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Bilateral Trade Talk between Nigeria and India: A Recipe

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Abstract

This paper on bilateral trade talk between Nigeria and India: a recipe seeks to assess the impact of exogenous factors on bilateral trade flows between the two countries. Gravity model of bilateral trade flow with import and export as regressands were estimated with income, exchange rate and index of openness as regressors in the import demand and export supply models. Results show that all the three variables were strong drivers of bilateral trade flows for India, to the exclusion of Nigeria in both models. This unveils the need for Nigeria reassesses its position in the bilateral relationship.

Key words - Bilateral trade, Gravity model, income, exchange rate, index of openness

1.0 Introduction

Opinion as to what pull nations together towards bilateralism or drives them apart, economically, could be said to emanate from the same source; economic considerations. Concern over growing trade deficit between countries could both be a reason for better economic cooperation or may culminate into deadlock; apprehension between countries and threats of protectionism. The debate about the extent to which regional or bilateral agreements are complementary to multilateral agreements, or are either a risk or a distraction to multilateralism aside, either way; the number of regional and bilateral agreements is growing very rapidly both intra and between developed and developing countries. According to some analysts this development is a clear sign of dissatisfaction from the multilateral negotiation under the auspices of the World Trade Organization

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(WTO). While some see this as a possible means of avoiding anarchy at large; some view it as a means by which countries, especially developed ones, circumvent toppler and more general rules that are likely to result to more positive effect on global trade and social welfare benefits at the WTO level. According to Evenett and Venables (2002) studies on bilateral trade flows have been at the centre of research on international trade flows for almost four decades. Some recent contributions have explored the adequacy of the theoretical underpinnings for bilateral trade flows.

In perfectly competitive trade theories such as the Adam Smith's Absolute advantage principle, the David Ricardo's Comparative advantage principle and the Heckscher-Ohlin Model, one expects countries as a whole to gain from trade, due to free mobility of resources, increasing returns to scale, competition, etc. Beside the integration of the political economies through trade, competition alone affords better prices, innovation greater product varieties, which culminate into a better wellbeing for all countries.

In a bilateral negotiation between Nigeria and India with the former being latter's largest trading partner in Africa, the potential for substantially enhancing trade and investment between the two countries are numerous and both sides stand to benefit from the relationship. Nigeria in particular will certainly benefit from India's fast growing economy largely in the areas of information and communication technology (ICT), manufacturing, agriculture, large market for Nigeria's exports. Mutually, India also stands to benefit from Nigeria's vast natural reserve of crude oil and a very conducive atmosphere for foreign direct investment.

Against this background, this paper examines how income, exchange rate and openness (trade intensity) affect bilateral trade flows between Nigeria and India on the basis of historical trade data from 1970 to 2004. The essence here is to assess the beneficiability and sustainability of bilateralism between the two countries. The paper is, therefore, decomposed into five sections. Section one is on introduction while section two presents the literature review and theoretical issues. Section three dwells on research methodology of the paper while section four covers presentation empirical results and discussion. Finally, section five gives the summary and recommendations of the paper.

2.0 Literature Review and Theoretical Issues

From concept to an ideology, bilateralism now emerges as an instrument of political, cultural cum economic integration or cooperation between two countries. This ideology is natured by the growing disenchantment with the multilateral/ Plurilateral negotiations championed by such bodies like the United Nations and World Trade Organization or through their various organs. In the classical literature, trade serves as an engine of economic growth. Adam Smith (1723 - 1790) and David Ricardo (1772 – 1823) are the pacesetters of free trade in their classical case of two-country two-commodity model. In the words of Smith (1776)

“Between whatever part of the world foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out the surplus part of their land and labor for which there is no demand among them, and brings back in return for it something else for which there is a demand. It gives value to their superfluities, by exchanging them for something else, which may satisfy a part of their wants and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labor in any branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labor may exceed home consumption, it encourages them to improve its productive powers and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society.”

Stolper and Samuelson (1941) argue that in perfectly competitive trade model such as the Heckscher-Ohlin model, one expects countries as a whole to gain from trade. Thus, according to them, the world, at large will gain from multilateral liberalization, as resources are reallocated to those sectors in each country where there is a comparative advantage. In the absence of terms-of-trade effects, these efficiency gains should raise national welfare measured by the equivalent variation for every country, although some factor owners within a country may lose. Moreover, under the new growth theory, Rivera-Batiz and Romer (1991) and Grossman and Helpman (1991) offer additional support to the traditional arguments linking trade liberalization and growth. The new economic geography approach (Krugman, 1991) emphasized the impact regional integration could have on foreign firms' location decisions.

It has been observed that every country in the world today is a member of at least one PTA (Plurilateral Trade Agreement) and BTA (Bilateral Trade Agreement), and most are members of multiple BTAs. Jayat (2006) observes

that the interest in forming BTAs has been growing at a phenomenal rate. He pointed out that in the Asia-Pacific region alone, the number of BTAs has more than tripled over the past 5 years, from 57 in 2002 to 176 and as at October 2006 there are more than 300 worldwide. Factors responsible for the development are: disenchantment with progress of the WTO, snowballing and domino effects as a result of countries not wanting to be left behind, lower visibility and thus lower resistance from opposing forces, and pure politics driven directly by politicians or political parties (see Baldwin 1996). Jayat (2006) further identifies three specific factors motivating the formation of BTAs and these are: economic, strategic and event driven. According to him, the economic factor contains some specific sector driven and market access driver as motivators. Strategic factor is cajoled through lobby and threat of terrorism. Whereas event driven factor is either through plurilateralism, accession to world trade organization (WTO) or through political integration or disintegration.

Apart from the effect on global welfare and the world trading system, Bhagwati (2003) expresses concern over the impact that lobby driven BTAs have on the WTO as an institution. In addition, Scollay and Gilbert (2001), for instance, discover that all BTAs in the Asia-Pacific have negative effects on the welfare of some outside countries, with the sole exception of the New Zealand-Singapore agreement, according to them, which has a zero effect on all countries.

Several researchers have pointed out that whilst bilateral agreements may be tempting for a developing country to get some specific advantages from its developed-country partner, such as better market access for some of its products, there are also several potential dangers and disadvantages. Developed countries such as the US and Japan are known to want to use the instrument of bilateral agreements to obtain from their partners what they failed to achieve at the WTO, in which the developing countries have been able to oppose or resist certain negative elements in various agreements. In this regard, Sompop Manarang (Professor of International Economics at Chulalongklorn University): cautions that “The Thai government will have to reconsider its stress on bilateral trade negotiations. It will be difficult for the government to praise the free trade area (FTA) over the WTO deal because it is important for Thailand to pay attention to the bigger global trade platform.”

Empirical investigations based on the Heckscher-Ohlin theory were quite negative as was shown by the classic paper by Bowen, Leamer, Sveikauskas

(1987). Afterwards, Frankel, Stein and Wei (1995), in their study of regional trading blocks, find weak to no support for the Heckscher-Ohlin hypothesis. Frankel, Stein and Wei include, along with other variables, differences in capital-labor ratios, educational attainment and land-labor ratios in a standard gravity equation. They find that the coefficients on these variables are positive as predicted by the theory but are not statistically significant.

Studies on the effect of bilateral trade agreement and trade flows produced mixed outcomes. Using gravity model specification to assess the impact of bilateral trade, de Groot *et al* (2003) find that GDP positively and significantly affects trade, which is in line with theoretical expectations. Thus, trade is estimated to increase with the level of income per capita in both countries. This finding has also been reported frequently in other gravity studies (e.g., Frankel, 1997, 1998), but is not undisputed. The results further corroborate the observation by Deardorff (1998) that high-income countries trade disproportionately more with all trading partners and not just among themselves, while low-income countries trade less. Longo and Sekkat (2004) in addition to traditional determinants of bilateral flows assessed the impact of three categories of obstacles to trade: insufficient infrastructures, mismanagement of economic policies, and internal political tensions. Their results show that these obstacles have a significant impact on intra-African trade.

In another development, Klein and Shambaugh (2004) estimated the relationship between membership of a regional free trade area and bilateral trade flows. They found that, on average, members of free trade areas have trade flows that are 50 percent higher than trading partners that are not part of a free trade area. However, studies by Glick and Rose (2002) and Ghosh and Yamarik (2004) that used a large set of indicator variables specific to membership in a particular free trade area (e.g., NAFTA) found that the relationship between this large set of regional free trade agreements and bilateral trade is fragile. Recently Ghosh and Yamarik (2005) find that differences in per capita land are positively related to bilateral trade flows and are robust to the inclusion of other variables in their dataset, while differences in educational attainment and capital-labor ratios are significant in their base regressions, but fragile to the inclusion of indicators of stage of development.

From the review, it is clear that there is no agreement on specific determinants that explain bilateral trade flow for all countries just as there were no uniform

outcomes from studies that used somewhat similar variables in their analysis. With this as a background, the next section presents the research methodology of the paper.

3.0 Research Methodology

The gravity model is a standard framework for investigating patterns of bilateral trade. The model is inspired by Newton's equation of gravity in physics, which relates the gravity force with which two bodies attract each other proportionately to the product of their masses, and inversely to the square of their distance. First introduced by Linnemann (1966), it can be derived as a reduced form of a broad class of structural models (see Anderson, 1979 and Bergstrand, 1989). In general, the gravity model considers trade between a pair of countries as an increasing function of their national incomes and a decreasing function of their geographical distance (Frankel and Rose, 2002). Whereas, according to Longo and Sekkat (2004) gravity model assumes that the volume of trade between any two countries is a function of each country's trade potential and their mutual trade attraction. The absolute trade potential of a country depends on its total economic size (GNP) and on its intensity of trade. Although gravity model has always been successful in providing economically and statistically significant results, and explains most variations in bilateral trade, (Rose 2003) it has, however, been criticized as atheoretic model for its lack of theoretical foundations.

For the purpose of this paper, the model is modified to include three exogenous variables; gross domestic product (GDP), levels of exchange rate and index of openness were used as exogenous variables in the import and export models. The generic form of the gravity model for the two economies; Nigeria and India designed to capture the flow of import and export are presented in equation (1) and (2) as follows:

$$IMP_I = f(GDP_I, GDP_N, EXG_I, EXG_N, OPN_I, OPN_N) \quad (1)$$

$$EXP_I = f(GDP_I, GDP_N, EXR_I, EXR_N, OPN_I, OPN_N) \quad (2)$$

Where: IMP_I = India's Import from Nigeria

EXP_I = India's Export to Nigeria

GDP = Gross Domestic Product (income).

EXR = Exchange Rate

OPN = Index of Openness

Subscript _I and _N designate India and Nigeria respectively.

The above variables are measured in nominal terms and the series were obtained on annual basis from the publications of the Central Bank of Nigeria (CBN) and the International Financial Statistics (IFS) of the International Monetary Fund (IMF) covering the period from 1970 to 2004.

The equations can be expressed into an econometric log-linear model as:

$$\begin{aligned} \text{Log (IMP}_I) = & \gamma_0 + \gamma_1 \text{Log (GDP}_I) + \gamma_2 \text{Log (GDP}_N) + \gamma_3 \text{Log (EXR}_I) + \\ & \gamma_4 \text{Log (EXR}_N) + \gamma_5 \text{Log (OPN}_I) + \gamma_6 \text{Log (OPN}_N) + U_t \end{aligned} \quad (4)$$

$$\begin{aligned} \text{Log (EXP}_I) = & \beta_0 + \beta_1 \text{Log (GDP}_I) + \beta_2 \text{Log (GDP}_N) + \beta_3 \text{Log (EXR}_I) + \\ & \beta_4 \text{Log (EXR}_N) + \beta_5 \text{Log (OPN}_I) + \beta_6 \text{Log (OPN}_N) + U_t \end{aligned} \quad (5)$$

The theoretical expectations are: $\gamma_0, \gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \beta_0, \beta_1, \beta_2, \beta_3, \beta_5$ and $\beta_6 > 0$, while $\beta_4 < 0$. In addition, all the coefficients of the three models represent the elasticities of the regressors in the models. The variable U_t is a stochastic error term, which is designed to capture the explanation of non-included independent variables in the model. It is expected to be white noise and well behaved.

The method of ordinary least squares was employed for the estimation of the coefficients of the model. This is because the method combines the properties of unbiasedness and minimum variance, which together yield consistent and efficient estimates of the regressors. Equation (4) and (5) were estimated and the results are presented in the next section.

4.0 Empirical Results and Discussion

This section presents the regression results of the gravity models for import and export of India from and to Nigeria. From table 4.1, results show, on the statistical and econometric fronts, that the India's import model is a robust one. The constant and the coefficients of GDP, EXR, and OPN for India were all very significant and have correct signs, whereas their counterparts for the Nigerian economy were all statistically insignificant. Furthermore, in addition to

high probability that the coefficients are not statistically different from zero, the coefficient of GDP for Nigeria was incorrectly signed. And although the error term was found to be autocorrelated, however, the overall power of the model as exhibited by the strong value of adjusted R-square and significant value of F-statistic means that the bilateral import model can be relied upon for policy and for control purposes.

The economic implication of having statistically significant coefficients is that it indicates the sensitivity of the import model to a change in the regressor variables. For instance, while import in India is significantly sensitive to gross domestic product, exchange rate and measure of openness, such does not, however, hold for Nigeria. In fact, instead of improving bilateral trade, the negative sign of the coefficient of GDP suggests that it rather adversely affects it. Specifically, an increase in GDP by 1% increases bilateral trade in India by 1.22%, while the same unit increase reduces bilateral trade by 0.05% in Nigeria. This implies that the gravity model with import as dependent variable does not significantly improve bilateral trade as income rises in Nigeria.

Table 4.1

Regression Result

Dependent Variable: Log IMP _t			
Method: Least Squares			
Explanatory Variables	Estimates	t-Statistic	Probability
<i>Basic Gravity variables</i>			
Constant	-5.17*	-6.82	0.00
Log GDP _I	1.22*	24.10	0.00
Log GDP _N	-0.05	-0.69	0.50
Log EXR _I	-0.48*	-3.35	0.00
Log EXR _N	0.01	0.27	0.79
Log OPN _I	0.99*	8.24	0.00
Log OPN _N	0.04	0.70	0.49
R-square	0.996		
Adjusted R-square	0.994		
F-statistic	1013.4		
Probability (F-statistic)	0.00		
Durbin-Watson statistic	1.27 [†]		

All the variables expressed are in log in the estimation.

* Indicates statistical significance at 1% level.

† Indicates presence of Autocorrelation.

The same result show that while a 1% change in exchange rate causes India's bilateral trade to drop by up to 0.48% such cause a drop by only 0.01% in bilateral trade in Nigeria and with precariously, a very high probability of error of 79%. Similarly, the index of openness for the Nigerian suggests that the responsiveness of bilateral trade to index of openness is very low at 0.04% for any unit change.

Results of the gravity model with export as dependent variable on table 4.2 also show that the Indian coefficients in the bilateral trade model surpasses those of Nigeria in terms of having statistically significant and theoretically consistent coefficients. It was only the coefficient of EXR that although was theoretically consistent, but, was insignificant statistically. On the Nigerian side on the other hand, none of the three coefficients was found to be significant, although all were correctly signed. This notwithstanding, adjusted R-square and F-statistic were still very strong and significant. The error term is, however, autocorrelated.

Table 4.2: Regression Result

Dependent Variable: Log EXP _I			
Method: Least Squares			
Explanatory Variables	Estimates	t-Statistic	Probability
<i>Basic Gravity variables</i>			
Constant	-3.82*	-5.81	0.00
Log GDP _I	0.81*	18.35	0.00
Log GDP _N	0.06	1.11	0.28
Log EXR _I	0.20	1.58	0.13
Log EXR _N	-0.04	-1.09	0.28
Log OPN _I	0.74*	7.15	0.00
Log OPN _N	0.09	1.93	0.07
R-square	0.996		
Adjusted R-square	0.995		
F-statistic	1197.9		
Probability (F-statistic)	0.000		
Durbin-Watson statistic	1.07 [†]		

All the variables expressed are in log in the estimation

* Indicates statistical significance at 1% level.

† Indicates presence of Autocorrelation

The economic implication of the results like in the former model is that future levels of export can be efficiently predicted using the regressors in the model. Because the series were converted into log, the coefficients of the regressors measure their elasticities. On this note, none of the regressors has an elasticity value of up to one hence the responsiveness of bilateral trade to a change in any of the regressors is generally very low. More specifically, a unit change in GDP in India results in a change in bilateral trade by 0.81% while the same results in only 0.06% in Nigeria. Thus, as India's income increases by 100% for instance, their export to Nigeria rises by 81% while Nigeria's export to India only rises by 6%.

Except for the differences in the size of the income elasticity, this finding is consistent with that of Longo and Sekkat (2004) in their study on Economic Obstacles to Expanding Intra-African Trade where they show that an increase in the reporter (in a reporter partner bilateral relationship) GNP by 1% increases the reporter's bilateral trade by around 2%. The same increase in the partner activity increases its bilateral trade by 1.28%. See: Foroutan and Pritchett (1993), Elbadawi (1997), Baier and Bergstrand (2001).

Furthermore, the results show that the coefficient openness measure in India reveals a significant coefficient although with a fairly low elasticity, this notwithstanding, the elasticity comparatively, shows that openness favors India more than it did for Nigeria by up to 74% in 100% as against only 9% in 100% in the bilateral relationship.

5.0 Summary and Recommendations

This paper examines how income, exchange rate and openness affect bilateral trade flows between Nigeria and India on the basis of historical trade data from 1970 to 2004. It explores the beneficiability of bilateral trade flow between the two countries by estimating a gravity model with income, exchange rate and index of openness as regressors on one hand and import and export as regressands. Results of the gravity model with import as regressand show that the model has a very good fit and the regressors perform fairly well. Income, exchange rate and index of openness significantly determine flow of bilateral trade in India but not so well in Nigeria. Similarly, the results of gravity model

with export as regressand reveal that income and openness play significant role in explaining flow of bilateral trade in India more than in Nigeria by margin of over 60% in both instances.

The above results suggest some important policy implications for the two countries. While it is important and beneficial for India to pursue bilateral talk with Nigeria, especially given the fact that Nigeria has one of the strategically important export item, that is, crude oil, which it can import, under whatever flexibility is offered by the bilateral arrangement. The arrangement in addition offers India an opportunity to tap one of the biggest markets in the entire African continent by way of export to the Nigerian economy. Nigeria from the results stands to benefit less from the arrangement as income, exchange rate and index of openness change because of its low elasticities in the measured variables.

It is, therefore, imperative for Nigeria given its relatively weaker economy compared to India to reassess its position in the light of the nature and composition of its import and export and their determinants, quality of its infrastructure, quality of leadership in the political and economic institutions, etc., all of which, among others, are key variables in a gravity model of bilateral trade.

Lastly, although bilateralism is now the bug, it is difficult for any government to jettison the flexibility offered under wider multilateral arrangement especially the principles of special and differential treatment, and less than full reciprocity, which are recognized under the world trade organization.

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