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St. Mary's University, Ethiopia

IMPACT OF GOLD EXPORT ON ECONOMIC GROWTHIN ETHIOPIA USING ARDL APPROACH

Yared Tenkir Lemma

July 2022

ADDISABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES, INSTITUTE OF AGRICULTURE AND DEVELOPMENT STUDIES FOR PARTIAL FULFILLMENT OF MASTER OF SCIENCE DEGREE IN DEVELOPMENT ECONOMICS

Advisor: Sisay Debebe (PhD)

July 2022

ADDIS ABABA, ETHIOPIA

DECLARATION

I, the cosignatories, declare that this study entitled "**IMPACT OF GOLD EXPORT ON ECONOMIC GROWTH IN ETHIOPIA USING ARDL APPROACH"**my own work. I have undertaken the research work independently with the guidance and support of the research advisor. This study has not been submitted for any degree or diploma program in this or any other institutions and that all sources of materials used for the thesis have been duly acknowledged.
Declared by

Name: Yared Tenkir

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Date: July, 2022

Place: Addis Ababa, Ethiopia

ENDORSEMENT

This is to certify that **Yared Tenkir**has done the study on the topic "***IMPACT OF GOLD EXPORT ON ECONOMIC GROWTH IN ETHIOPIA USING ARDL MODEL APPROACH"*** This study is authentic and has not been before by any other researcher.

Advisor: Sisay Debebe (PhD)

Signature: 

Date: __July 2022_____

BOARD OF EXAMINERS

This is to certify that the thesis prepared by **Yared Tenkir**is entitled: "***IMPACT OF GOLD EXPORT ON ECONOMIC GROWTH IN ETHIOPIA USING ARDL APPROACH"*** and submitted in partial fulfillment of the requirements for the Degree of Master of Development Economics complies with the regulations of the Universid meets the accepted standards with respect to originality and quality.

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ABSTRACT

Many scholars have tried to point out how to better country to the development road. In our country also scholar policy makers and many stake holders suggest a way to economic development. One of the many approaches is through export oriented approach. Gold become one of emerging export item in Ethiopia and become of a focus for government since Great transformation plan one. It can be seen that the attention there is no enough study about the nexus between economic growth and Gold export in the country, even in Africa.The economic development the major objective of this study was to examine the impact of gold exports on economic growth in Ethiopia. The study employed an extended generalized Cobb–Douglas production function model using data from the National Bank of Ethiopia and World Bank data, a base from 1992 to 2021. All the variables were non stationary at level and integrated of order I (2), and then co-integration test was conducted to ensure the existence of long-run relationship using Johansen's approach. Consequently, all the variables confirmed co-integration, and the conventional VECM was estimated to extract both short-run and long-run relationships, Granger causality test was conducted to diagnose the direction of causation thefinding of the study revealed that gold exports have insignificant short-run impact on economic growth, but significant positive impact in long run. The result from causality exerted bidirectional relationship holds in Ethiopia's gold exports, likewise the result from IRF revealed gold exports has a positive impact on long-run, economic growth. Besides, labor force, capital formation, and real effective exchange rates included in the model were found positive and significant impact in long run. Based on the findings, it is recommended that a long-run policy towards exports in general and gold export is believed to provide significant impact on economic growth thus, increasing efficiency of the sector and exporting gold would enable Ethiopia to sustain domestic economic growth. Besides, values had better be added to gold before exporting and when this is done, it will lead higher economic growth in long run.

Keywords: gold, economic growth, gold export, ARDL

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Improving lives through economic growth that is inclusive and fair remains a priority that governments around the world take on as one of their key responsibilities. A given country's resource endowment, comparative advantage, stage of development, ideological leaning often dictates the type of economic policy it pursues. Experts argue that export-oriented economic models produces growth in real Gross National Product (GNP). Constantine, (2017).

Trade theory claims that export boosts the domestic economy via several channels. An increase in the exports of a country also leads to an increase in the real output. Additionally, growth in export encourages the domestic firms to specialize on the production of export goods which will lead to an increase in productivity level.The export growth is considered as an important instrument for economic growth of developing countries (Gabrielle, 2004). According to Dollar and Kraay (2007), trade causes economic growth for developing countries to reduce their poverty and they gave most encouraging examples of the China, Bangladesh, Malaysia and Costa Rica.Thus, growth can be generated by reallocation of the existing resources from the less efficient non-export sector to the higher productivity export sector.

Many studies have been conducted in the least developed countries (LDCs) on the contribution of export earnings to economic growth. Although most of the empirical works support the export-led economic growth hypothesis, there is no consensusensusover this issue. Some economists, Dodaro argued that the comparative advantage theory is valid, and the development level of a country affects the exported products and exports helps the countries to grow. Wacziarg (2000) analyzed the trade openness and economic growth for 57 countries for 19the 70- 1989 periods. The result of the study showed that trade openness affects the economic growth. In last decade, there have been many studthathose support the export-led growth hypothesis including Parikh and Stirbu (2004), Mamun and Nath (2005), Maneschiold (2008and), Herrerias and Orts (2010) also found export-led growth supportive results. The second group of studies did not find supportive results for export-led growth. Among others;

Jung and Marshall (1983), Hsiao (1987), Ahmed and Kwan (1991), Sengupta and Espana (1994), Akbar and Naqvi (2000), Ahmed et. al. (2000), Panas and Vamvoukas (2002) could not find any evidence for the positive effect of export on economic growth, so did not support export-led growth theory.

Ethiopia, like other developing countries, pursued the export-led growth strategy since 1992 after years of implementation of the import substitution strategy during the Imperial and Derg regimes. Following the export-led growth strategy, Ethiopia's economy, as well as its export composition remained highly dependent on agriculture. As can be seen in figure 1, with the exception of gold, the top ten export items for the country are agricultural products and coffee being the major one. The export earnings contribution, from 1960 to 2010, accounted to 11% of the GDP on average (Jarra, 2013), which is very low when compared with 30% contribution to GDP in Sub-Saharan African countries (Hailu, 2011). Such a low figure suggests that much must be done in the Ethiopian export sector to achieve the desired economic growth level.

In its second Growth and Transformation Plan (GTP II), the government of Ethiopia has placed due emphasis on enhancing the performance of the export sector. Apart from its potential role in creating well-paying employment opportunities, the sector is believed to generate adequate foreign currency earning that is highly needed for the country's industrialization process. Considering this, the Government, under the GTP II, has planned to expand the export base by strengthening the export performance of selected sectors, including the mining sector. Specifically, the share of mining export in GDP is projected to increase from 0.6 percent in 2014/15 to 1.7 percent at the end of the plan period (2020). In this regard, modern and artisanal production of gold is expected to increase from 9.054 thousand Kg to 25.37 thousand Kg, while foreign exchange earnings of gold export are projected to increase from 343.73 million USD to 2.011 billion USD during the plan period (FDRE, 2016).

Apart from playing a significant role in generating the necessary foreign currency for Ethiopia's development endeavors, gold mining sector also contributes towards employment creation and supports the livelihood of millions of Ethiopians. According to information from the ministry of mining, the number of small scale and artisan miners, who process gold in traditional way, is estimated to be around 1.26 million and the sector supports the livelihood of over 7.5 million people in the country (EEITI, 2016).The share of mining export in GDP is projected to increase from 0.6 percent in 2014/15 to 1.7 percent. In this regard, modern and artisanal production of

gold is expected to increase from 9.054 thousand Kg to 25.37 thousand Kg, while foreign exchange earnings of gold export is projected to increase from 343.73 million USD to 2.011 billion USD during the plan period (FDRE, 2016).

The study tried to assess the potential of the gold export in propelling the Ethiopian economic growth and transformation through conducting time series data analysis.

1.2. Statement of the Problem

Ethiopia's export sector depends on a few agricultural products and minerals primarily gold. Through the Second Growth and Transformation Plan (GTP), the government outlines the ambition to generate adequate revenue and foreign currency from the sector in such a way to support the national economy (World Bank Report, 2014).

The vision for the coming 15 to 20 years for the Mineral Sector is to establish a diverse, world-class, competitive and environmentally sound private sector led mining industry, based on transparent free market principles, contributing not less than 10% of the GDP thereby enhancing the socioeconomic development and eradication of poverty in Ethiopia.The GTP ambitious plan to increase the percentage of mineral export contribution to GDP from 1% to 10% needs study toward it.

Enhancing the performance of the gold export is crucial in meeting the targets set for the mining sector in general as gold is one of the major export commodity items in the mining sector. Gold export earnings contribute well above 90 percent to the foreign currency earnings of the mining sector. According to data from 2017, export earnings from gold ranks 4th and contributes to an average of 10 percent to the country's total export earnings since 2000.

There are many research and empirical work done examining the export sector in Ethiopia, however the primary focus has been on agricultural commodities.The work by Yalfal Temesgen Tigabu 2020, Netsanet Gizaw, Jemal Abafita & Tesfaye Melaku Merra 2022 can be taken asan empirical work.Although the government recognized the huge potential in gold mining sector, the sector remained under-studiedin Ethiopian context when compared with other countries with similar level of development both in terms of revenue generation and foreign exchange earnings.

1.4. Study Objective

1.4.1 General objective

The general objective of this study is to understand the role of gold export in Ethiopian economy.

1.4.2. Specific objective

The specific objectives are:

i. To assess the trend of gold export over time.
ii. To see the long run relation of gold exports on economic growth
iii. To see the short run relation of gold exports on economic growth.

1.5. Research Hypothesis

These are the hypothetical views that can be proved in the research

i. There is casual relationship between growth in gold export and economic growth.

ii. There is no difference between the mining and agricultural sectors in terms of externalities

1.6Significance of the Study

The mining sector should be seen as an opportunity to find an alternative to agricultural product export. The sector helps to earn foreign currency, encouraging industrialization by providing the capital and raw materials needed. Thus, this research will focus on an assessment of mineral export trend and its impact on economic growth.

The knowledge of exports is crucial because itaffects the growth and development of the Ethiopian economy. The study will be a valuable source of information for policy makers in international trade as they need such information in formulating policies toward the mineral sector. Policy makers, economists and other interested groups need information on the precise factors that affect exports, the contribution of exports from different sectors to economic growth (GDP) in all countries because it contributes to povertyreduction and job creation. It is also expected that the study will aid policy makers in their efforts to stimulate the growth of the sector through examining the role of export and provide relevant information on the sector to foreign and local potential investors who want to invest their capital in the sector.

1.7 Scope or Delimitation of the Study

This studyassess the contribution and impact of gold export on economic growth in Ethiopia by using yearly total exports data from 1992-2021. It did not cover earlierperiods because of the absence of complete data set enough updated. Though Ethiopia exports different minerals but the study is limited to gold which accounts 90% by export earnings. So the selection of the item is based on being among the top export fromthe country; this means the study does not consider the overall impact of exports of all minerals. The study will use only officially available data and did not regard any illegal flows ofthe same products to other countries.

Limitation of the Study

1.8. Organization of the study

The study is organized in five sections. Section two highlights theoretical and empirical literature. Third section presents research methodology used for the study. Fourth and fifth sections dictates analysis, and concluding remarks as well policy implication, respectively.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical

2.1.1 Overview of exports and Economic growth

Economic growth is defined as an increase in the amount of goods and services that a country produces over a long period of time. It is a steady process by which the productive capacity of an economy is increased over time resulting in a higher level of national output and income. The most common measures and pace of economic progress are real GDP or real GDP per capital. Real GDP per capital indicates the approximate amount of goods and services that each person can buy in a year if income were divided equally (Soubbotina et al: 2000).

In small open economies, export growth can expand countries limited domestic markets, and contribute to the economics of scale necessary for industrial developments. Export growth integrates domestic economy with regional and or global economies thereby expanding the dimension of competition to the international markets. Competition promotes resource allocation in developing countries as they transform from less productive farming sector to relatively more productive manufacturing sector. Therefore, factor productivities are improved through export growth (Chow, 1987).

Clearly, since exports are a component of GDP, exports growth contributes directly toGDP growth, they relax binding foreign exchange constraints and allow increases in importedcapital goods and intermediate goods (Chenery and Strout1966, McKinnon, 1964). Exportsallow poor countries with narrow domestic markets to benefit from economies of scale(Helpmann and Krugman, 1985). In addition, exports lead to improved efficiency in resourceallocation and, in particular, improved capital utilization owing to competition in worldmarkets (Balassa, 1978).The export of the primary product also has effects on the rest of theeconomy through reducing unemployment and underemployment, inducing a higher rate ofdomestic saving and investment, attracting an inflow of factor inputs into the expandingexport sector, and establish links with other sectors of the economy (Meier, 1995).

2.1.2. Theories on Economic Growth

Different models of economic growth stress alternative causes of economic growth. The principal theories of economic growth include:

Mercantilism

Mercantilismwas a type of national economic policy designed to maximize the trade of a nation and especially to maximize the accumulation of gold and silver. It was dominant in modernized parts of Europe from the 16th to the 18th centuries. It promoted governmental regulation of a nation's economy for the purpose of augmenting state power at the expense of rival national powers. With the establishment of overseas colonies by northern European powers early in the 17th century, mercantile theory gained a new and wider significance, in which its aim and ideal became both national and imperialistic.(onah celestine chijioke etal 2020)

Mercantilism functioned as the economic counterpart of the older version of political power divine right of kingsand absolute monarchy. Mercantilism includes a national economicpolicyaimed at accumulating monetary reserves through a positive balance-of-trade, especially of finished goods. Historically, such policies frequently led to war and also motivated colonialexpansion. Indeed, with the establishment of overseas colonies by northern European powers early in the 17th century, mercantile theory gained a new and wider significance, in which its aim and ideal became both national and imperialistic. Mercantilist theory varies in sophistication from one writer to another and has evolved over time. High tariffs, especially on manufactured goods, are an almost universal feature of mercantilist policy. The term "mercantile system" was used by its foremost critic, Adam Smith,but Mirabeau (1715-1789) had used "mercantilism" earlier. (aizel losaria 2020)

Classical model

Developed by Adam Smith in Wealth of Nations (1776), Smith argued there are several factors which enable increased economic growth

- Role of markets in determining supply and demand
- Productivity of labor. Smith argued income per capita was determined by “the state of the skill, dexterity, and judgment with which labor is applied in any nation
- Role of trade in enabling greater specialization.
- Increasing returns to scale e.g. specialization we see in modern factories and the economies of scale of increased production

Adam smith developed the classical model. This model assumed technological change was constant and increasing inputs could lead to diminishing returns. This led to the gloomy predictions of Malthus that the population would grow faster than the world's capacity to feed itself. Malthus underpredicted the capacity of technological improvements to increase food yields.

Neo-Classical model of Solow/Swan

The neo-classical theory of economic growth suggests that increasing capital or labor leads to diminishing returns. Therefore, increasing capital has only a temporary and limited impact on increasing the economic growth. As capital increases, the economy maintains its steady state rate of economic growth.(Solow,1957)

To increase the rate of economic growth in the Solow/Swan model requires:

- Increase in proportion of GDP that is invested however, this is limited as higher proportion of investment leads to diminishing returns and convergence on the steady-state of growth
- Technological progress which increases productivity of capital/labor
- It suggests poor countries who invest more should see their economic growth converge with richer countries.(Heijdra and Ploeg, 2006)

Harrod Domar model Savings Ratio and Investment

The HarrodDomar model is a type of neo classical model. It states growth rate depends on a function of the savings rate.

Some growth theories place a large emphasis on increasing domestic savings. Savings provide the necessary funds to finance investment. It is this investment which creates further growth. This has been an important factor behind the economic growth in Asia.

However, it depends on how efficient the investment is. If savings is too high it leads to lower growth because people cannot afford to consume. (Tejvan Pettinger (2015

New economic growth theories

Endogenous Growth Theory

Endogenous growth models developed by Paul Romer and Robert Lucas placed greater emphasis on the concept of human capital. How workers with greater knowledge, education and training

can help to increase rates of technological advancement. They place greater importance on the need for governments to actively encourage technological innovation. They argue in the free market classical view, firms may have no incentive to invest in new technologies because they will struggle to benefit in competitive markets. The model

- Places emphasis on increasing both capital and labor productivity.
- States that increasing labor productivity does not have diminishing returns, but, may have increasing returns
- They argue that increasing capital does not necessarily lead to diminishing returns as Solow predicts. They say it is more complicated; it depends on the type of capital investment.
- Increased importance of spillover benefits from a knowledge-based economy.
- Emphasis is placed on free markets, reducing regulation and subsidies. The argument is that we need to keep economies open to the forces of change.

Joseph Schumpeter argued that an inherent feature of capitalism was the „creative destruction" – allowing inefficient firms to fail was essential for allowing resources to flow to more efficient channels.(Salvadori, 2003)

2.1.3 General overview of Ethiopia Export

Ethiopia is following agricultural led industrialization economic policy. In the 2019/20 fiscal year. This growth in real GDP was attributed to.9.6 percent growth in industry, 5.3 percent in service and 4.3 percent in agriculture sectors. (National bank annual report 2020)

The structure of the export sector of Ethiopia is dominated by a few primary products that account for a lion's share of the country's export earnings, while the share of non-agricultural products in total merchandise exports is almost insignificant. For the past five decades, primary agricultural products accounted to about 80-90% of the merchandise export earnings of Ethiopia. Among the major export products, coffee accounts the major share of primary exports. From 1963/64-2011/12, Coffee, Oilseeds, Hides and Skin, Pulses, Chat, Fruit and Vegetables and Meat and Meat products accounted for 52.2, 7.8, 5.1, 3.4, 1.0 and 0.94 percent of the total export proceeds, respectively. The average percentage share of coffee in the total merchandise exports during the Imperial, Derge and the present government was 54.7, 56 and 45 percent, respectively. The smallest share of coffee in the total export was 24.5 percent in 1974/75, which was due to the problem of change in regime and political instability, and the largest share was

79.3 percent in 1978/79 due to the then government's development campaign efforts. All these figures illustrate the fact that the Ethiopian merchandise export sub-sector is largely dependent on a single export commodity (i.e coffee) for its badly needed foreign exchange earnings.(National bank annual report 2020)

Export contributed about 11.0 percent to the GDP during the past five decades (1960/61-2011/12). The share of exports in GDP was the highest during the present government. The highest share was recorded in the year 1996/1997 which was about 16.2 percent of the GDP, the lowest being 4.5 percent during the transitional period (1991/92) after the fall of the Derg regime.

Table 1 Ethiopian export commodities

Commodity	
Coffee	Text. & Text. Prdts
Oilseeds	Cereals and Flour
Leather and Leather Products	Natural Gum
Pulses	Civet
Meat Products	Hop
Fruits & Vegetables	Animal Fodder
Sugar	Natural Honey
Gold	Marble
Oil Cakes	Flower
Live Animals	Beverage
Chat	Spices
Petroleum Products	Others
Bee's Wax	**Others**
Tantalem	RE-exports
Cotton	

The revenue from export made the import of inputs possible that are crucial for development purposes thereby playing as an engine of growth to other sectors. During the period 1960/61-2011/12 proceeds from exports covered more than 70.4 percent of the import bill of the country. In some years during the Imperial period, the proceeds from export were able to cover the total imports bill and even register a surplus (see table 1 above). Hence, analysis of the reviewed literature (Abdurahman Mohammed Hussien (2014)), UNCTAD(2005)shows that, expanding

exports enables the country to reduce the serious foreign exchange constraint faced that acts as a bottleneck for the growth of the economy.

In general, assessed available literature reveals that the two previous regimes and the current government had tried to maximize the contribution of export sector to the development of different sectors of the economy by designing different policies and strategies.

2.1.4 The mining sector in Ethiopia: an overview

Geological surveys conducted in 1990s by the Ethiopian Geological Survey Institute provides the country has abundant mineral resources of: i) metals and precious metals; ii) coal; andiii) industrial minerals (M.PhilipMobbs, 1998). The mining sector remains one of the prioritysector in GTP II, with main strategic directions of attracting sizable foreign direct investment(FDI) for exploration and extraction of minerals, increase (tenfold) foreign exchange earningsof the sector and focus on production of mineral inputs for the manufacturing sector thatpromote import substitution. Mining operations within the country are expected to be animportant economic catalyst for the government's export-orientated developmentstrategy.

Recognizing the need to promote market-oriented modern mineral production,processing and marketing, the Ministry of Mines established Mineral Market and Value ChainDevelopment Directorate in 2014 bestowed with diverse responsibilities.

Ethiopia has rich deposits of coal, tantalum, iron, nickel, manganese, potash and phosphates. Gold and tantalum reserves are found in the South, West and North of the country. The oil and gas sector is still at the exploration phase. While largely untapped, resources are under development to help diversify Ethiopia’s economy away from agriculture.

Ethiopia produce of mineral commodities such as gold, which accounts for over 83% of output, but also produces limestone, salt, pumice and tantalum. There is also significant informal production, with around 350,000 artisanal gold miners estimated to support a population of up to five to seven million. According to the 2017 EITI Report, more than half (59%) of Ethiopia's gold production came from the ASM Sector. Ongoing exploration is taking place for oil and gas, although no commercially viable discoveries have yet been found.

There are also some other advanced stage primary gold exploration and development activities in different parts of the country which so far has identified close to 100 tons of indicated reserve of gold and other precious metals.

Ethiopia is the six biggest producer of tantalum in the world. The Kenticha tantalite mine is estimated to contain sufficient deposits to produce as much as 9,000 tonnes of processed tantalum products over more than 15 years. The mine also contains quartz, feldspar, kaolin and dolomite.

Other mineral products including platinum from laterite, industrial minerals, gemstones (opal, peridot and other precious stones) and decorative and construction materials are also produced by licensed foreign and local mining companies in the southern, western, central and northern regions of the country.

From Ethiopia's mineral potential, perhaps potash has garnered some of the greatest interest. The Canadian mining company, Allana Potash, is to start large-scale potash mining in the Afar Regional State. Allana Potash's Dallol project has proven sylvinite reserves of 32.97-million tons, grading 28% potassium chloride, and probable reserves of 60.81-million tons, grading 28.8% potassium chloride. Other companies such as the Indian Sainik Potash are also working on potash mines in the Dallol depression.(MoMP 2010).

Ethiopia has diverse and huge untapped mineral resources. This promising potential coupled with improving government policies and regulations has helped the country to appear on the radar screen of international mining investors. Currently, there are 136 companies working on 246 licenses and the number is still growing. (MoMP2010).

2.1.5 Background on the gold sector globally

Gold has always been one of the world's most precious and coveted metals. Rarity is the primary reason for its value. Estimates on global mine reserves of gold fluctuate slightly from year to year, but are not much higher than 50,000 metric tons. The countries with the largest estimated reserves are Australia, Russia, and the United States. Approximately 3,200 metric tons of gold was produced worldwide in 2020. Currently, China is the world's leading gold mining country, followed by Australia and Russia.(Metals Focus; World Gold Council 2010)

2.1.6 The gold mining sector in Ethiopia: an overview

Gold is Ethiopia's main mineral export, with export values rising more than 100 fold from USD 5m in 2001 to USD 602m in 2012. It has been mined since ancient times, primarily as alluvial or free gold. At present, Ethiopia has a single large-scale gold mine, Lega Dembi, in the southern area of the country. However, this may change soon. Recently, Ezana Mining had secured a large-scale gold mining license from the Ministry of Mines. Nyota Minerals has also applied for large-scale gold mining of its Tulu Kapi project in the Wollega zone of the Oromia Regional State.(Document of The World Bank 2016)

Ethiopian major Gold sights

The Western greenstone belts

The presence of gold mineralization in these areas has been known since the early 1930s, and several of the belts host gold. The most promising gold occurrences are located in the Tulu-Kapi and Ankore areas.(Geological survey of Ethiopia 2015)

The Northern greenstone belts

The most promising discovery in this greenstone belt is the Terakimiti prospect where trenching and drilling has revealed grades of up to 16 grams a tonne. The deposit contains an estimated total of 20 million tonnes of ore with a grade of 0.29 grams per ton and there is also 6 million tons of ore that contain 2.24% copper. (Geological survey of Ethiopia 2015)

The Southern greenstone belts

There are already two gold mines in the Southern greenstone belt. The Lega Dembi mine in the Oromia Region has two active sites already in production – one open pit and an underground gold mine. The Sakaro mine is an underground mine in the Gujji zone in Oromia Region which is still under development. (Geological survey of Ethiopia 2015)

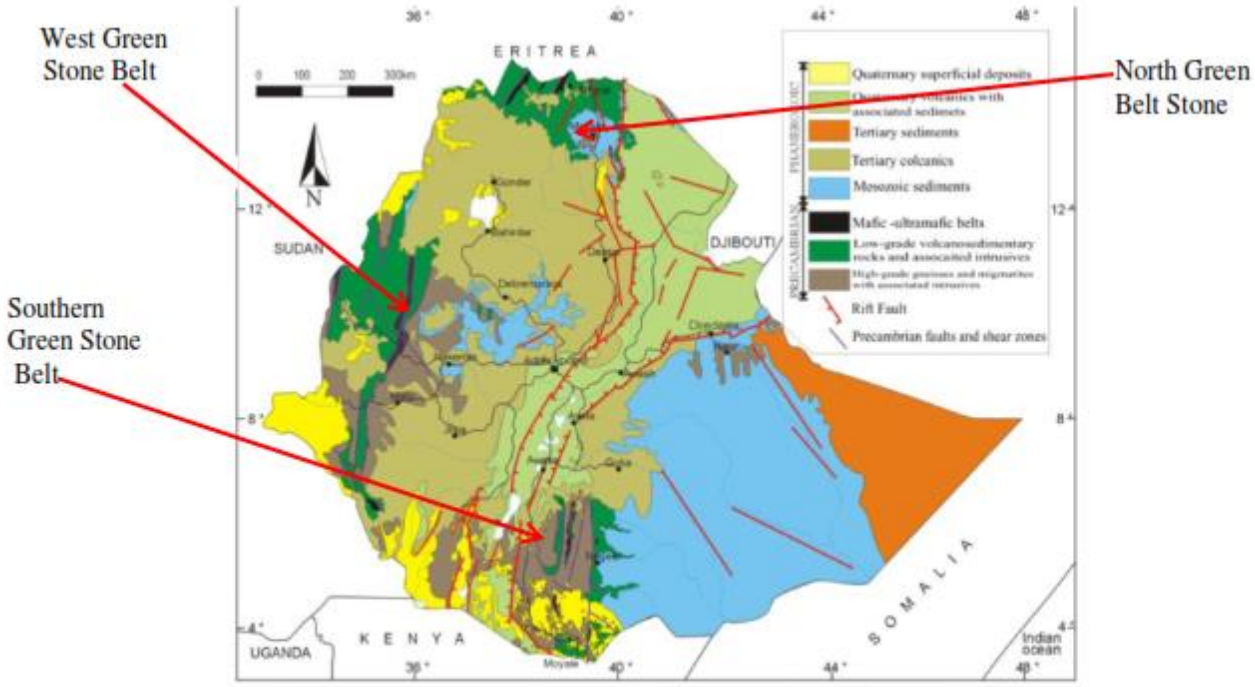


Figure 2 Major gold bearing areas

2.1.7 Large scale mining in Ethiopia

Ethiopia has only one large gold mining, Midroc Legedembi Gold Mine, whichproduces about 5 tons of gold per year (EEITI, 2016). Since 2011, Midroc Gold, on average, contributes to 38 percent of Ethiopia's total gold exports. The remaining supply is accounted for by artisanal and small scale gold miners who supply non-monetary gold to the National Bank of Ethiopia for export. The inability of other modern miners (companies) to enter into the sector, due to security issues in the respective areas, has limited the country's capacity to exploit its potential in the sector Ministry of Mining (2017). In addition to this, Midroc Gold's production has been declining over time as it has now exhausted mining gold from the surface, which normally gives a lot of gold, and started mining gold going deep in the mining area (underground, sub-surface mining). Moreover, quite recently, since April 2018, the Ministry of Mines, Petroleum and Natural Gas has suspended Midroc Gold's mining license and its production in Oromia region has been suspended since then. Although several large scale gold mining companies have taken licenses, none of them have started any visible operation so far. (Ministry of mines 2019)

2.1.8Artisanal andSmall-scaleMining

Artisanal and small scale mining generate about 15 percent of the world's nonfuel minerals. Yet is a major source of income in about 30 countries around the world. It provides livelihood for approximately 13 million workers a significant proportion of who are women and children andtheir families. This is true particularly in countries such as Bolivia, Brazil, Burkina Faso, China, Colombia, the Democratic Republic of the Congo, Ghana, Ecuador, India, Indonesia, Madagascar, Tanzania, and Thailand. Between 80 million and 100 million people are estimated to depend on small-scale mining for their livelihood worldwide (Stamp. 2015). According to the African Union's Africa Mining Vision of 2009, the number of Africans directly employed in artisan and small-scale mining varies between 3.7 and 8million, implying about 10% to 30% of the population are reliant on the sector. The ASM accounts for 18% of the continents gold production (Ibid, 2015).

While gold production nowadays is dominated by multi-national companies, this has not always been the case in many African countries. Small-scale mining operations that are often unregistered (and sometimes illegal) have accounted for a significant amount of gold production in Africa before reforms led to the entrance of large multinational companies (World Bank 1992). In Burkina Faso, for example, small-scale artisanal miners produced approximately 12 tons of gold compared to an output of 14 tons from large-scale mines between 1986 and 1997 Guèye 2001). In many regional countries, the relative volume of gold production by artisanal miners has gone down as production by multinational firms has increased. Accurate statistics are difficult to obtain due to the fact that the operations of many artisanal miners are not registered.

In Ethiopian context, about 1,259,910 people are directly engaged in the artisanal throughout the country. The No. of people dependent direct and indirectly on this mining sector can be more than five (5) million (Ibid, 2016). Thus, it can be proved to be a primary source of employment for job seekers from various parts of the country who are relatively disadvantaged in the labor market. In Ethiopia, as reported by the World Bank Group, mining contribution to the foreign exchange earnings reached about 10% of which the artisan mining takes the lion's share of over 65%.

The artisan mining also significantly contributes to the employment of at least 1.26 million people and supports the livelihood of over 7.5 million populations (Béné, C.et al.2012, 2014). Taking into account the number of artisan miners and average annual production, rough

estimation shows that, in the major gold producing areas of the country, a total of about 18,000 kg of gold is produced per annum. The largest production is recorded in Oromia, followed by SNNPR region of the country. The overall labor income to an individual miner is roughly estimated to be 8,000 to 10,000birr per annum, with a high standard deviation over the year, and considerably vary from mineral to mineral and location to location (EEITI, 2016).

2.2. Empirical literature reviews

There is less literature that explain about the influence of gold export and the economy in Africa using a multiple regression analysis to examine the relationship among the named response variable and explanatory variables as indicated in this study. Few studies explains about gold, agriculture and economic growth using regression analysis with experience from Africa.

Contemporary and earlier research studies have proved no incredulity in relationship between the exports and economic growth. Export led to economic growth in all countries like develop or developing. Pradhan (2010) from the Indian perspective described that there is long run stability between the exports, financial development and the economic growth and the future expectations are also correlated to the situation. Akram, khan, Atif & shafique (2011) shared the same idea in the perspective of Canadian economy stating the positive association between export and economic growth. Below is the table, which enlightens the relationship between export and economic growth. Most of the researchers conclude a positive relation, while some have the negative linkage between both of these.

Neingo and Tholana (2016) used “cost curves approach to examine gold price volatility and how it effectrevenue, production cost and labor issues were among the focus for his findings in south Africa”. The author never looked at gold export, agriculture and economic growth. Also the author never used a regression analysis for his analysis. The current author uses multiple regression analysis to examine the variable relationship.

Some of these investigate one-way causality relationship between export growth and economic growth, while others examine two-way causality relationship using granger. Two-way relationship implies that export growth causes economic growth while economic growth simultaneously causes export growth. Exports and economic growth are found to have one-way causality relationship in Indonesia and Singapore and two-way causality relationship in Indonesia and the Philippines (Ismail and Harjito, 2013). Real income and real export growth are found to be co-integrated in Bangladesh (Love and Chandra, 2005). There is a unidirectional

causality relationship between export growth and GDP growth in Belgium, Denmark, Iceland, Ireland, Italy, New Zealand, Spain and Sweden; while there is a bidirectional causality relationship export growth and GDP growth in Austria, Japan, France, Greece, Norway, Mexico, and Poland (Konya, 2006). There is a bidirectional causality relationship between export growth and real GDP growth in both short run and long run in Turkey for the period 1980-2007 (Taban and Aktar, 2008).

Through the presentation of trends and patterns of various indicators, in addition to economic growth, countries rich in minerals other than oil have experienced significant improvements in their human development index (HDI) scores that are on average better than those experienced by countries without minerals. In a sample of five low and middle-income countries with relatively long histories of mining, benefits came from foreign direct investment (FDI), export revenues, and fiscal revenues. (McMahon, Gary; Moreira, Susana. 2014).

Among the recent studies on the impact of mining of the solid minerals is Roderick (2011), in his study of mining and economic sustainability, employing mainly qualitative analysis. He concluded that through appropriate responses to the challenges of mining and economic development, the benefits of mining can be sustained, even when a mine or a mining community inevitably declines as the ore runs out. Mineral wealth lives on, but in other forms such as in educated and healthy people, efficient and fair social institutions, and man-made physical capital but mining and minerals can be a curse if the challenges are not met.

2.3 Conceptual Framework

According to Upton (2001), a conceptual framework can be defined as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a successive study. Therefore, a conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under examination and to communicate with a study (Upton, 2001). Hence, a conceptual framework is used to outline possible courses of action or to present a preferred approach to an idea or thought that developed based on the literature reviewed in respective to study undertaken.

- So, the conceptual frameworks for the study identify, Real GDP as dependent variable whereas gold export, gross fixed capital formation (formerly gross domestic fixed investment), foreign direct investment, and the labor force as independent variables.

Theabove-mentioned independent variables directly contribute to the economic growth and their intention the dependent variables, as to how the way to address these factors leads to the effect on Construction expenditure at study will undertake. This more illustrated through the figure below.

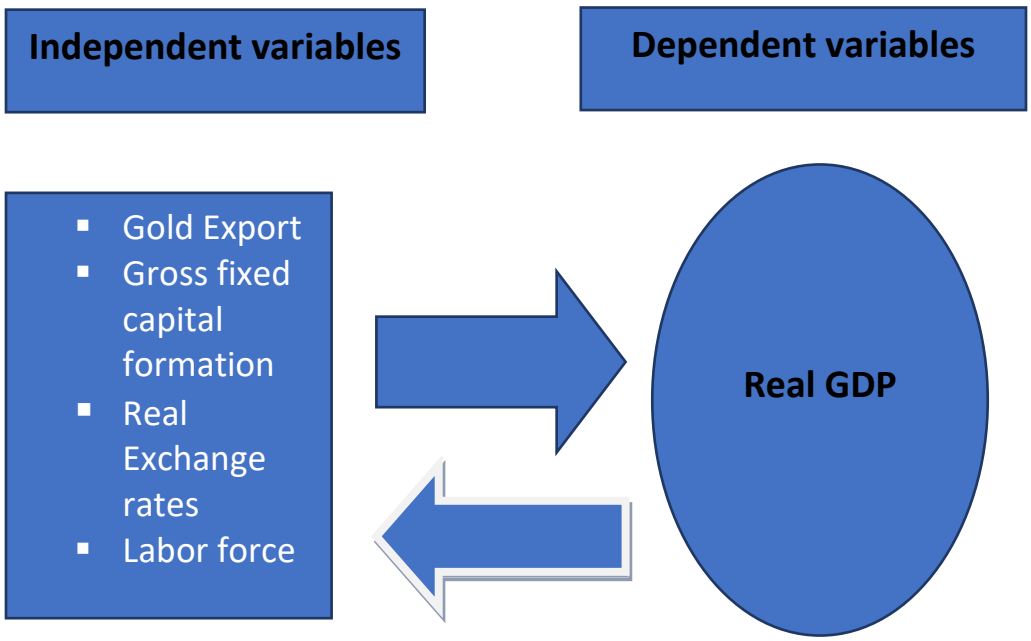


Figure 3 Conceptual framework of the Study

CHAPTER THREE

METHODOLOGY

3.1 Study area

Ethiopia located in the horn of Africa. Ethiopia is located at 3 degrees and 14.8 degrees latitude, 33 degrees and 48 degrees longitude in theEastern part of Africa and situated between the Equator and the Tropic of Cancer. The country covers an area of **1,126,829 km.** The highest elevation is Mount Ras Dashen, with 4620 m. A population of more than 114 million inhabitants (in 2020) makes the country the second-most populous nation in Africa behind Nigeria.The country has 9 regional states such as Oromiya regional state, Amahara regional state, Tigray regional state, Afar regional state, Benishangul-Gumuz regional state, Harari regional state, Somalia regional state, Southern Nation Nationalities and People regional state, Sidama regional state, South Western people's region and Gambella regional state.

From the main export commodities of Ethiopia such as Gold production are mainly from Oromiya, SNNP, Amahara, Benshangul-Gumz and Tigray region. The export of gold from large scale mining from Oromiya region is mainly from four area Shakiso town Legedenbi Midroc Mine P.L.C.There are local gold producers called Artisanal and small scale mines (ASM) in different parts of the country. (NBE annual report 2019)

3.2 Research Approach

This Chapter presents the approach of the study, design of the research instruments, the selection of the study model and the research participants. This study depends on the time series data collection and the technical econometrics part used to ordinary least square (OLS) method. This particular method has been selected because it has very attractive statistical properties that have made it one of the most powerful and popular methods of regression analysis, it also provides a comprehensive picture of the methods of data collection, presentation, and analysis, the study has focused on empirical relevant inputs past studies and data from those government and non-government institutions. And theoretical facts are those which are from the past studies and are supported with theories from economics, marketing, international trade and other related

disciplines, This study, while mainly based on secondary annual export data on gold contribution to national economy growth; thus data will be taken from domestic government bodies such as NBE, MOT, ERCA, MoFED, CSA 1992 to 2021.

3.3Data type and resource

The data for this study collected from secondary sources. Data collection conducted to capture information on various factors such as gold sector export contribution tothe national economy, gold price problems, administrative problems and issues related to environment and other relevant information. This study will usequantitative research approach and the data used to secondary data which is extracted from various sources also more appropriate to gather variety of data related to the study; we are looking the specific and macroeconomics factors the correlation between the real GDP and mineral export in Ethiopia.

3.4 Methods of data analysis

This study used both descriptive and Econometric statistics for data analysis. The descriptive statistics were used to show the trend of Mineral Export. Toassess the relationship between the mineral export and economic growth, the co-integration models were used. First, the stationary of the time series data were tested by Augmented Dickey Fuller test and optimal lag length were determine. Secondly, johansen co-integration test were performed in order to determine the number of existed co-integrated vector for the variable of interest. The main purpose for this test was to find out whether there is a long run equilibrium relationship between variable. Thirdly, vector error correction methods were performed in order to analyze the long run and short run relationship between variable. Finally, conclusion were drawn based on the hypothesis and the results.

This study is mainly based on secondary yearly export data on and for other control variables mentioned in the model from National Bank of Ethiopia (NBE), Ministry of Mine and Petroleum, Central Statistical Agency(CSA), Ministry of Finance and Economic Development(MoFED), Ethiopian Revenue and Customs Authority (ERCA) and various publications of International Monetary Fund (IMF) and World Bank (WB) covering the period from 2009 to 2021

3.4.1 Model specification

This study wasbased on a generalized Cobb–Douglas production function with aggregated and dis aggregated analysis. As a result, in this study coffee exports has been the selected agricultural item as an independent variable unlike Faridi (2012) that takes whole agricultural export as single variable. Thus, in the usual notation the production function can be written as equation

$$Y=f\ (l, k)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

It is also possible to expand this function by including mineral export (only Gold sector is consider for this study)

$$Yt = f\ (Lt, Kt, GOEX)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where, GEXt*;* is value of gold exports at year t. As typical neoclassical growth model assumes Cobb-Douglas production function with exponential form, The formulation of this equation can be amended by adding variable including exchange rate and consumer price index as a control variable;equation (2) can be rewritten as;

$$Yt = f\ (Lt, Kt, GOEX, RERt, CPIt)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (3)$$

Finally, from equation 2 and 3, equation 4 is derived by taking natural logarithm on both sides of equation 3 in order to discard the differences in the units of measurements for the variables and to minimize the gap between independent variables and dependent variables. It is then used to analyze the impact of gold exports on economic growth in Ethiopia from 2009 to 2021.

$$LRGDPt=\beta 0+\beta 1LLFt+\beta 2LCAt+\beta 3LRERt+\beta 4LCPIt+\beta 5\mathrm{GOE}Xt+\varepsilon t\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (4)$$

Where; LGDPt is natural logarithm of real gross domestic product, LLFt is naturallogarithm of labor force, LCAt is natural logarithm of gross domestic fixed capital formation, LRERt is natural logarithm of real exchange rate, LCPIt is natural logarithm of consumer price index,GOEXt is natural logarithm of gold export, and εt is error term$\beta 0$ is the constant term and$\beta 1$,$\beta 2$,$\beta 3$,$\beta 4$, and $\beta 5$,are the parameters of independent variables to be estimated.

Time series data is a sequence of observations of the defined variable at a uniform interval over a period of time in successive order. Most common series are in annual, quarterly, monthly, weekly and daily frequencies. Economic time series data often possess unique features such as

clear trend, high degree of persistence on shocks, higher volatility over time and meandering and sharing co-movements with other series.Enders Walter (2014) it is need to recommend such features of time series data properly and address them.In time series analysis, it is important to understand the behavior of variables, their interactions and integrations over time. If major characteristics of time series data are understood and addressed properly, a simple regression analysis using such data can also tell us about the pattern of relationships among variables of interest.As this study try to show the trend of the mineral export specially gold in the period 2002 – 2022 the time series model chosen to be appropriate.

Stationary and non-stationary series

A time series data is called stationary if its value tends to revert to its long-run average value and properties of data series are not affected by the change in time only. Verbeek (2017)On the contrary, the non-stationary time series does not tend to return to its long-run average value, hence, its mean, variance and co-variance also change over time. Most of the macroeconomic variables such as volume of gross domestic product (GDP), consumption, consumer price index, etc. exhibit a strong upward or downward movement over time with no tendency to revert to a fixed mean.

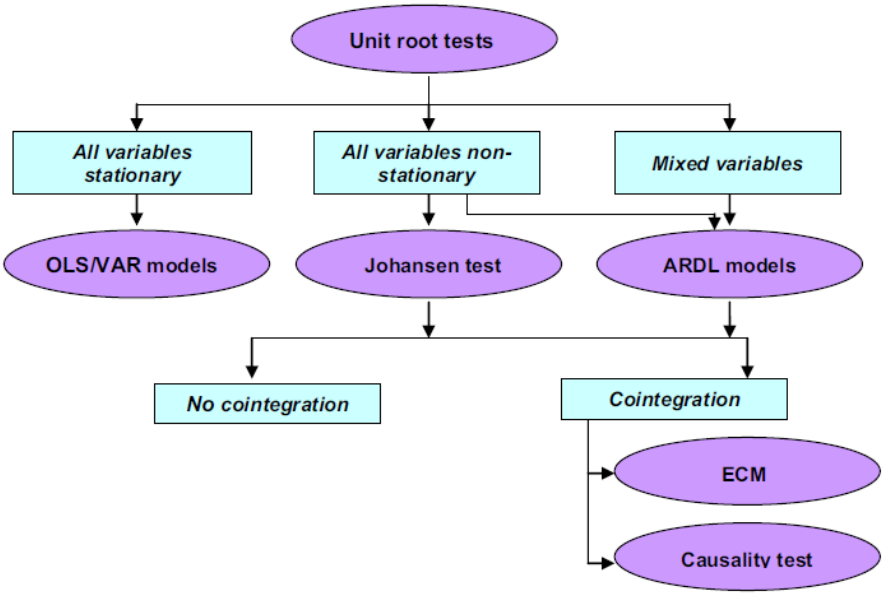


Figure 4

Autoregressive Distributive Lag (ARDL) model proposed by Pesaran, et.al (2001) has great merits over the well-known residual-based approach proposed by Engle and Granger (1987), and the maximum likelihood-based approach proposed by Johansen and Juselius (1990) (Al-Assaf et al 2019). Because ARDL model:- (i) used when the variables are integrated in different orders either I(0) or I(1), (iii) free from the residual correlation, (ii) producing the speed of adjustment with the long run equilibrium without losing the long run formation, (iv) capturing the co-integrating vector from the multiple co-integrating vectors (Nkoro & Uko,2016).

In this study, the Autoregressive Distributed Lag (ARDL) model, otherwise called the bounds testing approach proposed by Pesaran et al. (2001) is employed to examine empirically the existence of short and long term relationship between natural gas and economic growth, natural gas; economic growth and environmental conditions in Nigeria. The ARDL model is chosen for four major reasons. Firstly, once the model lag order is identified, the ARDL model can be estimated by Ordinary Least Squares (OLS). Secondly, it is possible to estimate the long-run and short-run parameters of ARDL model simultaneously. Thirdly, the ARDL can be applied irrespective of the order of the integration of the regressors, whether purely I(0), purely I(1) or fractionally integrated. However, the procedure will crash if l(2) series is presence

3.4.2Definition of variables, measurement, and hypothesis

In general gold is one of the major export commodity items in the mining sector. Gold export earnings contribute well above 90 percent to the foreign currency earnings of the mining sector. According to data from 2017, export earnings from gold ranks 4th and contributes to an average of 10 percent to the country's total export earnings since 2000.2 Apart from playing a significant role in generating the necessary foreign currency for Ethiopia's development endeavors, the artisanal gold mining sector also contributes towards employment creation and supports the livelihood of millions of Ethiopians. According to information from the ministry of mining, the number of artisan mining jobs is estimated to be around 1.26 million and the sector supports the livelihood of over 7.5 million people in the country (EEITI, 2016).

RealGross Domestic Product (RGDP)

It is a macroeconomic measure of the value of economic output adjusted for price changes either inflation or deflation. This adjustment transforms the money-value measure nominal GDP into an index for quantity of total output. Although GDP is total output, it is primarily useful because it closely approximates the total spending of the country these are the sum of consumer spending, investment made by industry, trade balance which means the excess of exports of goods or service over the imports of goods or service, and government total spending of the country. That is why the GDP must be divided by the inflation rate to get the growth of the real GDP. Different organizations and governments use different types of 'Real GDP' measures. In economics term used Solow Swan production function express as "Y" The production function takes the general form Y=f(K, L,X). Another way annual percentage growth rate of GDP at market prices based on constant local currency. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. (Oyejide, 1986 and Eita, 2009)

Labor Force (LF)

The labor force is the number of people who are employed plus the unemployed who are looking for work and the size of the labor force depend not only on the number of adults but also how likely they feel they can get a job. So, the labor pool shrinks during and after a recession. It is therefore expected that labor force will have a positive relationship with economic growth. Labor force participation rate the World Bank provides data for Ethiopia from 1990 to 2017 the average value labor force the last eighteen years data show that the country a minimum of 77.95 % GLF in 1990 and a maximum of 84.54 % GLF in 2005 ; thus is the country one of the competitive advantage of the economy growth. Also the economy theory Gross labor forces define as Labor (L) is a measure of the work done by human beings. It is one of the dependent variable (input) of the produce output, conventionally contrasted with such other factors of production as land and capital.

Gross Domestic Fixed Capital Formation (CA): Gross fixed capital formation (formerly gross domestic fixed investment) includes plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, commercial and industrial buildings. The neoclassical theory stipulates that

an increase in capital as an input in production leads to increases in output. It is therefore expected that Gross Fixed Capital Formation will have a positive relationship with economic growth.

Real Exchange Rate (RER): Real Exchange rates are included in the model to reflect the price competitiveness in the international markets and to ascertain its indirect influence on economic performance via export channel. It has been argued that exports in developing countries depend on the world demand for tradable goods. Thus, the fluctuations of the real exchange rates may be crucial for a small open economy like Ethiopia, which is influenced by the changes in the international market prices. In this regard, a positive correlation between real exchange rate and economic growth is anticipated (Henriques and Sadorsky1996).

Gold Export (GOEX)

Gold export is among the major export item which help the Ethiopian economy and major FOREX source for Ethiopia. Export expansion is a significant catalyst in improving productivity growth. Therefore, export expansion helps to concentrate investment in agricultural sectors which in turn increase the overall total productivity of the economy.Additionally, export growth may also relieve the foreign exchange constraint, allowing capital goods to be imported to boost economic growth. Therefore positive relationship will be expected on economic growth.

Variable	Variable name	Expected sign
RGDPt	Real gross domestic product(million birr)	*
LFt	Total labor force (15-64)	+
CAt	Gross domestic fixed capital formation(million birr)	+
RERt	Real exchange rate(million birr)	+
GOEX	Gold Export(million birr)	+

Table 2 Dependent and independent variables

Unobserved Variables

Other external and internal factors of mineral export the main impact on economy growth but these are they couldn't compute, or we could not determine available organized data from undeveloped country including in Ethiopia, while high impact on economy growth of the country. These are:

Research and Development (R&D): Thus, over the past century, mechanical, chemical, and biological revolutions have represented fundamental changes in mining technology which has impacts on economy growth. most of the developed country (USA, EU and Other developed country) the result of economy growth and technological innovations played a significant role in enhancing competitiveness and economic development in the last part of the 20th century. (Heboyan and House 2003)

Skilled Human Resources: Skilled profession among human capital is an important factor of production and has a direct impact on competitiveness for each sector. Therefore, the higher the stock of quality human capital, the more output can be delivered per labor unit. Improvement in the quality of human capital leads to lower unit costs of production and decreases marginal cost of production, enabling firms to trade better quality commodities at lower prices, this efficiency is the result of factors such as better technology, better farming practices, and increased human capital. Then these factors lead to production of the quantity and quality of goods sought in the market - production results in sales. (Kleynhans, 2006)

3.4.3Econometric model

Co-integration test

Granger (1981) introduced the concept of co-integration. Co-integration is the statistical implication of the existence of long run relationship between the variables which are individually non-stationary at their level form but stationary after first difference (Gujarati, 2004).The theory of co integration can therefore be used to study series that are non-stationary but a linear combination of which is stationary. Two main procedures are used to test for co-integration: The Engle and Granger (1987) test and the Johansen (1988) co- integration test. The Engle and Granger test is a two-step test which first requires that the variables be integrated of the same order. The first step consists of estimating the equation in level form while the second step consists of testing the stationarity of the residuals of the estimated equation. The existence of co-

integration is confirmed if the residuals are stationary at level form (Engle & Granger 1987).The Engle and Granger (1987) co-integration test is based on residuals:

$\varepsilon t = Yt - \beta 0 - \beta 1 Xt$…….. (4)

For testing co-integration, we use the following equation:

$\Delta \varepsilon t = \mu + \varphi \varepsilon t - 1 + \varepsilon t$…….. (5)

To test for co-integration we set:
H0= no co-integration (φ=0)
H1= co-integration ($\varphi \neq 0$)

The co-integration in multiple equations can be examined by Johansen (1981) and Johansen Juselius (1990) approach. Johansen procedure of co-integration gives two statistics. These are the value of LR test based on the maximum Eigen – value and on the trace value of the stochastic matrix. The Johansen test uses the likelihood ratio to test for co-integration. Up to (r-1) co-integrating relationships may exist between a set of r variables. The hypothesis of co-integration is accepted if the number of co- integrating relationships is greater than or equal to one. The decision rule compares the likelihood ratio to the critical value for a hypothesized number of co-integrating relationships. If the likelihood ratio is greater than the critical value, the hypotheses of co-integration is accepted, if not it is rejected.

Error Correction Model (ECM)

Engle and Granger (1987) pointed out that if two variables are co-integrated in first difference, their relationship can be expressed as VECM by taking past disequilibrium as explanatory variables for the dynamic behavior of current variables. The error correction model (ECM) first used by Engle (1987), and later popularized by Engle and Granger to correct for disequilibrium. An important theorem, known as Granger representation theorem, states that if two variables *Y* and X are co-integrated, then their relationship can be stated as VECM (Gujarati, 2004). VEC mechanism permits to examine short-run dynamics in the relationship between *Y* and *X* (Wooldridge, 2013). The size of the error correction (ECT) coefficient determines speed of

adjustment towards long-run equilibrium and error correction coefficient should be negative indicating the existence of short-run relationship among variables. For simplicity, in this study ECM can be estimated as;

$$\Delta \mathbf{LRGDPt} = \beta 0 + \beta 1 \Delta \mathbf{LLABt} + \beta 2 \Delta \mathbf{CAPt} + \beta 3 \Delta \mathbf{LCOFXt} + \beta 4 \Delta \mathbf{LRERt} + \alpha \mathbf{ECM\ (t}\text{-}1) + \mathbf{Ut}$$

Where, α**ECM (t**-1) which denotes short-run disequilibrium adjustments of the estimates of long-run equilibrium error and α _is the coefficient of the ECT.

Specification

In the study of the mineral export and Economic growth linkage, a number of variables that might be important in the analysis can be considered. However, the limited number of available observations often necessities the use of simple models that capture the basics of the relationships of interest. According to economy authors Tyler and Kavoussi ; the assessment of the effect of gold export performance on economic growth is carried out in a production function framework in which exports enter as an additional 'input' in the production process(Yaghmaian 1995)

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1 Introduction

The review of the literature revealed that the mineral export plays a significant role in strengthening the economy of a country. To have empirical evidence of the effect of the mineral export on GDP, it was important to conduct a statistical regression analysis on mineral export and GDP.

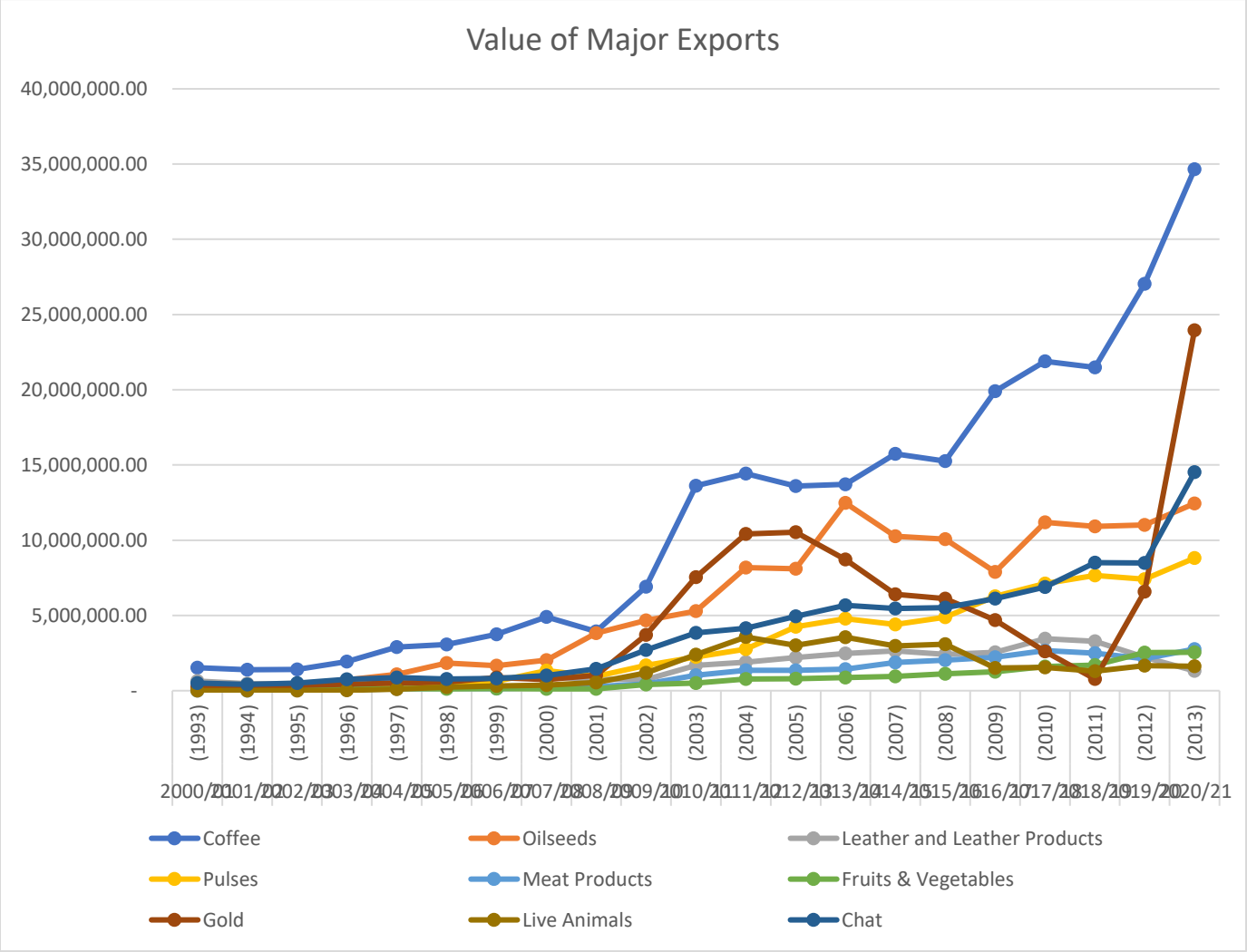
This chapter presents the results of the trends and impact of gold export on economic growth in Ethiopia from the period 1990 to 2020. It is composed of three main sections. Section one gives the trends. Section two gives a brief interpretation of statistical analysis before providing the compressive econometric analysis for each objective. Section three presents the results of econometric analysis (Unit roots, Co-integration, Error correction method and Granger-causality test) for each objective used to test the causal linkage between GDP and gold export. In this chapter, the results of the analysis conducted on the selected time-series data are presented. The chapter details not only the empirical results but also their relationship with the findings reported in previous studies as well as their limitations and scope.

4.2 Trend of exports in Ethiopia

The agriculture sector has historically been the engine of the Ethiopian economy, but it has recently given way to the expansion of the service sector. The National Bank of Ethiopia (NBE2019) notes agriculture, industry and services have contributed 32.7%, 29% and 39.5% to GDP respectively during the 2019/20 Ethiopian fiscal year. In 2019, Ethiopia's major goods exports included coffee (28.7%), cut flowers (14.1%), oil seeds (11.5%), chat (10.9%), pulses (7.9%), gold (6.6%), leather and leather products (2.4%). Ethiopia's total export earnings by value increased by 12% from the previous year. The increase in export earnings happened for the first time in five years. (NBE 2019)

The top five destinations for Ethiopia's exports in 2019 were China (13%), the United States (9.6%), Saudi Arabia (8%), Germany (5.9%) and United Arab Emirates (5.5%). By region,

Ethiopia's exports comprised of Asia (52%, Europe (24%), Africa (13%), and Americas (11%). Ethiopia primarily exports coffee, leather, and leather products to the United States.

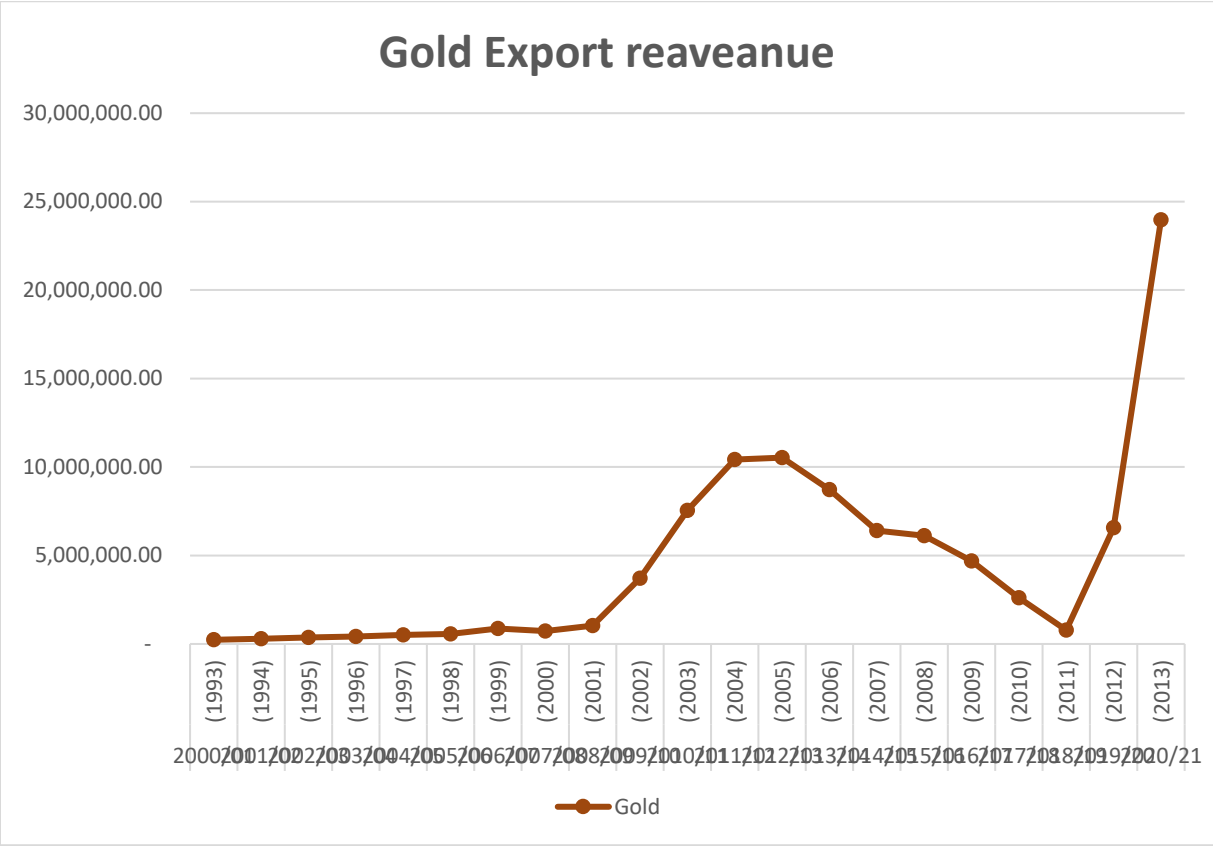


Source NBE annual report 2020 (authors calculation)

Trend in gold exports in Ethiopia

In 2020, Ethiopia exported $194M in Gold, making it the 82nd largest exporter of Gold in the world. At the same year, Gold was the 5th most exported product in Ethiopia. The main destination of Gold exports from Ethiopia are: Switzerland ($121M), United Arab Emirates ($71.9M), Hong Kong ($1.78M), and Turkey ($42.2k).

The fastest growing export markets for Gold of Ethiopia between 2019 and 2020 were United Arab Emirates ($55M), Switzerland ($49.2M), and Hong Kong ($1.78M).



Source (NBE) (Authors computation)

Figure 5 trend of Gold export in Ethiopia

4.3 Descriptive analysis of the data

Before going to provide a comprehensive econometric analysis, the study gives the brief interpretation of statistical analysis.

Descriptive statistics depict that basic feature of the data. It represents the quantitative descriptions in a manageable form and provides simple summaries statistics about the nature of the data series. It differs from inferential statistics as descriptive statistics describe what is or what the data shows, while inferential statistics is used to reach conclusions that extend beyond the immediate data alone.

Table 3 Summary of descriptive statistics of variables

STAT	RGDP	labor f	REER	Gross CF	Gold Export
max	2.11E+12	53950175	344.5183	12115911818	10536982.85
min	2.49E+11	21407690	93.78449	230,851,056	39,330.00
AVERAGE	8.49E+11	36090694	144.8176	359552.6	2744157.857
S.D	5.75E+11	10223912	47.55536	3977973942	3430318.911
SKEW	0.960383	0.33001	2.991594	0.714400628	1.246168416
KURT	-0.34733	-1.11299	12.17025	-1.049326123	0.167007875

Table 3 reports the descriptive statistics and interprets that the average real GDP at market prices is 84900 million birr. The average fixed capital formation was 359552.6million birr. The mean value of labor force is 36.090694 million people. The average real exchange rate is 144.8176.On the average gold export is 2.744157million birr

4.4 Econometric analysis

4.4.1 Stationary and non-stationary

A stochastic process is said to be stationary whenever the mean and variance are constant over time and values of covariance between two time periods depends only on the distance between two time not actual time taken and if not it is non-stationary. In other words, it can have time varying mean or variance or both across the period (Gujarati, 2004).

Unit Root Test

A time series variable is said to be covariance (weakly) stationary if it has constant mean, time invariant variance and a covariance between any two time period that depends only on the lag between them (Gujarati, 2004). Whereas, a non-stationary series has a different mean at different points in time and its variance increases with the sample size. So, the primary task in an econometric work is to check whether a series is stationary or not. Because using the classical estimation methods to estimate relationships with non-stationary variables results in spurious regression (Wooldridge, 2004 Gujarati, 2004).

The well-known Augmented Dickey- Fuller (1981) and the Phillips Perron (1988) tests were applied to test the existence of unit root and ascertain their order of integration. The primary interest is to determine whether the variables are stationary or not, both of these unit root tests suggest that the variables under examination are a unit root process at levels, and hence,

integrated of order one, I (1).The unit root test is undertaken both at the intercept and intercept plus trend regression forms, and the results of Augmented Dickey- Fuller (ADF) and PP unit root tests are given in Tables 4 and 5 below.

Table 4. Unit root test result at level I(0) form showing non stationary of all variables

Variables	Augmented dickey fuller ADF)		Phillips- Peron(PPP)	
	p-value	Test Statistic	p-value	Test Statistic
LGDP	0.9969	0.543	0.9969	0.63
LLF	0.7684	-1.659	0.7691	-2.783
LRER	0	-10.59	0	-19.102
LCA	0.2934	-2.571	0.3107	-2.535
LGEX	0.6942	-1.822	0.6942	-6.421

Values of Mackinnon test for ADF and PP: 1% = -4.352
5% = -3.588
10% = -3.233

The result reported in table 3 above indicates stationarity test of the variables at level form I(0).The null hypothesis of non-stationarity cannot be rejected even at 10% level for any of the variables because the critical values of Mackinnon test for ADF and PP are (-3.5) at 1%; (-2.888) at 5%and (-2.578) at 10%. To reject the null hypothesis, ADF and PP test statistics should be greater than the critical value, or in other words, the P-value should be significant at specific level of confidence. Since the null hypothesis was not rejected for all the variables at any convenient significant level, so all the variables had unit root at levels. Therefore, we can conclude that all the variables data are non- stationary at level.

Variables	Augmented dickey fuller ADF)		Phillips- Peron(PPP)	
	p-value	Test Statistic	p-value	Test Statistic
LGDP	0.9968	0.466	0.9969	0.63
LLF	0.0998	-3.128	0.7691	-2.878
LRER	0.1624	-2.899	0	-19.44
LCA	1	4.327	1	2.910
LGEX	0.0244	-3.67	0.5629	-8.365

Values of Mackinnon test for ADF and PP: 1% = -4.352
5% = -3.588
10% = -3.233

Table 5. Unit root test result at level I(1) form showing non stationary of all variables

From the result in Table 4, the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) test statistics for the first differences of all the variables series data were significant at 1% level of significance. This showed that, the series data is stationary at first difference and hence the variables are considered as integrated of order one or I (1) process. This result is in line with Gemechu (2002),Fentahun (2011) and Kagnew (2007)who examined the impact of real exchange rate on economic growth of Ethiopia, the Export performance and economic growth in Ethiopia and found stationary data at first difference for labor force and capital.

4.4.2 Test for Co-integration

The order of integration which inters the specified economic growth model is already specified for each variable. All the variables are integrated of order one I (1).The next step is to estimate the long-run relationship between economic growth and gold export in Ethiopia using Johansson maximum likelihood methods and the two steps Engel and Granger procedure. In order to proceed with Johansen co-integration technique, the lag order and deterministic trend assumption for the VAR should be specified.

During unit root test the assumption of including constant but no trend was accepted. Therefore, the deterministic trend assumption for the VAR excludes trend and includes constant. For the selection of the lag order, there are different types of lag selection criteria, which includes the sequential modified likelihood ratio (LR), Akaike information criteria (AIC),Final prediction

error (FPE),Schwarz information criterion(SC) and Hannan-Quinn information criterion(HQIC).However, it is not unusual that different criteria give a different number of maximum lag lengths (Hang, 2011). The problem is the choice of criteria to use. To overcome this problem, the model is run with different lag orders, chosen by different criteria and the LR test, and then implement the residual serial correlation and the residual normality test (Lutkepohl, 2005). An appropriate lag order needs to satisfy those tests. Therefore in this study the lag length selected by Schwarz information criterion and Sequential Modified Likelihood Ratio approach fulfills these requirements as well as prior knowledge of economic theory are used. The following table shows the lag length chosen by different information criteria.

Table 6 Results **of lag length selections using different criterion**

lag	LL	LR	FPE	AIC	HQIC	SBIC
0	**-2098.4**		8.3e+66	168.272	168.34	168.516
1	**-1925.87**	345.07	6.5e+61	156.469	156.875	157.932
2	**-1880.73**	**90.266**	**1.7e+61**	**154.859**	**155.602**	**157.54**
3	**-1788.26**	**184.96***	**1.8e+59**	**149.46***	**150.542***	**153.361***
4	**.**		9.2e+43*			

Endogenous: RGDP labourf REER GrossCF GoldExport

Exogenous: _cons

*indicates the lag length selected by the criteria

LR: Sequential Modified Likelihood Ratio

FPE: Final Prediction Error

AIC: Akaike information Criteria

SBIC: Schwarz Information Criterion

HQIC: Hannan-Quinn Information Criterion

Table 6 indicates that while LR, AIC and SC information criteria choose 3 lag order, FPE select 4 lag order HQ select 3 lag orders .Therefore, the information criteria provides conflicting lag orders as expected. However, from the theoretical point of view since the data is annual data, 3 lag order is a reasonable lag order selection. Thus the Johansen co-integration test conducted under the assumption of no trend but a constant in the series and 3 lag for the VAR. Most of the time the trace and maximum Eigen value statistics might give conflicting results. To deal with

this problem Johansen (1990) recommended basing on one of them to identify the number of co integration vectors. Thus, this study used the maximum Eigen value. Table 6 shows the co-integration test results for the economic growth model based on maximum Eigen values.

4.4.3 Heteroskedasticity test

In order to ensure that the residuals are randomly dispersed throughout the range of the independent variable, Heteroskedasticity test was used. The variance of the error should therefore be constant for all values of the independent variable. In the presence of Heteroskedasticity, the distributions of the OLS parameters are no longer normal. Heteroskedasticity is tested in this study using the Breusch-Pagan-Godfrey test. The decision rule is to reject the null hypothesis if the probability of the F-statistic and observed R^2 are less than 0.05, meaning Heteroskedasticity is present. On the other hand, if the probability of the F-statistic and observed R^2 are greater than 0.05, the null hypothesis is not rejected, implying that there is no Heteroskedasticity. As such, errors are homoscedastic. The test results are shown on table 10:

Command hettest, rhs fstat

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: labourf REER GrossCF GoldExport

F(4 , 24) = 2.11

Prob > F = 0.1105

Obs*R-squared = 0.9334

4.4.3 Results of Long run relationship

Accordingly, long-run relationship among the variables is presented in Table 7. Furthermore, the long-run parameters were determined by applying the long-run model

Table 7 : Long run relationship results

Dependent: **lnRGDP**	**Coef.**	**Std. Err.**	**T**	**P>t**
_cons	-23.49744	0.289	4.77	0.00
lnLF	2.272262	0.3785977	6.00	0.00
lnCA	0.0475902	0.0856891	0.56	0.584
lnRER	1.121209	00985393	11.38	0.00
lnGEXP	0.0942709	0.0856891	2.83	0.009

R-squared = 0.9334

Adj.R squared= 0.9804

1.GEXP and Economic Growth: The information in Table 7 presents **GEXP** has a positive and statistically significant impact on long-run economic growth. The coefficient of gold export is positive .0942709 telling that one percent increase in gold export results in 0.0942709 percent increase in economic growth. The findings of this study is consistent with the work of Gilbert et al. (2013) and Tigist (2015) examined the impact of export on economic growth recognized that export of gold has positive and significant effect on long-run economic growth. To this end, the government has made a strong effort to motivate mineral sector recently.

2. **LAB and Economic Growth**: The result from Table 7 shows labor force (LLAB) were found positive and statistically highly significant in explaining long run in economic growth in Ethiopia as the coefficient of LLAB is 2.272262. The coefficient 2.272262can be stated that, in the long run, an increase in labor force by 1% would result in 2.272262 percent increase in economic growth showing that growth is highly elastic to change in labor. The empirical result that is in fact confirmed by so many studies reviewed. Among others, the finding of Debel (2002), Gilbert et al. (2013), and Siaw et al. (2018) in Ghana and Faridi (2012) in Pakistan economy. Reviewed studies confirmed that an active labor force is one sources of growth in different countries, and in fact, this is true for Ethiopia as the finding of this study is consistent with economic theory.

3. Impact of Real exchange rate (lnRER) on economic growth

Real exchange rate has positive sign and is statistically significant in explaining the economic growth in the long run. Increase /appreciation/ of real exchange rate by 1 percent increases economic growth by 1.121209 percent. The finding suggests the need to shift in the structure of both production and trade towards products with demand elastic and high value added products since the relationship found is inelastic. This result is in line with the work of Fentahun (2011) who previously looked at the impact of real exchange rate on economic growth of Ethiopia and the Export performance and economic growth in Ethiopia respectively.

4.4.4 Results of short-run relationship

It is found that there is a relationships among variables in the model, the likelihood of short-run relationship may be explored by employing the conventional error correction model (VECM). As this model permits the introduction of prior disequilibrium as explanatory variables in dynamic behavior of existing variables, and therefore, it is useful in capturing both short-run and long-run relationships. As the error correction coefficient has information about the speed of adjustment move toward its equilibrium trend after an exogenous shock, it should be negative indicating such adjustments. Table 8 provides short-run dynamic link and set of short-run coefficients in VECM.

From the short-run model presented in Table 8, it can be seen that error correction term (ECT),α is negative, less than one, −0.48830 that is statistically significant at 1% level of significance and consistent with economic theory, and it shows the speed of adjustment as well as the indication for stable long-run relationship. The results revealed that in the short run, the deviation from long-run

LRGDP	**Beta Coef.**	**Std. Err.**	**Z**	**P> | Z|**
Constant	0.0124	0.0288	0.43	0.665
DLRGDP(−1)	0 .5920	0 .2793	2.12	0.034**
DLLAB(−1)	−1.6281	1.4863	−1.10	0.273
DCAP(−1)	−0.0484	0 .0271	−1.78	0.075** *
DLGOFX(−1)	−0.0078	0.0432	−0.18	0.855
DLREER(−1)	−0.1496	0.1254	−1.19	0.233

ECM(t-1)	−0.4883	0.1899	2.57	0.10

Equilibrium is corrected at roughly 48.83% every year. Equally, LRGDP is estimated to roughly take an average of almost 2 years to return to its long-run equilibrium level following a shock in the system. The coefficient of 1 year lagged Value of DLRGDP is 0.5920 and statistically significant in short run. The empirical finding of the study established a 1% increase in RGDP in lagged 1 year period will lead to a 0.592% increase in RGDP in the short run within the period of study. The coefficients of 1 year lagged value of DLLAB is negative (−1.6281) and statistically insignificant in explaining economic growth in short run. Although Ethiopia is highly populated country with higher labor force, labor force was found insignificant in short run. This might be due to higher unemployment as youths are not actively engaged in productive activities and the fact that unemployment is one of series challenges in Ethiopia now a day. Furthermore, the insignificant contradictory result is justifiable in developing countries because immobility of labor due to joint family, lack of self-improvement and shirk work among others.

CHAPTER FIVE

CONCLUSSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

The main objective of this study was to empirically determine the contribution and impact of Gold export on economic growth of Ethiopia using annual data for the period 1992 to 2021. Descriptive and time series techniques were used to determine the trends of Gold export and to evaluate the impact of exports on economic growth (GDP) respectively. Unit root tests (ADF and PP tests), a co-integration test (Johansen's procedure and Engle and Granger) to know the existence of long-run relationships between economic growth and Gold exports, Error correction method and Granger-causality tests was used to test for appropriateness of the estimations in order to avoid any spurious regression.

The results of the unit roots test indicated that all the variables are stationary in first differences-I (1), therefore, I(1) series were adopted to test for co-integration and causality between real GDP and Gold exports. The co-integration tests results showed that the long-run relationships exist between the GDP and Gold export and in its set up, error correction method estimates the long-run relationship between economic growth and Gold export as well as fluctuation in the short-run.

The impact of this on the export revenue is substantial in the long run. It is also evidenced by the significant expansion of domestic production and the value addition that it provides. Despite the capital formation, the short-term growth of the economy is still weak.

5.2 Policy implication

To realize rapid economic growth in Ethiopia, emphasis has to be given on the following key issues based on the result of current study;

The Ethiopian government need to encourage Artisanal and small scale miners to bring a real transformation in gold sector as it is one of the growing source of foreign currencies. To do this, the government institutions had better inspire both large scale Artisanal and small scale minersby

providing the necessary incentives. Knowing this fact, part of tax revenue from gold export has to be allocated for encouraging small producers in the sector.

Large scale and Artisanal and small scale miners need to be encouraged in producing, processing and exporting gold to the world market with major highlights toward value addition. Thus, mineral policy makers are advised to support continued investment in the mineral sector by taking note on the impact of gold exports on long-run economic growth. The government need to promote export diversification as well, which indicates export sector in addition to gold has to be inspired.

Although highly significant in long run, labor force was found insignificant in short run. This might be due to higher unemployment as the youths' are not actively engaged in productive activities, and little emphasis is given from the local government. As its impact to growth is quite bold in the long run, the government needs to consider this fact and need to convert labor force to more productive and effective labor that can generate rapid economic growth.

5.3. Directions for future research

In fact this work could not exhaust all specific components of exports as only gold is selected from all others. Observing at the impact of other specific agricultural or non-agricultural exports other than coffee (observed in this study) on economic growth was not observed. Even within gold exports, impact of exporting processed and unprocessed are not separately observed, and the limitation of this study.

REFERENCES

Anita, D. (1996).Export growth and Economic growth: A Reexamination of sometime-series Evidence of the Malaysian Experience. *Journal of Developing Areas,* 30 (2): 223-230.

Appleyard, D. R., Field, A.J. and Cobb, S.L. (2008). *International economics* (6thed.).New York, USA.McGraw-Hill Irwin.

Appleyard, D.R. and Field, A.J. (2001). *International Economics*. Edited by P. Shensa and E. Strathmann, NY, USA.McGraw-Hill Irwin.

Balassa, B. (1978). Export and Economic Growth: Further Evidence, *Journal of Development Economics,* 5:181 – 189.

Barbara, P. and Alberto, R. (2011).Exports, growth and causality: New evidence on Italy (1863-2004) The Economic History Society Annual Conference, University of Cambridge1-3 April 2011.

Barro, R., Lee, J.W. (1994). Sources of Economic Growth. *Carnegie Rochester Conference Series on Public Policy,* 40:1-46.

Bertelsmann Stiftung,BIT 2012-Ethiopia Country Report.Gutersloh: Bertelsmann Stiftung,2012

Boansi, D., Lokonon, B.O.,Appah, J. and Gebremarium, G.G. (2014). Economic and policy Foundations of Agricultural Exports from Ghana: A co-integration Analysis. *International Journal of Development Research,* 4(6):1240-1248. Chow, P.Y. (1987). Causality between Export growth and Industrial development. *Journal of Development Economics,* 26:55-63.

Chenery, H. and Strout, A. (1966). Foreign Assistance and Economic Development. *Journal of American Economic Review,* 56: 679 – 733.

Constantine, C. Economic structures, institutions and economic performance. *Economic Structures* **6,** 2 (2017). https://doi.org/10.1186/s40008-017-0063-1

Dickey, D. & Fuller, W. (1979). Distribution of the Estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association,* 74(3):427-431.

Domar, E.D. (1946). Capital Expansion, Rate of Growth and Employment. *Econometrica*, 14: 137-147.

EEITI (2016) Ethiopia extractive industries transparency initiative (EEITI) beneficial ownership disclosure road map

EIA. (2013).An Investment guide to Ethiopia, opportunities and conditions.

Enders, W. (1995). *Applied Econometric time series* ,3rd Edition, University of Alabama.

Engle, F.E. and Granger, W.J. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, 55(2): 251-276.

Enriques, I. and Sadorsky, P. (1996).Export-led Growth or Growth-Driven Exports: The Canadian Case. *Canadian Journal of Economics*, 29(3): 540-555.

ERCA. (2013).Import and export database. *ASCCUDA++* software.

Feder, G. (1983). Exports and Economic growth. *Journal of Development Economies*, 12: 59-74.

Fentahun, B. (2011). The impact of real effective exchange rate on the economic growth of Ethiopia. full thesis, Addis Ababa University. .

Gemechu, D. (2002). Export and economic growth in Ethiopia: An empirical Investigation. Full thesis, Addis Ababa University.

Gilbert, N. A., Linyong, S. G., & Divine, G. M. (2013). Impact of agricultural export on economic growth in Cameroon: Case of banana, coffee and cocoa. *International Journal of Business and Management Review*, *1*(1), 44–71.

Ghosh, A. and Phillips, S. (1998). Warning: Inflation may be harmful to your growth. International monetary fund, *staff paper*, 45(4):672-710.

Gujarati, D. (2004). *Basic Econometrics*. Fourth Edition. McGraw-Hill Companies.

Granger, C.W.J. (1988). Some recent developments in a concept of causality. *Journal of Econometrics*, 39:199-211.

Granger, C.W.J., Newbold, P. (1974). Spurious regression in Econometrics. *Journal of Econometrics*, 2:111-120. Green, W.H. (2000). *Econometric Analisis*. NewJersey: Prentice-Hall,Inc.

Haddaway, N.R., Cooke, S.J., Lesser, P. *et al.* Evidence of the impacts of metal mining and the effectiveness of mining mitigation measures on social–ecological systems in Arctic and boreal regions: a systematic map protocol. *Environ Evid* **8,** 9 (2019). https://doi.org/10.1186/s13750-019-0152-8

Hannan, E. J. and Quinn, B.G. (1978). The determination of the lag length of an autoregression .*Journal of Royal Statistical Society,* 41:190 – 195.

Hang T. N. (2011). Exports, Imports, FDI and Economic Growth, Working paper in economic N0: 11-03.

Harris, R.Z.D. (1995). Using Co-integration Analysis in Econometric Modeling. London, University of Portsmouth,PrnoticeceHalll.

Harrod, R.F. (1939). An essay in dynamic economics. *Economic Journal*, 49, 14-33

Heijdra, B.J. and Ploeg, F. (2006). *Foundations of Modern Macroeconomics*, Theories of Economic Growth, Chapter 14.

Johansen, S. (1988). Statistical Analysis of co integration vectors. *Journal of economic dynamics and control*, 12:231-254.

Johansen, S.and Juselius, K. (1990). Maximum likelihood estimation & inference on co integration with application to the demand for money. *Oxford Bulletin of economic &statistics*, 52:169-210.

Jung, W.S. and Marshall, P.J. (1985). Exports, growth and causality in developing countries. *Journal of Development Economics,* 18:1-12.

Khan, M.S. and Senhadji, A.S. (2001). Threshold effects in the relationship between inflation and growth. International monetary fund, *staff paper*, 48(1):1-21.

Lucas, R.E. (1988). The mechanics of economic development. *Journal of Monetary Economics*, 22: 3-42. Lutkepohl, H. (2005).*New introduction to multiple time series analysis*.

Massell, B.F. (1964). Export concentration and Fluctuations in Export Earnings: A Cross-Section analysis, *American Economic Review*, 54:47-63

MoFED. (2012).Growth of transformation Plan Annual Progress Report for F.Y.2010/2011,Addis Ababa. MoFED. (2013).Growth of transformation Plan Annual Progress Report for F.Y.2011/2012,Addis Ababa.

Meier, G.M. (1985). *Leading issues in Economic Development*, Sixth Edition, Oxford University Press.

Moschos, D. (1989). Export Expansion, Growth and the Level of Economic Development. *Journal of Development Economics*, 7(16):99 - 102.

Muhammad, Z.F. (2010). Contribution of agricultural export to economic growth in Pakistan.*Pak. J. Commer. Soc. Sci*, 6(1): 1-14.

Myint, H. (1958).The Classical Theory of International Trade and the Underdeveloped Countries. *Economic Journal*, 68(12):317-37.

NBE (National Bank of Ethiopia). Annual report for 2012/13.

Ousmanou N. (2003). Exports and Economic Growth in Sub-Sahara Africa: Is There a Connection? Faculty of Economics & Management. University of Yaounde II P.O.Box 1063 Yaounde, Cameroon. PCI. (2013).

Phillips, P.C. and Perron, P. (1988). Testing for a unit root in time series regression. *Biometrica*, 75(9):335-346.

Rahman, M. and Mustafa, M. (1998). Dynamics of real exports and real economic growth in 13 selected Asian countries. *Journal of Economic Development*, 22(2): 81-95.

Ramona, S. (2006). Export-led growth in South Africa. Full thesis. At the B.S.,Louisiana State University and Agricultural and Mechanical College. Romer, P.M. (1986). Increasing returns and long-run growth. *Journal of Political Economy* 94:1002-1037.

Rostow, W.W. (1990). *Theorists of Economic Growth from David Hume to the present;* with a Perspective on the next century, New York, Oxford University Press.

Ruba A. S., Thikraiat S. and Shatha A. (2014). The Causal Relationship between Exports and Economic Growth in Jordan**.** *International Journal of Business and Social Science.*5 (3):302-308**.**

Salvadori, N. (2003). *The Theory of Economic Growth*: A Classic Perspective, Edward Elgar Publishing Limited, UK.

Shahidur, R., Chilot, Y., Befikadu, B. and Solomon L. (2010). Constraints and opportunities for enhancing exports, pulse profile in Ethiopia. *Working paper*, July 2010.

Sharma, S.C. and Dharmendra, D. (1994). Causal Analyses between exports and Economic Growth in Developing Countries. *Journal of Applied Economics*, 26:1145 - 57.

Shewangizaw, S. (2003). The role of diversification in reducing impacts of export instability on Ethiopia economic growth, Full thesis.

Solow, R.M. (1957). Technical change and the aggregate production function. *Journal of Revieeconomics andnd Statistics,* 39(8): 312 - 320.

Solow, R.M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics,* 70:56-94.

Sprout, R.V.A. and Weaver, J.H. (1993). Exports and economic growth in a simultaneous equations model. *Journal of Developing Areas,* 27(3):289 - 306.

Taylor, M, P,. and Peel, D. (2000). Nonlinear adjustment, long-run eequalbrbariumnd exchange rate fundamentals. *Journal of International Money and Finance* 19:33 –53.

Tekeste Abrham, **(**Oyejide**,** 1986 and Eita**,** 2009**).** - AAU Institutional Repository http://etd.aau.edu.et › bitstream › handleGross Labor Force (GLF)

Tigist, Y. (2015). Impact of agricultural exports on economic growth in Ethiopia: the case of coffee, oils,ee,d and, pulses (No. 634-2017-5864).

Tijani, A., Ajetomobi, J.O. and Ajobo, O. (1999). A Co-integration Analysis of Nigeria Cocoa Export Supply. *Journal of Rural Economics and Development,* 139(1): 45 - 55. Tyler, W. (1981). Growth and export expansion in less developed countries: some empirical evidence. *Journal of Development Economics,* 329(9):121-130.

Ukpolo, V. (1994). Export composition and growth of selected low-income African countries: Evidence from time-series data. *Journal of Applied Economics*, 26(5): 445 - 49.

Vernon, R. (1966). International Investment and International Trade in Product Cycle. *Quarterly Journal of Economics*, 80:190-207

Verbeek,M (**2017)**A Guide to Modern Econometrics, 5th Edition – Wileyhttps://www.wiley.com › en-usA Guide to Modern Econometrics, 5th Edition.. ISBN: 978-1-119-40115-5 July **2017**

Voivodas, C.S. (1973). Exports, foreign capital, inflows and economic growth. *Journal of International Economics,* 22:337 - 349.

Zapata, H.O. and Rambaldi, A.N. (1997). Monte Carlo Evidence on Co-integration and Causation. *Oxford BullEconometricsnometric and Statistics,* 59 (2): 285-298.