LIBAN ABDINASIR HASHI

THE IMPACT OF TELECOMMUNICATION DEVELOPMENT ON ECONOMIC GROWTH CASE STUDY: SOMALIA

M.Sc. THESIS

SEPTEMBER 2023

NEAR EAST UNIVERSITY

INSTITUTE OF GRATUATE STUDIES

DEPARTMENT OF ECONOMICS

THE IMPACT OF TELECOMMUNICATION DEVELOPMENT ON ECONOMIC GROWTH CASE STUDY: SOMALIA

M.Sc. THESIS

LIBAN ABDINASIR HASHI

NICOSIA

September 2023

NEAR EAST UNIVERSITY

INSTITUTE OF GRATUATE STUDIES

DEPARTMENT OF ECONOMICS

THE IMPACT OF TELECOMMUNICATION DEVELOPMENT ON ECONOMIC GROWTH IN SOMALIA

M.Sc. THESIS

LIBAN ABDINASIR HASHI

SUPERVISOR

Assist. Prof. Dr. Abidemi Somoye

NICOSIA

September 2023

APPROVAL

We certify that we have read the thesis tittle **"THE IMPACT OF TELECOMMUNICATION DEVELOPMENT ON ECONOMIC GROWTH CASE STUDY: SOMALIA" (1970-2020),"** submitted by **LIBAN ABDINASIR HASHI** and that in our combined opinion it is fully adequate, in scope and in quality, in scope and in quality, as a thesis for the degree of Master of Educational Sciences, and hereby recommended for approval and acceptance.

Examining Committee	Name-Surname	Signature
Head of the Committee:	Prof.Dr.Hüseyin Özdeşer	.....
Committee Member:	Assist.Prof.Dr.Abidemi Somoye	.....
Committee Member:	Assist. Prof. Dr. Ala Fathi Assi	.....

Approved by the Head of the Department

06/09/2023

Prof. Dr. Huseyin Özdeser
Head of the Department

Approved by the institute of graduate Studies

/2023

Prof. Dr. Kemal Hüsnü Can Beser
Head of the Institute

Declaration

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Liban Abdinasir Hashi

...../...../2023

Acknowledgements

I am forever grateful to the Almighty Allah, the Source and Sustained of my life for His grace that has kept me till now. I could not have done this thesis without His enablement. I would like to thank my dynamic supervisory Prof.Dr.Hüseyin Özdeşer Chairman of Economics department Near East University, whose supervisory role had a major impact on the preparation of this paper, he made checked on the application that were not in accordance and turned them into a masterpiece. And this paper would not have been completed without his ingenuity and guidance through the processes. I would like to say thank you my supervisor Assist. Prof. Dr. Abidemi Somoye for his contribution of to work, this paper would not have been completed without his ingenuity through the process his response to emails sent by me daily make this work what it is now and I am grateful for his role played.

I would like to say thank you to Assist. Prof. Dr. Mehdi Seraj from the department of economics for his encouragement during this academic sojourn, his encouragement during my econometric class left an incredible mark and I am grateful. He made the applications of the various econometric tools easier for me to understand, from its installment to the applications and by extension, the interpretations of various results. I would like to thank my brother, the Aweiz, who's helping hand have made life easy for me since I embarked on this pursuit of master's degree, his respond to my request each time made life easy for me on this island. I will be indebted for the rest of my life because of the significant role he played in the accomplishment of my scholastic endeavours. My pursuit of a master's degree would have been doomed to failure in the absence of his financial support. I would like to thank my father Mr. Abdinasir Hashi and Mother Shukri Abdi for their continue support from childhood till now, their sacrifices have taken us through the unimaginable and because of them and through Allah, that I am able to reach this far.

Liban Abdinasir HASHI

ABSTRACT

THE IMPACT OF TELECOMMUNICATION DEVELOPMENT ON ECONOMIC GROWTH IN SOMALIA (1970-2020)

Liban Abdinasir HASHI

MA, Department of Economic, Near East University, Nicosia.

Supervisor: Assist. Prof. Dr. Abidemi Somoye

Sep, 2023, 97 pages

The study aims to assess the impact of telecommunication development (TEL), foreign direct investment, trade openness, exchange rate and on Somalia's economic growth for the 1970-2020 periods. The background of the study, the problem statement, importance of the study, the statement of hypothesis, and the definitions of importance terminology were all covered in Chapter 1 of this research. The literature review, which deals with the theoretical and empirical literature, conceptual mode, the discussion of how different factors affect economic growth, as well as crucial growth theories of growth, is covered in chapter 2. The Augmented Dickey-Fuller test and the Phillip-Perron test were used in this study, and the results show that all of the variables were stationary at intercept and intercept and trend level at first difference. In order to verify the results ARDL model, Serial correlation test, Heteroskedasticity test, Ramsey test, and cumulative sum (CUSUM) test were utilized. The findings of empirical tests suggest that TEL telecommunication development are connected to Somalia economic growth. To conclude, the results of the instruments used imply that the relationship between the variables is unidirectional.

Keywords: Telecommunication development, foreign direct investment, trade openness, exchange rate, Economic growth.

Özet

Çalışma, 1970-2020 dönemleri için telekomünikasyon gelişiminin (TEL), doğrudan yabancı yatırımın, ticari açıklığın, döviz kurunun ve Somali'nin ekonomik büyümesi üzerindeki etkisini değerlendirmeyi amaçlamaktadır. Araştırmanın arka planı, problem cümlesi, çalışmanın önemi, hipotez cümlesi ve önem terminolojisinin tanımları bu araştırmanın 1. Bölümünde ele alınmıştır. Teorik ve ampirik literatürü, kavramsal modeli, farklı faktörlerin ekonomik büyümeyi nasıl etkilediğine ilişkin tartışmayı ve büyümenin önemli büyüme teorilerini ele alan literatür taraması, 2. bölümde ele alınmaktadır. Artırılmış Dickey-Fuller testi ve Phillip -Bu çalışmada Perron testi kullanılmış olup, sonuçlar tüm değişkenlerin kesme ve kesme noktalarında ve birinci farkta trend düzeyinde durağan olduğunu göstermektedir. Sonuçların doğrulanması amacıyla ARDL modeli, Seri korelasyon testi, Değişken varyans testi, Ramsey testi ve kümülatif toplam (CUSUM) testi kullanılmıştır. Ampirik testlerin bulguları TEL telekomünikasyon gelişiminin Somali ekonomik büyümesiyle bağlantılı olduğunu göstermektedir. Sonuç olarak, kullanılan araçların sonuçları değişkenler arasındaki ilişkinin tek yönlü olduğunu göstermektedir.

Anahtar Kelimeler: Telekomünikasyonun gelişimi, doğrudan yabancı yatırım, ticari açıklık, döviz kuru, Ekonomik büyüme.

Table of Contents

List of Tables

List of Abbreviations

ADF	Augmented Dickey Fuller
PP	Phillips-Peron
OLS	Ordinary list square
ARDL	Autoregressive Distributed Lag
EC	Economic growth
FDI	Foreign direct investment
TOP	Trade openness
EXR	Exchange rate
TEL	Telecommunication
ECM	Error correction model
OECD	Organization on economic cooperation and development
GDP	Growth domestic product
GNP	Growth national product
U.S.	United States

CHAPTER I
INTRODUCTION

1.1 Introduction

The world is destined to become a global village as a result of the development of innovative and cutting-edge technologies, and this scenario is becoming more and more likely every day. Widely scattered economic activity is possible thanks to people employing cutting edge technology for communication in both the real world and on the credit market. The telecommunications infrastructure that nations and enterprises need to enable post-industrial, information-based economic growth in the twenty-first century is a challenge for them. Modern telecommunications infrastructure is necessary to link national credit and commodities markets with international financial and commodity markets, in addition to fostering economic growth (Kambil & Short, 1994).

The telecoms industry has grown quickly in a number of nations over the last 20 years. The opening of markets, privatization, and advancements in telecommunications technology are only a few of the factors contributing to the rapid spread of telecommunications services. The output of the world economy has likewise grown over that time. Particularly many transitional economies and developing nations have experienced rapid growth. The advancement of telecommunications technology is a recognized factor influencing globalization and the expansion of the global economy.

The development of satellite, optical fiber, mobile technologies, the Internet, and the World Wide Web has greatly improved human connections and information exchange on a global scale. Even accessing the internet services provided by telecom companies is still too expensive in Nigeria, despite the extensive and significant investments made there. Telecommunications companies blame Nigeria's institutional problems, including government policies and a lack of social infrastructure (such as energy, security, and water), for the expensive and inadequate services provided there.

The internet has become into a vital resource for learning, interacting with others, and growing businesses in Nigeria. With its popularity existing widely recognized is

interpersonal, business reasons, & educational endeavours is the United States, Europe as a whole and some regions of Asia, Nigeria is making enormous strides in adopting its usability and application. Few businesses could afford internet connection, which is now widely available in big cities and is mostly offered by the telecoms industry.

Numerous studies have looked at the connection between communications and economic development since the early 1990s. Many studies have looked at the effectiveness of telecommunications in various nations and locales. However, as circumstances for post-1998 productivity improvements and telecommunication development started to take root, few of them did so. Numerous countries started their telecom reform in 1998 or later. Over the past ten years, mobile telecommunications have also expanded quickly in several countries. Due to the availability of mobile telecoms services, a sizeable amount of private money (both domestic and foreign investment) has been drawn to the communications sector (Gruber & Verboten, 2001). The implications of mobile communications or telecoms reform on economic growth and productivity have not been adequately investigated in prior research findings. By offering a distinctive analysis of how mobile communications may affect economic growth and telecoms productivity, this paper seeks to address a knowledge gap in the field.

1.2 Background of the study

Since it was previously thought that boosting the agricultural and industrial industries was the best way to enhance a country's economic growth, all governments accorded these industries more weight in its strategies and plans. This trend has evolved due to the advent of other factors, such as the involvement of service industries and advances in technology, as well as the growth of these two important economic sectors. With the expansion of communications services, new market mechanisms, low-cost structures, and an enlarged value chain of businesses are all possible. (Kambil & Short, 1994), However, in poor countries, areas with access to telephone lines usually charge more on average for agricultural goods than areas without (Bayes et al., 1999).

Various methods were used by nations to upgrade their telecommunications infrastructure. It is true that the telecom sector enhanced the country's reliance on the foreign economy. The economy is impacted by telecom both directly and indirectly. Telecommunications' immediate benefits draw foreign direct investment (FDI), which opens up a range of sector-level opportunities and higher-paying jobs, an increase in the need for specialized labor, increased trade, passing on technological know-how to locals, etc. In a same vein, the market expansion brought about by liberalization gave consumers more options for what to buy. Mobile phone and wireless companies created the market for equipment that was competitive and offered cutting-edge advances.

As a result, a very competitive labor market was produced. On the other hand, call centers, customer support centers, and mobile phone franchises proliferated. Thanks to improvements in telecommunications, businesses may now interact with one another relatively easily and have internet access to the global market. The telecommunications industry continues to be essential to the expansion of any economy. Because it connects national credit and commodities markets with worldwide financial and commodity markets, technological communication infrastructure is essential for both local and international growth. This facilitates the free flow of foreign investment, the profitability of net exports, the expansion of the GDP, etc. It is believed that recent developments in telecommunications technology have created a competitive and successful commodity market. The 21st century is defined by the expansion of the vital telecommunications infrastructure for both nations and enterprises.

The telecom industry has expanded significantly on a global scale since the 1980s. Around that time, wealthy countries started to preserve their technological advancements in the telecommunications sector, whereas emerging nations started to develop their own telecommunications infrastructure after realizing the value of the sector for economic development. State-owned businesses were privatized as a consequence of this endeavor, and the telecoms industry experienced reforms. Recently, it has become clear how crucial the telecom sector is for economic growth, especially in developing countries.

The telecoms industry has grown quickly in a number of nations over the last 20 years. There are numerous variables that have fueled the telecommunications industry's explosive rise, including such as market liberalization, privatization, and developments in telecommunications technology. During that time, the global economy's output increased. Particularly many transitional economies and developing nations have experienced significant development. The advancement of telecommunications technology is a recognized factor influencing globalization and the expansion of the global economy. The development of satellite, optical fiber, mobile technologies, the Internet, and the World Wide Web has greatly improved human connections and information exchange on a global scale. The development of telecommunications technology has allowed for the globalization of trade and commerce.

The flow of information is now a vital resource because to improvements in communications technology. After Graham Bell's invention of the telephone in 1876, just over a century later, it has impacted almost every aspect of modern society. Access to and use of a telephone as part of telecommunication services has long been suggested to be a critical component of economic development given that the use of telephones has expanded most dramatically in industrialized countries (Wellenius, 1977).

Since 2000, it has been increasingly obvious how important the telecom sector is for economic growth, particularly in emerging economies. Many countries had issues with their telecommunications infrastructure. It is true to say that this industry increased the foreign sector's economic contribution to the national economies. There are differences between telecoms' direct and indirect economic consequences. Foreign direct investment (FDI) is significantly impacted by the telecommunications industry. The inflow of foreign cash into the country opens up a lot of options at the sector level. The demand for qualified individuals has expanded as a result of these new foreign service providers, and opportunities for well-paying jobs have also increased. In a similar line, the liberalization-induced market expansion gave customers more options for what to buy.

The marketplace for equipment that was highly affordable and offered cutting-edge innovations was formed by mobile phone and broadband firms. Nevertheless, the growth

of calling centers, customer service centres, and mobile phone franchises led to an increase in indirect labour and the emergence of a fiercely competitive labour market. Second, the development of telecommunication has also affected business activities. Thanks to the internet, companies can now connect with one another rather readily, and business owners may use it to access a worldwide market. New businesses strengthened the financial sector, and international investors could now easily access the stock markets of any nation in any region of the world.

In poor nations, a major barrier to economic growth and development has been a lack of access to telecommunications services. According to Alleman et al., (2004), claim that all of the continents, including Africa, have insufficient power supply, slow economic expansion, and sparse infrastructure and telecommunication coverage. However, between 2005 and 2015, mobile phone penetration increased throughout Africa, albeit more slowly than it did within Europe as well as the United States of America. This demonstrates that, as of 2005, mobile phone penetration within Africa remained lower than it was in Europe. (ITU, 2016). Electronic communication has advanced with the advent of telecommunications services, resulting in effective business communication that fosters economic progress.

A few research investigations have explicitly incorporated the expenditures made in telecommunications networks in a macro (aggregate) manufacturing process or an across the nation growth model to determine the effect of telecommunication on economic growth. Amplification (Madden & Savage, 2000), expansion (Mankiw et al., 1992), Their results showed an important beneficial connection within the telecommunications capital and economic growth globally through converting teledensity (the amount of primary telephone lines per 100 people) to the percentage of national gross domestic product related to the telecommunications investment using data collected for 43 countries between 1975 and 1990.

According to a different study, the economy as a whole and the communications network were intertwined (Roller & Waverman, 2001). Before constructing a micro model using the macro production function, they first constructed a small-scale

representation of supply and demand for telecom infrastructure. They found a significant causal relationship connecting the telecom industry to overall output. To assess how telecom infrastructure affects economic growth, (Datta & Agarwal, 2004) extended (Barro, et al., 1991)'s cross-country growth paradigm. We use delayed real Gross Domestic Product (GDP) per capita and first-lagged estimates of teledensity. They separately determined the connection between teledensity and economic growth. Then, to check for convergence, they used a model with a dynamic panel based on data. (Islam, 1995).

The African telecom industry began to undergo a considerable shift in the late 1990s.The mobile telecoms industry has expanded significantly in comparison to fixed line networks in nations like Nigeria, Uganda, and Cote d'Ivoire (ITU, 2006). The industrial revolution, the expansion of wireless mobile telephony, and the economic transformation of Africa in the early 1990s all had an impact on the development. It is clear that there are more fixed line service monopolies today. Africa experienced the highest growth in the globe. Compared to 14% in Oceania, 7% in Europe, 23% in Asia, 19% in America, and 7% in Oceania, this region had over 37% of the world's fixed line service monopolies. (ITU, 2007).

Applying an evolving fixed-effects panel data model, Datta & Agarwal (2001) investigate the effects of telecommunication deployment on economic growth for 22 OECD countries between 1980 and 1992. If they are greater connection lines per 100 persons, real GDP per person across the group of research nations has been seen to rise dramatically. The lagged values of the infrastructure for the telecommunications variable's statistically significant positive coefficients further imply that the effect is causal. The decline in returns on telecom infrastructure investments, as the authors also find, may be having a greater impact on telecom uptake in developing countries with fewer access lines. Between 1996 and 2003, information from 38 developing countries was used to assess how the use of mobile technology affected GDP growth (Waverman et al., 2005). The authors' initial strategy is to use a simultaneous equations model (Roller & Waverman, 2001).

The Generalized Approach of Moments is employed to estimate this model. The estimations indicate that mobile phone communications have a sizable positive impact, but this advantage is exaggerated and is not resistant to the addition of new nations or alterations to the framework's fundamental assumptions. In order to develop a cross-sectional endogenous growth model that is equivalent to using data for 92 countries between 1980 and 1996 to 2003, the authors employ ordinary least square regressions (Barro, 1991).

The expansion of the economy may be impacted in a number of ways by investments in telecommunications infrastructure. The goods that it generates, including cables and switches, are the main reason why investing in the telecommunications sector encourages growth. The demand for the goods and services necessary for their production ought to increase. The financial returns from investments in telecommunications infrastructure are also far higher than those from telephony alone. There are limitations to business contact if a telephone system goes offline. It costs money to place orders, obtain information, and hunt for services. While the mobile phone connection reaches its peak age, business costs for specific industries will decrease as output rises. Since managers can now communicate clearly over longer distances, the telephone may have an economic impact (Hardy, 1980).

The efficiency of productive units is increased by investments in telecommunications infrastructure and the services they provide. With the flexibility to communicate at any time, businesses have more opportunity to start profitable new businesses. Additionally, when the industrial process's information density rises, this effect becomes more significant. Investments in the telecommunications sector may therefore help other businesses. A nation's economic development is seen to be significantly impacted by the externalities and major knock-on effects of telecommunications investments.

The development and modernization of the infrastructure for communication has been one of the most significant technological developments in the previous 50 years. Since the 1980s, initial or the second-generation wireless networks for communication have greatly enhanced personal communications. Due to the development of wire line

telecommunications networks, a sizable portion of the world's population, particularly in industrialized countries, could communicate via fixed-line telephony. Technology for information and communications (ICT) has developed beyond the telephone, yet. Data transmission rates around the world are now achievable due to speed internet connections like digital subscriber lines (DSL) or Cable Internet. It is now possible to achieve much faster up- and download speeds as fiber-based wire line broadband access technologies like FTTH (Fiber-to-the-Home), FTTB (Fiber-to-the-Building), or hybrid FTTC (Fiber-to-the-Cabinet) and FTTN (Fiber-to-the-Node) technologies have started to replace the slower entirely copper- or coax-based first-generation wire line technologies.

The fourth generation (4G) mobile broadband technology known as Long Term Evolution (LTE) was introduced in 2010 and considerably enhanced cellular telecommunications networks. To entice investment from high-income nations that had already taken part in the privatisation process, the majority of African governments liberalised the telecoms industry. Unlike the private companies that normally dominated the mobile phone industry in Africa, fixed-line telephone services were typically offered by monopolies that were owned by the government. A telecommunications regulatory body is in existence in 83.3% of African economies, and partial or complete competitive systems are present in 93.3% of them. (ITU, 2007).

By 2010, virtually all populated rural locations in a number of African countries had mobile signal coverage. Other nations with mobile rural coverage rates of over 90% include Kenya, Malawi, Mauritius, Seychelles, South Africa, Comoros, Kenya, and Uganda. Other nations' efforts to expand rural mobile coverage ought to be effective by the end of 2015. (Enowbi, 2008) These nations include Cape Verde and Burundi.

Investments in telecommunications infrastructure may have a variety of effects on the economy. The demand for the items it produces, such as cable, switches, etc., which in turn boosts demand for the products and services that go into their manufacturing, is the most visible way that investment in telecommunications infrastructure supports growth. Financial returns from telecommunications infrastructure investments are likewise substantially higher than those from telecoms alone. There are limitations to business

contact when a telephone system is offline. There is substantial transaction costs associated with placing orders, finding information, and looking for services. Business costs will decline as an industry's output increases and the telephone network reaches its maximal maturity. Any potential economic effects of the telephone will result from managers' better capacity to interact quickly over greater distances (Hardy, 1980).

The productivity of producing units is increased by investments in telecommunications infrastructure and the services they provide. Businesses are more likely to launch fresh, beneficial initiatives when they have the freedom to communicate whenever they choose. Additionally, when the knowledge complexity of the manufacturing procedure rises, this effect becomes stronger. Consequently, investing in the telecommunications sector could be advantageous for other businesses. It has been proposed that telecommunications investments have a substantial impact on a nation's economic development because to their large externalities and spillover effects.

Configuring traditional phone systems and data networks, finding cell towers, and assessing radio antennas are a few examples of services linked to telecommunications infrastructure. Telecommunications infrastructure services make it feasible to set up, maintain, and provide advice regarding electronic communications. The digital environment has changed as a result of the proliferation of technology, especially in Africa.

According to Kumar & Patel (2015), these changes are now achievable thanks to telecommunications services. In many small and developing nations, telecommunications are still maturing and undergoing important reforms in order to reach a point where it can effectively connect businesses and speed up production processes at an affordable price. Companies as well as sectoral components are quickly participating in post-industrial and information-based economic growth with the necessary telecommunications networks due to the speedy passage through growth stages brought about by technological advancements. (Noah & David, 2013).

Fundamental research has been done on the relationship among telecommunication expenditures on infrastructure and economic growth. Since Jipp's (1963). While some

studies concentrate on time series unique to a country or industry, others look at a cross-section of nations over time. Economic development and investments in telecommunications infrastructure are strongly correlated, according to empirical studies, with investment returns being larger in developing countries (Dholakia & Harlam, 1994).

Economic growth and telecommunications investment are also causally linked. The improvement in the percentage of national income spent on telecommunications services brought about by investments in telecommunications infrastructure encourages even more telecommunications investment. It is immensely fascinating to measure how much telecommunications contribute to economic growth, especially in light of the massive global investments made in telecommunications infrastructure. Economic researchers support the ITU approach, which measures the stock of telecommunications capital using major telephone lines, despite the fact that they lack investment information for many developing nations. A thorough statistical investigation of this proxy's accuracy has not been performed.

The recent growth in network capacity and tele-accessibility on a worldwide scale is evidence of the vital part that telecommunication plays in achieving economic success. . The number of fax machines increased from 14 million to 35 million globally between 1990 and 1995 (a 19.3% average annual growth), whereas the teledensity—the number of primary telephone lines per 100 people—rose from 9.9 million to 12.1 million globally (a 4.2 percent average annual growth) over the exact same time period. Between 1990 and 1995, these additions were made. It goes without saying that developing countries have quicker growth rates (ITU et al., 1997) estimated that telecommunications investments would amount to an average of 124 billion US dollars (USD) between 1996 and 2000, with the primary telephone lines having an average yearly growth rate of 8.4%. For instance, between 1990 and 1995, the average annual growth rates in Africa for telephone lines, fax machines, and teledensity were 7.9%, 32.2 percent, and 4.9 percent, respectively.

A contemporary telecommunications infrastructure is necessary for an economy to drastically change and become more competitive. Modern infrastructure for telecommunications is crucial for developing countries because it promotes regional economic growth and draws in fresh investment from both local and international sources to further advance sustainable development. All facets of society are now covered by universal telecommunications services in the sophisticated advanced economies of Europe and America. Mobile phone ownership in America increased from 52.1 percent in 2005, to 112.2 percent in 2015, followed by to 112.8 percent in 2018. In contrast, the proportion of individuals in Europe who possess a mobile phone rose from 91.7 in 2005, to 120.6 in 2015 until dropping to 120 by 2018. Africa now has 76 mobile phones per 100 people, up from 76 in 2018, 75.3 in 2015, and 12.4 in 2005 (ITU, 2019).

The rapid rise of the world's tele-accessibility or network infrastructure highlights the critical role which telecommunications play in the advancement of the economy. Between 1990 and 1995, the overall amount of phone lines went form 520 million to 692 million (a rate of 5. average yearly increase), and the total number of fax devices increased from fourteen million to 35 million. The teledensity, or primary phone lines per 100,000 persons, increased from 9.9 to 12 million during this time. There is a reputation for faster growth in less developed countries. For instance, between 1990 and 1995, the average annual growth rates in Africa for telephone lines, fax machines, and teledensity were 7.9%, 32.2%, and 4.9%, respectively (ITU, 1997). The ITU (1997) anticipated that between the years 1996 and 2000, the overall number of major telephone lines will increase by 8.4% annually. Has an annual investment in telecommunications of USD 124 billion.

Since 2000, more people have realized how crucial the telecom industry is to economic development, particularly in developing countries. There were problems with the telecommunications infrastructure in many nations. It is true that this industry has increased the nation's dependency on the world economy. The economy is impacted by telecom both directly and indirectly. The telecoms sector is attractive to foreign direct investment (FDI) and is significantly impacted by it right away. Opportunities in numerous industries are made possible by the country's increase in foreign investment.

These new international service providers have increased the need for skilled workers and opened up chances for well-paying employment.

In a similar line, the liberalization-induced market expansion gave customers greater choices for what to buy. Cell phones and wireless companies created a market for equipment that was competitive and offered cutting-edge advances. As calling centers, customer service places, and cellphone franchises expanded, so did the number of indirect jobs and the level of labor market competition. Second, the development of telecommunications had an effect on commercial activity. With the internet, businesses can now connect with one another relatively readily, and entrepreneurs may use it to tap into a global market. New businesses strengthened the financial sector, and international investors could now easily access the stock markets of any nation in any region of the world.

The inability of Nigeria's economy to generate revenue is significantly impacted by these issues in the telecoms sector. The difficulties the telecom industry has faced have also increased the cost of utilizing their services. Commercial companies' use of telecommunications services will increase manufacturing expenses, which could cause a decline in business sector profitability. The GDP will be affected because it is calculated using the mean efficiency of all businesses.

The use of telecommunications and several metrics of economic prosperity have been linked by many economists. Jipp (1963), by illustration, used data from numerous nations to examine the relationship between income and telephone density and discovered a positive association between the two. Studies on how communications effect economic growth in the late 1970s provided some hopeful results, according to Saunders et al. (1994). Furthermore, (Bebee & Gilling, 1967) examined the connection with the implementation of telephone facilities and economic growth using data from 29 nations in various stages of development. There is a wealth of credible data in the literature that clearly shows how important communications infrastructure is to economic growth.

Given the large number of research, it is evident that telecommunication and economic growth were related. For instance, a study by Jorgenson (2001) conducted in the US discovered that investment in information technology (IT) were responsible for more than half of the recent rise in US economic growth. He worked with (Dedrick & Kraemer, 2001) on the study. Who analyzed data from 43 nations to support the notion that raising IT spending is associated with rising productivity. To your surprise, you can communicate with your loved ones while working on your farm thanks to Somalia's widespread use of telecommunication.

Telecommunications companies have begun to compete with one another in an endeavor to rule the market. Consumers gain as a result of price reductions made by businesses in reaction to competition. It goes without saying that Somalia's telecom sector is growing daily and that each company deploys new technological innovations, some of which include (microwave, fiber optic, and most recently a dielectric). On the other hand, when these companies flourish or bring technological progress and stable increase, telecoms in Somalia speed up a completely new range of economic development (Enowbi, 2008).

Six major firms offer telecommunications services in Somalia. They are Golis Telecom, Hormuud Telecom, Telecom Somalia, Telesom, and Somafone. They offer a variety of goods and services, including Landline, GSM, roaming, top-up, data messaging, MMT, voice, security, 3G, GPRS, and much more. All of these services are focused on expansion and competitiveness. They employ a variety of tactics to acquire a persistent competitive advantage (Ali & Dhaha, 2013).

Inflation is a result of economic expansion, which is the steady increase of the marketplace value of the things an economy produces. It is frequently expressed as the real value of the economy, or real GDP. The GDP's geometric yearly increase between the beginning to the last year over a certain length of time is a common definition of economic growth. Inadvertently, this growth rate highlights a pattern in the mean amount of GDP over the time period rather than the GDP instability that surrounded the trend.

1.3 Statement of the Problem

The Somalia telecommunications industry is always growing, and each company introduces new technology that encourages the development of all other businesses. Additionally, this sector actively involved in fiscal and monetary policy. In order to advance my investigation of Somalia's telecommunications providers, I set out to discover a solution to the problems Somalis experienced with their mobile cellular subscriptions, including Hormmud, Somtel, and Golis. Additionally, the fierce rivalry has forced mobile telecommunications businesses to put more of an emphasis on customer retention than on consumer satisfaction.

1.4 Importance of the study

The government of Somalia and decision-makers found the results of this study in the ministry of communication and technology valuable. The results of this study were also very significant for the telecommunications industry, and they will be helpful to my investigation of Somali telecommunications firms like Hormmud, Somtel, and Golis. Itself to promote regional economic growth. Future research in such a war-torn nation can use the study's findings as a baseline. Since the Somali republic's fall in 1991, In the telecommunications industry, private businesses have helped the nation's economy advance by offering crucial services to the general public and respecting corporate social responsibility. This study is beneficial to private telecommunications firms as well because it will make it easier to identify the right person using a mobile phone.

1.5 Objective of the study

1. To determine how telecommunication development affected Somali’s economic growth in Somalia.
2. To ascertain how trade openness effect economic growth in Somalia.
3. To ascertain how exchange rate affect economic growth in Somalia.
4. To ascertain how foreign direct investment affected economic growth in Somalia.

1.6 Research questions

1. What is the link between Somalia's telecommunications development and economic growth?

2. How does Somalia's economic growth respond to trade openness?

3. What part does foreign direct investment play in Somalia's economic growth?

4. What effect does the exchange rate have on Somalia's economic growth?

1.7 Hypothesis

The hypothesis is stated below:

H1: Economic growth and telecommunications development are positively connected.
H2: Economic growth and trade openness have a beneficial relationship.
H3: Economic growth and foreign direct investment go hand in hand well.
H4. The growth of the economy is correlated with that exchange rate.

1.8 Definition of terms

Telecommunications development: Telecommunications are becoming a more vital part of the economic infrastructure in the industrial sector. The industry's need for cutting-edge communications technology for competitive reasons has led to this understanding. Less developed nations are starting to understand how poor telecommunications services would deter new investment and put current sectors at a competitive disadvantage.

Trade openness: To gauge trade openness, import and export volumes are normalised by GDP Mishra et al. (2007), found a significant correlation between bilateral equity investment and underlying trade developments. In order to invest in international assets, Trading provides investors with a better opportunity to learn about international markets' accounting and regulatory requirements. Additionally, the risk of default declines as trade integration increases. Finally, trade transactions may directly contribute to cross-border financial flows such as export insurance, trade credits, and payment facilitation.

Information on trade openness is available from the World Development Indicators of the World Bank.

Foreign direct investment: is a sort of international investment in which domestic enterprises use foreign assets but not equity investments. It invests privately raised money from abroad in goods or services. Typically, the foreign firm investing the foreign currency controls the domestic company in which the investments are made. FDI is now an essential component of any nation, especially developing nations. Rising production and consumer demand are indicators of economic development. The economy expands when both the population and per capita consumption rise. The real rise in the economy as a whole, or gross national product (GNP) is a common and well-liked indicator for gauging economic growth (Ayres & Robert, 1989).

Economic growth: is the gradual increase in the value of the products which an economy produces in the market, taking inflation into account. One common way to express it is the real GDP, or actual national product. The GDP's geometric yearly increase between the beginning to the preceding year over a particular period of time is a common way to describe economic growth. This rate of growth obliquely depicts an increase for the mean amount of GDP over the period relative to the Average Income volatility that follows the trend.

Exchange rate: International trade and cross-border money transfers are impacted by the relative values of two currencies. The exchange rate is the price of one currency in terms of another. Depending on the context, they might be presented as either an average rate throughout a certain time period or an end of period rate. The World Bank and IMF both agree (IMF), exchange rate can be broken down in to three primary classifications: (1) market rates, which are established by the market; (2) official rates, which are decided by the government; (3) currency rates.

CHAPTER II
LITERATURE REVIEW

2.1 Introduction

The terms and ideas associated with the rise of telecommunications, the relationship between telecommunication and economic development, including the consequences of trade openness, exchange rates, and foreign direct investment will all be covered in this chapter.

2.2 Telecommunication development

In order to integrate into this global community, developing countries work to sustain and develop their technologies. Recent developments in communication technology have led to the emergence of a strong and valuable commodity market. In order to equip themselves with the essential telecommunications system as the twenty-first century transitions into post-industrial, information-based economic growth, nations and industry are attempting to do so (Kambil & Short, 1994).

The telecommunications industry has grown significantly as a result of investment, and it now supports many other crucial sectors and is one of the main forces behind economic expansion. The efficacy and productivity of the economy can be significantly boosted by telecommunications technologies, according to (Becchetti L., Londono Bedoya, D.A., & Paginate 2003). The majority of these technologies were created as communications services advanced using mobile communications, fixed main lines, and the Internet; as a result, new market mechanisms, low-cost structures, and an expanded value chain of businesses are now all easily accessible (Kambil & Short, 1994). But in developing nations, places with telephone infrastructure typically have average agricultural commodity prices that are higher than places without (Bayes et al., 1999). The telecoms sector has seen considerable global changes since the 1980s.

Due to the fact that investments in telecommunications increase consumer interest in goods and services and have a clear yet indirect effect on the production process, it is

anticipated that the economic return will be significantly greater than the return on investment alone (Batuo, 2008). It is anticipated that such investments in Africa would increase as a result of the abundance of opportunities in industrialized nations. In particular, given the enormous untapped market potential (along with frequently restricted access to finance and comparable lower labor and rent costs) (Luis & Stephan 2011).

Telecommunications help to lower communication costs by promoting interaction among sellers and buyers, rural and urban areas, and between and within sectors. Because of this, individuals and groups may easily, rapidly, and cheaply share and get information on a variety of political, economic, and social problems (Aker & Ambit, 2010). During that time, developed nations began to expand or maintain their telecommunications infrastructure, while developing nations also began to do so after realizing the sector's significance for their own economic development. They have gradually enacted changes to the telecommunications industry and privatized state-owned businesses. On a small scale, researchers made an effort to contribute to the creation of a theoretical framework with policy implications in this domain (Kambil & Short, 1994).

In addition to proving the idea that telecommunication may be one of the variables that drive economic growth, the study intends to investigate the connection among demand with telecommunication services and economic growth. Several studies have indicated that ICT has a range of effects on economic growth, particularly in developing as well as industrialized nations. These research projects, which (Dewan & Kraemer, 2000), a link between IT investment and worker productivity exists in wealthier nations but not in less developed ones. This was accomplished using data gathered from 36 different countries between 1987 and 1993. For the year 2001, he used information from the European Union (also known as the) and the Organization for Economic Cooperation and Development, or OECD, during the years 1992 to 1997. He discovered that, although having a significant impact on GDP growth globally throughout the 1990s, the European Union had been less impacted by ICT than other developed countries.

In CEE nations undergoing change, the connection between the growth of the telecommunications sector as well as the growth of the economy was investigated by (Madden & Savage 1998). They found a connection between telecommunications investment and economic growth. (K.S. Sridhar & V. Sridhar, 2007). Through the global communications network or important equipment manufacturers, the communication infrastructure of the rich countries is accessible to many developing nations. These connections have caused the telecommunications branch to take on a dual structure, one of which can be viewed as the "advanced" sector and the other as the "traditional" sector. Data transit, mobile phone services, and cable television are examples of the former. The latter comprises the telegraph, radio, and conventional telephone service.

Due to the fact that an effective growth strategy must focus on the conventional sector's largest expansion, this dual structure is a sign of underdevelopment. The advanced sector will finally be able to develop thanks to the financial and human resources that the conventional sector will eventually produce. To operate cable television and introduce the use of terminals for data transfer, for instance, the conventional telephone system must have advanced sufficiently. Sadly, developing nations typically waste their resources by distributing them in a way that would be better suitable for developed nations in their quest for national stature.

Additionally, virtually all new countries establish a local equipment sector for their national communications network in the early phases of their economic development. This industry frequently receives government funding and is formed with the aid of foreign businesses due to a lack of human capital. The regional equipment industry benefits directly from the government in a considerable way through tax cuts and tariff protection. Additionally, sales to the telecommunications industry, which is frequently governed by a government agency, offer a safe market for the neighborhood business. Equipment sales frequently outpace actual telecoms service needs. Such industries would never be able to financially sustain themselves. Additionally, they have very little chance of success in international markets.

Investments in telecommunications infrastructure have a number of possible effects on economic growth. The items it produces, like as cables, switches, etc., which raise demand for the commodities and services that go into their creation, are the most visible way that investing in telecommunications infrastructure fosters growth. Additionally, financial returns from investments in telecommunications infrastructure are much higher than those from telecommunications alone. When a telephone system is broken, business contact is restricted. Placing orders, obtaining information, and looking for services are all connected with significant transaction costs.

As the telephone network reaches its maturity, business expenses for specific industries will decrease as output rises. If the telephone has any economic impact, it will be due to managers' increased ability to communicate swiftly over longer distances. (Hardy, 1980). Because of this, investing in telecommunications infrastructure has a number of advantages that help productive units run more effectively. Interaction between companies will boost their ability to make innovative, successful endeavors. With the industrial process's increased information density, this effect likewise becomes more significant. Therefore, investments in the telecommunications industry might benefit other industries.

The majority of study has concentrated on industrialized nations; as a result, there is scattered and unclear empirical evidence regarding how telecommunications infrastructure affects economic activity in developing nations. The primary source of knowledge about the connection among the amount of telecommunications facilities with economic development in emerging countries is cross-country research. The literature's examination of developed and developing nations also raises some concerns because the benefits of telecommunications investment on economies may vary depending on each nation's degree of development. Therefore, it's likely that developing countries won't be able to instantly apply the lessons learned by those developed countries. Due to the fact that making investments in infrastructure for communication is desired, if not essential, as a tool for significant economic growth in rising nations, there has been a requirement for empirical investigations in this field using data from just one country.

From 1970 to 1997, state-level data for the US were used. Consider how telecommunications infrastructure expenditures impact the expansion of the regional economy (Yuma et al., 2002). The authors build a production-function model that includes networking and regional spillover variables using balanced two-step least squares regressions and first-difference specialized least squares. The findings show that raising the state's telecommunication capital stock has a considerable beneficial impact on its economic output growth in addition to having a significant negative impact on other states. These detrimental spillover effects by a state that raised its telecommunication expenditure between 1984 and 1997 are greatly amplified by geographic proximity.

Used data from emerging nations to examine the link between telecommunications and economic growth. They evaluated several equations that account for economic growth, telecommunications adoption, the availability of investment in telecommunications, and all of these factors. Three-stage least squares (SLS) analysis. Both landlines and mobile phones were independently used to calculate these calculations. They found that while traditional economic explanations can explain why individuals want landlines, they are unable to explain why people prefer mobile phones.

Academics have recently performed substantial research on the subject to demonstrate a link between communications and economic advancement. An illustration is Ricketts (2002). The success of economic activities is reportedly impacted by the use of telecommunications, among other things, to increase coordination and interaction. The successful conduct of economic activity requires high degrees of cooperation and communication. (Aleman et al., 2004). Contrarily, it was asserted that in addition to promoting domestic economic growth, a cutting-edge communications infrastructure is necessary for drawing in new investments and competing in the global economy.

Telecommunications and its ancillaries generally support economic growth by boosting efficiency across all industries, allowing cross-border expansion of markets for economies of scale, lowering costs and easing access to services, particularly in administration, education, health, and financial services, giving access to research,

developing ICT products and services, and promoting better governance, which is a requirement for growth. This article examines how telecommunications infrastructure affects the economy. This crucial subject has received a lot of media attention since the "the specifics superhighway" is growing and could affect the economy.

Using information collected over a 20-year span from 21 OECD nations, we investigate potential implications of telecom innovations. Numerous potential consequences on economic growth are associated with investments in telecommunications infrastructure. The fact that the products it produces—cable, switches, and other items—increase demand for the commodities and services that go into their production—is the most obvious reason why investing in telecommunications infrastructure promotes growth.

Additionally, investments in telecommunications infrastructure yield economic returns that are significantly greater than those from telecommunications alone. When a telephone system is in poor condition, contact between businesses is restricted. Ordering, acquiring information, and looking for services all involve significant transaction costs. As the telephone network develops, business expenses will decrease and output will rise for specific companies in specific economic sectors. If the telephone does have an influence on a country's economy, it will be due to managers' increased ability to communicate clearly over longer distances (Andrew Hardy, 1980).

Recently, domestic and foreign investments in African telecoms have increased, with a concentration on mobile telecoms. But the sector still faces daily obstacles like persistent network issues, high phone and internet service costs, and a low fixed line penetration rate. Telecommunications companies blame structural issues such restrictive governmental regulations and subpar social facilities (such as electricity, security, and water) in Africa for their challenging business environment.

In Africa, networks are frequently designed end-to-end, using a unique network architecture and less intricate network integration. Although fixed wireless technologies frequently replace copper in the last mile connections to businesses and households, mobile networks are more likely to have a fiber-optic core than a totally wireless one. One's ability to study, solve problems, and be creative is improved by using

telecommunications services. Even though work may be negatively impacted in the short term, the ability for businesses in developing countries to stand out on international online marketplaces and participate in the knowledge economy will likely depend on how communication, accessibility, security of networks, capability/skills, market structure, and firm governance interact.

Studies on how the expansion of telecommunications influences economic development in industrialized economies reveal a relationship between the two. (Jipp et al., 2000). However, research on this subject is scarce in Sub-Saharan Africa. Without considering its impacts, the study looked at the causal relationship among telecoms development and growth in the economy. Although being one of the factors that affect it, the impact of telecommunications growth to economic expansion has varied across countries at different stages of development.

Furthermore, research indicates that it is mostly irrelevant how much telecommunications development affects economic expansion (Roller et al., 2007). For example Karner & Onyeji, (2007) between 1999 and 2005, look at how private telecom investments affected economic growth in 14 African and 13 CEE nations. The influence is positive but marginal, according to their regression results. The chosen countries' telecommunications infrastructure, they contend, is comparatively poor, which lessens the impact of private telecoms investment. Different spheres (Roller & Waverman, 1996). Between 1970 and 1990, the effects of telecommunications infrastructure investments on the GDP of 14 emerging and recently industrialized non-OECD nations as well as 21 OECD members were examined. OECD nations as well as those that had attained "critical mass," which is indicated by having more than 40 main telephone lines per 100 residents, were more affected than non-OECD countries. They discovered that the effect might not be linear.

Sridhar (2004) the same thing was said. To ascertain the connection between communications and economic development, data from 28 developing nations will be reviewed. The study comes to the conclusion that mobile phone penetration is significant and fixed lines have a positive impact on national output. More developing nations than

OECD nations are expected to be impacted by the development of telecommunications. This agrees with the conclusions of earlier studies (Waverman et al., 2005). Who discovered that utilizing a cell phone significantly and significantly affects economic growth? The research conducted with (Cronin et al., 1993) additionally identified a connection between the advancement of telecommunications and economic expansion. The results of the study revealed a link between the economic growth of the nation and the condition of its communications infrastructure. Results of a study on causation by (Madden & Savage, 1998) more evidence that telecommunications investment and economic development in CEE countries are positively and reciprocally correlated (Chakra Borty & Nandi, 2003).

2.3 Trade openness on economic growth

A further generation of trade theory that focused on the examination of the changing connections between global commerce and economic growth occurred between 1980 and 1990. The dynamic viewpoint is preferable to the static method for understanding trade benefits since it tries to appreciate the mechanisms that clarify the way globalization supports development in addition to how they develop over time. Productivity growth is a significant way that trade can assist economic growth. If a nation diversifies it’s trading routes and invests in R&D that results in the production of goods with higher profit margins, its comparative advantage may raise.

By analyzing the connection between R&D spending and the creation of competitive advantage, researchers found that countries with a considerable amount of human capital consistently become net exporters of unique products as well as net consumers of labor-intensive conventional items. (Grossman & Helpman 1989). They also demonstrate how commerce will increase over time as a share of global GNP or expenditure if the manufacturing of new commodities needs a greater workforce than the manufacturing of distinct products already on the market. Romer's (1990) hypothesis states that a country's economy will grow faster if its overall quantity of human capital—a crucial resource for R&D—is higher. Giving developing nations with limited human resources more access

to a broader global workforce pool can consequently help those nations experience faster economic growth.

Grossman & Helpman (1991) Demonstrate how lowering trade barriers would increase incentives for domestic R&D while also benefiting the local economy by facilitating interactions with international businesspeople and markets. According to the "international R&D spillovers" theory, which capitalizes on the benefits of trade openness for productivity growth, a country can benefit from R&D conducted abroad by importing capital and intermediate goods from other countries (Coe et al., 1995).

In addition to productivity growth, benefits from increased consumer choice have also been studied as sources of benefits from international trade (Romer et al., 1994). In posts arguing that permitting trade would transfer market shares to the most productive businesses while driving less productive ones out, (Tybout, 2001). Understanding how increased global trade competition affects the development of the market for efficient plants as well as the improvement of intra-plant efficiency is made possible by looking at plant efficiency (Acemoglu et al., 2002). Discover how institutions that defend property rights are created as a result of trade openness, which is essential for the expansion and sustainability of an economy (Venables & Krugman, 1995). According to economic geography, market access may increase the advantages of agglomeration and result in higher income levels. The effect on a North American Free Trade Agreement (NAFTA) on trade among its signatories was also investigated (Gould, 2009).

The writer Bergstrand (1985) referred to the theoretical underpinnings of the gravity model, which presuppose that producers adhere to their financial restraints, seek to maximize profits, and keep a constant degree of substitution elasticity. Exchange rates were computed taking into account both market hedging and the world war. Between 1986 and 1996, NAFTA considerably increased the US-Mexico trade flows, as shown by evidence (Gould, 2009) utilizing trade statistics for the three months prior to and following NAFTA. Due to existing bilateral agreements, trade between the United States and Canada and between Canada and Mexico was not affected in this way. Industrialized states place considerable value on retaining their particular economic and

political autonomy even though North-South RTAs have aided commerce. In the late 1970s, the vast majority of developed nations embraced the principles of South-South cooperation into their economic strategies.

The majority of developing countries found that by establishing trade relations with other developed nations as opposed to relying primarily on the wealthy North, they were more likely to have access to affordable solutions to their economic development problems. In order to use economies of scale to transform small, mostly agricultural economies into larger, more industrialized economies, initially in Asia and subsequently in other emerging nations, regional integration was considered as a critical strategy (Eris & Ulasan, 2013) succeeded to understand the relationship between openness to trade and over time economic growth by painstakingly reducing uncertainty in models with Bayes model averaging techniques. The study's conclusions showed that different openness to trade proxies were fully integrated, but that no particular proxy was clearly associated with economic progress.

Descriptive and comparative analyses were employed by (Semancikova, 2016) to research the connection between trade and trade openness, macroeconomic performance, and both. According to empirical research, market combined trade openness have a positive impact on macroeconomic indexes. (Bagnai et al., 2016) employed the post-Keynesian balance-of-payments restricted growth model (SSA), with a focus on the effects of South-South trade, to analyze the then-increasing economic growth in Sub-Saharan Africa. Yearly data from 1990 to 2008 were used for the analysis, which was done with the framework of the co-integration estimate method. The focus was on 20 SSA countries with low and middle-income population levels.

The results demonstrated that the SSA's balance-of-payments limitations have been relaxed. Studies like these Yang & Gupta (2008) determined that member countries' commerce has not been improved by SSA trade agreements. Except for a small number of RTAs in their analysis that had issues with member nation compliance, research by Carrere et al. (2004) has indicated that African RTAs had a favourable impact on bilateral trade flows. This study was conducted in response to these RTA detractors in

Africa. For instance, (Afesorgbor & Van Bergeijk, 2011) came to the conclusion that intra-regional trade within ECOWAS and SADC was better than that of the EU agreement, and that the studied regional integration had a greater impact on developing trade than the EU. Similar findings were made by Turkson (2012), who discovered that while trade pacts between SSA and the EU positively impacted trade between ECOWAS, the EAC, and SADC, they had an adverse impact in ECCAS and IGAD.

Even though extensive research has been done on the benefits that nations would enjoy, there is still disagreement about whether a country should adopt the free-trade approach for its foreign trade. The logical course of action is to defend emerging industries. Unless the way it produces grows more productive and efficient, the government must shield a newly founded sector from foreign competition. To put it another way, an effective industrial strategy could help turn a secret competitive advantage into a real one (Harrison & Rodriguez-Claire, 2009).

When assessing the positive aspects of such a proposal, one must balance the advantages of having a safeguarded industry against the accompanying expenses. For example, the Mill test only asks that the covered industry survive global competition in the long run. The Bastable test, in contrary, goes one step further by requiring the amount of discounted future gains from the restricted sector outweigh the current protective costs (Bardhan et al., 1971). Describe further instances where the advantages of protection outweigh the risks to consumer welfare.

Numerous empirical studies have examined the relationship between international trade and economic growth. Included is the expanded regression theory put forth by (Barro, 1996). Using a specific openness measure and a set of restrictions, economists often correlate actual gross domestic product per employee, or real GNP per person, with total factor productivity growth rate. The export-to-import ratio relative to GDP, tariff rates as an obvious measure of trade policy, and built-in indicators of openness are some of the openness metrics that have been used (Sachs & Warner, 1995). The data at first appear to support the notion of trade and growth in the economy are positively correlated when taking market volumes as an indicator of openness. Using cross-sectional data from 30

developing nations, Edwards (1992) demonstrates a substantial link between the two variables between 1970 and 1982.

According to Harrison (1996), openness had a favorable and considerable impact on growth while he was researching 51 developing countries between 1960 and 1987. 62 developing and developed countries' trade shares, according to research by Vamvakidis (2002), have a favorable impact on growth from 1970 to 1990; however, the two factors are unconnected for the years from 1950 to 1970. Controls are utilized in all of these studies; they follow the same structure and rely on the model of neoclassical growth. A macroeconomic base gauge, an amount of material money, and a degree of human capital make up these checks. This is true even if the objectives of each study differ.

This econometric model is improved by other studies that take institution and geography into account. According to Acemoglu et al., (2002), Economies that have mechanisms in place to uphold the law and protect property rights perform better than those that do not. Because they would not have the same market access, landlocked countries might not reap the same agglomeration benefits as those with extensive shorelines (Krugman & Venables, 2005). In favor of focusing on the use of a two-stage instrumental variable (IV) estimation to distinguish between the geographic and institutional growth impacts of trade, these research completely discard the earlier controls. These investigations' findings conflict with one another.

Institutions are the only factor contributing to economic progress, (Rodrik et al., 1995) who looked at cross-sectional groups of countries, wrote in their study. While institutions have little direct impact on growth, trade openness continues to play a crucial role in fostering it. According to (Alcala & Ciccone, 2004), It compares nations worldwide between 1985 and 1990. However, other studies use IV approaches instead of concentrating on identifying growth-independent variables as a trade share instrument in their growth regressions. Romalis (2007) uses US market access as a weapon in opposition to (Frankel & Romer, 1999), who uses geographic considerations to affect trade between two nations. Estimates of the instrumental variable (IV) indicate that openness and growth are positively correlated across all studies. Contrarily, Rodrik &

Rodriguez, (2000). Learn that when geographic characteristics such as latitude as well as a tropical environment are taken into account for instruments, the IV estimations for trade share are no longer trustworthy.

Studies that used criteria other than trading shares to measure openness have additionally generated erratic results. The association between projected boundaries and non-tariff development challenges appears to be strong and inverse. According to Harrison (1996). As opposed to that, (Yanikkia, 2003) demonstrates how lowering trade barriers might aid in the expansion of the economies of developing countries. (Estevadoral & Taylor). Examine how the growth of the capital, intermediate, and consumer goods industries is impacted by average tariff rates. Despite the less obvious connection between the two, their analysis demonstrates that taxes on capital and intermediate items are linked to slower development than those on consumer goods. (Warner & Sachs,1995).

A more exact openness metric was developed using information on the amount of non-tariff obstacles, median tariffs, black market exchange rates, the economy (socialist or not), or exporting monopoly for important commodities. Later research either altered the classification of nations according to a more recent era or changed the index. (Vamvsakidis, 1999). Even the earliest studies demonstrate an adverse relationship between development and trade policy limitations, according to (Warcziag & Welch, 2008). Contrary with the preceding two categories of tariff and non-tariff barriers, they show how the black market exchange rate actually drives the index and fails to reflect trade policy (Rodriguez & Rodrik, 2000).

2.4 Foreign direct investment on economic growth

FDI started to gradually increase in the first decades of the 1990s. As a result, FDI and its effects on development are the subject of a lot of financial study right now. FDI can act as an exogenous component in traditional growth models, increasing investment levels or their ability to increase GDP (Sala-i-Martin, 1996). Technical transfers, diffusion, and spillover effects, in accordance with the endogenous growth theory, result in long-term economic expansions. (Romer, et al., 1986). FDI therefore has the ability to

greatly increase long-term growth. Despite the fundamentally different underlying premises, both techniques' empirical equations in the literature frequently resemble one another (Dowrick S. & Rogers M, 2002).

The macroeconomic situation in Nigeria is unstable, which has negatively impacted the nation's capacity to draw FDI from abroad. How well foreign investments perform in a particular nation depends on a variety of factors, including the scope of the market, the accessibility of human resources, the stability of the macroeconomic climate, and pushes and pull dynamics. The fact that FDI only marginally boosts output shows that it had little impact on Nigeria's economic expansion (Akanegbu & Chizea, 2017) state that after various reforms, the country still only makes up a small portion of global FDI. The impact of FDI on the expansion of the economy in Nigeria was assessed using time series data gathered yearly during 1991, to 2014, as well as a conservative production equation (in which FDI, money, and labour all are seen as production inputs). The findings indicate that FDI barely increases Nigeria's output productivity.

Utilizing data that are either cross-country or country-specific, it is often easy to draw judgments regarding the macroeconomic data on the immediate impact of FDI on development, which is somewhat irregular. A few research also point to beneficial mediated effects. The applicable methodology and the national boundaries vary significantly among studies. For instance, some studies look at how FDI influences growth using cross-sectional estimating methods, while others employ dynamic panel analysis. Furthermore, endogeneity isn't always present and isn't typically explored in the literature. Numerous empirical research demonstrated that FDI positively impacted growth (Li & Liu, 2005), however others claim that it had a too-weak or no impact (Carkovic & Levine, 2005). Additionally, the evidence varies per nation (Ericsson & Manuchehr, 2001).

Positive growth is not correlated with FDI in any observable way (Carkovic & Levine, 2005), the quantity of human capital, either directly or indirectly. The study sampled 72 distinct nations using the dynamic panel estimation approach (GMM). (Borensztein et al., 1998) 69 developing economies from around the world were looked at, and it was

determined that FDIs are a crucial tool for encouraging technological transfer and increasing GDP. However, FDI only boosts productivity when the host economy is capable of incorporating cutting-edge technologies. Up until a certain point, FDI does not considerably increase growth on its own. According to Mello (1999), FDI encourages knowledge impacts and technical innovation, both of which result in long-term development in economies in both developed and developing countries. Instead, how much FDI boosts GDP is determined by the degree of complementarity with substitution—degree 6—between the local investment and FDI.

Additionally, evidence of the beneficial effects of FDI on growth is provided by both established and developing nations (Choe, 2003). But this connection is flimsy since it is subject to outliers. Numerous studies have demonstrated that financial intermediation volume, resilience, and soundness in national financial markets significantly contribute to the beneficial benefits of FDI for economy (Alfaro et al., 2004). According to some skewed data, the degree of wealth in a nation may also change how FDI influences growth. Developing nations with higher incomes, for example, may profit from FDI spillovers due to their increased capacity for experiential learning (Blomstrom et al., 1992). A meta-analysis of various studies that focus on developing economies but are nation-specific is also carried out by (Meyer & Sinani, 2009). The growth of the institutional framework in recipient nations, as evidenced by openness and economic freedom, they contend, is correlated with the productivity spillovers from FDI.

Physical capital, production methods, managerial skills, commodities and services, marketing knowledge, advertising, and firm administrative procedures all make up the whole package that is FDI (Thirlwall et al., 1999). It is believed that FDI has a substantial impact on the expansion of the destination economy. The Exogenous Growth Theory states that FDI has the power to boost a nation's economy by bringing in fresh capital, novel products, and cutting-edge technology. According to the theory of endogenous growth, talent exchange can increase knowledge within the recipient country (Elboiashi, 2011). According to Herzer et al., (2008), the greater likelihood for intervention and technical transference associated with foreign direct investment,

meaning foreign direct investment, substantially speeds up the economic growth of the host country.

According to the literature, technological and knowledge impacts from FDI will eventually impact economic growth as long as the structural modifications brought on by TNC entry, especially connections with clients and suppliers (vertical linkages), increase the efficiency, technological proficiency, and production of local firms and support the growth of capital and knowledge. Lall et al., (2003). How much FDI improves productivity development and technical advancement of local enterprises will depend on their ability to absorb foreign capital and the characteristics of their external environment. The external environment of an organization can either support innovation and enable agglomeration economies (for instance, knowledge spillovers arising from cooperation or innovation/technology collaboration among firms and institutions) or it can act as a barrier to innovation.

The underlying tenet is that regional market structures encourage the dissemination of innovation and creativity as well as the gathering and exchange of information and expertise amongst various economic sectors (Henderson et al., 1996). This increases the importance of local firms' ability to absorb information because their industries' and firms' technical sophistication affects the rate and dynamic at which they can do so. Kinoshita & Lu (2006), it is critical to consider the host country's R&D expenditures rather than its absorptive capacity when estimating the magnitude of knowledge spillovers from FDI. He discovers a connection between FDI spillover and host nation R&D spending.

To understand how empirical analyses of the connection between FDI influx and economic growth work, several studies have been done. On the other hand, there hasn't been much scholarly study on the broad connection between the local economy and foreign direct investment. Panel analysis was used in the study. According to studies conducted over a lengthy period of time, FDI enhances the domestic economy in 14 industrialized nations during 1971 to 2005 (Herzer, 2008). The results also showed that domestic output and FDI have a long-term, reciprocal causal relationship. Later, (Herzer,

2010) employed cross-country and time series regressions to examine how FDI from abroad affects economic growth.

The cross-country regression covered the years 1980 to 2000 and used data from 50 different countries. In a time series study, data from 1980 to 2004 were used concurrently to look at US FDI abroad. The results of both regressions were consistent on the positive correlation between growth and outward FDI. The Granger-causality test of a time series estimator revealed a two-way causal relationship between development and outbound FDI, (Lee, 2010) employed multivariate and multivariate approaches to give an empirical assessment of Japan as one among the industrialized economies, using data from a dataset encompassing the years 1977 to 2006. The bivariate model's findings demonstrate that FDI inflows boost GDP per capita in the short term, but that there's clear bidirectional causation over the long term.

The results of the multivariate model demonstrated a sustained, positive causal link between investment from abroad and per-capita GDP. Growth as well as a quantitative analysis of Malaysian FDI abroad were considered. (Wong, 2010). His analysis made use of data from Q1 1999 through Q4 2008. The results of the bivariate model showed a one-way causal relationship between growth and FDI. In other words, growth actually has the opposite impact of what Granger intended—it causes FDI.

According to Busse & Groizard (2008), Institutional quality is anticipated to have an impact on the host economy's capacity to absorb foreign investment, which will mitigate the beneficial benefits of FDI on economic growth. A functional legal system, strong institutional and legal stability, and a connection between FDI and growth are essential. (Prüfer & Tondl, 2008). According to this school of thought, a stable and welcoming business climate may increase FDI spillovers because it affects how firms operate and may have an effect on how efficiently FDI resources are used. Depending on the institutional environment of host economies, FDI may have favorable productivity spillovers (Meyer & Sinani, 2009).

Despite this, little research has been done on how institutions affect FDI's impact on growth. (Busse & Groizard, 2008), FDI efficacy may be constrained by onerous

regulatory requirements, and there is some evidence to support this claim. This is especially true for the top 20% of the most regulated economies when regulations are extremely severe. More controlled economies in particular are less equipped to benefit from FDI inflows. (Prüfer & Tondl, 2008). The study demonstrated how improvements in productivity among 1990 and 2003 assisted 16 nations in Latin America in highlighting the close connection among FDI and growth. Furthermore, they claim that there is a strong legal foundation for the relationship between FDI and GDP. Alguacil et al., (2011) add to the topic of how those abilities affect the ability of host nations to accept and profit from FDI. The host country's government is urged to develop a set of rules that equally emphasize boosting FDI from overseas and developing their own political and economic framework.

Over the past two decades, developing and emerging market nations have increased their involvement in FDI inflows as a result of both push and pull forces (Reinhart et al., 2008). On the push side, a growing number of businesses opened facilities abroad as a result of falling transportation costs, discernible variations in factor pricing, and sluggish development rates in industrialized nations. On the pull side, FDI was actively sought after by many governments through a variety of preferred rewards and regulations, facilitating flows while also recognizing that FDI was required to bring the capital, the internet, and expertise required to move the economy to traditional industries to higher-end services and manufacturing (Harding & Javorcik, 2007).

Despite the theoretical advantages, conflicting results on the consequences of FDI have been observed in actual study (Lipsey, 2004) Although there isn't always a connection between GDP or growth and the volume of inbound FDI stocks or flows, macro-level empirical research generally demonstrates that the presence of foreigners benefits incomes and the number and variety of domestic exports. In the majority of early cross-sectional research, a relationship between foreign presence and micro-level productivity within industries was discovered.

The most recent analysis focuses on FDI inflows for China's sectoral economy, looking at FDI inflows for Vietnam and China from 1985 to 2002. Its outcomes most nearly

match ours (Vu et al., 2006). Using an expanded view of production functions and regress methodologies, they arrive to the conclusion that FDI has an immediate and positive influence on the economy in addition to a secondary one due to its impact on worker efficiency. They found that manufacturing frequently profited more from sector-specific FDI than other industries, which is comparable to our sectorial findings.

2.5 Exchange rate on economic growth

Exchange rates are significantly impacted by speculative activity, which has an impact on markets that depend on the exchange rate market. The expected shocks that affect currency rates include seasonal changes, capital flight, and political unpredictability, according to studies. However, there is a great deal of strong speculation on the FX (foreign currency) markets, and there is also a lot of rash buying and selling of huge amounts of some currencies. Exchange values thus endure extremely high volatility. Numerous factors, such as speculation, have an impact on how volatile asset prices are overall. Some analysts claim that high levels of speculation and market volatility are a sign that there may have been a lot of transactions. Over 90% of FX traders in Japan, Singapore, and Hong Kong have been found to concur that speculating raises unpredictability (Carlson & Osler, 2000).

Freidman (1953), who felt that the market would only favour rational speculators (Carlson & Osler, 2000), supports the idea that sensible speculation must make currency rates less volatile. According to Carlson and Osler's (2000) findings, the basic indicators of changes in currency rates include microstructural elements like the level of speculative activity. According to Ddek & Gregor (1994), there are enormous amounts of money transfers, and a sizeable portion of it is "hot money" since it moves fast to locations with strong profit margins and does not stay in one place for very long. Since the trading activity on foreign exchange markets is based on highly liquid currencies, it is expected that the value of currencies may move swiftly in response to unexpected events (Sensoy et al., 2015).

The choice of a system for exchange rates is crucial for economy to advance. The degree of development in the relevant nation is an additional consideration (David et al., 2010).

Due to the fact that the selection of exchange rate regimes had less of an influence on the rate of economic growth in developed countries with full economies and sizable markets, they are better able to manage real and financial shocks. A more flexible exchange rate system may speed up significant economic development, although overall growth rates are only tangentially correlated with it.

For economies that are developing and in transition, such as those in Asia and Africa, choosing an exchange rate regime is very important. Places with inefficient and underdeveloped financial markets. These economies are therefore ill-equipped to deal with both economic and genuine shocks. (Oyejide & Udun 2010). Rogoffs & Reinhartl (2004) argued that when choosing flexible exchange rate regimes, developing countries are generally better placed. Oyejide & Udun (2010) although this isn't always the case, it was once thought that countries, especially those at the beginning stages of financial growth and integration, wanted to have a defined or fairly constrained regime.

Furthermore, as reported by David et al. (2010), regulated whereas managed floating regimes are associated with the fastest rates of development in developing and emerging nations, and the most effective regulatory structures exhibit a nonlinear relationship and development. They also highlighted how little the advanced European countries' regime decisions affected their pace of GDP growth. Establishing that there, marginally higher growth rates are more frequently associated with flexible regimes. In order to reduce the potential of currency appreciation to provide the desired results, Ubok-udom (1999) prepared a list of the special economic characteristics of Nigeria that were analyzed in relation to the country's difficulties with SAP implementation. He claimed that changes in regional output growth are linearly associated with changes in the typical real exchange rate in his study of the relationship between exchange rate variance with the progression of overall output in Nigeria (1971-1995). To more accurately depict the times of currency depreciation, he used dummy variables.

The empirical result showed that all of the coefficients of the main explanatory variables have a negative sign. In the interim, the study by (Ogun, 2006) in a study on the impact of real exchange rate volatility and misalignment on Nigeria's growth in non-oil exports,

these effects were clearly demonstrated. To calculate the real exchange misalignment, he employed the divergence from purchasing power parity (PPP) and the model-based assessment of the equilibrium real exchange rate (ERER). He also used the conventional trade hypothesis model of the variables affecting export growth. He emphasized that actual exchange misaligned and instability had a negative impact on the expansion of Nigeria's non-oil exports, irrespective of the other misaligned criteria that were used. However, it was argued that between 1970 and 2006, trade liberalization enabled Nigeria's industrial sector to grow and stabilize the currency rate market. By employing an error-correcting approach, this was done (Adebiyi & Dauda, 2009).

They asserted that there was a considerable and positive correlation among the industrial output index and actual export. The measure of industrial production rises by 12.2% for every 1% increase in actual exports. It suggests that the deregulation plan helped exports by decreasing the worth of the currency. Nevertheless, Rodric (2006) Contrary to what is commonly believed, research on the subject revealed no statistically significant link with exchange rates and the expansion of Kenya's GDP. However, there are other connections as well, including profitable trade in the financial, advertising, agricultural, and aid sectors.

In Australia, the overall and sectoral effects of exchange rate shocks have been investigated. The statistics quantify these responses, even though economic theory may anticipate the broad contours of societal responses to exchange rate fluctuations. Mining, manufacturing, personal services, and other commercial services are among the sectors most vulnerable to currency changes, according to the poll (Manalo et al., 2015).

Researchers in Turkey have looked at how changes in exchange rates affect actual output, pricing levels, and the actual value of the aggregate demand's component parts. The anticipated exchange rate hike will adversely affect actual production growth, investment demand, export demand, and price inflation, according to study. The asymmetric effects of unplanned currency rate changes highlight how crucial unexpected depreciation is in containing both economic growth and the rise in personal

consumption and investment. This is true even when export growth is accelerating. (Kandil et al., 2007).

For Egypt and Turkey, it was examined how changing exchange rates affected actual output, pricing, especially the genuine value of the overall demand components. The analysis' conclusions show that the predicted increase in the Turkish Lira's purchasing power will have a detrimental effect on real manufacturing development, equipment requests, export demand, and inflationary pressures. It was investigated for Egypt and Turkey how fluctuating exchange rates impacted actual output, pricing, and particularly the true worth of the total demand components. The analysis' findings indicate that actual manufacturing development, equipment requirements, demand for exports, and inflationary pressures will all suffer as a result of the Turkish Lira's expected increase in purchasing power. Unexpected changes in the currency rate frequently impede Egypt's actual output and consumption growth while boosting exports (Kandil & Nergiz Dincer, 2008).

The impact and responsiveness of employment to real exchange rate and real economic growth were assessed in South Africa using a model and multivariate co-integration techniques. According to the analysis, employment reacts well to economic expansion but negatively to real exchange rates over the long term. Real economic growth and employment have short-term positive associations, whereas employment and the real exchange rate have short-term negative correlations (Chipeta et al., 2017).

They asserted that there was a considerable and positive correlation among the manufacturing output index and actual export. The measure of industrial production rises by 12.2% for every 1% increase in actual exports. It suggests that the deregulation plan helped exports by decreasing the worth of the currency. According to the study, Somalia's capital, Mogadishu, has a high rate of inflation. Additionally, the vast majority of Americans are pleased with their financial situation. As a result, inflation severely slows economic growth by enhancing consumer access to goods and services. The investigation's findings demonstrated a direct link between Mogadishu prices and house inflation (Malin, 2016).

There is a significant positive relationship between the exchange rate with Somalia's dysfunctional governance. The total amount of foreign loans, the amount of available money, and the balance of trade, on the opposite hand, are all severely harmed. Somalia hasn't had a working national government since 1991.The purchasing power of Somalia's money has soared as a result. To raise the worth of the Somali shilling, Somalia's central bank should take steps to improve the country's political environment (Ibrahim & Nageye, 2017).

2.6 Economic growth

Economic growth is one of the most important indicators of the standard of living in a community. Economic growth refers to the rate at which the marketplace generates services and goods that add value (Lithy, 2017). Inflation is caused by economic growth, which is the continual rise in the value of goods generated by a country's economy in the marketplace. It is calculated using the real GDP, or really economic growth rate (IMF, 2012). It is possible to encourage "intensive growth," which refers to the process of speeding economic development, by making better use of resources (which could include work, tangible assets, energy, or materials).

The term the "rate for economic growth" in this context refers to the geometric annual growth rate of the GDP over a lengthy period of time, computed with the start of the period to the last year. The average GDP level over the period has typically shown this pace of increase. Extensive growth is defined as an increase in GDP that is entirely driven by increases in the amount of available inputs (increasing population, expanding area). The estimated GDP data provided by the country's statistical agencies are used to calculate the economy's growth rate.

To calculate the rate of growth of GDP/capita, the analyst uses population and GDP information at the beginning and conclusion of the analysis (Bjork & Gordon J, 1999). Rising manufacturing and consumer spending are indicators of economic growth. Consumption per person reflects economic growth regardless of how the population grows. An increase in the actual gross domestic product (GNP), also known as real

GDP, is a conventional and frequent indicator of economic growth. Ayres & Robert (1989), the ratio of output value to labor input, which is taken into account when calculating labor productivity, has historically been the main factor driving real per capita economic growth (Van rennin & John, 2011).

Economic growth has historically been associated with the building up of physical and human capital, as well as the increase in production carried on by technological advancement (Lucas & R.E., 1988).Increasing the workforce's specialty is also crucial for raising production. Riesman & George (1998). Efficiency gains have been the primary factor in economic growth per capita since the late 19th century. There was an important rise in production based on the amount in labor, supplies, energy, and land during the 20th century. The remaining growth in production has been made possible by using more inputs. Higher production is the result of these two improvements. Along with more new products and services, more of the previously produced commodities were produced (Kendrick & J. W. 1961).

GDP (gross domestic product) growth, which is referred to as a rise in a country's economic production of goods and services, is an indication of economic growth, according to (Okpara, 2006). Economic growth can be described as a rise in a nation's economic revenue as indicated by its capability to produce goods and services, regardless of whether the gain in GDP is coupled with a higher or lower rate of population growth. According to Robert Solow (Adebayo, 2005), economic growth is the increase in a nation's output of goods and services over a given time period. As measured by advancements in spending, the internet, literacy rates, and educational attainment levels, economic growth is often regarded to imply an increase in a nation's capacity to produce goods (Abdul Hakeem, 2014).

According to Demurger et al., the fundamental drivers of China's economic growth as well as any tendencies toward convergence or divergence, varied significantly throughout the course of sub-periods, particularly in light of considerable changes to the regime's economic policy. For instance, in China's initial stage of market reforms, the demise of the communes and the partial deregulation of food production, which took

place between 1978 and 1984, greatly increased the output of the major food-producing regions. However, local trade had been replaced by foreign trade as the main engine of economic expansion by the late 1980s.

The coastal regions started to perform better than the inland provinces as a result, and continue do today. Since that switch, there has been a significant rise in overall power, which can be attributed to continued advances in energy conversion efficiency, (Ward & Benjamin 2004). Two further key historical sources of output (canals, railways, and highways) were automation and transportation infrastructure (Grubber & Arnulf, 1990).

Information and telecommunications infrastructure are essential for economic growth, according to both theorists and practitioners. For instance, using a phone is seen as a quick way to get and share information (World Bank, 2012). Taking information from 24 low-, middle-, and high-income nations, the evolving relationship between communication technology and economic growth has been examined over this 18-year period of time, between 1985 and 2003. For the participating nations in the study, the findings revealed an encouraging and statistically significant correlation between telephones and actual gross domestic product per capita. Even after accounting for investments, population growth, historical GDP per capita levels, and gradual development, the results are still favorable. Additionally, they learned that telecommunications investments are anticipated to yield higher returns, meaning that governments stand to gain more from greater telecommunications investment.

Tella et al., (2007) looked into the connection between telecommunications and the growth of Nigeria's economy. With the aid of a three-stage minimum-squares econometric method, they were able to solve a set of equations that take into consideration economic growth, telecom investment, and penetration. According to the study, using landlines and mobile phones significantly affected economic growth at a level of 5%.University of Nigeria researchers recently looked at how Nigeria's communications infrastructure affects economic expansion. (Osotimehin et al., 2010).

The effect of investments in telecommunications infrastructure on Nigeria's GDP-based economic growth indicator (GDP) was assessed in the study. Utilizing pooling normal

least-squares (OLS) regression methods on a national-level data set, they found that telecommunications employment and facilities as measured by teledensity, were both significant at the 1% level and are positively connected with economic expansion in Nigeria. The report claims that Nigeria's output and development are impacted by its communications infrastructure (Onakoya et al., 2012).

Examined the impact of telecommunications infrastructure investments on Nigeria's economic development. They found that the output of the economy was significantly impacted by investments in telecommunications infrastructure, both immediately by means of manufacturing output and indirect through the output of other sectors. They developed a three-stage least squares multidimensional model of simultaneous equations to describe the transmission processes by which telecommunications infrastructure fosters growth (Frederick et al., 2013).

The "catching-up effect" theory holds that less developed countries typically have faster per capita growth, catching up to more developed countries. Typically, convergence is gauged by the starting per capita GDP level (Barro & Salai Martin, 1995) as less developed nations surpass more developed ones in terms of economic growth, it will become evident that growth is consistently harmed by initial GDP. An empirical analysis was conducted on the economic progress of 53 African nations between 1958 and 2001. The data were collected as end-time averages over five years. Was conducted by (Anyanwu, 2011).

The literature on growth assistance was reviewed for this study. He comes to the conclusion that assistance has a good impact on growth and that the state of politics has no bearing on this impact. ODA, however, only slightly hinders the economic expansion of SSA nations. According to Fayissa & Nsiah, (2010). Furthermore, it is claimed that foreign direct investment (FDI) makes a major contribution to both economic and scientific progress. Recent studies, such those by (Borensztein et al., 1998), SSA countries are shown to be little or not affected by FDI. These studies also demonstrate how FDI enhances growth.

The use of comparative advantage, technological transfer and knowledge diffusion, growing scale economies, rivalry, to mention a few, could all have an impact on economic growth theoretically. Contradictory results, though, have been found. Numerous studies have revealed that open economies expanded more swiftly (Dollar et al., 1992), However, a few scholars have questioned the validity of these results, particularly in light of methodological and measurement issues. As a result Fowowe (2008) concludes that openness has little to no impact on SSA expansion.

According to Baliamoune (2009), Higher-income African countries seem to gain from trade openness whereas lower-income countries see negative effects. Furthermore, using data from 158 nations between 1970 and 2007, Arezki & Gylfason (2011) discovered that GDP growth outside of the resource sector was positively and statistically significantly influenced by trade openness. Romer (1990) states that higher long-term economic growth rates are a result of a country's labor force's higher degree of education, which is favorably correlated with productivity and innovation.

Empirical research, including that by (Mankiw et al., 1992), has discovered a lot of evidence to back up the claim that human capital drives economic expansion. Empirical scientists have determined the magnitude of the human capital poo using a variety of factors, including education; IQ, health, diet, and work experience (Garza-Rodriguez et al., 2020). Mankiw (1956) Economic experts began to recognize the importance of the aforementioned characteristics in the 1990s, and they changed the neoclassical growth model to take human capital into account (Jones & Vollrath, 2013).

Numerous demographic and labor market developments, which are directly tied to human capital, can affect the prosperity of the economy. Some instances of these phenomena include the allocation of employees by age at work, the labor shares, rises in fertility and death rates, development, poverty, and immigration (Cruz & Ahmed, 2018). According to Munir & Shahid (2020), an increase in the proportion of people who are working age along with a decline in the fertility and death rates may result in a rise in the labor force and a sped-up rate of economic growth. In a manner similar to this,

urbanization is a prerequisite for a nation to keep expanding and, at the very least, achieve middle-income status (Cruz & Ahmed, 2018).

Immigration can, however, have a variety of effects on the geography of the nation of destination, depending on how much natives and immigrants compliment or replace one another (AboElsoud et al., 2020). Neither the updated Solow growth model as well as the model of neoclassical growth predict that immigration inflows increase the population and asset distribution in the country that receives them, which slows the long-term growth of GDP per capita (Kang & Kim, 2018). On the other hand, there is a benefit when immigrants contribute human capital to the area that complements the natives and raises per capita output by raising pay (AboElsoud et al., 2020).

Nondiscriminatory taxes and productive expenditure that increases investment incentives, raises the capital's marginal product, and promotes growth are two examples of possible government interventions (Buenos, 2009). Similar to this, central banks significantly influence a country's economy through a number of processes, including as managing currency exchange rates, increasing loan availability, and targeting inflation. Bondarchuk & Raboshuk (2020), these financial tools are essential for boosting the economy since empirical research has shown a high, positive association between economic growth and those (Akalper & Duhok, 2018).

Since the 1990s, economies in peripheral or developing regions have needed to use specialized foreign resources to finance their expansion (Alencar et al., 2019), in particular, because there has been a large increase in the flow of money between nations. Through new investments, knowledge transfer, integration into international economic networks, the growth of human resources and skill sets, and greater competitiveness, FDI increases the output of the host countries (Chanegriha & colleagues 2020). Despite in-depth empirical study, the mechanism underlying the link between FDI and growth remains a mystery (Khalid & Marasco, 2019).

CHAPTER III
METHODOLOGY

3.1 Introduction

The information was gathered from the World Bank of Somalia and other pertinent sources, and it spanned the years 1970 to 2020. The main study findings were also reviewed to identify their economic consequences. This chapter provides a description of the approaches and procedures employed for the empirical analysis of the study. Among the figures included in this study is information on the usage and Somalia's economy, foreign direct investment, trade openness, exchange rate, as well as telecommunication development.

3.2 Sources of data

We can grasp statistics by looking at the data. Displaying the sample data values graphically or in tables is one way to become familiar with them after we receive them. Charts and graphs are essential statistical tools because they graphically communicate information. These graphical representations can be used to observe the behavioral patterns of the variables under investigation. The primary information source for the study was secondary data. Were the data sources for Somalia reliable? The World Bank receives the data in Somalia.

3.3 Model specification

The ARDL is econometric model the data get from the World Bank was used as the study's model. Telecommunications has an effect on the exchange rate, foreign direct investment, trade openness, and economic growth.

This is how the model is defined:

EG= (tel, exr, top, fdi) ……. (1)

Equation (1) can be converted into an estimating model using an econometric model.

$EG = \beta_0 + \beta_1 TEL + \beta_2 TOP + \beta_3 EXR + \beta_4 FDI\ \mu_1$…….. (2)

EG= Economic Growth

TEL= Telecommunication

TOP= Trade Openness

FDI= Foreign Direct Investment

EXR= Exchange rate

$\beta 0$= Intercept term

t = Time from 1970- 2020

Bi = the parameters' relative slope coefficient.

μ= Stochastic Error Terms

3.4 Methodologies

Co-integration and the ARDL (autoregressive distributed lag) approach were both employed in this investigation. Trends were analyzed using the Breusch-Pagan Godfrey test, and errors were found using the autocorrelation test in combination with the Breusch-Godfrey LM and the CUSUM test for variance. We'll evaluate the estimate's importance. Only precise estimates are permitted, and they must be backed up.

3.5 Autoregressive distributed lag model

Using either stationary or non-stationary sources of data and a distributed lag model with autoregressive model distribution of wealth, a combination of orders of integration, the ARDL technique. On the model, it is sometimes referred known to as the Ordinal Least Square (OLS) (Pesaran et al., 1997). Busu (2020) claims that this model offers the right amount of delays to incorporate the process of producing data into one modeling framework. Since it helps to spot changes in the variables, the ARDL model is crucial for analyzing data using economic variables. One of ARDL's main advantages is

according to (Osman et al., 2019), is that it operates better with little data and is more dependable. The investigation's 29-year time series of the data would produce accurate findings. All models exhibit collinearity, according to Qamruzzaman & Wei (2018), however this method was created to get around those weaknesses and improve data accuracy. This approach tackles the issue of choosing the proper lag duration by making the model more linear and further structuring the length of the lag. ARDL is utilized to more effectively handle the latency problem. Due to the sample size, this model is thought to be a more advantageous strategy for identifying the lag problems using the variables of Jordan.

$$\Delta yt = \beta 0 + C0t + \sum \lambda i \Delta yt{-}i \; q \; i{=}1 + \sum \varphi j \Delta xt{-}j \; p \; j{=}0 + \delta 1 yt{-}1 + \delta 2 xt{-}1 + \varepsilon t \ldots\ldots \quad (1)$$

Where, $\beta 0$ is a constant, $C0$ is the time trend; εt is the white noise error. The coefficients λj & φi for all j represents the short-run relationship while $\delta 1$ and $\delta 2$ corresponds to the long-run relationship.

3.6 Augmented dickey-fuller test

The Augmented Dickey-F Fuller Test (ADF) is one of the most often used statistical methods for testing if a specific time series has consistency in either direction. The ADF test, developed through the unit's root analysis section, is one of the most popular methods for analyzing time series. To determine stationary conduct or the existence of the unit root, use the ADF test. Using a modified formula, the dependent variable is increased by the difference in the delays of the independent and dependent variables, in accordance with Paparoditis & Politis (2018). Examining the stationary nature of as well as a first-order differenced series is the essential unit root test. Below is a list of the three various ADF test versions.

No constant and no trend

$$\Delta Yt = \gamma 1 Yt - 1 + \sum i = 1 m \alpha i \Delta Yt - i + \mu t \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Constant and no trend

$$\Delta Yt = \gamma 0 + \gamma 1 Yt - 1 + \sum i = 1 m \alpha i \Delta Yt - i + \mu t \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Constant and Trend

$$\Delta Yt = \gamma 0 + \gamma 1 Yt - 1 + \gamma 2t + \sum i = 1 m \alpha i \Delta Yt - i + \mu t \ldots\ldots\ldots\ldots (4)$$

μt is the dependent variable's first difference, and t is an error term that is entirely made up of white noise. In order to verify the structure of the initial dependent variable, it is important to look at the graphical representation. According to Islam et al., (2018), equation 1 can be used if a data set doesn't show any signs of movements or a trend. If the series just demonstrates drift and no trend, equation 2 can be applied, while equation 3 can be applied if the series has both drift and trend. With the aid of this test, the relationships between the constituent parts, independent variables, dependent variables, and the null hypothesis can be found.

3.7 Unit root test

The test known as the unit root is frequently used to determine if a time sequence of information is stationary. The mean and variance of a time series that is stationary are constant. Most empirical time-series research currently begins with a test for the unit root. The most respected and well-liked test is the (Dickey & Fuller, 1979) exam. Since most time series data exhibit a pattern across time, we first search for its stochastic properties before doing our analysis. To make the series stationary, the integration sequence must be established.

3.8 ARDL bound co-integration test

A time series of data can be integrated using the ARDL co-integration method to find an equilibrium relationship. The idea was first put forth in 1987 by Nobel laureates Clive Granger, Robert Engle, and British economist Paul Newbold; they later published it. The bound test developed by ARDL assesses the co-integration to see whether there is a link between several time series. Collections of time series data that frequently document different observations. The Co-Integration test searches for situations in which more than two non-stationary time series have been combined in a way that prevents the results from straying as time goes on beyond their intended equilibrium. The major goal

of the study is to ascertain the degree of responsiveness among various elements during a predetermined time period.

3.9 Breusch-pagan godfrey test

The empirical Breusch-pagan Godfrey test is used to assess the null hypothesis. The main objective is to test the heteroskedasticity concerns of the regression. The statistical characteristic of varied dispersion is heteroskedasticity. The probability of error growth along the Y-axis is estimated using the Breusch-Pagan test. The test presupposes that one or more of the explanatory variables in the model-set are linear functions of the error variances. Errors are independent of the Y-values even if the regression model is still heteroskedastic.

The equation for the Breusch-Pagan Godfrey test is as follows.

$$N* R^2$$

This suggests:

- n _ sample size

- R^2 _ R^2 squared residuals from the initial regression's (coefficient of determination) regression.

H0: Variances of the errors are equal.

H1: The error variations are not all the same.

According to Shenkin (2018), the analysis accounts for variable errors resulting from a linear connection across several variables and assesses the development of mistakes in each component using explanatory variables.

3.10 Breusch-godfrey lm test

It is commonly known to everyone that the Breusch-Godfrey LM test has a tendency to auto correlate mistakes. It is a method that is frequently used to determine a regression model's residuals. (Rasi, 2018) claims that it is predicated on the idea that all residuals were unconnected to the sequence on p. A linear regression method called Breusch-Godfrey L-M assessment residuals includes both the beginning variables and unassigned variables. Systems with lagged independent variables or residual autocorrelation are ineligible for the test.

H0: There isn't a serial correlation for any order greater than p.

H1: serial correlation exists for orders up to pT.

A Lagrange Multiplier test is used to determine a hypothesis's or model's viability. It is widely employed to evaluate the accuracy of various modeling assumptions. Econometric and economic models are other names for the framework whereby the L-M test operates. The following equation represents the L-M test:

$$LM = (n - p)R^2$$

We have n, which denotes the original sample size, p, which denotes the DF, and R 2, which denotes the r-squared.

Where k = the number of independent variables.

3.11 Cusum Test

The CUSUM test, which also makes use of recurring residuals with different distribution if the null hypothesis is true, was developed by Brown, Durbin, and Evans in 1975. Applying the Cumulative total (CUSUM) of the recursive residuals for a, which accumulates detects persistent movements in the regression coefficient, the stability parameter is examined.

CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This chapter will discuss the analysis of the data acquired for this inquiry. This chapter will also include the level of analysis's results and interpretation. For trend analysis, mean, median, maximum, and minimum are to be used, while descriptive statistics for graphs are to be used.

4.2 Descriptive statistics

Descriptive statistics can be used to summarize or describe the properties of a sample or data set. A few instances of descriptive statistics include the frequency of a variable, the mean, the variance, standard deviation, and variance. Inferential statistics may be useful if we wish to figure out what characteristics the separate components of a data sample have in common when we look at it as a whole

Table 4.2: *Descriptive statistics*

	EG	**FDI**	**LTEL**	**LTOP**	**LEXR**
Mean	1.295665	0.865354	10.23467	4.292964	7.484844
Median	1.514156	1.269905	10.65134	4.407371	9.402315
Maximum	3.403651	1.942125	11.51293	4.669913	10.35961
Minimum	-4.236812	-4.151916	7.130099	3.296109	1.839756
Std. Dev.	1.275121	1.30911	1.362538	0.360657	3.437416
Observation	50	50	50	50	50

Table 1 shows the effects on the inputs to the model variables. The data are presented as mean, median, minimum, maximum, standard deviation, skewness, as well as kurtosis, among other essential trend aspects. Table 1 displays the findings of the descriptive analysis together with the key trends' features, including the mean, median, lowest and highest values, in addition to the standard deviation, skewness, and kurtosis. The data set's values are added together, and the mean is determined by dividing the sum by the reported value. The mean is derived by dividing the sum of the data set's values by the reported value. Between 1970 and 2020, our GDP climbed by an average of 0.7% every year. EG 1.295665, FDI 0.865354, LTEL 10.23467, LTOP 4.292964, and LEXR annual growth rates are typical for our economy. The median displays the value that corresponds to the midway of an observation when it is arranged from greatest to lowest values or vice versa. The median numbers for TEL are 10.65134, TOP are 4.407371, EXR are 9.402315, FDI are 1.26990, TOP are 4.407371, and EG are 1.514156. EG 3.403651, FDI 1.942125, LTEL 11.51293, LTOP 4.669913, while LEXR 210.35961 had the highest values at their maximums. The lowest possible values for EGR, FDI, LTEL, LTOP, and LEXR are 1.839756, -4.236812, and -4.151916, respectively. The standard deviation is used to compute the variance, sometimes referred to as the variation from the mean, of our variables. A standard deviation exists. EG 1.275121, FDI 1.30911, LTEL 1.362538, LTOP 0.360657, and LEXR 3.437416 are the figures.

4.3 Unit root test

To discriminate between stationary and non-stationary time series including data, the unit root technique is frequently utilised. The infinite covariance, a constant variance, and a constant mean (x) describe a stationary series of periods.

If the t-statistic is greater than the significant values, the null hypothesis is going to be accepted. The information being collected is non-stationary so there is a unit root. T-statistics are probably not up to the required requirements. Since the information is stationary, the unit root cannot elude detection. The unit root test is widely used to discern between stationary and non-stationary time series with data. A stationary time series is one with a fixed mean (x), infinite covariance, or constant variance.

Since t * > ADF critical-values _, we do not reject the null hypothesis since a unit root exists.

When t * ADF critical-values_, the null hypothesis is rejected because there isn't a unit root.

The data being collected exhibits non-stationarity and a unit root. Probably below the crucial value for T-statistics. The data are steady, and the unit's root does not exit. In-depth analyses of Somalia's economic development, trade openness, currency value, foreign direct investment, including telecommunications from 1970 to 2020 are provided in this article.

Gujarati (2004) underlines that if a non-stationary time series fails to become stationary, regressing it on additional non-stationary time series may yield an inaccurate conclusion. To prevent performing an incorrect regression, it is crucial to ascertain the stationarity of time series data during dealing with them. The results from an irregular series of events, which can only be observed at that exact point in time and cannot be extrapolated to future times, offer as another justification for doing stationary tests.

To achieve a trustworthy t-statistic that appropriately depicts the degree the stationary change in data from time series, the unit root test must be performed first. Before use any other estimating methodologies, this is necessary. The unit root test is a popular method for determining if a continuing data flow is constant. Most Augmented Dickey-F Fuller Test (ADF) is one of the most popular statistical methods for detecting when a time series is stationary or not.). The enhanced test (ADF), a type of unit roots test that is frequently used in literature, calls to perform the stationary test of series in order to prevent incorrect regression. If this is done, the test results and the test statistics are still valid and suitable. (Groen, 2003). To estimate the 30 order of integration, one might use the variables' potential number of stationarity differences. The following regression phases form the foundation of the ADF test: (Asteriou & Hall, 2007). In order to ascertain whether the variables are steady in their level form, the ADF test for level form and the Phillips Peron unit root tests are used within this dissertation.

A trustworthy stationarity analysis method is the Phillips-Perron (PP) test. Phillips & Perron (1988). This is because the PP test is non-parametric, performs better with larger data sets, and is more sensitive to structural problems. Similarly to the ADF test, the null hypothesis, or H0, will be accepted if the data point has a unit root. However, if there is no unit root (i.e., there is a likelihood of less than 5%), the null hypothesis will be accepted and the other hypothesis (H1) would be rejected.

Table 4.3: *Unit root test*

ADF				
Intercept			Trend and intercept	
Variable	t-stats	Prob*	t-stats	Prob*
EG	Level	0.9997	Level	0.0233
	1st diff	0.0007	1st diff	0.0019
FDI	Level	0.9849	Level	0.0107
	1st diff	0.0000	1st diff	0.0000
LTEL	Level	0.2933	Level	0.6949
	1st diff	0.0000	1st diff	0.0000
LTOP	Level	0.1623	Level	0.0236
	1st diff	0.0038	1st diff	0.0202
LEXR	Level	0.8720	Level	0.3583
	1st diff	0.1273	1st diff	0.0314

Source: Extract from estimation output using E-views 12 student version

PP test				
Intercept			Trend and intercept	
Variable	t-stats	Prob*	t-stats	Prob*
EG	Level	0.6525	Level	0.0000
	1st diff	0.0001	1st diff	0.0000
FDI	Level	0.6362	Level	0.0004
	1st diff	0.0000	1st diff	0.0000
LTEL	Level	0.7147	Level	0.6145
	1st diff	0.0000	1st diff	0.0000
LTOP	Level	0.0910	Level	0.0749
	1st diff	0.0000	1st diff	0.0000
LEXR	Level	0.8604	Level	0.8052
	1st diff	0.1581	1st diff	0.0414

Source: Extract from estimation output using E-views 12 student version

The symbols *, **, and ***, respectively, signify significant levels of 10%, 5%, and 1%. When dealing with factors that aren't level-stationary, one should utilize the first differences operator.

According to the findings of the ADF and PP tests, as shown in the aforementioned Table 2, all of the elements are stationary at the level of 1%. If the null hypothesis has not been refuted, check to see if the data has a unit root since we do. Considering the average of the Distribution Function (ADF) probability value is 0.0223, which is less than 5%, the data does not have a unit root. The data has a unit root if the t-value statistic is negative below the cutoff. The data fails the unit root test when the probability value of the PP test is less than 5%.

4.4 ARDL bound test for Cointegration

Table 4.4: *ARDL bound test for cointegration*

F-Bound Test Null hypothesis: No levels relationship

Test Statistic	Value	Significant	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	17.09673	10%	3.03	4.06
K	4	5%	3.47	4.57
		2.5%	3.89	5.07
		1%	4.4	5.72
			Finite Sample: n=30	
Actual sample size	30	10%	3.43	4.624
		5%	4.154	5.54
		1%	5.856	7.578

Source: Extract from estimation output using E-views 12 student version.

In order to ascertain how much there is a long-term relationship among the economic growth component and the other factors considered in the research, an ARDL bond test approach, or a long-term technique, was used in this study. The goal of this study was to ascertain whether these traits remained connected throughout time. Table 3 presents the outcomes of employing this tactic in an easy-to-understand manner.

The following elements will be considered while making a decision: In the opinion of Ho, if the correlation coefficients in F are smaller below the least I (0) requirement, there is no overtime link.

4.5 Results of a short run of ARDL-ECM

Table 4.5: *Results of a short run of ARDL-ECM*

Variable	Coefficient	Std.Error	t-statistic	Prob*
C	19.59194	2.034858	-9.628162	0.0000
@TREND	-0.182714	0.016924	-10.79612	0.0000
DL(TOP)	1.160225	0.760335	1.525940	0.1427
D(FDI)	2.022798	0.158587	12.75513	0.0000
DL(EXR)	-0.639280	0.234706	-2.723755	0.0131
CoinEq(-)1	-0.712267	0.070325	-10.12820	0.0000
R-squared				0.903466
Adjusted R- square				0.883355
F statistic				44.92333
Durbin Watson stat				1.906711

Source: Extract from estimation output using E-views 12 student version.

The result of this experiment's instantly obvious ARDL model is shown in Table 4. The coefficient of the mistake correction model is -0.712267. The fast adaptation component predicts that the difference between the economy's current value and the potential value

of the equilibrium would close in less than a year, given a statistically significant value equal -0.712267. As a result, the system is long-term heading toward balance at an average rate of 71.22%.This revised coefficient's negative sign and statistically significant value (probability) served as confirmation of the co-integration. The error repair coefficient is statistically significant and actually has a negative sign at the 1% level of significance. This supports prior research on the long-run the co-integration of significant model variables. Our independent variables appear to be extremely useful in describing changes in economic development, as indicated by R-square 0.903466, a metric of a the model's overall fitness. With the exception of crude oil, which is supplied in dollars per barrel, each and every single one of these information series is expressed as a percentage (%).Given that the probability value is smaller than 0.10 (p-value 0.10), the variable conforms within T-statistics within the 10th percentile of significance. As a result, this series was changed into a log. If the F-statistics were statistically significant at the 1% level of significance, the model might be statistically significant overall. There existed an important connection between FDI and Somalia's economic growth between 1970 and 2020. This decision was made after considering the available facts. The investigation's findings support this conclusion. The findings suggest that FDI may influence economic growth in the short term. Just an extremely weakly indirect relationship between Somalia's exchange rate and its economic growth exists between 1970 and 2020. The results revealed a link between the exchange rate and quick, short-term economic growth. While the P-value is 0.6362, the estimated trade openness is 1.160225.The investigation's findings corroborate this statement. The findings suggest that FDI may influence economic growth in the short term. Only a very modest inverse causal connection between Somalia's exchange rate and economic growth exists between 1970 and 2020. The relationship between exchange rate and quick, short-term economic growth was also observed. The projected trade openness was 1.160225 whereas the P-value is 0.1427. This results in the conclusion that, at the selected level of relevance (0.1), trade openness significantly enhances economic growth. According to the 1.906711 Durbin-Watson statistics, the variables might not be automatically connected.

4.6 Results of a long run of ARDL- ECM

Table 4.5: *Results of a long run of ARDL- ECM*

Variable	Coefficient	Std.Error	t-statistic	Prob*
LTEL	0.3112266	0.253267	-1.232948	0.2319
LTOP	9.429621	2.248532	4.193679	0.0004
FDI	2.982094	1.161288	2.567919	0.0184
LEXR	-.402572	0.170292	-2.364004	0.0283

Source: Extract from estimation output using E-views 12 student version.

Once it is established that the variables under examination exhibit long-run co-integration, the study estimates the model's long-run coefficients. Telecommunications have a negative long-term influence on economic growth, according to the calculated long-run connection coefficient. This demonstrates how the economic development of Somalia could stagnate due to increased telecommunications expenses. The t-stat indicates that the likelihood value is significant at the 10th percentile of significance based on the statistic with a p-value of less than 0.10 (p-value 0.10). Foreign direct investment, or FDI, is projected to have a beneficial impact on economic growth when its consequences are taken into account. This suggests that as international trade increases, the GDP will as well. The probability value for TOP, which is below or equal to 0.10 (p-value), is used to base decisions. Foreign direct investment is flexible for economic growth throughout the long run, as indicated by the computed value of 0.0184. Additionally, I discover that trade openness was statistically significant at the 1% level of significance and has a positive relationship with economic growth.

4.7 Serial correlation LM test

Table 6: *Serial correlation LM test*

Breusch-Godfrey Serial Correlation LM test: Null hypothesis: No serial correlation at up to 1 leg			
F-statistic	0.035650	Prob. F (1,19)	0.8522
Obs*R-squared	0.056183	Prob. Chi-Square (1)	0.8126

Source: Extract from estimation output using E-views 12 student version.

Table 6 the Breusch-Godfrey L-M test, according to the explanations, corrects mistakes in a regression model caused by auto-correlation. Residues, a usual technique for regression research, are also applied. Neither series nor order exhibiting a regular association is the experiment's null hypothesis. Because our p-value is lower than the 5% level of confidence and our null hypothesis was officially accepted. There is no evidence of a serial link, according to the results of the chi-square test and F-statistic.

4.8 Heteroskedasticity Test

Table 7: *Heteroskedasticity Test*

Heteroskedasticity test: Breusch-Pagan-Godfrey Null hypothesis: homoscedasticity			
F-statistic	1.069722	Prob. F (1,24)	0.3113
Obs*R-squared	1.109417	Prob. Chi-square	0.2922

Source: Extract from estimation output using E-views 12 student version.

The results of the Breusch-pagan-Godfrey test are shown in Table 7. The chi-square test result is 0.2922. If the probability value exceeds 0.05 (5%) in percentage terms, the homoscedasticity null hypothesis is accepted. The results of the Breusch-Pagan-Godfrey test demonstrate unequivocally that the model's residuals are not heteroscedastic. The fact showing the error variance equals when considered in the larger context of the results provides additional proof indicating heteroskedasticity is not a problem in the data set.

4.9 Ramsey reset test

Table 8: *Ramsey reset test*

	Values	DF	Probability
F-statistic	0.859509	1(19)	0.3655

Source: Extract from estimation output using E-views 12 student version.

Table 8 above displays the residual diagnostic test results based on the ARDL limits test model utilized in this investigation. We use the Jarque-Bera normalcy test, the Breusch-Godfrey test for serial correlation, and the Breusch-Pagan-Godfrey test for heteroskedasticity. The findings demonstrate that there are no issues with serial correlation whenever economic growth and telecommunication are included as dependent variables; the residuals are homogenous and generally distributed at the 1%, 5%, and 10% level of significance. Although the residuals of the model with economic growth as the variable that is dependent have a normal distribution or do not exhibit serial correlation issues, they do exhibit heteroskedasticity issues at the 1%, 5%, and 10% levels of significance. Consequently, the study's model produces reliable, solid outcomes.

4.10 Cusum test

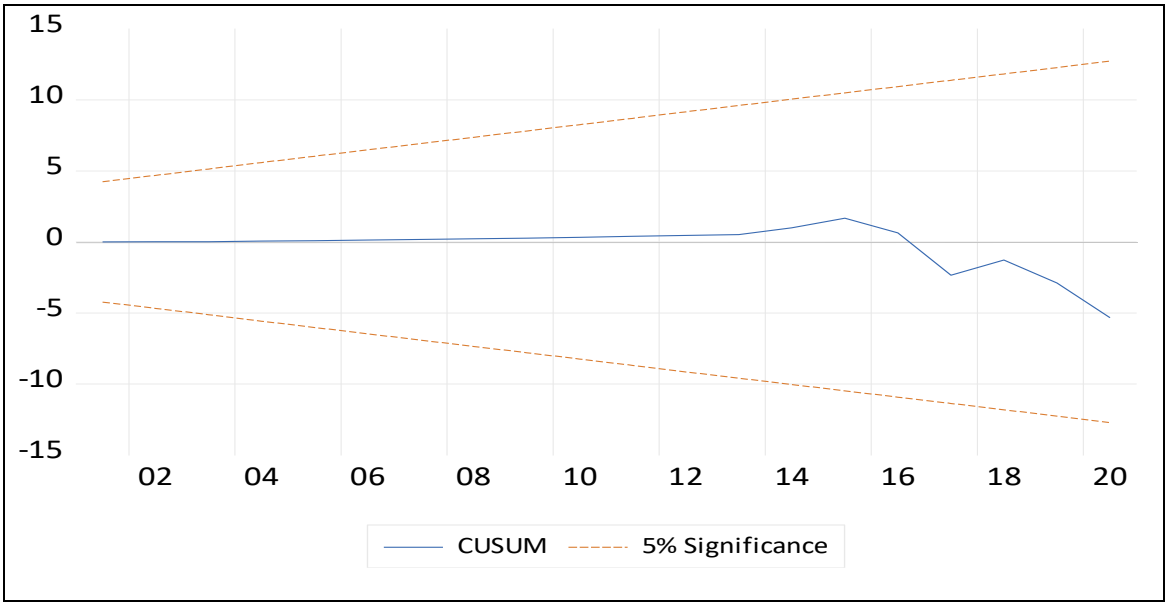

Figure 4.10 Cusum Test

4.11 Cusum of square test

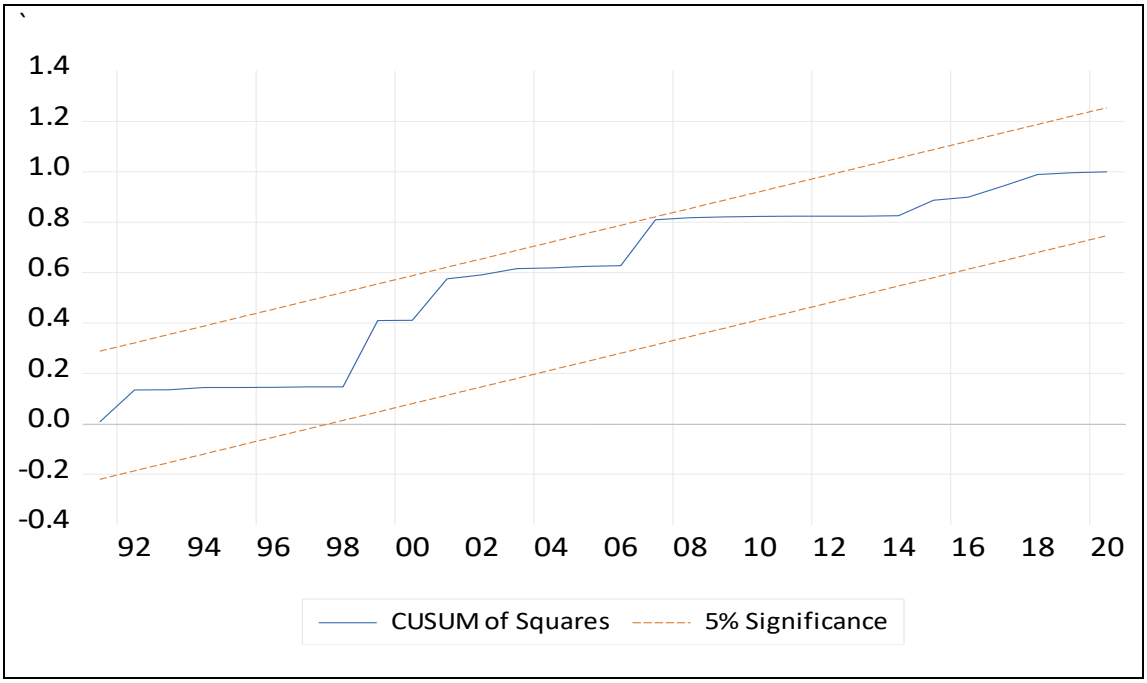

Figure 4.11 Cusum of Square Test

CHAPTER V
SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of the study

The study used time series data from 1970 to 2020 and an ARDL model for a coin-integration test to examine the impact of telecommunication development on economic growth in Somalia. EG was a dependent variable, but FDI, TOP, EXR, and TEL are variables that are independent. In the literature, the effect of telecommunication development on Somalia's economic growth was evaluated as well. The study's objective is to determine whether or not the demand for telecommunication services has any impact on economic growth and whether or not telecoms may be a factor in promoting it. ICT has a wide range of effects on economic growth, particularly in developed and emerging countries, according to numerous researches.

Dewan & Kraemer (2000) is one of these investigations. It supported the assumption that spending on information technology is positively connected with worker productivity in advanced nations but not in emerging ones using information from 36 different countries during 1987 and 1993. He used information from the European Union collected by the Organization on Economic Cooperation and Development (OECD) between 1992 and 1997 for the year 2001. (EU). In the 1990s, ICT significantly influenced GDP development around the world, but he noticed that the European Union grew more slowly than other wealthy nations. The study looked at the relationship between telecom infrastructure investments and economic growth in Central and Eastern European developing nations. Spending on telecommunications and economic expansion go hand in tandem (Madden & colleagues, 1998) found. (K.S. Sridhar & V. Sridhar, 2007).

5.2 Findings

The major goal of this study was to determine how Somalia's economic progress was impacted by the expansion of telecommunications. The GDP of Somalia increased from 2014 to 2015, with 7.5071001 to 14.8953014, according to a research that examined how telecommunications impact economic growth. This study discovered a link between

the growth of telecommunications and economic progress. The nation of Somalia's GDP is being increased by the quickly growing telecoms sector.

5.3 Policy Implications

The results of this study, however, have important ramifications for the actual world, particularly for the telecommunications sector in Somalia. The variables that are included in this study's study have already been empirically investigated, and the factors have also been previously analyzed utilizing a variety of evaluation approaches.

5.4 Conclusion

Our research demonstrates how Somalia's economic progress "Between" 1970 and 2020 was impacted by the expansion of telecommunications. As indicated in chapters three and four, experimental results that are pertinent to the specific goals in chapter one I have been achieved.

Using the ARDL bound test co-integration, we were able to determine the impact of telecommunication development on economic growth in Somalia.

An ARDL econometric approach was used to assess the impact for the telecommunications industry on trade openness and foreign direct investment.

The growth of telecommunications is advantageous to Somalia's economic progress. Liberalization of trade and foreign direct investment, however, serve as roadblocks to economic growth.

In the short term, the ARDL method FDI, and TOP are positive relationship with economic growth, While EXR have negative relationship with economic growth. Increased levels of trade openness (TOP), foreign direct investment (FDI), telecommunication development (TEL), and the exchange rate will all be tied to future economic growth.

According to long-term ARDL TOP, FDI have positive relationship with economic growth. While EXR and FDI have negative relationship with economic growth.

5.5 Recommendation

Our analysis shows that the influence of telecommunication development and economic growth is going to be particularly significant over the long run due to the data imbalance it causes.

As expectations change and the quality of the information declines, the relevance of telecommunications may, in the short term, both restrict growth and be only ephemeral. In order to ensure consistency and logic in market and economic circumstances.

1. Because our telecommunication firms are accountable and because consumer information could endanger their lives if it were to become public, we expect them to secure it.

2. Somalia the telecoms sector has to know more about its competitors in order to improve their position by resolving the issues those competitors have brought up.

3. The government must build and improve numerous auxiliary elements in the communications system in order to address the best problem, such as the business climate, transit system, educational system, and primary power training.

4. Create a Public Service Management Policy (PSMP) that includes specific instructions on hiring, career development, performance evaluation, and a transparent compensation structure with a regular incentive program.

4. Institutional and legal framework strengthened to mandate improved conditions of employment in the public and private sectors

5.6 Suggestions for Future Research

Our understanding of how telecommunications development affects economic growth has significantly increased as a result of the study. Additional variables and analysis approaches might be used in other investigations. However, future research may examine how the development of telecommunications, in addition to elements like foreign direct investment and trade openness, has impacted Somalia's economic growth.

REFERENCES

Abdul Hakim, S. 2014: (The impact of capital market performance on economic growth In Nigeria).

AboElsoud, M. E., AlQudah, A., & Elish, E. (2020). Does a change in immigration affect the unemployment rate in host countries? Evidence from Australia. *Journal of Applied Economics*, *23*(1), 21–43.

Asteriou, and S.G. Hall, Applied Econometrics: A Modern Approach, PALGRAVE MACMILLAN, New York, 2007.

Alencar, D., Strachman, E., Barbosa, L. O. S. B., & Puty, C. A. C. B. (2019). On foreign direct investments and the balance of payment constrained growth model in Latin America, 1990–2014. PSL Quarterly Journal, 72(290), 207–221.

Anyanwu, J. C. (2011), 'Aid and Economic Growth in Africa: Empirical Evidence from Recent Data, 1958–2001', in D. Gbetnkom (ed.), *International Finance*: Theory and Policy in Africa,

Ayres, Robert (1989). "Technological Transformations and Long Waves" (PDF): *9.*

Aker, J.C., & Mbiti, I.M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives, 24*(3), 207–232. Doi: 10.1257/jep.24.3.207.

Alleman, J., C. Hunt, D. Michaels, P. Rapport and L. Taylor, 2004. Telecommunications and economic development: Empirical evidence from Southern Africa. *International Telecommunication society,* Sydney. Available from http: / / www. Colorado. Edu/ /engineering/Alleman/print files/soafrica_paper [Accessed *10*/10/12].

Arezki, R. and T. Gylfason (2011), 'Commodity Price Volatility, *Democracy and Economic Growth',* CESIFO Working Paper No. *3619,* October.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2002). Reversal of fortune*: Geography and institutions in the making of the modern world income distribution MIT Press.*

Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.4132478 &site=eds-live&scope=site.

Alcalá, F., & Ciccone, A. (2004). Trade and productivity MIT Press. Retrieved from http://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.*25098695* &site=eds-live&scope=site.

Afesorgbor, S., Van Bergeijk, P.A.G., 2011. Multi-membership and the Effectiveness of Regional Trade Agreements in Western and Southern Africa: *a Comparative Study of ECOWAS and SADC. No. 520.* Institute of social sciences Working paper

Akalper, E., & Duhok, D. (2018). Does monetary policy affect economic growth: Evidence from Malaysia. *Journal of Economic and Administrative Sciences, 34*(1), 2–20.

Alfaro, L., 2003, "Foreign Direct Investment and Growth: Does the Sector Matter?" *Harvard University, Harvard Business School,* Working Paper.

Adebiyi, M.A & Dauda, R.O.S (2009). Trade Liberalization policy and Industrialization Growth performance in Nigeria: An Error Correction Mechanism Technique, being a paper presented at the 45th annual conference of the Nigerian economic Society, 24th to 26th August, *Central Bank of Nigeria* new building auditorium, Abuja.

Buenos, N. (2009). Fiscal policy and economic growth: Empirical evidence from EU countries (MPRA Paper 19174). *University Library of Munich.*

Busu. (2020). The fixed versus random effects debate and how it relates to centering in multilevel modeling. *Psychological Methods, 25* (3), 365–379. https://doi.org/ggbk25

Busse, M., and Groizard, J. L. (2008). Foreign Direct Investment, Regulations and Growth. *World Economy, 31*(7), 861–886.

Bjork, Gordon J. (1999). The Way It Worked and Why It Won't: Structural Change and the Slowdown of U.S. Economic Growth. *Westport, CT; London*: Praeger. pp. 2, 67. ISBN.

Becchetti, L., Londono Bedoya, D.A., & Paganetto, L. (2003). ICT investment, productivity, and efficiency: Evidence at the firm level using the stochastic frontier approach. *Journal of Productivity Analysis, 20,* 143–167. Doi: 10.1023/a: 1025128121853.

Bayes, A. et al (1999), "Village Pay Phones and Poverty Reduction: *Insights from a Grameen Bank Initiative in Bangladesh",* ZEF – Discussion Paper on Development Policy No. *7,* Centre for Development Research (ZEF), Bonn, May 1999.

Baliamoune, M. (2009), 'Openness, Growth, and Convergence in Africa: Evidence from 1980–1999 Data', *Journal of African Development,* Vol. 11, No. *1,* pp. 109–26.

Borensztein, E., J. De Gregorio and J. Lee (1998), 'How Does Foreign Direct Investment Affect Economic Growth?' *Journal of International Economics,* Vol. *45,* pp. 115–35.

Barro, R. and X. Sala-i-Martin (1995), Economic Growth, McGraw-Hill, New York.

Batuo, E.M. (2008). The role of telecommunications infrastructure in the regional growth of Africa (MPRA Working Paper). Italy: *Marche Polytechnic University.*

Bebee. E. L. & E. T. W. Gilling (1967), "Telecommunications and Economic Development: A Model for Planning and Policy Making", *International Telecommunications Society,* Sydney.

Barro, R. (1991) Economic growth in a cross-section of countries, *Quarterly Journal of Economics, 106*, 407–43.

Bergstrand, J.H., 1985. The gravity equation in international trade: *some microeconomic foundations and empirical evidence.* Rev. Econ. Stat. *67* (3), 474–481.

Bagnai, A., Rieber, A., Tran, T.A., 2016. Sub-Saharan Africa's Growth, South-South trade and the generalized balance-of-payments constraint. *Camb. J. Econ. 40* (3), 797–820.

Bardhan, P. K. (1971). On optimum subsidy to a learning industry: An aspect of the theory of infant industry protection The Wharton School of Finance and Commerce, *University of Pennsylvania, and the Osaka University Institute of Social and Economic Research* Association.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.*10*.2307.2 525496&site=eds-live&scope=site.

Barro, R. J. (1996). Determinants of economic growth: A cross-country empirical study. Unpublishedmanuscript.fromhttp://search.ebscohost.com.proxy.iwu.edu/login.as

px?direct=true&db=ecn&AN=*0718330*&site=eds-live&scope=site; 3http://www.nber.org/papers/w5698.pdf

Borensztein, E., J. De Gregorio and J.-W. Lee (1998), "How does a foreign direct investment affect economic growth?" *Journal of International Economics,* vol. 45, No. *1*, Amsterdam, Elsevier.

Cruz, M., & Ahmed, S. A. (2018). On the impact of demographic change on economic growth andpoverty.*WorldDevelopment,105*(C),95106.https://doi.org/10.1016/j.worlddev .2017.12.018 Darku, A. B., & Yeboah, R. (2018).

Chipeta, C., Meyer, D. F., & Muzindutsi, P.-F. (2017). The Effect of Exchange Rate Movements and Economic Growth on Job Creation. *Studia Universitatis Babes-Bolyai Oeconomica, 62*(2), 20–41. https://doi.org/10.1515/subboec-2017-0007

Carkovic, M., & Levine, R. (2002). Does foreign direct investment accelerate economic growth? *University of Minnesota Department of Finance working paper.*

Chanegriha, M., Stewart, C., & Tsoukis, C. (2020). Testing for causality between FDI and economic growth using heterogeneous panel data. *The Journal of International Trade and Economic Development, 29*(5), 546–565.

Carlson, J. A., & Osler, C. L. (2000). Rational speculators and exchange rate volatility. *European Economic Review, 44,* 231–253.

Chakraborty, C. and B. Nandi, 2003. Privatization, telecommunications and growth in selected Asian countries: An econometric analysis. Communications and Strategies, *52:* 31-47.

Cohen, P., West, S. G., & Aiken, L. S. (2007). Applied multiple regression/correlation analysis for the behavioral sciences. Mahwah, NJ: Erlbaum.

Cronin, Francis Telecommunication's infrastructure investment and economic development. Telecommunications Policy 1993, vl7n*6,* Aug p. 415-430.

Cieslik, A., & Kaniewsk, M. (2004). Telecommunications infrastructure and regional economic development: *The case of Poland. Regional Studies, 38,* 713–725.

Coe, D. T., & Helpman, E. (1995). International R&D spillovers. *European Economic Review, 39*(5), 859-887. doi:http://www.sciencedirect.com/science/journal/00142921

Choe, J.I., 2003, Do Foreign Direct Investment and Gross Domestic promote Economic Growth?" *Review of Development Economics*, *7*(1), 44-57.

Carrere, C., 2004. African regional agreements: impact on trade with or without currency unions. J. *Afr. Econ. 13* (2), 199–239.

Dollar, D. (1992), 'Outward-Oriented Developing Economies Do Grow More Rapidly: Evidence from 95 LDCs, 1976– 1985 ', *Economic Development and Cultural Change,* Vol. 40, No. *3,* pp. 523–44.

Dewan, S.; Kraemer, K. L. 2000. Information technology and productivity: *preliminary evidence from country-level data, Management Science 46*(4): 548–562. http://dx.doi.org/10.1287/mnsc.46.4.548.12057.

Dedrick, J., K. L. Kraemer. 2001. Information technology and productivity: results and implications of cross-country studies. In M. Pohjola (Ed.), *Information Technology and Economic Development.* Cambridge: Oxford University Press.

Dholakia, R.R. & Harlam, B. (1994), Telecommunication and economic development,

Telecommunication policy, 15(6), 529-535.

Datta, A. and Agarwal, S. (2004) Telecommunications and economic growth: *a panel data approach,* Applied Economics, *36,* 1649–54.

David, O. J; Umeh, C & Abu, A. A (2010). The Effect of Exchange Rate Fluctuations on the Nigerian Manufacturing sector, *African Journal of Business Management, 4*(10), 2994-2998

Dědek, O., & Gregor, M. (1994). Hot money, speculation, and exchange-rate policy. *Russian and East European Finance and Trade, 30*(6), 50–70.

Daveri, F. (2001), 'Information Technology and Growth in Europe', *University of Parma/IGIER working paper*.

Ericsson, J., and Manuchehr, I. (2001). On The Causality Between Foreign Direct Investment And Output: A Comparative Study. *The International Trade Journal, 15*(1), 1–26.

Eris, M.N., Ulasan, B., 2013. Trade openness and economic growth: the Bayesian model Averaging estimate of cross country growth regressions. *Econ. Modell. 33,* 867–883.

Edwards, S. (1992). Trade orientation, distortions, and growth in developing countries. *JournalofDevelopmentEconomics,39*(1),31-57. doi:http://www.sciencedirect.com/science/journal/03043878.

Edwards, S. (1998). Openness, productivity, and growth: What do we know? Blackwell Publishers. Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.*2565567* &site=eds-live&scope=site.

Enowbi (2008), "The Role of Telecommunication Infrastructure in the Regional Economic Growth of Africa" MPRA Paper No. *16741*.

Engle, R. F., & Granger, C. J. W. (1987). Cointegration and error correction representation, estimation, and testing. Econometrica, 55, 251–276. https://doi.org/10.2307/1913236

Friedman, M. (1953). The case for flexible exchange rates. *Essays in Positive Economics, 157,* 203.

Frankel, J. A., & Romer, D. (1999). Does trade cause growth? *American Economic Association.*Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.*117025*& site=eds-live&scope=site.

Fayissa, B. and C. Nsiah (2010), 'Can Remittances Spur Economic Growth and Developments in Sub-Saharan Africa?' paper presented at the 2010 AFEA/ASSA Conference, *Atlanta & Africa.*

Fredderke, J.W., & Bogetic, Z. (2009). Infrastructure and growth in South Africa: Direct and indirect productivity impacts of 19 infrastructure measures. *World Development, 37*(9), 1522–1539. Doi: 10.1016/j.worlddev.2009.01.008.

Fowowe, B. (2008), 'Financial Liberalization Policies and Economic Growth: Panel Data Evidence from Sub-Saharan Africa', *African Development Review,* Vol. 20, No. *3,* pp. 549–74.

Gould, D., 2009. Has NAFTA Changed North American Trade? *Federal Reserve Bank of Dallas.*

Gujarati, N. D. 2004. *Basic Econometrics,* 4th edition. New York: McGraw - Hill, 2004. ISBN 978-0070597938.

Garza-Rodriguez, J., Almeida-Velasco, N., Gonzales-Morales, S., & Leal-Ornelas, A. P. (2020). The impact of human capital on economic growth: The case of Mexico. *Journal of the Knowledge Economy*, *11*(2), 660–675.

Grossman, G. M., & Helpman, E. (1989). Product development and international trade The*UniversityofChicagoPress*.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.1833238 &site=eds-live&scope=site.

Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. NBER WorkingPapers,1.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edb&AN=61417489&site=e ds-live&scope=site.

Groen, J.J.J. and F. Kleibergen (2003), Likelihood-Based Cointegration Analysis in Panels of Vector Error-Correction Models, *Journal of Business and Economic Statistics 21*: 295ñ318.

Gruber, H., & Verboten, F. (2001). The diffusion of mobile telecommunications services in the European Union. *European Economic Review, 45,* 577–588.

Godfrey, L. (2006). Tests for regression models with heteroskedasticity of unknown form. *Computational Statistics& Data Analysis, 50,* 2715-2733. doi:10.1016/j.csda.2005.04.004.

Harding, T., & B.S. Javorcik (2007). *Developing Economies and International Investors*: Do Investment Promotion Agencies Bring Them Together?

Herzer, D., Klasen, S. and Nowak-Lehmann D, F. 2008. In search of FDI-led growth in developing countries: the way forward. *Economic Modelling 25*(5): 793-810.

Hardy, A., 1980, "The Role of the Telephone in Economic Development," *Telecommunications Policy, 4:* 278-286.

Harrison, A. (1996). Openness and growth: A time-series, cross-country analysis for developingcountries.*JournalofDevelopmentEconomics,48*(2),419-447. doi:http://www.sciencedirect.com/science/journal/03043878

Henderson, H. (1996). Social innovation and citizens' movements. *In Slaughter, R.A. Ed. New thinking for a new millennium. Routledge, 213*- 235.

IMF, 2012. IMF world economic outlook. Available from www.imf.org.

Ibrahim, M. I., & Nageye, A. I. (2017). Determinants of Exchange Rates in Somalia. *Asian Journal of Economic Modelling, 5*(3), 233–244. https://doi.org/10.18488/journal.8.2017.53.233.244.

Jorgenson, D. (2001): "Information Technology and the U.S. Economy," *American Economic Review, 91*(1), 1-33.

Jipp, A. (1963), ``Wealth of nations and telephone density", *Telecommunications Journal*, July, pp. 199-201.

Jones, C. I., & Vollrath, D. (2013). *Introduction to economic growth (3th ed.)*. W. W. Norton and Company.

Johansen. S. (1992). Determination of cointegration rank in the presence of a linear trend, *Oxford Bulletin of Economics and Statistics, 54,* 383-397.

Khalid, A. M., & Marasco, A. (2019). Do channels of financial integration matter for FDI's impact on growth? Empirical evidence using a panel. *Applied Economics, 51*(37), 4025–4045.

Kripfganz, Sebastian and Daniel Schneider. 2018. "ardl: Estimating autoregressive distributedlagandequilibriumcorrectionmodels.".URL:https://ideas.repec.org/p/boc/usug18/09.html.

Kandil, M., & Nergiz Dincer, N. (2008). A comparative analysis of exchange rate fluctuations and economic activity: The cases of Egypt and Turkey. *International Journal of Development Issues*, *7*(2), 136–159. https://doi.org/10.1108/14468950810909114

Kandil, M., Berument, H., & Dincer, N. N. (2007). The effects of exchange rate fluctuations on economic activity in Turkey. *Journal of Asian Economics, 18*(3), 466–489. https://doi.org/10.1016/j.asieco.2006.12.015

Kambil, A. and J.E. Short (1994) Electronic Integration and Business Network Redesign:ARoles—Linkage Perspective.*JournalofManagementInformationSystems10*:4, 59–83.

Kinoshita, Y. & Lu, C., (2006). On the role of Absorptive Capacity: FDI Matters to Growth. *William Davidson Institute* Working Paper, nº *84.*

Kang, Y., & Kim, B. (2018). Immigration and economic growth: do origin and destination matter? *Applied Economics*, *50*(46), 4968–4984.

Karner, J. and R. Onyeji, 2007. Telecom private investment and economic growth: The case of African and Central & East European countries. Unpublished Thesis,

Jonkoping University, *Jonkoping International Business School,* JIBS, Economics.

Krugman, P., & Venables, A. J. (1995). The seamless world: A spatial model of internationalspecialization.Unpublishedmanuscript.Fromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=ecn&AN=0718777&site=edslivescope=site;http://www.nber.org/papers/w5220.pdf

Kendrick, John (1961). "U.S. Productivity Performance in Perspective, *Business Economics,* October 1, 1991" .doi:10.2307/23485828.

Leithy, W. E. (2017). A Review of the impact of national culture on economic growth. *International Journal of Economics & Management Sciences, 06*(04|4).

Li, X., and Liu, X., 2005, "Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship," *World Development 33*(3), 393-407.

Lucas, R. 1988. On the mechanics of economic development. *Journal of Monetary Economics, 22*: 3- 42.

Luis, J.M., & Stephan, H. (2011). Determinants of foreign direct investment of South African telecommunications firms into sub-Saharan Africa (Working Paper 222). Johannesburg, RSA: *Wits Business School, University of the Witwatersrand.*

Landes, David S. The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present. *London: Cambridge* U.P., 1969. Print.

Lee “Minimum LM Unit Root Test with One Structural Break.” *Working Paper, Department of Economics,* Appalachian State University, (2004).

Lee, S. H., Levendis, J., & Gutierrez, L. (2012). Telecommunications and Economic Growth: An Empirical Analysis of Sub-Saharan Africa. *Applied Economics, 44*(4), pp. 461-469.

Lall, S. (2003). Reinventing industrial strategy: The role of government policy in building industrial competitiveness. Research Report, *the Intergovernmental Group on Monetary Affairs and Development* (G-24).

Lipsey, R.E. and Sjoholm, F. 2004. FDI and wage spillovers in Indonesian manufacturing. *Review of World Economics 140*(2):287-310.

Madden G., & Savage, S.J. (1998). CEE telecommunications investment and economic growth. *Information Economics and Policy, 10*(2), 195–207.

Manalo, J., Perera, D., & Rees, D. M. (2015). Exchange rate movements and the Australian economy. *Economic Modelling, 47,* 53–62. https://doi.org/10.1016/j.econmod.2015.02.013

Meyer, K. E., and Sinani, E. (2009). When and where does foreign direct investment generate positive spillovers? A meta-analysis. *Journal of International Business Studies, 40*(7), 1075–1094.

Munir, K., & Shahid, S. (2020). Role of demographic factors in economic growth of South Asian countries. *Journal of Economic Studies, 48*(3), 557–570.

Mankiw, N. G., Romer, D., & Weil, N. D. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics, 107*(2), 407–437.

Mishra, A., Daly, K., 2006. A multi-country empirical investigation into international financial integration. *Journal of Asia Pacific Economy 11* (4), 444–461.

Madden G., & Savage, S.J. (1998). CEE telecommunications investment and economic growth. *Information Economics and Policy, 10*(2), 195–207.

Noah, A. O., & David, O. O. (2013). Digital provides a panacea to public welfare and poverty management in Nigeria. *Entrepreneurial Journal of Management Sciences* (Al-Hikmah University, Special Edition).

Ndukwe, E. (2005), "The Challenges of Globalization and the Imperative of Creating Adequate ICT Infrastructure in Nigeria", *A paper presented at the e-Nigeria.*

Onakoya, B.O.A., Tella A.S., & Osoba M.A. (2012). Investment in Telecommunications Infrastructure and Economic Growth in Nigeria: A Multivariate Approach. British *Journal of Economics, Management & Trade, 2* (4), 309-326.

Ogun, O (2006). Real Exchange Rate Behaviour and Non-oil export Growth in Nigeria. *African Journal of Economic Policy, 11*(1), June

Ubok-Udom, E.U (1999). Currency Depreciation and Domestic Output growth in Nigeria: 1971-1995, *The Nigerian Journal of Economics and Social studies, 41*(1), 31-44.

Okpara, G.C (2006). Capital market in the development of Nigeria's economy.

An empirical analysis. *Nigerian Journal of Economic and Financial Research, 1.*

Osotimehin, K. O., E. Y. Akinkoye, and O. O. Olasanmi. 2010. "The Effects of Investment in Telecommunication Infrastructure on Economic Growth in Nigeria (1992–2007)."

Oyejide & Udun (2010). Exchange Rate Regime and Economic Growth: Evidence from Developing Asian and Advanced European Economies. Retrieved from: www.cgu.edu.include/ huang.

Paparoditis E, Politis DN (2018). "The Asymptotic Size and Power of the Augmented Dickey Fuller Test for a Unit Root." *Econometric Reviews, 37*(9), 955–973.

Phillips, P. C. B. and S. Ouliaris (1990), "Asymptotic properties of residual based tests for cointegration," *Econometrica, 58,* 165–193.

Pesaran, et al., (1997), MicroÖt 4.0*: Interactive Econometric Analysis, Oxford University Press (forthcoming).*

Pesaran, (2001). Bounds testing approaches to the analysis of level of relationship. *Journal of Applied Econometrics, 16* (3), 289–326.

Qiang, C.Z. (2009). Washington. Telecommunications and economic growth. Unpublished Paper. DC: World Bank.

Rogoffs K & Reinhart, C.M (2004). The modern history of Exchange rate arrangements: A reinterpretation. *Quarterly Journal of Economics, 119*(1), 1-47

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule the primacy of institutions over geography and integration in economic development Kluwer Academic

Publishers.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.40212696 &site=eds-live&scope=site.

Reinhart, C. M., & V.R. Reinhart (2008). Capital flow bonanzas: an encompassing view of the past and present. *NBER Working Paper Series*, (November), *1*–68.

Ro¨ller, L. and Waverman, L. (2001) Telecommunications infrastructure and economic development: a simultaneous approach, *American Economic Review, 91*, 909–23.

Ricketts, M., 2002. The economics of business enterprise. UK: Cheltenham: Edward Elgar.

Romer, D. (1996), Advanced Macroeconomics. United States of America: The McGraw-Hill Companies.

Romalis, J. (2007). Market access, openness, and growth. Unpublished manuscript. Fromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=ecn&AN=0911079&site=eds-livescope=site; http://www.nber.org/papers/w13048.pdf.

Romer, P. M. (1990). Endogenous technological change The University of Chicago Press.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.2937632 &site=eds-live&scope=site.

Romer, P. M. (1994). The origins of endogenous growth American Economic Association.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.2138148 &site=eds-live&scope=site.

Romer, P. M. (1990). Human capital and growth: Theory and evidence. *Carnegie-Rochester Conference Series on Public Policy*, *32*(1990), 251–286

Rodríguez, F., & Rodrik, D. (2000). Trade policy and economic growth: A skeptic's guidetothecrossNnationalevidenceMITPress.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.10.2307.3585399&site=eds-live&scope=site

Sensoy, A. (2015). An alternative way to track the hot money in turbulent times. Physical A: Statistical Mechanics and Its Applications, 419, 215–220.

Sala-I-Martin, X. X (1996). Regional cohesion: evidence and theories of regional growth and convergence. *European Economic Review*, *40*(6), 1325–1352.

Semancikova, 2016. Trade, trade openness, and macroeconomic performance. *Proceed. Soc. Behav. Sci. 220,* 407–416.

Sridhar, K.S., & Sridhar, V. (2007). Telecommunications infrastructure and economic growth: Evidence from developing countries. *Applied Econometrics and International Development, 7*(2), 37–56.

Sounders, R. J., Jeremy, J. W. & Bjorn W. (1994) Telecommunication and economic development, 2nd edition, Baltimore, MD: *John Hopkins University Press.*

Sachs, J. D., & Warner, A. (1995). Economic reform and the process of global integration. *Brookings Papers on Economic Activity, (1),* 1-118. Retrieved from http://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=bsh&AN=9508222967&site =eds-live&scope=site.

Tybout, J. R. (2001). Plant- and firm-level evidence on 'new' trade theories. Unpublished manuscript.fromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=ecn&AN=0715694&site=eds-livescope=site; http://www.nber.org/papers/w8418.pdf

Thirlwall, A. P. 1999. Growth and development. 6th edition. London: Macmillan Press Ltd.

Tellat A.S., Amaghionyeodiwe, L.A., & Adesoye, B.A. (2007). The Effects of Investment in Telecommunication Infrastructure on Economic Growth in Nigeria.

Ubok-Udom, E.U (1999). Currency Depreciation and Domestic Output growth in Nigeria: 1971-1995, *The Nigerian Journal of Economics and Social studies, 41*(1), 31-44.

Vamvakidis, A. (1999). Regional trade agreements or broad liberalization: Which path leadstofastergrowth?*InternationalMonetaryFund*.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.3867634&site=eds-live&scope=site.

Vamvakidis, A. (2002). How robust is the growth-openness connection? Historical evidenceKluwerAcademicPublishers.Retrievedfromhttp://search.ebscohost.com.proxy.iwu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.40216054&site=eds-live&scope=site.

Vu, T. B., Gangnes, B., and Noy, I., 2006, "Is Foreign Direct Investment Good for Growth? Answers Using Sectoral Data from China and Vietnam." Unpublished.

Van Reenen, John. 2011a. "Does Competition Raise Productivity Through Improving Management Practices?" *International Journal of Industrial Organization,* vol. 9, no. *3,* pp. 306-317.

Wong, K. N. (2010). Outward FDI and home country economic growth: a Malaysian case. Discussion paper *56*/10 *Department of Economics,* Monash University Malaysia.

Wacziarg, R., & Welch, K. H. (2008). Trade liberalization and growth: New evidence. *WorldBankEconomicReview*,*22*(2),187-231. doi:http://wber.oxfordjournals.org/content/by/year

Waverman, L., Meschi, M., & Fuss, M. (2005). The Impact of Telecoms on Economic Growth in Developing Countries. *Vodafone Policy Paper Series, 2,* pp. 10-23.

Wellenius, B. 1977. Telecommunications in developing countries. *Telecommunications Policy, 1*(4): 289–97.

Ward, M. R., and S. Zheng. 2016. Mobile Telecommunications Service and Economic Growth: Evidence from China." *Telecommunications Policy 40*: 89–101.

Yanikkaya, H. (2003). Trade openness and economic growth: A cross-country empirical investigation.*JournalofDevelopmentEconomics,72*(1),57-89. doi:http://www.sciencedirect.com/science/journal/0304387.

Yilmaz, S., Haynes, K. E., & Dinc, M. (2002). Geographic and Network Neighbors: Spillover Effects of Telecommunications Infrastructure. *Journal of Regional Science, 42*(2), pp. 339- 360.

Yang, Y., Gupta, S., 2008. Regional trade arrangements in Africa: past performance and the way forward. Afr. Dev. Rev. 19 (3), 399–431.

Similarity Report

Liban Abdinasir Hashi

ORIGINALITY REPORT

14%	13%	7%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	docs.neu.edu.tr Internet Source	3%
2	iiste.org Internet Source	<1%
3	ijaer.org Internet Source	<1%
4	www.pakinsight.com Internet Source	<1%
5	Submitted to Yakın Doğu Üniversitesi Student Paper	<1%
6	Submitted to Ajman University of Science and Technology Student Paper	<1%
7	fp.unmas.ac.id Internet Source	<1%
8	www.tandfonline.com Internet Source	<1%
9	Huseyin Ozdeser, Oluwatoyin Abidemi Somoye, Mehdi Seraj. "The impact of financial	<1

Ethics Letter

NEAR EAST UNIVERSITY

SCIENTIFIC RESEARCH ETHICS COMMITTEE

05.06.2023

Dear Liban Abdinasir Hashi

Your project **"The impact of telecommunication development on economic growth in Somalia"** has been evaluated. Since only secondary data will be used the project does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Prof. Dr. Aşkın KİRAZ

The Coordinator of the Scientific Research Ethics Committee