WHAT DETERMINES THE EXPORT PERFORMANCE OF ETHIOPIA: A TIME SERIES ANALYSIS

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This is to certify that the paper prepared by Nega Muhabaw, entitled: what determines the export performance of Ethiopia: a time series analysis, and submitted in partial fulfillment of the requirement of the Degree of Masters of Art in Applied Economic Modeling and Forecasting (Financial Policy Analysis and Planning) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

WHAT DETERMINES THE EXPORT PERFORMANCE OF ETHIOPIA: A TIME SERIES ANALYSIS

Nega Muhabaw

Addis Ababa University, November, 2013

This paper identified some of the main determinants of export performance in Ethiopia for the period 1974-2011.To test empirically the relationship between export performance and its major selected determinants such as terms of trade, trade openness, gross domestic product, real effective exchange rate, domestic credit and capital expenditure over a period.

The results from the econometric analysis revealed that all the above listed explanatory variables significantly affected export performance in the long run except capital expenditure. In the short run, terms of trade became insignificant and negative in sign which was unexpected. Capital expenditure was also insignificant like in the case of long run. However, except these two variables other variables were found to significantly affect the export performance of the country. On the other hand, out of the variables significantly affected export both in the long run and short run; terms of trade, trade openness, and real gross domestic product affected export positively as expected. Especially when we look at the magnitude by which trade openness affected the dependent variable both in the long run and in the short run positively and significantly, it can be regarded as one of the key finding in this study.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADF	**Augmented Dickey Fuller**
AIC	**Akaike Information Criterion**
CSA	**Central Statistical Agency**
DC	**Domestic credit**
DF	**Dickey Fuller**
ECM	**Error Correction Model**
GDP	**Gross Domestic Product**
IFS	**International Financial Statistics**
IMF	**International Monetary Fund**
LDC	**Least Developed Countries**
MDG	**Millennium Development Goal**
MoFED	**Ministry of Finance and Economic Development**
NBE	**National Bank of Ethiopia**
NEPAD	**New partnership for African development**
OLS	**Ordinary Least Squares**
REER	**Real Effective Exchange Rate**
TO	**Trade Openness**
TOT	**Terms of Trade**
UNCTAD	**United Nations Conference for Trade and Development**
UNIDO	**United Nation Industrial development**
USA	**United state of America**
USD	**US Dollar**
WTO	**World Trade Organization**

CHAPTER ONE

1. Introduction

1.1 Background of the study

Ethiopia has experienced strong economic growth in recent years. With real GDP growth at or near double digit levels since 2003/04, the country has consistently outperformed most other countries in Africa and expanded much faster than the continent-wide average. Real GDP growth averaged 11.2% per annum during the 2003/04 and 2008/09 period, placing Ethiopia among the top performing economies in Sub-Sahara Africa. This growth performance is well in excess of the population growth rate and the 7 percent rate required for attaining the MDG goal of halving poverty by 2015. Yet, a number of issues warrant the attention of policy makers.

The country's exports have also been growing strongly, averaging about 25.1 percent per annum since 2003/04. While coffee remains the largest source of merchandize export earnings, non-traditional exports have registered faster growth. As a result, the share of non-coffee exports rose from 40 percent in 1997 to 65 percent in 2008. In this regard, the growing demand by China and India for Ethiopia's non-traditional exports, such as sesame and other oilseeds, has contributed to the country's output and export growth. Indeed, the continued rapid expansion of both these economies is likely to sustain the growth in Ethiopia's exports in the medium term (Peter Mwanakatwe and Lamin Barrow, 2010).

Ethiopia's export sector is dominated by export of few primary commodities which include agricultural products mainly coffee, oilseeds, gold, chat, flower, pulses, live animals, and hide skins.

Ethiopia's Export Performance has reached remarkable in the recent few years that are it reached a never-before-seen level of $2 billion in the year of 2010. This export level is an impressive 38 percent increase from the $1.5 billion in exports registered in the previous year, and nearly three times the average annual export level of the prior decade (2000-2009).

In terms of growth rates, the fastest growing commodities (focusing on those with at least$10 million in annual sales) were gold (188 percent growth), live animals (72 percent growth), and textiles and clothing (67 percent growth) (own calculation from the raw data of ERCA's annual report, 2010).

Of course, the recent improvement in exports should not be exaggerated given the still modest scale of Ethiopia's exports when seen in a broader context. Export of goods in Ethiopia is only about 11 percent 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), and exports per person remain very low: only $24 in Ethiopia compared to $200 in Sub-Saharan Africa

and $580 in developing Asia. 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 (ERCA annual report, 2010 and IMF International Financial Statistics Report; (2010)).

1.2 Statement of the problem

Over the past two decades, developing countries have gradually increased their share in global trade. Asia and particularly China account for most of the change, which has been facilitated by diversification of exports. 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 (Bacchetta, 2007).

As cited from Abay and Zewdu(1999)Innate structural problems, weak policy frameworks and institutions, protection at home and abroad (IMF and World Bank, 2001), and the structure of African exports, which is characterized by dependence on primary commodities (Alemayehu, 2006; Biggs, 2007; UNCTAD, 2008) are considered as the reasons for Africa's poor export performance.

Like other African countries, Ethiopia has faced these problems for a long time. For instance, in 1983 the Provisional Government of Socialist Ethiopia noted that the basic constraints for Ethiopian exports include the low volume of exportable products, the limited degree of diversification of exports, which are made up mainly of unprocessed primary products, frequent economic crisis which substantially reduce the demand for and prices of primary products, artificial trade barriers by trading partners etc.

In response to the problem, Ethiopia has taken different measures such as export financing incentive schemes, export trade duty incentive scheme and duty free importation scheme to those wholly engaged in supplying their products to foreign markets. When compared to the pre-1991 period, the trade policy regime has become more liberal (Alemayehu, 1999). Owing to this policy shift some improvements in export performance have been registered. Trade statistics show that export earnings have increased during the post reform period. According to the Ministry of Trade and Industry (MOTI), the real value of export earnings increased from ETB 5 billion during the first six year period of the Derg regime (1973-1978) to ETB 39.7 billion in the last six years of the EPRDF regime (2000/1-2006/7).

Regarding the composition of exports, until the 1990s the Ethiopian export sector could be characterized as a 'three-commodity sector' consisting of coffee, hides and skins, and oilseeds and pulses. Between 1966 and 1996, on average 59% of the country's export earnings came solely from coffee (Abay and Zewdu, 1999). According to MOTI data, although coffee is still the dominant export item, since 2001/02 its contribution to total export earnings has declined to 30.6% in

2010. On the other hand, the share of non-coffee agricultural exports and major manufacturing export commodities (leather and leather products; textile; and agro processing products) has increased remarkably and reached 63.7%.

However, Ethiopia's share in total world exports is still very low, amounting to 0.01% in 2006 (WTO, 2007). In this regard, Alemayehu (1999) and Abay and Zewdu (1999) argue that Ethiopia's external trade has major problems both on the supply side – its dependency on few primary products, characterized by large fluctuations in volume; and a very high degree of concentration of exports on few commodities – and on the demand side – a low income elasticity for the type of commodities that Ethiopia exports, declining prices for its exports, and limited destinations for Ethiopian exports. Both supply and demand side problems are typical African problems: For example, more than 50% of African countries' export earnings are derived from only three principal commodities such as coffee, tropical beverages and cocoa (Alemayehu,2006). On the other hand, international organizations have often recognized that Africa's exports still face market access problems in the international markets (UNIDO, 2002; UNCTAD, 2008).

Different studies have been conducting on the same topic using different methods during different time and their result shows that there is a big contradiction on the determinants of export growth rate for developing countries as well as country specific results as a result policy makers' encountered problem in formulation of policy regarding the sector.

In addition to this a lot of changes are occurred in the overall the economy in the recent years that prompting need for further research to identify plausible determinants of export growth rate so that information is provided to the concerned authorities hence leading to the formulation of corrective policies to address the problem.

Having the above information , Even though there is a remarkable increase in the export sector it is not as intended and data shows that the export growth rate of Ethiopia is low as compared to African countries with similar features of economic structure and other features. So in considering those gaps, this paper tries to identify the key determinants of export performance in Ethiopia from 1974-2011 to come up with recent and reliable information that informs for responsible bodies and for deciding correct decision in policy making.

1.3 Objectives of the study

General Objective

The objective of this paper was to identify the significant determinants of export performance of Ethiopia with the aim of establishing the relationship between export and its determinant factors: terms of trade, trade openness, real effective exchange rate, real gross domestic product capital expenditure and domestic credit.

Specific Objectives

- Examining the relationship between export performance and its determinants.

- identify those qualitative factors and constraints hindering the growth of the export sector, and
- Suggest a possible recommendation for decision makers regarding how to promote export growth rate and informs other concerned bodies.

1.4 Significance of the study

Export unsteadiness affects the general performance of the economy. Ethiopia being a primary commodity (agricultural) exporting country is exposed price to fluctuations on the world market. The study is significant in identifying the major factors that affect the export performance of the country by bringing empirical evidence using time serious data analysis. In addition, the study is also significant in that it incorporates additional important variables determining the export performance of the country which have not been incorporated in other previous or recent studies including the study by mouze(2005), Birhanu(2005), lemlem(2008) and others. Furthermore, the study uses very recent data for empirical analysis. In general, identifying the determinants of export performance will help to provide information to the policy makers to enable them come up with the appropriate policy regarding the growth of the sector and the economy as a whole and will help broaden the understanding of determinants of export which will aid policy formulation to improve the performance and ultimately overall economic growth.

1.5 Scope of The study

The research will bound in studying the export performance determinants in Ethiopia: during the period 1974 – 2011 using annual data that obtained from the national bank of Ethiopia, Mofed and different websites. The period covers only the two regimes (Derg and EPRDF).This is because to make the study as up to date as possible.

1.6 Limitations of The study

The area, export performance determinants, being vast and crucial for growth and development, many determinant measures could be used for determining export performance. However, shortage of time was one of the limitations in conducting this research paper. Lack of organized data regarding general export performance determinants in Ethiopia another limitation of the study that imposed lots of work on the researcher in organizing different sorts of data to get consistent information.

1.7 Methodology of the study

1.7.1. Types of data and source

Secondary data will be used for the analysis that mostly obtained from NBE, MOFED, EEA, CSA, Ethiopian Investment Agency, UNCOMTRADE data base and other compiled sources.

1.7.2. Methods of Data Analysis

The available data will be analyzed using descriptive types of data analysis, model as per the data, graphs and charts. And also try to use Econometric model to see export performance and determinants in Ethiopia.

1.8 Organization of the study

The paper will be arrange and proceed as follow. Section two explains macro-economic performance of Ethiopian export. Section three will presents both theoretical and empirical literature. Model specification and description jointly with data detection and sources will be discussed in Section four. Section five will presents estimation of the model and analysis of the results. The last section is dedicated to conclusion and policy recommendation.

CHAPTER TWO

2.1 Macro-Economic Performance of Ethiopian Export

According to NBE annual report, Ethiopia's annual exports recently reached a never-before-seen level during 2011/12 amounted to USD 3.15 billion, about 14.8 percent higher than the previous fiscal year. Based on recent data on the composition of exports, this note reviews where this growth came from in terms of both supply-side factors (i.e., which commodities showed the largest increases) as well as demand-side contributors (what foreign markets mattered most). For example: Earnings from export of oilseeds grew by 44.6 percent and reached USD 472.3 million, as a result of significant increment in volume of export (44.6 percent) and marginal improvement in international price (0.03 percent).

Revenue from gold rose by 30.5 percent annually to USD 602.4 million driven by 9 percent growth in volume and 19.7 percent increase in international price. Revenue from gold accounted for 19.1 percent of total export earnings.

Export of live animals earned USD 207.1 million, depicting a 40 percent growth over the preceding year owing to a rise in the volume of exports (28.4 percent) and higher international price (9 percent). Earnings from live animals contributed 6.6 percent of the total merchandise export proceeds.

Driven by marginal improvement in the volume of export (0.7 percent) and moderate rise in international price (15 percent); export proceeds from pulses increased by 15.8 percent to USD 159.7 million accounting for 5.1 percent of the total merchandise exports.

In terms of the commodity composition of exports, although coffee continues to dominate the top spot that reached the highest ever level last year ($833.1 million) while at the same time falling to the lowest ever share in Ethiopia's total exports (just 26.4 percent). Notable among Ethiopia's non-coffee exports is the growing importance of five major products that each bring in more than $100 million per year: these include oil seeds ($472.3 million), gold ($602.4 million), chat ($240.3 million), flowers ($197 million), and pulses ($159.7 million). Export products with annual sales of more than $10 million have also increased substantially and now include products as varied as processed meat, vegetables, textiles and clothing, spices, leather products, minerals and cotton .To give a sense of some of the physical volumes behind these dollar figures.

Table 2.1: Values of Major Export Items

(In Millions of USD)

Particulars	2009/10		2010/11		2011/12	
	Value	Share (%)	Value	Share (%)	Value	Share (%)
Coffee	528.3	26.4	841.8	30.6	833.1	26.4
Oilseeds	358.5	17.9	326.6	11.9	472.3	15.0
Leather & Leather products	56.4	2.8	103.8	3.8	109.9	3.5
Pulses	130.1	6.5	137.9	5.0	159.7	5.1
Meat & Meat Products	34.0	1.7	63.3	2.3	78.8	2.5
Fruits & Vegetables	31.5	1.6	31.5	1.1	44.9	1.4
Live Animals	90.7	4.5	147.9	5.4	207.1	6.6
Chat	209.5	10.5	238.3	8.7	240.3	7.6
Gold	281.4	14.0	461.7	16.8	602.4	19.1
Flower	170.2	8.5	175.3	6.4	197.0	6.2
Others	112.5	5.6	219.1	8.0	207.1	6.6
Total	2003.1	100.0	2747.1	100.0	3152.7	100.0

Source: Ethiopian Revenue and Customs Authority

With respect to the destination of Ethiopia's exports, Ethiopia's merchandise exports have vast market in Europe, accounting for 47.1 percent of the total merchandise exports. Within European countries, Switzerland, accounting for about 38.6 percent of the total exports, was the largest market mainly for gold. Germany, the second important market in the continent accounting for 20.7 percent, mainly imported coffee, textile & garments, flower and leather & leather products. The Netherlands, constituting 14.6 percent of Ethiopia's export to Europe, was an important export destination primarily for flower, gold, vegetable and coffee. Italy with 5.4 percent of the total Ethiopian exports to the Europe was the market for coffee, leather & leather products, textile & garment and pulses.

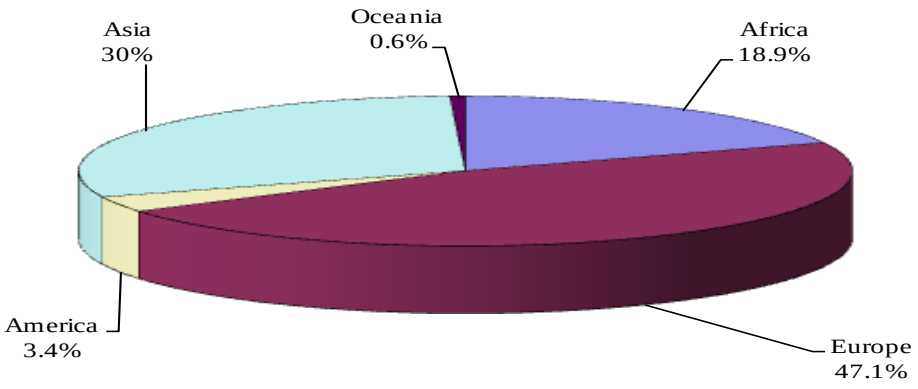
About 30 percent of the total Ethiopian exports were shipped to Asian market, of which China accounted for 34.6 percent, Saudi Arabia 21.7 percent, United Arab Emirates 8.1 percent, Israel 6.4 percent and Japan 4.8 percent. The prime export items shipped to China included oilseeds, leather & leather products, mineral products, natural gums and vegetables, Coffee, meat & meat products, oilseeds, live animals and flower were exported to Saudi Arabia. Meat & meat products, pulses, live animals, oilseeds, vegetables, natural gum, flower and food were the major export products sold to United Arab Emirates. Israel bought mainly oilseeds, coffee and vegetables while Japan imported mainly coffee, oilseeds, and flower.

Meanwhile, about 18.9 percent of Ethiopia's total exports went to African nations of which Somalia, Sudan, Djibouti, and Egypt together accounted for 93.3 percent of the total exports to the continent. Exports to Somalia mainly included vegetables, live animals and chat. Live animals, coffee, pulses and spices were the main exports to Sudan. Djibouti imported vegetables, live an-

imals, chat, textile & garments, fruits and pulses whilst Egypt bought live animals, oilseeds, meat & meat products and pulses.

Ethiopia's exports to American accounted for 3.4 percent of the total export during 2011/12 of which United States and Canada together made up 92.5 percent. The United States imported mainly coffee, oilseeds, mineral products and leather & leather products while Canada mainly bought coffee.

Fig 2.1 Export by Destinations



Source: NBE

2.2 Reforms and Exports

In May 1991, the Ethiopian landscape was markedly overwhelmed by major economic and political changes. The military junta that terrorized the country for 17 years collapsed and a coalition of liberation front's assumed political power. Extremely delighted with and motivated by the fall of the communist regime in the country, delegates of Western governments and institutions hurried to the capital Addis Ababa to sell their free market economic policies toolkits, packaged as Structural Adjustment Programme (SAP), sponsored by the International Monetary Fund (IMF) and the World Bank (WB). Though deeply communist themselves, the new leaders, desperately in need of resources and foreign exchange, were easily persuaded to undertake the proposed economic reforms in exchange for low interest loans and development aid.

Under the new reform program, foreign trade and exchange rate regimes were liberalized; prices of domestic inputs and finished goods were decoupled from arbitrary government regulation and interference; public sector reform that accorded autonomy to the state owned enterprises (SOEs) was implemented; some enterprises were privatized; the financial market was reformed to allow private sector participation in commercial banking, insurance and micro credit services; export tariffs were abolished; export subsidies to domestic, export-oriented firms were eliminated and were replaced by incentives that provided the duty-free importation of raw materials.

Most important, in October 1992, Ethiopia's national currency, the Birr, saw a major free fall when it was devalued by 242% from its pegged rate of 2.07 per US dollar to 5 per US dollar, signaling the first major onslaught on the value of Birr which since then has been virtually in a slippery slope. The authorities defended and justified such massive, one-time devaluation by pointing to the high premium on the parallel market which was close to 238% on the eve of the devaluation measure.

In May 1993, the transitional government also introduced a" Ducth auction" system for foreign exchange with the objective of liberalizing the foreign exchange market. The auction system operated side by side with the official exchange rate until the two were finally unified in July 1995. Before the unification, the dual-exchange rate regime was maintained by an amalgam of government decree (relevant for the official rate) and quasi-market mechanism (which applied to the auction rate).

It was expected that the new devaluation measure would enhance domestic production and employment; eliminate the gap between the official and the parallel market rates, and improve the country's foreign reserves by minimizing illegal trade in smuggled goods and by re-directing much of the unofficial remittance flow towards official intermediaries.

Though still fragile and vulnerable to the vagaries of nature and aid money, the export sector in Ethiopia has shown tangible improvements since the country abandoned the fixed exchange rate regime in 1991 and implemented a series of macroeconomic stabilization and adjustment programs.

For instance, real export receipts have increased fivefold between 1992 and 2009. The export industry has also seen significant diversification away from its dependence on coffee. In 1991, when the reform package was launched, coffee brought more than 55% of the country's total export revenue but by the end of 2009 its share declined to less than 35% while the shares of other goods such as chat, flower, leather and leather products have increased substantially. The flower industry represents the major success story, whose share registered remarkable growth from less than 1% at the beginning of the 2000s to about 10% a decade later. Though much of this diversification is within the same industry, the overall result shows a significant departure from the traditional, mono-crop dominated export sector. (Wondemhunegn, 2011)

CHAPTER THREE

3. LITRATURE REVIEW

3.1Theoretical literature

3.1.1 Definitions of Export Performance

A conceptual definition of export performance addresses two parts: export and performance. Export is the international marketing related decisions and activities of internationally active firms (Cavugil and Neviv, 1981). The over-tone of the word performance, in the literature sense, does not pose any problem for it is the act of carrying out or accomplishing something such as a task or action. When it comes to economics, this word has been defined in many ways and no unifying principle has underlined its quantification. However, in the context of current study, Export performance is defined as: (i) the success or failure of the efforts of a nation to sell domestically produced goods and services in other nations markets (Zou and stan, 1998); (ii) the export effectiveness, export efficiency and continuous engagement in exporting (Shoham, 1991); (iii) the composite outcome a nation's international sales (Shoham, 1996); and (iv) the three sub-dimensions which encompasses sales, profit and growth (Madsen, 1987).

3.1.2Ethiopia's Export Performance

The performance of the country's exports highly dependent on its exchange rate regime and more specifically the real exchange rate .various studies have shown that the demand for the county's exports increase when its export prices fall in relations to the world prices. The depreciations of its currency compared to other currencies particularly, the dollars makes its exports cheaper on the international market. For example Sharma (2001) discovered that the demand for Indian exports increased when its export prices fell. He also said that the appreciations of the Indian rupee at one time adversely affected Indian exports. In Uganda an investigations of the impact of trade liberalizations on export volumes by kasekende and Atingi-Ego (1999) found no significant relationship between real exchange rate and export volumes .it is further argued that a competitive exchange rate is associated with export growth. In Tanzania, a time series study on non-traditional export (NTE) found a statistically significant relationship between real devaluations and export growth of NTEs. (C. f BerhanuLakew, 2003)

In theory, devaluation promotes exports and aggregate economic activity through the famous "multiplier effect." However, currency devaluation may not produce the desired outcomes for several reasons:

First, the Marshall-Learner (ML) condition may not hold in the short run. The ML condition is a theoretical viewpoint that links exchange rate fluctuations and trade performance from the perspective of elasticity. According to this theory, ceteris paribus, a country will improve its current account deficit by devaluing its currency provided that the sum (in absolute value) of the elasticity of demand for its exports and imports is greater than one. But most empirical results show that

short run elasticity are smaller than their long run counterparts and countries may not achieve increased employment, investment and output following devaluation.

Second, if we allow for changes in some variables, such as changes in the national income, devaluation will improve the trade balance only if the improvement in trade balance generated by currency depreciation more than offsets the improvement in imports brought about by a rise in the national income. This is called the Lausen-Metzler effect.

Third, the so called J-curve effect may dilute the immediate benefits from devaluation for two major reasons: a) even if the ML condition held, export receipts may not increase in the short-run due to supply side constraints associated with time lags, which is largely the case for agricultural commodities that need several months to harvest; b) most imports are less responsive, if not, non-responsive at all despite the increase in their prices after devaluation. This applies to most capital goods and raw materials (such as oil) that have inelastic demand in capital-deficient and oil importing countries such as Ethiopia. As a result, the fall in foreign spending on the country's exports and the increase in domestic spending on imports will cause the trade deficit to get worse before it improves, which makes the trade balance curve assume the shape of letter "J."

The empirical evidence on the relationship between devaluation and export performance is generally mixed with the conclusions differing depending on the nature of the economies investigated, the type of methodology employed, and/or the sample size and data frequency used in the specific study.

On the flip side, therefore, devaluation may make imports less attractive leading to increased spending by domestic consumers and investors as measured by domestic currency. Moreover, inflationary infection induced by currency depreciation could eat up the potential gains from nominal devaluation. A number of studies have shown that changes in nominal devaluation entail massive increase in the prices of goods and services, thereby diminishing the international competitiveness of the economy. In other words, nominal devaluation results in real devaluation and effectively improves a country's trade performance only if we have net positive change after adjustment in the price levels.

Still even more interesting is the impact of devaluation on income re-distribution. According to Paul Krugman and Lance Taylor (1997), even when devaluation does not affect the country's terms of trade, it, however, could entail a number of income effects. To this effect, they have identified three major channels through which devaluation could possibly redistribute income among various economic factors:

Firstly, when the devaluation measure is undertaken in an environment where trade deficit prevails, the increase in the prices of traded goods are immediately followed by a reduction in real domestic income and by a corresponding rise abroad, since export receipts of the devaluing country are overwhelmed by its swelling expenditures on imported items. Thus, the value of the home country's „foreign savings" rise ex ante, while aggregate demand falls ex post, and imports

decline along with it. The bigger the initial trade deficit, the more pronounced the cotrationary effects.

Secondly, even if the country had balanced trade initially, the prices of traded goods increase relative to domestic goods following devaluation, resulting in windfall profits and rents for businesses and investors engaged in export and import-competing industries. If wages are rigid in the short run and if the marginal propensity to save from profits exceeds the one from wages, ex ante national savings rise. The magnitude of the resulting contraction is a function of the difference in savings propensities between wage earners and businesses specializing in exports and import-competing industries.

Finally, devaluation can also affect the fiscal position of the national government. Particularly, assuming that budget was initially unbalanced, the government can raise substantial additional money if there are progressive taxes on income as well as if taxes on profits are higher than taxes on wages. Moreover, if exports or imports are subject to ad valorem taxes, devaluation generates redistribution of income from the private sector to the state coffers, whose saving propensity is unity in the short run. Once again, the final outcome is reduction in aggregate demand (Wondemhunegn, 2011).

3.1.3 Restraints to Ethiopia's Export Growth

The World Bank (1987), in a report entitled "Ethiopia: an export action program", have considered exchange rate overvaluation, the low level of investment in the economy, the coffee surtax, the in adequate marketing infrastructure, the high tariffs on imports of raw materials, the unfavorable terms of trade and in sufficient adjustment of producer prices as limiting factors to the country's export growth.

It has supplemented its analysis of the constraints to Ethiopia's export growth by a log linear export supply model specifying the volume index of exports as a function of real GDP, unit value index of export deflated by implicit GDP deflator, the export weighted REER, the ratio of export taxes to exports and the private consumption/GDP ratio, the result revealed a statically significant influence of export tax and private consumptions variables.

In the transitional government of Ethiopia economic policy document it was reported that "the decline of exportable agricultural product has worsened the foreign exchange position of the country" and past misguided policies, to a larger extent, were blamed for such a failure in agricultural production (Transitional Government of Ethiopia, 1991)

3.1.4 Factors Holding Back Ethiopia's Trade Performance

Given that Ethiopia has tariff-free access to the world's largest economies, the European Union and the United States, and generally faces lower tariffs in other of its major markets than it applies itself, the major factors that account for the low trade share of GDP and the yawning trade

deficit must be considered to lie in its domestic economic framework. Following Ciuriak (2010), the factors that hinder Ethiopia's exports may be enumerated as follows:

(a) The macroeconomic policy mix: the use of the exchange rate as an external anchor for domestic price stability resulted in a steep rise in the real effective exchange rate through the 2000s, undermining the competitiveness of exports and of import-competing production.

(b) High trade costs: Ethiopia is one of the most difficult places in the world from which to engage in the global economy, ranking 123rd out of 155 countries in the World Bank's 2010 trade logistics survey1 and 159th out of 183 countries in terms of trading across borders in the World Bank's 2010 Doing Business survey. Contributing factors include:

— The complexity of the process for exporting and importing (8 documents required in each case, compared to a world minimum of 2 in France).

— The long time it takes to export and import even standard containers (49 and 45 days respectively).

— Slow and expensive transportation (road transport rather than rail and lack of seamless multimodal transport systems—most inward and outward bound containers are unstuffed/stuffed in Djibouti).

— Cumbersome customs procedures (a risk-based approach to customs inspections and international transit agreements to facilitate border crossings have not been implemented, resulting in multiple inspections en route).

— Several indirect effects of the large trade imbalance and high direct trade costs work to further raise trade costs, including: the number of empty containers leaving Ethiopia, which is factored into the cost of shipping; the high costs of importing add to the cost of production inputs which in turn reduces the competitiveness of exports; and long lead times for import and export are closely associated with heightened uncertainty concerning the exact amount of time that is required to import or export, which can be even more damaging for traders than the time costs themselves.

(c) Private sector under-development: Ethiopia's industrial structure is dominated by a relatively small number of government-owned firms and conglomerates, features a high degree of market concentration, and is characterized by relatively high administrative barriers to entry (Ethiopia ranks 93rd in the world in ease of starting a business under the World Bank's Doing Business methodology). According to the most recent survey of Ethiopia's manufacturing sector, there were only 1,930 manufacturers in the country in 2008/09 defined as "large and medium scale"

[1]See Arvis et al (2010).

employing 133,673 persons2, and 43,338 "small scale" manufacturing establishments, more than half of which are grain mills, employing 138,951 persons3. These are very small numbers for a country with a total population in excess of 80 million. Since a significant contribution to trade growth comes from new firms entering export markets with new products, a stunted private sector results in a weak supply response to new market opportunities afforded by trade liberalization or facilitation. Moreover, Ethiopia opened its first industrial park (in Dukem) only in 2009; since industrial districts that promote knowledge "spillovers" across firms are the drivers of industrial development, Ethiopia is off to a late start in developing its industrial culture4.

(d) Producer services: Some of the most sought after services needed to accelerate the efficiency of production in the goods sector, such as finance, telecommunications and transport, are relatively inefficient themselves. Moreover, even though Ethiopia's services sector has been expanding its share of GDP, there is some anecdotal evidence to suggest that this expansion reflects in part the extraction of rents through high margins, which in turn works to reduce the competitiveness of the underlying industrial sectors. Since only the most profitable firms can engage in export markets, high producer services costs eliminate a swathe of potential industrial goods exporters from export markets.

(e) Thick borders: Ethiopia's trade with its immediate neighbors is comparatively low in good measure because of the poor connections to the regional borders and inadequate border infrastructure; ignoring the special cases of Djibouti (for which trade statistics are distorted by inclusion of goods in transit) and Somalia as well as oil imports from Sudan, Ethiopia's two-way trade with its immediate neighbors in 2008 amounted to US$118 million, little more than one-fifth the amount that would be expected given the size and proximity of these economies.

(f) High tariffs applied by potential African partners: Ethiopia has good access to global markets due to zero tariffs in the major industrialized countries but still faces significant tariff barriers in its African trading partners, with a simple average of about 9.54% in the countries that are part of the Tripartite Free Trade Area (TFTA) negotiations.

This enumeration of inhibiting factors provides a short list of issues for the new government to address to improve Ethiopia's trade performance. The list is organized in rough order of importance, in that the first three items appear to be more important factors than the latter three. Notably, traditional trade policy issues – tariffs and border measures – are not top of the list.

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[2]Large and medium-scale manufacturers are defined as those that employ 10 or more persons and use power-driven equipment. Source: Central Statistical Agency, Manufacturing Industries Survey, http://www.csa.gov.et/index.php?option=com_content&view=article&id=62&Itemid=489.

[3]Small scale manufacturers are defined as those with fewer than 10 employees and using power-driven machinery.
Source Central Statistical Agency, Ethiopian Small Scale Manufacturing Industries Survey, http://www.csa.gov.et/index.php?option=com_content&view=article&id=92&Itemid=413

[4]Itis to be noted that the development of the industrial park is still in its infancy stage; it is not likely that any Significant level of production will commence before 2011/2012.

Much of the policy action required to improve Ethiopia's trade performance thus lies in other areas. (c.f: Dan Ciuriak and Claudius Preville, 2010)

3.2 Empirical literature

In investigating the determinants of Egypt's export Supply willson (1984)found a positive and relationship between domestic market productions and exports in the case of raw cotton, cotton yarn, potatoes and bleached rice except cotton fabrics indicating the existence of domestic production externalities in these products i.e. exports can be expanded without domestic production for the internal market being sacrificed.

By estimating a log linear manufactured exports supply function with adjustment lags for Malaysia. Beng (1999) found a positive and statically significant coefficient for REER and OECD countries real GDP variables

Agasha (2006)using an export growth function, found out that Uganda's export growth rate significantly and positively affected by its previous growth rate and terms of trade but is not significantly affected by real effective exchange rate.

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 elasticity in the three export categories, it was found to have highest elasticity for merchandise export while lowest elasticity for exports of machinery & transport equipment's. 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 elasticity nearly above 1 in all cases.

Agasha (2006) 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.

Mulualem (2006) 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.

YISHAK (2009) analyze determinants of export performance of Ethiopia. A gravity model is employed with panel data using 30Ethiopia's trading partners for the period 1995–2007. The model is estimated with the Generalized Two Stages Least Squares (G2SLS) method. Endogeneity of FDI and GDP to exports, heteroskedasticity and serial correlation for AR (1) are controlled. The results show that good institutional quality and internal transport infrastructure appear to be major determinants, whereas the real exchange rate and FDI have no statistically significant effect on Ethiopia's export performance. Likewise, the growth of domestic national income affects Ethiopian exports positively.

Foreign market access conditions also play a significant role. The results indicate that import barriers imposed by Ethiopia's trading partners do play an important role in determining the volume of Ethiopian exports. Moreover, export performance is positively related to Ethiopia's trading partners' national income, and distance, which is a proxy for transport costs, affects Ethiopian exports negatively

Sisay(2010) in his study analyses 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 com-

modities, 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.

Samual (2012) on his study identified some of the main determinants of agricultural export in Ethiopia for the period 1980-2010. To test empirically the relationship between agricultural export performance and its major selected determinants such as terms of trade, gross domestic product, domestic price, world price, kilometers paved roads and fertilizer input import over a period; co integration and error correction approaches in the regression analysis were used. The results from the co integration and error correction models revealed that all the above listed explanatory variables significantly affected agricultural export performance in the long run except domestic price. In the short run, gross domestic product (GDP) became insignificant and negative in sign which was unexpected. Domestic price was also insignificant like in the case of long run. However, except these two variables other variables were found to significantly affect the agricultural export performance of the country. On the other hand, out of the variables significantly affected agricultural export both in the long run and short run; terms of trade, world price, fertilizer input import over a period and kilometers of paved roads affected agricultural export positively.

CHAPTER FOUR

4. Data and Methodology

4.1 Sources of Data

The study uses secondary data collected from different sources. The main data sources Are National Bank of Ethiopia, Ethiopian Revenue and Custom Authority, UNCTAD data base, Central Statistics Agency, World Development Indicator, Ethiopian Economic Association CD-ROM Data base.

4.2 Model Specification

4.2.1 Theoretical Model

This study focuses on the determinants of Ethiopia's export performance incorporating both supply and demand related variables. Hence, the study signifies Ethiopia's export performance as a function of trade openness, Terms of trade, real effective exchange rate, Capital expenditure, real gross domestic product, and domestic credit. The model that has been used in this paper is thus the adopted Samuel (2012) imperfect substitution model which is expressed as follows:

X =f (TO, TOT, REER, Kex, RGDP, DC,) ---------- 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) and Samuel (2012) in estimating determinant of cut flower export in Ethiopia and determinants of agricultural export in Ethiopian respectively.

4.2.2 Empirical Model

A log-linear form single equation export determination model of equation 4.1 is employed to capture the determinants of export in Ethiopia is thus given by:

$$\ln X_t = \beta_0 + \beta_1 \ln TOT_t + \beta_2 \ln RGDP_t + \beta_3 \ln DC + \beta_4 \ln TO_t + \beta_5 \ln REER_t + \beta_6 \ln Kext + \varepsilon_t \quad \text{------4.2}$$

Where;
Xt= export performance in million US dollars.
TOT = Terms of trade
TO=Trade openness
GDP= Value of gross domestic product in million US dollars.
REER = Real effective exchange rate
DC=Domestic Credit
Kex = capital expenditure
β's are unknown parameters to be estimated
t = time in years (1974-2011)
ε = random terms

4.2.3 Definitions of Variables

Real Effective Exchange Rate: In the literature, it is recognized that depreciation of the real effective exchange rate has positive contributions for increased exports while real appreciation of the exchange rate is generally associated with a retard in exports. Thus, the importance of maintaining a realistic real exchange rate is being propagated as a policy remedy to ensure the competitiveness of exports in the world market (Prasad, 1992). Index of trade weighted real effective exchange rate is included in the present study, to empirically test the relationship between this variable and the level of exports. The expected sign of this variable is positive.

Domestic credit: it is the availability of loan, which is source of finance in case, where there is shortage of capital. If there is high access to the credit, the export performance will increase and vice versa. In fact, lack of access to pre- and post-shipment export finance was reported as one of the fundamental constraints on export growth in Ethiopia. (Berhanu: 2003)

Domestic credit is captured by amount of credit which is advanced to the government and private sector. So the expected sign is positive.

Terms of trade: this is one of the determinants of export performance in both developing and developed countries. Favorable terms of trade are associated with increased export growth rate and unfavorable terms with low export growth rates .Svedberg (1990) argued that in the 1990s, sub-Saharan Africa had unfavorable terms of trade which negatively impacted on exports

Trade openness: 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. (Belayneh and Wondaferahu: 2012)

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 a proxy 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) 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.

Infrastructure: Infrastructure is one of the major factors which affects or constrains exports especially in least developing countries. Of the factors that boost production as well asexport supply of commodities, infrastructural facilities come at the forefront. Its development is a key ele-

ment of countries ability to produce and move goods. Weak infrastructure is a major impediment to trade, competitiveness and sustainable development in most African countries, particularly land-locked and small island countries. It reduces the return to trade and economic activity and hinders growth prospects of a given country. (Samuel: 2012)

In this study the impact of infrastructure is captured by capital expenditure since the increments of capital expenditure on infrastructure like availability of road, railway telecommunication, electricity etc. Creates marketing opportunities in the international market and also the absence of such facilities does not bring the desired export performance of the country, therefore, we expect the sign of this variable to be positive.

Gross Domestic Product (GDP): Higher GDP values in the exporting country imply increased capacities for export. It is expected to have to have a positive impact on exports. For instance, Kumar (1998) in his study on the determinants of export growth in developing countries confirmed that GDP has a significant positive impact export volumes. He also underlined that higher level of production is the main cause of export expansion. So, a higher GDP implies a higher production and hence larger volume of exports. Therefore, we expect a positive relationship between the dependent variable and GDP.

To estimate the above equation, the time-serious approach was applied and the empirical results were tested using Eviews 7.

4.3 Methodology

Many of macroeconomics time series data are exposed to the problem of non-stationary in the process of econometric analysis. Regression on such data (non-stationary variables) led to spurious regression as mean and variance are time variant and hence the basic assumption of OLS will be violated. Therefore, it is important to test the variables using the co-integrated and error correction model to solve the problems encountered with OLS regression and to see the long-run and short-run relationship impacts of the variables to be estimated. A macroeconomics time series data are stationary, if its mean and variance are constant over time and the value of covariance between the two-time periods depends on distance or lag. when the mean, variance, and auto covariance of individual time series are not time invariant, these time series data are not stationary (Gujerati, (1991) Harris, (1995)).

The use of the error correction model in applied econometrics goes back to Sargan (1964). However, its integration into modern time series econometrics began with the publication of two important papers in the mid-1970s. These were the analysis of the UK consumption function by Davidson, Hendry, Srba and Yeo – DHSY - (1978) and that of the UK demand for broad money by Hendry and Mizon (1978). These papers were important because they emphasized the potential importance of levels terms within a time series regression framework as a means of capturing the equilibrium interactions between variables. As a result of the publication of these articles understanding of the theoretical and empirical properties of co integrating relationships has increased enormously.

Testing procedures have been developed by Engle and Granger (1987) and Kremers et al (1992) for single equation models and Johansen (1988) for multiple equation systems.

The Engle-Granger procedure is to apply the Augmented Dickey-Fuller test to the residuals from a least squares regression between the levels of the variables. Appropriate critical values for this

test have been computed by MacKinnon (1991). Kremers et al estimate an error correction model and use the t-ratio for the error correction term as their test statistic.

In general, the advantages of using the ECM determining the export growth lie in its ability to capture the short-run dynamic characteristics of export demand given the long run co-integration (equilibrium) relationship. In other words, the ECM reflects a dynamic self-correcting process of export demand behavior towards its long-run steady sate (Song, Witt, and Li 2003). In addition, ECM can avoid the occurrence of spurious regression and multicolinearity problems, which may otherwise affect the reliability and accuracy of the econometric analyses. Therefore, the above reasons answered why this model is selected for this study and finally using this model will give reliable and accurate results.

4.4 Methods of Estimation and Procedure: test used

4.4.1 Stationary test

The standard classical methods of estimation which are used in the applied econometric work are based on a set of assumptions one of which is the stationary of the variables. A variable is said to be covariance (weakly) stationary if the mean and the variances of the variable are constant over time and the covariance between two periods depends only on the gap between the periods, and not the actual time at which this covariance is considered whereas a non-stationary series has adifferent mean at different points in time and its variance increases with the sample size (Debel G., 2002).

According to Madala (1992), a time series is said to be strictly stationary if the joint distribution of any set of N observations Y1, Y2------Yt is the same as the joint distribution of Y1 +k, Y 2 +k …Y t+ k for all N and K. The distribution of Yt is independent of time and thus it is not only the mean and the variance that is constant but also all higher values of t are independent of t.

In time series analysis, most encountered series are in fact non-stationary. Contrary to the situation of stationary process which fluctuates around their mean, the reversion to a fixed value rarely occurs for non-stationary process. If a non-stationary time series is regressed on one or more non-stationary time series, the results are prone to spurious regression problems. This is a situation where results obtained suggest there are statistically significant relationships between the variables in the regression model when in fact all that is obtained is evidence of contemporary correlations rather than meaningful causal relations (J. Gudeta, 2010).

Therefore, it is necessary to check whether or not the variables included in the model are stationary or not before going to the next step which is regression analysis.

Unit root test

Unit-roots are important to detect the stationary of time-series data. To test if the series, used have unit-roots we apply a test based on the work of Fuller (1976) and Dickey and Fuller (1979, 1981). The Augmented Dickey-Fuller test is a similar but modified version of the Dickey-Fuller test which is used when error term is not a white noise. While testing for stationary, if a variable becomes stationary at level, then it is said to be integrated of order zero, I (0). And if the variable is stationary at its first difference, it is said to be integrated of order one I (1). Similarly, if a vari-

able can be transformed to stationary series by differencing n times, then it is integrated of order n, I (n). (Verbeck, 2004)

4.4.2 Co-integration and the Error Correction Model

Co integration test

Co-integration is used to regard or take care of the non-stationary of the variables and to examine whether there exist long run equilibrium relationships among the variables under consideration (Gujerati, 2004)

As Alemayehu,et.al (2009) noted, the co-integration test shows that even though the variables taken separately are not stationary, i.e., are I(1), their linear combination may be stationary. In such a case the variables are say to be co integrated series is not spurious and hence, it enables to establish long run relationship between independent and dependent variables.

The Engel Granger (EG) two stage procedure and Johansen maximum likelihood approach are the two methods of testing for the existence of co-integration among variables. According to Gujerati (2004),while using EG approach, in the first step ,the long run model in the level form which is integrated of order one, I(1) ,is estimated. In the next step, the residual form the long run model is tested for its stationary. If the residual is found to be stationary, then the variables are co- integrated. That is, there exists long run equilibrium relationship among the variables. We use EG approach in this study to test the co-integration using ADF tests.

The error correction model (ECM)

The error correction model used to capture both the long run and short run model.

Note: co integration test only indicates long run relationship but not short run. That is why error correction model required. To explain the short run relationship between independent and dependent variables that are co-integrated, ECM is used.

According to Gujerati (2004), even if the variables of the model are co-integrated, there may be disequilibrium in the short run. ECM tells us how much time it takes to adjust this short run shocks. As a result, the residual of the long run model can be treated as the equilibrium residual and it can be used to connect the short run behavior the model's dependent variables to its long run value. The ECM is also important since it conveys information for the speed of adjustment from short run disturbance to long run equilibrium. If the variables are stationary, say at first difference, the short run model, ECM can be given as:

$$\Delta yt = B0 + B1\Delta xt + ut - 1 + Et$$

Where, Δ=is the first difference

E_t= the disturbance (error) term

$U_{t-1=}$ the one year lagged of the long run residual value, it called ECM

X_t= represent the short run disturbance in Y_t

$U_{t-1=}$ represents the speed of adjustment towards the long equilibrium

CHAPTER FIVE

5. EMPIRICAL ANALYSIS

5.1 Result of Unit Roots Tests

In time serious analysis the first task before any meaningful regression is to test the existence of unit roots in the variables and establishing their order of integration. Because the variables used in the analysis need to be stationary and/or should be co integrated in order to infer a meaningful relationship from the regression (D.Gemechu, 2002). All the variables used in the estimation process are tested using Augmented Dickey Fuller test statistic and the results are presented in table 5.1 below.

Table 5.1: Results of unit root tests for order of integration of the variables

ADF test at level

Variable	ADF	p-value	Result
Lnx	0.236413	0.9714	Non-stationary
Lnto	1.138595	0.6900	Non-stationary
Lntot	-2.885085	0.0567	Non-stationary
Lnrgdp	3.616688	1.0000	Non-stationary
Lnreer	-1.047585	0.7258	Non-stationary
Lnkex	0.502240	0.9845	Non-stationary
Lndc	-1.003059	0.7421	Non-stationary

ADF test at First Difference

Variable	ADF	p-value	Result
Lnx	-7.408089	0.0000	stationary
Lnto	-5.174910	0.0001	stationary
Lntot	-6.070423	0.0000	stationary
Lnrgdp	-3.483992	0.0145	stationary
Lnreer	-4.713966	0.0005	stationary
Lnkex	-5.913676	0.0000	stationary
Lndc	-5.130766	0.0002	stationary

The Augmented Dickey-Fuller (ADF) test is employed to test the stationary of the variables in the model. As summarized in the Table Above all the variables export(x), real effective exchange rate(reer), trade openness(TO), terms of trade(TOT) and capital expenditure(kex)are non-

stationary at levels since the critical value is greater than the computed values for the variables. Rather all variables are characterized by I (1) process, implying they are stationary at their first difference.

5.2 Co integration test

Table 5.2: Co-integration test using ADF

Residual		ADF	P- Value
ECM		-5.852714	0.0000
Critical values	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

For co- integration to exist the residual has to be integrated of order zero or stationary at first difference or at level as it was broadly discussed before. Accordingly, the table displays that the residual is found to be stationary at level with a p-value of 0.0000 which is zero.

5.3 Estimation of the long run and error correction models

The results of various diagnostic tests such as Breush-Pagan-Godfrey test for heteroskedasticity (Annex 4), Breush-Godfrey LM Test for serial correlation (Annex 5), Jarque-Bera test for normality (Annex 6), and Ramsey's general test of model misspecification (Annex 7) are reported and all tests did not detect any problem of serial correlation, hetroskedasticity, non-normality and model misspecification

The estimation of the long-run model reveals that terms of trade, real GDP, and trade openness are the positive determinants of the country's exports while real effective exchange rate and domestic credit representing negatively related with the country's export performance. All the determinants are significant at 5% level except capital expenditure and its lag value which is statistically insignificant.

Terms of trade has statistically significant on export. this is consisted with Musinguzi, Obwane and Stryker(2000) found out that terms of trade has a significant positive relationship with export but though an increase in terms of trade marginally increase export . Kaskande and Atingi-Ego while studying the impact trade liberalization key markets in sub Saharan African, found out that export performance are significantly correlated with terms of trade. Svadberg (1990) did a similar study on sub Saharan Africa countries between1980-1985 and attributed the sluggish export performance in Africa at the time to unfavorable terms of trade.

The fact that real exchange rate is a significant determinant of the country's export imply that enhanced competitiveness through strict quality control as well as through a shift in the structure

of both production and trade towards products with higher income elasticity of demand (manufactures) is a valid option in the long-run.

Table 5.3: Result of the Estimated Long Run Model

Variables	Coefficient	Std error	P-value
C	-3.365885	1.730569	0.0615
LTOT	0.752780	0.298006	0.0173
LTO	0.994832	0.139270	0.0000
LRGDP	1.329862	0.166832	0.0000
LREER	-0.274683	0.124632	0.0356
LDC	-0.669066	0.127469	0.0000
LKEX	0.242958	0.205578	0.2469
LKEX(-1)	0.062731	0.159860	0.6976

Number of observation=37 R-squared=0.9858

Prob (F-statistic) =0.0000 F-statistic= 288.96

Adjusted R-squared=0.9824 Durbin-Watson (DW) =1.889

5.4 Short-run Dynamics

Having already obtained the long-run model and estimated the coefficients, the next step will be estimation of coefficients of the short-run dynamics that have important policy implications. Hence, an error correction model will be estimated that incorporates the short term interactions and the speed of adjustment towards long run equilibrium. So, the error correction model has been estimated using the OLS technique and the results are summarized in table 4.4 below

Table 5.4: Result of the Error Correction Model

Variables	Coefficient	Std error	P-value
C	0.027600	0.050353	0.5879
DLTOT	-0.096866	0.262015	0.7144
DLTO	1.401514	0.145880	0.0000
DLRGDP	1.884043	0.195314	0.0000
DLREER	-0.224043	0.167658	0.1922
DLDC	-0.921427	0.302650	0.0050
DLKEX	0.023036	0.152844	0.8813
ECM(-1)	-0.750285	0.186820	0.0004

Number of observation=36 R-squared=0.919837

Prob (F-statistic) =0.0000 F-statistic= 45.89814

Adjusted R-squared=0.899796 Durbin-Watson (DW) =1.688077

Similar to the case of long run model, the results of various diagnostic tests such asBreush-Pagan-Godfrey test for heteroskedasticity, Breush-Godfrey LM Test for serial correlation, Jarque-Bera test for normality, and Ramsey's general test of model misspecification which are listed and discussed in annex 9, 10, 11 and 12 respectively are reported and all tests did not detect any problem of serial correlation, hetroskedasticity, Non-normality and model misspecification too.

On the other hand from the estimation results of the short run error correction model in table 5.4 above, the coefficient of the error correction term is significant with expected negative sign which implies that there is a feedback mechanism in the short run. The error correction model helps to correct for disequilibrium in the short run and therefore the negative coefficient in the results above in confirmation that there is no disequilibrium of the variables in the short run and relatively large magnitude (-0.750285). Its magnitude indicates that deviation from the long run equilibrium is adjusted fairly quickly where 75.02% of the disequilibrium is removed each period. The result of R2 is also 0.91(91%). Which reveals that of Ethiopian export performance is caused by the explanatory variables included in the model, while 9% is by other variables which were not included in the model. Furthermore, F-statistic is significant with a probability of 0.00000 which implies that the model fit.

Furthermore trade openness, real effective exchange rate; capital expenditure and domestic credit are the significant determinants of the country's exports in the short-run. Consistent with expectation, openness, real GDP and Capital expenditure are positively related with the country's exports while negative relation was found in the case of real effective exchange rate and domestic credit. The negative and significant domestic credit coefficient had its own policy implication: We should need a proper domestic demand management policy in order to achieve greater credit expansion since increased domestic consumption of exportable product have a dampening effect on the country's exports.

In the estimation one period lagged capital expenditure were found to be insignificant and left out of the short-run dynamics model. The insignificant capital expenditure variable may signify the possibility of failing capital expenditure in the short-run.

Furthermore, coefficients of the short run model show that trade openness, real GDP and domestic credit are significant; indicating that the variables significantly affect the export performance of Ethiopia in the short run. However, despite real effective exchange rate not affected the export in the short run unlike in the case of long run, its result is different from what already expected**.**

The sign of the coefficient of domestic credit became negative. The unexpected negative relationship registered from the result of the estimated model might be due to different reasons. For

instance, if we increases the amount of credit to the borrower those are exporters and importers. These credits unlikely initiate those importers rather than the export sector**.**

The appreciation of domestic currency has obviously negative impact on exports since it decreases the competitiveness of the country's export in the world market. On the hand, appreciation will also make imports cheap. Following the cheapness of import, domestic exporters may get incentive to import high quantities of different machineries, instruments, chemicals and others that will increase the productivity and volume of exportable goods. The other one is because of the fact that when foreign price level of products increases, domestic exporters will get incentive to increase the volume of their exports which will in turn leads to the increments of total export of the country.

When we come to terms of trade, its coefficient is significant and positive in sign as expected. It shows that an improvement by 1% in the terms of trade will lead to 9% increase in the total export of the country. The other important explanatory variable is capital expenditure which is a proxy of infrastructural facilities and other investment that improve the export performance of the country, but the variable is insignificant contrary to the expectation it might have come from the in efficiency of the capital to improve the export performance of the country.

CHAPTER SIX

6. CONCLUSIONS AND POLICY IMPLICATIONS

6.1. Conclusion

The vital question investigated in this paper is which factors significantly determine the export performance of Ethiopia. To address this question we use the time series data consisting of the period 1974-2011. The study uses secondary data collected from different sources. In this study total export (in million Birr) is used as dependent variable and terms of trade, trade openness, real gross domestic product, real effective exchange rate, capital expenditure and domestic credit are expected to affect export performance of the country are used as independent/explanatory variables.

Accordingly, the first task was estimation using OLS technique to test the relationship between agricultural export performance and explanatory variables. Pre-estimation tests of the statistical behavior of the variables using Augmented Dickey Fuller test for the presence of unit root showed that all the variables except terms of trade and fertilizer input were non-stationary at level. However, all the variables were stationary at first difference. Thus, they are regarded as integrated of order one. The next step was co-integration test which helps us to know the presence of long run relationship between the dependent variable and the explanatory variables. After co-integration test was conducted using Engle Granger procedure and its presence was confirmed, since the error correction term is significant and negative in sign as expected, the long run equation was estimated and according to the result all the variables except capital expenditure were found to significantly affect the export performance of the country. But, the sign of variables like domestic credit was found to be different from what already expected. For instance, the sign of domestic credit was negative. This might be due to the fact that when domestic credit increases, the borrowers are mainly using for import and consumption rather than for encouraging export which in turn diminishes exports. The significant coefficient of real GDP shows that high production capacity at a point in time determines the export potential utilization and total supply of export for a country.

Next, the Error Correction Model (ECM) was estimated to show the short run relationship between the dependent and explanatory variables. Accordingly, the regression result shows that terms of trade, real effective exchange rate and capital expenditure was insignificant in the short run. That means in the short run these variables have no impact on the export performance of Ethiopia. On the other hand except these three explanatory variables all other variables such as real gross domestic product and trade openness over a period were found to affect the dependent variable significantly and positively as already anticipated. The coefficient of domestic credit was negative despite its significance

The result also revealed that real effective exchange rate affects export of Ethiopia negatively but the insignificant coefficient indicates that depreciating the real exchange is little to do with enhancing export of Ethiopia.

6.2. Policy implications

Based on the findings of this study the following policy implications may be drawn:

The model depicted that there is a positive and significant relationship between the real exchange rate and export performance but it is not strong result. So the government has to ensure a stable exchange rate policy in order to avoid the exchange rate risk attached to the assets, import prices and profit considerations of direct investor in developing countries that contributes to improve and promote export growth sector.

The fact that real exchange rate is a significant determinant of the country's export in the long run imply that enhanced competitiveness through strict quality control as well as a shift in the structure of production and trade towards income elastic products such as manufacturers is indispensable in the longer time horizon. So, the central bank should go on with the exchange rate liberalization efforts, which has been in effect since October 1992 and exporters should be quality and quantity responsive so as to exploit the opportunity created by the exchange rate reform.

The positive and significant coefficients of the production capacity, denoted by real GDP in the long run ,suggests that macroeconomic policy reforms aimed at improving the growth of real GDP enhances the total export performance of Ethiopia.

The agriculture exports (primary product) which cannot be compute in the international market is better to be replaced by the industrial exports, which command reasonable and stable prices in the world markets. Moreover, the industrialization will reduce the dependence on imports by initiating the process of import substitution and directly increases to the growth of export.

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Annexes

Annex 1: Unit Root test
ADF test at level

Null Hypothesis: LX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.236413	0.9714
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LTOT has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.636070	0.0958
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LTO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.138595	0.6900
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LRGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.616688	1.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LREER has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.047585	0.7258
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LDC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.003059	0.7421
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LKEX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.502240	0.9845
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

ADF test at first difference

Null Hypothesis: DLX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.408089	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLTOT has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.070423	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLTO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.174910	0.0001
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLRGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.714252	0.0100
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLREER has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.713966	0.0005
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLDC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-5.130766	0.0002
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DLKEX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.913676	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Annex 2: Long run estimated equation

Dependent Variable: LX
Method: Least Squares
Date: 08/05/13 Time: 11:53
Sample (adjusted): 1975 2011
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTOT	0.752780	0.298006	2.526057	0.0173
LTO	0.994832	0.139270	7.143164	0.0000
LRGDP	1.329862	0.166832	7.971261	0.0000
LREER	-0.274683	0.124632	-2.203950	0.0356
LDC	-0.669066	0.127469	-5.248845	0.0000
LKEX	0.242958	0.205578	1.181826	0.2469
LKEX(-1)	0.062731	0.159860	0.392414	0.6976
C	-3.365885	1.730569	-1.944958	0.0615

R-squared	0.985866	Mean dependent var	7.752892
Adjusted R-squared	0.982454	S.D. dependent var	1.346249
S.E. of regression	0.178327	Akaike info criterion	-0.421583

Sum squared resid	0.922217	Schwarz criterion	-0.073277
Log likelihood	15.79929	Hannan-Quinn criter.	-0.298789
F-statistic	288.9600	Durbin-Watson stat	1.888907
Prob(F-statistic)	0.000000		

Annex 3: Co-integration test

Null Hypothesis: ECM has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.852714	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Diagnostic tests for estimated long run equation

Annex 4: Test for heteroskedasticty

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.855199	Prob. F(7,29)	0.5523
Obs*R-squared	6.330937	Prob. Chi-Square(7)	0.5017
Scaled explained SS	4.190476	Prob. Chi-Square(7)	0.7576

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/24/13 Time: 14:23
Sample: 1975 2011
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.033093	0.365149	-0.090628	0.9284
LTOT	0.034524	0.062879	0.549058	0.5872
LTO	0.029838	0.029386	1.015398	0.3183

LRGDP	0.015688	0.035201	0.445655	0.6592
LREER	0.000168	0.026297	0.006382	0.9950
LDC	-0.000256	0.026896	-0.009504	0.9925
LKEX	0.026213	0.043377	0.604306	0.5503
LKEX(-1)	-0.054723	0.033730	-1.622381	0.1155

R-squared	0.171106	Mean dependent var	0.024925
Adjusted R-squared	-0.028971	S.D. dependent var	0.037093
S.E. of regression	0.037627	Akaike info criterion	-3.533382
Sum squared resid	0.041058	Schwarz criterion	-3.185075
Log likelihood	73.36756	Hannan-Quinn criter.	-3.410587
F-statistic	0.855199	Durbin-Watson stat	2.134149
Prob(F-statistic)	0.552312		

Ho: Homoskedasticity
H1: Heteroskedasticity
Thus, we accept the null hypothesis of constant variance or homoscedastic

Annex 5: Test for serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.227706	Prob. F(2,27)	0.7979
Obs*R-squared	0.613731	Prob. Chi-Square(2)	0.7357

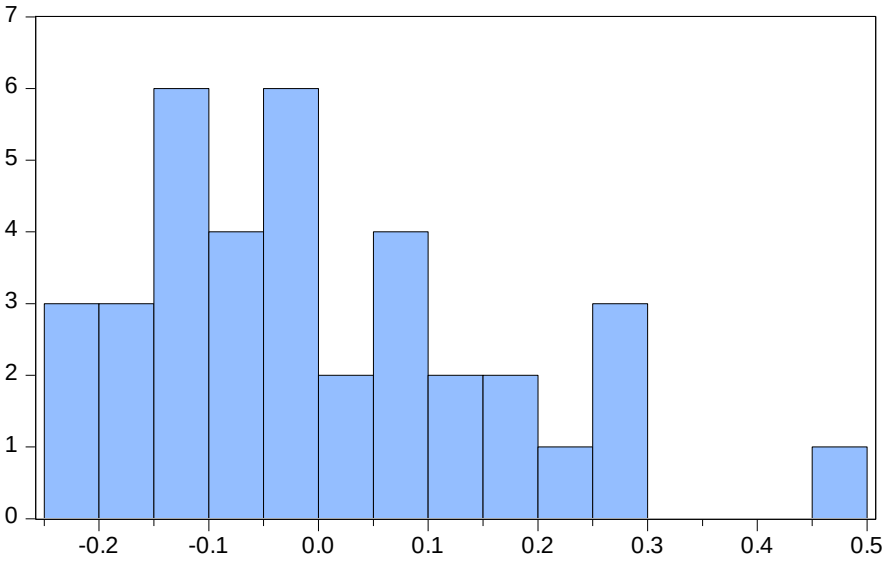
Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 08/24/13 Time: 14:26
Sample: 1975 2011
Included observations: 37
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTOT	0.017968	0.313883	0.057243	0.9548
LTO	-0.003851	0.143713	-0.026795	0.9788
LRGDP	-0.003641	0.171547	-0.021224	0.9832
LREER	-0.007880	0.131850	-0.059768	0.9528
LDC	0.018475	0.134590	0.137272	0.8918
LKEX	-0.015104	0.226728	-0.066617	0.9474
LKEX(-1)	-0.002210	0.177138	-0.012476	0.9901
C	-0.045649	1.790876	-0.025490	0.9799
RESID(-1)	0.005673	0.227447	0.024942	0.9803
RESID(-2)	-0.138742	0.208876	-0.664233	0.5122

R-squared	0.016587	Mean dependent var	-1.29E-15
Adjusted R-squared	-0.311217	S.D. dependent var	0.160054
S.E. of regression	0.183275	Akaike info criterion	-0.330201
Sum squared resid	0.906920	Schwarz criterion	0.105182
Log likelihood	16.10873	Hannan-Quinn criter.	-0.176709
F-statistic	0.050601	Durbin-Watson stat	1.958024
Prob(F-statistic)	0.999967		

Ho: No serial correlation
H1: Serial correlation
Therefore, we fail to reject the null hypothesis.

Annex 6: Normality test



Series: Residuals
Sample 1975 2011
Observations 37

Mean	-1.29e-15
Median	-0.028249
Maximum	0.453567
Minimum	-0.232891
Std. Dev.	0.160054
Skewness	0.719789
Kurtosis	3.154928
Jarque-Bera	3.231931
Probability	0.198699

From the above chart of normality test, Jarque-Bera tells us that the distribution is Normal.

Annex 7: Ramsey test for model specification

Ramsey RESET Test
Equation: DUFERALR
Specification: LX LTOT LTO LRGDP LREER LDC LKEX LKEX(-1) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.602602	28	0.1202

F-statistic	2.568334	(1, 28)	0.1202
Likelihood ratio	3.247125	1	0.0715

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.077484	1	0.077484
Restricted SSR	0.922217	29	0.031801
Unrestricted SSR	0.844733	28	0.030169
Unrestricted SSR	0.844733	28	0.030169

LR test summary:

	Value	df
Restricted LogL	15.79929	29
Unrestricted LogL	17.42285	28

Unrestricted Test Equation:
Dependent Variable: LX
Method: Least Squares
Date: 08/24/13 Time: 14:32
Sample: 1975 2011
Included observations: 37

Variable	Coeffi-cient	Std. Error	t-Statistic	Prob.
LTOT	1.364709	0.479634	2.845312	0.0082
LTO	1.877719	0.567364	3.309552	0.0026
LRGDP	2.725361	0.885803	3.076713	0.0046
LREER	-0.340315	0.128115	-2.656330	0.0129
LDC	-1.266171	0.392727	-3.224053	0.0032
LKEX	0.405956	0.224586	1.807579	0.0814
LKEX(-1)	0.148388	0.164623	0.901382	0.3751
C	-12.69214	6.058642	-2.094882	0.0454
FITTED^2	-0.054457	0.033980	-1.602602	0.1202

R-squared	0.987053	Mean dependent var	7.752892
Adjusted R-squared	0.983354	S.D. dependent var	1.346249
S.E. of regression	0.173692	Akaike info criterion	-0.455289
Sum squared resid	0.844733	Schwarz criterion	-0.063444
Log likelihood	17.42285	Hannan-Quinn criter.	-0.317146
F-statistic	266.8348	Durbin-Watson stat	1.864702
Prob(F-statistic)	0.000000		

Ho: Model specified correctly
H1: Model specified incorrectly

We fail to reject the null hypothesis since the probability of F-statistic is 0.1202 which is greater-than 0.1.

Annex 8: Short Run Estimated Equation

Dependent Variable: DLX
Method: Least Squares
Date: 08/06/13 Time: 11:30
Sample (adjusted): 1976 2011
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLTOT	-0.096866	0.262015	-0.369698	0.7144
DLTO	1.401514	0.145880	9.607297	0.0000
DLRGDP	1.884043	0.195314	9.646212	0.0000
DLREER	-0.224043	0.167658	-1.336311	0.1922
DLDC	-0.921427	0.302650	-3.044528	0.0050
DLKEX	0.023036	0.152844	0.150713	0.8813
ECM(-1)	-0.750285	0.186820	-4.016079	0.0004
C	0.027600	0.050353	0.548126	0.5879

R-squared	0.919837	Mean dependent var	0.128429
Adjusted R-squared	0.899796	S.D. dependent var	0.452711
S.E. of regression	0.143306	Akaike info criterion	-0.854542
Sum squared resid	0.575023	Schwarz criterion	-0.502649
Log likelihood	23.38176	Hannan-Quinn criter.	-0.731722
F-statistic	45.89814	Durbin-Watson stat	1.688077
Prob(F-statistic)	0.000000		

Diagnostic tests for estimated short run equation

Annex 9: Test for heteroskedasticty

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.232765	Prob. F(7,28)	0.0617
Obs*R-squared	12.89629	Prob. Chi-Square(7)	0.0747
Scaled explained SS	8.984105	Prob. Chi-Square(7)	0.2538

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/24/13 Time: 14:52

Sample: 1976 2011
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019926	0.007737	2.575453	0.0156
DLTOT	0.008695	0.040260	0.215972	0.8306
DLTO	0.050185	0.022415	2.238892	0.0333
DLRGDP	0.049648	0.030011	1.654331	0.1092
DLREER	0.030610	0.025761	1.188223	0.2447
DLDC	-0.093367	0.046504	-2.007734	0.0544
DLKEX	0.020693	0.023485	0.881104	0.3858
ECM(-1)	0.008120	0.028706	0.282873	0.7794

R-squared	0.358230	Mean dependent var	0.015973
Adjusted R-squared	0.197788	S.D. dependent var	0.024585
S.E. of regression	0.022020	Akaike info criterion	-4.600638
Sum squared resid	0.013576	Schwarz criterion	-4.248745
Log likelihood	90.81149	Hannan-Quinn criter.	-4.477818
F-statistic	2.232765	Durbin-Watson stat	1.719484
Prob(F-statistic)	0.061677		

Ho: Homoskedastic

Annex 10: Test for serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.985727	Prob. F(2,26)	0.3867
Obs*R-squared	2.537313	Prob. Chi-Square(2)	0.2812

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 08/24/13 Time: 14:54
Sample: 1976 2011
Included observations: 36
Presample missing value lagged residuals set to zero.

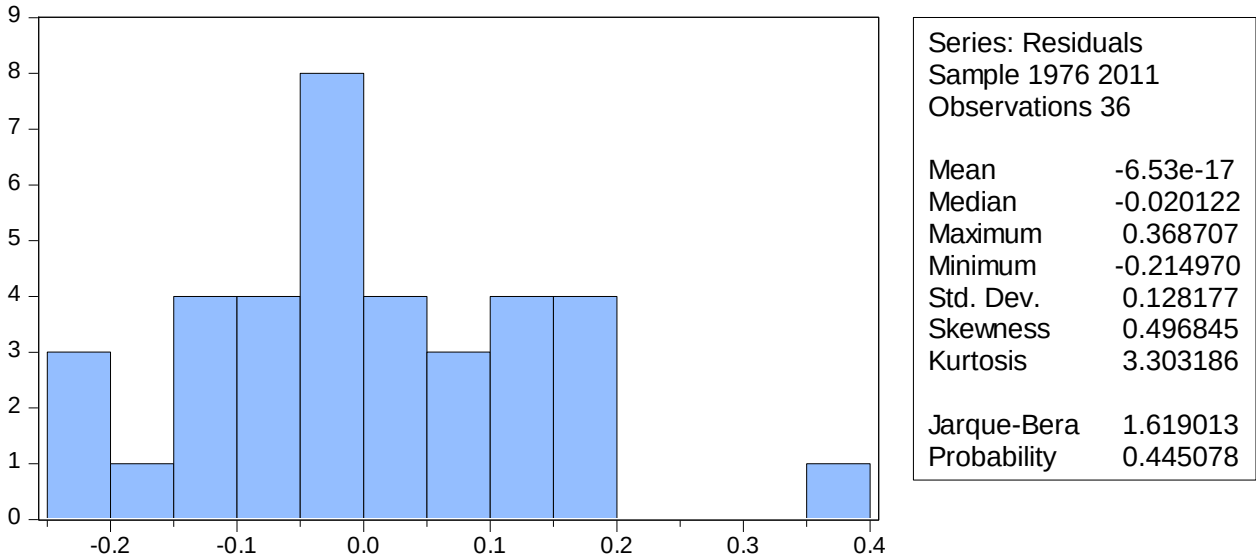
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLTOT	-0.023191	0.265646	-0.087302	0.9311
DLTO	-0.000255	0.146874	-0.001733	0.9986
DLRGDP	-0.021477	0.198870	-0.107995	0.9148

DLREER	-0.081680	0.178923	-0.456507	0.6518
DLDC	-0.036553	0.312783	-0.116865	0.9079
DLKEX	0.005135	0.155723	0.032978	0.9739
ECM(-1)	-0.276151	0.279249	-0.988907	0.3318
C	0.005581	0.053521	0.104287	0.9177
RESID(-1)	0.449946	0.330826	1.360070	0.1855
RESID(-2)	0.040254	0.228600	0.176092	0.8616

R-squared	0.070481	Mean dependent var	-6.53E-17
Adjusted R-squared	-0.251276	S.D. dependent var	0.128177
S.E. of regression	0.143379	Akaike info criterion	-0.816519
Sum squared resid	0.534495	Schwarz criterion	-0.376653
Log likelihood	24.69734	Hannan-Quinn criter.	-0.662994
F-statistic	0.219050	Durbin-Watson stat	2.178803
Prob(F-statistic)	0.988932		

Ho: No serial correlation

Annex 11: Normality test



Since the probability of Jacque-Bera is equal to 0.44 which is greater than 0.1, the distribution is normal distribution.

Annex 12: Ramsey test for model specification

Ramsey RESET Test
Equation: SHRNEQ

Specification: DLX DLTOT DLTO DLRGDP DLREER DLDC DLKEX ECM(
-1) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.036249	27	0.9714
F-statistic	0.001314	(1, 27)	0.9714
Likelihood ratio	0.001752	1	0.9666

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.80E-05	1	2.80E-05
Restricted SSR	0.575023	28	0.020537
Unrestricted SSR	0.574995	27	0.021296
Unrestricted SSR	0.574995	27	0.021296

LR test summary:

	Value	df
Restricted LogL	23.38176	28
Unrestricted LogL	23.38264	27

Unrestricted Test Equation:
Dependent Variable: DLX
Method: Least Squares
Date: 08/24/13 Time: 15:00
Sample: 1976 2011
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLTOT	-0.097323	0.267113	-0.364350	0.7184
DLTO	1.403324	0.156720	8.954363	0.0000
DLRGDP	1.885396	0.202364	9.316854	0.0000
DLREER	-0.224859	0.172207	-1.305746	0.2027
DLDC	-0.921429	0.308196	-2.989746	0.0059
DLKEX	0.023339	0.155870	0.149735	0.8821
ECM(-1)	-0.749040	0.193320	-3.874614	0.0006
C	0.027930	0.052081	0.536284	0.5962
FITTED^2	-0.002964	0.081766	-0.036249	0.9714

R-squared	0.919841	Mean dependent var	0.128429
Adjusted R-squared	0.896090	S.D. dependent var	0.452711
S.E. of regression	0.145932	Akaike info criterion	-0.799035
Sum squared resid	0.574995	Schwarz criterion	-0.403156
Log likelihood	23.38264	Hannan-Quinn criter.	-0.660863

F-statistic	38.72860	Durbin-Watson stat	1.686031
Prob(F-statistic)	0.000000		

Ho: Model specified correctly
We fail to reject the null hypothesis.

DECLARATION

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

Declared by

Name: ……

Signature: …….

Date: ……..

Confirmed by Advisor

Name: ……

Signature: …….

Date: ……..