



Determinants of Ethiopian Trade Balance: Vector Error Correction Model (VECM) Approach

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Abstract

Trade balance is one core component of national income of countries especially in the present times on which every nation have open economy and foreign interaction. It may be in positive or negative depending on the trading and economic power of the nation. For instance Ethiopia has a negative trade balance for the previous two decades, implies that export of the country could not cover the import expenditure. This indicates that the proportion between export and import is always less than one. There are different factors which result into having as such circumstance. This study tried to assess the main determinants of the trade balance of Ethiopia by considering ratio of export and import as an approximation to trade balance. The study implements error correction model to analyze a time series data from 1981-2011, collected from World Bank. The long-run co-integration result shows that GNI per capita, domestic inflation and trade dependency of the country have negative and significant integration with the ratio of export to import. Given this, world oil price inflation has positive and significant effect on the ratio. The vector error correction model of the short-run regression shows that the previous year ratio (Export/Import), elasticity to import, previous year world oil price, agricultural growth and previous year GNI per capita have positive and significant effect on the speed of adjustment of the long-run trend of the ratio. Given this, elasticity of export, previous year inflation and current year GNI per capita affects the speed of adjustment negatively and significantly. The ECM result shows that the speed of adjustment of the deviation from the long-run trend line is 91%, which indicates that Ethiopian economic system is responsive for each policy measures.

Keywords: Trade Balance; Vector Error Correction; Co-Integration; Long-Run; Export; Import.

1. Introduction

Ethiopia has one of the fastest-growing (double digit growth) economy in the world and she has the fourth largest economy in Africa. This fast growth is exhibited in all economic sector of the country. The dominant sector, agriculture, shows a moderate growth rate as compared to the other sectors. This sector is merely rain-fed type, which means it is purely nature governed. It is plagued by periodic drought, soil degradation caused by overgrazing, deforestation, high population density, traditional means of production and poor infrastructure (making it difficult and expensive to get goods to market). Yet agriculture is the country's most promising source in supplying the exportable items and it affects the trade balance significantly but it is not in the required position to have trade balance surplus. The country has very huge potential for supplying exportable crop or livestock products though there are some constraints in the performance of the sector, agriculture.

Agriculture accounts for almost 41% of GDP, 80% of exports and 84% of the labour force employment. Production is overwhelmingly of a subsistence nature and a large part of exportable commodities are provided by the smallholder cash-crop producers. Export items of the country are almost entirely agricultural commodities, in which the principal ones include coffee, pulses, oilseeds, cereals, potatoes, sugarcane and vegetables. Given this, coffee is the largest foreign exchange source and the flower industry becoming an emerging type. Ethiopia's coffee exports represented 0.9% of the

world exports, and oilseeds and flowers represent 0.5% (MoFED, 2006). Though Ethiopia's exports are agricultural raw products that have lower values but importable items of the nation are manufactured products which are high valued type (CSA, 2007).

Ethiopia runs consistent trade balance deficits due to lower production of exportable goods and logistic difficulties. The country is a net importer of fuel, foodstuffs, technological products and textile apparel, which in aggregate result into a continuous trade balance deficit for a long period of time (more than four decades). This deficit remains high in spite of notable increases in exports and having flexible exchange rate that show increasing trend especially in recent times. The trade balance gap is becoming wider in recent times because of importing many raw materials used by mega projects; including infrastructure and services that needs more of imported inputs. Import requirements associated with mega projects that are currently being implemented in the country are main factors that exaggerate trade deficit of the country. Ethiopian exports tripled from 97.42million kilograms worth of 9.64billion birr in 2006 to 1.13billion kilograms worth 31.7billion birr in 2010. Though this is the case in the export side but the rate of increment in the import of the country is also very huge, which result into having wide trade balance deficit. Ethiopia's trade balance repudiated to narrow during the last five years despite the impressive growth of Ethiopia's export revenue. The export revenue covered only 26% of the country's import expenditure in 2010, which showed an improvement as compared to what it was in 2006 (only 24% of the import expense). The trend in 2009 showed a significant amount of reduction as compared to preceding years, in which exports able to cover only 18% of the country's import (Grenchal, 2013).

Given all the above, this study tried to assess the main determinants of the trade balance of the Ethiopia considering the time interval of 1981–2011 fiscal years. At the same time it tried to examine determinants of the speed of adjustment of disequilibrium from the normal trend (short run analysis).

2. Methodology

2.1. Type and Method of Data Collection

The research used secondary data from works of different individuals and organizations. The data were collected from report of different organizations like the National Bank of Ethiopia, World Bank, Central Statistics Agency (CSA) and others. The study mainly relay on time series data from 1981-2011 sourced from World Development Indicator (WDI) of World Bank. This implies that the research used 31 years to address the pre-defined objectives, in which the sampled period is enough to have time series analysis. Since balance of trade of the country is usually recorded once in a year, this study used annual time series data.

2.2. Method of Data Analysis

In this onset, the primary objective of this paper is to examine the role of various determinants on balance of trade in determining short-and long-run trend of it. More precisely, the aim is to examine which of the factors have both long-and/or short-run interaction with trade balance of the country. Trade balance is one part and main actor in affecting national income of the country. It contains two main items that are export and import of the country. Since it is the difference between the two that means trade balance is export minus import, the first one has a positive effect towards increasing the magnitude of the trade balance, and the latter one has a negative effect implies that increment of import always result into trade balance reduction. Though this is the formulation of trade balance this research used ratio of the two as a dependent variable in analysis. Ratio of the two is more preferable because it is not sensitive to unit of measurement and many scholars had adopted it (Jarita, 2007). Given this, this research had tried to use difference of the two but the data is not stationary up to the third difference, which does not allow applying error correction model. One may use the vector autoregressive model if the data are not stationary but it is difficult to interpret the result as a coefficient and determinant of the dependent variable. Thus, the research had better got to have the ratio of the two as an approximate to the trade balance. This ratio is simple and can be interpreted as nominal or real trade balance (Bhamani–Oskooee, 1991). Export of the country is determined by the domestic national income(Y), real world income(\bar{Y}), export production capacity(C), world oil price (WOP), the domestic inflation (I), elasticity of export(ϵ_e), elasticity of foreign importer (export destination)(ϵ_i), exchange rate(R) and other variables. More succinctly, the export function can be specified as:-

$$X = F(Y, \bar{Y}, C, I, \epsilon_e, \epsilon_i, R) \quad (1)$$

The import of one nation can be affected by the domestic national income (Y), consumption preference of the domestic society (ϵ_m), the exchange rate (R), domestic price inflation (π) and other factors. More concisely, import functions can be expressed as:

$$M = F(Y, \epsilon_m, R, \pi) \quad (2)$$

Since the trade balance is difference of the export and import and it is usually stated in terms of domestic price hence it could take the following form:-

$$T = X - qM \quad (3)$$

Where X is export of the country, M is import and q is the marginal propensity to import. Thus,

$$T = F(Y, \bar{Y}, C, I, \varepsilon_x, \varepsilon_i, \mathbf{R}, \varepsilon_m, \pi) \quad (4)$$

Effect of the independent variables like (Y, \bar{Y} , C, I, ε_x , \mathbf{R} , ε_m , π) on trade balance of Ethiopia can be judged by using the following regression model in a linear form especially in the long-run:-

$$T = \alpha + \beta_1 Y + \beta_2 \bar{Y} + \beta_3 C + \beta_4 I + \beta_5 \varepsilon_x + \beta_6 \mathbf{R} + \beta_7 \varepsilon_m + \beta_8 \pi + \mu_t \quad (5)$$

Where α and all $\beta_i \neq 0$ and μ_t is the stochastic term. Following Johansen (1988) and Johansen and Juselius (1990), assume that all the above variables are endogenous, then using matrix notation of vector Z_t , the vector autoregressive model (VAR) of order p can be written as:-

$$Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + A_3 Z_{t-3} + \dots + A_p Z_{t-p} + \varepsilon_t \quad (6)$$

It can be reformulated in a vector error correction model (VECM) as follows:-

$$\Delta Z_t = r_1 \Delta Z_{t-1} + r_2 \Delta Z_{t-2} + r_3 \Delta Z_{t-3} + \dots + r_{p-1} \Delta Z_{t-p} + \Pi Z_{t-1} + \varepsilon_t \quad (7)$$

Where $r_i = (I - A_1 - A_2 - \dots - A_p)$ ($I = 1, 2, \dots, P-1$) and $\Pi = -(I - A_1 - A_2 - \dots - A_k)$ from which the speed of adjustment in the deviation from the normal long-run trend may be the result of a change in one of the determinants.

From equation 4 some of the variables affect trade balance in two opposite directions for instance one can consider the case of the domestic national income and the exchange rate. This implies that the expected sign of them on trade balance could be vague. Given this, the domestic national income has a direct effect on import of the country and an indirect effect on the export side. This indicates effect of the national income on trade balance through import could be higher than that of the effect on the trade balance through export. Having this premise the research expects that increment in the domestic national income will result into enlargement in the trade deficit of the country (reducing the ratio). The effect of exchange rate on trade balance is purely dependent on the circumstance happening on the exchange rate itself that means whether there is successive devaluation or revaluation. If the nation performs successive devaluation, then there could be inverse relationship between exchange rate and trade balance, given that there is fulfillment of the Marshall-Lerner condition. This is what this research expects for the case of Ethiopia. Unfortunately the data regarding exchange rate are not well structured to include this variable in the regression model.

One may use OLS method of estimating the effect of those variables on trade balance if his/her interest is only to assess the negative or positive effect of them. If these variables follow random works or have different orders of integration, a regression of one variable against other variables can lead to spurious results since the OLS estimates would definitely not yield consistent parameter estimates (Vincent, 2003). This method of analysis could not show the short- and long-run relationship of the variables separately. Some of the variables may affect the trade balance in the short or long-run only or they may affect it both periods. Therefore, the requirement, in modeling BOP, is an approach that captures the long-run relationship between the variables while avoiding spurious inferences. Moreover, by estimating equation 7 one could be able to analyze the dynamics of adjustment process (short- run) of export and imports ratio from the normal trend. In having this interaction there would be inclusion of the error correction coefficient as one explanatory variable that can show speed of adjustment of each deviation from the normal long run trend within one year.

3. Data Analysis and Discussion

3.1. Trade Balance Trend of Ethiopia

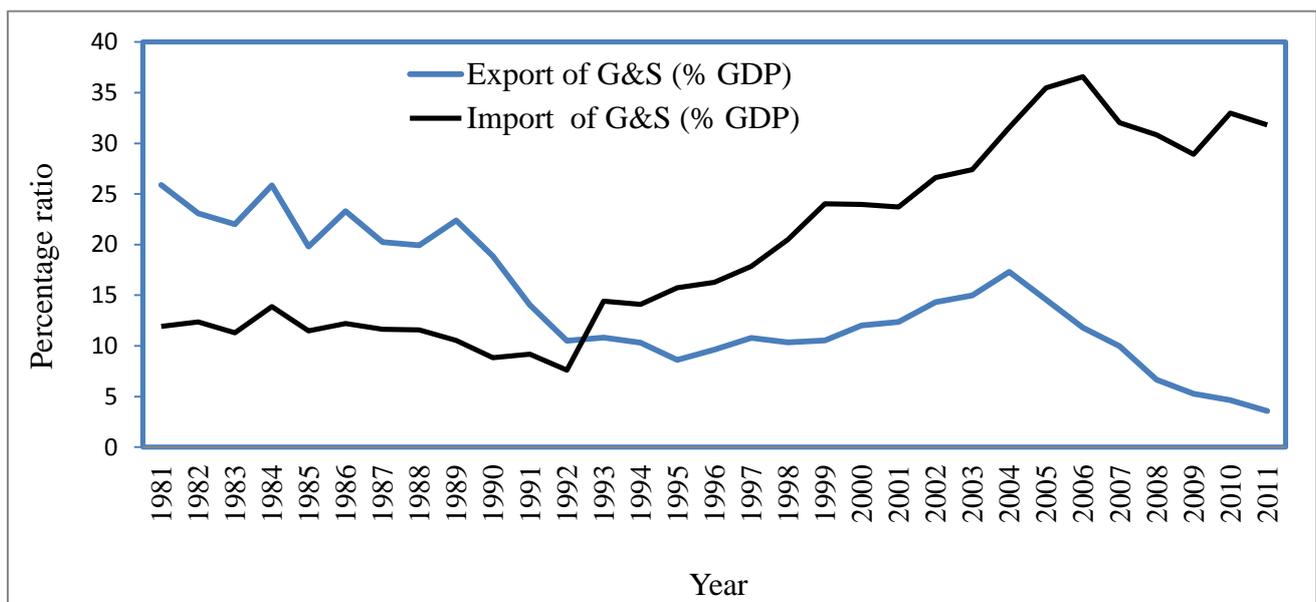
The following table shows that the trade balance was negative for the whole years considered and the magnitude of the deficit was extremely high during 2009 as of the drastic increment in import of the country. The trade balances for the three years (2008, 2009 and 2010) in the given period were trend of sever deficit. Moreover, the serious problem is its complication and continued depth of deficit from year to year. Despite this trend, the amount in 2011 shows slight improvement as compared to what it was in 2010 though it remains in deficit.

Particulars/years	2007	2008	2009	2010	2011
Trade Balance	-3940.90	-5344.80	-6279.20	-6265.80	-5506.20
Exports	1185.10	1465.70	1447.40	2003.10	2747.10
Imports	5126.00	6810.50	7726.60	8268.90	8253.30

Source: Summarized from MoFED and NBE cited by Grenchal, 2013.

The 2008 deficit was deeper by 35.6% from its previous year amount and the consecutive year (2009) deficit was intensified by 17.5% having continuous reduction. Changes were observed in 2010 by slight improvement of 1.22% reduction of deficit and a 22.35% significant narrowing of deficit in the year 2011. The main reason for the stubbornly high trade deficit of Ethiopia is the result of the fact that most inputs used in the country for projects such as infrastructural facilities are raw materials that are imported type. Since the country has been engaged in massive infrastructure projects and drastic economic growth, which intermediate inputs, the trade deficit has failed to narrow (MoFED, 2008). Due to structural break in 1993 export and import of the country showed difference circumstances before and after this year as to the following figure. There was an upward movement in the percentage of both import and export of goods and services from the total GDP of the country. The gap between the two percentages shows successive increment and the overall difference of the two is becoming V-shaped, which implies that the gap becomes wider and wider with the going of time especially after 1993.

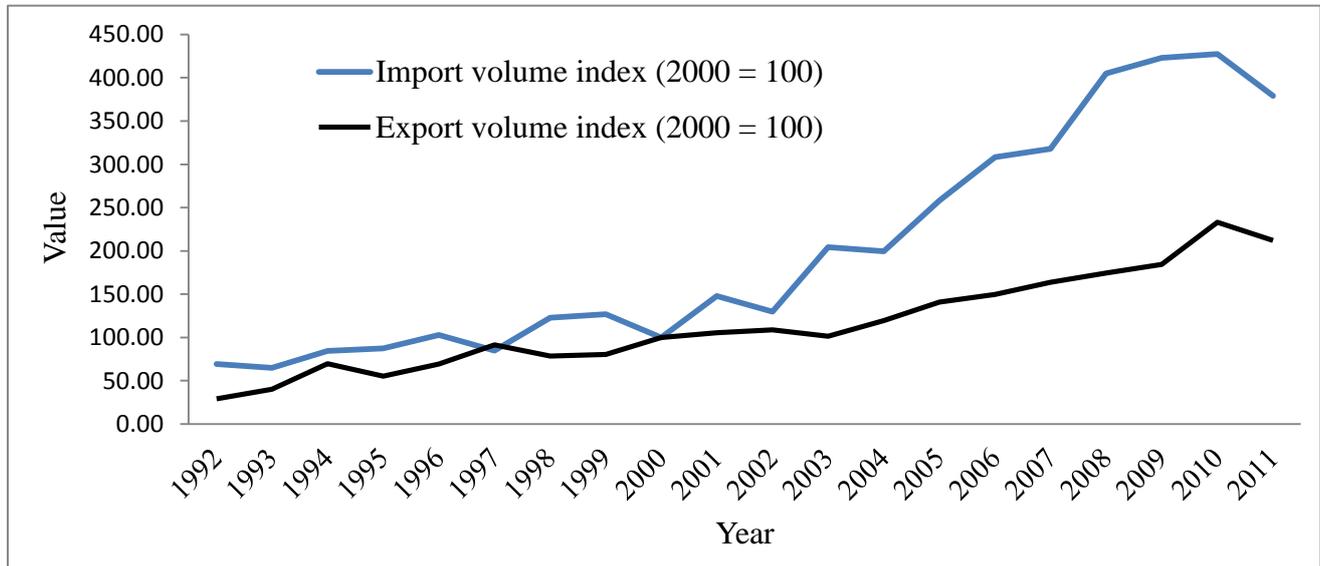
Figure 1: Share of Import and Export From the Total GDP



Source: World development indicator of World Bank

Before outbreak of the world financial crisis in 2007 and 2008 there was successive increment in both percentages. But after that time the percentages show reduction and oscillatory movement in some of the years having wider gap. The same thing happens when there is consideration of the volume of export and import (2000 was the base year for calculating).

Figure 2: Volume of Import and Export

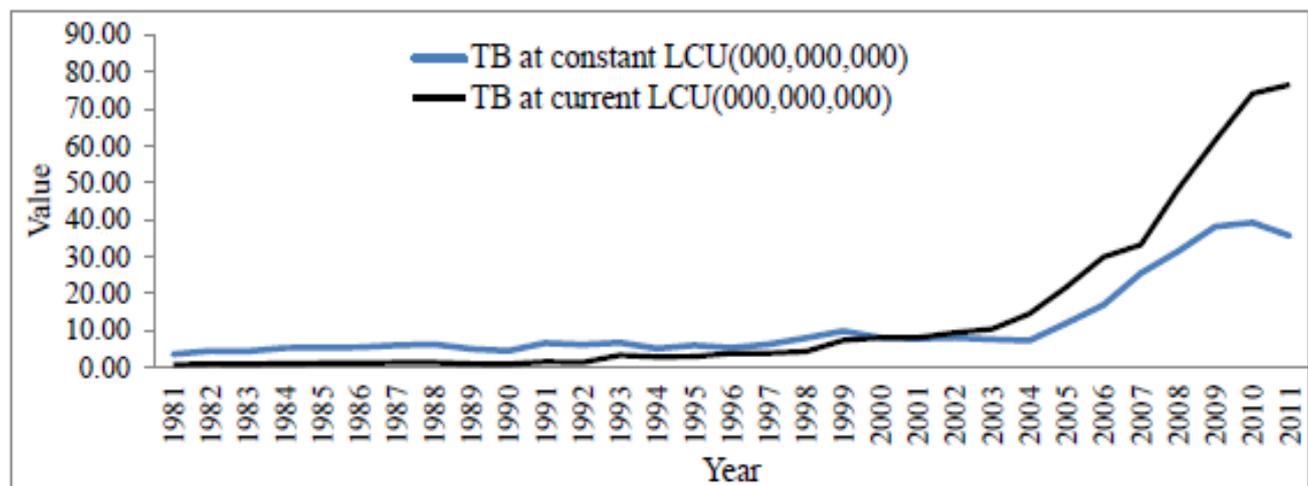


Source: World development indicator of World Bank

Similar to percentage of the export and import from GDP the same behavior is observed in the volume of them (See fig. 2). With the going of time there is increment in the gap between the two volumes. Having the following graph one can say that the reason behind huge and increasing gap in the above two percentages is drastic increment in volume of import but not value of the importable items, which may be aggravated through devaluation of the domestic currency.

Consideration of the constant local currency unit shows the real trade balance that is adjusted from inflation of the domestic economy. As the following graph shows that trade balance of the country calculated based on current local currency unit was higher than the constant local currency based before 2000. This implies that during that time interval there was not as such huge inflation, which is one of the reasons why the current trade balance is higher than the constant one. But after that time on wards the trade balance based on current local currency one is becoming higher due to domestic inflation that can enlarge the current local currency based trade balance without having a change in the output level.

Figure 3: Trade Balance in Constant and Current Local Currency Unit



Source: World development indicator of World Bank

If you see the graph it shows that there is reduction in the trade balance based on the constant local currency, which implies that there is reduction in quantity of goods traded after 2010. This reduction behavior in recent times may be as a result of reduction in the importable items. Before 2001 balance of trade of the country calculated by considering the constant local currency unit was relatively higher, this implies that volume of import was higher.

3.2. Stationary/Unit Root Test

It is suggested that when dealing with time series data, a number of econometric issues can influence the estimation of parameters using OLS. Regressing time series variable on another time series variable using OLS estimation could result into a very high R^2 (goodness of fit), although there is no meaningful relationship between the variables. This situation reflects the problem of spurious regression between totally unrelated variables that are generated by a non-stationary process.

Therefore, prior to testing Co-integration and implementing further econometric methodology needs to examine the stationarity test for each individual time series variables. Most macroeconomic time series data are non-stationary, i.e. they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A non-stationary time series will have a time dependent mean or make sure that the variables are stationary, because if they are not, then automatically the model result may be spurious. Therefore, a stochastic process that is said to be stationary simply implies that the mean $[E(Y_t)]$ and the variance $[Var(Y_t)]$ of Y (dependent variable) remain constant over time for all t , and the covariance $[co-var(Y_t, Y_s)]$ and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all t and s . Since standard regression analysis requires that the time series data should be stationary, first test for this requirement to determine whether the series used in the regression process is a difference stationary or a trend stationary.

Having all the above it is mandatory to have test of unit root problem/ stationary for each of the variables considered in the regression. To test the stationary of variables, Augmented Dickey Fuller (ADF) test, which is commonly used to investigate unit root problem was implemented. The results of the unit-root tests, based on a unit-root null hypothesis versus a stationary alternative are presented in the following table. As of the information on the table three of the independent variables are stationary at level but the remaining independent ones and the dependent variables are stationary at the first difference. Fulfillment of being stationary at the first difference would directly lead into implementation of the co-integration test.

Table 2: Augmented Dickey-Fuller Test for Unit Root Problem

No	Variable	At level	At 1st difference	Order of integration
1	Ratio (E/M)	0.1154	0.0002	I(1)
2	Gross domestic income	0.9926	0.0403	I(1)
3	Agriculture growth	0.0000	0.0000	I(0)
4	Inflation	0.0628	0.0000	I(1)
5	World Oil Price	0.9865	0.0003	I(1)
6	Trade percentage of GDP	0.9296	0.0546	I(1)
7	Cereal Production	0.9910	0.0005	I(1)
8	Elasticity of import	0.000	0.000	I(0)
9	Elasticity of export	0.000	0.000	I(0)

Source: Own analysis, 2013

3.3. Lag Length Determination

Since the dependent variable is time series type, the previous year observation of either the dependent or independent variable may be considered as an explanatory cofactor. This implies that the previous year value of the dependent variable may be also taken into account as an independent variable in the regression. This process could force the research to determine the lag length that will be considered in the operation. In some occasions three of them may show different level of lag. In this research two of them (HQIC and SBIC) methods show that the maximum lag length that should be considered in the operation is one. But AIC shows that it is possible to consider up to the second lag length. It is not uncommon to find consistent result when alternative strategies for model choice are used, it may lead to different outcomes that make some subjective judgment necessary (Hill *et al.*, 2011). Given this, the research considers only first lag of the dependent as well as the independent variables as an additional explanatory.

Table 3: Lag Length Determination

Lag length	AIC	HQIC	SBIC	LR
0	-2.1485	-2.0343	-1.7645	-
1	-2.4246	-2.2962*	-1.9927*	9.4563*
2	-2.4259*	-2.2832	-1.9459	2.0341
3	-2.4140	-2.2570	-1.8861	1.679
4	-2.3770	-2.2058	-1.8011	1.0021

Source: Own regression result, 2013

3.4. Long-Run Co-integration Test

Implication behind this series of tests is that if each time series variable is non-stationary, linear combinations of such time series variables that are stationary might exist. In that case, multiple times series variables are co-integrated and share some common stochastic trends. One can interpret the presence of co-integration to imply that the long-run movements in these multiple time series variables are related to each other. Indeed, if there is a long-run relationship between two or more non-stationary variables then the general concept of co-integration is that deviations from this long-run path are stationary. If this is the case, the variables in question are said to be co-integrated of a certain order level. A time series can however, only be co-integrated if it is integrated of the same order (Eagle and Granger, 1987). The fact that variables are co-integrated implies that there is an adjustment process, which prevents errors in the long-run, relationship from becoming larger and larger. Engle and Granger (1991) showed that any co-integration series has an error correlation presentation, suggesting that co-integration is a necessary condition for an error correction model (ECM) to hold. Indeed, such models incorporate both the economic theory relating to the long-run relationship between variables and short-run disequilibrium behaviors (Vincent, 2003).

This test tried to show co-integration of the dependent variable and the independent ones. This is the way of asserting existence of co-movement in the two types of variables. The existence of correlation between the two variables should be tested by having this test. Here the research performed this test to assert the existence of long-run co-integration between the dependent and independent variables. This implies that here the research is trying to see long-run first order of integration. In having this, the research firstly tried to have the first difference of both the dependent and independent variable to facilitate application of vector error correction (VEC) model of analysis. This indicates that each of variables considered here should be at its first difference as well as stationary at that level (see table 2).

Based on the regression result four of the explanatory variables have co-integration with the dependent variable (ratio of export and import (E/M)). This analysis is the pre condition and base of having the short-run inter relationship of the two variables. Three of the significant variables (GNI per capita, domestic inflation and proportion of GDP from trade) affect the dependent variable (E/M) negatively, which is a result similar to work of Gebre-Egziabher (2003). This means increment of GNI per capita, domestic inflation or proportion of GDP from trade would result into reduction in the ratio (E/M) in the long-run. This indicates that three of them will increase import of the country or reduce the export, which will result in reduction in the ratio (E/M). Positive effect of the lagged variables may be related to expectation of the participants in the export and import activities.

Increment of inflation in the domestic economy has a direct effect of reducing the exportable items of the country. This occasion may happen in either of the two directions: one the government may protect export of some agricultural products if there is successive domestic inflation to settle the domestic economy like the case of the previous year in which there was protection of exporting some agricultural products like maize, lentils, wheat and other basic products. The other side of the problem may be because of reduction in the foreign demand due to increment in price of the domestic products for the foreigner consumers. In this case the foreign demanders may cut back their consumption of our products. As figure 1 shows that there is drastic increment in import of the country, which directly results into increment in the proportion of trade from GDP. As of this, every increment in the proportion of GDP from trade will directly result into reduction in the ratio (E/M). Since import is highly dependent on national income, each increment in income will result into increment of import, which in turn result reduction in the ratio (E/M).

Table 4: Johansen Normalization Restriction Imposed (The Dependent Variable is D Ratio EM)

Description	Coefficient	Std. Err.	Z-value	P> z
Dper capita income	0.00098	0.000165	5.93	0.000
Dinflation	0.02319	0.001894	12.24	0.000
DWOP	-0.01839	0.001894	-9.71	0.000
DTRGDP	0.00870	0.003014	2.89	0.004
DCP	7.20e-11	1.07e-08	0.01	0.995
Cons	-0.010439	-	-	-

Source: Model result, 2013

Given the above circumstance world oil price has positive effect on the ratio, which may be due to restrain in importing more because of cost as well as being motivated to export more to cover each successive increment in the cost of import. Since Ethiopian purely dependent on imported oil, successive oil price increment initiate the country to export more to have stable foreign reserve.

3.5. Estimation of the Vector Error Correction Model (VECM)

ECM is the time series of residuals from the co-integrating vector. The equation of this model incorporates a corrective mechanism by which previous disequilibrium in the relationship between the ratio (E/M) and one or more determinants are permitted to affect current change. In this way, an allowance is made for any short-run divergence in the ratio from its long-run trend. The equation can then be reduced to a parsimonious equation after avoiding insignificant variables and imposition of constraints that holds a reasonable approximation (Adam, 1992 and Vincent, 2003). This econometric analysis tries to show the short-run interaction of the two variables. This model is direct extension of the above long-run result after considering the significant variables in the co-integration equation. Here there is formulation of the error correction by considering the losing-run coefficients. Based on the long-run regression result the speed of adjustment for each deviation from the equilibrium level can be formulated. The change in one or more of the independent variables would result into short-run deviation from the long-run trend of the ratio of export and import. Based on this formulation the research tried to regress the dependent variable on variables that were just transferred from the long run model and variable those are stationary at their level without differencing. The vector error correction model was formulated in the following form:-

$$ECM = DRatio(E/M) - 0.0009756(DGNIpercapita) - 0.0231863(Dinfla) + 0.0183895(Dwop) - 0.0086987(DTRGDP) + 0.0104394.$$

The model result in the following table shows that all of the variables affect the dependent variable significantly in different directions Some of the variables like elasticity of import, lag of GNP per capita, agricultural growth, lag of the dependent itself and world oil price affect the dependent variable positively and significantly. Considering one of the variables, growth of agriculture, those affect the ratio (E/M) positively there is a direct relationship between the export of the country and agriculture that is the dominant source of export, and this should enlarge the ratio and the trade balance of the country.

Table 5: The Parsimonious Vector Error Correction Model (Dependent Variable D Ratio EM)

Description	Coefficient	Robust Std. Err.	t_value	P> t
DRatioEM_1	1.21626	0.40845	2.98	0.008
GNIpercapita	-0.00078	0.00032	-2.41	0.026
GNIpercapita_1	0.00078	0.000375	2.07	0.052
Dinfla_1	-0.01829	0.00623	-2.94	0.008
DAgrigrow	0.00520	0.00177	2.94	0.008
DWOP_1	0.01418	0.00492	2.88	0.010
Elast	0.01595	0.00754	2.12	0.048
Elaexpo	-0.02276	0.00686	-3.32	0.004
ECM_1	-0.91042	0.29515	-3.08	0.006
Cons	-0.00307	0.07506	-0.04	0.968

Source: Model result, 2013

If one observes the inflation, it affects the ratio (E/M) and the trade balance in the opposite direction, especially the previous year domestic inflation of the country affects the trade balance negatively through increasing import of the current time. This is due to expectation of the domestic importers and consumer about future price. The reverse circumstance happens in the case of the previous year world oil inflation. This implies that having higher world price of oil in the previous year then there will be increment of the ratio, which implies that there may be reduction in import of the country. Elasticity of export, previous year domestic inflation and current year GNI per capita affects the ratio (E/M) negatively and significantly. Previous year domestic inflation may reduce the demand of foreigners to import from the domestic economy. This implies that there will be direct reduction export revenue of the country. Given this, exporters may not be initiated to export more if there was price hick in the domestic economy in the previous year performance of the country. Given all the above, the speed of adjustment of the deviation/ disequilibrium, that results from change in one of the independent variables in the short run, from the long run trend is too fast that is 91.04% per year, which means no full adjustment within one year.

4. Conclusions and Recommendations

The research tried to assess the main determinants of Ethiopian trade balance. It also had tried to see the speed of adjustment in the deviation from the normal trend (equilibrium) level. Having this, there was examining both the short- and long-run determinants of the trade balance, in which the long-run were the base to formulate the short-run model. The descriptive analysis shows that successive devaluation of the domestic currency is not in a position to cover the import expenditure rather it increases the overall import and alarmingly exaggerate the trade balance deficit. This implies that there should be consideration of different circumstances before devaluating the domestic currency.

The research found that GNI per capita and domestic inflation have significant and negative long-run integration with the export-import ratio, which means that increment of them would directly result into reduction in the ratio. This may exaggerate trade deficit of the country.

Given this, world oil price increment has a positive long-run effect on the ratio, which means upward movement of price would result into improvement in export-import ratio. This is due to reduction in import as of increment in the world oil price (cost of transportation), which will directly result into increment in the ratio that may be favorable for the well performance of the trade balance of the country.

The short-run analysis reveals that previous year ratio of export-import, elasticity of import, previous year GNI per capita, growth of agriculture production and previous year world oil price affects the ratio significantly and positively. This implies that increment of them will try to improve the ratio, which means there would be a direct improvement in the trade balance when there is a change in one or combination of variables at a time.

Since export of the country is mainly sourced from the agricultural sector, the model result also asserts this condition in which agriculture has a positive and significant contribution in improving the ratio of export-import. This indicates that improvement in agriculture of the country would result into increment in the export and overall improvement in trade balance.

The domestic inflation (both in the current and previous year) is not only disturbing and negatively affecting the domestic economy but it is also becoming one bottleneck for the balance of payment of the country through affecting the trade balance. It is one of the reasons for the devastating increment of trade balance deficit of the country in recent times. Thus, protecting the domestic price hike would result into settlement in trade balance of the country.

The short-run regression, error correction model, result shows that the speed of adjustment of the deviation of the ratio from the long-run trend line is very fast that is 91% in one year and it will completely converge to its long-run equilibrium in thirteen month.

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