

The Relationship between Export and Economic Growth in Ethiopia

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Declaration

The project is my original work, has not been presented for a degree in any other university and that all sources of material used for the project have been fully acknowledged.

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ABSTRACT

The relationship between exports and economic growth has been a popular subject of debate among development economists. The aim of this paper is to test the relationship between export and economic growth in Ethiopian economy from 1975-76 to 2010/11. A bi-variate model is specified and estimated by using cointegration tests and error correction model. From the estimation of the specified model, we reported that there is a positive relationship between export and economic growth in the longrun and short run at 5 percent significance level and evidence in support of the export-led growth (ELG) hypothesis in that export growth has a causal influence on economic growth.

From a policy perspective, the acceptance of the ELG hypothesis lends credence to the view of 'outward orientation' as an effective policy for economic growth.

1. INTRODUCTION

1.1 Background

From the early 1960s, policy makers and researchers had a great interest in the relationship between export and economic growth. Their main reason and motivation is that they want to know if a country should increase its export to to achieve a better economic growth or whether they should stimulate economic growth from the outset to lead to more export. Regarding the relationship between export and economic growth, four possibilities could be recognized: Some analysts believe that the causality direction is from export to economic growth which is expressed as Export-Led Growth (ELG) hypothesis (Balassa. 1978, Bahagwati. 1978, Edwarards. 1998). According to this hypothesis the export development and free entry and exit are considered as the key causes of economic growth. For example, firms can take advantage of more efficient allocation of resources, scale economies and encouraging creativity and innovation caused by foreign competition (Helpman and Krugman, 1985). Also, there are various studies which support Growth Led Export (GLE) in a way that the causality direction is from economic growth to export growth. Regarding the Growth Led Export hypothesis, export development is set off through benefits of efficiency caused by increase in interior work force's skill levels and technology advancement (Krugman, 1984, Bhagwati 1988). The above two above approaches do not overlap. Therefore the third possibility is that there is a feedback relationship between export and economic growth. At last (as the fourth possibility) it is possible that there is no relationship or just a simple contemporaneous relation between these two variables. Moreover, export can cause more import of intermediate goods which leads to increase of capital accumulation and output growth (Mohsen Mehrara, 2011).

The relationship between export growth and economic growth in developing countries has been of continuing interest both in theoretical and empirical literature. A large number of empirical studies have been conducted during the last two decades to investigate the role of exports in economic growth or the export-led growth hypothesis, using either time-series or cross-section

data. These studies have been conducted along a number of divergent lines. The early studies on this

issue examined the simple correlation coefficient between export growth and economic growth. These studies generally concluded that there is strong evidence in favor of export-led growth hypothesis based on the fact that export growth and economic growth are highly correlated. For Smith, as suggested by Van den Berg and Lewer (2007). International trade has a very positive effect on economic growth. A sudden shift in trade policy that opens up new trade provides an immediate gain in real per capita income, which, in turn, accelerates technological progress and increases the rate of economic growth permanently.

The aim of this study is to investigate the existence and magnitude of the link between export and economic growth in Ethiopia. Thus this paper will use the data on Ethiopia during 1975-76 to 2010/11 periods. The empirical implementation then followed a co-integration and error correction approach that makes use of long-run and short-run analysis.

1.2 Statement of the Problem

High incidence of poverty, low social service facilities, unemployment, backward technology and low productivity, environmental degradation, etc. are the characteristic features of Ethiopian economy. Agriculture takes the lion's share of economic structure with other proportion of service and industrial sector. The per capita income of the country is one of the lowest in the world and the combined rapid population growth makes the situation worse. Nevertheless, the recent performance is encouraging. In comparison with sub-Saharan Africa, Ethiopian economy is performing well, especially over the past decade. According to a report by the World Bank (2012) "Over the past decade, the Ethiopian economy has been growing twice the rate of the Africa region, averaging 10.6 percent of GDP per year between 2004 and 2011 compared to 5.2 percent in sub-Saharan Africa".

The country's exports are highly concentrated in agricultural commodities, while the share of non-agricultural products in total merchandise exports is almost insignificant. Concentration on few trading partners resulted in demand constraint

for the nation's primary exports and could be one reason for the poor performance of the sector and hence of the economy. Therefore, assessing the contribution of exports to economic growth are issues that will be examined in this study.

1.3 Objective of the Study

- To examine the relationship between export and economic growth in Ethiopia using co-integration and error correction techniques.
- To highlight possible intervention areas for export growth and diversification based on the findings.

1.4 Significance of the Study

The study provide the needed information that guides the planners to make informed decisions to successfully deal with the problems of enhancing economic growth and the findings can be used as a reference for later research works.

1.5 Limitation of the study

The shortage of available data and short period of time available for the study was the main limitations of the study.

1.6 Organization of the Study

The rest of the project is organized as follows. Chapter Two reviews the export policy in Ethiopia. ChapterThree reviews the relevant theoretical and empirical literatures. The methodology, model specification and the data are

dealt with in Chapter Four. ChapterFive is devoted to the empirical examination of the issues using different econometric techniques. Finally, conclusions and policy recommendations are provided in Chapter Six.

2. A Review of the Export Policy in Ethiopia

2.1 The pre 1974/75 Periods

The private sector, mainly foreign capital, had occupied the sheer weight of both exports and imports activities. The development plan had three phases (Imperial Government of Ethiopia, 1955, 1962, 1968) .these are:-

- **The First Five-Year Development Plan (1957/58-1961/62):**

Import substitution industrial promotion and infrastructure facilities like road development were the focus. Diversification of the export structure by exploiting the large livestock population, and the products of agro-processing industries to secure average annual export growth of 9% and 11% share of exports in national income.

- **The Second Five-Year Development Plan (1962/63-1966/67):**

Structural change and export diversification received priority. New export products of industrial origins and mining products were supposed to play key role.

The average annual export growth rate was expected to reach 11%.

- The share of agricultural exports to trim down to 72.3% in 1966/67 from 93.6% in 1962/63
- Manufactured products to wind up to 24.2% from 5.2%.

The policies: the formation of government foreign trade corporations, revisions of existing customs tariff to protect domestic products and stimulate exports, directing credit and subsidy policies towards the production and promotion of exports, conclusion of a series of bi-lateral and multilateral agreements and better participation at international trade fairs.

- **The Third Five-Year Development Plan (1968/69-1973/74):**

Geographic diversification of traditional export produces (coffee, livestock products and oilseeds) and the development of non-agricultural exports were the focus. Envisioned to reduce the share of traditional exports from 86% in 1967/68 to 75% in 1973/74. The share of coffee was planned to plummet from 55% to 40% in the same period partly due to the addition of new products in the export basket.

The measures adopted include overvaluation of the exchange rate, high tariff rates, wide-ranging foreign exchange control and non-tariff barriers like restrictions on some items and heavy tax on export.

2.2 The Derge Regime (1974/75- 1990/91)

The overall policies favored the expansion of collective and public enterprises while private enterprises were kept at bay for long. An inward looking strategy behind a highly protective tariffs and quantitative restrictions was the development strategy. The government undertook a ten-year perspective plan (1985/86- 1994/95):

- Aimed at orienting export structures of the country towards high value added products and increasing the amount and composition of manufactured exports, expanding the foreign exchange earnings, and increasing the socialization of the export sector.
- However, particular attention was given to state owned export companies heedless of their inefficiency.

- Geographic diversification of exports towards the markets of socialist countries and neighboring African countries. Average annual export growth rate was targeted to stand at 15.4%. State owned export companies were expected to take up 90% of the export business.
- To reduce the share of all traditional exports (coffee, hides and skins, pulses and oilseeds) to 53.2% from 73.5%.
- The share of other export products (live animals, meat products, fruits and vegetables, spices, sugar and molasses, natural gum, chat and others) was targeted to rise from 26.5% in 1985/86 to 46.8% in 1994/95.

The tools employed: provision of favorable tax, tariffs and foreign exchange rate measures, improving exports in terms of quality, quantity and variety and providing current information on world market prices and other factors in international market to exporters and producers. The other efforts: the introduction of the export subsidy scheme in 1983/84 and the directive issued to ban the export of raw hides and skins in 1989/90.

2.3 The Post 1990/91 Period

Since 1992, Ethiopia under the support and guidance of the IMF and the World Bank has undergone liberalization and enhanced Structural Adjustment Programs (SAPs) to restrain internal and external imbalances of the economy. One of the basic tasks of the new policy regime is to increasingly open the economy to foreign competition with a view of benefiting the economy from expanded markets.

The tools implemented include:

- Devaluation of the Birr and step-by-step liberalization of the foreign exchange market,
- Streamlining import and export licensing system,
- Tariff reduction, and provision of incentives to exporters,
- Abolishing taxes on exports and subsidies to parastatal exporting enterprises,
- Encouraging export-oriented investment,
- Introduction of duty draw back and foreign exchange retention scheme,
- Minimizing administrative and bureaucratic procedures.
- Promulgating an export development strategy, Established export support institutions, Instituted export specific incentive schemes, Foreign exchange retention scheme, Export duty incentive schemes such as duty draw back scheme, voucher scheme and bonded manufacturing warehouse scheme, Export credit guarantee scheme, External loan and suppliers' or Foreign partners' credit.

3. REVIEW OF LITERATURE

3.1 Theoretical Literature

The idea that international trade brings economic growth and increases the welfare of a nation started during the 17th century by a group of merchants, government officials and philosophers who advocated an economic philosophy known as mercantilism. According to mercantilists, for a nation to become rich and powerful, it has to export more than it imports where the resulting export surplus is used to purchase precious metals like gold and silver. Thus the government in its power has to control imports and stimulate the nation's exports.

Adam Smith attacked the main mercantilists' views and proposed the classical theory of international trade based on the concept of absolute advantage model. According to him stock of human, man-made and natural resources rather than stock of precious metals were the true measure of the wealth of a nation and argued that the wealth of a nation can be expanded if the government would abandon mercantilist controls. In addition, he showed that trade can make a nation better off while making another worse off [Mannur, 1996 p.21].

Absolute advantage, however, explains only a very small part of the world trade today i.e. trade between developed and developing countries. Most of the world trade especially trade among developed countries could not be explained by absolute advantage [Salvatore,1990].

The model of comparative advantage was later articulated by David Ricardo to replace the principle of absolute advantage. According to this model, a country will specialize in the production and export of the commodity in

which it has a comparative advantage i.e. the commodity that it can produce at the lowest relative cost.

The comparative advantage model is based on a set of assumptions one of which is the labor theory of value. According to the labor theory of value, (a) either labor is the only factor of production or is used in the same fixed proportion (b) labor is homogeneous i.e. of only one type. Since neither of these assumptions is true the labor theory of value must be rejected. In addition to the above argument, the comparative advantage model states that trade depends on the terms of trade which in turn is determined by internal cost ratios in two trading countries i.e. by supply conditions alone. This obviously is flawed since terms of trade are not only determined by supply factors but also by demand forces. In order to modify the Ricardian theory, the principle of reciprocal demand was formulated by J.S Mill and later was developed by Edgeworth and Marshall. According to the reciprocal demand theory, it is both the demand and supply conditions which determine the terms of trade and hence trade between countries. However, the theory says nothing about the gains to be obtained through trade; it merely fills some gaps which existed in the early classical theory.

In recent years economists have therefore challenged the static neo-classical model and developed new models that explain trade between developed and developing countries. Unlike the traditional model which is assumed to apply to all nations, the so called North- South trade models focus specifically on trade relation between rich and poor countries [Ocampo, 1980].

The notion of trade as an “engine of growth” is given much emphasis by many economists. Proponents of the traditional theory of trade still contend that trade can contribute substantially to the development of primary-

exporting countries. It is argued that the growth of many developed countries like the United States, Canada, Australia, New Zealand (referred as regions of recent settlement), which were once developing nations is mainly attributed to international trade. However other economists strongly believe that the accrual of the gains from international trade is biased in favor of the advanced industrial countries and that foreign trade has inhibited industrial development in poor nations. Thus these economists contend that international trade as being completely irrelevant for developing nations and the development process.

The controversy on the notion of trade as an engine of growth led developing countries to pursue different trade strategies for development. In what follows we present the two trade policies adopted by many developing countries namely, import substitution and export promotion and the discussion follows (Todaro, 1994).

In the 1950s and 1960s, many Latin America and Asian countries, such as Chile, Peru, Argentina, India and Pakistan followed ISI strategy. By the late 1960s, African countries such as Ethiopia, Nigeria and Zambia began to pursue a similar strategy [Singer, 1950; Prebisch, 1950]. Theories by the structuralists [Singer, 1950; Prebisch, 1950] provided justification for a protectionist policy (SI) by considering the division of the world into a center (the developed countries), and a periphery (the developing world), where trade acted as a source of impoverishment in the latter and as a source of enrichment in the former. According to these theories, trade brings growth for the industrialized countries with little or no gain at all for the developing countries. Some studies [Ocampo, 1986; Ocampo and Taylor, 1998] have also expressed their concerns on the ground that in return to the 'modest' benefit of liberalization; a country may have to pay a higher price in terms

of slow productivity growth, worsening income distribution, and likely de-industrialization. According to Deraniyagala and Fine (2001), import liberalization strategy is less attractive for export expansion to generate positive influence on growth. They disclosed that, if selective protection is done properly, it will be more efficient than complete trade liberalization.

Marxist writers went further and said that poor countries should not trade at all with the so-called “north” [Redding, 1999]. The principal reason for protection and thus in-ward-looking strategy is the infant industry argument [Bardhan, 1970] that underlines the need for protecting firms at the beginning of their lifetime. Traditional trade models [Dornbusch and Samuelson, 1977; Rodriguez, 1974] moreover, considered the possibility of an optimal level of protection for a country that could influence the terms of trade. It has also been shown that protection can raise income when there is no full employment (Brecher, 1974 and 1992, as cited in [Vamvakidis, 2002]). In spite of these anti-trade theories, there exists a vast literature on the links between trade and economic growth and development.

However, after years of implementation, ISI failed to act as an appropriate trade development strategy. Since then the idea of export expansion strategy gained popularity as a major determinant of economic growth for developing countries. Thus, ISI was eventually replaced by an out-ward-looking export promotion policy similar to that which the four Asian “tiger” countries adopted (Todaro & Smith, 2006). From 1960s on, in the developing countries export activities were widely considered as a path to industrialization and instruments that useful in boosting economic growth [Krugman & Obstfeld, 2003].

A lot of literature consists of analysis and testing of the outward-oriented export promotion policy or Export-Led Growth (ELG) hypothesis. This hypothesis states that promotion of the export sector is the best way to achieve economic growth. There are many explanations as to why exports are a crucial way to obtain growth[Giles et al 2000]. According to Giles and Williams [2000], export stimulates growth in a number of ways. These include supply/production and demand linkages, economies of scale (due to larger international markets), increased efficiency, adoption of superior technologies (embodied in foreign-produced capital goods), learning effects and improvement of human resources, increased productivity (through specializations and creation of employment)

On an aggregate scale, the impact of globalization and the liberalization of trade that many regions in the world have adapted have “led to a massive expansion in the growth of world trade relative to world output” Thirwall(2000 page 130). Thus trade among nations has become an integral part of the new economies because of trade liberalization. Based on data analysis, economists have claimed that the increase in exports for a given country leads to an increase in gross domestic product. The question now is how this is possible.

As seen by Ricardo’s theory and the aforementioned example of comparative advantage in trade, another benefit of exporting is that it creates a new market for producers. Using the example from above, before engaging in trade, the US producers of computers only have their internal market. After trade, now these producers have a new market with the Canadian consumers. Thus if the resources and capital available to them make it feasible to increase production, the computer producers will be able to

expand their production and increase their revenues. If this effect is analyzed on an aggregate basis, the sum of all the firms' benefits will expand the national income of the country as a whole, Balassa(1978). This same logic can be applied to a number of producers in a variety of industries. Or, as Thirwall(2000) stated, "If production is subject to increasing returns, export growth becomes a continual source of productivity growth" Thirwall(2000 page 135).

Using the data for 41 less developed countries for the period 1950-73, Michael (1977) tested the hypothesis that "export growth accelerates economic growth" using spearman rank correlation coefficient. He used the rate of growth of exports share of GDP and output growth to avoid spurious results stemming from the fact that exports are a component of GDP. The spearman rank correlation coefficient for the sample as a whole was found to be 0.38, which was significant at 1% level.

However the positive association of the economy's growth with the growth of export share is particularly strong among the more developed countries and does not exist at all among the less developed countries. Thus, he concluded that growth in output is affected by export performance once countries achieve some minimum level of development.

Similarly Balassa (1978) tested the hypothesis using the rank correlation methodology. He used pooled data on eleven developing countries for 1960-73. Again he found a positive correlation coefficient between growth of exports and output growth.

Feder (1982) tested the export-growth relationship for a group of semi-industrialized less developed countries for the period 1964-73. He developed an analytical framework, incorporating the possibility that the marginal

factor productivities are not equal in the export and non-export sectors of the economy. The regression result indicated that the coefficient of the export variable is about 0.42, which is significant at 5% level. This led to a strong support to the hypothesis that marginal factor productivities in the export sector are higher than in the non-export sector. Using the mean values of the sample variables he decomposed the average rate of GDP growth for the period under consideration. The contribution of exports is further decomposed into the gain in growth due to beneficial externalities affecting the non-export sector and the gain due to other elements underlying higher factor productivity in the export sector. Accordingly, the inter-sectoral externality effect of exports is found to be higher than the effect of higher factor productivity in the export sector.

In order to examine the relationship between export expansion and economic growth, Kavoussi (1984) took a sample of seventy-three low and middle-income developing countries for the years 1960-78. From the regression result he found that in large and heterogeneous sample of developing countries he considered, higher rate of economic growth is associated with higher rates of export growth. He also demonstrated that the positive correlation between exports and growth is not limited to middle-income countries (as argued by the previous authors) but holds for low-income countries as well. Furthermore, his result has shown that primary exports play an important role in the growth process of the low-income countries. On the other hand his finding seems to indicate that exports of manufactured goods to be strongly associated with economic growth for the middle income countries.

3.2 Empirical Literature review

According to Faye Ensermu (2001) the rate of growth of real export has a positive effect on the rate of economic growth in the context of the Ethiopian economy. In other words, it has tested the validity of the hypothesis which is consistent with Ethiopia's objective. In the long run, it even contributed greater than the real investment to gross domestic product (I/Y). Thus, export has a role to play by real investment to gross domestic product (I/Y) in explaining economic growth. He claims this is true, since the occurrence of unit root and the presence of co-integrating relationships support the use of error correction models, making it possible to distinguish between the short run and long run effects of export on economic growth.

Pandhi (2007) conducted his study on selected African nations, namely Malawi, Nigeria, Democratic Republic of Congo, and Guinea Bissau. He found that exports play an important role in the GDP growth of their respective economies. The relationship between trade and exports is one that is agreed upon by economists from many different schools of thought, and the areas of contention are usually those dealing with the causality issues or the extent of the role that exports play in economic growth. This paper supports the export-led growth theory.

“Export growth is the only component of demand that provides the foreign exchange to allow other components of demand in an economy to grow faster” Thirwall (2000 page 133).

Victor Ukpolo (1998) examined the relationship between exports and economic growth and concluded that they are co-integrated, which confirms the existence of a long run relationship between the two variables. In

addition, the evidence seems to verify the notion that economic growth Granger-causes export growth, but fails to support the export-led hypothesis that export growth causes economic growth for the South African economy for the period under study (1964-1993).

Ekanayake (1999) found out the co-integration and error-correction modeling techniques used in his study have revealed that there is a bi-directional causality between export growth and economic growth in seven of the eight countries considered. There is evidence for short-run Granger causality running from economic growth to export growth in all cases except Sri Lanka. While there is strong evidence for long-run Granger causality running from export growth to economic growth in all cases, there is evidence of short-run causality running from export growth to economic growth only in Indonesia and Sri Lanka.

The study by Shihab (2014) examined the role of export in the economic growth process in Jordan using causality tests for data over the period 2000 to 2012. Granger causality was applied to test the causal relationship between export and economic growth. The results showed that there is evidence of uni-directional causality between export and economic growth in Jordan and the direction of causality runs strictly from economic growth to exports. In conclusion, this study provided support for growth-led export in case of Jordan.

Anwer and Sampath(1997) examined causality between exports and economic growth for 96 countries, using data from the World Bank for the period of 1960-1992. While determining the stationarity of the two variables and their orders of integration, they found that GDP and exports are

integrated of different orders for 35 countries. Among the other 61 countries, for 30 countries there was no long run relationship between the two variables; 20 countries show causality at least in one direction, with unidirectional causality from GDP to exports for 12, from exports to GDP for 6 and bidirectional causality for 2 countries; and 11 countries do not show any causality between GDP and exports. There are only 9 out of 96 countries which show positive impact of economic growth on exports. Contrary to the common thinking that exports promote economic growth they found that the majority of the countries do not show any relationship between exports and economic growth.

4. METHODOLOGY, MODEL SPECIFICATION AND DATA SOURCES

4.1 Econometric Methods

4.1.1 Stationary and Non-Stationary Series

The standard classical methods of estimation which are used in the applied econometric work are based on a set of assumptions one of which is the stationarity of the variables. A variable is said to be covariance (weakly) stationary if the mean and the variances of the variable are constant over time and the covariance between two periods depends only on the gap between the periods, and not the actual time at which this covariance is considered.

A non-stationary series has a different mean at different points in time and its variance increases with the sample size. So, the first thing in an econometric work is to check whether a series is stationary or not. Using the classical estimation methods to estimate relationships with non-stationary variables results in spurious regression. This is a situation in which results obtained suggest there are statistically significant relationships between the variables in the regression model when in fact all that is obtained is evidence of contemporaneous correlations rather than meaningful causal relations [Harris (1995)].

Hence the non-stationary (trend) in variables needs to be removed first before getting into any econometric work. If the trend in a variable is trend deterministic, then it is perfectly predictable and can either be removed by regressing the variable on time (with the residuals from such a regression forming a new variable which is trend-free and stationary) or can be

captured by including a deterministic time trend as one of the regressors in the model. If on the other hand the trend is not deterministic (stochastic) then it is not perfectly predictable. In such a case the variable needs to be differenced to nullify the trend and make it stationary. A variable is said to be integrated of order one denoted $I(1)$ if it must be differenced one time to make it stationary. A level stationary series is said to be integrated of order zero i.e. $I(0)$. In general if the series need to be differenced d times before it becomes stationary, it is said to be integrated of order d denoted $I(d)$.

4.1.2 Tests for Unit Roots

There are several ways of testing for the presence of unit root. From these one of them is the ADF test. The ADF test solves this problem by considering a higher order and augmenting the random walk equation with some more lags. It is suggested to allow both an intercept and time trend in the regression model used to test the presence of unit root. The null hypothesis is that the variable is non-stationary against the alternative stationary. The null hypothesis is rejected only when there is strong evidence against it at the conventional levels of significant.

4.1.3 Cointegration and the Error Correction Model

(ECM)

Many macroeconomic time series are not stationary at levels and are most adequately represented by first differences. Even though the individual time series are not stationary, a linear combination of these variables could be stationary (i.e. they may be co-integrated). If these variables are co-integrated, then they have a stable relationship and cannot move “too far”

away from each other. In contrast lack of co-integration suggests that such variables have no long run link, in principle they can wander arbitrarily far away from each other Rao(1994).

Engle and Granger (1987) have shown that if variables are integrated of order one I(1), and the stochastic error terms are integrated of order zero I(0), then the variables are said to be co-integrated. If the variables are co-integrated there must exist an error-correction. The inclusion of error-correction terms introduces an additional channel through which Granger causality could be detected. According to Granger (1986), the error-correction models produce better short-run forecasts and provide the short-run dynamics necessary to obtain long-run equilibrium.

4.2 Model Specification

Let Y denote real GDP and X denote real exports. Let the long run relationship between the two variables in log linear form is given as follows:

$$\text{Log}Y_t = \alpha + \beta \text{Log}X_t + \varepsilon_t$$

Where ε_t is an error term. In this set up and according to Engle and Granger's (1987) representation theorem if both Log Y and Log X are integrated of order one, I(1), but the residuals, ε 's are integrated of order zero, the two variables are said to be co-integrated. Co-integration between the two variables could also be established through the error correction modeling technique.

$$\Delta \log Y_t = \alpha + \sum_{i=1}^n b_i \Delta \log Y_{t-i} + \sum_{i=0}^n c_i \Delta \log X_{t-i} + d\varepsilon_{t-1} + \mu_t$$

The variables LogY_t and LogX_t in the model are taken as real gross domestic product and real export respectively. Variables are then converted in to natural logarithmic form.

4.3 Data

The main sources of data in this study are the Ministry of Finance and Economic Development, National Bank of Ethiopia (NBE) Ethiopian Export Promotion and various publications of World Bank (WB).

The length of the time series data used in the analysis ranges from 1975/76 to 2010/2011 G.C.

5. EMPIRICAL ANALYSIS

5.1 Result of Unit Root Tests

Before any meaningful regression is performed with the time series variables, it is essential to test the existence of unit roots in the variables and hence to establish their order of integration. The variables used in the analysis need to be stationary and/or should be co-integrated in order to infer a meaningful relationship from the regression.

Estimation of the co-integration relationship to be undertaken in the next section requires both the time series variables in the model to be integrated of order one. The test results of the standard ADF statistics for both time series variables used in the estimation are presented as follows.

Table 1

Augmented Dickey-Fuller Unit Root Test for GDP (At level)

Null Hypothesis: LGDP has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		1.285362	0.9979
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Table 2**Results of ADF test for GDP at level**

Null Hypothesis: LGDP has a unit root			
Exogenous: Constant, Linear Trend			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-2.091879	0.5293
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

Table 3**Augmented Dickey-Fuller Unit Root Test for GDP constant (1st difference)**

Null Hypothesis: D(LGDP) has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-7.236509	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Table 4**Augmented Dickey-Fuller Unit Root Test for GDP constant and trend (1st difference)**

Null Hypothesis: D(LGDP) has a unit root			
Exogenous: Constant, Linear Trend			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-7.838446	0.0000
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

Table 5**Augmented Dickey-Fuller Unit Root Test for export at level**

Null Hypothesis: LEXP has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		0.346616	0.9769
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

Table 6**Augmented Dickey-Fuller Unit Root Test for export at level**

Null Hypothesis: LEXP has a unit root			
Exogenous: Constant, Linear Trend			
Lag Length: 1 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-2.224432	0.4593
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

Table 7**Augmented Dickey-Fuller Unit Root Test for export (1st difference)**

Null Hypothesis: D(LEXP) has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-4.792068	0.0006
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Table 8

Augmented Dickey-Fuller Unit Root Test for export t (1st difference)

Null Hypothesis: D(LEXP) has a unit root			
Exogenous: Constant, Linear Trend			
Lag Length: 0 (Automatic - based on SIC, maxlag=7)			
t-Statistic			Prob.*
Augmented Dickey-Fuller test statistic		-4.939082	0.0023
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

From the above test results we see that the variables are non-stationary at levels but stationary at first difference hence the variables are considered as I(1) processes.

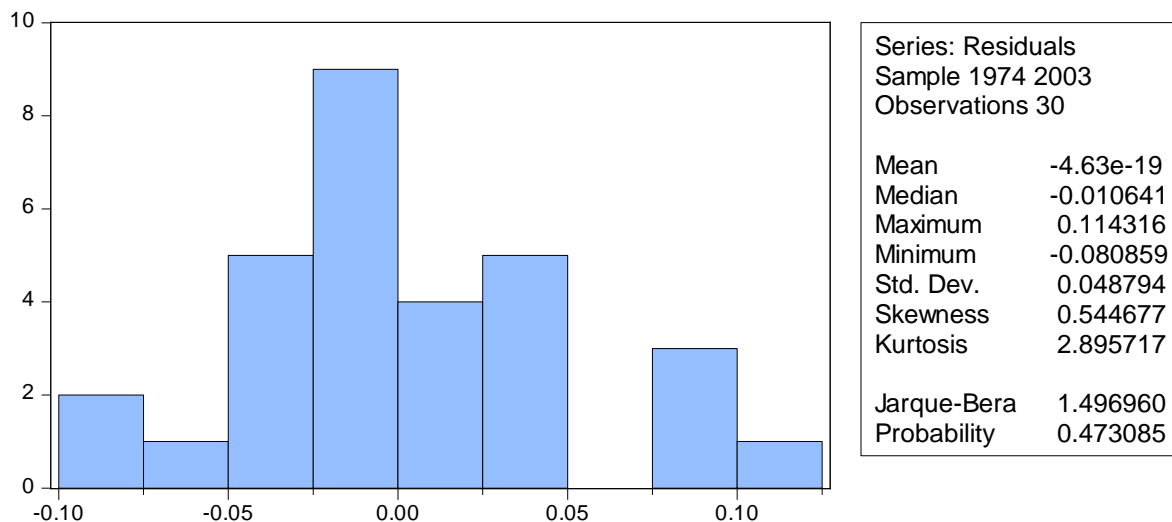
5.2 Diagnostic test

Figure 1

5.2.1 Normality test

H0: all model variables are normal

H1: all model variables are not normal



5.2.2 Serial correlation test

H0: There is no serial correlation between model variables

H1: There is serial correlation between model variables

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.170673	Prob. F(2,25)	0.1351
		Prob. Chi-	
Obs*R-squared	4.438801	Square(2)	0.1087

5.2.3 Heteroskedasticity test

H0: All model variables are homoscedastic

H1: All model variables are heteroskedastic

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.618393	Prob. F(2,27)	0.5463
Obs*R-squared	1.314016	Prob. Chi-Square(2)	0.5184
Scaled explained SS	1.008856	Prob. Chi-Square(2)	0.6039

The diagnostic tests including Breusch-Godfrey serial correlation LM test, Jacque- Bera-normality test and Heteroskedasticity test are failed to reject the entire above null hypothesis at 5% significant level. All the tests show that the model has the desired econometric properties, i.e, it has a correct functional form and the model's residuals are serially uncorrelated, normally distributed and homoscedastic. Therefore, the results reported are valid and reliable for interpretation.

5.3 Estimation of the Long Run

Table 9

Dependent Variable: LGDP Method: Least Squares Date: 06/04/14 Time: 15:53 Sample (adjusted): 1973 2003 Included observations: 31				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEXP	0.773969	0.044974	17.20933	0.0000
C	1.087847	0.130919	8.309335	0.0000
R-squared	0.910813	Mean dependent var		3.326178
Adjusted R-squared	0.907738	S.D. dependent var		0.273623
S.E. of regression	0.083112	Akaike info criterion		-2.074912
Sum squared resid	0.200321	Schwarz criterion		-1.982396
Log likelihood	34.16113	Hannan-Quinn criter.		-2.044754
F-statistic	296.1611	Durbin-Watson stat		0.908901
Prob(F-statistic)	0.000000			

In evaluating the regression, attention is paid to the R-squared term, the sign on the coefficient of the independent variable, and the statistical significance of the independent variables. To start with the R-squared value, it is 0.910813. The R-squared values can range from 0 to 1. The higher value of R-squared means that the model and regression line are a good fit, and vice versa.

The coefficient of exports is positive, which is expected. The export were significant at the 5% level Thus, the sign and the significance of the coefficient on export support the hypothesis that export have a positive effect on growth. Therefore we can see in the above long-run model export positively and significantly affects economic growth in the long-run.

Having this result, the next step will be estimation of coefficient of the short-run dynamics that have important policy implications.

5.4 Result of Unit Root Tests for residual

Table 10

Null Hypothesis: ECT has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=1)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.989849	0.0473
Test critical values:	1% level	-3.670170		
	5% level	-2.963972		
	10% level	-2.621007		

From the above test result we see that the residual is stationary at 5% and 10% level. Therefore the residual is stationary and is integrated of order zero I (0).

Since both variables Log Y and Log X are integrated of order One, I(1) and the residuals, ϵ 's are integrated of order zero the two variables are said to be co-integrated. Having this result we can estimate the short run relationship.

5.5 Estimation of the Short run Relationship

Table 11

Dependent Variable: D(LGDP)				
Method: Least Squares				
Date: 06/04/14 Time: 16:42				
Sample (adjusted): 1974 2003				
Included observations: 30 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018518	0.010067	1.839390	0.0769
D(LEXP)	0.285309	0.101437	2.812668	0.0090
ECT(-1)	-0.362859	0.119477	-3.037064	0.0052
R-squared	0.348705	Mean dependent var		0.027745
Adjusted R-squared	0.300461	S.D. dependent var		0.062607
S.E. of regression	0.052364	Akaike info criterion		-2.966568
Sum squared resid	0.074033	Schwarz criterion		-2.826448

Log likelihood	47.49852	Hannan-Quinn criter.	-2.921742
F-statistic	7.227935	Durbin-Watson stat	2.442250
Prob(F-statistic)	0.003062		

We estimate a dynamic error correction model (ECM) and the variables are in first difference. The error correction term that is EC_{t-1} in the estimated equation is significant and bears a theoretically correct signs. The estimated co-efficient of EC_{t-1} indicates that approximately 36% of the disequilibrium in economic growth is corrected immediately i.e. in the next year. In the estimated error correction model, the coefficient of lagged change in GDP is positive and significant at 5 per cent significance level which shows that GDP in the previous period led to a positive change in the GDP in short run.

6. CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusions

Since 1992, the economic growth policy of Ethiopian government was guided by the idea of export-led growth. The view of export-led growth conceives growth of exports as having a favorable impact on economic growth. According to this view, export expansion to foreign markets improves resource allocation and production efficiency [Shan and Sun, 1998].

This study attempted to examine the contribution of exports to economic growth of Ethiopia using different econometric techniques. In the first part an OLS techniques was used to test the export-economic growth relationship.

Data from different sources covering the period 1973-2003 are used for the analysis. Pre-estimation tests of the statistical behavior of the variables (the ADF

tests for unit root) showed that both the variables used in the analysis are integrated of order one (I(1)). Then, the static long run equation was estimated and from the result both the variables have the expected signs.

The error-correction model was then estimated. The regression result shows that exports growth do significantly affect the growth of the economy. Specifically, a one percent change in exports brings about 0.29 percent change in economic growth. The regression results support a positive and significant relationship between exports and economic growth.

In sum, this study attempted to test whether exports contribute to economic growth or not in the Ethiopian context. An error-correction model and the methodological frameworks that have been employed so far in the literature were used to test the required relationship. The results suggest that exports

can substantially contribute to economic growth of the country and the results obtained are not sensitive to the methodology used.

6.2 Policy Implications

As we can see from the results export has a significant role for economic growth, therefore the country should strongly follow export led growth (ELG) hypothesis.

Exports provide foreign exchange earnings and also create employment opportunity, and eventually growth in output, policy should pay considerable attention to exports in order to fully exploit the benefits of the sector and promote economic growth.

In order to fully achieve a neutral incentive system that is conducive for efficient export promotion. To this regard, the following measures should be taken.

- The tax burden on exports and imports of inputs should be lowered
- cost of transportation which greatly hindered the competitiveness of the different export sectors need to be greatly reduced
- Much emphasis should be given to infrastructural facilities development such as transport, communications and water supply facilities.
- Implementation of manufacturing
- Extensive power generation

In general, a closer look and detailed investigation into each sectors is very important if export promotion and diversification schemes are to be successful.

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