# DETERMINANTS OF EXPORT PERFORMANCE IN ETHIOPIA: VAR MODEL ANALYSIS

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## ABSTRACT

*Despite encouraging improvements in recent decades, Ethiopia's export performance has typically been portrayed as poor compared with other sub -Saharan African countries. The major objective of this paper is to investigate factors that determine the export performance of the country by using an econometric model for the period 1970/71-2010/11. This study tried to review the export performance; trends and share of different export items and examine the long run and short run determinants of export performance of Ethiopia. The long run and short run estimates are investigated using Johansson co-integration and Vector Error Correction approaches. The data is collected from NBE (2011), EEA statistical data base CD-ROM (2010), and WB and WDI (2011). The findings of the study revealed that in the long run export performance has found to be positively influenced by real effective exchange rate, openness, RGDP of home country, infrastructural development and private credit as a ratio of GDP (financial development). The RGDP of trading partner has found to be statistically insignificant. Hence, the long run elasticities of export performance with respect to real effective exchange rate, openness, RGDP of home country, infrastructural development and private credit as a ratio of GDP (financial development) are 0.7, 0.54, 1.7, 0.3 and 0.44 respectively. In the short run only last year openness has directly involved in enhancing export performance of current year. Maintaining high and sustainable economic growth, improvements in infrastructural facilities and credit access, and maintaining conducive and stable exchange rate policies as well as working to reduce trade restriction mechanism should due emphasis so as to improve Ethiopia's export performance.*

***Keywords:*** *Ethiopia, Export Performance, Johansson c-integration, trading partner, Vector Error Correction*

## INTRODUCTION

Economic development is one of the main objectives of every society in the world and economic growth is fundamental to economic development. There are many variables that

contribute to economic growth. Export is considered as one of the very important accelerators of growth. The economics literature supports the contention that development requires economic growth to alleviate poverty, and greater access to world markets is perceived as a necessary condition for more rapid growth. For example, using cross-sectional regression, Agosin (2007) finds that export diversification has a stronger effect on per capita income growth.

To this end many developing countries have working to increase their share in international trade. For example Bacchetta (2007) explained that many developing countries gradually increased their share in international trade from just less than one quarter to about one third. Asia and particularly China account for most of the change, which has been facilitated by diversification of exports. The same writer also explained that while developing Asia's share in total world exports increased from 11.7% in 1985 to 21.5% in 2005, Africa's share decreased from 4.3% to 2.9% over the same period. Different reasons have been forwarded for the main reasons for Africa's poor export performance. For example, Alemayehu (2006) and Biggs (2007) stressed that the structure of African exports, which is characterized by dependence on primary commodities, as the main reason.

As in the case of many developing countries, Ethiopia's export has been limited to few primary products, which are mainly agricultural commodities. According to the World Bank (2009), the share of Ethiopia's manufactures export in the total export is only 9.0 percent (implying primary agricultural commodity to be 91 per cent) while that of China is 94 Percent. When we look at the last 41 years data, the export structure of Ethiopia has been characterized by greater concentration on few traditional exports such as coffee, hides and skins and oilseeds and pulses. From the total exports of the country coffee was the dominant export commodity accounting for about 52.27 per cent of the country's total exports, on average.

Though Ethiopia's total exports have been growing at an average rate of 15.23 per cent during the year 1970/71 to 2010/11, Ethiopia's export sector is still small; evidenced by the lower export/GDP ratio and the declining share of exports in import financing. Exports of goods in Ethiopia are only about 7 per cent of GDP, compared to an average of near 30 percent of GDP in Sub-Saharan Africa. Export levels still fall short of what is registered by other African countries with much smaller populations (Uganda and Tanzania both export more than $3 billion per year. Growth rates are also very modest if one makes a comparison with Asian countries over a decades-long time frame. For example, Ethiopia's total exports were higher than that of Vietnam in the 1980s but are now just a tiny fraction: $2 billion in Ethiopia versus $65 billion in Vietnam (Capital, 2010 and NBE, 2011).

Similarly, the share of export in import financing (Export/Import ratio) has contracted from the 1970/71 to 1979/80 average level of 88.46 percent to 40.67 percent in 1980/81 - 1989/90 and 28.94 percent in 1990/91 – 1999/2000 and further it declined to 24.68 percent for the period 2000/01-2010 /11 on average. With regard to share of world export, Ethiopia's share in total world exports is still very low, amounting to 0.01% in 2010 (WTO, 2011).

Such unsatisfactory performance; given the government's endeavour to increase the country's foreign exchange earnings by pursuing concrete policy measures and incentive schemes calls for specific case studies concerned with systematic identification of factors constraining export growth. Thus identifying and examining the factors that significantly affect Ethiopia's

export performance helps us to know what explains variation in Ethiopian export performance that should facilitate the design of policies to improve the performance and ultimately overall economic growth. Hence, the main objective of this study is to empirically investigate factors that determine the country's export performance by specifying an econometric model for the period 1970/71 to 2010/11. More specifically the study attempts toexamine the long run determinants and short run dynamics of export performance of the country by incorporating demand and supply side factors so as to identify possible policy intervention areas for export growth. The output of this study is expected to provide estimates of export response of the country with respect to change different variables that potentially determine it. In addition to this the results can be used, as an input towards designing appropriate extension programs and development projects to maximize the benefits of the sector.

This paper is organized as follows: section 2 provides literature reviews, including theoretical and empirical evidence on Determinants of export performance. Section 3 discusses Model specification, data source and description, estimation techniques. Section 4 presents analysis and results of the study. Finally, section 5 presents conclusion and policy implication based on the estimated results.

## LITERATURE REVIEW

Different studies have been conducted by different people to analyze the determinants of exports and to analyze their impact on export performance. Different studies used the imperfect substitution model proposed by Goldstein and Khan (1985) to analyze the determinants of countries export performance. For example Munoz (2006) analyze the impact of parallel market and governance factors on Zimbabwe's export performance using quarterly data and found positive and significant relationship between exchange rate and export.

Similarly, On a study made on the factors affecting export performance in three different export categories; total merchandize exports, manufacturing exports and exports of machinery and equipment on nine East & South East Asian countries by Jongwanich (2007) using quarterly data and Imperfect Substitutions Model, Results found from the long run equation reveal that real exchange rate to have different elasticities in the three export categories, it was found to have highest elasticity for merchandise export while lowest elasticity for exports of machinery and transport equipments. Real exchange rate impact also varies among the nine countries, it was found to have lowest elasticity for Philippines while the largest elasticity for Indonesia. Contrary to real exchange rate influences, world demand was found to have highest impact for exports of machinery and transport equipment and lowest impact for merchandize export.

World demand as determinants of countries' export has been significant, but it was found to be insignificant for Indonesia's export in all the three categories. The coefficient of world demand was highly elastic for China, more than 1, but less than 1 for the other countries in the group (ibid). The same study also revealed that, production capacity was found to affect positively and significantly all countries exports in all categories with elasticities nearly above 1 in all cases.

Recent studies on export have been focused on the role of trade facilitation reforms on export performance. A study made by Portuga-Perez and S.Wilson (2010) tried to analyze the role of hard infrastructure (roads, ports, airports, rail infrastructure and information communications technology) and soft infrastructure (efficiency of customs and domestic transport and business regulatory measures and transparency) on export performance of 101 countries during 2004 -07. The results from their study revealed that an improvement in hard and soft infrastructure leads to more exports which ensure that investments on physical infrastructure have a positive impact on exports, but declining as per capita income increases, on the contrary investments in ICT and soft infrastructures were found to have more impact on richer countries.

Domestic transport infrastructure is one of the major factors affecting export supply capacity of a nation. It is expected to play an important role especially at the early stages of export sector development (UNCTAD, 2005). Most African countries are characterized by poor transport infrastructure, which is a major impediment to trade, competitiveness and sustainable development (Bacchetta, 2007). Due to poor internal transport infrastructure African transport costs are high making their exports expensive and uncompetitive and reducing foreign earnings from exports (Matthee et.al, 2007). Therefore, improvements in transportation services and infrastructure can lead to improvements in export performance (Fugazza et.al, 2008). They argue that infrastructure directly affects transport costs by determining the type of transport used (for example, the type and quality of roads determines the maximum size of trucks) and delivery time for the goods. Fugazza (2004) finds that the internal transport infrastructure has a significant and positive impact in raising exports.

The role of financial development on export has been discussed by many authors as a supply side determinant. Empirical literatures like Berman and Hericourt (2008) tried to study the role of financial development on export. Using a large cross-country firm level database in developing and emerging economies, they found that financial constraints create a disconnection between firms' productivity and their export status. These two authors conclude that an increase in a country's financial development increases the number of exporters and hence countries overall export performance. Manova (2008) also developed a model to explain the role of financial development on trade flow with countries at different levels of financial development, credit constrained heterogeneous firms, and sectors of varying financial vulnerability. The author showed that financially developed countries are more likely to export more.

The other major factor that affects export supply capacity or export demand decision is the real exchange rate. The real exchange rate can be an important variable in determining export growth, diversification and international competitiveness of goods produced in a country (UNCTAD, 2005). It is a key variable that requires close government supervision in any program to expand and diversify exports (Biggs, 2007) since its management can influence export performance over a large number of different product groups (Mouna and Reza, 2001).

Biggs (2007) explained the real exchange rate is often rendered uncompetitive in low income countries by poor economic management and turbulence in financial markets. Ensuring that the real exchange rate adjusts to more realistic levels is a means of enhancing the economy's incentives for exporting and can lead to an increase in the production of export products

(Oyejide, 2007). While an overvalued currency can undermine export competitiveness through a direct loss of price competitiveness for exporting firms undervaluation of the currency can bolster export competitiveness (Biggs, 2007), enhance the incentives for export activities (Oyejide, 2007).

On the other hand, some studies indicate that the effect of exchange rate on export is negative. For example in estimating the relationship between exchange rate and export competiveness for Singapore which may have more relevant for small economies whose export have highly dependent on raw materials and intermediate goods from abroad, Telak and Yeok (1998) showed that in the presence of high import content, export is not adversely affected by currency appreciation. Their justification for this result is in the presence of high import content appreciation results lower import price which in turn reduce cost of export. Similar result was found by Fang and Miller, (2004) but for different reason. They tried to show currency depreciation doesn't improve export rather it results exchange rate risk (generated by fluctuations) which significantly impedes export.

The other factor affecting export performance is degree of openness to trade. Opening economic policies to trade with the rest of the world is needed for export and economic growth. This is because in recent decades there is no country achieving economic success in terms of substantial increases in living standards for its people without liberalizing itself to the rest of the world. Trade liberalization has generally taken place in LDCs as part of the structural adjustment program.

Trade liberalization implies considerable reduction in tariff and non-tariff barriers, so as to establish a noticeable open market as compared with the pre- liberalization era. The empirical researches focusing on the impact of trade liberalization (openness) on export earnings have exhibited positive results. For example literatures show that countries which get on liberalization programs have improved their export earnings (Ahmed, 2000). Similarly, Seyyed et.al (2011), using panel data evidence for 19 countries found that open trade policy enhances GDP and export growth. Using these results clearly prefer open trade policy over more trade barrier which enhance GDP and export growth. Conversely, Giovani and Levencko, (2007) argue that increased trade openness has contributed to rising uncertainty and exposed countries to external shocks and hence, adversely affects country's export.

## DATA AND METHODOLOGY

## Data Source and Type

Time series secondary data have been used in this study. The data set has been collected from National Bank of Ethiopia (2010/11), Ministry of Finance and Economic development (2011), and WB (2011). For the purpose of analyzing the country's determinants of export performance, the export equation in this study has been estimated using time series data for the period 1970/71-2010/11.

The time series data that are used in this study are export of goods and services valued in US dollar, real income of trading partner (average real GDP of 13 major trading partners which accounts about 78 percent of Ethiopia's export destination) valued in USD, real GDP of home country valued in USD, credit to the private sector as a ratio of GDP which is unit free and openness (calculated using the sum of export and import of goods and services as a ratio

of GDP) are collected from WB (2011). Data for real effective exchange rate is collected from EEA statistical data base CD- ROM (2010) and NBE (2011) and checked to WB data for consistency. Government expenditure for transportation and communication is calculated by taking both capital and current expenditure for communication and transportation including road. Since the researcher did not find data for such variables from IMF and WB, these variables are collected from both NBE (2011) and EEA statistical data base CD-ROM (2010).

## Econometrics Model Specification

This study focuses on demand and supply side determinants of Ethiopia's export performance. Hence, the study signifies Ethiopia's export performance as a function of real GDP of trading partners, real effective exchange rate, and openness, real GDP of home country, infrastructural development, and financial development. The model that has been used in this paper is thus the adopted Goldestien and Khan (1985) imperfect substitution model which is expressed as follows:

$$EX = f(RGDPTP, REER, OPEN, RGDP, TCEX, PRC) \text{ --------------------------- (4.1)}$$

Thus to determine Ethiopia's export performance, a log-linear form export determination model is employed incorporating both supply and demand related variables. The model is therefore akin to the one used by Amin (2007) in estimating determinant of cut flower export in Ethiopia and Hailegiorgis (2011) in estimating export performance of oil seeds in Ethiopia. In contrast, however, the model includes the ratio of exports and imports to GDP as a measure of openness to trade, identified as the most important determinant of export by Chinn and Prasad (2003) and domestic production (GDP) which is identified as very important determinant of export by Ahmed and Majeed ,(2006) in estimating developing countries export performance. Therefore, the regression equation is given by:

$$\ln EX = \alpha + \beta_1 \ln RGDPTP + \beta_2 \ln REER + \beta_3 \ln OPN + \beta_4 \ln RGDP + \beta_5 \ln TCEX +$$

$$\beta_6 \ln PSC + \varepsilon_t \text{ ------------------------------ (4.2)}$$

Where,

EX= Export earnings at time t in log form is the dependent variable

RGDPTP= the real GDP of our trading partners (about 78 percent of Ethiopian export destination countries)

REER= Real Effective Exchange Rate in log form (which is found by trade weighted Birr/foreign currency*foreign price index/domestic price index)

OPN= Exports plus imports as a percentage of GDP, a proxy for degree of openness in log form

RGDP= Real GDP at home country in log form

TCEX= Public expenditure in transportation and communication as a ratio of GDP as a proxy for infrastructural development in log form

PRC= Private sector credit as a ratio of GDP in log form

$\varepsilon_t =$ Error term

Based on available theoretical literature the first three variables in the model are called external (demand side) determinants of export performance. Ethiopia is one of the countries whose export performance depends on overseas economic situation. As the country is a small open price taker economy in the world market World market forces, generally determine the prices of its exports. Hence, the demand for Ethiopia's export in the world market is influenced by fluctuations in developed countries income particularly that of our trading partners. That is, all other things remain constant; an increase in the real GDP of Ethiopia's major trading partners, which is denoted by $RGDPTP$, either due to the output growth of our major trade partners, liberalization measures, or diversification measures increases the demand for our product and hence increase Ethiopia's export earnings ($\beta_1 > 0$).

The movement in value of export also correlates with relative prices. In theory, real effective exchange rate movements are also negatively correlated with the growth in exports performance. Thus, the expected sign of the REER coefficient is ambiguous. This is because it depends on the exchange rate regime that the country experiences. According to the Marshal-Lerner condition and Mundel-Fleming model, a decrease in real effective exchange rate or appreciation of domestic currency will make exportable items costly, then the demand for our exports in external market is likely to fall and this in turn will reduce foreign exchange earnings. In such a case, the expected sign of real effective exchange rate (REER) will be positive (i.e. $\beta_2 > 0$). The reverse is likely to occur (i.e., $\beta_2 < 0$) if the increase in real exchange rate (devaluation) worsens export by increasing cost of export by decreasing the country's competitiveness in international market.

As reviewed in the literature part, the impact of openness is also ambiguous. Some scholars strongly acknowledge that the more open an economy to the external world the higher will be its foreign exchange earnings from export. The implication is that a country needs to integrate to the world market by diversifying its trading partners. The degree of integration of a country to external market is thus measured by openness to trade, which is proxied by the sum of exports and imports of goods and services to GDP ratio. Thus, an increase in the ratio of exports and import of goods to GDP (or $OPN$) implies better integration of Ethiopia to the external world and hence higher export earnings. In short, an increase in openness will have positive impact on export performance (or $\beta_3 > 0$). However, if openness leads to shocks in the goods market that declines in export demand, it will decrease exports earnings ($\beta_3 < 0$).

On the other hand, the fourth, fifth and sixth variables are regarded as internal (supply side) determinants of export earnings. The inclusion of real output in the model is based on the argument that the output capacity of an economy is an indication for future supply capacity. Thus, an increase in output will enhance export earnings ($\beta_4 > 0$). Economic theory also strongly acknowledges that the quality of infrastructure is one of the key determinants of export performance. Infrastructure (road, power, communication, etc) development, which is the key determinant factor for the flourishing of any industry especially export sector is proxied by the ratio of public investment on transportation and communication to GDP ($TCEX$) Therefore, expanding infrastructure density of various types with an acceptable

level of quality or the increase in public investment in infrastructure to GDP ratio ($TCEX$) in Ethiopia will have positive impact on export growth. That is, the expected sign of ($TCEX$) is positive (or $\beta_5 > 0$).

The empirical findings of Amin (2007) suggest a strong positive relationship between a cut flower export and the export credit. According to him since the industry need huge finance the business is impossible without credit facility by banks and would not have registered such a remarkable result. In light of this argument, therefore, private sector credit as a ratio of GDP ($PRC$) by the banking system is added as an explanatory variable in export model in order to examine whether there is a friendly credit access by banks to country's export performance. In this case, the impact of $PRC$ on exports is positive ($\beta_6 > 0$).

## Estimation Technique

Many macroeconomic time series are not stationary at levels and are most adequately represented by first differences. Non-stationarity of time series data has often been regarded as a problem in empirical analysis. Working with non-stationary variables lead to spurious regression results, from which further inference is meaningless. Thus, it is better to distinguish between stationary and non-stationary variables. Harris (1995:15) noted "… a data series is said to be stationary if its error term has zero mean, constant variance, and the covariance between any two-time periods depends only on the distance or lag between the two periods and not on the actual time at which it is computed."

Hence, the first step in time series econometric analysis is to carry out unit root test on the variables of interest. The test examines whether the data series is stationary or not. To conduct the test, the conventional Dickey-Fuller (DF) and Augmented Dickey – Fuller (ADF) test has been used with and without a trend. Since the actual data generating process is not known a priori, the test of determining the orders of integration of the variables has conducted first by including a constant only and then both a constant and a trend. The ADF test is based on the regressions run in the following forms.

$$\Delta Y_t = \alpha_1 + \beta Y_{t-1} + \mu_t \text{----------------------------------------- (3.3)}$$

$$\Delta Y_t = \alpha_1 + \alpha_{2t} + \beta Y_{t-1} + \mu_t \text{--------------------------------- (3.4)}$$

Where, $t$ is the time or trend variable. Equation (3.3) adds a drift, and equation (3.4) introduces both a drift and a time trend. In each case the null hypothesis is that $\beta = 0$, that is, there is a unit root. The null hypothesis ($H_0$) is thus a series contains a unit-root (non-stationary) against the alternative hypothesis ($H_1$) stationary (deterministic trend). 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. There are two common methods for testing co-integration and estimating the relationship among co-integrated variables. These are the Engle and Granger (1987) two-step procedure and the Johansen's (1988) maximum likelihood methods.

The Johansen procedure takes care of the above shortcomings by assuming that there are multiple co-integrating vectors. Thus, testing for co-integration using the multivariate VAR

approach developed by Johansen (1988) is necessary because failure to capture the existence of more than one co-integrating vector yields misleading long-run coefficients. In which case, the estimated parameters of the long run coefficient would only be a linear combination of the parameters of the two or more co-integrating long-run relationship (Harris, 1995). Thus, an unrestricted VAR can be formulated to estimate the long run relationship among jointly endogenous variables.

The cointegration regression so far considers only the long-run property of the model, and does not deal with the short-run dynamics explicitly. Clearly, a good time series modeling should describe both short-run dynamics and the long-run equilibrium simultaneously. Finally, whether the long run parameters are obtained using the Johansen cointegration analysis, the Johansen (1988) Vector Error Correction Model (VECM) has been estimated. Diagnosis tests on the estimation technique should also be performed at each stage of reduction to check parameter consistency.

## Estimation Results and Discussions

Table 1 depicts the stationary test for the variables included in the model. From the table it is clear that the null hypothesis of a unit root is rejected for all variables with a drift term (constant). Moreover, the null has been rejected for lag one of all variables at one percent level of significance. Therefore, it is possible to conclude that the variables are integrated of order one.

It is well known that the VAR analysis may depend critically on the lag order selection of the VAR model. Usually, different lag order can affect the interpretation of the VAR estimates when those differences are large enough. The most common strategy in empirical studies is to select the lag order by some pre specified criterion and to condition on this estimate in constructing the VAR estimates. Thus, Eviews 7 output shows the following result for lag length selection according to each criterion.

**Table 1.** Results of Dickey fuller and Augmented Dickey fuller unit root test at the first difference of the variables

| Variable | Dickey Fuller Class | | | | Order of integration |
|---|---|---|---|---|---|
| | Dickey Fuller | | Augmented Dickey Fuller | | |
| | | | Lag length 1 | | |
| | Constant | Constant & Trend | Constant | Constant &Trend | I(1) |
| $\Delta$LEX | -4.8289** | -4.7541** | -4.8289** | -4.7541** | I(1) |
| $\Delta$LRGDPTP | -4.6720** | -4.7955** | -4.6726** | -4.7955** | I(1) |
| $\Delta$LREER | -4.4855** | -4.4412** | -4.4855** | -4.4412** | I(1) |
| $\Delta$LOPN | -5.1396** | -5.2033** | -5.1396** | -5.2033** | I(1) |
| $\Delta$LRGDP | -4.5561** | -5.4988** | -4.5561** | -5.9945** | I(1) |
| $\Delta$LTCEX | -6.5071** | -6.4525** | -6.5071** | -6.4525** | I(1) |
| $\Delta$LPRC | -4.6495** | -4.6730** | -4.6495** | -4.6730** | I(1) |

**Note:** ** denotes rejection of the hypothesis of unit root in the first difference of variable at 1%. Significance level for DF and ADF statistic

According to the Table 2 SBC criterion, the lags ($\rho$) of VAR model, AIC criterion the lags ($\rho$) and other criterion the order of VAR is 1. All criterions gave the same results, so the lag ($p$) of 1 was used in the model as the order of VAR. Then the Johansen (1988) test of was applied and results are shown in the following table. Following the unit root tests and lag length section cointegration test was carried out using the Johansen (1988) cointegration method. The results of VAR (1) cointegration are shown in Table 3 below.

**Table 2.** Lag length Selection

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 39.66049 | NA | 4.42e-10 | -1.674897 | -1.376309 | -1.567766 |
| 1 | 312.5431 | 433.8134* | 4.75e-15* | -13.15606* | -10.76735* | -12.29901* |
| 2 | 358.8970 | 57.05098 | 6.99e-15 | -13.02036 | -8.541542 | -11.41340 |

**Note:** * indicates lag order selected by the criterion calculated using EViews-7

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

LR: sequential modified LR test statistic (each test at 5% level)

The maximum value was greater than critical value at zero co-integrating vector (r =0) for both trace test and Maximum-Eigen value test. This indicated the existence of one co-integrating relationship. Thus the above table shows that the null hypothesis of no co-integration is rejected at the conventional level (0.05) and the study conclude that there exists a relationship among the proposed variables in the long run. Trace test and Eigen value test indicates that there are one co-integrating vector. All the variables are co-integrated of order one having the long run relationship.

**Table 3.** Johansen's Cointegration Test

| Ho: | Eigen values | Maximum Eigenvalues ($\lambda_{max}$) | | | Trace Statistics ($\lambda_{trace}$) | | |
|---|---|---|---|---|---|---|---|
| | | Johansen's Test statistics | Critical Value (5%) | Prob. ** | Johansen's Test statistics | Critical Value (5%) | Prob. ** |
| H=0 | 0.702003 | 47.21620* | 46.23142 | 0.0391 | 129.0263* | 125.6154 | 0.0305 |
| H≤1 | 0.568399 | 32.76990 | 40.07757 | 0.2627 | 81.81013 | 95.75366 | 0.3067 |
| H≤2 | 0.361111 | 17.47296 | 33.87687 | 0.9023 | 49.04024 | 69.81889 | 0.6789 |
| H≤3 | 0.351122 | 16.86791 | 27.58434 | 0.5913 | 31.56728 | 47.85613 | 0.6359 |
| H≤4 | 0.213428 | 9.362751 | 21.13162 | 0.8021 | 14.69937 | 29.79707 | 0.7992 |
| H≤5 | 0.127879 | 5.336269 | 14.26460 | 0.6989 | 5.336615 | 15.49471 | 0.7721 |
| H≤6 | 8.86E-06 | 0.000346 | 3.841466 | 0.9872 | 0.000346 | 3.841466 | 0.9872 |

**Note:** *denotes rejection of the hypothesis at5 per cent significance level,** Mackinnon Haug-Michelis (1999) P-values

Once the order of cointegration is identified for each variable that enters the specified model of export determination, the next step is to estimate the long run relationship between Ethiopia's export performance and it determinants using the Johansen (1988) maximum likelihood method. This method is selected because it produces consistent estimates of the long run parameter, which could be tested using likelihood ratio (LR) statistics.

The normalized cointegration equation is depicted in above table by changing the signs of the standardized $\beta$ coefficients ( see table 4) which reveals that openness, credit to the private sector, real effective exchange rate, real gross domestic product of home country and infrastructural development are positive determinants of Ethiopia's export in the long run. Since all variables are used in the logarithmic form, the estimated coefficients can directly be interpreted as long term elasticity. All the above variables except infrastructural development, which is significant at 5 percent, are significant at 1 percent level. But RGDP of trading partner is found to be statistically insignificant.

**Table 4.** Normalized co-integration coefficients (standard errors in parenthesis)

| LEX | LRGDPTP | LREER | LOPN | LRGDP | LTCEX | LPRC | constant |
|---|---|---|---|---|---|---|---|
| 1.000000 | -0.110334 (0.24269) | -0.704254 ** (0.06421) | -0.538535 ** (0.06417) | -1.699555 ** (0.13440) | -0.300267 * (0.11351) | -0.438845 ** (0.07890) | -16.79659 |
| t-statistics | 0.454629 | 10.96798 | 8.392317 | 12.6455 | 2.645291 | 5.562041 | - |

**Note:** ** Significance at 1% and * significance at 5%.

The impact of the real GDP of trading partner on export performance is statistically insignificant. The finding is similar to the finding of Amin (2007) for Ethiopia where the increase in the per capita incomes of our trading partners has no impact on the demand for exports. Moreover, the finding supports Prasad (2000), who argued the growth of trading partner income will not drive movements in developing countries exports.

The movement in real effective exchange rate has also appears to have a positive relationship with export performance. In theory, Marshal-learner condition, real effective exchange rate movements are positively related with the growth in exports performance in long run. An increase in the real effective exchange rate means a real depreciation of the domestic currency, which makes exportable items cheap. Thus, according to this research output a one percent change in real effective exchange rate results 0.7 percent change in the total export earnings. It is well known that exports of LDCs are price inelastic in the international market due to nature of the product that LDCs produces. Hence this result is consistent with this fact. The positive and significant coefficient also shows that export may be influenced by exchange rate policy. It follows that devaluation of birr in terms of foreign currency improves price competitiveness of export and hence leads to an increased export performance of Ethiopia.

The coefficient for trade openness has also found positive. One percent trade liberalization (openness) affects the Ethiopian export performance to increase by 0.54 percent per year. This result is consistent with the theoretical expectations of trade liberalization for exports.

And the result is also consistent with empirical evidences like Ahmed (2000) which asserts the importance of trade liberalization programs that improved export earnings.

The result for impact of RGDP of home country is also in accordance with Macroeconomic theories. For example the coefficient for real gross domestic product for home country is 1.699 which means that a one percent change on real out GDP of home country results 1.699 percent increase in total export earnings. This is consistent with Ahmed and Majeed(2006) in estimating developing countries export. They found that GDP of home country affects their export positively. This is due to the fact that output capacity of an economy has implication of supply capacity by maintaining a country's competitiveness in the international market in the long run.

Regarding the fifth variable, government investment in infrastructure has significant positive impact at 5 percent significance level in increasing export earnings in Ethiopia in the long run. That is expanding physical infrastructure (transportation, road construction, and communication) density of various types with an acceptable level of quality has significant positive impact on the volume of production and hence earnings from export. The result indicates that a 1% increase in public investment in transportation and communication leads to an increase in export earnings by 0.3 percent. This result supports UNCTAD (2000), which argued infrastructure (road, power, communication, etc) development is a key determinant for the flourishing and development of any industry, especially export sector in developing countries and will have positive impact on the volume of production for export. This result is also consistent with empirical findings like Fugazza, (2004) and Edwards and Odendaal, (2008) which emphasizes improvements in transportation services and infrastructure can lead to improvements in export performance.

Finally, the result also indicates that an increase in domestic credits to the private sector has increased Ethiopia's export earnings significantly by 0.44 percent during the study period. This might be due to the fact that, an increase in domestic credit in Ethiopia has lead to the depreciation of our currency and hence stimulates export as found and argued by Kim, (1985) an increase in domestic credit (expansionary monetary policy) will have positive impact on export earnings if it results in an equi-proportionate depreciation of the exchange rate.

## The Short Run Error Correction Model

The most important thing in the short run results is speed of adjustment term. It shows that how much time would be taken by the economy to reach at long run equilibrium. Negative sign of speed of adjustment term shows that the economy will converge towards long run equilibrium. But if it is positive, the economy will not converge to the long run equilibrium. Thus the output from Eviews 7 is presented in Table 5.

The Vector Error Correction Model (VECM) result in table 4.5 above shows that only one variable affects the Ethiopian export performance in the short run. That is only openness in the previous year affects current export in the short run. The more trade liberalization in the previous year the more export would be. This may due to the fact that the more the economy is integrated to the rest of the world; it has immediate response to enhance the country's export. Here the adjustment coefficient is negative which shows that the variable will converge towards long run equilibrium after taking 61 percent annually adjustments in the

short run. As can be seen from the diagnostic tests above, the hypothesis of the non-existence of serial correlation, the presence of normality and the existence of homoscedasticity are not rejected for the Export performance error correction specification.

**Table 5.** Results for VECM estimates

| $\Delta \ln EX$ | | | | |
|---|---|---|---|---|
| **Variables** | Coefficient | Std.Error | t-statistics | Prob. |
| **DLREER** | -0.322332 | 0.186039 | -1.732608 | 0.0931 |
| **DLOPN** | 0.358927 | 0.128394 | 2.795517 | 0.0088** |
| **DRGDP** | 0.368027 | 0.367102 | 0.987768 | 0.3312 |
| **DLTCEX** | 0.187204 | 0.113870 | 1.644015 | 0.1103 |
| **DPRC** | 0.032239 | 0.133305 | 0.241844 | 0.8105 |
| **DLEX** | 0.049670 | 0.165054 | 0.300929 | 0.7655 |
| **C** | 0.033874 | 0.024316 | 1.393094 | 0.1735 |
| **ECM_1** | -0.610554 | 0.163715 | -3.729374 | 0.0008** |
| **R-squared** | 0.539381 | Mean dependent VAR | | 0.084432 |
| **Adjusted R-squared** | 0.435370 | S.D. dependent VAR | | 0.156776 |
| **S.E. of regression** | 0.117804 | Akaike info criterion | | -1.258906 |
| **Sum squared resid** | 0.430212 | Schwarz criterion | | -0.917663 |
| **Log likelihood** | 32.54867 | Hannan-Quinn criter. | | -1.136471 |
| **F-statistic** | 5.185824 | Durbin-Watson stat | | 2.365803 |
| **Prob(F-statistic)** | 0.000547 | | | |
| **Model Diagnostic test;** <br> **Normality test:** $\quad$ = 2.604023[ 0.271984] <br> **LM test for serial correlation** = 0.1056 [0.0687] <br> **ARCH** $\quad\quad$ = 0.6907 [0.6809] | | | | |

**Note:** ECM-1 is the lagged residual saved from the estimated long run equation

## CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper analyzed Ethiopia's export performance and contribution of different export items for the period 1970/71-2010/11. In addition to this time series econometrics method is employed to identify determinants of Ethiopia's export performance. In order to know the long run and short run determinants, Johansson co-integration methodology is employed. The empirical finding on Ethiopian export determination model confirms that, real GDP of home country, real effective exchange rate, financial development, trade liberalization, infrastructural development are positive and significant determinants of country's export. Real GDP of trading partners were found to be statistically insignificant to determine country's export in the long run. Among the aforementioned variables only trade liberalization (openness) was found to be the only determinant of country's export in the short run. It is found to be positive and statistically significant where as the rest variables are found to be statistically insignificant.

The empirical result suggests that an increase in the country's real effective exchange rate cause a gain in competitiveness of that country. Thus, a conducive and stable exchange rate policy has to be ensured. That is government has to control up rising movement of domestic price and allow further nominal depreciation of local currency in longer run in order to encourage more export. The conclusion also reveals that government should work more with the major trading partners to liberalize its trade and succeed its aspiration to join WTO. This can be done through bilateral and multilateral trade agreements by reduction of tariff and other trade restriction mechanisms so as to maintain export growth. In promoting Ethiopian export the role of maintaining a high and sustainable economic growth is indispensable. The development of telecommunication and transportation facilities is crucial not only in promoting countries economic growth; it is also to sustained export performance. Thus, it needs investment in infrastructural development. This pertains in particular improvements of the main roads that connect the production areas and central markets. The role of communication service should also due attention. Thus it needs more investment to improve the role of the sector for export growth. Access to finance is critical. That is the empirical finding has policy implication that needs encouragement of credit to the private sector. This can be maintained by further reduction cost of borrowing, improving the institutional qualities, controlling inflation and reducing the government budget deficit.

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## Annex 1: Model stability