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# Relative responsiveness of trade flows to changes in exchange rate and prices in selected ECOWAS countries: Does Orcutt hypothesis hold?

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**This paper examines the elasticities of both export and import models in selected ECOWAS countries employing quarterly series from 1980Q1 to 2007Q4. Specifically, the objective of the paper is grounded in the need to evaluate the relative responsiveness of trade flows to changes in real effective exchange rate and prices among these countries. The empirical evidence from this paper indicates evidence of long run relationships among the variables for the selected countries. Though income, exchange rate and relative prices are found to be significant in explaining the behavior of trade flow among the selected countries, the result rather undermines the validity of the Orcutt hypothesis in the case of exports models in these countries. The general pattern among the selected countries indicates that exports flow responds quicker to relative prices than it does to exchange rate. Results from the estimated imports model, on the contrary, show that imports flow responds to exchange rate quicker than import prices. The results, therefore, make a clear case for mixed country specific evidence with respect to relative responsiveness of trade flows to changes in exchange rate and prices. There is need for further investigation of the validity of Orcutt hypothesis in the developing countries.**

**Key words:** Trade flows, exchange rate, relative prices, Orcutt hypothesis, ARDL bound test.

## INTRODUCTION

Over the years, various researchers and policy makers as well have developed strong interest in investigating the determinants of exports and imports demands. The reason behind this concern is not farfetched. Both exports and imports demand play a crucial role in economic growth and development. In fact, the magnitude and direction of international trade flows among countries have been subjected to various policy debates especially in the developing countries. To this end, numbers of empirical studies have been able to estimate the determinants of trade flows. The general consensus in the literature is that while world income, exchange rate, and relative export price do have significant impacts in influencing exports demand, imports demand on the other hand, has been a function of domestic income,

exchange rate and import prices (Riedel, 1988; Tegene, 1989; 1991; Bahmani-Oskooee, 1986; Bahmani-Oskooee and Kara, 2008).

Meanwhile, among the determinants of trade flows (both import and export) none has ever been subjected to rigorous theoretical and empirical investigation than the exchange rate and relative prices (Bahmani-Oskooee and Kara, 2008). Given their crucial role in the determination of trade flows, exchange rate and relative prices have continued to attract the attention of policy makers and researchers. This, of course, is not unconnected with the close linkage among the current account balance, exchange rate performance and trade relative prices in any given open economy especially the developing ones. A proper and thorough understanding of this linkage is of paramount interest to policy makers. The idea behind the relative responsiveness of trade flows to exchange rate and relative prices was first popularized by Orcutt in 1950. In his pioneering theoretical contribution to international trade theory, Orcutt conjectured that a

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country's trade flows could respond to a change in exchange rate quicker than they do to a change in relative prices (Orcutt, 1950). Consequently, there have been several empirical studies which aimed at investigating the empirical justification or otherwise of Orcutt statement. While the original Orcutt hypothesis has been extended with the aim of incorporating some recent developments in the international trade scene, the empirical literature, so far, has been flooded with conflicting evidences (Kreinin, 1967; Houthakker and Magee, 1969; Junz and Rhomberg, 1973; Wilson and Takacs, 1979; Tegene, 1989, 1991; Marquez, 1999; Bahmani-Oskooee, 1986). Though factors such as variables employed, data measurement and definitions, methodological approaches, study coverage (whether pooled or country specific) and time frame could be responsible for the differences in these findings, however, the eventual results of Orcutt hypothesis have been said to be country specific (Bahmani-Oskooee and Kara, 2003).

Though this study aims at contributing to this ongoing empirical exercise with the eventual purpose of estimating the relative responsiveness of trade flows to exchange rate and relative prices among some selected ECOWAS countries, its path is charted differently. The motivation for this study is centered on the need to examine the viability of trade performance in the light of exchange rate movement and relative prices in the ECOWAS region.

One of the focal objectives of ECOWAS lies in the need to foster trade performance not only among the country members but also with the rest of the world. However, out of 15 ECOWAS countries, only 6 are included in this study namely: Cote d'Ivoire, Ghana, Gambia, Nigeria, Sierra Leone and Togo. Apart from the issue of data availability, the choice for the inclusion of these countries in our analysis is informed based on their weight as regards trade (both export and import) performance in the region.

For instance, about 90% of export and 85% of import among the ECOWAS countries are being accounted for by these countries. Also, Cote d'Ivoire, Gambia, Ghana, Nigeria, Sierra Leone and Togo collectively account for about 80% of the Gross Domestic Product (GDP) of the region.

Therefore, given the above striking trade features in the ECOWAS region, this study aims at answering the following pertinent research questions: 1.) what are the determinants of trade flow in the ECOWAS region? 2.) How significant are these determinants in the long run? 3.) How responsive is the trade flow among the selected countries to changes in exchange rate and relative prices? It is expected, meanwhile, that an empirical exploration aimed at finding answer to these research questions would not only help in guiding policy makers in formulating sound and more informed policies with respect to international trade performance, but also contribute immensely to the literature. Consequently, the overall objective of this paper is to investigate the relative

responsiveness of trade flow to changes in exchange rate and prices among some selected ECOWAS countries.

In line with other studies, the empirical evidence as presented in this paper further advocates for more country specific analysis. This is not unconnected with the mixed results with respect to relative responsiveness of trade flows to changes in exchange rate and prices in this study as evident in the countries under investigation. There is need, therefore, for further investigation of the validity of Orcutt hypothesis in the developing countries. The remainder of this study is, therefore, structured as follows: part 2 discusses materials and methods. Here, we present the specification of exports and imports models and methodological approach employed in this study. While the empirical analysis and results are detailed in part 4, conclusion is made in part 5.

## MATERIALS AND METHODS

### Data sources and measurement

With the overall aim of examining the relative responsiveness of trade flows to changes in exchange rate and prices in the developing countries with a special focus on some selected ECOWAS countries and as earlier articulated, the intent of this study is rooted in an attempt to investigate the validity or otherwise of the Orcutt hypothesis among the selected countries. To this end, this section delves into issues concerning data employed, study scope and model specification among other things. The variables used in this study include the following: export, world income, domestic export price, world export price, exchange rate (for export demand model); and import, domestic income, domestic price level, import price, exchange rate (for import demand model). All variables are in quarterly frequency. Having expressed them in their real forms, all variables are in natural log forms. They are sourced from International Financial Statistics (IFS). The study scope ranges from 1980Q1 to 2007Q4.<sup>1</sup> Data definitions and measurement are described in Table 1.

### Model specification

Given that over time, exports and imports demands have been subjected to rigorous empirical investigation and following recent developments in time series econometrics a number of authors have been able to model various determinants of exports and imports demands.

Until now, these varied specifications reflect mainly differences in data employed and theoretical underpinning. The model used in this study not only reflects theoretically enriched but also parsimonious specification models of exports and imports flows. Therefore, following the approach of Bahmani-Oskooee and Kara (2003, 2008), both models are specified in the following form:

Export Demand Model

$$\ln ex_t = \alpha_0 + \alpha_1 \ln yw_t + \alpha_2 \ln \left[ \frac{dep}{wep} \right]_t + \alpha_3 \ln rer_t + \mu_t \quad (1)$$

<sup>1</sup> The choice of 1980Q1 to 2007Q4 is primarily due to the availability of data among the countries under investigation

**Table 1.** Data employed and measurement.

| Data               | Data measurement   |
|--------------------|--|
| Export             | Merchandise export measured in local currency unit.              |
| Export price       | Export quantum/quantity index (2000 = 100)                       |
| Import             | Merchandise import measured in local currency unit               |
| Import price       | Import quantum/quantity index (2000 = 100)                       |
| World export price | World export price index (2000 = 100)                            |
| Domestic price     | Consumer price index (2000 = 100)                                |
| World income       | Industrial production index from industrial countries (2000=100) |
| Domestic income    | Real gross domestic product in local currency unit               |
| Exchange rates     | Real effective exchange rate index (2000 = 100)                  |

$$\alpha_1 > 0; \alpha_2 < 0; \alpha_3 < 0$$

Where

$ex_t$  = Merchandise exports at time  $t$ ;  
 $yw_t$  = World income at time  $t$ ;  
 $[dep/wep]_t$  = Relative price of domestic exports ( $dep$ ) compared to that of the world ( $wep$ );  
 $rer_t$  = Real effective exchange rate at time  $t$ ;  
 $u_t$  = Error term

Following the above specification, therefore, increase in the world income is assumed to induce domestic exports. Hence, an estimate of  $\alpha_1$  is expected to be positive. Again, given that an increase in the domestic exports price relative to world price consequently leads to a decrease in the demand for domestic exports, an estimate of  $\alpha_2$  is expected to be negative. It is also expected that an estimate of  $\alpha_3$  would be negative. The argument here is that with a fall in real effective exchange rate, exports are anticipated to rise.

Import Demand Model

$$\ln im_t = \beta_0 + \beta_1 \ln yd_t + \beta_2 \ln \left[ \frac{pm}{pd} \right] + \beta_3 \ln rer_t + \varepsilon_t \quad (2)$$

$$\beta_1 > 0; \beta_2 < 0; \beta_3 > 0$$

Where

$im_t$  = Merchandise imports at time  $t$ ;  
 $yd_t$  = Domestic income at time  $t$ ;  
 $[pm/pd]_t$  = Relative prices of import ( $pm$ ) compared to that of domestic goods ( $pd$ ) at time  $t$ ;  
 $rer_t$  = Real effective exchange rate at time  $t$ ;  
 $\varepsilon_t$  = Error term

From the import demand model, the estimates of  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are expected to be positive, negative and positive, respectively. In other words, while the propensity to import increases with increase in domestic income, relative price of import to domestic good, on the other hand, is expected to be negatively related to import demand. Furthermore, a decrease in real effective exchange rate dampens imports.

Now, investigating the relative responsiveness of trade flows to changes in effective exchange rate and prices involves thorough examination of dynamic adjustment nature of both export and import demand models specified above (Bahmani-Oskooee and Kara, 2008). Hence, this study shall employ the Unrestricted Error Correction Model (UECM) which follows the order of Autoregressive Distributed Lag (ARDL) proposed by Pesaran et al. (2001). Pesaran et al. (2001) proposed an (ARDL) bounds testing approach to investigating the existence of co integration relationship among variables.

Compared to other cointegration procedures, such as Engle and Granger, (1987) and Johansen and Juselius (1990), the bounds testing approach appears to have gained popularity in recent times due to the following reasons: Both long-and short run parameters of the specified model can be estimated simultaneously. Again, the approach is applicable irrespective of the order of integration whether the variables under consideration are purely I (0), purely I (1) or fractionally integrated.

(ARDL) Specification of Export Demand Model

$$\begin{aligned} \Delta \ln ex_t = & \alpha_0 + \alpha_1 \ln ex_{t-1} + \alpha_2 \ln yw_{t-1} + \alpha_3 \ln \left[ \frac{dep}{wep} \right]_{t-1} + \alpha_4 \ln rer_{t-1} \\ & + \sum_{i=1}^p \alpha_{5i} \Delta \ln ex_{t-i} + \sum_{i=1}^q \alpha_{6i} \Delta \ln yw_{t-i} + \sum_{i=1}^r \alpha_{7i} \Delta \ln \left[ \frac{dep}{wep} \right]_{t-i} + \sum_{i=1}^s \alpha_{8i} \Delta \ln rer_{t-i} + \mu_t \end{aligned} \quad (3)$$

(ARDL) Specification of Import Demand Model

$$\begin{aligned} \Delta \ln im_t = & \beta_0 + \beta_1 \ln im_{t-1} + \beta_2 \ln yd_{t-1} + \beta_3 \ln \left[ \frac{pm}{pd} \right]_{t-1} + \beta_4 \ln rer_{t-1} \\ & + \sum_{i=1}^p \beta_{5i} \Delta \ln im_{t-i} + \sum_{i=1}^q \beta_{6i} \Delta \ln yd_{t-i} + \sum_{i=1}^r \beta_{7i} \Delta \ln \left[ \frac{pm}{pd} \right]_{t-i} + \sum_{i=1}^s \beta_{8i} \Delta \ln rer_{t-i} + \varepsilon_t \end{aligned} \quad (4)$$

To test for the long run co integration relationship among the variables under consideration in both equations, we estimate equation (3) and (4) by Ordinary Least Square (OLS) method and thus conduct an F-test for the joint significance of the coefficients of the lagged level of the variables.<sup>2</sup> Consequently, the computed F-statistic is then compared to the non-standard critical bounds

<sup>2</sup> The intuition here is simple and as follows: For equation (3): Ho:  $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$  against H<sub>1</sub>:  $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$  and for equation (4): Ho:  $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$  against H<sub>1</sub>:  $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$

**Table 2.** Ng-Perron unit root tests for exports model.

| Country   | Variable | MZa    |         | MZt    |         | MSB   |        | MPT   |        |
|-----------|----------|--------|---------|--------|---------|-------|--------|-------|--------|
|           |          | Level  | FD      | Level  | FD      | Level | FD     | Level | FD     |
| Cote d'v. | Yw       | -13.7  | -26.0** | -2.62  | -3.60** | 0.19  | 0.13** | 6.62  | 3.01** |
|           | Ex       | -7.84  | -39.6** | -1.96  | -4.44** | 0.25  | 0.11** | 11.6  | 2.32** |
|           | dep/wep  | -6.53  | -49.3** | -1.78  | -4.96** | 0.27  | 0.10** | 13.9  | 1.84** |
|           | Rer      | 2.19   | -62.9** | -2.69  | -5.61** | 0.18  | 0.08** | 6.26  | 1.44** |
| Gambia    | Ex       | -16.0  | -28.7** | -2.82  | -3.78** | 0.17  | 0.13** | 5.69  | 3.17** |
|           | dep/wep  | -5.71  | -48.5** | -1.54  | -4.92** | 0.26  | 0.10** | 15.6  | 1.88** |
|           | Rer      | -8.46  | -24.6** | -2.05  | -3.50** | 0.24  | 0.14** | 10.7  | 3.73** |
| Ghana     | Ex       | -9.46  | -170**  | -2.17  | -9.22** | 0.22  | 0.05** | 9.63  | 0.53** |
|           | dep/wep  | -16.4  | -53.2** | -2.85  | -5.15** | 0.17  | 0.09** | 5.59  | 1.71** |
|           | Rer      | -4.10  | -42.3** | -1.42  | -4.59** | 0.34  | 0.10** | 22.1  | 2.18** |
| Nigeria   | Ex       | -6.50  | -46.8** | -1.77  | -4.83** | 0.27  | 0.10** | 14.0  | 1.95** |
|           | dep/wep  | -15.9  | -26.0** | -2.81  | -3.60** | 0.17  | 0.13** | 5.73  | 3.53** |
|           | Rer      | -8.27  | -35.9** | -1.96  | -4.23** | 0.23  | 0.11** | 11.2  | 2.55** |
| Sierra L. | Ex       | -7.03  | -49.3** | -1.87  | -4.96** | 0.26  | 0.10** | 12.9  | 1.85** |
|           | dep/wep  | -20.2  | -23.9** | -3.16* | -3.45** | 0.15* | 0.14** | 4.58* | 3.84** |
|           | Rer      | -7.50  | -39.6** | -1.82  | -4.45** | 0.24  | 0.11** | 12.3  | 2.30** |
| Togo      | Ex       | -3.72  | -30.4** | -1.33  | -3.89** | 0.35  | 0.12** | 24.0  | 3.02** |
|           | dep/wep  | -4.92  | -17.5*  | -1.56  | -2.91*  | 0.31  | 0.166* | 18.4  | 5.40*  |
|           | Rer      | -19.9* | -48.2** | -3.15* | -4.90** | 0.15* | 0.10** | 4.61* | 1.89** |

Note: The variables are expressed in their natural logarithms. Meanwhile, \*\*(\*) denotes the rejection of the null hypothesis at 1% (5%) significance level. The asymptotic critical values for each of the test for 1 and 5% level of significance are obtained from Ng and Perron (2001, Table 1).

values reported in Pesaran et al. (2001).<sup>3</sup>

## RESULTS AND DISCUSSION

As earlier stated, the overriding objective of this paper is to empirically examine the validity or otherwise of the Orcutt hypothesis among some selected ECOWAS countries. For ease of rendition, this section presents the results of the methodological and analytical processes followed in this paper.

In Tables 2 and 3, the result of Ng-Perron (2001) modified unit root test of the variables employed in this study clearly reveals that most of the variables are stationary at first difference for both models under consideration with the exception of real exchange rate in the case of Togo and relative export price in the case of Sierra Leone which are actually stationary at level.<sup>4</sup> While the

stationary status of the variables is being determined, the next step is to examine the long run relationship among these variables.

The outcome of the result of bounds testing co integration approach is presented in Table 4. As clearly evident from this table, there exist long run relationships among the variables for both exports and imports models for all the countries under investigation. A vector of variables integrated of order one is co integrated if there exists linear combinations of the variables, which are stationary. The idea behind co integration is that if two or more time series move together in the long run, even though the series themselves are trended, the difference between them is constant. The results from our analysis, therefore, support the existence of co integration relationship among the variables in both models for all the countries considered. Meanwhile, a closer look at the elasticity estimates of exports supply as depicted in Table 5 reveals that world income elasticity estimates are rightly signed and also significant for all countries considered. This is not the case with the elasticity estimates of ratio of domestic export price to world export price which are, though significant, but not rightly signed with respect to the a priori expectation. Again, while the real exchange rate elasticity estimates follow the expected sign except

<sup>3</sup>If the computed F-statistic exceeds the critical upper bounds value, then the null hypothesis of no cointegration is rejected. If the computed F-statistic falls below the critical lower bounds value, then the null hypothesis of no cointegration is not rejected. But when the computed F-statistic falls between the critical lower and upper bounds values, then the knowledge of integration of the variables under consideration is required, or else, no conclusion can be reached about the cointegration status.

<sup>4</sup>Meanwhile, the essence of testing for the stationarity properties of the variables is because the (ARDL) bounds testing approach to cointegration becomes applicable only in the presence of I(0) or I(1) variables. Thus, the assumption of bounds testing will collapse in the presence of I(2) variable.

This test, of course, is necessary in order to avoid the econometric problem of spurious regression.

**Table 3.** Ng-Perron unit root tests for import model.

| Country   | Variable | MZa     |         | MZt     |         | MSB    |        | MPT    |        |
|-----------|----------|---------|---------|---------|---------|--------|--------|--------|--------|
|           |          | Level   | FD      | Level   | FD      | Level  | FD     | Level  | FD     |
| Cote d'v. | Im       | -7.32   | -39.7** | -1.88   | -4.45** | 0.25   | 0.11** | 12.4   | 2.32** |
|           | Yd       | -15.6   | -24.7** | -2.79   | -3.51** | 0.17   | 0.14*  | 5.84   | 3.70** |
|           | Mp       | -18.3   | -41.5** | -3.01   | 4.55**  | 0.16   | 0.10** | 5.05*  | 2.19** |
|           | Rer      | 2.19    | -62.9** | -2.69   | -5.61** | 0.18   | 0.08** | 6.26   | 1.44** |
| Gambia    | Im       | -8.46   | -25.9** | -2.05   | -3.59** | 0.24   | 0.13** | 10.7   | 3.54** |
|           | Yd       | -14.4   | -41.6** | -2.68   | -4.56** | 0.18   | 0.10** | 6.33   | 2.18** |
|           | Mp       | -4.60   | -23.3** | -1.42   | -3.40** | 0.31   | 0.14*  | 19.1   | 3.94** |
|           | Rer      | -8.46   | -24.6** | -2.05   | -3.50** | 0.24   | 0.14** | 10.7   | 3.73** |
| Ghana     | Im       | -36.9   | -103**  | -4.29** | -7.18** | 0.11** | 0.06** | 2.46** | 0.88** |
|           | Yd       | -1.35   | -46.1** | -0.82   | -4.80** | 0.60   | 0.10** | 67.3   | 1.99** |
|           | Mp       | -12.4   | -46.9** | -2.44   | -4.84** | 0.19   | 0.10** | 7.57   | 1.94** |
|           | Rer      | -4.10   | -42.3** | -1.42   | -4.59** | 0.34   | 0.10** | 22.1   | 2.18** |
| Nigeria   | Im       | -8.14   | -27.6** | -2.01   | -3.71** | 0.24   | 0.13** | 11.1   | 3.33** |
|           | Yd       | -3.06   | -23.6** | -1.21   | -3.41*  | 0.39   | 0.14*  | 29.3   | 3.98** |
|           | Mp       | -3.67   | -38.2** | -1.17   | -4.37** | 0.32   | 0.11** | 22.2   | 2.39** |
|           | Rer      | -8.27   | -35.9** | -1.96   | -4.23** | 0.23   | 0.11** | 11.2   | 2.55** |
| Sierra L. | Im       | -5.81   | -55.2** | -1.68   | -5.25** | 0.28   | 0.09** | 15.6   | 1.65** |
|           | Yd       | -8.24   | -51.9** | -2.02   | -5.09** | 0.24   | 0.09** | 11.0   | 1.75** |
|           | Mp       | -8.30   | -37.6** | -2.01   | -4.30** | 0.24   | 0.11** | 11.0   | 2.60** |
|           | Rer      | -7.50   | -39.6** | -1.82   | -4.45** | 0.24   | 0.11** | 12.3   | 2.30** |
| Togo      | Im       | -22.3   | -35.8** | -3.33*  | -4.22** | 0.14*  | 0.11** | 4.14*  | 2.55** |
|           | Yd       | -13.0   | -33.9** | -2.55   | -4.11** | 0.19   | 0.12** | 6.99   | 2.69** |
|           | Mp       | -24.3** | -288**  | -3.47** | -12.0** | 0.14*  | 0.04** | 3.83** | 0.31** |
|           | Rer      | -19.9*  | -48.2** | -3.15*  | -4.90** | 0.15*  | 0.10** | 4.61*  | 1.89** |

Note: The variables are expressed in their natural logarithms. Meanwhile, \*\*(\*) denotes the rejection of the null hypothesis at 1% (5%) significance level. The asymptotic critical values for each of the test for 1 and 5% level of significance are obtained from Ng-Perron (2001, Table 1).

**Table 4.** Co integration result.

| Countries examined | Exports model |      | Imports model |      |
|--------------------|---------------|------|---------------|------|
|                    | F-Stats.      | Lags | F-Stats.      | Lags |
| Cote d'Ivoire      | 13.28*        | 7    | 7.28*         | 7    |
| Gambia             | 8.06*         | 4    | 19.67*        | 6    |
| Ghana              | 16.97*        | 5    | 12.03*        | 8    |
| Nigeria            | 7.33*         | 8    | 13.40*        | 4    |
| Sierra Leone       | 10.49*        | 10   | 17.11*        | 9    |
| Togo               | 16.40*        | 4    | 17.26*        | 7    |

Note: The asymptotic critical value bounds are obtained from Table C1 (iii) case III: Unrestricted intercept and no trend for  $k = 3$ ; Lower bound  $I(0) = 3.23$  and upper bound  $I(1) = 4.85$  at 5% significance level, while at the 1% significance level lower bound  $I(0) = 4.29$  and upper bound  $I(1) = 5.61$  (Pesaran et al., 2001). The lag structure was selected based on the Akaike Information Criterion; \* Denotes the rejection of the null hypothesis at 1% significance level.

in the case of Nigeria and Sierra Leone, only the cases of Nigeria and Ghana are seen to be significant. Meanwhile, the results, as evident from Table 6, suggest a significant positive relationship between import demand and domestic income, except in the case of Gambia where the

relationship is insignificant. However, the positive relationship being established between import prices and imports demand is rather counter intuitive. The result of real exchange rate elasticities in these countries is also mixed.

**Table 5.** Export model estimation.

| Variables           | Cote d'Ivoire | Gambia        | Ghana          | Nigeria        | Sierra Leone    | Togo          |
|---------------------|---------------|---------------|----------------|----------------|-----------------|---------------|
| C                   | 3.79 (4.85)*  | -1.35 (-1.03) | 4.73 (3.95)**  | -7.62 (-5.50)* | -3.86 (-3.86)** | 2.79 (2.47)** |
| Yw                  | 0.36 (4.08)*  | 1.46 (7.51)*  | 0.36 (1.73)*** | 2.30 (9.79)*   | 1.50 (2.62)**   | 0.58 (4.38)*  |
| dep/wep             | 0.98 (4.12)*  | 0.83 (2.43)** | 0.53 (10.97)*  | 0.57 (4.44)*   | 0.49 (16.95)*   | 0.53 (12.15)* |
| Rer                 | -0.13 (-1.30) | -0.10 (-0.75) | -0.35 (-6.29)* | 0.30 (3.75)**  | 0.34 (1.59)***  | -0.17 (-1.30) |
| R <sup>2</sup>      | 0.76          | 0.85          | 0.75           | 0.85           | 0.79            | 0.82          |
| Adj. R <sup>2</sup> | 0.75          | 0.83          | 0.74           | 0.83           | 0.78            | 0.81          |
| F-Stats.            | 173.26        | 179           | 68             | 43             | 131             | 164           |

Note: \*, \*\* and \*\*\* represent 1, 5 and 10% level of significance, respectively.

**Table 6.** Import model estimation.

| Variables           | Cote d'Ivoire   | The Gambia     | Ghana           | Nigeria         | Sierra Leone    | Togo           |
|---------------------|-----------------|----------------|-----------------|-----------------|-----------------|----------------|
| C                   | -5.46 (-11.10)* | -2.28 (-4.41)* | -4.53 (-11.02)* | -2.00 (-11.71)* | -5.90 (-2.97)** | -1.61 (-7.54)* |
| Yd                  | 2.25 (9.21)*    | 1.43 (0.94)    | 2.18 (4.91)*    | 2.91 (8.91)*    | 0.96 (3.05)**   | 2.82 (6.95)*   |
| mp/dp               | 0.41 (2.64)**   | 0.06 (5.23)*   | 0.14 (12.54)*   | 0.30 (12.23)*   | 0.05 (4.13)*    | 0.35 (4.55)*   |
| Rer                 | -0.51 (-6.01)*  | 0.44 (2.73)**  | -0.07 (-1.17)   | 0.19 (0.19)     | -0.37 (-3.25)** | 0.41 (2.91)**  |
| R <sup>2</sup>      | 0.88            | 0.74           | 0.71            | 0.78            | 0.89            | 0.85           |
| Adj. R <sup>2</sup> | 0.87            | 0.72           | 0.69            | 0.76            | 0.88            | 0.84           |
| F-Stats.            | 152             | 112            | 89              | 106             | 168             | 139            |

Note: \*, \*\* and \*\*\* represent 1, 5 and 10% level of significance, respectively.

Recall that the Orcutt hypothesis postulates that a country's trade flows could respond to a change in exchange rate quicker than they do to a change in relative prices. Of course, the central purpose of this paper is to verify the validity, or otherwise, of this hypothesis in some selected ECOWAS countries. Apart from the mixed results being established among these countries with respect to the signs and magnitudes of elasticity estimates in both exports and imports models, the empirical evidence from this paper rather undermines the validity of the Orcutt hypothesis in the case of exports models. The general pattern among the selected countries indicates that exports flow responds quicker to relative prices than it does to exchange rate. On the other hand, results from the estimated imports models, as evident in the magnitudes of the elasticity estimates of import show that imports flow responds to exchange rate quicker than import price, thus supporting the Orcutt hypothesis among the countries. There is need, therefore, for further investigation of the validity of Orcutt hypothesis in the developing countries.

## Conclusion

The idea of relative responsiveness of trade flows to exchange rate and relative prices was first popularized by Orcutt in 1950. In his pioneering theoretical contribution to international trade theory, Orcutt conjectured that a

country's trade flows could respond to a change in exchange rate quicker than they do to a change in relative prices. Consequently, there have been several empirical studies which aimed at investigating the empirical justification or otherwise of Orcutt statement.

This paper examines the elasticities of both export and import models in some selected ECOWAS countries by employing quarterly series from 1980Q1 to 2007Q4.

More specifically, the objective of the paper is grounded in the need to evaluate the relative responsiveness of trade flows to changes in real effective exchange rate and prices among these countries. The empirical evidence from this paper indicates evidence of long run relationships among the variables under consideration in both models for the selected countries. Apart from the mixed results being established among these countries with respect to the signs and magnitudes of elasticities in both exports and imports models, the empirical evidence from this paper rather undermines the validity of the Orcutt hypothesis in the case of exports models in these countries. In other words, the general pattern among the selected countries indicates that exports flow responds quicker to relative prices than it does to exchange rate. On the other hand, results from the estimated imports models, as evident in the magnitudes of the elasticities of import show that imports flow responds to exchange rate quicker than import price thus supporting the Orcutt hypothesis among the countries. This underscores the need for investigating the validity of Orcutt hypothesis

claim on a country-by-country basis especially in developing countries.

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