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Export Performance and Determinants in Ethiopia

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Acknowledgment

Acronyms

- EEA/EEPRI: Ethiopian Economics Association/ Ethiopian Economic Policy Research Institute
- FDI: Foreign Direct Investment Net Inflows
- GDI: Gross Domestic Investment
- GDP: Gross Domestic Product
- HDI: Human Development Index
- HDR: Human Development Report
- IMF: International Monetary Fund
- REER: Real Effective Exchange Rate
- TOT: Terms of Trade
- WAMZ: West African Monetary Zone
- WB: World Bank, International Bank for Reconstruction and Development
- WDI: World Development Indicators
- GNI: Gross National Income

Abstract

In this study analysis of factors affecting export supply of Ethiopia, during the period 1981 – 2004, have been made using co integration analysis. Data trend reveals that Ethiopian export performance was highly volatile during the period, on average merchandise exports have been growing at 7% per annum, while manufacturing exports were growing at 4% per annum. The trend also reveals that Ethiopia's export sector is mainly dominated by few primary commodities, where manufacturing exports account for less than 15% of merchandise exports on average.

The two models estimated depict that merchandise export volumes are significantly influenced by gross capital formation (proxy for production capacity) and share of trade in GDP (proxy for trade liberalization) while other variables; terms of trade, real effective exchange rate, foreign income, and foreign direct investment were found to be insignificant. Manufacturing exports equation reveals an interesting result, manufacturing exports supply was found to be negatively & significantly affected by foreign income. Similar to merchandise export results, manufacturing exports were also found to be positively affected by gross capital formation. Terms of trade, real effective exchange rate, share of trade in GDP, and foreign direct investment were found to be insignificant. The study concludes with recommendations to increase share of manufactured exports and diversify export base of the country.

1 Introduction

1.1 Background

Ethiopia has been showing a remarkable growth during the recent years starting from 2004 where annual GDP growth rate was above 10% and where also the country was among the best performers in GDP growth.[2] According to WDI 2008 country profile, Ethiopia has a population of 77 million with annual growth rate of 2.6% in 2006. In the same year national poverty rate was 44%, Gross National Income was 12.9 billion US$ where as GNI per capita was 44 US$. The country has a life expectancy at birth of 52 years. HDR 2009 report gives the country a rank of 171 with an HDI of 0.414.[3]

Ethiopian economy is highly dependent on agriculture, though its share is declining now. In 2006, value added in agriculture accounts for 47% of GDP while industry and services account for 13% and 39% respectively. The country is gradually liberalizing its economy. Share of merchandise trade in GDP increases from 11.4% in 1990 to 42.1% in 2006. Exports account for 16% of GDP while imports account for 42%.[4]

Ethiopia has been exporting mainly traditional exports. Merchandise exports have been growing at an average rate of 7% during 1981 -2008 while manufacturing exports were growing at an average rate of 4%. Real merchandise exports were 1.16 billion USD$ in 2008, while manufacturing real exports were 92.3 million USD, 8% of merchandise exports. Merchandise export revenue was highly dependent on non manufacturing exports, where the average share of manufacturing exports during 1981 – 2008 was around 14.4%. (Own computation using data from WDI)

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[2] GDP growth was 13.6% in 2004, 11.8% in 2005, 11.3% in 2006, 11.1 in 2007 & 11.3% in 2008, source is WDI 2009
[3] Human Development Report 2009
[4] WDI 2008

1.2 Statement of the Problem[5]

Though Ethiopian real merchandise exports have been growing at an average rate of 7% during the study period, Ethiopian export sector is still small[6] (passing 1 billion US$ only after 2005) where merchandise exports reached only 1.1 billion dollar in 2008. Despite high growth rate of exports the country's trade deficit has been increasing by an average rate of 7% and reached a value of 1.9 billion dollars in 2004. Ethiopian export is still highly dependent on non manufacturing exports. Manufacturing exports share declined from that of 20.5% in 1981 to 8% in 2008. Export revenue according to MOFED data were highly dependent on few commodities, where Coffee, Chat, Oil Seeds, Hide Skin and Flower accounted for 78% in average.

High dependence of exports on primary exports has many drawbacks for the country. First, traditional exports have been dominated by declining terms of trade which made export earnings not to increase well enough despite increased export volumes, despite the recent spikes in value of traditional exports. This can be revealed from the fact that unit value of exports was 116 in 1981 while it declined to 81 in 2004 showing nearly a 30% decline in 24 years. Secondly, exports of traditional exports do not have much linkage effects in the economy because mostly they are sent raw.

1.3 Objectives

This paper mainly addresses two purposes. First the paper will try to reveal the performance & trend of merchandise (&manufacturing) exports during 1981 – 2008. Second the paper will analyze the determinants of export performance, real merchandise & manufacturing exports during the period 1981 – 2008.

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[5] Numbers used are taken from WDI 2009
[6] Looking at 2006 data, current merchandise exports were 3.4 billion US$ for Kenya, 5.6 billion for Sudan (Oil) and 1.6 billion for Tanzania while 1.01 billion for Ethiopia

1.4 Scope of the Study

The study analyzes determinants of export performance, real export values, during the period 1981 – 2008. Leaving aside the short run dynamics, the study will try to analyze what has determined export supply during 1981 – 2004 (Data trend work is mostly done for 1981 – 2008, but regression analysis is done for 1981 – 2004 because real effective exchange rate was not available after 2004. The period has been chosen due to lack of data for Ethiopia before 1981.

1.5 Significance of the Study

Lower export revenues not only mean lower income to exporters & their employees, but it also means lower capacity to import. By revealing export determinants and export trends the paper will try to reveal the influential factors in Ethiopian exports a. The paper will also broaden the understanding on the subject matter and hence will initiate further dialogues & research on the sector.

1.6 Limitations of the Study

The study faces the following limitations. First, due to lack of market access data for the study period, it was available starting from 1996, the impact of market access on Ethiopian exports were not included in the study. Second, the impact of tariffs on exports was also not analyzed due to lack of data for the whole sample period (But tariffs were found to have the expected impact, a significant negative coefficient, when the regression is made for 10 years for which tariff data was available).

1.7 Organization

The study is divided into five main sections. Following the introduction, chapter II will make review of literature. In chapter III, data trends will be

revealed. In chapter 4, the research methodology will be revealed and analysis of empirical findings will be made. In the last section, conclusions and recommendations will be made.

2 Literature Review

Sonia Munoz (2006) on her/his study made on the impact of parallel market and governance factors on Zimbabwe's export performance used data from 1984 Q1 – 2004 Q4. The study used merchandize export data figures to Zimbabwe's 10 most trading partners. The researcher used the Imperfect Substitutes Model proposed by Goldstein & Khan (1985) to analyze the data

The model used real exports of Zimbabwe to country i as an explanatory variable while it employs real & parallel exchange rates, Industrial production index of country i, as a proxy for foreign income and other qualitative variables to account for corruption, bureaucracy quality, democratic accountability, economic risk, internal conflict, ethnic tensions, law and order, and investment profile.

The researcher estimated the export demand equation using a panel data model with random effects. According to the results elasticity of official exports with respect to official exchange rates were found to be 0.11, while with respect to parallel exchange rates it was found to be -0.26. Both elasticity coefficients were significant. Foreign income was found to be insignificant in affecting export demand. Among the qualitative variables incorporated ethnic tension was found to affect export performance significantly.

Aggrawal (2001) in his study of the impact of multinational enterprises on India's export performance used panel data from 1996 - 2000 over 916 firms classified into 30 industries. The study tested two hypotheses; 1) *do MNE affiliates perform better than their local counterparts in the export market in a liberalized market 2) MNE affiliates have greater comparative advantage in high-tech than in low & medium – tech industries*

The results from the first regression designed to show the determinants of inter-firm variations in export performance showed that MNE affiliates perform better than their local counterparts hence validating the first hypothesis. The results also suggest that firm size, import of raw materials & capital goods and R&D to have positive & significant impact on export performance, while workers skill & purchase of technology were found to have a negative & insignificant impact.

The results from the second regression intended to analyze Industry group-wise determinants of export performance rejects the second hypothesis made in the study. The variables showing MNE impact, i.e. Foreign Equity share & emerged insignificant for the high-tech industry group, but being weakly significant for medium-tech industries. In low-tech industries the impact of Foreign Equity was found to be positive & significant. Similar to the first results in the Industry group wise analysis import of capital goods & raw materials turned significant to all firms , though the latter turned insignificant in low-tech industries.

R&D variable were found to be positive & significant in medium-high tech industries, but insignificant in others. Though skill was found to be insignificant in the sample for all firms, it was found to have a positive & significant impact for firms in the high-tech industry group. Agraawal (2001) concludes the results by stating the following;

> *"It was found that the export performance of firms was linked strongly with firm size and imports of raw materials and components in almost all technology groups."*

On a study done on analyzing the impacts of trade liberalization on Sub-Saharan African export performance Babatunde (2009) used panel data set from 1980 – 2005. The results from the model are given in the next table.

Variable	Fixed Effects Regression	Random Effects Regression
Country productive capacity	Positive but insignificant	Positive but insignificant
REER overvaluation	Positive & significant	Positive & significant
Real Effective Exchange Rate(REER)	Negative & insignificant	Negative & significant
Tariff	Negative & insignificant	Negative & insignificant
Import of raw materials	Positive & statistically	Positive & statistically

Babatunde(2009) summarized the results as follows

> "The panel evidence supports the view that the real effective exchange rate is an important factor affecting export performance in SSA. Trade liberalization can be said to affect export performance indirectly through the increased access to imported raw materials."

In a study designed to analyze the impact of independent exchange rate policies of the WAMZ (West African Monetary Zone) participating countries on export supply, Balogun (2007) used a panel data set from 1990:1 to 2004:4 for 5 members of WAMZ. The model used nominal exports as dependent variable while nominal exchange rate, real domestic income, real foreign income and domestic & foreign price levels as explanatory variables.

The results from the total export function of WAMZ countries shows that export performance is positively influenced by domestic output, export prices and exchange rates while foreign income is found to affect export performance negatively. Though nominal exchange rate was found to be positive & significant, it was found to be inelastic (coefficient = 0.15) indicating that export performance of the region is limitedly responsive to exchange rate changes.

The study also made individual regressions for WAMZ member countries in order to see the validity of the aggregate results on individual basis. Similar to the aggregate pooled results, for Nigeria & Gambia, exchange rate was found to have a positive & significant impact on export performance, but it was also found to be elastic in the case of Gambia. Export performance of Gambia was found to be negatively influenced by income (domestic & foreign), while it was positive for Nigeria.

Contrary to the panel result, export performance of Ghana &Guinea was found to be unaffected by exchange rate changes. Ghana's export performance was found to be positively influenced by domestic output while Guinea's export performance was found to be positively influenced by export price. Results from Sierra Leone regression were contrary to the theory, export price & exchange rate devaluations were found to have a negative & significant impact while import prices a positive & significant impact.

A more comprehensive study on African countries Mold & Prizzon(2008) used a dynamic panel data set for 48 African countries over the period 1987 – 2006 to identify the key determinants of export performance.

The results from the pooled regression reveal that unit price of exports, real effective exchange rate, taxes on trade and diversification index to affect export volumes negatively and significantly while income per capita, and share of manufacturing in GDP & FDI inflows as a percentage of GDP to affect export volumes positively & insignificantly during the period 1987 – 2006. A periodic analysis of the same data shows that elasticity of unit price of exports were significant(126%) & negative during 1987 – 2001 while positive & insignificant during 2002- 2006.

To avoid the endogeneity problems the researchers used a dynamic panel using a GMM estimator. The results from the GMM model showed similar results; price of exports affects export volume negatively & significantly

(though now its elasticity is lower, 41%) Similar to pooled OLS results income per capita, share of manufacturing in GDP & FDI inflows as a percentage of GDP to affect export volumes positively & insignificantly. Contrary to the pooled OLS results, as a result of accounting for endogeniety by the GMM model, though still negative in sign, real effective exchange rate, trade taxes and diversification index were found to affect export volume insignificantly.

Finally Mold & Prizzon (2008) conclude the research making the following conclusions:

> *"Finally, our analysis drives home the important point that it is not enough to export greater volumes – what matters is the ability to capture "rents", in the Schumpeterian sense. Even if the income terms of trade are positive, if technical progress is low in primary production, then growing export quantities may have a high opportunity costs in resource terms…."*

A more comprehensive study by Fugazza (2004) used data for 84 countries from 1980 – 1999. The researcher used real exports as dependent variable while real gross domestic product, population, foreign market access, internal transport access & export sector competitiveness, depicted by real exchange rate and institutional quality as independent variables.

Among the factors showing supply capacity, GDP was found to have a positive & significant impact on export performance though less the elasticity is less than 1. Population was found to be insignificant. Internal transport access proxied by % of paved roads was found to have varied impact through time to time & also through period. It was found to have a significant positive impact on export performance over 1988-1991 for the weakest export performers while it becomes significant for all quantiles after 1991 but more significant for weak export performers.

Similar to % of paved roads real exchange rate was found to affect export performance significantly but only for the weak export performers. Foreign direct investment, which may show technological upgrading & improved capital formation, was found to have a significant positive impact at all levels of export performance. Institutional quality was found to be insignificant in affecting export performance except for the period 1992- 1995. Finally, the results from the model show that foreign market access has a significant positive impact on export performance though its impact declines as export performance increases.

Agasha(200_) used VEC model to analyze the determinants of export growth rate in Uganda. The researcher used quarterly data from 1987 – 2006. The researcher estimated export growth rate as a function of Gross Domestic Product, Terms of Trade, Real Exchange Rate, Foreign Price level & Foreign Direct Investment. The results from the long run co-integrating regression show Gross Domestic Product, Real Exchange Rate & Terms of Trade to affect export growth rate positively & significantly while Foreign Price level were found to affect export growth rate negatively & significantly. FDI was found to be insignificant.

Edwards & Alves (2005) in their analysis of determinants of manufacturing export supply in South Africa used a panel data set of 28 manufacturing sectors using import substitution model. The researchers used dynamic fixed effects (DFE) & Generalized Method of Moments (GMM).

The results from the export demand equation estimated to check whether the small country assumption holds for South Africa shows that South Africa is a price taker. The results from the equation estimated on export supply determinants reveal that South African total manufacturing export volume is positively & significantly influenced by relative prices(i.e. real effective exchange rate),real foreign income, skilled to unskilled labor ratio and

import penetration and rail capacity. On the other hand output deviation from the trend was found to have a negative significant impact, supporting the vent for surplus hypothesis for South Africa. Unit labor costs and output trend were found to have insignificant influence on manufacturing export performance.

On a study made on the factors affecting export performance in 3 different export categories; total merchandize exports, manufacturing exports & exports of machinery & equipment on nine East & South East Asian countries; China, Hong Kong, Korea Republic, Malaysia, Philippines, Singapore, Taipei, Thailand & Indonesia, Jongwanich (2007) used quarterly data from 1990 – 2006. The researcher used Imperfect Substitutions Model & estimated the model using General to Specific Modeling procedure due to variables being stationary in different orders.

Results 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 & 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 & transport equipment & lowest impact for merchandize export.

Though the impact of world demand on other countries' export has been significant, 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. Production capacity was found to affect positively & significantly all countries exports in all categories with elasticities nearly above 1 in all cases.

Mulualem (200_) on his study of determinants of manufacturing performance in Ethiopia used Ordinary Least Squares (OLS) estimation method using annual data from 1970 – 2004. The results from the model reveal that Ethiopian manufacturing exports are positively & significantly influenced by investment to GDP ratio, total factor productivity and foreign income while real effective exchange rate was found to have insignificant influence on exports.

Recent studies on export have concentrated on the impacts of trade facilitation reforms on export performance. A study made by Poutugal-Perez & S.Wilson (2010) analyzed the impact of hard infrastructure (roads, ports, airports, rail infrastructure and information communications technology) and soft infrastructure (efficiency of customs & domestic transport and business regulatory measures & transparency) on export performance of 101 countries during 2004 -07. The results from the study reveal that an improvement in hard and soft infrastructure leads to more exports. Investments on physical infrastructure were found to have a positive impact on exports, but declining as per capita income increases, on the contrary investments in ICT were found to have more impact on richer countries. Soft infrastructures were also found to affect exports positively.

Another study made on the impact of inland transit delays, documentation, and customs & port delays on Sub-Saharan Africa export performance made by Freud & Rocha (2010) founds that inland transit time delay to have a significant negative impact on exports while customs & ports time and documents time were found to have a smaller impact. The researchers conclude the results as follows.

> "Our results imply that while inland transit delays have a robust negative impact on export values, higher times in other areas have much smaller effects in reducing Africa's exports. A one day increase in inland transit time reduces exports by 7 percent on average. Put

another way, a one day reduction in inland travel times translates into nearly a 1.5 percentage point decrease in all importing-country tariffs. In addition, this effect is higher for time-sensitive goods compared to time-insensitive goods. We show that long times are associated with high uncertainty in road transport, which jeopardizes exporters' delivery targets."

3   Data Trends

3.1   Export Trend during 1981 – 2008

As the graph below shows, real merchandise & manufacturing exports has been steadily improving during the period 1980 – 2008 but with ups and downs during 1980 – 1998. The countries total merchandise export (real value) reached a value of 1.16 billion dollars in 2008 from a value of 347 million in 1981 showing an average growth rate of 7% per annum. Manufacturing exports in Ethiopia has increased from a value of 70.97 million in 1981 to 92.3 million dollars in 2008 showing average growth rate of 4% per annum. (In the graph left axis is for manufacturing exports while right axis is for merchandise exports.)
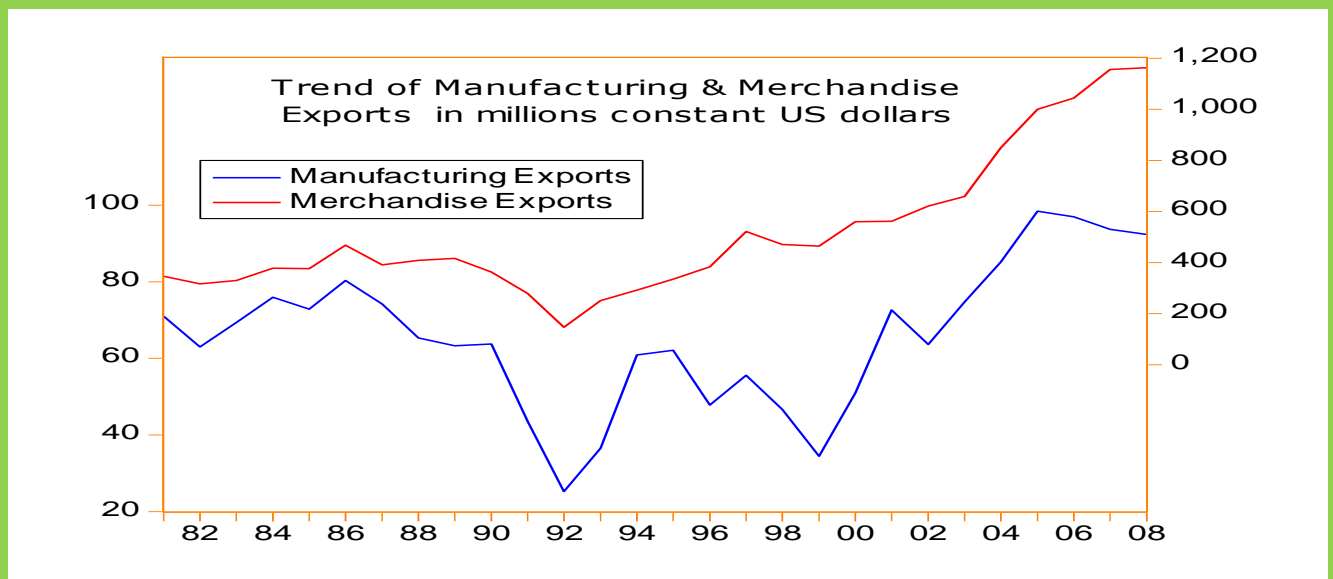
Figure 1, Trends in Exports during 1981 - 2008

Looking at growth rates, in the next figure, reveals that real export growth was highly volatile in Ethiopia during the study period. Merchandise exports have been growing at average rate of 7% per annum while manufacturing exports were growing at an average growth rate of 4%.
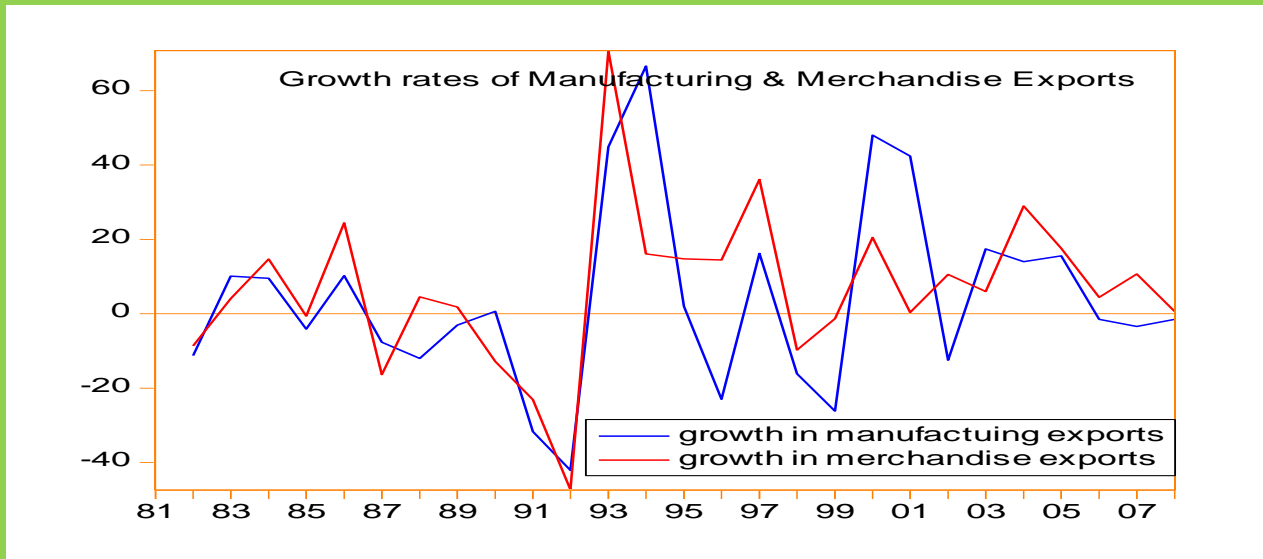
3.2 Structure of Ethiopian Export in Terms of Volume[7]
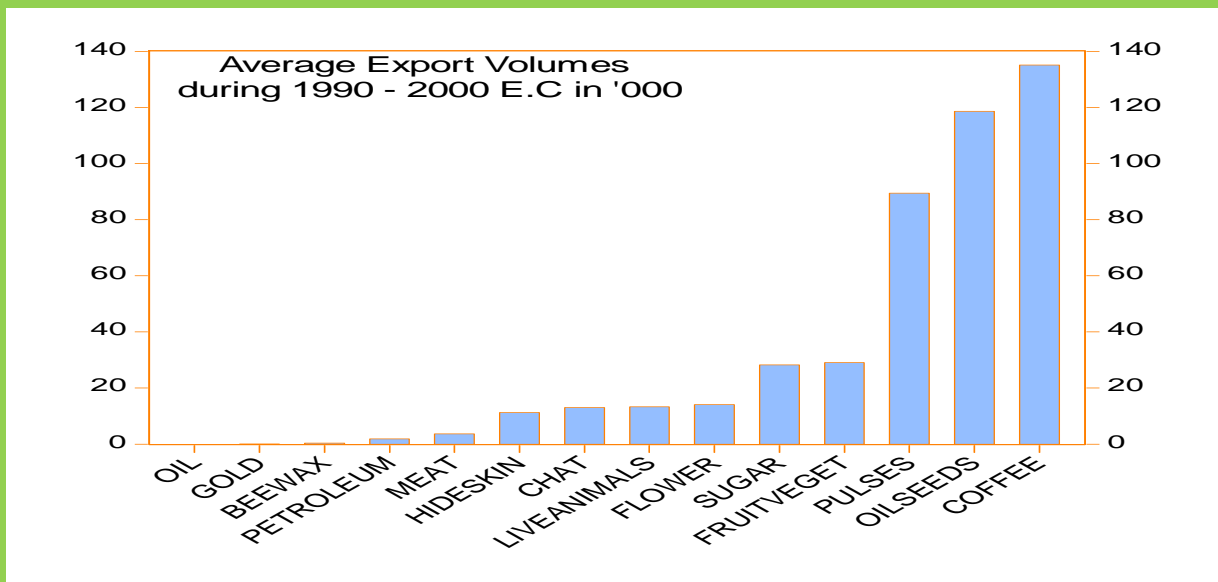
Figure 3, Export Structure of Ethiopia in metric tons, drawn using data from MOFED

The above graph clearly shows that most of Ethiopia's exports are primary products, and also the share of manufactured products such as metals are very small in total (except sugar which is fifth in rank). In terms of value still

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[7] Data was available from 1977 to 2000 , but only data after 1990 is used to hide the impact of petroleum exports which vanishes after 1990,

exports are highly dependent on primary products as the graph below reveals.
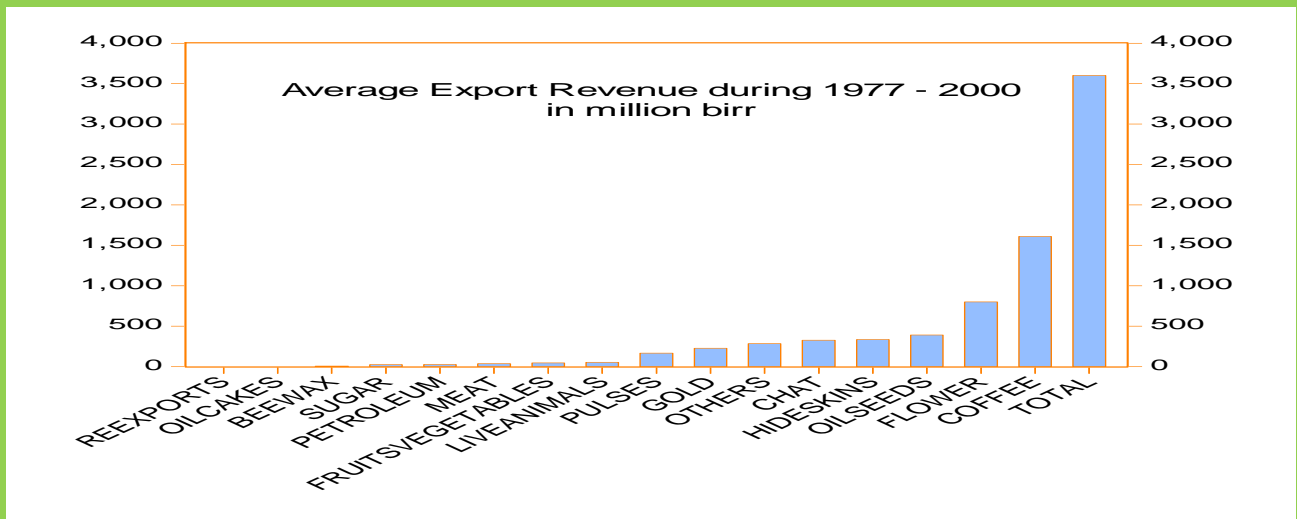
Figure 4, Export Values Average Trend

Using this same MOFED data reveals that from 1970 to 2000 E.C (1984/85 to 2007/08) five major export items of Ethiopia; Coffee, Flower, Oilseeds, Hide Skins & Chat, account on average for 78% of export revenue, the graph below gives details on each year.
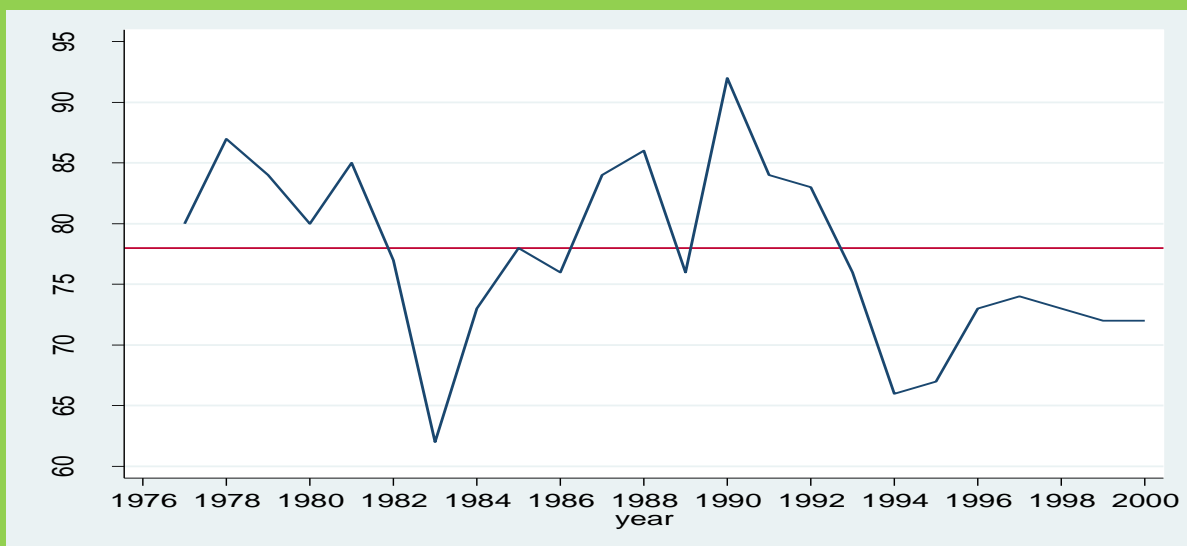
Figure 5, Share of Major Export Items in Export Revenue, drawn using MOFED data

The following main points can be inferred from the export trends.

1. Ethiopian Merchandise export structure still remains undiversified. On average five commodities; Coffee, Flower, Oil Seeds, Hide Skins & Chat account for 78% of export revenue. The dependence of export revenues on few commodities has made Ethiopia's export performance highly volatile depending on the performance of the major commodities. These products are mainly primary products with fewer linkages in the economy and also declining prices internationally, though there are up swings.

2. Manufacturing exports are showing a lingering growth in Ethiopia where their share in total exports declines from 14%[8] in 1981 to 4.6% in 2004. Similarly share of manufacturing in merchandise exports declined from 20.5% in 1981 to 8% in 2008. This has potential implications for Ethiopia. First it implies that growth in manufacturing exports is week while in non manufacturing exports, primary products, is high. The graph below shows the trend of manufacturing share in merchandise exports. Second it implies that Ethiopia's exports are not much value adding & linkage creating in the domestic economy, because primary exports are mostly raw exports or exports with minor processing.

Figure 6, Share of Manufacturing Exports in Merchandise Exports

[8] The percentages are own computations using the data

3. The final implication which is the result of the higher share of non manufacturing exports in Ethiopia is the disparity between real exports growth and export revenue growth. Though merchandise exports have been growing at an average rate of 7% (6.78%) during the study period, merchandise export also revenue grows only at an average rate of 6.54% which signifies that Ethiopia's export products value were not at least increasing which is mainly the result of high nonmanufacturing export share.

4. Lower share of manufacturing exports also implies that Ethiopia's export sector doesn't play a huge role in creating employment and linkage effects in the economy since primary product exports are with less linkages and lower employment generating capacity. In addition, concentrating on non manufacturing exports has made the country not to get the benefits of manufacturing exports; transfer of technology & capital, development of industries related with export industries, and others.

4 Econometric Model and Estimation

4.1 Econometric Model

Imperfect Substitutes Model used by many researchers to analyze export determinants has been used for this study. According to the model export function is estimated by simultaneously estimating export demand and supply equations.

In this study export demand and supply equations will be simultaneously estimated assuming Ethiopia is price taker. Export demand is positively influenced by nominal exchange rate of the exporter, real income and foreign price level while it is negatively influenced by export prices. The demand equation is given below.

$$X^d = b1 - b2*p_x + b3*e + b4*P_f + b5*Yf \ldots\ldots 1(\text{demand equation})$$

Where X^d is export demand, p_x is domestic price of exports, e is nominal exchange rate, P_f is foreign price level, Yf is real foreign income and b's are the coefficients.

Export supply is on the other hand positively influenced by domestic export prices and negatively influenced by domestic price level. Export supply is also affected by other variables such as production capacity, trade liberalization, tariffs, infrastructure costs, trade facilitation measures and others. Export supply equation is depicted below.

$$X^s = a1 + a2*p_x - a3*p_d + a4*z\ldots\ldots\ldots\ldots 2(\text{Supply Equation})$$

Where x^s is export supply, p_x is domestic price of exports, p_d is domestic price level, and z is a set of other variables which affect export supply such as production cost, trade liberalization, production capacity & others. Taking

market equilibrium $x^d = x^s$ and taking the price taker assumption finally results into the following model.

X = c0 + c1*gcf + c2*reer + c3*gdpf + c4*trshare + c5*O..........
Export Supply Equation

Where X is real exports, gcf is real gross capital formation, reer is real effective exchange rate, gdpf is gross domestic product of Ethiopia's major export partners, trshare is trade as a % of GDP used as a proxy for trade liberalization, O is a variable depicting other variables such as terms of trade, road network, energy and foreign direct investment.

Export supply is affected by the producers production capacity, real gross capital formation of Ethiopia is used in the model as a proxy for production capacity of Ethiopia. Though real gross domestic product also can be a proxy for production capacity gross capital formation is used to avoid endogeinity between GDP and exports. Relative prices, depicted by real effective exchange rate, are important determinants of export supply. This is because increase in relative export prices decrease demand for Ethiopia's exports while decrease results in the reverse result. Though the impact of trade liberalization on export performance is mixed on the empirical arena, theoretically trade liberalization is expected to have a positive impact on export performance. This because more openness results in less distorted prices & less protectionism which reduces anti-export bias and results in a strong supply response of the export sector. Share of trade in GDP is used as a proxy for trade liberalization.

Other variables also affect export supply. One o this is terms of trade, terms of trade was included to check whether Ethiopia exports more to reap the benefits of improved terms of trade for its products or export less when terms of trade increase just to achieve the target revenue. Foreign direct investment is expected to affect exports positively through various ways

such as increased access to foreign capital, technological transfer, better marketing knowledge & others. Infrastructure provision also highly influences export performance, roads influence exports through reduced transportation cost & time, similarly energy infrastructure also influence export performance. In this study the impact of foreign direct investment, road network and energy investment were found to be insignificant & were excluded from the final model[9], but the model including also the above variables is given in the appendix.

4.2   Estimation

In this section the estimation of the two long run equations will be made. First merchandise exports equation and then manufacturing exports equation. When estimating the three equations time series properties of the data will be accounted for to avoid for spurious regression. As Gujarati (2004) puts it regression on non stationary data may lead to a spurious regression if the variables are not co-integrated.

In estimating the equations unit root tests was be made on the levels of the variables and if all are not found stationary unit root test will be made on the first difference of the variables and the estimated equation will be checked for cointegration. Unit root test was done on the variables included in the two equations and they were found to be stationary at first difference, unit root details are below. (The results given in the table in the next page are for stationarity test with trend & constant but the results are also the same for the other groups (the significance does not vary), i.e. with constant, with trend and no constant & trend)

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[9] It is hard to say that infrastructure investment are insignificant because number of observations reduces to 14, that may be one reason why the impact seems insignificant.

Table 1, Unit Root Test Summary Results with trend & constant

Variable	Level	First Difference
Real Merchandise Exports	0.83	0.00
Real Manufacturing Exports	0.69	0.00
GCF (Gross Capital Formation)	0.49	0.00
Foreign GDP (gdpf)	0.24	0.01
Reer (Real Effective Exchange Rate)	0.30	0.01
Tot(Terms of Trade)	0.89	0.00
Trshare (Share of Trade in GDP)	0.92	0.00

The data used for the study is taken from World Bank Macro data found on EEA/EEPRI data CD, African Development Indicators from World Bank Macro data found on EEA/EEPRI data CD and World Bank online data and WDI 2008 CD.

4.2.1 Determinants of Merchandise Export Performance

Similar to that of total exports the residual from the merchandise equation was found to be stationary at 1%. The regression result is as follows:

Table 2, Determinants of Merchandise Export Performance long run equation

	b	se	t	p
lngdpf	-0.90052	0.60066	-1.49922	0.151151
lnreer	0.142525	0.171165	0.832674	0.415941
lntot	-0.16478	0.125585	-1.31207	0.205985
lngcf	0.886103	0.181881	4.871892	0.000123
trshare	0.02086	0.007649	2.72703	0.013833
_cons	9.279489	5.012459	1.851285	0.080607

The model has an adjusted R-squared of 0.91 and significant F-value. The model passed all specification tests; except Hetroskedasticity and Ramsey's omitted variable tests, including normality, serial correlation & multi co linearity.

The manufacturing exports equation was also found to be co-integrated. The residuals were found to be stationary at 1%. The model was found to have an R-square of 0.66. The model was found to pass multi collinieary, autocorrelation, normality and omitted variables test. The model is estimated using robust estimators due to the prevalence of Hetroskedasticity.

	b	se	t	p
lngdpf	-2.93415	0.677031	-4.33385	0.0004
lnreer	-0.1322	0.248953	-0.53101	0.601903
lntot	-0.65047	0.425407	-1.52904	0.143637
lngcf	0.734089	0.244487	3.002568	0.007643
trshare	0.001807	0.012391	0.14587	0.885645
_cons	34.03607	8.846255	3.847512	0.00118

Table 3, Determinants of Manufacturing Exports

4.3 Empirical Analysis of Findings

In this section analysis of the results of the previous section will be made. The summarized result of the three regression equations is given below.

Explanatory Variable	Real Merchandise Exports	Real Manufacturing Exports
Gross Capital Formation	0.88*	0.73*
Real Foreign Income	-0.90****	-2.9*
Real Effective Exchange Rate	0.14****	-0.13****
Terms of Trade	-0.16****	-0.65**

Explanatory Variable	Real Merchandise Exports	Real Manufacturing Exports
Share of Trade in GDP	0.02*	0.001****

Table 4, Summary Regression Table

Note: * significant at 1 %, ** significant at 5%, *** significant at 10% and **** insignificant

1. Merchandise Exports Equation

As the results in the previous section shows Ethiopian real merchandise exports were found to be positively & significantly influenced by gross capital formation and trade liberalization, share of trade in GDP while all the other explanatory variables were found to be insignificant

The positive & significant association of production capacity, proxied by gross capital formation, and exports is in conformity with most empirical findings, such as Balogun (2007), Fugazza(2004) , Agasha (200_) and Edwards & Alves(2005), were proxies for production capacity were found to have a positive & significant impact on export supply. The positive association between production capacity and exports might have come from the fact increased gross capital formation results in more production capacity and capital to the economy, so that output(export) increases.

Contrary to theoretical expectations, foreign income was found to have an insignificant impact on exports. This impact may arise from the export structure of Ethiopia. Ethiopia is exporting primary products which are income and price inelastic which mainly indicates that export supply is not directly influenced by foreign demand factors. Similarly **Ethiopian real merchandise exports were found to be influenced insignificantly &**

positively by real effective exchange rate. This insignificant impact of relative prices on export supply might be the result of undervalued exchange rate, price inelastic exports (primary products mostly) and weak domestic demand of export commodities.

Terms of trade has been included to test whether favorable terms of trade inhibits Ethiopia to export more. **The results from the model reveal that export supply is not affected by fluctuations in terms of trade.** This insignificant impact of terms of trade goes opposite to that of Agasha (200_) who found a positive impact of terms of trade on Uganda's export growth rate. The insignificant impact of terms of trade on exports might have come from two sources. First terms of trade was depicting a constant trend during most of the study period (it stayed at a value of 121 for 10years (nearly 42% of the sample period), this lack of variation in TOT might have made it to have an insignificant impact on exports. Second, exports in Ethiopia might not be TOT insensitive; i.e what is produced for export is exported despite lower TOT because either the product can't be sold in domestic market at attractive price or the foreign exchange is needed.

Trade liberalization proxied by share of trade in GDP was found to have a positive & significant impact on exports. This result might have come from the fact that increased trade results in more access to imported capital, knowledge, avoids distortions in the economy and makes capital available to export sector. **Though not included in the table, foreign direct investment, road network (result is hard to accept for road because sample size gets to 14) and commercial energy use were found to be insignificant in affecting merchandise export supply.**

2. Determinants of Real Manufacturing Exports

Similar to the result on Merchandise exports production capacity, proxied by gross capital formation, was found to significantly influence manufacturing exports. The difference is the elasticity is higher for merchandise exports (0.88 vs 0.77)

Contrary to Merchandise exports result, Manufacturing export supply was found to be negatively & significantly influenced by foreign income. This negative result was opposite to that of Mulalem (200_) on Ethiopian manufacturing exports. The negative association of exports & foreign income might show that Ethiopia's manufacturing exports are inferior exports to foreign customers, but this is hard to justify without a deep analysis of manufacturing exports. Or it might be due to the weighted real foreign income might not be a good proxy for our manufacturing products importer nations' real income.

Similar to the results for merchandise exports real effective exchange rate was found to have an insignificant impact on manufacturing export supply. Contrary to Merchandise export results, terms of trade was found to have a significant negative impact on export supply. Though this result is contrary to expectations, it might have come from lack of variation in our TOT data. **Finally, trade liberalization was found to have an insignificant impact on manufacturing exports though significant for merchandise exports.** The insignificant impact of trade liberalization on manufacturing exports might come from two sources. First since trade liberalization results in domestic imports of cheap products produced by manufacturing industries abroad, it might reduce the ability of domestic firms to achieve economies of scale in production. Second, since manufacturing export growth has been sluggish it might not been capable of reaping the benefits of more trade.

5 Conclusions and Recommendations

5.1 Conclusions

In this paper analysis of determinants of export performance for Ethiopia during 1981 – 2004 period has been made in two categories of exports, real merchandise exports and real manufacturing exports.

The impact of production capacity, proxied by gross capital formation, foreign income, real effective exchange rate, trade liberalization, proxied by share of trade in gross domestic product, terms of trade, foreign direct investment, and commercial energy use & road network on real export of merchandise and real manufacturing exports has been analyzed.

The two models estimated were found to have higher Adjusted R-squared, significant F-values, free from collinearity and serial correlation. The residuals from the model were also found to follow normal distribution which signifies the use of OLS in the estimation. Due to Hetroskedasticity both models were estimated using robust standard errors.

Gross capital formation, a proxy for production capacity, was found to significantly & positively influence the two groups of exports being significant at 1% for both. This significant impact of gross capital formation on exports implies that Ethiopia can enhance its export supply through increased investment by increasing domestic productivity & output.

The impact of foreign income was found to be different on the two export groups. Real foreign income was found to have an insignificant impact on merchandise exports while a negative & significant impact on manufacturing exports. Insignificant impact of foreign income on merchandise exports might be due to inelastic demand response towards primary commodity exports of Ethiopia. The negative impact of foreign income on manufacturing exports is hard to justify and it

might be the result of weighted foreign real income being a poor proxy for manufacturing product importer nation's income.

Real effective exchange rate, a representative for relative prices, was found to have an insignificant impact on merchandise and manufacturing exports.

Terms of Trade was found to have a significant negative impact on merchandise exports while insignificant impact on manufacturing exports. As theoretically expected, trade liberalization, proxied by share of trade in GDP, was found to positively influence merchandise exports while it was found to have an insignificant influence on manufacturing exports.

5.2 Recommendations

Based on the findings of the study and data trends the following recommendations are made.

- ✓ Since merchandise exports were found to be income inelastic in the study it is important for Ethiopia to concentrate on making exports more competitive both price wise and quality wise.

- ✓ The trend of exports during the study period reveals that Ethiopia has been mainly exporting primary products for which demand is price and income inelastic. It also depicts that real exports were highly volatile during the study period. Two important lessons can be taken from this, First Ethiopia must increase its manufacturing exports and hence diversify its export base both to reduce export earnings volatility and also increase its export revenue. Second, due to its low manufacturing export base, the country is importing more manufactured products. Thus increasing manufacturing exports is important not only for the export sector but also for the domestic sector.

- ✓ Foreign direct investment flow has been found to have a positive impact on export performance in different countries, (Aggrawal (2001), Mold & Prizzon (2008), though insignificant for Ethiopia. Ethiopia must try to attract more foreign direct investment not only to improve its exports, but also to bring in foreign exchange, capital, technology & other important resources such as market knowledge.

6 Annexes

Merchandise Exports Equation

	b	se	t	p	ci95
lngdpf	-0.90052	0.60066	-1.49922	0.151151	-2.16246,.3614187
lnreer	0.142525	0.171165	0.832674	0.415941	-.2170803,.5021302
lntot	-0.16478	0.125585	-1.31207	0.205985	-.4286212,.0990687
lngcf	0.886103	0.181881	4.871892	0.000123	.5039858,1.26822
trshare	0.02086	0.007649	2.72703	0.013833	.0047893,.0369309
_cons	9.279489	5.012459	1.851285	0.080607	-1.251296,19.81027
r2	0.917096	Where b is coefficient, se is standard error, t is t value, p is overall p value (of the F-statistics) and ci95 is 95% confidence interval			
p	4.39E-12				
N	24				

Unit Root Tests on The Residuals of Merchandise Equation , Cointegration Test

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. dfuller resmec

Dickey-Fuller test for unit root                 Number of obs   =        23

                         ─────────── Interpolated Dickey-Fuller ───────────
                Test          1% Critical       5% Critical      10% Critical
            Statistic            Value             Value             Value
─────────────────────────────────────────────────────────────────────────────
  Z(t)        -4.976            -3.750            -3.000            -2.630
─────────────────────────────────────────────────────────────────────────────
MacKinnon approximate p-value for Z(t) = 0.0000
```

1% critical value of Engle-Granger cointegration test is -3.96 but -4.976 (absolute value) is grater than the critical value thus the residuals are stationary for cointegration.

Manufacturing Exports Equation

	b	se	t	p	ci95
lngdpf	-2.93415	0.677031	-4.33385	0.0004	-4.356537,-1.511758
lnreer	-0.1322	0.248953	-0.53101	0.601903	-.6552273,.3908338
lntot	-0.65047	0.425407	-1.52904	0.143637	-1.544212,.2432808
lngcf	0.734089	0.244487	3.002568	0.007643	.2204408,1.247737
trshare	0.001807	0.012391	0.14587	0.885645	-.0242242,.0278391
_cons	34.03607	8.846255	3.847512	0.00118	15.45078,52.62136
r2	0.666739	Where b is coefficient, se is standard error, t is t value, p is overall p value (of the F-statistics) and ci95 is 95% confidence interval			
F	7.657547				

p	0.000519	
N	24	

Unit Root Tests on The Residual , Cointegration Test

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Dickey-Fuller test for unit root              Number of obs   =        23

                        ─────────── Interpolated Dickey-Fuller ───────────
                Test        1% Critical       5% Critical      10% Critical
             Statistic         Value             Value             Value
─────────────────────────────────────────────────────────────────────────
 Z(t)          -4.268          -3.750            -3.000            -2.630
─────────────────────────────────────────────────────────────────────────
MacKinnon approximate p-value for Z(t) = 0.0005
```

1% critical value of Engle-Granger cointegration test is -3.96 but -4.268 is grater than the critical value thus the residuals are stationary for cointegration.

Merchandise Exports Full Equation

	b	se	t	p	ci95
lngcf	0.809459	0.360432	2.245803	0.048524	.0063669,1.612551
trshare	0.019635	0.010573	1.856994	0.092973	-.0039242,.0431933
lnreer	0.133121	0.220355	0.604121	0.559219	-.3578608,.6241031
lntot	-0.18917	0.295341	-0.64052	0.536234	-.8472342,.468889
lngdpf	-1.64148	3.097374	-0.52996	0.607705	-8.542864,5.259895
lnfdi	0.011747	0.037359	0.314432	0.759655	-.071494,.0949876
lnenergy	0.429199	1.911254	0.224564	0.826841	-3.829342,4.687739
_cons	13.79434	17.89474	0.77086	0.458616	-26.07762,53.66631
r2	0.887564	Where b is coefficient, se is standard error, t is t value, p is overall p value (of the F-statistics) and ci95 is 95% confidence interval			
F	11.27702				
p	0.000495				
N	18				

Similar to the results of Merchandise exports full equation, commercial energy use and foreign direct investment net inflows were found to be insignificant in affecting manufacturing exports.

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[10] The paper has no year of publication, but since it has used data till 2006, it will be in the period after 2006 that's why I put it like 200_ (i.e. may be 2007, 2008 or 2009)

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