THE EFFECT OF FOREIGN DIRECT INVESTMENT ON AGRICULTURAL OUTPUT IN SOMALIA: AN APPLICATION OF ARDL MODEL

ABDULKADIR MOHAMED NUR
X50/37467/2020

SUPERVISOR: DANIEL ABALA OKADO

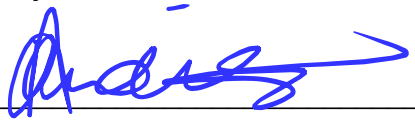
A RESEARCH PAPER SUBMITTED TO THE DEPARTMENT OF ECONOMICS AND DEVELOPMENT STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN ECONOMICS OF THE UNIVERSITY OF NAIROBI

NOVEMBER 2022

DECLARATION

Student declaration

This project is my own work, and it has not been submitted to any other university for review.

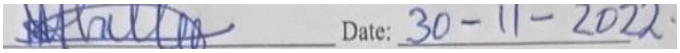
Signature:  Date: 11/11/2022

Abdulkadir Mohamed Nur

X50/37467/2020

Supervisor declaration

This project has been submitted for appraisal with my approval as University Supervisor.

Signature:  Date: 30-11-2022

Daniel Abala Okado
Department of economics and development studies, University of Nairobi

DEDICATION

I dedicate this research paper to my cherished sister **Kiin Mohamed Nor** for her truly unforgettable encouragement. She has been a source of inspiration and support during my historical education journey.

ACKNOWLEDGEMENT

During the preparation of this work, Daniel Abala Okado gave me invaluable guidance, assistance, encouragement, continual analytic feedback, and changes, for which I am grateful. I honestly acknowledge his great lecture, mentor, advice, and support.

I am grateful to my beloved sister Kiin Mohamed Nor, whose constant love and support keep me motivated and confident.

TABLE OF CONTENTS

DECLARATION ..... **ii**
DEDICATION ..... **iii**
ACKNOWLEDGEMENT ..... **iv**
List of Tables ..... **vii**
List of Figures ..... **viii**
Definitions of Terms ..... **ix**
List of Abbreviations/acronyms ..... **x**
ABSTRACT ..... **xi**
CHAPTER ONE: INTRODUCTION **1**
1.1 Background of the Study 1
1.1.1 Evaluation of Somali FDI (1960-2020) 2
1.2 Statement of the Research Problem 3
1.4 Research Objectives 4
1.4.1 General Objective 4
1.4.2 Specific Objectives 4
1.5 Significance of the Study 4
1.6 Organizations of the paper 5
CHAPTER TWO: LITERATURE REVIEW **6**
2.1 Introduction 6
2.2 Theoretical Literature 6
2.3 Empirical Literature 8
2.4 Overview of Literature 12
CHAPTER THREE: METHODOLOGY **14**
1.0 Introduction 14
3.1 Theoretical Framework 14
3.2 Model specification 15
3.3 Definitions and Measurements of Variables 16
3.4 Data Sources 18
3.5 Estimations Method 18
3.6 Pre-estimation Diagnostic Test 19

CHAPTER FOUR: DATA ANALYSIS, RESULTS, AND DISCUSSIONS 20
4.1 Introduction 20
4.2 Descriptive Statistics of the data 20
4.3 Unit Root Test 21
4.4 Pearson Correlation Results 21
4.5 Lag Order Selection 22
4.6 Results of Bounds test 23
4.7 Johansen cointegration test 23
4.8 Empirical Estimation 24
4.8.1 ARDL long-run Estimation Result 24
4.8.2 ARDL Short-Run Estimation Results 25
4.8.3 FMOLS Estimation Results 26
4.8.4 DOLS Estimation Results 27
4.8.5 Regression Summaries OF ARDL, FMOLS AND DOLS 28
4.9 Discussion of the Findings 29
4.10 Post Estimation Diagnostics Test 30
4.10.1 Normality test 30
4.10.2 Serial Correlation Results 30
4.5.3 Heteroscedasticity Test for the Model 31
4.10.4 Stability Diagnostic Test 31
4.10.5 Ramsey Reset Test Results for model 32
CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS 33
5.1 Introduction 33
5.2 Summary 33
5.3 Conclusion 33
5.4 Policy Implications 34
REFERENCES 36

LIST OF TABLES

Table 4. 1 Descriptive Statistics of the data 21
Table 4. 2 Result of Unit Root Test 21
Table 4. 3 Pearson Correlation Matrix 22
Table 4. 4 Lag Selection Order 23
Table 4. 5 Bounds Test Results 23
Table 4. 6 Johansen Cointegration Test 24
Table 4. 7 Long Run Estimation of ARDL Result 25
Table 4. 8 Short-run Estimation Result of ARDL 26
Table 4. 9 FMOLS Estimation Result 27
Table 4. 10 DOLS Estimation Result 28
Table 4. 11 Regression Summaries of ARDL, FMOLS and DOLS 29
Table 4. 12 Result of Serial Correlation LM Test 31
Table 4. 13 Heteroskedasticity Test Output 31
Table 4. 14 Ramsey RESET Test Results 32

LIST OF FIGURES

Figure 4. 1 Normality Test 30
Figure 4. 2 CUSUM test 31
Figure 4. 3 CUSUM squares test 32

DEFINITIONS OF TERMS

Foreign Direct Investment: Moosa (2002) says it is when investors from one country buy assets to control the production and distribution of a company in another country. Similarly, as UNCTAD (2012) the term "net inflow of foreign direct investment" refers to the amount of money invested by a foreign country in a domestic company. This money is invested for the long-term profit of, and under the direction of, a foreign organization.

Agricultural Output: Agricultural output or gains in agricultural production are used to quantify agricultural growth in this research. Agricultural productivity was defined in this research as the sector's net output after integrating all results and deducting direct inputs. It's also called the agricultural output-to-input ratio, and it's calculated using total factor productivity (TFP).

Foreign private investment: Is referred to an industry, undertaking, or institution engaged in the manufacture, distribution, or processing of any commodities, and the provision of government-specified services, or the development and extraction of specific mineral resources and products.

Total Factor Productivity: The relationship between the actual output and the resources that were employed to produce it is defined by the term "total factor productivity."

LIST OF ABBREVIATIONS/ACRONYMS

ADF	Augmented Dickey–Fuller
AfDB	African Development Bank
ARDL	Autoregressive Distributed Lag
CCR	Continuum of Care Reform
COVID	Coronavirus disease
DOLS	Dynamic Ordinary Least Squares Estimator
ECM	Error Correction Model
ER	Exchange Rate
FAG	Foreign Aid and Grants
FDI	Foreign Direct Investment
FMOLS	Fully Modified Ordinary Least Squares
FPI	Foreign Private Investment
GDP	Gross Domestic Product
GTAP	Global Trade Analysis Project
MNEs	Multinational Enterprise
NEE	Net Export Earnings
OLI	Ownership, localization and internalization
OLS	Ordinary Least Squares regression
TFP	Total Factor Productivity
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollar
VAR	Vector Autoregression
VECM	Vector Error Correction Model

ABSTRACT

The study investigated the effect of foreign direct investment on agricultural output in Somalia. The study utilized time-series secondary data sourced from the World Bank Indicators and the United Nations Data website, SESRIC, the Central Banks of Somalia, and the IMF between 1970 and 2020. The study adopted "Cobb-Douglas production function" to estimate the effect of FDI on agricultural output in Somalia. Before estimation, the augmented Dickey-Fuller test was used to make sure that the data was stationary. The study employed the ARDL model to evaluate the co-integration approach for estimating long-run and short-run associations and dynamic interaction between the variables. FMOLS and DOLS were also used in the research to figure out how sensitive and stable the long-run characteristics were. The result of the Johansen cointegration analysis showed the presence of three cointegrating equations in the long-run dynamics. The correlation findings demonstrate that the variables possessed a correlation coefficient that was higher than the threshold of 0.8. The major regression findings of this study show that all explanatory variables' outcomes from all applied models (ARDL, DOLS, and FMOLS) have a strong positive relationship with agriculture output in Somalia. All the study's three models' coefficients are positive, and all their t-statistics are statistically significant and greater than the 5% critical value. In the short term, Somalia's agricultural output is positively affected by all the estimated explanatory variables in this study. The study suggests that, to enhance the sustainability of the country's economic growth, the government should create sufficient investment incentives to stimulate foreign investment in the agriculture sector's development process.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

In an open economy, foreign direct investment is described as the long-term interaction between foreign direct investors and local businesses (UNCTAD, 2012). Similarly, Farrell (2008) defined foreign direct investment as the accumulation of capital, entrepreneurial management, and technology that enables firms to compete in foreign markets to sell products and services. COVID-19 has had a detrimental impact on worldwide foreign direct investment, which dropped by 40% in 2020 from its value in 2019 (UNCTAD, 2020). Amazon's, Deliveroo's, Embraer's, and Boeing's merger plans have all been put on hold because of the global epidemic. Financial markets have discounted the stocks of firms that have been the target of takeover offers or have been damaged by regulatory clearance delays for mergers. Early research and literature on foreign direct investment (Dunning, 1993; Caves, 1996) identified the motivation for foreign investors to invest in resident firms through a productive market that provides capital investment in the form of technologies, production knowledge, marketing information, and managerial skills (Blonigen, 2005). For local investors and multinational firms, Dunning (1998) identified four main aims of FD investors. First, FD investors work as resource-seeking with the availability of natural resources in terms of price and quality. Infrastructure also makes it possible to use resources and export goods without government constraints. Secondly, FD investors are market seekers, with a few exceptions, cost of actual labour, costs of material, tariff and trade barriers, transportation costs, and preferential access to import licenses. This kind of investment is mainly in the local market. Thirdly, FD investor primarily focuses on labour, materials, and machinery costs as an efficiency-seeking investment. FD investor looks for agglomerative economies, such as cities (export processing zones). FDI is allowed to engage in intermediate and final product commerce. Fourthly, FD investor seeks strategic asset acquisition, requiring the availability of knowledge-related assets and markets to safeguard or strengthen investment businesses.

Theoretically, foreign direct investment contributes to agricultural growth productivity by forming gross capital and integrating new inputs and foreign technology into local enterprises' production functions. Farmland and labour productivity are improved by better access to farm inputs, such as improvement of crop varieties, better capital adoption of farming techniques, fertilizer, and technological improvement will raise crop yields and great output (Almfraji & Almsafir, 2014)

Furthermore, local farmers have access to opportunities from both foreign direct investors and domestic investors. Farmers can generate mass production and improve production storage and transportation facilities through communication infrastructure, increasing agricultural product export and farm revenue (Görgen, 2009).

Foreign investment may help Africa's development efforts by supplementing domestic savings, creating jobs and growth, connecting the continent to the global economy, transferring cutting-edge technology, enhancing efficiency, and strengthening the local workforce's abilities. China is Africa's most promising investor argued by Mlachila and Takebe (2011), some Chine state-owned firms have shifted their investments from mining to agriculture, manufacturing, and service industries. Ghanaian poultry, Kenyan coffee, Madagascar sugar, Mali, Uganda, and Zambian cotton were targeted. In recent years, the China Investment Fund for Africa, which Chinese private companies established to invest directly in Africa, has expanded its capacity to allow equity investing in vital areas such as African agriculture. Regardless of Africa and its abundance of fertile land perfect for agriculture, Africa has long suffered from food poverty and scarcity. The "Feed Africa" campaign program coordinated by African Development Bank to boost and accelerate Africa's investment stated that Africa has around 65% of the world's uncultivated arable land. While African efforts to increase agricultural production, foreign investment is essential for agriculture output and food security (AfDB, 2016). The bank-focused plan pursues to modify how African nations spend $35.4 billion on food imports. During the global pandemic crisis, significant development and emerging economies lost 10%, amounting to US$45 billion, when the long-term anticipation for foreign investment in African Continental Free Trade Area Agreement in 2020 halted the investment protocol (UNCTAD, 2020).

1.1.1 Evaluation of Somali FDI (1960-2020)

The trend of FDI in Somalia has existed for five decades, starting from the civilian government in 1960–1969, the revolutionary government in 1969–1991, the civil war in 1991–2002, and the federal government in 2002–2020. Therefore, from 1960 to 1969, Somalia witnessed nine years of relatively free trade where multinational companies dominated the local enterprises through foreign direct investment with an applied free trade policy. From 1970 to 1982 the military regime nationalized all enterprises, which demotivated the foreign director investors applying the Soviet Socialism model, however, the FDI remained relatively stable. From 1982 to 1988, the Somali FDI relatively increased as the country has an open free trade policy.

After the collapse of the central government of Somalia in 1991, the country experienced a decade of civil war that destroyed all capital infrastructures. From 2001 to 2012, foreign direct investment increased gradually, with a special urgency on restoring of capital infrastructure of the countries. From 2013 to 2020, FDI shifted its attention to greenfield projects, joint ventures, and international firm subsidiaries (UNCTAD, 2020). Somali country boasts a vast geographical mass and one of the world's longest coastlines in Africa, beaches, oil reserves, abundant natural resources and inexpensive labor. The largest investors in Somalia are Germany and the United States. Bilateral trade agreement between Somalia and Germany for the protection and development of investments, Germany has the largest subsidiary of a multinational firm of agriculture in the country, the German Agro Action Office (AfDB, 2016). Somalia receives extremely little foreign direct investment than neighbouring nations like Ethiopia, Kenya, and Djibouti (Ibrahim, Omar, & Ali, 2017). Omar (2018) investigated how foreign direct investment affects Somalia's economic development. The research showed that the number of goods exported from and brought into Somalia by foreign investors has a positive effect on overall economic output of Somalia.

1.2 Statement of the Research Problem

The African continent has an abundance of fertile land suitable for agriculture but has long suffered from poverty and food insecurity. There is a need to enhance and expedite investment, according to the African Development Bank's 'Feed Africa' initiative. In Africa, because the continent has 65% of the world's uncultivated arable land, African countries spend US$35.4 billion on food imports each year rather than investing and strengthening the agricultural sector through foreign direct investment and other investments (AfDB, 2016). In Sub-Saharan Africa alone, it is estimated the annual investment needed is 45 billion USD in the food and agricultural sector along with rural community development in order to achieve ‘zero hunger’ by the year 2025 (Kubik & Husmann, 2019).

Generally, FDI plays a significant positive role in agricultural output, but Somalia’s agricultural output has not been performing well as the sector is receiving trivial FDI and using outdated techniques and technologies over the past three decades. FDI inflow only into Somalia has gradually increased since 2012, primarily focusing on strengthening the infrastructure sector while the agricultural sector gets trivial attention and already facing environmental problems i.e. floods, droughts, deforestation charcoal, and erosion crippled the agricultural sector. In view of the obstacles mentioned above that adversely affect the growth of agricultural output in Somalia. Also, the

Somali Agricultural sector is facing several factors that reduce its output, including climate change, lack of infrastructure, public institutions, property rights, technology, and capital markets. Low financing in Somali's agricultural sector will reduce employment creation and the general output of the economy. Agriculture is an essential and primary sector in Somalia's economy despite the booming service sector (telecommunication, Banking and service industry), and agriculture provides 65% of employment opportunities and greatly contributes to the GDP growth of Somalia. As a result, the foreign direct investment could boost general economic growth and the agriculture sector's total output, as shown in the Keynesian literature, complementing capital as a component of production. Although earlier foreign direct investment studies (for instance, Omar, 2018; Ibrahim et al., 2017; Mayow, 2021) focus only on the effect of foreign direct investment on economic growth and economic development performance in Somalia. Thus, the focus of this study was to investigate how FDI affects agricultural output in Somalia. This was done to fill a gap in the existing literature.

1.3 Research Questions

1. What is the contribution of FDI to agriculture output in Somalia?
2. What is the existing empirical relationship between the net inflows of FDI and agricultural output in Somalia?
3. What are the policies that can increase FDI and agricultural output in Somalia?

1.4 Research Objectives

1.4.1 General Objective

To investigate how agricultural output in Somalia was affected by foreign direct investment.

1.4.2 Specific Objectives

1. To identify and quantify the contribution of FDI to the agriculture output in Somalia
2. To investigate the existing empirical relationship between the net FDI inflows and agricultural output in Somalia
3. To propose some policies that increases the foreign direct investment in the agricultural sector in Somalia

1.5 Significance of the Study

This study presents to the government agencies with helpful information that would allow them to establish beneficial strategies for effective and efficient use of FDI to boost agricultural output performance and develop regulations and procedures concerning agricultural investment. Also, the

results of this study will guide policymakers in Somalia, private investors, foreign investors, and development partners to understand the working of the open economy of the country.

The results of this study will help both international investors and Somalian farmers figure out how foreign direct investment (FDI) affects agricultural production in the country.

The results of this study contribute to expanding literature and help academics, students and interested researchers in exploring the topic further and conducting other studies. It serves as a foundation for further study.

1.6 Organizations of the paper

After this introductory chapter, the other parts of the paper are structured in the following manner: In the second chapter, the study takes a look at the research that has been done on the topic of how "foreign direct investment" relates to agricultural output in Somalia. This body of literature may be broken down into three sections: the reviewed theoretical literature, the reviewed empirical literature, and a literature review highlighting the research gaps. The following section is devoted to the methodology section, and it discusses the theoretical foundation upon which the research is based, as well as the variables, their definitions, measurements, and the expectations for the signs of the variables. The examination of the data, the conclusions, and the discussions are presented in the fourth chapter. A normality test and a cointegration test were also included in addition to the descriptive statistics on the data, as well as the stationarity of the data. A summary of the findings, some conclusions, and some policies are presented in the last section.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter covers the empirical and theoretical literature on prior research on various researchers' foreign direct investment and agricultural output. The literature reviewed is relevant to the research topic. Books, magazines, journal articles, and unpublished works were among the literature sources. The review's goal was better understood how previous research on FDI, and agricultural output is linked to this study. The review was focused on the parallels and differences in approaches, conclusions, and techniques between the evaluated literature. This study found the reviewed literature and the existing gap to contribute further knowledge by analyzing the methods of reviewed studies with this study.

2.2 Theoretical Literature

Theoretically, foreign investment is thought to boost agricultural output. In creating the monopolistic benefits theory of foreign direct investment, Hymer asserts that the business organization and imperfect competition theories explain the motive to execute foreign direct investment (Hymer, 1976). In addition, Brainard (1997) also concluded that trade, rather than foreign direct investment, is the sole method to engage in international commerce if markets operate efficiently in a perfectly competitive economy without market misrepresentations. Buckley and Casson (1979, 2001, 2009) developed the concept further by seeing foreign direct investment as an economic asset that internalizes corporate activities and connects to global markets. These principles are based on organizations seeking the lowest-cost location for each operation and that corporations develop via internalization until it adds more costs than benefits (Alberta, 2006). According to Kuslavan (1998), the majority of international corporations are profit-maximizing and growth-oriented businesses. Also, flaws in the production factors will force these companies to learn about and accept the emerging markets so that they can increase profits by balancing out certain costs.

Additionally, Coase (1937) proposed the internalization hypothesis to explain the rise of multinational corporations (MNEs) and their drive to attract foreign direct investment. Buckley and Casson (1979, 2001, 2009) developed the concept arguing that foreign direct investment is an economic asset that links internalize corporate activities to the global markets. These ideas are founded on the idea that companies seek the lowermost cost site for each transaction and that

organizations develop by internalizing until the costs overshadow the advantages (Alberta, 2006). Similarly, Hymer (1976) claimed that monopolistic recompences include factor market inefficiencies produced by branded, advanced technology and access to borrowed money to attract foreign direct investment. This suggests that the availability of such benefits will increase monopoly profits and encourage enterprises to invest in foreign direct investment (Kuslavan, 1998). According to Vintila (2010) argue the monopolistic-oligopolistic paradigm, foreign direct investment occurs purely because of market flaws, and enterprises may overcome these market failures by direct foreign investment. Foreign direct investment will not happen if market weaknesses do not exist, and foreign production will be done offshore through export, import and outsourcing agreements.

However, Ogbanje (2010), on the other hand, looked at the relationship between FDI and Nigerian agricultural output. This study employed foreign direct investment as a diagnostic test and the OLS technique to estimate variables, their study showed that Nigeria's agriculture sector received the least foreign investment while manufacturing received the most. Furthermore, the findings demonstrated that GDP and FDI investment positively affect the agricultural sector. Implying that foreign direct investment and GDP increase the agricultural output. Gunasekera et al. (2015) analyzed the effect of the net inflow of foreign investment on African agriculture. The study examined the possible effects of foreign investment in African agriculture by examining the major issues surrounding foreign investment in agriculture. Utilizing the dynamic GTAP model, the effect of improved land productivity and FDI in Africa was analyzed.

A major premise of the study is that FDI in agriculture does not necessarily benefit small farmers. It links its products with small farmers in the area through a variety of business strategies. Certain requirements must be satisfied for collaboration to be effective, as several partnerships have failed to improve the quality of local farmers life. Agricultural output, rural per capita income, and economic growth are not increased by successful cooperation. Even though there is not much data, this research shows that the types of economic models used have a big impact on whether or not investment improves market access. Small farmers in agricultural areas will make more money because of this, and even in the best-case scenario, doing business with local small farmers will be good for the farmers and the rural areas around them (Tulus & Tambunan, 2014).

But Mundell (1957) proved that countries with a lot of capital will give their resources to countries with less to get a better return on their investments. From the point of view of Mundell's model of

export substitution, FDI from an industry that is strong in the home country into an industry that is weak in the host country is consistent. Similarly, A trade general equilibrium model by Kojima (1973) complements FDI. The model transfers capital from the less successful industry of the country sending it to the more successful industry of the country receiving it. The country that sends FDI sells high-tech parts and components to the country that puts them together. Kojima (1977) also found that the transfer of knowledge from advanced economies to poor economies is often shown as a wide range of industrial skills related to production. Kojima argued that the spread of technology through FDI was beneficial to poor and emerging countries because it encouraged more stable and diversified economic growth and an increase in international commerce.

2.3 Empirical Literature

The impression of external investment on the agricultural sector's development in Nigeria's economy was examined by Oloyede (2014) from 1981 through 2012. ADF and the causality of the Granger test were applied to test time series data. According to the study, foreign net inflow investment has a significant positive long-term effect and short-term effect on agriculture. The net inflow of FDI is one of the most important tools for improving employment chances via commercialization and modernization since agriculture holds the majority of the population employment opportunities. Agricultural sector contributes the growth of country's GDP.

Food processing, agriculture services, and infrastructure have a significant potential impact on agricultural output. Agriculture and foreign direct investment growth are inversely related, implying that agriculture does not get a major share of foreign direct investment (Dhungana & Ghimire, 2013). Prior agricultural foreign direct investment and the current proportion of agricultural export and import in China significantly influence domestic agricultural investment. Furthermore, foreign direct investment displaced the previous year's local investment in China's agriculture. On the other hand, imports and exports drowned out domestic investment in China's agriculture. No significant association between the net inflow FDI of agriculture and agricultural research and development in the western and central regions, and there is no technology spillover effect. Therefore, the eastern region's export size has a large effect on agricultural R&D competence, but the import scale of the middle and western sectors has a significant impact (Wen, Zhuang, & Zhang, 2020).

Despite many government efforts the agricultural sector is characterized by poor performance and yields limited cultivated areas due to the government's reliance on an oil-dependent mono-agricultural economy. Between 1980 and 2009, a three-step procedure was used to assess the implications of FDI, trade, and their consequences on Nigeria's agriculture sector growth. The unit root tests ADF and Philips-Parron (PP) were utilized. Cointegration is present, according to Johansen and Juselius' multivariate Co-integration diagnostic test. The Granger causality relationship test reveals a bidirectional, unidirectional, and no causal affiliation between agriculture sector growth in Nigeria and FDI. More upcoming direct investment should be acquired to increase agricultural production and development overall, as well as to establish a legal and administrative quality foundation. The study encouraged the improvement of the attractiveness of Nigeria's agricultural sector output exportation in the international market and boosted foreign exchange earnings (Izuchukwu et al. 2014).

Furthermore, Edeh et al. (2020) studied Nigeria's agricultural production and its impact on FDI. ADF, ARDL, FMOLS, and DOLS were used to test for unit roots and estimate regression parameters. According to the study, net FDI has a favorable influence on agricultural productivity. Foreign direct investment. Sunde (2017) studied South Africa's economic progress, FDI, and exports. ARDL and VECM Granger causality tests were used to estimate causality. Foreign direct investment, GDP, and exports are correlated. Granger causality using VECM demonstrated unidirectional relationship between GDP and FDI. GDP and FDI have a one-way link. Exports cause and are caused by economic growth, whereas exports and FDI only cause exports.

Alvarado et al. (2017) also looked into how FDI affected the growth of economies in some Latin American countries. For this study, panel data econometrics with a fixed-effect model was used. Their results indicated that foreign direct investment is not an effective approach for promoting economic development in Latin American countries, except for those with high incomes. When the growth of the economy as a whole is looked at, FDI has no statistically significant effect. When the varying degrees of progress that the nations in the area have attained in terms of their economic growth is considered, the conclusion is revised. The research revealed that the effect is negative and statistically significant in relatively low-income nations. Similarly, FDI net inflows have a positive and considerable influence on agricultural output for developed countries. However, the impact is uneven and insignificant in middle-income nations. To better understand the association between FDI and economic development, Ould (2015) examined the literature. With the Granger-

causality test, ECM, and other analytical tools analyzed the dependent and explanatory factors. FDI is linked to GDP growth, according to the study. Throughout the study, no correlation between GDP and FDI has ever been found using the Granger Causality test. Effiong and Eke (2016) looked at the influx of foreign investment. Crop production in Nigeria is positively influenced by foreign aid and grants (FAG), private foreign investment (FPI), the exchange rate (ER), and net export earnings (NEE) according to these results. The above-stated variables were estimated using an error correction model (ECM).

Pakistan's agricultural sector has been examined by Chandio et al. (2019) for its link to economic growth. Tests on ADF and Phillips-Perron stationery were carried out. Several long-term models, including ARDL, DOLS, FMOLS, and CCR, were used to examine the relationships between variables over a long period. The study discovered that the agricultural net inflow of investment has a long-term and substantial influence on economic progress. When it comes to economic growth, Melak (2018) examined the influence of foreign direct investment. It was used in this work to do time series data analysis using the OLS technique. The Dickey-Fuller technique was used to conduct the tests. According to the statistics, there is a significant relationship between the net inflow of investment, GDP per capita, FDI stock inflow and total investment. Gross capital formation and FDI in/outflow negatively influence Ethiopia's economic development.

The impact of foreign investment and other explanatory variables on agricultural development was examined by Owutuamor & Arene (2018). Among the factors considered were (GDPAG), which is the share of GDP that agriculture makes up, (lnFDI) which is the total amount of FDI inflows into agriculture. Aside from that, there's a nominal exchange rate, a difference between domestic and US interest rates, the total stock of gross foreign debt, a GDP standard deviation, and political uncertainty denoted by (lnER, (lnINT, and (lnPOL). The diagnostic testing was carried out using ADF and co-integration tests. The data was estimated using Granger causality tests and the OLS approach. As a result of the research, it seems that the net inflow of foreign investment has no direct effect on agricultural development. Also, Admas et al. (2015) investigated how economic growth was affected by foreign investment in Sub-Saharan Africa and how regulatory regimes affected foreign direct investment. According to the data, neither FDI nor limitations significantly influenced the research. Among the data analysis techniques employed were the improved Dickey-Fuller test, the Johansen cointegration process, the error correction model, the Granger causality test, and the impulse response. In both the absence and presence of an inflation shock, the data

demonstrated no long-term equilibrium link between FDI in agriculture and agricultural output in Nigeria. Even though agricultural foreign investment has a short-term causal influence on agricultural output, it has no short-term causal effect on the former. No long-term link between these variables is supported by the fact that they respond to exogenous shocks in opposing ways (Akande, 2013).

Similarly, Idowu & Ying (2013) investigated foreign direct investment and its impact on the agricultural industry. The study variables were estimated using a VAR model. According to the research, FDI has no substantial effect on agricultural production, but it does have a favorable effect on the labour market. Additionally, Gachunga (2019) studied FDI inflows and its impact on Kenya's infrastructure, industry, and agriculture on the nation's economic development. The OLS method of estimation was used to analyze the connection between FDI and GDP. The study showed that FDI in infrastructure has played a significant role in driving GDP expansion. But FDI has had a small but positive effect on the manufacturing and farming sectors.

The complex question of how variable rainfall affects economic growth is a topic that has received a lot of attention recently. Indian academics looked at state-level economic data and rainfall data from 1961 to 2012 to study the link between rain and India's economic growth. There were 920 million people in India in 2000, or about 12 % of the world's population, in the 15 states with populations above 20 million people. Even within these nations, physical and human geography differences reflect a wide variety of water security issues and serve as a proxy for global economic development and environmental circumstances. Affluent and impoverished nations alike rely on agriculture to contribute to economic growth and a stable food supply. According to their findings, rainfall variability and economic development are intertwined in three different ways. Growth and rainfall are inseparably related. The association between rainfall and growth has declined from considerable to insignificant. Wetter states are less sensitive to rainfall variations. Long-term earnings and rainfall increases are interrelated. State governments grow faster than federal governments but earn less per capita. According to Indian national patterns, transitioning away from agriculture hasn't lowered economic vulnerability to unpredictable rainfall. Rainfall may still affect economic growth in economically different states, allowing for additional research on how it affects the economy directly or indirectly through other hydro-climatic elements (Gilmonta et al., 2018).

2.4 Overview of Literature

The amount of net foreign direct investment (FDI) is an important factor in determining agricultural productivity and output. Previous studies (Ogbanje, Okwu, & Saror, 2010; Oloyede, 2014; Edeh et al., 2020; Alvarado et al., 2017; Effiong & Eke, 2016) have found that external investment has a significant positive relationship with agricultural sector output. Other empirical and theoretical studies (Wen et al., 2020; Melak, 2018; Owutuamor & Arene, 2018; and Idowu & Ying, 2013) argue that the net inflow of foreign investment has a negative effect on agricultural output.

As a direct consequence of this, the current research project on Somalia investigates the relationships between the following categories of explanatory variables: the net flow of foreign direct investment (FDI), government expenditures, gross capital formation, exchange rate, annual average rainfall, and arable land. When these other factors are included, it is much simpler to understand how foreign direct investment has such a significant impact on agricultural production in Somalia. The theories of ownership, localization, and internalization proposed by Dunning (1988), Mundell (1957), and Kojima (1973) served as the foundation for this investigation. Even though studies on foreign direct investment in Somalia, like Omar's (2018), Ibrahim et al.'s (2017), and Mayow's (2021), only look at how FDI affects Somalia's economic growth and development, this does not mean that FDI in Somalia does not have other effects.

In a nutshell, the study of the relevant literature revealed that its empirical findings provide support for the theory and the hypothesis put forth in the literature regarding the presence of a positive association between foreign direct investment and the growth of the agricultural sector. Most of the research that was reviewed disagreed with their conclusions; although some studies discovered that foreign direct investment (FDI) had a positive effect on the agriculture sector, other research discovered that it has a negative impression on the agricultural sector. The literature review for this study revealed that most of the research on foreign direct investment (FDI) and agricultural sectors had been conducted at the aggregate level in Nigeria, Pakistan, Tanzania, South Africa, Kenya, and Ethiopia, with only a few studies concentrating on the disaggregated effect of FDI. Also, this research discovered that earlier studies conducted in Somalia primarily focused on the influence that foreign investment has had on the entire Somali economy. As a result, the current study attempts to address the food shortages and unemployment that are caused by low agricultural productivity. The agriculture sector, which is home to most Somalia's job openings, will receive a

boost, along with the nation's overall food supply, if Somalia is successful in luring foreign direct investment through investments that need significant amounts of cash. Considering the investigation of the impact that foreign direct investment has on the agricultural output in Somalia. Finally, the study's results show that both foreign direct investment (FDI) and other control variables have short- and long-term positive effects on agricultural output in Somalia.

CHAPTER THREE
METHODOLOGY

1.0 Introduction

Examining how FDI affects Somalia's agricultural output is the main purpose of this paper. This study was adopted by Dunning's (1988) theory of ownership, localization, and internalization (OLI) to configure its capacity to control these OLI advantages in the target market. The ADF method is used to test the stationarity of the dependent and independent variables. In addition, ARDL was used in this study to assess the co-integration approach for estimating long- and short-run associations, as well as dynamic interaction between the research variables.

3.1 Theoretical Framework

This study adopted Dunning's (1988) theory of Ownership, localization and internalization (OLI) to arrange its aptitude to achieve these OLI advantages in the target market. Similarly, the study used Mundell's (1957) and Kojima's (1973) When the latter prevents the importation of capital-intensive items from the former, the concept of capital derivation from a capital plentiful economy to a capital shortage jurisdiction in quest of a better marginal rate of return is applied.

The study employed the Cobb-Douglas production function, as proposed by Solow (1961), Barro (1992), and Lyashenko (2013), which is the most appropriate model for finding possible sources of growth with the possibility and limits of substitution. The Cobb-Douglas production function has two inputs, capital and labour, as resources. Furthermore, (Solow, 1957; Arrow, 1961), entrepreneurial skills and innovation (Schumpeter, 1934), human capital, intellectual and social capital (Romer, 1986; Lukas, 1988). Von Neumann (1945) and Frankel (1962) created experimental variants of this concept, while Solow (1956) thoroughly examined the situation. Lucas (1988), Jones and Manuelli (1990), and Rebelo (1991) all fit this paradigm in the 1980s, as did Romer (1986), but in a slightly broader sense.

$(Y_t = AK_t \text{ and Kt } = sY_tK_t,)$ (1)

Where S is an exogenous and constant investment rate, while A is an exogenous and constant efficiency parameter. In this setup, K stands for physical capital, but it was understood as knowledge by Romer (1986) and substituted by human capital by Lucas (1988). The growth model used in this article was the Solow swan model. Solow's model treats saving rates, population growth, and technological advancement as exogenous variables. Labor and capital are two inputs

at their marginal products, and t is the production function at time, assuming Cobb-Douglas production functions, is:

$$\left[Y_t = A_t {K_t}^{\alpha} {L_t}^{1-\alpha}\right], \qquad \theta < \alpha < 1 \tag{2}$$

Where Y represents production, K is the physical capital, while L represents labour force, a represents the elasticity of physical capital, and A represents a technological level. The number of effective labour units rises at a rate of $(n + g)$ at $A_t l_t$. According to the model, a certain amount of output is always invested. "The development of k may be calculated using k as the stock of capital per unit of labour $k = \frac{K}{AL}$ and y is the amount of output per effective unit of activity ($Y = \frac{Y}{AL}$)".

The study used the Solow (1956) growth model, which breaks down economic development into fundamentals in the production function, to recognize the link between foreign direct investment and agricultural productivity.

$$Y = f(K, L) \tag{3}$$

Accepting the Cobb Douglas model (1928), Mankiw, Romer, & Weil (1992) stipulated that agricultural productivity would be the output of a function of capital (K), labour (L), and human capital (H), productivity at the time(t). As states the following equation:

$$Y_t = A_t \, K_t \alpha H_t \lambda \, L_t \gamma \tag{4}$$

Where Y represents output growth, A is "total factor productivity", K is capital, L is labor, and H is human capital. Agriculture output (AGO) is defined as a "function of foreign direct investment" (FDI), Gross Capital Formulation (GCF), Exchange Rate (ER), Government Expenditure (GEXP), Arable Land (ArL), and Annual Average Rainfall (AAR). As a result, the general production function is.

$$AGO = A_t GCF_t^{\beta_1} FDI_t^{\beta_2} GEXP_t^{\beta_3} ArL_t^{\beta_4} \, ER_t^{\beta_5} AAR_t^{\beta_6} \tag{5}$$

3.2 Model specification

After cointegration and bound test the paper employed "ARDL model to estimate the long-run relationship between the variables" as specified in the below equation (6). The paper estimated equation 6 by using logarithms and differentiating Equation 5 above with regard to time frame:

$$lnAGO_t = \alpha_t + \beta_1 lnGCF_t + \beta_2 lnFDI_t + \beta_3 lnGEXP_t + \beta_4 lnArL_t \, \beta_5 lnER_t + \beta_6 lnAARF_t + \mu \tag{6}$$

Nonetheless, the ARDL model's short-run dynamics are described in the following Equation, with the variables' co-integration in equations (6) and (7) .

$$AGO_t = \alpha + \sum_{i=0}^{p_1} \Delta\beta_1 lnGCF_{t-i} + \sum_{i=0}^{p_2} \Lambda\beta_2 lnFDI_{t-i} + \sum_{i=0}^{p_3} \Delta\beta_3 lnGEXP_{t-i}$$
$$+ \sum_{i=0}^{p_4} \Delta\beta_4 lnArL_{t-i} + \sum_{i=0}^{p_5} \Delta\beta_5 lnER_{t-i} + \sum_{i=0}^{p_6} \Delta\beta_6 lnAARF_{t-i} + \lambda ECM + \mu_1 \quad (7)$$

AGO is proxied for agricultural output, including crop and livestock production. GCF is gross capital formation, FDI is a net inflow of foreign direct investment into agriculture, GE is proxied total government expenditure transferred to agriculture, ArL stands for arable land dedicated to farming and pastures, ER stands for the "real exchange rate", and AARF stands for average annual rainfall for the specified period.

Similarly, β_1 to β_6 are the coefficients to be estimated, α is the constant term, Δ is the differential, ln is natural logarithms, μ is the error term, and p_1 to p_6 are the lags.

3.3 Definitions and Measurements of Variables

Table 3. 1 **Variables Description**

Variables Name	Variable Measurement	Variable Definitions	Data Source	Expected Sign
Agricultural output (AGO)	Value in USD	This means annual agricultural output is the total value of the crops, animal heads and leather for each year relative to the base period of production. As invented by Leontief (1987), his input and output model of economic techniques.	World Bank	Dependent variable
Foreign Direct Investment **FDI**	Value USD	is defined as a proxy for the net inflow's investment in agriculture. According to empirical findings by Borenzstein, Gregorio, and Lee (1997) and Massoud (2008), FDI is the best way to explain agricultural growth.	World Bank	+
Arable Land (ArL)	kilometre square	This is generally land dedicated to agriculture or regulated for animal husbandry and crop production for human use. It's used to describe both farmland and cropland, and pasture. This variable is critical in determining	World Bank	+ or -

		agricultural productivity (Blaug, 1997). (Thomas, 1993). Smith believed the land's output to be the primary source of revenue and prosperity for all countries (Smith (1776), 1909). Agriculture, according to Smith, is more productive than manufacturing because it combines two forces in its production: land and labour, whereas manufacturing just has one labor.		
Gross Capital Formation (GCF)	Value in USD	The investment variable was previously known as gross capital formation in various economic literature studies. According to several studies, GCF is the most important and variable contribution to agricultural production and economic growth. As a result, analyzing this variable will reveal its importance to Somalia's agricultural production. This study will use GCF to proxy gross capital formation in agriculture	SESRIC	+
Government Expenditure (GExp)	Value in USD	Formally, GEXP is total government spending in the fiscal year through two main recurrent expenditures and capital expenditures. FDI may be replaced by domestic investment, which has a significant impact on agricultural output. Government spending is a proxy for domestic investment, a rise in domestic investment will boost agricultural production (Oyimbo et al. 2013)	SESRIC	+
Exchange Rates (ER)	Real exchange rate	The buying power of a currency with another currency is described by its exchange rate. Conventional stabilization schemes spurred by international organizations typically include devaluations as a significant component and are considered the primary policy tool in the balance of payments stability. According to traditional economic theories, devaluations have a beneficial impact on production. For this reason, the	IMF	+ or -

		currency rate is based on actual exchange rates and Bilateral exchange rates in US dollars.		
Average Annual Rainfall (AAR)	Amount in mm	From 1970 through 2020, the average annual rainfall quantity in millimetres (mm) in Somalia. Van Passel, Massetti, and Mendelsohn (2016), Schlenker et al. (2005), Seo & Mendelsohn (2008), and Kurukulasuriya & Mendelsohn (2008) claim that studying this variable will have a substantial impact on agriculture because rainfall impacts agricultural productivity.	World Bank	+

3.4 Data Sources

Annual time-series data on agricultural output, as assessed by the percentage of FDI in agricultural output. The study used secondary data sourced from the World Bank Indicators and the United Nations Data website, SESRIC, the Central Bank of Somalia and the IMF using time-series observations from 1970 to 2020

3.5 Estimations Method

The looked at how foreign direct investment affects agricultural output in Somalia. The study used ADF test technique. The application of Johansen's (1988) maximum likelihood technique, according to Holden and Perlman (1994), eliminates the necessity for unit root tests because the existence of a cointegrating between the variables guarantees the existence of unit roots (Sims 1988). Looking for evidence of stationarity around a mean of positive number in the series' initial difference, and then performing the test with the greater than zero mean and a temporal trend. The Linear regression statistic clearly rejects serial correlation up to the fourth order if enough lagged dependent variables are given. Because the study's goal is to explore the impact of foreign direct investment on Somalia's agricultural sector, ARDL was used. According to Pesaran et al. (2001), testing for co-integration in the variables using an ARDL model was recommended. The study used ARDL to evaluate the co-integration approach for estimating long- and short-run associations and dynamic interaction between the research variables. The ADRL was employed in this investigation for the following reasons: ARDL calculates the model's long- and short-run parameters. It obtains accurate and impartial assessment. Compared to Johansen's co-integration technique, it produces superior results in a small sample. Parameters were collected over the long

term, and FMOLS was used to assess their sensitivity and strength before any calculations were made. The researcher can examine the long-term correlation between the dependent and control variables and can use F-statistics to evaluate the significance of the lags of the variables.

The relationship coefficients in the long and short runs were examined. DOLS, which Saikkonen created (1991) and Stock and Watson (1993), this model's long-term co-integration was estimated using a parametric approach of variable integration and only observed values were included in the model.

3.6 Pre-estimation Diagnostic Test

The Unit Root Tests: Before the estimation phase, the unit root test is used to see if the variables are stationary or if they are integrated in first order or not (Gujarati, 2004). The H0: asserts that the variables have no unit root or stationarity, while the substitute hypothesis asserts that they have unit roots. The result may be misleading or illogical when time series non-stationaries are regressed on one another (Andren, 2007). As a result, the ADF test was used to determine whether or not there was an association between the dependent variable and other control variables. It handles first- and higher-order autoregressive processes. “The study found that variables are stationary in the first-order condition”.

The Normality Test: - The normality test is used to measure the central tendency of the data and its normal distribution”. The “Jarque-Bera” test is a common option for determining if the variables in a model are regularly distributed. Jarque-Bera mean-based skewness and Kurtosis coefficients were employed to validate normality. Skewness numbers ranging from -3 to 3 reflect the degree of asymmetry, while 0 denotes symmetry. The study found that the data were normally distributed.

The Heteroscedasticity: The heteroscedasticity test is a useful tool for establishing whether or not the dataset contains any outlying instances. The study found that the variance of the residuals is homoscedastic.

CHAPTER FOUR
DATA ANALYSIS, RESULTS, AND DISCUSSIONS

4.1 Introduction

This chapter presents some descriptive statistics of the data and the outcomes of the model's estimate presented in Chapter Three. Additionally, expectations and theoretical underpinnings are used to understand the findings of the estimate.

Before the estimation was done, the data was described in terms of descriptive statistics, unit root for stationarity tests, correlations, lag order and the integration of the variables. Following the completion of the pre-test, the ARDL long and short runs, FMOLS, and DOLS were calculated. Finally, post-estimation diagnostic tests were performed utilizing the normality, serial correlation, heteroscedasticity, model fitness, and Ramsey RESET tests.

4.2 Descriptive Statistics of the data

Table 4.1 shows that the Jarque-Bera test is the most effective method for fitting and being close to zero, and the data is normally distributed. According to Table 4.1, the normal distribution is negatively skewed and has a left-side higher tail since the means of the study variables (AGO, FDI, and AAR) are all substantially positive but smaller than the medians of the research variables. The distribution is positively skewed and has a right-wide tail, as seen by the mean studies of the variables (ER, GEXP, ARL, and GCF) being considerably positive and higher than the median of their studies. A high positive kurtosis value indicates that the distribution follows a leptokurtic shape, with tails that are unusually long and thin. If the kurtosis is larger than 1, the distribution has a peak and wide, fat tails. Because the kurtosis is positive, we can see that the distribution tends to have a wide tail and a small mean.

The sample period of the data is between 1970 to 2020 with 51 observations. The descriptive statistics summary of the data presented that the agricultural output in Somalia is averaged by 17450.10 USD with a deviation of 10472.38. The deviation of the FDI was 19913186, with the mean being 104.034771. An average of 9585.05 Somali shillings were exchanged for one USD. Government expenditure averaged 214461848 USD with a standard deviation of 136476471. Gross capital formation, Arable land, and annual average rainfall averaged 4645824 USD, 1045902 km and 321.3333 mm respectively.

Table 4. 1 Descriptive Statistics of the data

	AGO	FDI	ER	GEXP	GCF	ARL	AAR
Mean	17450.10	104034771	9585.05	214461848	4645824	1045902.	321.3333
Median	18839.13	113700000	5725.00	163400000	4371147	1023000.	326.7800
Maximum	32601.81	126000000	31558.90	563600000	7333290	1350000.	367.7500
Minimum	4657.210	63124150	6.280000	51423133	2870122	931000.0	257.5100
Std. Dev.	10472.38	19913186	10298.31	136476471	1327819	90646.40	28.44845
Skewness	0.034338	-0.775903	0.632191	1.166361	0.472807	1.651145	-0.720871
Kurtosis	1.330298	2.119755	2.003426	3.231537	1.982235	6.195149	2.686675
Jarque-Bera	5.934320	6.763734	5.507616	11.67730	4.101323	44.86744	4.625688
Probability	0.051449	0.033984	0.063685	0.002913	0.128650	0.000000	0.098979
Observations	**51**	**51**	**51**	**51**	**51**	**51**	**51**

4.3 Unit Root Test

Table 4.2 shows that none of the model-level variables (AGO, FDI, GEXP, GCF, AAR, ArL, and ER) have a unit root, as determined by the Augmented Dickey-Fuller (ADF) test. All t-statistics have absolute values lower than the threshold value of 5%, suggesting that the study's variables are not stationary at level. After the study variables are transformed to first order, however, all of the study's variables become stationary at the 5% critical level. The ADF test findings reveal that AGO, GEXP, GCF, AAR, ArL, and ER are stationary in the first difference at 5% critical levels, while FDI is stationary at the second order. Since the data was relatively normal, the first-order condition test was used. That is because the first order made all variables stationary. ARDL, FMOLS, and DOLS were needed to examine their relationships.

Table 4. 2 Result of Unit Root Test

Level				**First and Second Order**			
Variable	**ADF test statistic**	**5% C. values**	**Pro statistic**	**ADF test statistic**	**5% C. values**	**Pro Statistic**	**Order of Integration**
AGO	-0.63122	-2.9224	0.8539	-10.23783	-2.9224	0.0000	I (1)
FDI	-2.30175	-2.9237	0.1498	-6.556131	-3.5155	0.0000	I (2)
GEXP	-3.248472	-2.9211	0.0229	-4.920029	-2.9224	0.0002	I (1)
GCF	1.586042	-3.5023	1.0000	-5.341726	-3.5043	0.0003	I (1)
AAR	1.1799157	-2.9281	0.9976	-5.464834	-2.9281	0.0000	I (1)
ArL	-2.874383	-2.9224	0.0557	-6.006123	-2.9237	0.0000	I (1)
ER	-0.288004	-2.9251	0.9188	-6.039194	-2.9251	0.0000	I (1)

Source: Eviews 12 ADF unit root test result

4.4 Pearson Correlation Results

Table 4.3 below displays the study's correlation results. The result demonstrates that “foreign direct investment” has a highly significant positive correlation (0.9290 with a p-value of 0.0000) with

agricultural output in Somalia. The study found that variables (gross capital formation, exchange, and arable land) have significant positive correlation with agricultural output in Somalia. However, variables (government expenditure and average annual rainfall) have a strong significant negative correlation with agricultural output in Somalia and a significant negative correlation with other explanatory variables.

Therefore, the correlation findings demonstrate that the variables possessed a correlation coefficient that was higher than the threshold of 0.8. This shows that the model has problems with multicollinearity because the correlation value is 0.8, all of the explanatory variables are highly linked, and the significance of the correlation is at the 2-tailed 0.01% level.

Table 4. 3 Pearson Correlation Matrix

		LNAGO	LNFDI	LNGEXP	LNGCF	LNER	LNARL	LNAAR
LNAGO	Correlation	1.0						
	Sig.	-----						
	Obs.	51						
LNFDI	Correlation	0.9290	1.0					
	Sig.	0.0000	-----					
	Obs.	51	51					
LNGEXP	Correlation	-0.6396	-0.8114	1.0				
	Sig.	0.0000	0.0000	-----				
	Obs.	51	51	51				
LNGCF	Correlation	0.9408	0.8577	-0.5757	1.0			
	Sig.	0.0000	0.0000	0.0000	-----			
	Obs.	51	51	51	51			
LNER	Correlation	0.9660	0.9391	-0.7649	0.9107	1.0		
	Sig.	0.0000	0.0000	0.0000	0.0000	-----		
	Obs.	51	51	51	51	51		
LNARL	Correlation	0.7571	0.7268	-0.4438	0.6774	0.7122	1.0	
	Sig.	0.0000	0.0000	0.0011	0.0000	0.0000	-----	
	Obs.	51	51	51	51	51	51	
LNAAR	Correlation	-0.7754	-0.6849	0.3549	-0.8885	-0.7156	-0.6094	1.0
	Sig.	0.0000	0.0000	0.0106	0.0000	0.0000	0.0000	-----
	Obs.	51	51	51	51	51	51	51

4.5 Lag Order Selection

The Akaike Information Criterion (AIC) was utilized for this study to control the optimal lag length that would result in the lowest possible value for the criteria being selected. To ensure that the error term is not wrongly defined, the decision instruction was selected the model with the lowest value for the information criterion.

Table 4.4 below presents the lag structure for the model. The results of the lag selection criterion demonstrate that a lag length of two is the ideal option at a 5% significance level according to the likelihood ratio (LR), the Akaike's information criterion (AIC), the final prediction error (FPE), and the Hannan-Quinn (HQ) test statistic. While the Schwarz Information Criteria (SC) determined that a lag length of one provided the best results at a significance level of a 5%. The study used a lag length of two to utilize and determine the estimation of the cointegration test of Johansen.

Table 4. 4 Lag Selection Order

Lag	LogL	LR	FPE	AIC	SC	HQ
0	174.2164	NA	2.56e-12	-6.825158	-6.554898	-6.722622
1	655.7962	805.9091	5.62e-20	-24.48148	-22.31940*	-23.66119
2	731.7685	105.4309*	2.11e-20*	-25.58239*	-21.52849	-24.04434*

* indicates lag order selected by the criterion

4.6 Results of Bounds test

The tabular representation of the results of the border cointegration test may be seen below in Table 4.4. The F-statistic value of 13.46, when compared to the necessary level of significance of 5%, is higher than both lower and upper limit values of the Pesaran test statistic. This indicates that the Pesaran test statistic is reliable. The results of the bound test show that there is a long run cointegration between explained and control variables in the study.

Table 4. 5 Bounds Test Results

			Significant	**Bound test**	
Test statistic	**Value**	**K**		**LB**	**UB**
F-statistics	13.46126	6	5%	2.45	3.61
t-statistics	-9.30971			-2.86	-4.38
H0: No Relationship					

Source: Eviews 12 output for the bounds test result

4.7 Johansen cointegration test

Table 4.6 below reports the Johansen cointegration results. According to the results of the trace statistics test, three cointegrating equations are present, with high significant probabilities of 0.000, 0.000, and 0.0075, respectively. Further evidence that there are two cointegrating equations comes from the maximum eigenvalue statistics test, which returns significant values of 0.0003 and 0.0022, respectively. Both analyses confirm the presence of positive cointegration in the model.

Table 4. 6 Johansen Cointegration Test

Panel A: Trace Test

"Hypothesized No. of CE(s)"	Eigen value	Trace Statistic	Critical Value 5%	Prob.**
None *	0.737988	194.1095	125.6154	0.0000
At most 1 *	0.652213	129.8199	95.75366	0.0000
At most 2 *	0.439924	79.12398	69.81889	0.0075
At most 3 *	0.368776	51.29920	47.85613	0.0229
At most 4	0.295336	29.21468	29.79707	0.0583
At most 5	0.210720	12.41304	15.49471	0.1382
At most 6	0.021731	1.054606	3.841465	0.3044

4 cointegrating eqn(s) at the 5% level
* rejection of the hypothesis at the 5% level

Panel B: Maximum Test

"Hypothesized No. of CE(s)"	Eigenvalue	Max-Eigen Statistic	Critical Value 5%	Prob.**
None *	0.737988	64.28956	46.23142	0.0003
At most 1 *	0.652213	50.69592	40.07757	0.0022
At most 2	0.439924	27.82477	33.87687	0.2217
At most 3	0.368776	22.08452	27.58434	0.2161
At most 4	0.295336	16.80164	21.13162	0.1816
At most 5	0.210720	11.35844	14.26460	0.1371
At most 6	0.021731	1.054606	3.841465	0.3044

2 cointegrating eqn(s) at the 5% level
* rejection of the hypothesis at the 5% level

4.8 Empirical Estimation

4.8.1 ARDL long - run Estimation Result

As shown in Table 4.7 below, except for annual average rainfall and arable land, both of which had positively insignificant p-values, while all other explanatory variables in the study were statistically significant. However, all the variables in this study have positively affected agricultural output in Somalia. It was determined from the study that an increase of only one percentage point in foreign investment boosts agricultural output in Somalia by 4.8%. Also, a 1% increase in government spending on agriculture will raise Somalia's agricultural output by 0.53%. For every one percentage point increase in gross capital formation, agriculture in Somalia grows by 0.65%. Also, a percentage increase in average annual rainfall would directly increase Somalia's agricultural output by 0.20%, while a percentage increase in arable land would directly increase Somalia's agricultural output by 0.307%. The study found that a percentage increase in the exchange rate would increase agricultural output by 0.40%. R^2 revealed that the model variables

explained 98% of agricultural output. Despite a Durbin–Watson score below 2.0, the model displays positive autocorrelation. The model's F-statistic (0.0000) shows stability and suitability for this study.

Table 4. 7 Long Run Estimation of ARDL Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNFDI	4.806986	1.052457	4.567396	0.0000
LNGEXP	0.536410	0.075040	7.148321	0.0000
LNGCF	0.655997	0.235336	2.787495	0.0081
LNAAR	0.203081	0.403294	0.503556	0.6173
LNARL	0.307132	0.263069	1.167494	0.2499
LNER	0.401397	0.075157	5.340769	0.0000
LNER (-1)	-0.215984	0.060411	-3.575267	0.0009
C	-42.09400	8.571123	-4.911142	0.0000
R^2	0.986454	Mean		9.554600
R^2_{adj}	0.983407	S.D.		0.732801
S.E.	0.094396	AIC		-1.705789
SSR	0.356421	SC		-1.323385
Log likelihood	52.64473	HQ.		-1.560167
F-statistic	323.6676	DW		1.798409
Prob(F-statistic)	0.000000			

4.8.2 ARDL Short - Run Estimation Results

Table 4.8 demonstrates Somalia's short-run FDI contribution to agriculture output. The results suggest that all factors increase agricultural productivity. Increases in FDI will boost agricultural output in Somalia by 2.72 percent in the short term. Increasing Somalia's government spending on agriculture by one percent would improve agricultural production in 0.29 percent in the short term. The study found that a percentage increase in gross capital formation increases Somalia's agricultural output by 4.19% in the short term. The study concluded that an increase in average annual rainfall would raise Somalia's agricultural output by 0.46%. The study also indicated that a percentage increase in arable land in Somalia will lower agricultural output by 0.0028% in the short term. According to the study, an exchange rate increases Somalia's agricultural output by 0.36%.

The short-run coefficient determination was 0.93, indicating that model variables explained 93% of farm production volatility. The model has positive autocorrelation, even though the Durbin–Watson score was 1.79, below 2.0. Lastly, the error correction term has a negative value that is

statistically significant. This demonstrates how rapidly the short-run model will eventually reach equilibrium in the long run.

Table 4. 8 Short-run Estimation Result of ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ (LNAGO (-1))	0.774297	0.202112	3.831040	0.0013
Δ (LNAGO (-2))	0.843869	0.171397	4.923481	0.0001
Δ (LNAGO (-3))	0.364063	0.117159	3.107434	0.0064
Δ (LNFDI)	2.729757	0.972519	2.806895	0.0121
Δ (LNFDI (-1))	-2.054950	0.949497	-2.164252	0.0450
Δ(LNGEXP)	0.296772	0.078310	3.789696	0.0015
Δ (LNGEXP (-1))	-0.572550	0.142397	-4.020803	0.0009
Δ (LNGEXP (-2))	-0.576285	0.113273	-5.087558	0.0001
Δ (LNGEXP (-3))	-0.463184	0.110146	-4.205194	0.0006
Δ (LNGCF)	-4.191587	2.171120	-1.930611	0.0704
Δ (LNGCF (-1))	-7.187995	1.799431	-3.994594	0.0009
Δ (LNGCF (-2))	-4.277829	1.997288	-2.141819	0.0470
Δ (LNGCF (-3))	8.142366	2.161632	3.766767	0.0015
Δ (LNER)	0.368167	0.054884	6.708040	0.0000
Δ (LNER (-1))	-0.345919	0.074988	-4.613001	0.0002
Δ (LNER (-2))	-0.311086	0.088831	-3.502011	0.0027
Δ (LNER (-3))	-0.172622	0.073143	-2.360057	0.0305
Δ (LNARL)	-0.002845	0.219562	-0.012959	0.9898
Δ (LNAAR)	0.469372	0.616173	0.761753	0.4566
Δ (LNAAR (-1))	1.192790	0.622312	1.916707	0.0722
Δ (LNAAR (-2))	-1.097524	0.566744	-1.936541	0.0696
Δ (LNAAR (-3))	-1.075622	0.551132	-1.951661	0.0677
CointEq(-1)*	**-2.073688**	**0.283162**	**-7.323316**	**0.0000**

R^2	0.935185	Mean	0.039574
R^2_{adj}	0.875771	S.D.	0.165647
S.E.	0.058384	AIC	-2.536910
SSR	0.081809	SC	-1.631519
Log likelihood	82.61739	HQ	-2.196206
F-statistic	39.15654	DW	1.785943
Prob(F-statistic)	0.000000		

4.8.3 FMOLS Estimation Results

Table 4.9 shows FMOLS results where all explanatory factors have a significant positive impact on agriculture sector production. FDI increases will boost Somalia's agricultural output by 1.45%. Somalia's agricultural output will rise by 0.36% with a percentage increase in government spending. The FMOLS model also predicts a 0.799% production gain in Somalia from a percentage rise in gross capital formation. In Somalia, a 1% increase in annual average rainfall boosts agricultural output by 0.90%. In the FMOLS model, the probability value of LNARL is

0.1220, which is over 5%, and the coefficient is positive, but the t-test result of 1.53 is not statistically significant. Thus, Somalia's agricultural output will rise by 0.35% due to arable land modification. Somalia's currency rate positively affects agricultural output. A percentage change in the exchange rate will boost Somalia's agricultural output by 0.12%.

The results of the FMOLS estimate are shown in Table 4.9. The coefficient determination was 0.980364, meaning that 98% of the variance in agricultural output was explained by the model's variables. The explanatory variable fits and is explained well, and it has a high correlation with the outcome variable, as revealed by the adjusted R-squared.

Table 4. 9 FMOLS Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFDI	1.458712	0.214259	6.808174	0.0000
LNGEXP	0.364628	0.043918	8.302453	0.0000
LNGCF	0.796003	0.187919	4.235893	0.0001
LNAAR	0.900619	0.335201	2.686805	0.0102
LNARL	0.359256	0.233986	1.535371	0.1320
LNER	0.124509	0.015273	8.152177	0.0000
C	-47.50802	6.472516	-7.339961	0.0000
R^2	0.980364	Mean		9.554600
R^2_{adj}	0.977624	S.D.		0.732801
S.E.	0.109618	SSR		0.516692
Long-run variance	0.007242			

4.8.4 DOLS Estimation Results

Table 4.10, which shows the results of the DOLS study, shows that foreign direct investment (FDI) and other factors had a positive and statistically significant effect on agricultural output in Somalia over the whole period that was the focus of the study. The DOLS model estimation results also show that the probability value of variables (LNFDI, LNGEXP, LNARL, and LNER) has portrayed (**0.0004**), (**0.0001**), (**0.0231**), and (**0.0000**), respectively, indicating a strong positive relationship with agricultural output in Somalia, and their t-test showed (4.14), (4.65), (2.43), and (5.65), which is significant and higher than the critical value of 5%. However, the DOLS model shows that the probability value of variables LNGCF and LNAAR is portrayed as (**0.0697**) and (0.6566), respectively, indicating not statistically significant but has positive relationship in agriculture output in Somalia. Basically, the value of Somalia's agricultural production is linked to FDI and all the other variables in the DOLS model in a positive way.

Table 4.10 shows the DOLS coefficient determination, showing that the model variables explained over 99% of the variation in agricultural production. The adjusted R-squared value of 98%

demonstrates that there is a substantial correlation between the outcome variable and the explanatory factors, demonstrating that the explanatory variable was a good match and played a major role in explaining the variance in agricultural production.

Table 4. 10 DOLS Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFDI	1.219050	0.294290	4.142338	0.0004
LNGEXP	0.370853	0.079626	4.657425	0.0001
LNGCF	0.640843	0.336886	1.902255	0.0697
LNAAR	0.304128	0.675257	0.450389	0.6566
LNARL	0.875570	0.359626	2.434672	0.0231
LNER	0.148164	0.026199	5.655215	0.0000
C	-44.68757	10.17946	-4.389976	0.0002
R^2	0.992406	Mean		9.561875
R^2_{adj}	0.984482	S.D.		0.722283
S.E.	0.089975	SSR		0.186196
Long-run variance	0.004740			

4.8.5 Regression Summaries OF ARDL, FMOLS AND DOLS

Outcomes from the three methods (ARDL, DOLS, and FMOLS) are summarized in Table 4.11 below. The study's explanations have a strong, statistically significant positive relationship with Somalia's agricultural output, as shown by the results. The coefficients of all three models in this analysis are positive, and their corresponding t-statistics are statistically significant. Most of the study's explanatory p-value results of the three applied techniques show a strong, significant positive relationship with agricultural output, except LNGCF, which is not significant when applied in the DOLS model, while LNAAR is not significant in both ARDL and DOLS. However, the p-value of the LNARL variable was not statistically significant in all three applied models: the ARDL, DOLS, and FMOLS.

Table 4. 11 Regression Summaries of ARDL, FMOLS and DOLS

Variables	ARDL	DOLS	FMOLS
LNFDI	**4.806986**	**1.219050**	**1.458712**
	[4.567396] *	[4.142338] *	[6.808174] *
	0.0000	0.0004	0.0000
LNGEXP	**0.536410**	**0.370853**	**0.364628**
	[7.148321] *	[4.657425] *	[8.302453] *
	0.0000	0.0001	0.0000
LNGCF	**0.655997**	**0.640843**	**0.796003**
	[2.787495] *	[1.902255]	[4.235893] *
	0.0081	0.0697	0.0001
LNAAR	**0.203081**	**0.304128**	**0.900619**
	[0.503556]	[0.450389]	[2.686805]
	0.6173	0.6566	0.0102
LNARL	**0.307132**	**0.875570**	**0.359256**
	[1.167494]	[2.434672]	[1.535371]
	0.2499	0.0231	0.1320
LNER	**0.401397**	**0.148164**	**0.124509**
	[5.340769] *	[5.655215] *	[8.152177] *
	0.0000	0.0000	0.0000

*Denotes significant at 5%.

4.9 Discussion of the Findings

The empirical research found that the net inflow of FDI had a statistically significant positive effect on agricultural output during the time period that was studied. This supports empirical evidence from previous studies of (Ogbanje, Okwu & Saror, 2010; Oloyede, 2014; Edeh et al. 2020; Alvarado et al. 2017 and Effiong & Eke 2016) which showed that FDI has a positive statistically significant association between FDI and agricultural output in developed and developing countries. Also accepts the studies expected variable outcome sign which was positive. Similarly, the research found that there is a strong link between how much the government spends and how much crops are grown in Somalia. This result supports the results of (Edeh et al. 2020) which showed that FDI and government expenditure has positive relationship with agricultural output and this result support the theory of Oyimbo et al. (2013) which argues government expenditure increases in domestic investment and will boost agricultural output. Results from the government expenditure variable matched the expected outcome sign of the variable stated in the methodology. Also, the results of the gross capital formation variable showed that GCF was strongly linked to agricultural output in Somalia. This result disagrees and argues the previous literature evidence from (Malek, 2018) which stated that GCF negatively impact on Ethiopia's agricultural output, while the result supports the expected variable outcome sign indicated in the methodology.

According to Gilmonta et al., (2018) long-term earnings and rainfall increases will result agricultural output increase. Therefore, this study found that AAR variable has a strong positive relationship with agricultural output in Somalia. In addition to Effiong and Eke (2016) looked at the influx of foreign investment. Crop production in Nigeria is positively influenced by foreign aid and grants (FAG), private foreign investment (FPI), the exchange rate **(**ER**),** and net export earnings (NEE). Therefore, the study also found that ER has positive relationship with agricultural out in Somalia. The study hypothesis that the expected variable outcome sign could be either positive or negative and the study recognized that the variable outcome sign is positive. Finally, the study found that Arable land variable has positive insignificant with agricultural output. The study hypothesized that the ArL variable expected outcome sign could be either positive or negative. The study recognized that ArL outcome sign is positive.

4.10 Post Estimation Diagnostics Test

4.10.1 Normality test

The Jarque-Bera test served as the foundation for the normality test, which was carried out with the goal of determining whether or not the model's residuals follow a normal distribution. Because the Jarque-Bera probability value is less than a 5% of the critical level, the study concluded that the null hypothesis is accepted, and the study has evidence.

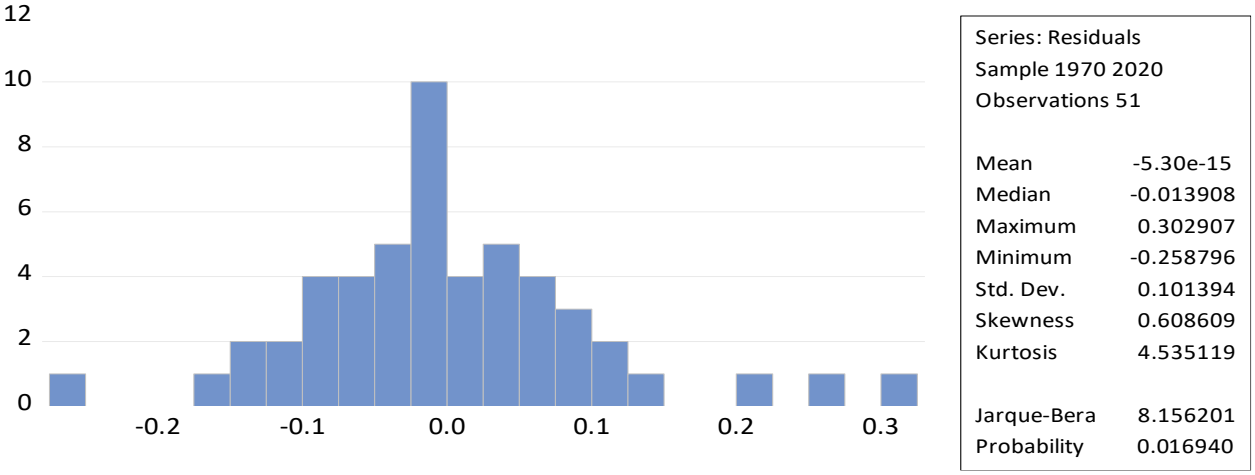


Figure 4. 1 Normality Test

4.10.2 Serial Correlation Results

The Breusch-Godfrey Serial Correlation LM test shows that the likelihood of Chi-Square (0.6645) is greater than the 5% significant level. Thus, the model is free of serial correlation.

Table 4. 12 Result of Serial Correlation LM Test

F-statistic	0.413115	Prob. F (2,38)	0.6645
Obs*R^2	1.064011	Prob. Chi-Square (2)	0.5874

4.5.3 Heteroscedasticity Test for the Model

The data is not heteroscedastic, as shown by the Breusch-Pagan-Godfrey test. The chi-square probability is 0.0921 and the F-statistic value is 1.896993, both of which are more than the 5% threshold for statistical significance. This study accepts the homoscedasticity, also called the homogeneity of the residual variance, null hypothesis.

Table 4. 13 Heteroskedasticity Test Output

F-statistic	1.896993	Prob. F (9,40)	0.0805
Obs*R^2	14.95712	Prob. Chi-Square (9)	0.0921
Scaled explained SS	15.46411	Prob. Chi-Square (9)	0.0790

4.10.4 Stability Diagnostic Test

The CUSUM and CUSUM of Squares tests were used to evaluate model consistency. This post-test aims to refute the model's stability assumptions. H_0: (if the CUCUM line is outside the dotted lines, the model is unstable). Figures 4.2 and 4.3 display the test findings. The CUSUM and CUSUM square tests show that the model is dynamically stable because the solid lines are inside the boundary of the dotted lines.

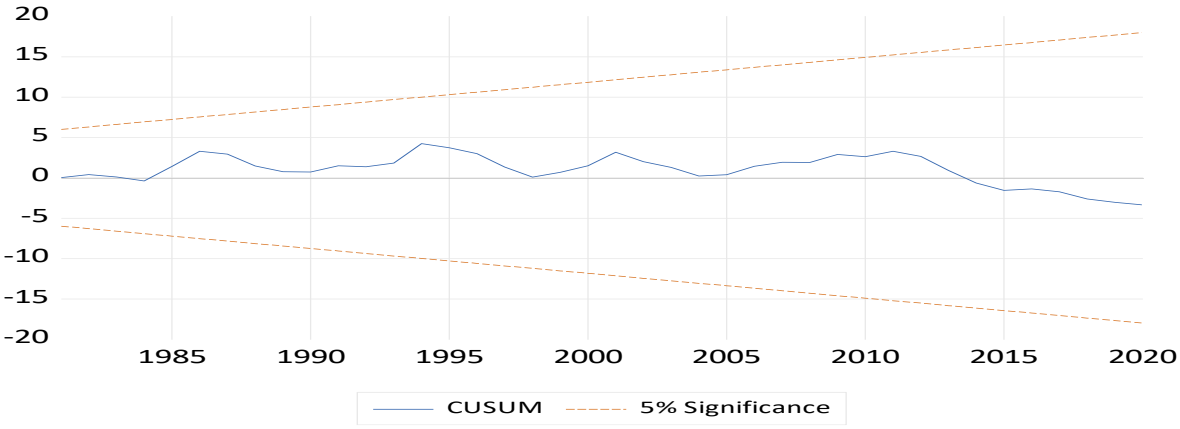


Figure 4. 2 CUSUM test

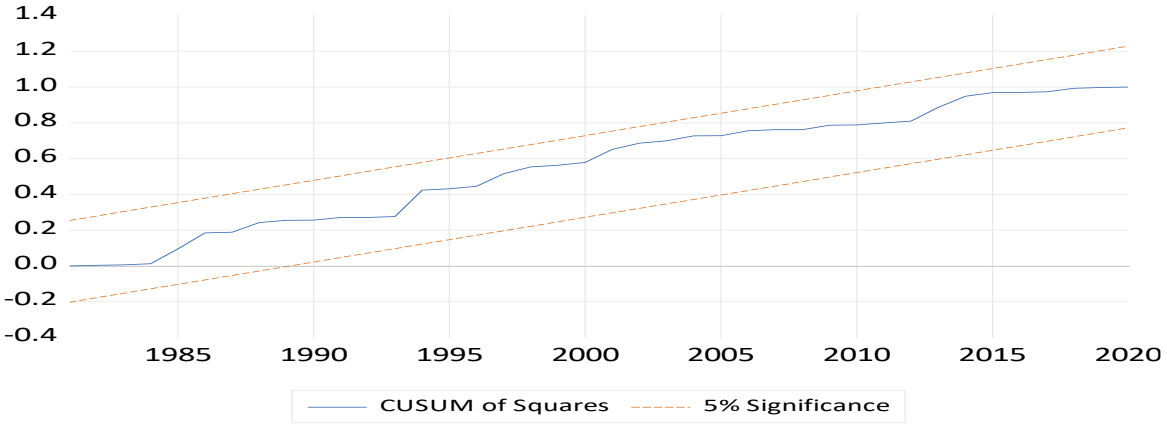


Figure 4. 3 CUSUM squares test

4.10.5 Ramsey Reset Test Results for model

The main purpose of this post-estimation test is to check the accuracy of the predicted model parameters. The model was accurately specified; hence the F-statistic is applied. If the F-statistic is less than 5% significant, this hypothesis should be rejected. If F-statistics are below the upper and lower bounds of the 5% critical level of significance, the estimation should accept the null hypothesis. Table 4.14 reveals that the "F-statistic" exceeds both the lower and upper bounds of the 5% critical level. The null hypothesis should not be rejected at 0.05. The estimated model was correctly expressed.

Table 4. 14 Ramsey RESET Test Results

	Value	df	Probability
t-statistic	0.764020	39	0.4495
F-statistic	0.583727	(1, 39)	0.4495
Likelihood ratio	0.742823	1	0.3888

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

5.1 Introduction

Key findings, conclusions, policy implications, and future research directions are summarized in this chapter. The study analyzed FDI's contribution to Somalia's agriculture sector and other empirical relationships. This was done to learn more about how FDI affects agricultural production in Somalia.

Estimating the output equation using data from 1970 to 2020 allowed the project to be completed successfully. After a careful look at the literature and a discussion of empirical studies, this chapter gives the study summary, conclusion, and policy implications.

5.2 Summary

The study was examined whether or not FDI in agriculture in Somalia increased crop yields. The study aimed to determine how much of an impact foreign direct investment has on agricultural output in Somalia as well as look into any empirical links that may already exist between net FDI inflows and agricultural output. Motivating Foreign Direct Investment (FDI) in Somalia's Agricultural Sector via Policy Implications.

Descriptive statistics indicated the data was normally distributed and close to zero. The mean and median were positive. Positive kurtosis indicates that most numbers are in the tails. Since the dependent variable and all explanatory variables became stationary with a constant and trend at 5% critical levels, the study used a first-difference model. The limits cointegration test reveals a long-term link between model variables. Johansen (1991) found three cointegrating equations. The regression indicated that the model's goodness of fit and variables explained 98% of the outcome variable variance. The model has positive autocorrelation, even though the Durbin–Watson score was 1.79.

5.3 Conclusion

The study looked at how FDI affects Somalia's agriculture. Additional inflows of foreign investment, technology transfer and capital investment will positively affect agricultural output in Somalia since the country has sufficient absorptive ability to capture new knowledge, a significant proportion of fertile land appropriate for agriculture, and an average annual rainfall that can be effectively used for irrigation.

The study guided by Dunning's (1988) theory of Ownership, localization, and internalization (OLI) to arrange its aptitude to achieve these OLI advantages in the target market. Similarly, the study will use Mundell's (1957) and Kojima's (1973) When the latter prevents the importation of capital-intensive items from the former, the concept of capital derivation from a capital-plentiful economy to a capital shortage jurisdiction in quest of a better marginal rate of return is applied. The study estimated the effect of FDI on agricultural output in Somalia using the "Cobb-Douglas" production function and time series data covering 1970–2020. The study employed ARDL model to evaluate the co-integration of long- run and short-run dynamic interaction between the research variables. Also, the study employed FMOLS and DOLS to test the sensitivity and strength of long-run parameters gathered.

This study was intended to examine how foreign investment affects Somalia's agricultural sector. The study was motivated by the fertile land suitable for agriculture, the increasing gross capital formation, the fluctuations of exchange rates, government spending, average annual rainfall, and the increasing foreign direct investment that may lead to an increase in agricultural output in Somalia.

The major outcome of this study shows that all explanatory variables resulting from all three models (ARDL, DOLS, and FMOLS) have a strong positive relationship with agriculture output in Somalia. All three models' coefficients are positive, and their t-values are all significant at the 5% level of certainty in this investigation. Most of the study's explanatory p-value results for the three applied techniques show a strong, significant positive relationship with agricultural output, except for LNGCF, which is not significant when applied in the DOLS model, while LNAAR is not statistically significant in both ARDL and DOLS. However, the p-value of the LNARL variable showed no statistical significance in all three applied models (ARDL, DOLS, and FMOLS).

5.4 Policy Implications

The paper says that the small change in output is due to the low levels of FDI in the country. This means that agricultural development can happen with little help from outside sources, which is supported by the study results that show FDI has a positive and significant effect on agricultural output. Thus, for foreign direct investment (FDI) to be successful, a responsive macroeconomic policy must be established, and the public must accept the necessity of spending money as the

norm if the investment is to provide the desired outcomes and increase investment. Important policy recommendations stemming from this study's conclusions are as follows:

First, to encourage the sustainability of the economic growth of the country, the government should offer suitable investment incentives to encourage foreign investments to participate in the development process of the agricultural sector. This can be done by making investments easier and giving foreign investors more freedom to get into the Somali market.

Second, the government should work to change the public's perception of farming as an old version of technology to attract more foreign and domestic investment and increase production. Macroeconomic policy must be reliable and consistent.

Third, governments and other corporations should be legally obligated to offer the necessary capital for agricultural sector advancement.

Fourth, Somalia should take steps to increase foreign direct investment because it is a key factor in economic growth. This implication is that improvement on the foreign direct investment leads to economic growth.

Finally, the study advocates a policy that is good for the agriculture sector and the environment. Foreign direct investment (FDI) will be very easy to get with these kinds of steps, especially in the agricultural and manufacturing sectors.

Investment profits can be more reliable if the country's politics remain stable. When investors leave due to a lack of trust in the government, tax revenue suffers. The confidence of people who own assets can be raised by passing laws that make it illegal to take away assets and goods without paying for them.

REFERENCES

Adams, S., Evans, E., & Opoku, O. (2015). Foreign direct investment, regulations and growth in sub-Saharan Africa. *Economic Analysis and Policy. 47*, 48-56.

AfDB, A. D. (2016). *Feed Africa: Strategy for agricultural transformation in Africa 2016– 2025.* . Retrieved from https://www.afdb.org/fileadmin/uploads/afdb/Documents/GenericDocuments/Feed_Africa_Strategy_for_Agricultural_Transformation_in_Afr.

Akande, O. R., & Biam, C. K. (2013). Causal relations between foreign direct investment in Agriculture and Agricultural output in Nigeria. *African Journal of Agricultural Research, 8(17)* , 1693-1699.

Almfraji, M., & Almsafir, M. (2014). Foreign direct investment and economic growth: literature review from 1994 to 2012. *Procedia – Social and Behavioural Sciences, Vol. 129*, pp. 206-213.

Alvarado, R., María, I., & Ponce, P. (2017). Foreign direct investment and economic growth in Latin America Economic. *Analysis and Policy. 56*, 176-187.

Blonigen, B. (2005). A review of the empirical literature on FDI determinants. *Atlantic Economic Journal, Vol. 33 No. 4*, pp. 383-403.

Brainard, S. L. (1997). A Simple Theory of Multinational Corporations and Trade, A tradeoff between proximity and concentration. *National Bureau of Economic Research*, 42-69.

Caves, R. (1996). *Multinational Enterprise and Economic Analysis.* New York: Cambridge University Press.

Chandio, A. A., Mirani, A. A., & Shar, R. U. (2019). Does agricultural sector foreign direct investment promote economic growth of Pakistan? Evidence from cointegration and causality analysis. *World Journal of Science, Technology and Sustainable Development, 16(4)*, 196–207.

Dadson, A.-V., & Sackey, R. A. (2018). Agricultural sector foreign direct investment and economic growth in Ghana. *Journal of Innovation and Entrepreneurship*, 1-15.

Dhungana, B. R., & Ghimire, R. (2013). The Role of FDI on agriculture sector in India. *Conference Paper: Foreign Direct Investment in India's Retail Sector: Issues and Options* (pp. 1-14). Gorakhpur, India: National Seminar organized by Department of Business Administration.

Dunning, J. (1993). *Multinational Enterprises and the Global Economy.* Addison-Wesley Publishing Company.

Dunning, J. H. (1998). Location and the Multinational Enterprise: A Neglected Factor? *Journal of International Business Studies, 29, 1*, 45-66.

Edeh, C. E., Eze, C. G., & Ugwuanyi, S. O. (2020). Impact of foreign direct investment on the agricultural sector in Nigeria. *African Development Review: WILEY Vol 32*, 551–564.

Effiong, J., & Eke, I. (2016). The Impact of External Capital Inflows on Crop Production in Nigeria. *International Journal of Advanced Academic Research, 2(4)*, 20-43.

Farrell, R. (2008). *Japanese investment in the world economy: A study of strategic themes in the internationalisation of Japanese industry.* Cheltenham, UK: Edward Elgar.

Gachunga, M. J. (2019). Impact of Foreign Direct Investment on Economic Growth in Kenya. *International Journal of Information Research and Review Vol. 06, Issue, 02*, 6161-6163.

Gilmonta, M., Hal, J., Grey, D., Dadson, S., Abele, S., & Simpson, M. (2018). Analysis of the relationship between rainfall and economic growth in Indian. *Global Environmental Change*, 56-72.

Görgen, M. R. (2009). Foreign direct investment (FDI) in land in developing countries. *Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Eschborn*.

Gujarati, D., & Porter, D. C. (2007). *Basic econometrics.* New York: McGraw-Hill.

Gunasekera, D., Cai, Y., & Newth, D. (2015). Effects of foreign direct investment in African agriculture. *China Agricultural Economic Review, Vol. 7 Iss 2*, 167 - 184.

Hallam, D. (2011). International investment in developing country agriculture issues and challenges. *Food Security 3 (S1)*, S91–S98.

Hymer, S. (1960). *The International Operations of National Firms. A study of FDI.* Cambridge: MTT Press.

Ibrahim, M. I., Omar, Z. M., & Ali, A. Y. (2017). The Determinants of Foreign Direct Investment in Somalia. *International Journal of Economics and Financial Issues, 7(3),* , 713-720.

Iddrisu, A., Immurana, M., & Halidu, B. (2015). The impact of foreign direct investment (FDI) on the performance of the agricultural sector in Ghana. *International Journal of Academic Research in Business and Social Sciences, 5(7)*, 240-259.

Idowu, A. A., & Ying, L. (2013). An Evaluation and Forecast of the Impact of Foreign Direct Investment in Nigeria's Agriculture Sector in A VAR Environment. *Journal of Economics and Sustainable Development Vol.4, No.10*, 17-28.

Izuchukwu, O.-O., Huiping, H., Abubakar, A. S., & Olufemi, E. A. (2014). FDI Trade and Its Effects on Agricultural Development in Nigeria: Evidence From Time Series Analysis. *International Journal of Management Science and Business Administration, Volume 1, Issue 1,*, 28-40.

Kubik, Z., & Husmann, C. (2019). Determinants of foreign direct investment in the African food and agriculture sector. *Center for Development Research (ZEF)*.

Kuslavan, S. (1998). A Review of Theories of Miultinational Enterprises. *CILT*, 163-180.

Mayow, M. A. (2021). The effect of foreign direct investment inflows on the economic performance in Somalia.

Melak, A. (2018). The Contribution of Foreign Direct Investment for Economic Growth of Ethiopia: Time Series Analysis. *International Journal of Contemporary Research and Review, Vol. 9, Issue. 02*, 20442-20454.

Mlachila, M., & Takebe, M. (2011). FDI from BRICs to LICs: emerging growth driver. *International Monetary Fund Working Paper No. WP/11/178, Africa Department, International Monetary Fund, Washington, DC*.

Moosa, I. A. (2002). *Foreign Direct Investment Theory, Evidence and Practice.* London: MacMillan Pelgrave .

Ogbanje, E. C., Okwu, O. J., & Saror, S. (2010). Agricultural sector, Agricultural Gross Domestic Product, Investment, Foreign Direct Investment, Nigeria. *PAT 6(2)*, 15-25.

Oloyed, B. B. (2014). Impact of Foreign Direct Investment on Agricultural Sector Development in Nigeria. *Kuwait Chapter of Arabian Journal of Business and Management Review Vol. 3, No.12*, 14-24.

Omar, Z. M. (2018). Foreign Direct Investment and Economic Growth in Somalia. *Journal of Economics and Sustainable Development Vol.9, No.18*, 48-54.

Ould, L. (2015). An Investigation of the Impact of Foreign Direct Investment on Economic Growth: A Case Study of Mauritania. *International Journal of Economics and Management Sciences 4: 224*.

Owutuamor, Z. B., & Arene, C. J. (2018). The Impact of Foreign Direct Investment (FDI) on Agricultural Growth in Nigeria (1979-2014). *Review of Agricultural and Applied Economics* , 40-54.

Rakotoarisoa, M. (2011, June 16-18). A contribution to the analysis of the effects of foreign agricultural investment on the food sector and trade in Sub-Saharan Africa. *Paper presented at the 14th Annual Conference on Global Economic Analysis*, pp. 1-31.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations.* London.

Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. *Research in Business and Finance. Vol 41,* 434- 444.

Tulus, T., & Tambunan, H. (2014). Identifying Business Models Adopted by FDI in Agriculture in Indonesia. *Journal of Economics and Development Studies Vol. 2, No. 1*, 99-130.

UNCTAD. (2012). World Investment Report : Transnational Corporations, Extractive Industries and Development. *United Nations Conference on Trade and Development. https://unctad.org/webflyer/world-investment-report-2012*.

UNCTAD. (2020). *World Investment Report : Transnational Corporations, Extractive Industries and Development.* United Nations Conference on Trade and Development. https://unctad.org/webflyer/world-investment-report-2020.

Vintila, D. (2010). FDI Theories: An Overviewof the main FDI Theories. *Academy of Economic Studies*.

Wen, Z., Zhuang, L., & Zhang, R. (2020). The Empirical Analysis on the Import and Export Technology Effect of Agricultural FDI in China. *Global Economic Review*, 1-14.

Yusuff, M., Afoloyan, O., & Adamu, A. (2015). Analysis of foreign direct investment on agricultural sector and its contribution to gross domestic product in Nigeria. . *Journal of Economic Trends in Economic and Management Sciences, 6(2),* 94 – 100.