign investors and industry associations, the authority can identify areas for policy improvement and address concerns. Furthermore, capacity-building efforts by tax officials can help maximize benefits while minimizing risks, ultimately contributing to fiscal stability and economic development.
- Manufacturing has a positive effect on tax revenue in Ethiopia. As manufacturing increased, tax revenue increased. As manufacturing increases, tax revenue also increases. The revenue authority can promote sustainable economic development by fostering a thriving manufacturing sector, which generates tax revenue, attracts new business, and creates job opportunities. It is crucial for the revenue authority to balance tax policy and collaborate with stockholders to ensure a fair and efficient tax system.
- Inflation has a positive effect on tax revenue in Ethiopia. Understanding the short-term and long-term impact of inflation on tax revenue is crucial for revenue authorities. Policies promoting stable prices and sustained economic growth ensure consistent tax revenue for the government. However, inflation can also decrease tax payments, preventing fiscal obligations. Therefore, promoting price stability and economic determination is essential for long-term public finances.

5.4: Further Direction of Research:

The research suggests that other researchers can expand the study by considering additional time periods because the ARDL model requires a minimum of 30 to 80 years of data. By doing so, researchers can gain a deeper understanding of the relationship between agriculture and tax revenue, as well as the connection between foreign direct investment and tax revenue in Ethiopia. Additionally, they can incorporate additional variables such as political instability. Ultimately, this contributes to the development of more effective strategies for enhancing tax revenue generation and fostering national development.

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APPENDIX

ORIGINAL DATA

YEAR	TR	AGRI	FDI	MAF	NFLN	OPPS	NGDP
1992	1682.2	63.83134	0.00162	3.113509	4.714	27.84407	25794.1973
1993	2205.7	59.9453	0.039634	3.946226	6.2935	28.69366	33088.07973
1994	3076.5	52.69945	0.248414	4.273618	14.8355	23.44896	35144.3457
1995	3878.59	51.92471	0.184499	4.886132	-8.9987	24.20362	42037.14772
1996	4723.29	51.16537	0.256553	5.212365	-2.6526	23.427	47064.73352
1997	5358.94	54.02899	3.35874	7.301088	0.1044	25.41995	51440.8893
1998	5292.23	49.06191	3.334141	5.256874	10.3936	29.34442	55628.10432
1999	5528.89	45.48546	0.908733	5.733774	1.8942	31.98112	68920051
2000	6130.57	44.66602	1.633515	5.605245	-10.7732	33.04811	70345511.8
2001	7,857.90	42.34057	4.24476	5.776228	-1.2	31.47233	68825240.2
2002	8,194.30	38.69237	3.248073	5.766491	17.8	34.11079	75935168.5
2003	10,466.20	37.28506	5.392123	5.770038	2.4	37.77908	89614803.1
2004	12,397.90	38.67976	5.380416	5.350706	10.7	45.99167	110101894.7
2005	14,158.70	41.1745	2.137801	4.842961	10.8	49.91158	136128471.6
2006	17,353.60	42.52417	3.568235	4.637738	15.1	49.86843	177851416.7
2007	23,800.70	42.26501	1.126471	4.579682	55.2	46.9541	256766112
2008	29,007.50	45.18456	0.400997	4.108135	2.7	45.33407	346823929.4
2009	43,318.10	45.88269	0.682729	3.880256	7.3	48.44308	395991173.2
2010	58,980.80	41.44682	0.963031	3.973906	38	46.20343	528579822.1
2011	85,739.90	41.24997	1.967357	3.682551	20.8	48.23294	766915478.3
2012	107,010.30	44.33094	0.643173	3.420061	7.4	45.3979	889644886
2013	133,118.30	41.23951	2.820408	3.702189	8.5	41.47179	1088631824
2014	165,277.30	38.52045	3.335691	3.991325	10.4	40.74108	1331983708
2015	190,519.70	36.05698	4.066489	4.404619	7.5	39.65612	1568097451
2016	210,172.50	34.69888	5.576203	5.691399	8.4	34.89905	1832553685
2017	235,229.50	33.77928	4.912701	6.186589	16.8	31.10363	2202372700
2018	268,457.40	31.2188	3.98772	5.827617	15.3	31.19937	2696222737
2019	311,476.50	33.63333	2.65736	5.594369	21.5	28.8153	3374746938
2020	388,763.50	35.55827	2.225386	5.303281	24.6	24.00611	4341024223
2021	477,770.30	37.57383	3.828306	4.605689	34	24.29897	6157015233
2022	593,232.10	37.63903	2.894692	4.240702	29.3	26.56684	8722307698

FORM OF NATURAL LOGALIZIM (Ln)

YEAR	LnTR	LnAGRI	LnFDI	LnMAF	LnNFLN	LnOPPS	LnNDP
1992	7.427858	4.156244	-6.42525	1.13575	1.550537	3.32662	10.1579
1993	7.6988	4.093432	-3.22806	1.37276	1.839517	3.356676	10.40693
1994	8.031548	3.964605	-1.39266	1.452461	2.697023	3.154826	10.46722
1995	8.263227	3.949795	-1.69011	1.586401	2.19708	3.186502	10.64631
1996	8.460261	3.935063	-1.36042	1.651034	0.97554	3.153889	10.75928
1997	8.586521	3.989521	1.211566	1.988023	-2.25953	3.235534	10.84819
1998	8.573995	3.893083	1.204215	1.659537	2.34119	3.379102	10.92644
1999	8.617742	3.817393	-0.0957	1.746374	0.638797	3.465146	11.19728
2000	8.721043	3.799213	0.490734	1.723703	2.377062	3.497964	11.0972
2001	8.969275	3.745746	1.445685	1.753751	0.182322	3.449109	18.04708
2002	9.011194	3.655642	1.178062	1.752064	2.879198	3.529614	18.14539
2003	9.255906	3.618593	1.684939	1.752679	0.875469	3.631755	18.31103
2004	9.425282	3.655316	1.682766	1.677228	2.370244	3.82846	18.51692
2005	9.558085	3.717819	0.759778	1.577526	2.379546	3.910253	18.72911
2006	9.761555	3.750073	1.272071	1.534227	2.714695	3.909388	18.99646
2007	10.07747	3.74396	0.11909	1.52163	4.010963	3.84917	19.36368
2008	10.27531	3.810755	-0.9138	1.412969	0.993252	3.814059	19.66433
2009	10.67633	3.826088	-0.38166	1.355901	1.987874	3.88039	19.7969
2010	10.98497	3.724411	-0.03767	1.37975	3.637586	3.833054	20.0857
2011	11.35907	3.71965	0.676691	1.303606	3.034953	3.876042	20.45789
2012	11.58068	3.791683	-0.44134	1.229658	2.00148	3.815466	20.60633
2013	11.79899	3.719397	1.036882	1.308924	2.140066	3.725013	20.80819
2014	12.01538	3.651189	1.20468	1.384123	2.341806	3.707237	21.00994
2015	12.15751	3.5851	1.40278	1.482654	2.014903	3.680245	21.17313
2016	12.25568	3.546707	1.718508	1.738956	2.128232	3.55246	21.32898
2017	12.36832	3.519848	1.591824	1.822384	2.821379	3.437325	21.5128
2018	12.50045	3.44102	1.38322	1.762608	2.727853	3.440398	21.71512
2019	12.64908	3.515518	0.977333	1.721761	3.068053	3.360907	21.93959
2020	12.87073	3.571173	0.79993	1.668326	3.202746	3.178309	22.19138
2021	13.07689	3.626308	1.342423	1.527292	3.526361	3.190434	22.54086
2022	13.29334	3.628042	1.062879	1.444729	3.377588	3.279664	22.88915

STATIONARITY TEST/UNIT ROOT TEST RESULT FOR VARIABLES

1.Augmented Dickey-Fuller test statistic

1.1. Tax Revenue Share to GDP in Percent

```
. dfuller d.LnTR

Dickey-Fuller test for unit root                    Number of obs   =        29

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)              -3.176            -3.723            -2.989           -2.625
——————————————————————————————————————————————————————————————————————————————

MacKinnon approximate p-value for Z(t) = 0.0214
```

1.2. Trade openness Ratio

```
. dfuller d.LnOPPS

Dickey-Fuller test for unit root                    Number of obs   =        29

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)              -3.611            -3.723            -2.989           -2.625
——————————————————————————————————————————————————————————————————————————————

MacKinnon approximate p-value for Z(t) = 0.0056
```

1.3. Inflation Rate

```
. dfuller d.LnNFLN

Dickey-Fuller test for unit root                    Number of obs   =        29

                                 ———— Interpolated Dickey-Fuller ————
                    Test         1% Critical       5% Critical      10% Critical
                  Statistic           Value             Value            Value
——————————————————————————————————————————————————————————————————————————————
 Z(t)             -10.341            -3.723            -2.989           -2.625
——————————————————————————————————————————————————————————————————————————————

MacKinnon approximate p-value for Z(t) = 0.0000
```

1.4. Nominal GDP

```
. dfuller d.LnNDP

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -5.713           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

1.5. Sharing of Manufacturing

```
. dfuller d.LnMAF

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -5.315           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

1.2.6. Foreign Direct Investment

```
. dfuller d.LnFDI

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -5.747           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0000
```

1.7. Sharing of Agriculture in GDP

```
. dfuller d.LnAGRI

Dickey-Fuller test for unit root                   Number of obs   =        29

                                 ------------ Interpolated Dickey-Fuller ------------
                 Test         1% Critical       5% Critical      10% Critical
               Statistic           Value             Value            Value
------------------------------------------------------------------------------
 Z(t)            -4.018           -3.723            -2.989           -2.625
------------------------------------------------------------------------------
MacKinnon approximate p-value for Z(t) = 0.0013
```

2. HETROSKADESITY

4.1.1. Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.615214	Prob. F(15,13)	0.1957
Obs*R-squared	18.87327	Prob. Chi-Square(15)	0.2195
Scaled explained SS	3.676182	Prob. Chi-Square(15)	0.9986

4.1.2. Heteroskedasticity Test: Harvey

Heteroskedasticity Test: Harvey

F-statistic	2.980357	Prob. F(15,13)	0.0274
Obs*R-squared	22.46681	Prob. Chi-Square(15)	0.0961
Scaled explained SS	26.71325	Prob. Chi-Square(15)	0.0312

4.1.3.Heteroskedasticity Test: Glejser

Heteroskedasticity Test: Glejser

F-statistic	1.944212	Prob. F(15,13)	0.1178
Obs*R-squared	20.05855	Prob. Chi-Square(15)	0.1697
Scaled explained SS	9.462973	Prob. Chi-Square(15)	0.8521

4.1.4.Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH

F-statistic	1.983015	Prob. F(1,26)	0.1709
Obs*R-squared	1.984219	Prob. Chi-Square(1)	0.1589

4.2.Lag Length Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-115.1946	NA	1.08e-05	8.427215	8.757252	8.530578
		285.3367			0.859358	
1	81.82359	*	4.40e-10	-1.780937	*	-0.954030
				-		-
2	144.7141	60.72189	3.31e-10*	2.738905*	2.211649	1.188453*

Table 4.3 ARDL Bound Test to Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.953725	10%	2.53	3.59
K	6	5%	2.87	4
		1%	3.6	4.9

t-Bounds Test Null Hypothesis: No levels

relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-10.09130	10%	-3.13	-4.37
		5%	-3.41	-4.69
		1%	-3.96	-5.31

Table4.4: Johansen- Test for Co-integration

Johansen tests for cointegration

Trend: constant — Number of obs = 29
Sample: 1967 - 1995 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	56	40.500339	.	208.4276	124.24
1	69	77.718462	0.92322	133.9913	94.15
2	80	105.65377	0.85435	78.1207	68.52
3	89	124.47467	0.72692	40.4789*	47.21
4	96	132.36745	0.41977	24.6933	29.68
5	101	138.12743	0.32783	13.1734	15.41
6	104	142.81784	0.27637	3.7926	3.76
7	105	144.71412	0.12259		

Table.4.5: Johansen Normalization Restriction (The Long Run Result)

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
LnTR D1.	1	.	.	.	.	.
LnAGRI D1.	-2.526248	3.196262	-0.79	0.429	-8.790806	3.73831
LnFDI D1.	-1.81831	.1853311	-9.81	0.000	-2.181553	-1.455068
LnMAF D1.	2.560452	1.904065	1.34	0.179	-1.171447	6.292351
LnNFLN D1.	.9506134	.2085491	4.56	0.000	.5418647	1.359362
LnOPPS D1.	1.502745	1.359287	1.11	0.269	-1.161408	4.166899
LnNDP D1.	.3153653	.1134771	2.78	0.005	.0929543	.5377763
_cons	-.2041675	.	.	.	.	.

Table 4.5 ARDL ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.869262	0.293979	-9.760078	0.0000
@TREND	4.45E-05	0.000931	0.047724	0.9627
D(LNTR(-1))	-0.308705	0.108258	-2.851558	0.0136
D(LNOPPS)	0.191940	0.085765	2.237973	0.0434
D(LNNGDP)	0.052827	0.006821	7.745078	0.0000
D(LNNGDP(-1))	-0.026551	0.005741	-4.624583	0.0005
D(LNFDI)	-0.013876	0.008908	-1.557757	0.1433
D(LNAGRI)	0.496592	0.133855	3.709919	0.0026
D(LNAGRI(-1))	-0.524750	0.132566	-3.958407	0.0016
CointEq(-1)*	-0.043176	0.004279	-10.09130	0.0000

R-squared	0.909081	Mean dependent var	0.192915
Adjusted R-squared	0.866014	S.D. dependent var	0.096868
S.E. of regression	0.035458	Akaike info criterion	-3.574147
Sum squared resid	0.023888	Schwarz criterion	-3.102666
Log likelihood	61.82514	Hannan-Quinn criter.	-3.426485
F-statistic	21.10854	Durbin-Watson stat	2.724345
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

Table 4.7.Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.034945	Prob. F(2,11)	0.9658
Obs*R-squared	0.183090	Prob. Chi-Square(2)	0.9125

Table 4.8. Ramsey RESET Test

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.258978	12	0.2320
F-statistic	1.585026	(1, 12)	0.2320