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15 August 2006

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*We acknowledge useful comments from P. Alagidede (PhD), *Department of Economics, Loughborough University, UK.* The usual disclaimer applies.

AGGREGATE IMPORT DEMAND AND EXPENDITURE COMPONENTS IN GHANA: AN ECONOMETRIC ANALYSIS

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Abstract

In this paper, the behaviour of Ghana's imports during the period 1970-2002 is studied using disaggregated expenditure components of total national income. We use the newly developed bounds testing approach to cointegration and estimated an error correction model to separate the short- and long-run elements of the import demand relationship. The study shows inelastic import demand for all the expenditure components and relative price. In the long-run, investment and exports are the major determinant of movements in imports in Ghana. In the short run household and government consumption expenditures is the major determinant of import demand. Import demand is not very sensitive to price changes.

Keywords: import demand, imperfect substitution, ARDL cointegration, bounds test approach

JEL Classification: C22, F1O, F41

Introduction

Ghana is classified as a low income country with real GDP per capita in 2002 of US$428.6. Ghana has a population of around 20.4 million inhabitants as of 2004 and has about 40% of the population living under the national poverty line (World Bank, 2004). Ghana's macroeconomic performance has been rather sluggish over the last two decades. Economic growth has stagnated around 4.7 per cent per annum. In 2004 the Ghanaian economy grew by 5.5 per cent and a higher growth rate of 5.8 per cent is forecasted for 2005 (Government of Ghana, 2005).

In Ghana, imports as a share of GDP has been rising strongly, particularly over the past three decades. Again over the past 30 years imports have fluctuated considerably, generally in line with changes in real GDP. A significant portion – about 55 per cent – of Ghana's GDP was spent on import payments in 2002. Given the importance of imports for Ghana's economic growth and development, and the ensuing implications on the balance of payments, the central aim of this paper is to estimate the aggregate import demand for Ghana during the period 1970 to 2002.

The economy has been going through structural changes in recent years. Ghana has not remained a primarily agricultural economy. The share of agriculture in GDP has declined from about 45% in 1990 to about 36% in 2004. During the same period, the manufacturing and services sectors increased from 16.8% and 38.4% to about 25% and 39% respectively. In 2001, exports and imports of manufactures stood at 16.35% of merchandise exports and 56.29% of merchandise imports respectively (World Bank-WDI, 2004).

Ghana has become more open since trade liberalisation in the early 1980s. In 2002, Ghana exported $2624.97 million worth of goods and services but the total imports bill was $3,379.94 million (World bank-WDI, 2004). The country continues to have a negative trade

balance. In 2002, Ghana's external trade balance on goods and services stood at a deficit of $754.96 million about 12.3% of GDP. The indicator for trade openness (Trade as a percent of GDP) in the economy has increased consistently since the liberalisation from 6.3% in 1982 to a peak of 116% in 2000 and declined to 97.5% in 2002. Capital goods, crude oil, and energy have constituted the most important items of import. However, Ghana also imports a considerable amount of primary raw materials and other intermediate and consumable goods. Non-durable consumable goods imports have become particularly important on Ghana's imports bill due to the declining capacity in domestic production and changing preferences due to globalisation. Although Ghana has embarked on massive export promotion campaign with the promulgation of an Export Free Zone Act, it has not succeeded in increasing export over imports. The import penetration ratio (import as a per cent of GDP) has increased from a minimum of 2.98% in 1982 to the highest of 67.24% in 2000 and declined to 54.87% in 2002.

The above analysis shows that external trade is a key determinant of economic growth and development in Ghana. For policy purposes, it is pertinent to know the determinants of aggregate import demand in Ghana. The paper, to the best of our knowledge, is the first to use the recent disaggregated import demand formulation approach to study the behaviour of aggregate import demand in Ghana. Following recent studies by Tang (2003), Ho (2004), and Narayan and Narayan, (2005), we use the disaggregated components of domestic income (i.e. final demand expenditure components) together with the standard relative price variable to specify the aggregate import demand model for Ghana.

The use of the disaggregated components of total domestic income to estimate aggregate import demand is a relatively recent research approach (Tang, 2003; Ho, 2004; Narayan and Narayan, 2005) different from the traditional approach which uses only domestic income and the relative prices. Two advantages accrue from using the disaggregated import demand

model over the traditional aggregate import demand model. The later implicitly assumes that the import contents of all components (C, I and X) in the final expenditure demand are identical. If this assumption does not hold, the use of a single demand variable will lead to aggregation bias (Giovanetti, 1989). By disaggregating the final demand, the disaggregate model not only can avoid the problem of aggregation bias, but also can be used to estimate the separate effects of each component on import demand. Moreover, by avoiding aggregation problems, the disaggregate model has better forecasting powers than the traditional import demand models (Narayan and Narayan, 2005).

The rest of the paper is organized as follows. Section 2 presents recent literature review of the aggregate import demand studies that used the disaggregation approach. Section 3 presents the specification of the aggregate import demand model. Section 4 describes the econometric methodology used. We discuss the result in section 5. Section 6 concludes the paper.

Recent Empirical Import Demand Literature

There is an overplus of studies that examine the causal factors of aggregate import demand models. From the empirical literature we surveyed, no study was found that specifically estimates the determinants of aggregate import demand in Ghana. It is therefore only logical for us to survey the literature that is directly relevant to the theme chosen for this study. At this point, we focus on reviewing only those studies that have used the disaggregate approach.

Abbott and Seddighi (1996) used the cointegration approach of (Johansen and Juselius, 1990) and the error correction models of (Engel and Granger, 1987) to estimate an import demand model for the UK. From their results consumption expenditure had the largest impact

on import demand (1.3) followed by investment expenditure (0.3) and export expenditure (0.1). The relative price variable (the ratio of import price to domestic price) had a coefficient of 20.1.

Mohammed and Tang (2000) also used the (Johansen and Juselius, 1990) cointegration technique and estimated the determinants of aggregate import demand for Malaysia, over the period 1970-1998. The results indicated that while all expenditure components had an inelastic effect on import demand in the long run, investment expenditure had the highest correlation (0.78) with imports followed by final consumption expenditure (0.72). Expenditure on exports was found to have the smallest correlation with imports (0.385). They also found a negative (-0.69) and inelastic relationship between relative prices and import demand. All results were found to be statistically significant at the 1 per cent level.

Mohammad *et al*. (2001) examine the long-run relationship between imports and expenditure components of five ASEAN countries (Malaysia, Indonesia, the Philippines, Singapore and Thailand) through Johansen multivariate cointegration analysis (Johansen 1988; Johansen *et al.* 1991). Annual data for the period 1968-1998 are used for the countries (except Singapore, with a shorter period 1974-1998). The disaggregate model, in which the final demand expenditure is split up into three major components, is used. The results reveal that import demand is cointegrated with its determinants for all five countries.

Min *et al.* (2002) estimated South Korea's import demand using the Johansen and Juselius (1990) approach over the 1963-1998 period. They found evidence of long run elastic (1.04) impact of final consumption expenditure on import demand and inelastic (0.49) impact of export expenditure on import demand. Both results were statistically significant at the 1 per cent level. However on the impact of investment expenditure, while they found it to be negatively related with import demand, it was statistically insignificant. On the impact of

prices, they found relative prices negatively impacting import demand at the 1 per cent level of significance.

Tang (2003) estimated China's import demand using the bounds testing approach to cointegration. In the long run, he found expenditure on exports having the biggest correlation with imports (0.51), followed by investment expenditure (0.40) and final consumption expenditure (0.17). The relative price variable appeared with a coefficient of 20.6, implying that an increase in relative prices induces a 0.6 per cent fall in the demand for imports.

Ho (2004) has also estimated the import demand function of Macao by testing two popular models: (i) aggregate and (ii) disaggregate import demand model with the components of aggregate expenditure using quarterly data over the 1970 to 1986 period. Using JJ-Maximum likelihood cointegration and error correction technique, Ho (2004) found significant partial elasticities of import demand with respect to investment (0.1396), exports (1.4810) and relative prices (-0.3041) with their expected signs implied by the economic theory in the disaggregated model.

Narayan and Narayan (2005) recently applied the bounds testing approach to cointegration to estimate the long-run disaggregated import demand model for Fiji using relative prices, total consumption, investment expenditure, and export expenditure variables over the period 1970 to 2000. Their results indicated a long run cointegration relationship among the variables when import demand is the dependent variable; and import demand to be inelastic and statistically significant at the 1 per cent level with respect to all the explanatory variables in both the long-run and the short-run. The results revealed long run elasticities of 0.69 for both export expenditure and total consumption expenditure respectively, followed by relative prices (0.38) and investment expenditure (0.17).

The Import Demand Model: The Imperfect Substitutes Framework

The standard import demand model with income and relative price as the explanatory variables has been the work horse in the literature in both developed and developing countries. Goldstein and Khan (1985) presented two trade models: the imperfect substitutes model and the perfect substitutes model. Whilst the perfect substitutes is mainly for the trade of homogeneous goods, the imperfect substitutes is the one mostly used in studying imports of manufactured goods and aggregate imports[2].

In this paper, we use an aggregate import demand model derived within the imperfect substitution modelling framework. The core assumption underlying the imperfect substitutes model is that imports and exports are not perfect substitutes for domestically produced goods. According to Magee (1975), cited in Agbola and Damoense (2005), this theory ensures that the market is neither filled completely by domestic nor foreign goods when each good is produced under constant (or decreasing) costs. That is each country is both an importer and exporter of a traded good. In addition, the imperfect substitution model assumes no importation of substandard goods or goods that complement domestic goods.

The basic import demand model within the imperfect substitutes framework is of the form:

$$M_t = \beta_0 + \beta_1 Y_t + \beta_2 P_t^d + \beta_3 P_t^m \qquad (1.1)$$

where M_t demand for real imports is a function of domestic income (Y_t), prices of domestic goods and services or cross prices (P_t^d), and prices of imports or own prices (P_t^m).

[2] Surveys of research on imperfect substitutes modelling include Goldstein and Khan, 1985; Knetter, 1992; Marquez, 1993; Hooper and Marquez, 1995; Senhadji, 1998; Tambi, 1998; Sinha, 1999; Dutta and Ahmed, 2001; Annie, 2004; and Agbola and Damoense, 2005.

Under the assumption of homogeneity[3], the demand for imports is can be expressed in terms of real domestic income Y_t and relative prices $\left(\frac{P^m}{P^d}\right)$ as:

$$M_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 \left(\frac{P^m}{P^d}\right)_t \qquad (1.2)$$

The single relative price variable explains why economic agents switch their demand between imports and domestic goods (Carone, 1996). Equation (1.2) is the framework most commonly used in empirical studies of import behaviour because it provides an important advantage in the estimation stage. Specifically, it eliminates the multicollinearity problems that could exist in equation (1.1) due to the correlation between the domestic and import prices especially in small open economies such as Ghana.

In this paper, we follow the recent formulations by Tang (2003), Ho (2004), Narayan and Narayan (2005) among others. We divide domestic income (Y_t) into its final demand expenditure components (i.e. C+I+X) and specify a computable disaggregate import demand model for Ghana as follows:

$$\ln M_t = \alpha_0 + \beta_1 \ln C_t + \beta_2 \ln I_t + \beta_3 \ln X_t + \gamma \ln RP_t + \alpha_1 D_t + \varepsilon_t \qquad (1.3)$$

Where $\ln M_t$ is the natural log of real imports of goods and service; $\ln C_t$ is the natural log of the final consumption expenditure (i.e. the sum of household and government final expenditures); $\ln I_t$ the natural log of the expenditure on investment goods (i.e. gross capital formation including change in inventory); and $\ln X_t$ is the natural log of expenditure on total

[3] Economic theory regards demand functions to be homogenous of degree zero in prices and money income (Deaton and Muellbauer, 1980). This proposition is commonly referred to as "absence of money illusion". This implies that if one multiplies all prices and money income by a positive number, the quantity demand will remain unchanged. This involves dividing the right hand side of equation (1.1) by domestic prices (P_t^d) (see Goldstein and Khan, 1985). Sited from Agbola and Domoense, 2005.

exports of goods and services. All are in billions of cedis. $\ln RP_t$ is the natural log of the relative prices (the ratio of import price index to domestic price index), D is a dummy variable for trade liberalisation and ε_t is the *i.i.d* error term, at period t. Following Agbola and Domoense (2005), the index of trading partners' export price indices is used to proxy import price index for Ghana, since data for import price index is not available. *A priori* estimated coefficient associated with the relative price (RP_t) is expected to be negative (i.e. $\gamma<0$) and the coefficients associated with the expenditure components (C_t, I_t and X_t) are expected to be positive (i.e. $\beta_1>0$, $\beta_2>0$, $\beta_3>0$).[4]

The above specifications represent only the long-run equilibrium state of import demand. However, for policy reasons, the short run adjustment of imports to changes in its determinants is imperative. They fail to recognise the dynamic adjustment behaviour of import demand. A basic assumption is that importers are always on their demand schedules such that demand for imports always equals the actual level of imports. Nevertheless, it is generally recognized that imports do not immediately adjust to their long run equilibrium level following a change in any of their determinants (Mohammad and El-Sakka, 1999). Factors such as the costs of adjustment, inertia, delivery lags, etc., cause the slow adjustment by economic agents to the changes in the determinants of import demand.

To capture the speed of adjustment we estimate the following dynamic error correction model:

[4] From the law of demand, an increase in import prices reduces demand for imports as imported goods become relatively more expensive while demand for imported goods increase as domestic prices increase. Therefore, it is expected that import price relative to domestic price will be negatively related to real import.

$$\Delta \ln M_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta \ln M_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta \ln C_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta \ln I_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_4 \Delta \ln X_{t-i} + \sum_{i=0}^{n} \gamma \Delta \ln RP_{t-i} + \psi ECM_{t-1} + \alpha D_t + \nu_t \quad (1.4)$$

where, Δ represents first difference operator and ECM_{t-1} is the one period lagged error correction term estimated from equation (1.3). ψ measures the speed of adjustment. All other variables are as previously defined. The coefficient measures the speed of adjustment to obtain equilibrium in the event of shocks to the system. Equations (1.3) and (1.4) are estimated using annual time series data for the period 1970 to 2002. The data series used were taken from the International Monetary Fund's *International Financial Statistics, 2004*, World Bank's *World Development Indicators, 2004* and the *Bank of Ghana Statistical Bulletin*.

Methodology

This study utilises the autoregressive distributed lag (ARDL) bounds testing procedure developed by Pesaran, *et al*. (2001) to examine the cointegration relationship between import demand and its determinants. The choice of this test is based on the following considerations. Firstly, unlike most of the conventional multivariate cointegration procedures, which are valid for large sample size, the bound test is suitable for a small sample size study (Pesaran, *et al*., 2001). Given that our sample size is limited with a total of 33 observations only, this approach will be appropriate. Secondly, the bounds test does not impose a restrictive assumption that all the variables under study must be integrated of the same order. The F-test has a non-standard distribution and depends upon: whether variables included in the ARDL model are I (0) or I (1); the number of regressors in the system; and whether the ARDL model contains an intercept and/or a trend. Hence, to apply the bounds procedure, the following autoregressive

distributed lag (ARDL) model will be estimated in order to test the cointegration relationship between import demand, relative price and the expenditure component variables:

$$\Delta \ln M_t = \alpha_0 + \delta_1 \ln M_{t-1} + \delta_2 \ln C_{t-1} + \delta_3 \ln I_{t-1} + \delta_4 \ln X_{t-1} + \delta_5 RP_{t-1} + \sum_{i=0}^{p} \phi_i \ln M_{t-i} + \sum_{j=0}^{q} \varpi_j C_{t-j} + \sum_{l=0}^{q} \varphi_l \Delta \ln I_{t-l} + \sum_{m=0}^{q} \gamma_m \Delta \ln X_{t-m} + \sum_{n=1}^{q} \xi_n \Delta \ln RP_{t-n} + \alpha_1 D_t + \varepsilon_t \quad 1.5$$

where, all variables are as previously defined. There are two steps in testing the cointegration relationship between import demand and its explanatory variables. First, we estimate Equation 1.5 by ordinary least square (OLS) technique. Second, the presence of cointegration can be traced by restricting all estimated coefficients of lagged level variables equal to zero. That is, the null hypothesis $H_N : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$ against the alternative $H_A : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$. If the computed F-statistic is less than lower bound critical value, then we do not reject the null hypothesis of no cointegration. Conversely, if the computed F-statistic is greater than upper bound critical value, then we reject the null hypothesis and conclude that there exists steady state equilibrium between the variables under study. However, if the computed value falls within lower and upper bound critical values, then the result is inconclusive. The approximate critical values for the F-test are obtained from Narayan (2004). Critical values for the I(0) series are referred to as the Upper bound critical values, while the critical values for the I(1) series are referred to as the lower bound critical values.

Empirical Results and Discussions

To enable us to use the bounds testing procedure, we estimated equation (1.5) using the Autoregressive Distributed Lag approach to cointegration[5]. ARDL estimates were estimated

[5] Microfit 4.1 for Windows developed by Pesaran M.H. and Pesaran B. (1999) was used.

for each variable in our model equation (1.3) is taken as a dependent variable in the calculation of the F-statistics. The computed F-statistics from the Wald tests for restrictions imposed on the parameters are reported in Table 1. According the computed F statistics, we can reject the null hypothesis of no cointegration at 1 percent significance level for import demand. The computed F-statistic $F_M(.) = 16.1395$ is higher than the upper bound critical value of 5.763 at the 1 per cent significance level. With the exception of the investment variable, the computed F-statistics for the other variables are lower than the lower bound critical value (4.223) at the 1 per cent level. For the investment variable, the F statistics fell between the upper and lower bounds, making it inconclusive to determine the order of integration. However unit root test of all the variables indicates an I(1) order[6]. This indicates that the alternative hypothesis of the existence of a unique cointegration relationship between imports and its determinants can be accepted for Ghana. In other words, we have proved that import demand, final consumption expenditure, investment expenditure, exports expenditure and relative prices are cointegrated only when import demand is normalised.

Table 1: ARDL Bounds Test for Cointegration Analysis for Equation 1.5

Critical values (F statistic) for the bounds test: Restricted intercept and no trend[a]

	1 per cent level		5 per cent level		10 per cent level	
K	*I*(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)
4	4.223	5.763	3.002	4.150	2.493	3.497

	Computed F-statistic
F_M *(M/ C, I, X, RP)*	16.1395**
F_C *(C/ M, I, X, RP)*	2.5365

[6] Due to limited space we do not report the results of the ADF unit root test in this paper.

$F_I(I/ C, M, X, RP)$	5.7254
$F_X(X/ C, I, M, RP)$	2.8656
$F_{RP}(RP/ C, I, X, M)$	3.1125

[a]**Notes**: Critical values are extracted from Narayan (2004), pp. 26-28, appendixes 1-3. Critical values for the bounds test: Case II. *k* is the number of regressors. The asterisks indicate the following levels of significance: *5% and **1%.

Having established that import demand is cointegrated (long run relationship) with its determinants, we proceed to estimate equation (1.3) for the long run elasticities using the following ARDL model of lag lengths (*q, r, s, v, w*):

$$\ln M_t = \beta_0 + \sum_{i=1}^{q} \beta_1 \ln M_{t-i} + \sum_{i=1}^{r} \beta_2 \ln C_{t-i} + \sum_{i=0}^{s} \beta_3 \ln I_{t-i} + \sum_{i=0}^{v} \beta_4 \ln X_{t-i} + \sum_{i=1}^{w} \beta_5 \ln RP_{t-i} + \alpha_1 D_t + \upsilon_t \quad (1.6)$$

Where, all variables are as previously defined. The lengths of the lags in the ARDL model was selected based on Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion before the long run elasticities were estimated using the ARDL approach. For our annual data, Pesaran and Shin (1999) suggest a maximum of 2 lags. The selected maximum lag length that minimised the SBC was 1.

The results for the long run elasticities are reported in Table 2. All the estimated variables have their expected signs. However, consumption expenditure and the relative price variables are insignificant. The elasticity estimates indicates that in the long run, aggregate import demand in Ghana is mostly influenced by both investment and export expenditures with elasticities of 0.63 and 0.64 respectively. Aggregate imports will increase by 0.63% and 0.64% respectively in response to 1% increases in investment and export expenditures.

Table 2: Estimated Long Run Elasticities of Import Demand using the ARDL Approach

ARDL(1,1,0,0,1) selected based on Schwarz Bayesian Criterion. Dependent variable is $\ln M_t$. 32 observations used for estimation from 1971 to 2002

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
Constant	0.091652	0. 92048	0.099569 [0.922]
$\ln C_t$	0.083127	0.44890	0.18518 [0.855]
$\ln I_t$	0.63323	0.18381	3.4449** [0.002]
$\ln X_t$	0.63770	0.12079	5.2794** [0.000]
$\ln RP_t$	-0.016457	0.044227	-0.37211 [0.713]
DUM_t	-0.086311	0.18641	-0.46302 [0.648]

The magnitude of the relative price elasticity suggests that Ghanaians are less responsive to increases in the import price levels. A 1% increase in import prices will only reduce aggregate imports by 0.02%, all things being equal. The various measures of impact of the expenditure component on aggregate import demand are therefore very pertinent. The dummy variable for trade liberalisation carries the unexpected sign and is insignificant and does not affect the results when it was removed. All estimates are inelastic.

Table 3 reports the results of the short run error-correction model. All the short-run elasticities are of the correct sign, being statistically significant at the 5 per cent level. The short run results are however a bit different from the long run results. In the short run, consumption expenditure has the highest influence on aggregate import demand in Ghana, followed by exports and investment expenditures respectively. According to the results, a 1% increase in final consumption expenditures will lead to a 0.84% increase in aggregate import

bills. A 1% increase in investment and exports expenditures will also lead to a 0.45% increase in aggregate import demand.

The relative price variable still has the least influence on aggregate import demand in Ghana. Imports will only reduce by 0.28% when import prices rise by 1%. All variables have inelastic demand in the short run too.

Finally, the error correction term, ECM_{t-1}, which represents the speed of adjustment is significant and carries the correct sign. Thus the long run equilibrium is achievable. The coefficient -0.72 suggests that in Ghana adjustment from the short run to long run equilibrium is very fast. The short run clearly fits the current situation as Ghana is clearly highly dependent on imports especially for consumption to make up for short falls in local production.

Table 3: Error Correction Representation for the ARDL Import Demand

ARDL(1,1,0,0,1) selected based on Schwarz Bayesian Criterion. Dependent variable is $\ln M_t$.
32 observations used for estimation from 1971 to 2002

Regressor	*Coefficient*	*Standard Error*	*T-Ratio [Prob]*
Constant	0.06575	0.65900	0.0998 [0.921]
$\Delta \ln C_t$	0.83830	0.33596	2.4952 [0.020]
$\Delta \ln I_t$	0.45425	0.13053	3.4799 [0.002]
$\Delta \ln X_t$	0.45745	0.11878	3.8513 [0.001]
$\Delta \ln RP_t$	-0.28471	0.13686	-2.0803 [0.048]
DUM_t	-0.06192	0.14094	-.43929 [0.664]
ECM_{t-1}	-0.71735	0.15061	-4.7629 [0.000]
Diagnostics			

R^2	0. 72095	χ^2_{Norm}	1.1183 [0.572]
Adj. R^2	0. 62390	$\chi^2_{\mathrm{Re}\,set}$	0.1282 [0.720]
F-stat. $F(\ 6,\ 25)$	9.9040[0.000]	χ^2_{Auto}	2.3564 [0.125]
S.E R	0.11169	χ^2_{White}	0.5689 [0.451]
AIC	21.0236	*SBC*	14.4278

$$ECM_t = \ln M_t - 0.083\ln C_t - 0.633\ln I_t - 0.638\ln X_t + 0.016\ln RP_t + 0.086DUM_t - 0.0917$$

A set of diagnostic tests conducted on the short run model revealed no problem with respect to model functional formulation (RESET), normality (Jacque-Bera), serial correlation and heteroskedasticity in the error term. Also we test for stability of the coefficient estimates using cumulative sum (CUSSUM) and cumulative sum of squares (CUSSUMQ) test. The regression model is found stable within the 5% bounds level of significance.

Conclusion and Policy Implications

In this paper we have used the ARDL bounds testing approach to cointegration to examine the relationship between expenditure components, relative price and aggregate import demand in Ghana. We found a cointegration relation among the variables and used it to estimate both long and short run disaggregated import model for Ghana.

The study finds an inelastic and positive relationship exist between the three expenditure components and aggregate import demand. Relative price is also inelastic but negatively impact aggregate demand. For policy implication, this suggests that Ghana will have to improve its price competitiveness in external trade to be able reduce its trade deficits and

increase foreign exchange reserves levels. Price competitiveness is also important for the growth and development of the local industry and survival export enclaves.

Finally, the results are also consistent with theory and support the findings of other recent studies such as Narayan and Narayan (2005). It adds to knowledge by providing new estimates for import demand elasticities in Ghana.

Notes

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