Addis Ababa University
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Determinants of Ethiopian Exports

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Approval sheet

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As thesis research advisor, I hereby certify that I have read and evaluated this thesis prepared, under my guidance, by Lemlem Amare entitled 'Determinants of Ethiopian Exports'. I recommend that it be submitted as fulfilling the thesis requirement.

Haile Kebret (PhD)		18/06/2008
Major Advisor	Signature	Date

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Abstract

The objective of this study is to examine the determinants of the demand for and supply of Ethiopian exports. It is conducted using time series econometrics. The estimation technique used is the Stock Watson dynamic OLS (DOLS) approach. The variables used as determinants of demand are: the real effective exchange rate, real income of trading partners (Real GDP of Ethiopia's 4 major trading partners) and dummy variable for openness (since Ethiopia followed varying policy regimes). On the other hand, the variables used as determinants of export supply include: Gross Domestic Product, diversification, Dummy for government subsidy on Export (i.e., duty drawback and credit given to exporters) and the ratio of price of exports to domestic price (i.e. px/pd).

The estimated results indicated that real effective exchange rate and real income of trading partners have positive and significant effect; whereas openness has negative effect on the demand for Ethiopia's exports. On the supply side, diversification, *Gross Domestic Product, Export credit and Duty drawback scheme of exportable products has positive and significant effects. However, relative price (the ratio of price of exports to domestic prices) is negatively related to the supply of exports suggesting that some of the commodities are diverted to the domestic market as their prices increase. Policy measures taken have also contributed positively to the development of the export sector. This can be seen from the positive effects of duty drawback and credit given to exporters.*

I. Introduction

1. 1 Background

As one of the main sources of government revenue, export earnings play a significant role in the economic growth of a country. This is the rationale for different countries adopting 'export led development' as their growth strategies. The success story of the Asian tigers is a case in point, or at least argued to be, in this regard.

Compared with the rest of the world, African countries do not get sufficient foreign earnings from exports. Nath (2005) indicated that international trade has been growing fast recently in developing countries, but they seem to be weaker partners in the global market. This is partly because of the challenges they face in getting access to trade opportunities.

Similarly, in addition to access, developing countries in general and African countries in particular, face deterioration in their terms of trade and, therefore, a deficit in their balance of payments position. In volume terms, however, the export performance of African countries seems to have increased according to some recent figures. For example, Morrissey and Mold (2007:2-3), indicated that

"...the continent's share in world merchandise trade, measured in value terms, has declined steadily since 1980, from around 6 percent to around 2 percent in 2002. However, when analyzed in volume terms a different picture of African export performance emerges. On

average, for non oil exporters, export volumes increased by over 130%" (WTO, 2004).

The above study also indicated that unlike the conventional economic theory of a positive relationship between price and quantity supplied, there is a significant negative relationship between price and quantity in order to make up for the reduction in export earning. That is, for every 1 percent decline in prices, African exporters increase the volume of their exports by approximately 1 percent. This might be due to the fact that African exporters are price takers. They, therefore, react to the decline in the unit price of their exports by increasing the volume of their exports to make up for the price reduction and hence maintain their revenue.

At any rate, although African countries seem to have performed well when viewed in volume terms, the value of their exports seem to have been deteriorating from time to time. Consequently, the revenue obtained from exporting goods and services is inadequate and mostly falls short of the needed foreign currency for development of their economies and hence face what is referred to as "foreign exchange gap". It is, therefore, important to investigate the determinants of the export performance of these countries.

Almost all Sub-Saharan African (SSA) Countries have been liberalizing their trade policies (i.e. export taxes, quantitative restrictions, and tariff and non-tariff barriers) in recent years, partly owing to the structural adjustment policies of the 1980s. But despite the policy changes, they have not derived a significant benefit from these measures (ibid). According to the above authors, this is mainly due to the overdependence of their exports on primary commodities. They, therefore, suggest diversification of exports to mitigate the problem of dependence on few primary commodities for their foreign exchange earnings and hence economic growth.

Being one of the SSA countries, the export performance of Ethiopia is also at its lowest stage. According to the World Trade Organization (WTO, 2007) report, Ethiopia's Share in the world total exports in 2006 was 0.01%. Exports of goods and services as percentage of Ethiopia's GDP was 15.8 in 2006 (WB 2007). In addition, as a price taker and exporter of primary commodities in general it faces low and declining prices on world markets for its primary products.

Despite such general challenges, however, some improvements in export performance seem to have been registered in the last five years compared to previous years. For instance, in 1997/98 total export earning was 616 million USD and had reached 1.2 billion USD in the last fiscal year (2006/07). On average, the export sector grew by 22.4% every year during 2001/02 to 2006/07. This improvement was mainly attributed to the increase in the volume of exports and the development of new products like flower rather than an increase in the prices of commodities in the world market. For the 2007/08 budget year, it is planed to further increase the export earning to 1.7 billion USD.

A study by Kagnew (2007), indicated that exports positively affect the growth of the Ethiopian economy. The evidence regarding the relationship between export and economic growth holds despite the fact that the Ethiopian export basket is dominated by traditional primary produces. It also indicated that this finding is consistent with the export-led growth hypothesis.

As it is the case in other countries, the foreign earning generated by exporting different commodities and services is one of the major sources of foreign exchange in Ethiopia. The revenue generated will obviously be used for development activities in order to bring economic growth. Accordingly this study will examine the determinants of export earning and their contributions to economic growth, if any.

1.2 Objective of the study

In light of the above observations, therefore, the objective of the study is to assess the determinants of Ethiopia's exports.

More specifically it attempts to examine the contributions of the policy changes implemented in recent years on the performance of the export sector. It is hoped, an examination of the determinants of export earnings in general and the contributions of the recent policies in particular will guide policy makers in identifying the relevant policies to promote growth.

Further, in addition to identifying its determinants, the study also aims at evaluating the main attributes of the Ethiopian export sector in terms of its diversification, concentration and other features and their changes, if any, in recent years following the liberalization measures that have been undertaken since 1992.

1.3 Contribution of the study

A similar study (Msc thesis) was conducted in 2000 using 1965-1997 data. It was carried out using export determination model. As is evident, there have been policy changes since 1997 and promising improvements in the export earning. For instance, the removal of export tax including on coffee, the 70% loan for export oriented projects if they have their own 30% and the duty drawback incentive scheme and other schemes which aim to encourage the performance of the export sector can be mentioned as policy changes. The industrial development strategy of the country written in 2003 also shows the government's commitment to encourage diversification in particular and export performance in general.

In addition to updating the data and evaluating the impacts of the changes in policy this study improved the measurement of some of the variables. For instance, this study used the weighted average Real GDP of Ethiopia's 4 major trading partners instead of world exports as a proxy for world demand.

Moreover this study will be conducted using a different technique of estimation i.e. the Stock Watson dynamic OLS (DOLS) approach with recent data i.e., from 1970/71 to 2006/07 in analyzing the Determinants of Ethiopia's Exports. It will also incorporate the effect of those policy changes. There will also be around ten years gap compared with the previous study.

II. Performance of the Ethiopian Export Sector

2.1. Performance of the Sector

During the socialist Derg regime the main focus of the strategy of the economy was import substitution. Not enough emphasis was given to the export sector. There was no series attempt to diversify the sector. There were very few exported items namely coffee, hides and skins, pulses, oilseeds, chat, fruits and vegetables. In contrast, after the liberalization measures that have been undertaken by the EPRDF, new products like flower, textile and textile products, leather products and some other agro processing products have been significantly contributing to the growth of the export sector.

The export statistics shows that export earning is increasing from time to time. If we take the first six years of the derg regime (1973-1978) there was an export earning of 5.084 billion birr. During this period the share of coffee was on average 63.4% while the share of other exported products only constituted 36.6% (MoTI, 2007). On the other hand, if we take the recent six years of the EPRDF period (2001/02-2006/07) the total export earning reached 39.7 billion birr. That is, it has increased more than seven fold compared with the derg regime's 5.084 billion birr.

As noted above, one of the salient features of the Ethiopian export sector is its lack of diversification or concentration on few crops. Coffee has been the major export crop for a very long time. Until the end of the 1990's the contribution of coffee to the total export earning of the country was around 60%. The country had been dependent on a single exportable item for a long period of time. Although, coffee is still the dominant export item, its contribution to the total export earning has declined and reached around 36.3% on average since 2001/02 (EEPA, 2007). On the other hand, the share of non-coffee exports has been rising remarkably and reached 63.7% for the same year. In this case, though not yet dominant, the role of the flower sector development is promising. In terms of value, the flower sector has had an actual growth rate of 443.69% in the last five years.

The major manufacturing (non-agricultural) export commodities are leather and leather products, textiles and some agro processing products. Although their contribution to the export earning has been very small, their share is increasing from time to time. The share of leather and leather products (including semi processed hides and skins) has reached 89.5 million USD which was 7.6% of the total export earning in 2006/07. In addition, 12.6 million USD was obtained from exports of textile and textile product which was 1.1% of the total export earning during the same period (MoTI, 2007).

Diversification is one of the most important indicators of the performance of the export sector. In order to see the extent to which the Ethiopian export sector is diversified some way of calculating it is required. One of the several ways to measure export diversification is the share of the four or three biggest items in total exports value of goods and services (Cherkaoui and Ahmad, 2001). This method is applied in calculating diversification because it is straight forward and hence can easily be understood due to its simplicity.

As could be seen from Appendix 1, the maximum share of the first commodity (coffee) was 88% and 70% during the derg and the EPRDF regimes, respectively. However we can see that the share of the first commodity (coffee) decreased especially in the last seven years on average constituting 37%. This indicates that other exportable products are taking its share.

On the other hand there was no significant difference on the share of the second (hides and skins) and the third (pulses) commodities in both regimes. This implies that since the largest share was occupied by coffee, the declined share of coffee was taken by other new products rather than the second and the third commodities. This is also an indication of the existence of diversification. There was, however, an increase in the share of the fourth commodity (oilseeds) in the last five years. On the whole, the share of the first four commodities declined steadily from an average of 89% in the second half of the 70's to 64% on average in the last five years.

Therefore, it seems that the liberalization measures and the conducive environment created in support of the export sector are bringing positive results. This can be seen from the above evidence in terms of an increase in the export earning and the entry of new products i.e. diversification in the sector.

2.2. Recent Policy initiatives

Following the fall of the derg regime in 1991, the EPRDF came to power and took a wide-range of liberalization measures reversing the socialist oriented policies of the derg regime. These policies included different trade policies, strategies and trade liberalization measures which have had wide implications on the workings of the economy. Within the context of free market based economic policy, Agricultural Development Led Industrialization (ADLI) Strategy was developed and has been the principal economic strategy of the government. The objective of ADLI is promoting economic efficiency and growth, development of domestic technological capacities and capabilities for the promotion and development of intermediate and capital goods' industries, promotion of inter and intra-sectoral linkages, creation of a sound domestic base for the transfer, adaptation, and development of technology, promotion and greater use of labour intensive technologies and local resources, achievement of industrial competitiveness in areas of clear comparative advantages in industrial exports, and promotion of balanced regional industrial development (MoTI, 2007).

An industrial development Strategy was also adopted in 2003 to ensure sustainability and develop the sector's effective linkages with the agricultural sector. Among the fundamental features of this strategy are: private sector led industrialization; development of export oriented industries and strengthening the capacity of the existing industries to be competitive at the national, regional and international levels; utilizing, to the extent possible, labour intensive technologies with a view to creating employment, generating incomes and alleviating poverty; investment promotion and facilitation with increased emphasis on foreign investment, public-private consultative and partnership for efficiency in policy development and implementation, as well as, industrial development. The strategy emphasized export-led growth, while at the same time emphasizing the development of physical infrastructure, food security and social sector (MoTI, 2007).

The industrial development strategy specifies leather and leather products, textile and garment and food processing or in general agro-processing industries as priority sectors with the potential for employment generation, prospects for export, and strengthening the agro-industry linkage and broader base development. It also gives emphasis for the production and export of high value agricultural products like Vegetables, flowers, fruits as well as fresh and chilled meet (MoI, 2003).

In order to effectively implement the development of the export sector the following measures were taken by the government.

Export Incentives:

- Determination of the currency exchange rate based on a daily inter-bank foreign exchange system;
- Devaluation of the Birr and step-by-step liberalization of the foreign exchange market, with the final aim of making it a market determined system;
- Simplification of export licensing procedures;
- Minimizing administrative and bureaucratic procedures;

- Proclamation and frequent revision of the Investment Codes of the country i.e. encouraging export-oriented investment;
- Giving 70% loan for export related investment projects through the development bank of Ethiopia if investors cover 30% on their own;
- Establishment of different export support institutions;
- Absence of sales and excise tax for all export commodities - this includes removal of export tax, in whatever form, on products destined for export markets;
- No ex ante export price controls by the National Bank of Ethiopia, and
- Instituting export specific incentive schemes. These include:
    - Export Trade Duty Incentive scheme: Proclamation Number 249/2001; this enables exporters to have access to inputs at world market price and be able to compete on equal footing with their competitors - this frameworks comprise Duty Draw-Back Scheme, Voucher Scheme and Bonded Manufacturing Warehouse scheme.
    - Cost sharing scheme: exempt income tax to be paid to foreign experts hired by export focused organizations.
    - Export Financing Incentive Schemes include:
        - Export Credit Guarantee Scheme
        - Franco Valuta Scheme
        - Foreign Exchange Retention Scheme
    - Exporters' Award Scheme
    - All these measures are expected to promote exports by attracting potential investors to this sector. Hence with

such and similar measures, policy makers were emphasizing that the export sector will serve as an engine of growth, as is believed to have served in many newly emerging economies of Asia.

Box 2.1. Exporters concern and Suggested solutions

This year's export day was celebrated at Millennium hall November 3, 2007 (Oct 23 Saturday 2000 E.c.) in which the meeting was led by Prime Minister Meles Zenawi and organized by the Ministry of Trade and Industry. Exporters raised the following questions through their association representatives and solutions after which responses were forwarded by the Prime Minister.

Exporters concern

- Shortage of supply compared with the demand, contraband and speculation activities in the coffee sector.

- Lack of International market Information and involvement of foreigners in exporting in Pulses, Oilseeds and Spices sector.

- encouraging out growers in the

- Lack of skilled manpower, quality raw materials, and high cost of imported inputs.

- Illegal trade in the live animals and meat sector.

Suggested solutions

- farmers should get reasonable price, Value added coffee export and minimizing transaction costs.

– our embassies should give international market Information.

- government will assist exporters through training, research and in the process of exporting.

-establishing textile institute and strengthening leather institute.

- Privatization of government industries.

- government will share the cost of hiring foreign experts.

III. Literature Review

3.1 Theoretical literature

Alemayehu (2006) has clearly stated different trade theories that answer the question why trade between countries exist.

For mercantilists the desire to accumulate precious metals (gold bullion) was an important matter. Against this background the principle of the classical school, absolute and comparative advantages have emerged. The rigidity of the classical school's assumptions about the structure of costs, among others, led to the evolution of the neoclassical (or orthodox) trade theories. This theory was followed by trade theories based on technological gaps and imperfect competition models Alemayehu (2006). The apparent failure of all these theories in explaining the evolving trade patterns, especially among developed countries, led to the development of other theories that are based on imperfect competition and scale economies. Parallel to this development there was/is a critical (non-orthodox) school which provides an alternative analysis about both the patterns of trade and the gains from it. Analysts in this school primarily focused on North-South trade where the South is mainly primary commodity exporter and importer of manufactured goods (Ibid).

Ricardo stressed that trade between countries (even when there is no absolute advantage) could increase the welfare of the two countries because they can specialise in the trade in which they have a comparative (cost) advantage. For the Hechecher-Ohlin-

Samuelson (H-O-S) model the main cause of trade is the relative level of factor endowment i.e., the Hechecher-Ohlin (H-O) model predicts that the capital surplus country will specialize in the production and exports of capital-intensive goods while the labour rich country in the production and export of labour-intensive goods.

In this case the Recardian theory and the H-O-S model's recommendation for African countries like Ethiopia is specialization and export of primary commodities. However there are criticisms to the above theory as not fully explaining attendant trade patterns. Among such criticisms the Leontief Paradox and the Linder hypothesis are prime examples. The former says countries import even the product which intensively uses the factor of production that the country is endowed with; and the later says there is more trade between countries with similar demand structure (income levels) irrespective of the factors with which they are endowed with.

3.1.1. Export as an Engine of growth

Various studies have been carried out that examine the extent to which exports serve as an engine of growth based on the experience of different countries. In that respect, Appendix 9 documents the number of research studies conducted along these lines. As could be seen from the Table, the results support that export positively contributes to economic growth (UNCTAD, 2001). In this regard the export-led growth hypothesis (ELGH) indicates that export expansion is one of the main determinants of growth. It shows that the overall growth of countries can be attributed to expanding

exports. That is why the term exports can perform as an "engine of growth" is being used. In addition, the association between exports and growth is often attributed to the possible positive externalities for the domestic economy arising from participation in world markets like, the reallocation of existing resources, economies of scale and various labour training effects.
http://www.cuts-citee.org/pdf/RREPORT08-MODULE-02.pdf

Moreover the document obtained on the above website indicated that, the East Asian economies, which have registered the highest GDP growth rates, have also shown the highest export growth rates during the period 1980-2000, while Africa has experienced very low growth rates in both GDP and exports during this period. It has also been stated that trade and in particular export growth can play the following roles in supporting economic growth.

- Static efficiency gains which arise through specialization according to current comparative advantage;
- Increased capacity utilization which arises if external demand enables the employment of previously idle (or surplus) labour and land resources which previously were not utilized owing to a shortage of effective domestic demand or if trade reduces the costs of wage goods;
- Increased physical and human capital investment owing to improved returns to investment which can arise either through the identification of new opportunities associated with external demand or through the improved profitability of investment following the cheapening of the production costs.(ibid)

With regards to export and engine of growth a study conducted for Egypt supports the ELGH (Export Led Growth Hypothesis). It indicates shocks to exports lead to a significant response in GDP. It also indicated that government policy should be geared towards encouraging the export sector of the country in order to achieve the development objective of the country (Abou-Stait, 2005). A study conducted for Costa Rica also supports the ELG hypothesis in that exports have had a positive effect on the overall rate of economic growth of the country (UNCTAD, 2001).

It has also been indicated that Sub-Saharan Africa has lagged behind other developing regions in both export performance and economic growth over the past two decades. Sharer (1999) showed that from 1975 to 1997, nominal exports and real GDP in sub-Saharan Africa grew annually by 4.7 percent and 2.2 percent, respectively, compared to 15.7 percent and 7.6 percent in six East Asian countries, and 9.6 percent and 3.0 percent in Latin America. Africa's share of world trade has fallen from about 4 percent in 1980 to less than 2 percent today.

The issue of ELGH has got acceptance by different researchers as it can be seen from the above discussion. Export and economic growth are positively related. This indicates any economic development of a country could be realized with giving special emphasis to exports. Hence conducting studies in the area of export is important for designing appropriate economic policies.

3.1.2. The Asian Experience

When we look at the experience of Asian countries, their development levels of most of these countries within a period of not more than half a century was more or less similar with our country Ethiopia. Among the reasons mentioned by different scholars for this development is designing and implementing an appropriate industrial and trade policy and strategy.

The policies and strategies were the de-monopolization of trade, streamlining of import regimes, reduction of red tape, implementation of transparent customs procedures, replacement of quantitative restrictions with tariffs, avoiding extreme variations in tariff rates and excessively high rate of effective protection, allowing exporters duty-free access to imported inputs, refraining from large doses of anti-export bias and refraining from excessive taxing of exports. Moreover they have also adopted export-led industrialization strategy (Alemayehu, 2006).

The role of the export sector development in the success story of Asian countries was dominant. Hsueh et al (2001) as cited in Alemayehu in explaining the development of Korea and Taiwan stated that they have adopted an export promotion policies like: devaluation of their currencies, introduction of import tax repayments, low-interest export loans, export processing zones, and the statue for encouraging investment. In this case similar measures are being undertaken in Ethiopia to enhance the export sector which might result in bringing positive changes for the sector in particular and economic growth for the country in general.

Bond (1987) has also indicated the importance of the export sector development for developing countries as a means to get rid of their debt problems and to improve their long run growth prospects.

3.1.3. Determinants of Export Performance

Export market like any other markets is determined by the demand and the supply for those particular products to be exported. Hence in many of the export performance studies both the demand and supply variables are considered as determinants. Sinha Roy (2002) indicated that export performance is related to various demand and supply factors. He also explained it by citing Arize (1990) that in some Asian developing countries demand and supply factors are equally important in determining their export growth pattern.

UNCTAD (2005) stated that both demand and supply-side factors are important determinants of export performance in both developed and developing countries. However the relative importances of demand and supply factors vary from country to country, depending a great deal on the stage of development of the external sector. It also shows that trade barriers, building competitive supply capacity to effectively exploit export opportunities, strong linkages to international markets, physical infrastructures, soundness of the macroeconomic framework and quality of institutions appear to be other major determinants of export performance. In his study regarding the determinants of India's export, Sinha Roy (2002) indicated that export growth responds to movements in relative prices, whether on the demand or the supply.

The benefits that can be obtained from improved export performance depend on the size of domestic value added or diversification. UNCTAD (2005: 63) explained it as follows

While the East Asian NIEs in particular managed to successfully combine diversification and trade expansion with growth in manufacturing value added and GDP, many other developing countries, on the other hand, often find themselves caught in a low and declining value-added trap arising from: (a) "export illusion" caused by the high import content of exports, wherein export earnings do not reflect the true domestic value added; and (b) "fallacy of composition", which arises when too many countries rush into the same sectors or products, thereby driving down terms of trade and export earnings, and thus denying themselves the achievement of the original objective of improving domestic value added through diversification. Addressing these twin problems should be a key policy priority.

It is well known that terms of trade of primary commodity exporting countries deteriorates as the world economy progresses. Hence this declining TOT requires diversification of export commodities to reverse the effect on the countries' earning.

The report also indicated the importance of giving simultaneous attention to national policies (supply capacity) and international actions (foreign market access) for successful export performance. Treating these issues separately i.e. fighting for better access to international markets without simultaneously paying attention to supply conditions will be unproductive in terms of export performance. Moreover determinants of export capacity vary across countries. For instance improved supply capacity has been the driving force behind the export performance of successful Asian countries; however supply capacity appears to have limited the export performance in African, Middle Eastern and Latin American countries.

3.2 Empirical literature

Among others, a study carried out by King (1997) surveyed the different estimation of time series models of foreign trade flows especially those relating to the volume of trade in imperfectly substitutable goods between one country and the rest of the world. It looked into development of these models over the last fifty years. He examined more than 70 studies conducted in different years.

According to the author, different studies had different objectives i.e., some have focused on homogeneous or nearly homogeneous goods in which there is single world price. In such cases the key determinant of a particular country's exports (imports) is the degree of excess domestic supply (demand) that they experience at this price. However according to the author the majority of the empirical studies were undertaken in the context of imperfectly substitutable goods hence there is less chance of a common price and the quantity sold by a particular country may depend on price differential between domestic and foreign sources of supply.

The author classified the imperfect- substitute models in to two:

1. The world trade models which tries to summarize total world trade in a single, multiple-equation model, where each individual equation seeks to estimate the value of a particular country's exports (imports)to (from) all other nations.

2. This class of export models for imperfect substitutes examined the determinants of the volume of exports between a single country and either another country or the rest of the world. It is also this model type that forms the focus of the present paper. In this case the following broad model types are identified:

3.2.1. Export Demand Models

Export demand model is the simplest export model type and its use in empirical studies goes back to the late1930's. The model implicitly or explicitly assumed that a country's supply of exports passively responds to changes in the level of foreign demand or the price elasticity of supply of exports tends to infinity.

The model is specified as

$X_t = f(R_t, YF_t)$

Where X_t is real exports in period t, R_t is a measure of competitiveness (usually the ratio of export prices, PX_t, to those of foreign competitors, PF_t, both expressed in common currency), and YF_t is a measure of foreign economic activity (usually real income).

However the model's treatment of the supply side factors is inadequate. As a result the simple export demand model estimated using OLS produces estimated coefficients that are both biased and inconsistent. Hence the popularity of the export demand model has declined over time. To overcome these sources of bias different approaches have been developed that explicitly incorporate a supply-side into the model.

3.2.2. Export determination models (export functions)

These are a combination of an export demand and an export supply models, brought together in a single , reduced form type equation which would then be estimated using OLS. Studies using this approach have thus tended to concentrate on resolving the omitted variable short coming of the basic export demand model. (ibid)

These functions have the following form Roy (1991) as cited in Berhane (2000):

$$EXP = f(EFF, WE, EXR, DDP, CGDP, EXDMPC)$$

Where, *EXP* is export from a country

WE is world demand

EXR is exchange rate

DDP is domestic demand pressure (Ratio of production index to trend value)

CGDP is Cumulative output

EXDMPC is ratio of the index of domestic price to the index of export price for domestically produced goods

EFF is efficiency index

However this model is criticized by King (1997) as the structure of the export determination model and indicated that the inclusion of supply side variables does not mean that the underlying assumption that supply passively follows changes in demand has been relaxed. An improvement in competitiveness or foreign economic activity is still expected to lead to a rise in the observed volume exported, regardless of whether there is an accommodating change in the supply side of the model or not . Export supply is still implicitly assumed passive.

It is further criticized that export demand is also assumed to be passive under this approach. Moreover the basic problem here is the ad hoc nature of the model with all of the supply side variables allowed to operate independently of those on the demand side, and vice versa. Consequently, it fails to capture the interaction that would normally exist between demand and supply which determines actual exports. This issue is, however, addressed by those studies taking a simultaneous-equations approach. (ibid)

Moreover Sinha Roy (2002) has criticized such models as single equation estimates that are not only based on stringent assumptions, but they are subject to simultaneity bias. Above all such partial explanations to export performance either in terms of demand or supply factors are found to hold good only for specific short periods.

3.2.3. Simultaneous-Equation Models

Unlike the export determination approach, studies employing a simultaneous-equation model have emphasized the avoidance of simultaneity bias, which may arise as a result of interdependence between current export volumes and prices, as the reason for rejecting the simple export demand model (King, 1997). He also indicated that the distinguishing characteristic of this type of study has been the use of a range of simultaneous equation techniques, instead of OLS, for estimation purposes. Some studies, for instance, have simply taken the basic export demand model and estimated it using two-stage least squares (2SLS). However the majority have constructed a structural model comprising separate export demand and supply equations which usually take the following form

$$xd_t = \alpha_0 + \alpha_1 (px_t - pf_t) + \alpha_2 yf_t$$

$$xs_t = \beta_0 + \beta_1 (px_t - pd_t) + \beta_2 ddp_t + \beta_3 k_t$$

Where $\alpha_1, \beta_2 < 0$ and $\alpha_2, \beta_1, \beta_3 > 0$; xd_t and xs_t are the natural logs of export demand and supply, respectively; k_t is the natural log of the level of productive capacity (usually equal to trend out put); and px_t, pf_t, yf_t, pd_t and ddp_t are the natural logs of PX_t (export price), PF_t (price of foreign competitors), YF_t (measure of foreign economic activity usually real income), PD_t (domestic price) and DDP_t (domestic demand pressure) respectively.

It should be noted DDP has not been included in all models. Some studies did not include it in their supply equation and some studies used real GDP or GNP in their supply equation, which can be interpreted as representing the product of capacity and demand pressure in an aggregate economy wide sense (ibid).

Studies by Goldstein and Khan (1978) and Bond (1987) which applied the approach to Industrial countries and developing countries, respectively, are probably the most widely cited in this regard. Both studies have used simultaneous-equation models and followed the notion that quantity exported adjusts to conditions of excess demand and the export price adjusts to conditions of excess supply. Mathematically

$$x_t - x_{t-1} = \gamma(xd_t - x_{t-1}), \qquad \gamma > 0$$

$$px_t - px_{t-1} = \lambda(x_t - xs_t), \qquad \lambda > 0$$

Goldstein and Khan (1978) have introduced two models of export demand and supply. These models were estimated simultaneously so as to eliminate any bias arising from the two way relationship between export quantities and export prices. The first model is Equilibrium model which makes the simplifying assumption that there are no lags in the system so that the adjustment of export quantities and prices to their respective equilibrium values is instantaneous. Where as the second model which is called disequilibrium model relaxes the above assumption and considers the possibility that adjustment of actual to equilibrium values may take place with some delay. Therefore in the disequilibrium model excess demand and supply are allowed to emerge and to affect the prices and quantities of exports. They have illustrated the models as follows:

3.2.3.1. Equilibrium model

The world demand for an individual country's exports is specified in log-linear form as follows:

$$\log X_t^d = \alpha_0 + \alpha_1 \log(PX/PXW)_t + \alpha_2 \log YW_t \quad \text{------------} (1)$$

where,

X_t^d = quantity of exports demanded

PX= price of exports

PXW = weighted average of the export prices of the country's trading partners

YW = weighted average of the real incomes of the country's trading partners.

Since equation (1) is specified in logarithms α_1 and α_2 are the (relative) price and real income elasticities of export demand, respectively. It is expected that $\alpha 1$ will be negative and α_2 positive.

The supply of exports is specified as a log linear function of the relative price of exports (i.e. the ratio of export prices to domestic prices) and of an index of the productive capacity of the country.

$$\text{Log } X_t^s = \beta_0 + \beta_1 \log(PX/P)_t + \beta_2 Y_t^* \text{ --(2)}$$

where

X^s = quantity of exports supplied

PX = price of exports

P = domestic price index

Y^* = logarithm of an index of domestic capacity

Equation (2) embodies the hypothesis that as the price of exports rises relative to domestic prices, production for export becomes more profitable and, hence exporters will supply more. In addition exports are posited to rise, *ceteris paribus*, when there is an increase in the country's capacity to produce. Therefore β_1 and β_2 are expected to be positive.

The equation can be normalized for the price of exports, PX_t as

$$\log PX_t = b_0 + b_1 \log X_t^s + b_2 Y_t^* + b_3 \log P_t \text{ ------------------------------- (3)}$$

where: $b_0 = -\beta_0/\beta_1$; $b_1 = 1/\beta_1$; $b_2 = -\beta 2/\beta_1$; $b_3 = \beta_1/\beta_1$

Equations (1) and (3) constitute the equilibrium model, and estimates of the structural parameters can be obtained by estimating these two equations simultaneously (assuming $X_t^d = X_t^s = X_t$ and the addition of stochastic error terms).

To obtain the effect of solely exogenous variables on the quantity and price of exports, the two equations can be solved to obtain the reduced forms:

$\text{Log Xt} = \alpha_0/D + (\alpha_1 b_0)/D - \alpha_1/D \log PXW_t + \alpha_2/D \log YW_t + (\alpha_1 b_2/D)\ Y_t^*$
$+ \alpha_1 b_3/D \log P_t$ ---(4)

$\text{Log } PX_t = b_0/D + \alpha_1 b_0/D - \alpha_1 b_1/D \log PXW_t + \alpha_2 b_1 / D \log YW_t + b_2/D\ Y_t^*$
$+ b_3/D \log P_t$ --(5)

Where $D = 1 - \alpha_1 b_1$ and is positive.

3.2.3.2 Disequilibrium Model

To introduce the possibility of disequilibrium behavior into the export model, Goldstein and Khan (1978) have utilized the adjustment mechanism outlined by Houthakker and Taylor (1970). In this model, export supply is assumed to adjust to the difference between demand for exports in period t and the actual flow in the previous period:

$\Delta \log x_t = \gamma (\log x_t^d - \log x_{t-1})$ ------------------------------------ (6)

Where γ is the coefficient of adjustment (assumed positive) and Δ is a first difference operator, $\Delta \log xt = \log xt - \log xt\text{-}1$.

The adjustment function (6) assumes that the quantity of exports adjusts to conditions of excess demand in the rest of the world, and therefore, the price of exports is determined in the exporting country.

By substituting equation (1) into (6) they obtained an estimating equation for exports:

$\log x_t = c_0 + c_1 \log (PX/PXW)_t + c_2 \log YW_t + c_3 \log x_{t-1}$ ---------------------------- (7)

Where $c_0 = \gamma \alpha_0$, $c_1 = \gamma \alpha_1$, $c_2 = \gamma \alpha_2$, and $c_3 = 1 - \gamma$

Based on the expected signs of the parameters α_1, α_2, and γ they expect that $c_1 < 0$; $c_2 > 0$; $c_3 > 0$.

The mean time lag in the adjustment of exports is equal to γ^{-1} and can be calculated from the parameters of equation (7) as $(1 - c_3)^{-1}$.

Since the quantity of exports is specified as adjusting to excess demand, the price of exports adjusts to conditions of excess supply:

$$\Delta \log px_t = \lambda (\log x_t - \log x_t^s),\ \lambda > 0 \text{ ------------------------------------ } (8)$$

Where: λ is the coefficient of adjustment. In this framework an increase in excess supply will lower the price of exports, and conversely the opposite holds for a decrease.

Substituting equation (2) into (8) and solving for $\log px_t$: they obtain

$$\log px_t = d_0 + d_1 \log x_t + d_2 \log P_t + d_3 Y_t^* + d_4 \log px_{t-1} \text{ ------------------------ } (9)$$

Where: $d_0 = -\dfrac{\lambda \beta_0}{1+\lambda\beta_1}$, $d_1 = \dfrac{\lambda}{1+\lambda\beta_1}$, $d_2 = \dfrac{\lambda\beta_1}{1+\lambda\beta_1}$, $d_3 = \dfrac{-\lambda\beta_2}{1+\lambda\beta_1}$, $d_4 = \dfrac{1}{1+\lambda\beta_1}$

Since $\beta_1 > 0$, $\beta_2 > 0$, and $\lambda > 0$, and it is expected that $d_1 > 0$; $d_2 > 0$; $d_3 < 0$; $d_4 > 0$.

The reduced form equations obtained from equations (7) and (9) are:

$$\log x_t = \frac{c_0 + c_1 d_0}{D'} - \frac{c_1}{D'} \log PXW_t + \frac{c_2}{D'} \log YW_t + \frac{c_1 d_3}{D'} Y_t^* + \frac{c_1 d_2}{D'} \log P_t + \frac{c_1 d_4}{D'} \log px_{t-1} + \frac{c_3}{D'} \log x_{t-1}$$

$$\log PXt = d_0 + \frac{d_1 c_0}{D'} - \frac{c_1 d_1 \log PXW_t}{D'} + \frac{c_2 d_1 \log YW_t}{D'} + d_3 \frac{Y_t^*}{D'} + d_2 \frac{\log P_t}{D'} + \frac{d_4}{D'} \log px_{t-1} + \frac{c_3 d_1}{D'} \log x_{t-1}$$

Where $D' = 1 - c1d1$.

These equilibrium and disequilibrium models were estimated for eight developed countries using Full information Maximum Likelihood (FIML) estimator. They found price elasticities, which are greater than one for 6 out of 8 countries in the disequilibria model indicating that fairly large response of exports to change in relative price.

However Browne (1982) as cited in king (1997) says the supply price approach may not be appropriate for modeling the exports of small open economies (SOE), whose exporters are normally regarded as being price takers. Hence export price fluctuations are determined by the demand side of the market and the volume exported adjusted towards the exporters' desired levels. Thus this kind of model was specified as

$$px_t - px_{t-1} = \lambda' (xd_t - x_t), \ \lambda' > 0$$

$$x_t - x_{t-1} = \gamma' (xs_t - x_{t-1}), \ \gamma' > 0$$

In log form:

$$\Delta \log x_t = \gamma(\log x_t^s - \log x_{t-1}) \quad \gamma > 0$$

$$\Delta \log px_t = \lambda(\log x_t^d - \log x_t), \ \lambda > 0$$

Regarding the determinants of Ethiopia's exports some empirical studies have been conducted as cited in Berhane (2000). Most of them used unit price of export, REER, ratio of export tax to total tax, Real GDP and level of private consumption to examine the export supply performance (WB, 1987); and ratio of export tax to total tax and level of private consumption were only statistically significant variables While export price and exchange rate variables were not statistically significant. Another study on Ethiopian export performance by Getachew (1991) estimated the elasticity of export supply variables and incorporated the demand variables also. The result was price elasticity, domestic demand pressure, and relative consumption were found to be statistically significant.

The most recent study on the determinants of export performance conducted by Berhane (2000) estimated using export determination model. The variables used in this model are world export as a proxy for world demand, exchange rate, domestic demand pressure, GDP, Export tax and relative price (the ratio of domestic price to index of export price of domestic goods). The estimation technique used was OLS. Accordingly, world demand, exchange rate, domestic demand pressure and GDP were significantly positive.

However the present study used different variables and an estimation technique. The estimation technique used in this study is Dynamic OLS which has advantages over OLS by coping with small sample and dynamic sources of bias. As indicated by Masih and Masih (1998) this estimation technique is the latest advances in dynamic time-series modeling within a temporal framework that allows for the co-existence of both short and long run forces that drive the often ignored deviating and cyclical influences so inherently pervasive in such aggregate variables over such a long time horizon. Further, variables like diversification, trading partner's income (GDP), and dummy for export subsidy (i.e. credit and duty draw back) are variables which are used in this study but not used in the previous study.

IV. Methodology, Data and Estimation Results

4.1 Model specification

As is the case that Ethiopia's exporters are price takers in the international market, the model developed by Goldstein and Khan (1978) seems to be of interest in our case. This study will, therefore, follow the same approach as that of Browne's (1982) model for a small open economy in which export volume adjusts towards the exporters' desired levels and export prices vary in line with demand. Accordingly,

$$\Delta \log x_t = \gamma(\log x_t^s - \log x_{t-1}) \quad \gamma > 0 \text{ -------------------------------- } (1)$$

$$\Delta \log px_t = \lambda(\log x_t^d - \log x_t), \ \lambda > 0 \text{ -------------------------------- } (2)$$

i. Export Demand Equation

$$X_t^d = \alpha_0 * [REER_t]^{\alpha 1} * [YW_t]^{\alpha 2} * \exp(\varepsilon_{1t})$$

This can be reformulated in log form as follows. In addition openness is also included as dummy variable in the demand equation.

$$\log X_t^d = \alpha_0 + \alpha_1 \log REER_t + \alpha_2 \log YW_t + \text{Dopenness} + \varepsilon_t \text{ ---------- } (3)$$

Where, X_t^d = *quantity of exports demanded*

REER = real effective exchange rate

YW = real income of trading partners (Real GDP of Ethiopia's 4 major trading partners)

Dopenness = dummy variable for openness and

ε_t = is the disturbance term.

α*'s* are coefficients that represent elasticities.

ii. Export Supply Equation

$$\log Xs_t = \beta_0 + \beta_1 \log Y + \beta_2 \log ddp_t + \beta_3 \log Divers + \beta_4 Sub + \beta_5 \log PR + \varepsilon_t \qquad (4)$$

Where, Xs_t = export supply

Y= Ethiopia's Gross Domestic Product

DDP= Domestic Demand Pressure

Diver=diversification

DSub=Dummy for government subsidy on Export (i.e., duty drawback and credit given to exporters)

PR= p^x/p^d i.e., ratio of price of exports to domestic price

ε_t = is the disturbance term.

β*'s* are coefficients that represent elasticities.

4.2. Data

Export Supply and Demand: the export demand and supply data of the country.

Diversification: It is one of the determinants of export performance. As the analysis by Morrissey and Mold (2007) showed for SSA the diversification index has a significant positive impact on export values. It is also indicated that constant efforts to support diversification are particularly relevant for commodity exporters when a secular downward trend is observed in volatile commodities prices (Fugazza, 2004).

Real Effective exchange Rate: It reflects the underlying relative movement of prices at home and abroad, proves to have a significant effect on the export performance of the lowest performers. It is expected to have negative relationship. According to UNCTAD (2005) study, results for all periods indicate that an overvalued real exchange rate adversely affects export performance, while on average a 1 per cent real depreciation could increase exports by 6 to10 per cent. Sinha Roy (2002) also indicated that depreciating currency for promotion of exports is the major thrust of exchange rate reforms in India. High export growth for India is in place when real exchange rate has depreciated at a faster speed neutralizing the effects of currency overvaluation.

Trading partner's income (GDP): as a representative of relevant foreign demand, weighted average Real GDP of Ethiopia's 4 major trading partners will be used. It is expected to have positive effect on export performance.

Gross Domestic Product (Y): An increase in the gross domestic product of a country is an indicator of the strength of its economy. This will have further positive effect on the performance of the export sector of that economy. Hence GDP is expected to have positive effect on the export performance of Ethiopia.

Domestic Demand Pressure (DDP): different studies like Berhane(2000) approximate this variable by domestic nominal credit. Since exportable products in Ethiopia are also highly demanded domestically an increase in domestic demand will have negative effect on export earning.

Price Ratio (PR) = px/pd i.e., ratio of price of exports to domestic price index (approximated by consumer price index). Roy(1991) as cited in Berhane(2000) when perfect competition prevails in the industry and the export demand curve is infinitely elastic an increase in export prices will lead to an increase in export sales with sales in domestic market remaining unchanged.

According to Sinha Roy (2002) in the Indian context, the development strategy in general and the industrial and trade policy regime in particular are one of the most important Factors in determining exports. To see the effect of policy changes in the Ethiopian context, variables like export credit and duty drawback incentives are incorporated as dummy explanatory variables. It is expected that the effectiveness of these policies will be captured by the incorporated dummy variables.

Export credit: Dummy for credit given to exporters

Duty Drawback: Dummy for duty drawback

These data are drawn from various sources to construct a time series data over the period 1970/71- 2006/07. The main sources of the data are the National Bank of Ethiopia, Ethiopian Customs Authority, Development Bank of Ethiopia, Ethiopian Export promotion Department under the Ministry of Trade and Industry and from the website http://www.ers.usda.gov/Data/Macroeconomics/

4.3. Estimation Technique

To carry out the study the Stock Watson dynamic OLS (DOLS) approach is used. This method has certain advantages over both the OLS and the maximum likelihood procedures in that it improves on OLS by coping with small sample and dynamic sources of bias. The Johansen method, being a full information technique, is exposed to the problem that parameter estimates in one equation are affected by any misspecification in other equations. The Stock Watson method is, by contrast, a robust single equation approach which corrects for regressor endogeneity by the inclusion of leads and lags of first differences of the regressors, and for serially correlated errors by a GLS procedure Al-Azzam and Hawdon (1999).

4.4. Estimation Results and Analyses

Recent econometrics analyses that involve time series data suggest that the variables in the model have to be tested for their stationarity before any meaningful inference is drawn from the results. The reason is that time series data more often than not entails the problem of non stationarity. And regression results generated from non-stationary time series data are spurious. According to Granger and New Bold as cited in Berhane (2000) any regression for which R^2 >DW is to be spurious and indicates a sign of lack of any equilibrium relationship among the variables in the regression. Hence testing for the stationarity of the variables through the unit root test is important before any estimation is made.

- **Unit root test (test for stationarity)**

The Augmented Dickey Fuller (ADF) test for unit root is one of the most commonly used methods of testing for unit root. Accordingly ADF test for stationarity is used in this study. As the test results can be seen in Appendix 1, the dependent variable Lxt is stationary both in levels and First difference. On the other hand all the independent variables are non-stationary at levels except Ldiver is stationary at levels with constant only. However all the independent variables are stationary at first difference with constant only and with constant and trend except Ly which is stationary with constant only at 1% but non stationary at 1% with constant and trend and stationary at 5% and 10%.

- **Co integration test for the Demand and Supply Equations**

This test is to test whether the linear combination of the variables is stationary. It implies test of equilibrium relationship between the variables in the model. If there is co integration, it means that even if the variables are non-stationary there is a long run relationship between variables as reflected in their linear combination. The two methods used to test for co-integration are:

i. Engle Granger method

The co-integration tests results using the Engle Granger method is presented in Appendix 3 and Appendix 4. As reported in the Appendix, the unit root test for the residuals of the demand and supply equations indicated that in both cases the residuals of both equations are stationary at 1%. This indicates that there is a long run relationship between the variables in the demand and supply equations.

ii. Johansen Method

The main shortcoming of the Engle Granger method is that while it is adequate when the order of integration only one it fails when there more than orders of integration. To address such possibilities the Johansen cointegration test is called for. In this study both test show there is only one cointegrating vector in both demand and supply equations. The results are depicted in Appendix 5 and Appendix 6, respectively.

After testing the variables for stationarity using unit roots and carrying out Co-integration of the variables, both the demand and supply equations are estimated using the above stated estimation techniques. The relevant results are reported below. To just note from the outset, both the demand and supply equations have satisfactory estimation attributes as indicated by the various diagnostic indicators (ranging from the R square to the Durbin Watson measures).

For the demand equation

The regression equation results for the demand of Ethiopia's exports are reported in the following Table.

Table 4.1: Estimation result of the demand for Ethiopia's exports.

Dependent Variable: LXT
Method: Least Squares
Date: 03/30/08 Time: 12:08
Sample(adjusted): 1972 2005
Included observations: 34 after adjusting endpoints
Convergence achieved after 56 iterations
Backcast: 1971

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LYW	0.985565	0.057271	17.20878	0.0000
D(LYW(-1))	20.93154	10.15835	2.060525	0.0495
D(LYW(1))	25.98608	10.90134	2.383750	0.0247
LREER	-3.901374	0.652340	-5.980582	0.0000
D(LREER)	1.088278	1.331894	0.817090	0.4213
D(LREER(1))	-3.289788	1.674495	-1.964645	0.0602
OPENNESS	-1.443938	0.479487	-3.011423	0.0057
MA(1)	-0.958567	0.071660	-13.37657	0.0000

R-squared	0.551216	Mean dependent var	19.78563
Adjusted R-squared	0.430389	S.D. dependent var	1.211502
S.E. of regression	0.914352	Akaike info criterion	2.861121
Sum squared resid	21.73701	Schwarz criterion	3.220265
Log likelihood	-40.63906	F-statistic	4.562041
Durbin-Watson stat	2.019787	Prob(F-statistic)	0.001962
Inverted MA Roots	.96		

The estimation result of the demand equation shows that real income of trading partners (weighted average Real GDP of Ethiopia's 4 major trading partners (LYW)) and real effective exchange rate (LREER) are significant. The weighted average Real GDP of Ethiopia's 4 major trading partners is found to be an important determinant of demand for exports from Ethiopia. Although exports from Ethiopia constitute very small fraction of the world export, the economic activities of Ethiopia's 4 major trading partner countries found to influence Ethiopia's exports. In this case an increase or decrease in the income (real GDP) of Ethiopia's buyer (importing) countries will increase or decrease the demand for Ethiopia's Exports.

Real effective exchange rate has negative and significant effect on the demand for Ethiopia's exports. This supports the theoretical and empirical literature that depreciation of the real effective exchange rate increases exports while an overvalued real exchange rate adversely affects export performance.

According to the estimation result of the equation openness has negative relationship with export demand. This seems to suggest that the study by Morrissey and Mold (2007) may hold for Ethiopia as well. According to their observation, almost all Sub-Saharan African (SSA) Countries have been liberalizing their trade policies (i.e. export taxes, quantitative restrictions, and tariff and no-tariff barriers) most of them in the 1980's. But despite the policy changes, they have not derived a significant benefit from these measures. They have also noted that this is mainly due to the overdependence of their exports on primary commodities. The result indicates that the same is happening in the Ethiopian case.

For the supply equation

Table 4.2: Estimation result of Supply for Ethiopia's exports.

Dependent Variable: LXT
Method: Least Squares
Date: 03/30/08 Time: 15:41
Sample(adjusted): 1973 2005
Included observations: 33 after adjusting endpoints
Convergence achieved after 30 iterations
Backcast: 1972

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDIVER	3.543823	0.894578	3.961444	0.0006
LY	0.898000	0.013559	66.22844	0.0000
LRP	-1.795082	0.822312	-2.182969	0.0395
SUB	1.109441	0.451792	2.455648	0.0220
D(LDIVER)	-4.189479	0.721610	-5.805739	0.0000
D(LDIVER(-1))	0.285798	0.522779	0.546691	0.5899
D(LRP(-1))	-0.355806	0.893570	-0.398185	0.6942
D(LY(1))	0.940052	0.797826	1.178267	0.2507
AR(1)	0.802461	0.074811	10.72658	0.0000
MA(1)	-0.989948	0.042803	-23.12779	0.0000

R-squared	0.780316	Mean dependent var	19.77175
Adjusted R-squared	0.694352	S.D. dependent var	1.227538
S.E. of regression	0.678650	Akaike info criterion	2.307624
Sum squared resid	10.59301	Schwarz criterion	2.761111
Log likelihood	-28.07580	F-statistic	9.077296
Durbin-Watson stat	1.700419	Prob(F-statistic)	0.000010

Inverted AR Roots	.80
Inverted MA Roots	.99

As can be seen from Table 4.2, the estimation result of the supply equation shows that gross domestic product (LY), diversification (LDIVER), government subsidies (export credit and duty drawback - SUB) and relative price (LPR) are significant. However domestic demand pressure was found insignificant and hence removed from the equation.

Diversification has positive and significant effect on export supply. This supports the analysis by Morrissey and Mold (2007) as stated above that the SSA diversification index has a significant positive impact on export values. In this case it is also important to consider and emphasize their suggestion that diversification of exports to mitigate the problem of dependence on few primary commodities, for foreign exchange earnings and hence economic growth, is an important. Hence this indicates that the government should further encourage diversification through devising enabling policies and making special follow up to their implementations.

As indicated in the literature part of this research, an increase in the gross domestic product of a country has a positive effect on the performance of the export sector of that economy. Hence GDP was expected to have positive effect on the export performance of Ethiopia. Accordingly the estimation result confirmed the expectation that GDP has positive and significant effect on export supply in Ethiopia.

Export credit and Duty drawback taken as dummy variables in the export supply equation have positive and significant effect. This indicates that the government's policy in this regard has met its intended objectives.

On the other hand, relative price (px/pd i.e., ratio of price of exports to domestic price index) has a negative relationship with export supply. An increase in domestic price of exported products relative to international export prices has a deteriorating effect on export growth.

V. Conclusions and Policy Recommendation

5.1 Summary of the Results

This study examined the demand for and supply of exports using econometric analysis. Hence it identified the determinants of Ethiopia's exports. Weighted average real GDP of our major buyers, real effective exchange rate and openness as a dummy variable are used as determinants of the demand for our export. On the other hand, variables like real GDP, diversification, relative price, duty drawback and credit given to exporters are used as determinants of export supply. On the whole, the estimates are acceptable both in terms of theoretical consistency and empirical significance.

More specifically based on the estimation results the following important concluding remarks could be made.

First, although exports from Ethiopia constitute a very small fraction of the world export, the economic activities of Ethiopia's 4 major trading partner countries found to be significant determinants of demand for Ethiopia's exports. That is, an increase or decrease in the income (real GDP) of Ethiopia's buyer (importing) countries will increase or decrease the demand for Ethiopia's Exports.

Second, a decrease in real effective exchange rate (depreciation of the real effective exchange rate) increases demand for Ethiopia's exports. That is a decline in dollar to birr ratio increases Ethiopian exports because it becomes cheaper in dollar terms for importing countries.

Third, openness does not seem to have increased the demand for Ethiopian exports. This can be attributed to the overdependence of our exports on primary commodities.

Fourth, diversification of exportable products has positive and significant effect on Ethiopia's export supply.

Fifth, an increase in Gross Domestic Product, Export credit and Duty drawback scheme also increases export supply.

And finally, as would be expected, an increase in the domestic price of exportable products relative to international export prices has a negative effect on export supply in Ethiopia as potential exports are diverted to the domestic market.

5.2 Policy Implications of the study

The policy implications of the study could be summarized as follows:

i. Diversification of products and markets

Although there is a promising beginning in terms of attempts to diversify Ethiopia's exportable products, the government should further encourage diversification through devising enabling policies and making special follow up to their implementations. Not only diversification of products but also increasing the number of potential international market destinations instead of concentrating on few buyers. An effort should be made to increase the export earning potential of the country.

ii. Capacity building for exporters

Among other factors, the supply side can be strengthened by building the capacity of exporters through need assessment programs. This helps to identify in what area they need to be assisted and solve their problems. This will also help to increase their supply capacity in particular and increase the export supply of the country in general. In addition, since we can do little or nothing on the demand side except may be more advertisement for the products we have, it is mandatory to strengthen our supply side which is at our hand.

iii. Devising and implementing conducive export related policies

Policy measures taken by the government to promote the development of the export sector have brought positive impact on exports. In this case policy variables like duty draw back and export credit taken in the regression equation and the results obtained can prove that positive impact of these variables in export earning. Hence the government should strengthen the policy measures that are being taken and should also take other similar measures in order to ensure the development of the export sector in particular and the development of the country in general.

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APPENDIX

Appendix 1: Share of the First Four Commodities in Total Exports of Goods (diversification) in Birr 1974/75-2006/07

Year	coffee (1)	hides and skins (2)	3(pulses)	4(Oilseeds)	(1-4) Commodities
1975/76(68)	0.56	0.08	0.10	0.07	0.80
1976/77(69)	0.60	0.08	0.07	0.04	0.78
1977/78(70)	0.79	0.09	0.05	0.02	0.95
1978/79(71)	0.88	0.08	0.01	0.01	0.98
1979/80(72)	0.74	0.16	0.03	0.02	0.94
1980/81(73)	0.66	0.08	0.03	0.02	0.79
1981/82(74)	0.59	0.15	0.03	0.03	0.80
1982/83(75)	0.20	0.03	0.01	0.01	0.24 *
1983/84(76)	0.68	0.11	0.02	0.03	0.85
1984/85(77)	0.70	0.11	0.02	0.02	0.85
1985/86(78)	0.74	0.11	0.01	0.01	0.87
1986/87(1979)	0.66	0.14	0.01	0.01	0.82
1987/88(1980)	0.57	0.17	0.02	0.03	0.79
1988/89(1981)	0.69	0.14	0.02	0.01	0.86
1989/90(1982)	0.54	0.18	0.05	0.01	0.78
Average 1975/76-89/90	0.64	0.11	0.03	0.02	0.81
1990/91(1983)	0.49	0.17	0.03	0.01	0.70
1991/92(1984)	0.60	0.21	0.00	0.00	0.82
1992/93(1985)	0.67	0.17	0.01	0.00	0.84
1993/94(1986)	0.58	0.16	0.02	0.04	0.80
994/95(1987)	0.66	0.14	0.04	0.02	0.85
1995/96(1988)	0.68	0.12	0.03	0.02	0.85
1996/97(1989)	0.66	0.11	0.03	0.02	0.82
1997/98(1990)	0.70	0.08	0.02	0.08	0.88
1998/99(1991)	0.60	0.07	0.03	0.08	0.78
1999/00(1992)	0.54	0.07	0.02	0.06	0.70

* Exports of Fruits and vegetables took the largest share which is a one time event.

2000/01(1993)	0.39	0.16	0.02	0.07	0.64
2001/02(1994)	0.36	0.12	0.07	0.07	0.63
2002/03(1995)	0.34	0.11	0.04	0.10	0.59
2003/04(1996)	0.37	0.07	0.04	0.14	0.62
2004/05(1997)	0.40	0.08	0.04	0.15	0.67
2005/06(1998)	0.35	0.07	0.04	0.21	0.68
2006/07(1999)	0.36	0.08	0.06	0.16	0.65
Average 2000/01-01/02	0.37	0.10	0.04	0.13	0.64

Source: Computed from NBE export Statistics

Appendix 2: The ADF test statistic for unit root for export demand and export supply equation

Varisbles	levels		First difference	
	with constant only	with constant and trend	with constant only	with constant and trend
LXT	-4.5387	-4.461618	-7.183338*	-7.099658*
LYW	-2.46105	-1.51734	-3.996539*	-4.870726*
LREER	-2.07243	-2.645594	-4.727849*	-4.657548*
LDIVER	-3.744404***	-3.750794	-5.851495*	-5.747727*
LY	-1.358335	-2.31524	-4.280402*	-4.135163**
LRP	-0.855548	-4.40892	-5.274706*	-5.21052*
SUB	-0.40996	-1.50448	-4.123106*	-4.309257*

- * indicates variables are significant at 1%, 5% and 10% Critical Value at First difference with constant and constant and trend.
- ** with yellow color indicates except at1%

*** With yellow color indicates significant at 1%, 5% and 10% at levels with constant only.

Appendix 3: ADF Test Statistic for the residual of the demand equation

ADF Test Statistic for the residual of the demand equation	-5.113641	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

Appendix 4: ADF Test Statistic for the residual of the supply equation

ADF Test Statistic for the residual of the supply equation	-4.369818	1% Critical Value*	-3.6576
		5% Critical Value	-2.9591
		10% Critical Value	-2.6181

Appendix 5: The Johansen cointegration test for demand equation.

Series: LXT LYW LREER

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.489598	37.01250	29.68	35.65	None **
0.192715	13.47303	15.41	20.04	At most 1
0.157065	5.980277	3.76	6.65	At most 2 *

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Appendix 6: The Johansen cointegration test for supply equation.

Series: LXT LDIVER LY LRP SUB
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.644620	70.96614	68.52	76.07	None *
0.344848	34.75633	47.21	54.46	At most 1
0.328448	19.95525	29.68	35.65	At most 2
0.140443	6.019493	15.41	20.04	At most 3
0.020436	0.722666	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Study	Sample[a]	Period of study	Methodology					Conclusions
			Data set	Economic growth	Exports	Econometric technique	Other variables	
		middle-income LDCs				production function		of development.
Balassa (1985)	43	1973–1979 Semi industrialized countries	Cross-section	Real GNP growth	Real export growth	OLS, production function	Savings, labour GDP per capita, share of exports (manufactured products)	Supports the hypothesis and suggests that outward trade orientation is beneficial.
Jung & Marshall (1985)	37	1950–1981 LDCs	Time series	Real GNP or GDP	Lagged real export growth	OLS, Granger causality test	Lagged GNP and GDP growth	Only in 4 cases out of 37 was there evidence that supported the export-led hypothesis (Indonesia, Egypt, Costa Rica and Ecuador).
Ram (1985)	73	1960–1970 1970–1977 Low- and middle-income LDCs	Time series two-sub periods	Real GDP growth	Real export growth	OLS, White test for specification bias and heteroskedasticity	Labour force growth and Investment growth	Supports the export growth hypothesis and suggests the existence of an threshold effect.
Chow (1987)	8	1960–1980 NICs	Time series	Manufacturing output growth	Export growth of manufactured goods	Sim's causality Test (1972), bivariate model	None	Support for reciprocal causality hypothesis regarding export growth and industrial development.
Darrat (1987)	4	1955–1982 Four-little dragons	Time series	Real GDP growth	Lagged real export growth	OLS, White test, bivariate model	None	Rejects the export growth hypothesis in 3 out of 4 cases. Is able to support it in only one case (Republic of Korea) on the basis of the causality test.
Heitger (1987)	36	1950–1970 Averages	Cross-section	Real GDP per capita	Export share of GDP	OLS, ad hoc production function	GDI/GDP effective rate of protection, labour force, technological adaptation and adult literacy	Supports the case for trade liberalization.
Ram (1987)	88	1960–1972 1973–1982 Low- and middle-income LDCs	Cross-section two sub-periods	Real GDP growth	Real export growth	OLS, production function	Government size, GDI/GDP, labour growth	Supports the export led- hypothesis but asserts that the huge intercountry differences and diversity suggest caution when interpreting the results.
Moschos (1989)	71	1970–1980 Averages	Cross-section	Real GDP growth	Real export growth	OLS, production function	Labour growth, real domestic investment growth	Supports the export-led growth hypothesis and suggests the existence of an threshold effect. The rate of growth seems unaffected by labour because of its magnitude, while capital has limited effects owing to its low productivity levels.
Colombatto (1990)	47	1971, 1978 and 1985	Cross-section 3 separate years			OLS, correlation coefficients	Government consumption, agricultural exports and	Rejects the export -led growth hypothesis.

Study	Sample[a]	Period of study	Methodology					Conclusions
			Data set	Economic growth	Exports	Econometric technique	Other variables	
							degree of openness	
Fosu (1990)	28	1960–1970 1970–1980 African countries	Pooled cross-sectional two periods	GDP growth	Rate of growth of merchandise exports	OLS, production function	Rate of growth of GDI, labour growth	Supports the export -led hypothesis.
Kugler (1991)	6	1970(1)-1987(4) Industrial countries	Time series	GDP exception in the case of the US (GNP)	Real export growth	ADF unit roots, Johansen's procedure, VARs	Consumption (durable, non-durable and services), investment (business fixed)	There is only weak empirical evidence supporting the export-led growth hypothesis. In only 2 cases out of 6 is a long-run relation verified (France, West Germany).
Afxentiou & Serletis (1991)	16	1950–1985 Industrial countries	Time series	Real GNP growth	Real export growth	Phillips-Perron unit roots, EG procedure, Granger causality tests	None	No systematic relationship between exports and GDP is verified. Only in 2 cases out of 16 was a bidirectional causality manifested (US and Norway).
Sengupta (1991)	5	1967–1986 South-East Asia (Republic of Korea)	Time series	Real GDP growth	Real export growth	OLS, production function	Labour growth and capital growth.	Supports the export-led hypothesis and suggests the positive externality effects of exports on growth.
Serletis (1992)	1	1870-1985 Canada	Time series	Real GNP growth	Real export growth	ADF unit roots, EG procedure, Granger causality tests	Imports	Supports the export-led growth hypothesis in the short run; however, no cointegration between the variables was found.
Khan & Saqib (1993)	1	1972–1988 Pakistan	Time series	GDP growth	Real export growth: primary products and manufactured goods	3SLS, production function	Labour growth, capital growth, World GDP Index, relative prices	Supports the hypothesis of a strong association between exports and growth performance.
Lussier (1993)	24 & 19	1960–1990 African economies	Cross-section and panel data	GDP growth	Real export growth	OLS, 4 versions of production function	Labour growth, GDI/GDP, export share of GDP	Supports the hypothesis in panel data but fails to find any positive association when using export growth as a share of GDP.
Sheehey (1993)	31 & 65	1960–1970 Semi-industrialized countries	Cross-section	GDP growth	Real export growth	OLS, production function	Labour growth, GDI/GDP, export share of GDP	Inconsistent evidence of higher productivity in the export sector compared with the non-export sector; thus, suggests caution when analysing empirical results.
Greenaway & Sapsford (1994)	19	1957–1985 1970–1985 1971–1985	Time series	Real GDP growth	Real export growth and export change/output	OLS, 3 versions of production function	Labour growth, rate of growth of investment, dummy for liberalization episodes	Little support for the export-led growth hypothesis and for the positive liberalization effects on growth.

Study	Sample[a]	Period of study	Methodology: Data set	Economic growth	Exports	Econometric technique	Other variables	Conclusions
Lee & Cole (1994)	73	1960–1970 1970–1977	Cross section two sub-periods	Real GNP growth	Real export growth	2SLS, production function, Hausman's test	Labour growth, GDI/GDP	Supports the existence of a bidirectional causality between exports and growth.
Van den Berg & Schmidt (1994)	17	1960-1987 Latin America	Time series	Real GDP growth	Real export growth	Phillips-Perron unit root, EG two-step procedure, OLS, VARs, production function	GDI/GDP, population growth	Points to a positive long-run relationship between exports and growth in 11 of the 16 cases analysed. Costa Rica is among those countries where the hypothesis was verified.
Jin (1995)	4	1976(2)-1993(2) Four little tigers of Asia	Time series	Real GDP	Real exports	F-tests, ADF, impulse response function, VARs, EG two-step procedure	Real exchange rate, foreign price shock, output shock	Bidirectional causality was found in the short run but no cointegration was detected; therefore, no long-run relationship is proved.
Figueroa de la Barra & Letelier-Saavedra (1994)	1	1979(1)–1993(4) Chile	Time series quarterly	Real GDP	Real exports and export change/output	ADF unit root, VARs, Johansen's procedure	Labour force, capital, exports + imports/GDP	Supports the hypothesis of export-led growth. The results do not change independently of the indexes of outward orientation used.
Henriques & Sadorsky (1996)	1	1870-1991 Canada	Time series	Real GDP growth	Real export growth	ADF unit roots, VARs, Johansen's procedure, Granger causality test	Terms of trade	No support for the export-growth hypothesis but failed to reject it.
Al-Yousif (1997)	4	1973–1993 Arab Gulf countries	Time series	Real GDP growth	Real growth of exports and export change/ output	ADF unit roots tests, White test, production function	Labour force and GDI/GDP	Evidence that supports the hypothesis in the short run; however, it fails to find any long-run relationship, i.e. does not find cointegration.
Islam (1998)	15	1967–1991 NICs of Asia	Time series	Real GDP growth	Export growth and export change/output	ADF unit root tests, Granger causality test, error correction model	Imports, government non-defence expenditures, trade orientation, investment, instability in exports earnings.	Evidence that supports the hypothesis in the short-run but only in 5 cases was a long-run relation (no cointegration) found.
Shan & Sun (1998)	1	1978(5)–1996(5) China	Time series monthly	Real industrial output	Export growth	Ad hoc production function, VAR	Labour force, investment and energy consumption	Indicates a bidirectional causality between export and real output. Therefore, the export-led hypothesis defined as a unidirectional causal ordering from exports to growth is rejected.
Begum & Shamsuddin (1998)	1	1961–1992 Bangladesh	Time series	Real GDP	Export growth and export change/output	OLS, VAR production function, MLE estimation and arch model	Labour force, GDI/GDP, dummy and trend	Supports the hypothesis.

Declaration

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

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