Determinants of Export Trade in Econometric Study with Special Reference to Ethiopia

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Abstract: *The objective of this study is to examine the determinants of export trade in Ethiopia over the period 1974-2014. The estimation technique used is the simultaneous equation framework with Two Stage Least Square approaches (2SLS).The variables used as determinants of demand side are: the real effective exchange rate, GDP of trading partners and trade liberalization On the other hand, the variables used as determinants of export supply include: Gross domestic products, the ratio of price of exports to domestic price, Infrastructure which is proxied by internet access per 1000 person. The data is collected from NBE (2011), EEA Statistical data base CD-ROM (2012), WB and MoFED. The estimated results specified that exchange rate and trade liberalization significantly affect the export value of Ethiopia. However, GDP of trading partners' is insignificant. On the other hand, on the Supply side, gross domestic product, infrastructure and policy dummy have positive and significant impacts on export supply of Ethiopia. However, relative price (the ratio of price of exports to domestic prices), is negatively related to the supply of export suggesting that some commodities are diverted to the domestic market as their prices increase.*

Keywords: Export, trade liberalization, Simultaneous Equation, 2SLS

1. Introduction

1.1. Background of the Study

The need for export as economic growth strategy has been accepted and it is also believed that expanding export capacity and increasing international competitiveness are vital for rapid growth and development. Ethiopia's export is composed of agricultural products and non-agricultural products. The major nonagricultural export commodities are leather and leather products, frozen meat, sugar and textiles. However, the bulk of its export comes from agricultural products among which coffee ,oil seeds, chat,and flower are the four major export commodities of the country which together constitute 57.6% of the annual export earnings in the year 2010/11 (MoFED,2012) . During the same period, the volumes of export of the four major export items are accounted for more than 69% of the annual export earnings (NBE,2011).

Still Ethiopia has a potential to increase its foreign exchange earnings from its export. For instances, the country has exploitable potential in, among other, coffee, livestock and sugarcane sector. In line with this, Ethiopia is among very few countries which can produce and supply organic coffee to the world market. Moreover, productivity of agricultural commodities for some commodities is highest in the world given the conducive weather condition. For instance, Ethiopia can produce 116 tons of sugarcane per hectare and 11.5 tons of sugar harvested hectare which is highest in world as compared to the world average production of 11.5 tons per hectare (LMC and IF, 2004). Hence, it at least boosts its agricultural products with some promising measures. The country can currently draw a lesson from past experience so as to exploit high potential to improve export performance. It has not yet been performing at its maximum potential on the export sector as compared to what could have been achieved with a better policy package.

In recent years the Ethiopian economy has considerably changed prompting different view as to the nature of the change. For the first time in the country's history prices and outputs moved in similar direction, both growing in double digits. The agricultural sector seems to be giving way to the service sector with the industrial sector maintaining its old share in the economy. There is a lot of speculation as to why this is happening and on the possible future direction of where the economy is going. For instances, according to World Bank Report (2011) Agriculture, industry and service sector constitute 49.3%, 11.1% and 39.6% respectively. However, the change in the share of sectoral composition is between agriculture and service sector where as industry sector is showing a stagnant growth so far. This imposes certain question in ADLI where the transformation is from agriculture to industry. Agricultural focused policies seem to be changing owing to the fact that productivity of small holder agriculture has not increased significantly. The industrial sector has not grown much in share as expected when growth comes. Accordingly, the usual shift from the Agricultural sector to industry and then to services has not materialized, thereby bringing a number of questions (Makonnen, 2012).

1.2. Statement of the Problem

According to the Ethiopian Export Promotion Agency (2002), exports of Ethiopia are subject to natural vagaries and suffer from supply side constraints caused by domestic factors. These constraints include traditional production system, weak extension system and shortage of production inputs and finance. Moreover, the type of commodities exported and trend in world demand and price for those commodities, the location of market for export, the trade policies of importing countries and exchanges rate are major reason for poor performance of export trade in Ethiopia (Abay and Zewdu, 1999).

Most of the empirical studies in the area consider either the supply side or the demand side determinants of export but

not both, except very few studies. For instance, when we consider document of the World Bank (1987), it considered only the supply side factors in the export function while the studies conducted by Tura (2002) considered only the demand side determinants of export. Moreover, Muscatelli (1992) and Sinha Roy (2002), emphasize on significance of the demand side determinants like world demand and world prices in explaining export behavior while others attributes much importance to the supply side. For instance, Khan and Knight (1985) show that supply side factors have significant influence on export performance in the long run. Therefore, this study initiated to identify the determinates of both demand and supply side factors that affect export performance of the country by carefully identifying both demand and supply side factors that is explaining export behavior of Ethiopia.

Moreover, to examine the impact of the trade liberalization on our exports behavior, export plus import to GDP is introduced in the demand side equation. Another important contribution of this study is the dynamics of trade in the country. Although Ethiopia's import and exports have been extensively studied, direction of trade and its dynamics in general has been neglected in the literature except the one **(**Makonnen, 2012**)**. But analysis of trade needs to take into explanation the dynamics of international trade and show whether trade in the country is moving in a promising direction. Hence, this paper fills this gap by discussing the dynamics of trade in Ethiopia.

Having the above facts and research gaps, this paper raises the following questions that are address in the study. What determine export trade in Ethiopia and its dynamics? What are the measures that have been taken by the government to make the sector competitive?

This paper attempts to fill in the gap by trying to address the limitations described above by using simultaneous equation framework.

1.3. Objectives of the Study

The general objective of this study is to find out the determinants of export trade in Ethiopia.
The specific objectivesare:
- To show the direction of export trade in Ethiopia
- To estimate the bounciness of allfactors
- To observe some important actions taken by Ethiopian government to make the sector competitive

1.4. Significance of the Study

Since good performance of export sector is one of the tools to enhance economic growth, the outcome of this paper helps those agents working in the export sector to identify major constraints and challenges facing the sector and the direction of export trade as well. Besides, it is believed that this paper provides information to policy makers on how to boost export in the country and hence, for the improvement of the balance of trade and economic growth. In addition, it serves as a reference for further study on related topics.

2. Empirical Literature

Basically, the most of the characteristics of export sector of LDCs may also hold for Ethiopia as Ethiopia is among one of those LDCs country. However, this does not mean that the sign and magnitude of those determinants of export cannot exactly tell about export performance of Ethiopia as there may be difference in characteristics and nature of export sector as well. Hence, we need to see those empirical literature related to Ethiopia's export sector though most of the studies estimated single equation as tried to explained in the methodology. Accordingly, this section will emphasizes on those empirical literature in Ethiopia. Tura (2002) estimated an export demand equation specifying real export as a function of real income of trading partners less their exports. His results revealed that both relative prices and foreign incomes are insignificant in the long run while foreign income is a significant export determinant in the short run. He concluded by highlighting the possibility of export diversification in the long run as foreign income and relative price are not significant determinant of the country's exports. (Befekadu, 2004/05).

SisayMinji(2010) investigated determinants of export trade and its performance in Ethiopia he found that relation between export performance and real exchange rate are insignificant using co-integration analysis in the period of 1981-2004 and also Yisak (2009) found insignificant result studied determinates of Ethiopia's export performance by employing A gravity model analysis. In opposite to this, Lemlem (2008) he found that negative relationship between export demanded and real effective exchange rate. The above literature result shows that real effective exchange and export relation is ambiguous.

Gemechu (2002) studied Exports and Economic growth in Ethiopia for the period of 1960-2000/01 he found that positive relationship between real growth of export and RGDP per capita. Lemlem (2008) examined determinates of Ethiopia exports found that positive relationship between RGDP and export supply and Kiros 2012 studied export growth and real GDP he found that direct relationship. Hence all the study in the literature found that positive relationship between export and real GDP.

Tarekegn (2009) regressed value of export on Real GDP of Ethiopia, REER, and Trade Partner's Real GDP of Ethiopia using OLS regression. Accordingly, he found that export performance of Ethiopia is positively correlated with RGDP of Ethiopia but Trade partner's real income insignificant while it is negatively correlated with the REER, which is in contrast to the theoretical expectation. They further argued that as the part of RGDP is invested in export sector by 1%, value of export also increases by about 1.72%.

On the other hand, they indicated that, averagely, a one percent increase in REER leads to a decrease in the value of export by about 0.47%, keeping other explanatory variables constant. They reason out that the Ethiopian economy is characterized by a predominance of rain-fed agriculture whose performance is often influenced by variability of weather; weak manufacturing; and narrow primary commodity export base, with high dependence on coffee.

Lemlem (2008) examined the impact of Trade partner's income by taking weighted average Real GDP of Ethiopia's major trading partners on exports trade of Ethiopia. Accordingly, she found positive relationship between Ethiopia's export trade and foreign income as proxied by weighted average Real GDP of Ethiopia's major trading partners and concluded that the Trading partners income is an important determinants of demand for exports from Ethiopia. Yshak (2009) examines the determinants of export performance of Ethiopia by employing gravity model for a panel of 30 Ethiopia's trading partners for the period 1995-2007. He indicated that the growth of domestic product (GDP) affects Ethiopian exports positively. Similarly, Kiros (2012) examines determinates export growth rate in Ethiopia using Co-integration and error correction model and found positive and significant effect between export and GDP.

According to Samuel (2012) examined the determinants of Agricultural export in Ethiopia using Co-integration and error correction model in time series data from1980-2010. He concluded that improved infrastructural condition positively and significantly determine the export performance of Ethiopia. Infrastructural facilities of a given country can be proxy by indexes such as percentage of paved roads out of the total road; number of fixed and mobile telephone subscribers (per 1000 people); number of internet subscribers (per 1000) and so on (Eyasu, 2011). Since the major export products are agricultural, the impact of infrastructure is proxied by kilometers of total paved roads considered.

Table 2.1: Share of Top Destination Countries for Ethiopia's Export

No	country	Percentage share from total export (1991/92-2000/01)	Percentage share from total export (2001/2002-2010/2011)
1	Germany	21.25	10.83
2	China	0.19	8.34
3	Netherland	1.60	6.43
4	Saudi Arabia	7.85	6.01
5	USA	6.13	4.74
6	Sudan	0.18	4.31
7	Italy	7.48	4.30
8	Djibouti	3.47	4.32
9	France	3.70	1.77
10	United Kingdom	2.54	2.54
11	U.A.R	0.19	0.70

Source: Own Computation Based on the Data obtained from NBE (2012)

With regard to American countries, the only significant country from the total share of our export is United States of America, whose share from the total export has also declined from 6.13% in the first decade to 4.74 % in the second decade (2001/02-2010/2011). This all suggests that there is a significant shift in the direction of Ethiopia's export from European and American countries to the developing countries like Asian and African countries.

3. Econometric Analysis

To examine the determinants of export trade in Ethiopia, the Three-Stage Least Squares (3SLS) approach is employed.

This technique has certain merits over other methods particularly OLS and Maximum Likelihood methods in addition to the advantages mention chapter three. For instance, it does not require any distributional assumption for right hand side independent variables, the entire system is correctly known and the random term of each equation is serially independent (non-auto correlation) (Bollen, 2001, Koutsoyiannis, 2008).

Table 3.1: Supply Equation Results

Variable[1]	coefficient	P-value
Constant	2.1493	0.000
d1lrgdp	-0.7012501[***]	0.000
d1licc	-0.342197[**]	0.027
d1lpdt	0.155504[***]	0.000
dr	-0.564403[**]	0.013
R^2 =0.55	Prob>F=0.0000	Obs =39

[1]*Since all variables are used in the logarithmic form in both demand and supply equations, the estimated coefficients can directly be interpreted as long term elasticity.*
*** Significant at 1% level and** Significant at 5% level

The result shows an improvement over the OLS estimation. All the supply side variables included in this model explain 55 percent of export supply of Ethiopia. The results for impact of RGDP of home country is also in accordance with macroeconomic theories that are improve export performance of one country. With regard to estimation results the RGDP of home country is significant and positively correlated with the supply equation. The coefficient of real gross domestic products of home country is 0.70 which means that one percent change in real GDP of home country results in 0.70 percent increase in total export supply. This 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. Accordingly, the results confirm the expectation that RGDP has positive and significant effect on export supply in Ethiopia. This support empirical results such as Kumar (1998), Ngeno (1990), Agasha (2008), Lemlem (2008) and Kiros (2012), who indicated the negative relationship between the RGDP of home country and export supply price (that is positive relationship between RGDP of home country and export supply), though they employed different methodologies.

On the other hand, Relative price which ratio of price of exports supply to domestic price (approximated by consumer price index) statistically significant at conventional level of significance and has the expected sign. The result supports the conclusion by Roy, (2002) and Lemlem, (2008), which says that since export is found to be responsive to the domestic prices, improved domestic profitability might act as a significant deterrent for domestic producers to go for export business.

Another crucial factor in the supply side determinants of export trade in Ethiopia is infrastructural condition of the country as proxied by fixed and mobile telephone subscribers (per 1000 people) which is positive and significant volume of export . The result shows that a 1 % increase in fixed and mobile telephone subscribers (per 1000 people) increases the export supply of Ethiopia by 0.34 percent during the period under consideration. The results

are consistent UNCTAD(2005),which argued infrastructure development is a key determinate for the 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. These results are consistent with findings like Fugazza (2004) and Edwards and Odeadaa(2008) with emphasizes improvement telecommunication facilities can leads to improvement in export performance.

Another factor that affects export performance of the country is policy changes which is used as dummy variables to show different regimes of the country which is integrated in export supply of the country. In Ethiopian exports did not show any change during imperial and Derg regime .Even though imperial government made different five years plan to boost export performance of the country did not achieved the goal .In Derg regime export is negatively affected because of unfavorable policy and restricted private sector enter in to export business .But as compare to imperial and Derg regime export sector shows some changes in the current regime because favorable policy which favor export improvement of the country since 1992 Ethiopia has taken different measures ,some changes in export performance have been registered during the post reform period .However, Ethiopia's share in the world total export is still very low, at 0.01 percent .Accordingly, the estimation results shows that policy changes have positive and significant effect on export performance of the country. This indicates that the government's policy changes in this regard met its intended objectives of the export sector growth of the country.

Table 3.2: Demand Equation Results

Variable	Coefficient	P-Value
Constant	0.0518087	0.001
d1lfi	-0.4173238	0.146
d1lepwt	0.522997 ***	0.002
d1lopp	-0.4281096 **	0.001
R2 =0.39, Prob>F= 0.0000 ,Obs =39		

***significant at 1% level, ** Significant at 5% level

The demand side equation results shows that all the variables are significant and expected sign except the foreign income proxied by the most trading partners GDP which is statistical insignificant at conventional level of significance. Since all variables are used in the logarithmic form, the estimated coefficients can directly be interpreted as logarithmic term elasticity. But foreign is found to be insignificant. The impact of FI on export performance insignificant similar to the finding of Amin (2007) for Ethiopia where the increases in the per capita incomes of our trading partners has no impact on the demand of export. However, the findings Prasad (2000), who argued the growth of foreign income, will not drive movement in developing countries export. This insignificant demand might be due to the possibility of substituting our exports either by producing at home or importing from other countries during adverse global shocks that may increase the prices of exports or reduce our production. Besides, the results also seem to confirm one of the two unanimously accepted arguments among scholars that "traditional export commodities of developing countries have low income

elasticity of demand". Thus we can argue that insignificant impact of foreign income on Ethiopian export which is characterized by export of primary products which is income inelastic. The intuition here is as income of Ethiopia's trading partners' increase, since majority of trading partners are developed nations, the income allocated to primary products is not be changed significantly because of the fact that the income allocated to finished and assembled product increases substantially. Because the nature of primary products exports in the world markets are set prices of that kind of products.

According to the estimation results indicated 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 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.

The results shows that real effective exchange rate has also appears to have a positive relation with export performance. In theory, Marshal-learner condition, real effective exchange rate movement is directly related with growth of export performance. An increase in the real effective exchange rates means real depreciation of the domestic currency, which makes exportable items cheap. Thus, according to this research output one percent change in real effective exchange rates results 0.52 percent change in the total export value of Ethiopia. It is well known that exports of LDCs are price inelastic in the international market due to nature of the product that LDCs produces. Therefore this result confirms with fact. This positive and significant coefficient also shows that export may be influenced by exchange rate policy. Also results show that the devaluation of birr in terms of foreign currency improves export price competitiveness which leads to an increased export performance of Ethiopia.

4. Conclusion and Policy Implication

4.1. Conclusion

The empirical findings reveal that most of both demand and supply side factors are significant factors determining the export trade of Ethiopia. Among the supply side determinants, RGDP of Ethiopia, domestic price, dummy used to show different period are significant determinants of our export. The significant RGDP of Ethiopia suggests that the variable had a favorable influence on the export performance of the country. With increase in the overall domestic economic performance, the export sector also did better during the period under consideration. This suggests that some portion of real GDP might have been invested in the sector and possibly facilitated both the production and the marketing of the export commodities. The analysis also showed that domestic price is a crucial determinant of export trade in Ethiopia. Infrastructure is also another supply side

factors that affect export; the empirical result suggest that infrastructure facilities enhance export performance in addition to economic growth.

On the demand side, the study also identified that trade liberalization which is measured by openness has fairly larger (more than unity) and statistically significant impact on value of Ethiopian export. This implies there is high and growing outside demand for Ethiopian products. Hence, openness is an important determinant of our export earnings and the existence of trade liberalization seems to be the driving force behind the growth of our export during the study under consideration. Similarly, relative price is statistically significant and the coefficient implies that depreciation of real exchange rate relative to its trading partners would increases our exports, keeping other variables constant.

4.2. Policy Implication

The strong relationship between better export performance and economic growth suggests that countries should identify the important factors that directly and indirectly determine their export performance if they aim at pursuing sustainable growth and prosperity. The two major determinants of export, supply side and demand side factors are investigated in this study. The findings indicate that policy makers should give equal emphasis for demand and supply side factors to improve export performance of the country.

- Among supply side determinates real gross domestic product has positive and significant relationship with supply of export .Therefore, since RGDP has positive and statistically significant contribution to the value of exports, there is a strong need to allocate more of the real GDP to the export sub sector to improve the efficiency with which it is used to further enhance the contribution of real GDP in the promotion of the export sub sector of the country.
- This study has found that other supply side factors, particularly domestic infrastructure are important determinants of the country's export performance. Thus there needs to be further investment on infrastructure development to boost export. This pertains, in particular to improvement of telecommunication facilities in production areas and central market.
- Since export is found to be responsive to the domestic prices, improved domestic profitability might act as a significant limit for domestic producers to go for export business. Hence, this suggests that export sector need to be concerned about the direction of domestic prices against world price
- Finally export trade moved from developed countries such as Europe and America to developing countries like Africa and Asia. Policy makers should give attention why our export trade shifted from developed countries to developing countries and also they should evaluate the impact of this shifts on our export performance.

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