Determinants of Trade Balance in Ethiopia

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Abstract

This study attempted to identify the short and long-run determinants of trade balance in the case of Ethiopia's economy for the period 1978 to 2009. In order to achieve the stated objectives a synthesis model of absorption, elasticity and monetary approaches to trade balance is estimated using Engle-Granger two step procedures of cointegration and general to specific error correction model. The findings of the study suggest that the most important long run determinants of trade balance are household consumption expenditure, real effective exchange rate and terms of trade while government consumption expenditure, household consumption expenditure, real effective exchange rate and terms of trade are the short run determinants of trade balance. Based on the findings of this study the researcher recommended raising import tariff on final consumer goods, expand industrial base, increase domestic saving to finance domestic investment, depreciation or devaluation of birr and improving the quality of domestic products to solve the trade imbalance.

1. INTRODUCTION

Nations' of the world differ in their resource endowments and level of technology applied in the production of goods and services. The engagement of nations in the international trade depends upon a nation's specialization in the production of goods and services and in which they have comparative advantages, which in turn constructs a room for improvement of the welfare of the society as a whole. This theory traces back to the last half of the 18th century, the time when Adam Smith realized the importance of specialization and trade in his Wealth of Nations (Hailegiorgis, 2011). Subsequently, many economists advocated the contribution of international trade for welfare of nations as the engine of growth in the overall process of economic development (Onafowora and Owoye, 1998; Arndt, 1999) as cited in (Hailegiorgis, 2011). Over the past two decades, developing countries have progressively increased their share in Global trade from just less than one quarter to about one third. Asia and particularly China account for most of the change, which has been facilitated by diversification of exports. 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 (Yishak, 2009).

Deep rooted 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 (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. Moreover, after the downfall of the Derg regime, the Transitional Government of Ethiopia stated that it is essential to increase and diversify exports. 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 (Yishak, 2009).

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. Although coffee is still the dominant export item, since 2001/02 its contribution to total export earnings has declined to 36.3% in 2007. 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, Ciurak and Previle (2010) argued 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. On the other hand, international organizations have often recognized that Africa's exports still face market access problems in the international markets (UNCTAD, 2008).

Generally, Ethiopia’s track record on using trade for development is not exactly encouraging. Different trade strategies have been used in the past, including import replacement/protection for infant Industries during the Imperial period, state-managed trade during the military government era, and a more market -oriented liberalized approach supported by much trade-related technical assistance in the most recent period. Nonetheless, Ethiopia has a low share of trade in GDP, its exports continue to have limited diversification, and its trade deficit has widened significantly, leaving it dependent on financial assistance to pay its import bill (Ciurak and Previle, 2010). For instance, the share of export in import financing (export/import) declined from 52% in 1997 to 22% in 2006/07. Therefore, Ethiopia's trade balance with its major trading partners calls for concern because such a wide and growing gap between the value of exports and imports of a country means that the country continues to need other sources of financing its import demand such as foreign aid and credit; and needs the resources at an increasing rate (MOFA, 2007).

2. Statement of the problem
Ethiopia is among the least developed countries where the economy is primarily agriculture based and quite backward. The rudimentary stage of industrial growth combined with the traditional style of farming force the people to depend on the gifts of nature for their livelihood and the country has chronically run a negative balance of trade, rendering the country dependent upon foreign aid and loans to finance imports. The imperial, the military and the current government tried to improve Ethiopia's balance of trade, the imperial and the current government by encouraging exports and the military government by curtailing imports. Macro economic reforms and various policies and strategies were adopted but trade balance is still not improving.

Ethiopia suffers from a disproportionate loss of revenue and resultant dependence on its trade links with the rich nations due to the country is a producer of primary products, used as raw materials in the industries of rich nations and for which it is paid very poorly. In addition, Ethiopia is prevented from improving the volume and quality of its output due to the acute shortage of foreign exchange earnings needed for importing vital machinery, spare parts, and other industrial input.

Generally, Despite Ethiopia having undertaken macroeconomic reforms and adopted various policies and strategies with respect to external trade, performance of the export sector has not been consistent with recommended policies and has been outstripped by the increase in imports and there have been increasing balance of trade deficits, which cause a serious lack of foreign exchange to meet the import bill and other payment obligations, such as external debt. This deficit raises suspicions that there could be certain policy variables that have led to the deteriorating trends of the balance of trade. This study, therefore, tests empirically the relationship between Ethiopia’s trade balance and its determinant variables, which are considered to be the root causes of the trade deficit.

3. Objectives of the study
The general objective of the study is to investigate the Determinants of Trade Balance in Ethiopia with the following specific objectives:

- To explore the short run determinants of trade balance in Ethiopia.
- To explore the long run determinants of trade balance in Ethiopia.
4. **Hypotheses**

Based on the stated problem, the study objective, and the literature review, the following hypotheses were tested:

- Real effective exchange rate appreciation negatively affects the trade balance.
- Household consumption expenditure negatively affects trade balance.
- Government consumption expenditure negatively affects trade balance.
- Terms of trade positively affects trade balance.
- Money supply negatively affects trade balance.
- Trade liberalization positively affects trade balance.

5. **RESULTS AND DISCUSSION**

**Results of Cointegration Analysis**

One of the major problems encountered in studying economic relationships is the likelihood of spurious regression. The first step in cointegration analysis is studying the order of integration of the variables under consideration. Before estimating the cointegration and ECM, the study examined each individual series, trade balance, real effective exchange rate index, household consumption expenditure, government consumption expenditure, terms of trade index and real money supply using the ADF unit root test statistic. Test results portray that the variables of interest show unit roots at level and stationary at its first difference.

**The Engle–Granger two step procedure of cointegration**

Cointegration is the statistical implication of the existence of a long run relationship between economic variables. The idea behind cointegration analysis is that, although macro variables may tend to trend up and down over time, groups of variables may drift together. If there is some tendency for some linear relationships to hold among a set of variables over long periods of time, then cointegration analysis helps us to discover it.

In this study a unit root test to the retained residual was applied to determine its Stationarity with drift, without drift, with drift and trend. The ADF test revealed that the retained residual is stationary at its level. This implies trade balance is cointegrated with the other explanatory variables, and that there exists a linear combination of the variables that is stationary. This finding leads to a conclusion that there are long-run equilibrium relationships among the variables. The steps of conducting a cointegration analysis are as follows:

In the first step the long run relationship among the variables has been estimated using OLS. The result is as follows:

\[
\ln \text{TB} = -0.081174 \ln \text{MS} - 0.244931 \ln \text{REER} - 1.683122 \ln \text{HC} - 0.257124 \ln \text{GC} + 0.352292 \ln \text{TOT} - 0.242737 \text{DM} + 7.279391
\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Err</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>\ln \text{REER}</td>
<td>-0.243859</td>
<td>0.109632</td>
<td>-2.224334</td>
<td>0.0354</td>
</tr>
<tr>
<td>\ln \text{HC}</td>
<td>-1.687716</td>
<td>0.478770</td>
<td>-3.525106</td>
<td>0.0017</td>
</tr>
<tr>
<td>\ln \text{TOT}</td>
<td>0.348266</td>
<td>0.168531</td>
<td>2.066480</td>
<td>0.0493</td>
</tr>
<tr>
<td>\ln \text{GC}</td>
<td>-0.257815</td>
<td>0.141862</td>
<td>-1.817368</td>
<td>0.0812</td>
</tr>
<tr>
<td>\ln \text{MS}</td>
<td>-0.084832</td>
<td>0.165867</td>
<td>-0.511448</td>
<td>0.6135</td>
</tr>
<tr>
<td>DM</td>
<td>-0.240010</td>
<td>0.134071</td>
<td>-1.790175</td>
<td>0.0855</td>
</tr>
<tr>
<td>C</td>
<td>7.325337</td>
<td>2.314629</td>
<td>3.164799</td>
<td>0.0041</td>
</tr>
</tbody>
</table>

R-squared 0.778943  
Adjusted R-squared 0.725889  
S.E. of regression 0.101885
Then the residual from the above regression can be written as
\[ Ut = \ln TB + 0.081174 \ln MS + 0.244931 \ln REER + 1.683122 \ln HC + 0.257124 \ln GC - 0.352292 \ln TOT + 0.242737 DM - 7.279391 \]

In the second step, the order of integration of residuals \( Ut \) has been tested using ADF statistic and the result indicates that the null hypothesis of non-stationary of \( Ut \) can be rejected. The result of ADF on residual, excluding the intercept and trend is presented in the table below.

Table 2: ADF test on Residual

<table>
<thead>
<tr>
<th></th>
<th>t-Statistic</th>
<th>Prob.♦</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>4.9007***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Test critical values:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1% level</td>
<td>2.6423*</td>
<td></td>
</tr>
<tr>
<td>5% level</td>
<td>-1.9526</td>
<td></td>
</tr>
<tr>
<td>10% level</td>
<td>-1.6216</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own Result (2011)


Therefore, Engle-Granger two-step procedure affirms that \( \ln TBt \) and \( \ln REERt \), \( \ln HCt \), \( \ln Ms \), \( \ln TOT \) and \( \ln GC \) are cointegrated. Since the residuals from the first cointegration equation are stationary, it is possible to interpret the results of cointegration equation as a long run equilibrium relationship. I.e. even though the individual variables are non-stationary a linear combination of them is stationary. The results suggest that REER appreciation has a significant negative impact on balance of trade and its elasticity is -0.24, which indicates that if REER increases or appreciation by 1 percentage point the balance of trade deteriorates by 0.24 percentage points keeping the other variables constant. An improvement in the terms of trade positively affects trade balance and its elasticity is 0.35, which indicates that a one percentage increase in terms of trade increase trade balance by 0.35 percentage point.

House hold consumption expenditure has also a significant negative impact on trade balance and its elasticity is -1.68 which indicates that a one percentage point increase in house hold consumption worsen trade balance by 1.68 percentage point keeping the other variables constant. The coefficient of government consumption expenditure is negative but statistically insignificant at 5% level of significance. The dummy variable used to capture the effect of trade liberalization shows unexpected sign, however, statistically insignificant at 5% level of significance. This result is consistent with the UNCTAD study, which indicated that trade liberalization introduced after a long period of import compression often leads to an increase in the demand for foreign goods. The coefficient of the real money supply is negative but statistically non-significant. This implies that real money supply has no effect on trade balance. It should be noted, however, that the negative sign of the coefficient of the real money supply variable in the trade balance equation is consistent with the argument that an increase in domestic money supply would lead to an increase in the level of real balances. Given that the coefficient of the real money supply variable is statistically non-significant, this implies that the monetary approach is not the major channel by which adjustment takes place in Ethiopia. The constant is significant, which implies that there are other factors which can influence the trade balance of Ethiopia.

Overall, the model has an \( R^2 \) of 0.78, implying that the independent variables significantly determine the dependent variable. The independent variable explains 78 percent of the variations in the dependent variable.
Results of General to Specific Error Correction Model

In this study the error correction model includes the present and lagged values of trade balance, real effective exchange rate index, terms of trade index, house hold consumption expenditure, real money supply, government consumption expenditure.

The short-run dynamics of the balance of trade of Ethiopia was estimated following general-to-specific modeling approach. Due to limited number of observations, the maximum lag length that can be used in the error correction model was three. Starting with three lags for all variables, the current and lagged observations on variables are excluded from the final parsimonious model based on tests of coefficient significance.

The results of parsimonious error correction model are given in the table below.

Table 3: Results of Parsimonious Error Correction Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Err</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ Ln HC</td>
<td>-0.978452</td>
<td>0.323586</td>
<td>-3.023781</td>
<td>0.0065</td>
</tr>
<tr>
<td>Δ InTOT(-1)</td>
<td>-0.693900</td>
<td>0.152686</td>
<td>-4.544612</td>
<td>0.0002</td>
</tr>
<tr>
<td>Δ InTOT(-2)</td>
<td>-0.311748</td>
<td>0.142648</td>
<td>-2.185435</td>
<td>0.0403</td>
</tr>
<tr>
<td>Δ Ln REER(-3)</td>
<td>-0.538277</td>
<td>0.124469</td>
<td>-4.324576</td>
<td>0.0003</td>
</tr>
<tr>
<td>Δ In GC(-2)</td>
<td>-0.317677</td>
<td>0.115376</td>
<td>-2.753408</td>
<td>0.0119</td>
</tr>
<tr>
<td>ECMt-1</td>
<td>-0.882880</td>
<td>0.180228</td>
<td>-4.986747</td>
<td>0.0001</td>
</tr>
<tr>
<td>C</td>
<td>-0.037262</td>
<td>0.015443</td>
<td>2.412878</td>
<td>0.0251</td>
</tr>
</tbody>
</table>

R-squared: 0.705577
Mean dependent var: 0.017700
Adjusted R-squared: 0.621456
S.D. dependent var: 0.126210
S.E. of regression: 0.077652
Akaike info criterion: 2.060841
Sum squared resid: 0.126626
Schwarz criterion: -1.727790
Log likelihood: 35.85177
F-statistic: 8.387657
Prob (F-statistic): 0.000000

This specification is used to test the J curve effect of devaluation. The J-curve effect is seen in economics when a country's trade balance initially worsens following a devaluation or depreciation of its currency. The higher exchange rate will at first correspond to more costly imports and less valuable exports, leading to a bigger initial deficit or a smaller surplus. Due to relatively low-priced exports, however, a country's exports will start to increase. Local consumers will also purchase less of the more expensive imports and focus on local goods. The trade balance eventually improves to better levels compared to before devaluation.

The Parsimonious error correction model passes all diagnostic tests. Breusch-Godfrey Serial Correlation LM test indicates that the residuals of the estimated error correction model do not suffer from autocorrelation; the errors are also normally distributed as Jarque-Bera test of normality fails to reject the null of normally distributed residuals.

Table 4.4 presents the results of final parsimonious error correction model. From the table it is evident that the lagged error correction term is highly significant and negatively related to the dependent variable. It has a coefficient of -0.88 with the statistic probability value of 0.0001. This satisfies one of the conditional requirements of a good specific model. The coefficient of lagged equilibrium (-0.88) implies a rapid speed of adjustment back to the equilibrium.

The results of the general to specific error correction model show some similarity with those of the cointegration equation model. Real effective exchange rate appreciation, terms of trade index, house hold consumption expenditure and government consumption expenditure were found to be highly significant in determining trade balance of Ethiopia.
The result indicates that a 1 percent increase in real effective exchange rate appreciation leads to a 0.54 percent reduction in trade balance.

The household consumption expenditure has a significant negative impact on trade balance and its elasticity is -0.98 which indicates a one percentage point increase in household consumption expenditure worsens trade balance by 0.98 percentage point.

The government expenditure has also a significant negative impact on trade balance and its elasticity is -0.32 which indicates that a one percent increase in government consumption expenditure worsens trade balance by 0.32 percentage point.

The terms of trade (at lag 1 and 2), however, influences trade balance negatively which is contrary to the results of the long run model but this result is consistent with the theory of demand. That is, the past terms of trade affects the current trade balance negatively.

6. Conclusions and policy recommendation

Conclusions

The study attempted to examine the long run and short run determinants of trade balance in Ethiopia for the period 1978 to 2009. In the case of Ethiopia, the most important long run determinants of trade balance are household consumption expenditure, real effective exchange rate, and terms of trade while real effective exchange rate, household consumption expenditure, government consumption expenditure and terms of trade are the short run determinants of trade balance. The coefficient of the real money supply and is negative but statistically non-significant at a 5% percent level. This implies that real money supply has no effect on trade balance. The implication is either nominal money supply has not grown by a significant amount or price has been grown by a significant amount rendering the real money supply insignificant in the trade balance dynamics. It should be noted, however, that the negative sign of the coefficient of the real money supply variable in the trade balance equation is consistent with the argument that an increase in domestic money supply would lead to an increase in the level of real balances. Given that the coefficient of the real money supply variable is statistically non-significant, this implies that the monetary approach is not the major channel by which adjustment takes place in Ethiopia.

The estimated short run model revealed that the trade balance converges to its equilibrium value. The speed of adjustment (-0.88) is high implying that it takes short for trade balance to move back to its equilibrium once its drifts away from its long run equilibrium value.

Policy implications

Based on the findings of this study, the following actions are recommended to address the trade imbalance:

- **Raise tariffs on imported final goods**: This study has revealed that Ethiopians simply are spending more on foreign goods than they are producing, and foreigners are spending less. This condition cannot be sustained. Reducing the trade deficit requires reduction of either private or government consumption expenditure by discouraging import of certain categories of goods and, at the same time, creating an enabling environment for increasing domestic production.

- **Expand industrial base**: As household consumption and government consumption expenditure have negative influence on trade balance as it highly stimulate import, the government should conduct a policy that will help domestic producers to stay competitive and expand the industrial base.

- **Increase savings to finance domestic investment**: To reduce the trade deficit, the country must increase the savings needed to finance domestic investment, which would then improve the industrial base. Different ways of doing that, however, would have greatly different effects on the economy. Reducing government spending would reduce services and transfer payments for education and health care that are available to the citizens. An increase in personal taxes would reduce private consumption, saving, and investment. An increase in the tax on business investment would reduce the future growth of real wages and consumption. Therefore, Ethiopia should consider the opportunity cost forgone in the choice to be made among these measures.
Depreciation or devaluation of birr: The result indicates that real effective exchange rate appreciation has a negative influence on trade balance. To address the problem birr will have to be depreciated (on a real trade-weighted basis) and foreign currencies appreciate to induce the changes in spending at home and abroad. The inducement is caused by the depreciating birr increasing the relative price of foreign goods in Ethiopian market and decreasing the relative price of Ethiopian goods in foreign markets.

Select and apply appropriate trade policy instruments: To address the problem constraining trade expansion and growth in Ethiopia, it is necessary that the choice of suitable policy instruments reflects the most direct relationship between issues involved in the identified constraint and the instruments available. Trade policy implementation has to prioritize the application of instruments to address specific problems on the basis of anticipated direct impact. Effective trade policy also depends on adopting a common direction for different instruments so that these instruments complement rather than contradict each other. The issue for the future is how the effectiveness of trade reforms is contingent on the existence of other characteristics of the environment in which production and investment decisions are made.

Improve the quality of domestic products: Improving the quality of domestic products shifts the domestic consumer’s preference to wards domestic products.

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