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# **An empirical evaluation of trade potential in the economic community of West African States**

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# Abstract

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Intra-ECOWAS trade has remained very low despite the integration efforts in the subregion in the past two decades. While noting that these efforts have not progressed as scheduled, this study investigates what the West African countries stand to gain by way of increases in intra-regional trade flows if all trade barriers are removed. The study uses a gravity model whose results suggest that there is trade potential in the subregion.

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# I. Introduction

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External and internal motivation has been the major factor in the evolution and development of regional bodies in developing countries, especially bodies that are devoted to regional integration. After independence, African countries found the need (both political and economic) to associate with one another. This stemmed from the belief that for their economies to develop, certain obstacles had to be removed. Regional bodies were created to take advantage of economies of scale in production and consumption, which are the fruits of effective and efficient regional integrations.

On the external front, these economies believed that their coming together under a regional body would be an effective means of asserting their economic independence. On the other hand, economies of scale, poor resource endowment and under- development, just to mention a few, have been adduced as economic arguments for the establishment of regional bodies. It is believed that regional integration would obviate these difficulties, which are the bane of isolated and poor economies in the sub-Saharan African (SSA) countries and pave the way for sustainable growth and development. Indeed, the treaty establishing the African Economic Community (AEC), which was signed in Abuja in 1991, perceived existing regional communities in the continent as building blocks thereby presuming the existence of a solid foundation on which it could build. However, with over 40 regional bodies in the continent there is need for the evaluation of existing efforts at integration.

In West Africa, there are many regional bodies. Three of them can be identified as explicitly concerned with the promotion of intra-regional trade flows: the Economic Community of West African States (ECOWAS), Communauté Economique de l'Afrique de l'Ouest (CEAO) and Mano River Union (MARIU). Our focus in this study is to analyse empirically the performance of ECOWAS—a body that encompasses, in its membership, other notable West African regional bodies. The membership structural relationship is shown in Appendix A.

## The research problem

When ECOWAS was established in 1975, it aimed, among other things, at the gradual:

- elimination of custom duties and other charges of equivalent effect in respect of the importation and exportation of goods between member states;
- abolition of quantitative and administrative restrictions on trade among the member states;

- establishment of a common customs tariff and a common commercial policy towards third countries; and
- abolition (as between the member states) of the obstacles inhibiting free movement of persons, goods, services and capital.

These are laudable objectives, but the achievements have fallen far short especially in the area of trade liberalization. The Community has been trying to provide basic infrastructure such as good roads, reliable communication network, efficient transportation system and strong financial institutions, which, hopefully, will facilitate trading among member states.

There is no doubt that the Community, with 16 member states cutting across francophone and anglophone countries in the West African subregion, has come a long way. It has established institutions necessary not only for effective management of day-to-day activities of the Community, but also for increasing trade flows among member states. The West African Monetary Agency (WAMA), an autonomous body that grew out of the West African Clearing House (WACH), was established to facilitate multilateral payments in the subregion and to provide means of overcoming the multiplicity of currencies in the region. The Fund for Cooperation, Compensation and Development (FCCD) was established as the financial arm of the Community. Its major functions are to mobilize financial resources for the implementation of the Community's projects and to supervise payment of compensation to member states that might have incurred losses in revenue as a result of the implementation of the trade liberalization scheme (TLS).

The Community's projects are mainly in the area of infrastructure. Two major road projects are at various stages of completion: the 4,767 km trans-coastal highway linking seven countries and the 4,633 km trans-Sahelian highway. These roads are designed to open up some member states. Telecommunications is another project of the Community designed to facilitate growth of intra-ECOWAS trade.

Apart from all these supportive measures, a multi-phase trade liberalization scheme has just taken off. At the moment the scheme is in its second phase, which entails total liberalization of trade. The scheme, which commenced on 28 May 1979, comprises two phases: consolidation of customs duties and charges of equivalent effect and non-tariff barriers, and total trade liberalization. The consolidation designed for the first two years was conceived as a basis for gradual removal of tariffs. Under this procedure, member states are not bound to reduce or remove import duties. Rather, they are expected not to fix new duties or to charge or increase existing ones. In this phase also, new tariff barriers are not to be set up and those in existence should not be increased.

The second phase, which entails total liberalization of trade, is based on three product types and three groups of countries for its implementation. The first of three product types includes unprocessed goods, which comprise animal, mineral and plant products that have not been processed. These products may now move freely within the Community without duties and entry charges and they are not eligible for compensation for loss of revenue suffered as a result of their importation from member states. The second group of products is referred to as traditional handicraft products defined as articles made by hand, with or without the aid of tools, instruments or gadgets activated directly or indirectly



by the artisan. The third group of products is classified as industrial products produced within the Community. While the first two groups of commodities are expected to enjoy free movement within the Community, the time table for the elimination of duties and taxes under the trade liberalization scheme for the third product group is based on the following criteria: (a) the level of development of respective countries; (b) the importance of custom receipts in member states' government revenue; and (c) the problems deriving from difficulty of access (land locked members). The implementation period ranges between six and ten years with corresponding annual rate of reduction in duties and taxes of between 16.6% and 10%, respectively. (See Table 1 for the timetable.)

**Table 1: The ECOWAS tariff reduction schedule**

Group of countries	Implementation period	Reduction rate of duties and taxes
A. Cape Verde, Burkina Faso, Gambia, Guinea-Bissau, Mali, Mauritania and Niger	10 years	10% annual reduction
B. Benin, Guinea, Liberia, Sierra Leone and Togo	8 years	12.5% annual reduction
C. Côte d'Ivoire, Ghana, Nigeria and Senegal	6 years	16.6% annual reduction

Source: ECOWAS Secretariat, Lagos.

Notwithstanding these efforts, intra-ECOWAS trade remains insignificant. It has not shown appreciable change over the years, and various reasons have been adduced for the limited response of intra-Community trade flows. Some analysts argue that these countries have limited trade potential; that is, even if trade were to be totally liberalized (i.e., all obstacles to free movement of goods and services removed) some of these countries would have little or nothing to trade with each other based on their levels of development and resource endowment. The second level of the argument centres on why trade barriers among member states have not been removed or are difficult to remove. In this regard, past import-substitution policies, revenue constraints, and skewed distribution of benefits and compensation scheme in the Community are usually considered in the explanation of the performance of the Community (Collier, 1993). These factors tend to reinforce each other, thereby allowing for the problem to perpetuate itself. As strong as the explanations on trade potential are, we are not aware of any study that has provided any empirical analysis on ECOWAS in this respect.

This study, therefore, attempts to verify empirically the claim that trade potential among member states of ECOWAS is low. The study seeks to measure the impact of integration efforts of ECOWAS on trade flows among member states.

## Objectives of the study

Specifically, it is the aim of this study to:

- Determine the period within which integration effects were first felt or noticed.
- Estimate trade potentials among ECOWAS member nations.
- Test for the gaps between potential and actual trade among member nations.
- Proffer suggestions to guide policy making on the basis of the major findings of the study.

The paper is organized as follows: This first section is introductory. Section II examines some pertinent issues on integration in the West African subregion and provides a general framework for the study. Section III is a review of related studies, while Section IV elaborates on the methodology of investigating the effects of regional integration efforts. The gravity model and the data used are presented in this section as well. Section V presents the empirical results and Section VI concludes the report.

## **II. Some issues on regional integration in West Africa**

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### **Multiple inter-government organizations (IGOs)**

The existence of numerous IGOs in the subregion seems to be unique. These organizations overlap in different areas especially in their objectives, aims and goals, and membership. Some, such as the Lake Chad Authority, extend beyond the regional boundary. Even within the regional confines, this relationship (overlap and duplication in most cases) affects the effectiveness of these organizations, as members are often confronted with different levels of loyalty that to some extent determine fulfillment and discharge of their obligations (especially financial obligations) to the different bodies. More damaging are the divergent issues and the unhealthy rivalry among some of the IGOs in the subregion.

As pointed out earlier, we are at present interested in those bodies that have regional trade as one of their main focuses, if not the ultimate objective. An important common ground for all of these bodies is their relationship with non-member countries (the third countries). This is more important for the West African regional trade blocs, especially their relationships with developed countries (mainly their former colonial masters). The relationship to some extent is part of the fallout from the history of the administration of these countries prior to their independence. It was noted that France administered francophone West African countries centrally while the British administration of anglophone West African countries was decentralized. The French system of governance not only brought these countries closer to each other in terms of cultural, political and economic institutions, for example, it also brought them into closer ties with France. The link with France is still being maintained. Some countries in the subregion have military pacts with France apart from the link between their currencies and the French franc. However, the recent devaluation of the CFA franc has made these countries look forward to rapid implementation of the trade liberalization scheme (TLS) of ECOWAS. The relatively close ties among the francophone countries in the subregion vis-a-vis their anglophone counterparts cannot be easily isolated from their relationship with France. Thus the differences between anglo- and francophone West African countries that are still manifest today can be linked to the relationship between France and Britain.

### **Domestic socio-political and economic exigencies**

The diverse demands on resource endowment at different domestic levels have caused regional agreements to be secondary on the agenda of these countries and thus regional integration is not being accorded its deserved attention. Political instability, economic

recession and alternative demands on limited resources are some of the features of the countries in the West African subregion. While these countries are still searching for solutions to these myriad problems, they tend to be limited in political will to address regional issues. The heavy dependence of various governments on taxes on international transactions is another factor.

## Differences in the fiscal and trade policies

Fiscal and trade policy differences are usually used to explain the tremendous and perhaps unprecedented level of unrecorded trans-border trade (UTT) in the subregion. UTT, which is of various forms and degrees, has been attributed to different factors including the arbitrary partitioning of the subregion into different countries. Proponents of this view argue that trans-Saharan and trans-coastal trading were a major feature of the subregion long before colonization. The routes for the pre-colonization trading, they argue, are now being used for UTT, which is advancing on a large scale. They also point out that the pre-colonial trading was barrier-free as there were no frontiers and the traders only paid royalty to their hosts. Further, they argue that the creation of frontiers was not based on any clear socio-cultural factors; rather it was arbitrary, hence kinsmen were divided by borders and yoked into different countries. These divisions were not recognized by the families so affected, who continued unabated with the socio-cultural and economic relationships that existed prior to the creation of the frontiers.

While these explanations are tenable in explaining the origin of UTT, they are incapable of explaining its increasing magnitude and structure. There is substantial evidence that UTT is on the increase. Moreover, the structure of UTT suggests that some of the commodities being traded are reactions to misalignment in the policies of the countries especially those with a common border. Further explanation can be sought in the fact that most West African governments are perceived to be distant from the people, and therefore the people do not see the relationship between their welfare functions and those of the government. Thus they believe that it would be irrational for their transactions to pass through the official market.

Empirical studies on UTT in the West African sub-region are relatively scanty, but available evidence suggests that the problem of this type of trade is well recognized. A 1979 report jointly prepared by UNECA and UNESCO for ECOWAS examined various forms of UTT, the causes of UTT, its direction and methods of flow, among other issues. Two types of UTT were identified. These include UTT arising from fraud (falsification and forging of documents), faulty recording and smuggling—with smuggling believed to form a substantial part of this type of trade. Border trade is another type of UTT and its characteristics may not be easy to examine. Border communities in the West African countries have many things in common and they engage in natural relations (social and economic) common to neighbours. It seems that the less distinct the frontiers are, the higher the incidence of UTT.

UTT thrives because of the existence and continuous incentives that its perpetrators derive from it. Thus, two major causes of UTT are important at least from the perspective

of this study: nature-induced UTT and UTT that is due to lack of harmony in policy. In the first category, unlike the second, this type of trade is carried out not to circumvent official markets. Rather, it is due to family links, ignorance and insufficient degree of civic awareness, and absence of trading organization and cooperation, among other factors. The physical size and levels of development of countries in West Africa also contribute enormously to the incidence of UTT, as development centres in some cases are so far away from the border communities that the development centre in one country may be closer to the border community in another country.

The second category of UTT, which is large and more detrimental to macroeconomic indicators, arises as more of a reaction to misalignment in the macroeconomic policies of different countries. Thus tariff and other trade barriers, monetary policy differences, trade restrictions, and price disparity for identical produce are some of the major causes of this type of trade. While policy harmonization and cooperation and the effective implementation of the trade liberalization scheme of ECOWAS would at least minimize, if not totally eliminate, the first category of UTT, it suffices to say that the second category cannot be significantly affected by policy changes.

Nevertheless, the fact that the magnitude of UTT seems to be increasing over the years, and that the increase also tends to follow changes in the policies of different countries, indicates that the bulk of UTT is due to lack of policy harmony. The implications of arbitrary border creation on UTT may be indirect. Since these countries attained political independence, there has not been a single border revision. Moreover, there seems to be no attempt by these countries individually or jointly to close the existing gaps among them. For example, Nigeria, which is bounded by francophone countries, has not recognized the need to incorporate French language, at compulsory level, into its educational policy. Different official languages notwithstanding, in Nigeria and elsewhere common local languages, coupled with nearly homogenous socio-cultural characteristics of border communities in the region, favoured the UTT at the expense of official trading.

The current structural adjustment programmes being implemented by these countries, with their major focus on liberalizing the external sector, would have provided the background for regional integration of the Community had the ECOWAS trade liberalization scheme taken off prior to the adoption of the structural adjustment programmes. Moreover, the implementation of the scheme should have been synchronized to achieve maximum benefit for all the countries concerned. For example, while some countries were in the middle of the programme, others were about to commence. A case in point was the devaluation of the CFA franc as it affected the francophone West African countries. Indeed, it was after the devaluation of CFA franc that these countries were ready and eager to implement the trade liberalization scheme of the Community. Perhaps a well coordinated liberalization/adjustment programme would have launched the Community onto a more sustainable growth path. In their implementation of the adjustment programmes, various countries in the subregion did distinguish their relationship with other West African countries from those of other countries. Thus, trade with the Community members is accorded the same status as trade with those of the third countries. Perhaps, given the structure of demand for and supply of foreign commodities, the West African countries are not best trading partners.

## The structure of imports and exports

Because there must be coincidence of wants for meaningful trade to take place, we proceed to examine the structure of foreign demand for and supply of commodities in the subregion. More specifically we are concerned with the existing capacity to meet the demand for foreign goods in the Community. To do this, we look at the historical structure of demand for and supply of foreign goods over the past decade. The idea is that if we assume that the structure of the past decade is maintained, then demand for a different category of goods will give a rough idea of the potential of the present trade liberalization scheme. Given this premise, we then proceed to compute the average figures based on SITC classifications of exports and imports by the West African countries.

Table 2 shows that West African total exports are less than total imports on the average, and that the structure of exports is significantly different from that of imports. Mineral fuels (SITC 3) averaged about 80% of total exports for the period. Other major exports include food and live animals, which constitute about 10% of total exports, with crude material excluding fuels (SITC 2) making up about 7% of total exports. Apart from manufactured goods (classified mainly by materials), which averaged about 1%, no other categories of exports accounted for up to 1%. Indeed, the other six SITC classes jointly accounted for only about 2% of total exports for the period under review.

The structure of imports, on the other hand, as revealed in Table 3, is more diversified. Each of the sectors, unlike those exports, recorded above 1% of total imports for the period. The major importing sectors are machinery and transport equipment (SITC 7), at 34% of the total imports, and manufactured goods classified chiefly by material (SITC 6), which accounted for 20%. Food and beverages (SITC 0); chemical and related products (SITC 5); mineral fuels (SITC 3), and miscellaneous manufactured articles (SITC 8) accounted for 16%, 10%, 8% and 6% of the total imports, respectively.

The foregoing analysis shows that the Community is a net exporter mainly in mineral fuels (SITC 3) and crude materials (SITC 2). On the other hand, the Community is a net importer of machinery and equipment (SITC 7), manufactured goods (SITC 6), chemical and related products (SITC 5), and miscellaneous manufactured articles (SITC 8).

In summary, the Community demands what she does not produce and produces what she does not consume, which indicates that given the composition of trade items there is potential for inter-ECOWAS trade as against intra-regional trade. For the current trade liberalization scheme of ECOWAS, the structure of trade suggests that liberalizing trade in unprocessed goods and traditional handicrafts (which may fit into any of SITC 2, 8 or 9 categories) may not promote significant intra-trade among the Community member states at least in the short run because the three SITC classes jointly accounted for about 9.5% of average imports and 12.6% of average exports for the period under review.

**Table 2: SITC classification of West African exports**

SITC	Average 1978-87	Percentage share in average total exports
0	3112.3	16.1
1	14.1	0.1
2	2125.5	11.0
3	13035.8	67.5
4	187.6	1.0
5	82.7	0.4
6	342.7	1.8
7	104.9	0.5
8	59.6	0.3
9	251.9	1.3
Total	19817.2	100.0

Source: Calculated from United Nations Economic Commission for Africa (various issues) Foreign Trade Statistics for Africa, Series C.

## Notes:

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| 0 = Food and live animals;            | 1 = Beverages and tobacco           |
| 2 = Crude materials (excluding fuels) | 3 = Mineral fuels                   |
| 4 = Oils and fats                     | 5 = Chemical and related goods      |
| 6 = Manufactured goods                | 7 = Machinery and equipment         |
| 8 = Miscellaneous manufactured        | 9 = Others not elsewhere classified |

**Table 3: SITC classification of West African imports**

SITC	Average 1978-87	% share in average total exports	Net imports
0	2743.1	15.6	-0.5
1	213.9	1.2	1.1
2	364.8	2.1	-8.9
3	1453.9	8.2	-59.3
4	214.9	1.2	-0.2
5	1771.8	10.0	9.6
6	3512.4	19.9	18.1
7	6062.7	34.4	33.9
8	1051.8	6.0	5.7
9	241.0	1.4	0.1
Total	17630.3	100.0	

Source: Calculated from United Nations Economic Commission for Africa (various issues) Foreign Trade Statistics for Africa, Series C.

### III. Related empirical and methodological issues

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Before we go into the discussion of empirical and methodological issues, it should be pointed out that existing studies on ECOWAS, especially those related to performance evaluation, are rich in analytical discourse but deficient in empirical content. Most of the studies that have attempted to investigate empirically the performance of regional bodies, are based on sub-Saharan Africa or developing countries in general. Other studies are based on the developed world experience, especially the European Community (EC) experience. Some also examine the experience of the defunct Council for Mutual Economic Assistance (CMEA). While we may claim that as far as we know there has been no study on the empirical evaluation of trade potential in ECOWAS, we would also want to highlight some of the findings from the empirical literature on related studies.

First, from the literature on ECOWAS, two groups of studies can be distinguished: those that base performance evaluation of the Community on its effect on intra-regional trade flows and those that attempt to explain the gap between integration in words and integration in action. The first group of studies includes Inotai (1991), Ariyo and Raheem (1991), and Alokun (1992). The bases of these studies are statistics of trade flows, which are mainly indicators of the process or effectiveness of integration efforts. They usually compare changes in relative shares of trade within and outside the Community. For example, a typical analysis such as depicted in Table 4 is usually used. The table shows that intra-ECOWAS exports accounted for about 9.6% of total value of exports of the Community, which was about \$1,503 million in 1989. Again, from the table, it can be deduced that the share of intra-ECOWAS trade as percentage of the total exports of the Community has been growing—from about 1.2% in 1960 to about 3.9% in 1980 and to about 9.6 % in 1989. Although intra-regional trade flows are statistically shown to be very low, this type of analysis does not necessarily or adequately measure the effect of integration efforts (Robson, 1987). Agu (1992), in trying to explain low intra-regional trade in ECOWAS, is of the opinion that countries in West Africa produce a set of homogeneous goods and hence they do not have goods to exchange. In other words, he postulates that there is no difference in the member states' factor endowment; and, he thus believes that members of the Community are not natural trade partners. However, two countries could have identical factor endowments and still trade with each other at intra-industrial level if there is possibility of product differentiation. Some analysts have opined that the low level of intra-ECOWAS trade flows derives from the fact that the West African subregion does not produce the right type of manufactured goods to meet its requirements.



**Table 4: ECOWAS exports (for selected years) (value in US\$ million)**

Year	Total value of exports	Exports to developing countries as % of total group exports	Intra-ECOWAS trade as % of total export
1960	17.0	6.7	1.2
1970	61.0	8.6	2.1
1976	478.0	20.5	3.1
1980	1956.0	6.2	3.9
1987	1132.0	13.2	7.8
1988	1298.0	14.9	9.2
1989 1503.0		16.9	9.6

Source: UNCTAD (1990).

The other group of studies concentrates on finding explanations for why these countries tend to unite in words and thereafter divide in their actions. In other words, explanations are provided as to why the agreed programmes of action on regional integration were at best delayed and often even canceled. Some of the explanations in this area are: lack of the political will to embark on tariff reduction or removal of such tariffs and the removal of other trade barriers by member states (Ariyo and Raheem, 1991; Ariyo, 1992; Ogun and Adenikinju, 1991). Indeed, taxes from foreign trade transactions form a significant proportion of total current revenue of various member states.

As shown in Table 5, the least percentage share of taxes on international trade and transactions in the central government revenue of ECOWAS member states in 1987 was 6.6%. This was recorded by Nigeria, probably due to its heavy reliance on oil revenue. The highest share of 42.5%, in the same year, was recorded by Ghana. In 1989, the share ranged between 12.0% and 44.0% of the total central government revenue. Perhaps the fear was that the Fund for Cooperation Compensation and Development would not be able to support such a huge amount if tariffs on intra-Community trade and transactions were removed. Even if FCCD can sufficiently compensate for the loss of revenue, it implies the loss of sovereignty on the part of each member state. This also highlights one of the major problems of regional integration in Africa as identified by various scholars—that policy harmonization, especially fiscal policy harmonization, can be a major impetus to regional integration effectiveness in Africa in general and West Africa in particular (see Collier, 1993; Ariyo, 1992). If policies are harmonized, the magnitude of unrecorded trans-border trade (UTT), which is currently very high among members within the regional body, will be limited. Perhaps this view is reflected in the inclusion of supranational clause in the just reviewed Treaty of the Community.

**Table 5: Taxation on international trade and transactions as % of Total central government current revenue**

Country	1989	1987
Sierra Leone	44.6	24.7
Nigeria	16.4	6.6
Mali	12.0	28.1
Burkina Faso	38.9	39.4
Ghana	35.2	42.5
Togo	32.3	32.3
Liberia	34.6	26.9
Cameroon	14	18.7

Source: IBRD (1989, 1991).

Other hindrances to effective integration efforts in the sub-region include political instability in the various member states and proliferation of integration efforts. In the subregion, two other major regional efforts are the CEAO and MARIUN. Not only do multiple groupings duplicate efforts and put financial pressure on member states, especially those who belong to more than one group, the subregion seems to be too small economically to justify such fragmentation. This is worsened by the fact that these groupings are polarized along francophone and anglophone lines, with francophone countries dominating in number and anglophone countries dominating possibly in size. This also suggests the possibility of ex-colonial interests or alliances.

This brings us to what is perhaps one of the most crucial issues in the formation and sustainability of regional integration. It is obvious that when states that are at different stages of economic development come together, some members tend to gain more than others. This is very glaring in the case of ECOWAS, where Nigeria seems to be at the centre of all the expected benefits. Consequently, apart from allocating the costs of integration efforts, there is a compensation scheme designed to redistribute the benefits in such a way that the net gainers compensate the net losers. Notwithstanding these measures, ECOWAS cites cooperative projects in the least developed member states. Distortionary effects of inefficient redistribution of costs and benefits that could be generated by this method have been identified by different scholars (e. g., Collier, 1993; Torre and Kelly, 1992).

A particular study worthy of review is Foroutan and Pritchett (1993), despite its focus on SSA and non-African countries. The paper used a simple gravity model to find out whether the existing level of intra-SSA trade is higher or lower than expected given the economic characteristics of the SSA countries. A cross-section data of 53 countries (34 non-African countries and 19 SSA countries) was used. The model was estimated for the average data for the period between 1980 and 1982. Because large volumes of trade flows among SSA countries are unobserved, a maximum likelihood Tobit model was used. It was reported that the model provided a good fit for the sample data.

The estimated model was used in two ways to examine African trade. First, the data set was divided into African and non-African countries. In this approach, the estimated coefficients from the non-African countries were used with values of independent variables to predict bilateral trade flows of SSA countries. The second approach was a direct one in the sense that dummy variables were included in the model to explain trade difficulties and attractions. Four dummy variables were used for African countries, while the preferential trade arrangements that were recognized (at least in the work) were ASEAN, LAFTA, CACM and the Lome convention. Though the results were not included in the presentation, it was reported that among the CEAO, ECOWAS, UDEAC and other preferential trade arrangements in the SSA countries, only CEAO appeared to have positively and significantly affected intra-regional trade among its members.

However, the results of the study suggest that though trade potentials are limited in SSA, it is not impossible for effective regional integration efforts to stimulate higher intra-SSA countries trade. This follows from estimates of the dummy variable for intra-SSA trade, which are positive but statistically insignificant. It should be noted that this study was not directed at evaluating trade potentials in any specific sub-regional integration efforts in SSA; rather, it asked and provided an answer to a simple question: Is intra sub-Saharan African trade too little compared with expectation, given demand, supply and total cost of transaction?

## IV. Methodology

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Various methods have been developed for empirically investigating the effect of regional integration efforts on trade flows of member states. The essence of these methods is how to reconstruct trade flows prior to integration and how best to forecast trade flows that would have occurred without regional integration efforts. These methods could be used to assess possible gains from potential regional integration efforts even before such integration comes into effect. Thus, they can be categorized differently to reflect the time frame of the particular study (either *ex post* or *ex ante*) or according to the particular approach adopted in measuring trade effects. Notwithstanding these different classifications, these approaches are designed to measure both the static effects (trade creation or trade diversion) and the dynamic effects (cost raising/reducing effects, economies of scale effects, terms of trade effects, etc). Here, our classification, which is based on different approaches to studying the effect of regional integration efforts on trade flows, broadly analysed three non-mutually exclusive groups.

First, the *survey approach* investigates the impact of regional integration efforts on trade flows by assessing the views of major actors and experts on international trade in the region, the expected benefits of the regional integration, and how they expect regional integration to affect costs of production and prices of inputs and outputs. As a result of the flexibility of this method, sources of different types of inputs and destinations of output can be investigated. Similarly, domestic and foreign data relating to costs and prices of inputs in the region can be directly analysed.

Second, the *analytical approach* focuses on the effects of economic integration explicitly, including tariff changes as one of the endogenous variables. Hence, the effect of changes in tariff are measured differently. Generally, the effect of tariff changes on domestic prices of imported goods is estimated. The estimated elasticities are then used to measure the *ex post* and *ex ante* effects on the particular member country or the group as a whole. The problems of measuring international trade elasticities are enormous, and various methods have been devised such as the use of *a priori* elasticities (Prewo, 1974). Estimates from general equilibrium models and import equations have also been applied by Prewo (1974).

Another approach is the *residual method*. The bulk of the literature on the effects of economic integration applied this method, which compares the reconstructed pre-integration (post-integration) trade with post-integration (pre-integration) matrixes to measure the effect of integration. The basic idea is to ensure that the residual is separated into its various components as there is a host of factors that can account for the difference between actual and projected figures based on the *anti-monde*. Second, there is the need

to split the trade effects into various components such as trade created or trade diverted. While there are many variations, it suffices to list some of them by methods of reconstruction of the trade matrix:

- Reconstruction based on the particular trade matrix using Stone's RAS method.
- Reconstruction based on a truncated reduced form of the share equations.
- Reconstruction based on import or apparent consumption share analysis.

Prominent among the residual approaches to reconstruction of trade flows is the construction of a normal trade matrix by gravitational model (Aitken, 1973), Linnemann (1966), Prewo (1974) and recently Erzan et al., (1992), Wang and Winters (1991), and Havrylyshyn and Pritchett (1991).

The gravity model usually proceeds on the premise that potential foreign goods supply and potential foreign goods demand, as well as trade resistance/promoting factors, are the major determinants of bilateral trade flow patterns. The supply potential in the origin, the demand potential in the destination, and both natural and artificial barriers are usually quantified as explanatory variables for trade flows between two countries. The model is usually expressed as:

$$X_{ij} = f(TP_i, TP_j, TA_{ij}) \quad (1)$$

where  $X_{ij}$ ,  $TP_i$  and  $TP_j$  are measures of trade flows from  $i$  to  $j$ , trade potentials in country ( $i$ ) and in the destination ( $j$ ), respectively.  $TA_{ij}$  are the sets of trade attraction between  $i$  and  $j$ . The gravity model, according to Bergstrand (1989), could be viewed as a reduced (long-run) equilibrium bilateral trade flow model. In this sense, trade potential in countries  $i$  and  $j$  is usually explained by a set of variables such as potential economic capacity, and domestic market-foreign market ratio. On the other hand,  $TA_{ij}$  are usually classified into quantitative and qualitative measures. This approach is of particular interest in this study for several reasons. First, it is handy for handling the specific nature of regional integration in the West African region where some countries belong to more than one regional group. Second, the element of proximity that provides a natural impetus to trading among the countries can also be handled within this framework. Third, as there has been no reduction in tariffs by member countries, this method, which does not include tariff changes in its analysis, is the most appropriate. Moreover, the method is capable of detecting when the first impact of integration is manifested (if at all). This approach, which has been applied in the measurement of the effects of economic integration on trade flows, is generally an econometric approach where regression equations based on cross-sectional data are investigated for periods prior to and after the integration.

## The gravity model

In this study, the value of trade between country  $i$  (the origin or the exporter) and country  $j$  (the destination or the importer) depends on demand factors in country  $j$ , potential

supply factors in country  $i$ , and factors that either promote (assist) or restrain the specific flows. The supply factors in country  $i$  depend on its economic size, which is assumed to vary directly with outflows of international merchandise trade. The economic size is usually proxied by either gross domestic product (GDP) or gross national product (GNP) of the particular country  $i$ . The study believes that GDP describes the domestic economic size more fully than GNP. Another factor that is expected to influence potential supply of international merchandise is the trade intensity of country  $i$ . This intensity, which is usually expressed as the ratio of total exports to total production (openness ratio), depends on some other factors such as the level of development and the size of the particular country. To capture trade intensity, we use, first, per capita GDP as a proxy for the level of economic development. However, it has been shown that population has a strong negative relationship with the degree of openness; hence, we try to compare the effect of substituting population with the per capita GDP. The physical size of the country is also included in the model.

For the exporter, the GDP determines economic capacity while the per capita GDP determines the production for export supply. For the importer, a similar argument holds. Again, the higher the GDP the higher the potential demand for foreign goods while a higher per capita GDP or population would suggest greater self-sufficiency and less demand for foreign goods.

The next set of variables reflects trade constraining factors. Basically, these factors can be classified into artificial barriers and natural impediments to trade, respectively. These components can, to a reasonable extent, be regarded as total costs of transaction, which include, among others, costs of transportation, distance between trading partners, trade policies (e.g., nominal tariff rates on imports from country  $i$  by country  $j$ ), and non-tariff barriers to trade such as import restriction, import licensing, foreign exchange rationing, just to mention a few. Some of these variables can be quantified while others are qualitative.

First, we present the quantitative variables. Total cost of transaction is proxied by distance between the trading partners. It should be noted that various scholars (for example, Geraci and Prewé, 1977) have attempted to incorporate transport cost factors directly into a gravity model. We decided in this study to use distance between trading partners, not only because it is easily quantified—unlike the cost of transportation—but because we also intend to capture more than the effect of transportation costs. Transaction costs as proxied by distance between the partners also capture time involved in the transactions. This is supplemented by two qualitative variables.

Another set of variables in this category (promoting/resistance variables) that is not (easily) measurable is captured through the use of dummy variables. Two sets of such variables are distinguished as cultural or proximity variables and artificial trade barriers. People in different countries with a common border tend to share a number of characteristics such as taste, fashion and local dialects, and they are usually better informed about different prevailing conditions (Wang and Winters, 1991) in near-by countries compared with other third countries. A common-border dummy variable is used as a proxy for all of these factors. It is equal to one if the trading partners share a common border; otherwise it takes zero as its value.

The effect of historical ties is captured through another dummy variable. This historical tie is assumed to be reflected in the official languages of the trading partners. It takes a value of one if both partners share a common language or zero if they do not. The primary interest of this study is the artificial trade barriers. These variables cannot be clearly quantified, hence we used dummy variables to capture their effects. In West Africa, three major regional integration efforts can be identified. Thus, we introduced two sets of three dummy variables for the West African countries and another set for the preferential trade body to which some of the control or normal trade group of countries belongs. In all, we have eight dummy variables. The first set of dummy variables equals one if the importing countries are members of ECOWAS, MARIUN, CEAO and Association of South East Asian Nations (ASEAN) respectively, otherwise, they are equal to zero. This is to test whether trade barriers in each of the groups are significantly different from what obtains in other countries in the sample. The second set of dummy variables equals one if both partners are members of ECOWAS, MARIUN, CEAO and ASEAN, respectively, otherwise it is assigned zero. This is to test whether the bodies have any significant effect on trade flows of their respective members. These variables for ECOWAS are of interest to us in this study. They are expected to be negative or insignificant prior to the integration period. Their value after integration depends on effectiveness of the particular regional body.

In summary, the gravity model for the period prior to integration is specified as:

$$XB_{ij} = \beta_0 + \beta_1 LYIB + \beta_2 LYJB + \beta_3 PCYJB + \beta_4 PCYIB + \beta_5 LDIJ + \beta_6 DL + \beta_7 DB + \beta_8 LINDAB + \beta_9 LAREAI + \beta_{10} LAREAJ + \beta_{11} DM1 + \beta_{12} DC1 + \beta_{13} DE1 + \beta_{14} DA1 + \beta_{15} DM2 + \beta_{16} DC2 + \beta_{17} DE2 + \beta_{18} DA2 + e \quad (2)$$

where  $XB_{ij}$  is the average flow of trade from country  $i$  (origin) to country  $j$  (the destination) for the period between 1970 and 1972. We measured this variable as amount of imports from country  $i$  as recorded by country  $j$ 's import figure. This measurement takes care of transportation costs, as imports are recorded in cif values. Moreover, countries tend to monitor their imports more than their exports, hence our procedure, we believe, will be more accurate than an approach based on export from the origin. The variables  $LYIB$  and  $LYJB$  are the GDP figures of the exporting country and the importing country, respectively.  $PCYJB$  and  $PCYIB$  are the per capita GDP of the reporter ( $j$ ) and the partner ( $i$ ). In the same manner, though not reflected in Equation 2,  $LNJB$  and  $LNIB$  were defined as population figures for country  $j$  and country  $i$ , respectively.

Distance between trading partners measured in nautical miles as a straight line between two major cities of the corresponding partners is represented by  $LDIJ$ . Two dummy variables,  $DL$  and  $DB$ , were used to capture language and border effects. A proxy for economic similarity ( $LINDAB$ ) in terms of similarities in demand structures especially at inter-industry level is defined as absolute difference in per capita GDPs of the trading partners.  $LAREAI$  and  $LAREAJ$  denote the geographical size of countries  $i$  and  $j$ , respectively. Finally, dummy variables for artificial trade barriers were included as  $DM1$ ,  $DC1$ ,  $DE1$  and  $DA1$ , and  $DM2$ ,  $DC2$ ,  $DE2$  and  $DA2$  for MARIUN, CEAO, ECOWAS and ASEAN regional bodies, respectively.

The procedure involved another equation similar to Equation 2. To fit post-integration data, we have:

$$XA_{ij} = \beta_0 + \beta_1 LYIA + \beta_2 LYJA + \beta_3 PCYJA + \beta_4 PCYIA + \beta_5 LDIJ + \beta_6 DL + \beta_7 DB + \beta_8 LINDAA + \beta_9 LAREAI + \beta_{10} LAREAJ + \beta_{11} DMI + \beta_{12} DCI + \beta_{13} DEI + \beta_{14} DA1 + \beta_{15} DM2 + \beta_{16} DC2 + \beta_{17} DE2 + \beta_{18} DA2 + e \quad (3)$$

where  $XA_{ij}$ ,  $LYIA$ ,  $LYJA$ ,  $PCYJA$ ,  $PCYIA$  and  $LINDAA$  are correspondingly defined as for  $XB_{ij}$ ,  $LYIB$ ,  $LYJB$ ,  $PCYJB$ ,  $PCYIB$  and  $LINDAB$  above. However, unlike those variables in Equation 2, they correspond to post-integration data. All other variables are as previously defined. All variables except the dummy variables are in natural logarithms.

## The data

It is necessary at this juncture to note that the selection of countries for the control trade blocs is not an easy task. Different researchers have adopted different methods in this process, albeit with due consideration given to the objectives of their studies. In some cases, two samples were used, which made results comparison possible. Notwithstanding the problems involved in the selection of a normal trade bloc, there are basically two reasons for including other countries (apart from members of the particular regional arrangement being considered) in the sample for the gravity model. The first is for comparative analysis; in this case the questions are: By how much would intra-trade have changed if the regional bloc replicated some of the characteristics of the normal bloc? Would it have been greater or lower than the observed trade? The second major reason for including other countries derived from the fact that prior to the formation of the trading bloc the members of the regional trade blocs had not only been trading with themselves but also with some other countries. Now that a regional bloc is in existence, the historical trade-flow data prior to the formation of the trading bloc are used to estimate the post-integration trade flows of the region.

While it is possible to project trade flows from the historical data of the regional bloc members only, there is need to incorporate structural changes that are exogenous to the bloc but that would have promoted or discouraged trading by the third party with the members of the regional bloc. It is in this vein that ex post and ex ante analyses of trade flows are not only feasible but also practicable.

Practical issues involved in sample selection cut across some of the concerns raised above. Indeed, the comparability of economies in the sample is usually considered. This involves the use of GDP, GNP, per capita income and the amount of trade flows (imports and exports), among other criteria for selecting the group of comparators.

In the comparative analysis, intra-trade flows of the normal trade bloc are critical to the analysis. In this case, the group is more appropriately referred to as a control group. However, the second analysis has to do with trade flows between the countries in the different groups. Hence, the analysis is independent of the intra-trade flows among the comparator group of countries.



Indeed, the trade matrix as used in the gravity model can be divided into other matrixes. Assuming that the sample countries are arranged in such a way that members of the regional bloc that is being studied are listed first while others follow, then the northwest sub-matrix of the trade matrix relates to the intra-regional trade of interest. The northeast sub-matrix relates to the relationship between the group of countries of primary interest and the control or normal group. This relationship, which displays the value of import originating from  $i$  (a member of the group of primary interest to country  $j$  (a member of the control group)), needs to be carefully distinguished from the relationship depicted by the southwest sub-matrix. The southwest sub-matrix, on the other hand, states the relationship between  $i$  and  $j$ . However,  $i$  still refers to the exporter but now as a member of the control group and  $j$  still the importer but from the primary interest group. The two sub-matrixes complement each other and give a complete picture of trade relationship between the two groups. Jointly, they state the demand and supply of foreign goods by the two groups. Is it necessary therefore to include the two sub-matrixes in the sample? Obviously, for an empirical work that considered both the exports and the imports from the two sides, the inclusion of the sub-matrixes may be to cross check the result from the either side. Also, the primary focus of the study may influence the selection of the sample class. For example, a study that seeks to probe potential trade on the basis of what would have happened had the primary interest group of countries displayed characteristics similar to those of the control group would imperatively include not only the northeast and southwest sub-matrixes, but also their southeast counterpart. Indeed, the southwest and the southeast sub-matrixes are to the control group as the northeast and northwest are to the regional bloc.

For this study, however, our emphasis is on two different but related issues. The first is whether, given the determinants of trade flows among ECOWAS member states, there is any substantial gain to be derived from the formation of the trading bloc. In other words, if these countries should remove all trade barriers, to what extent can they increase the trade flows among themselves? The second issue has to do with the effect of the formation of the Community on the trade flows of the member states.

The first issue calls for a group of comparator countries that have similar characteristics. A group of open economies may be used to examine what would be the change in the level of trade flows had the ECOWAS opened up as much as this group of countries. This will set an upper limit to the potential trade flows. If the members of this group of comparator countries are as open to themselves as to third countries, then a confirmation of the result of the model using another sample may be necessary or the sample size may be widened to include another group of countries. The second issue, which may be approached from different perspectives just like the first approach, is examined in terms of trade flow relationships between ECOWAS and some other similar group of countries.

In this study, the two issues were addressed, first, by using some members of the ASEAN and some Asian countries. Second, the database was extended to include some African countries as well as some South American countries. The constraints posed by African trade flow data have attracted attention in recent times. Prominent among these works is Yeats (1990), which identified and analysed different problems with this type of data. The major characteristic of these trade flow data is that official trade flow figures

portray insignificant trading among the African countries. Even among the recorded trade flows, a lot of discrepancies are identified. The reported flow at the origin is not usually comparable with the corresponding figure at the destination even after a high adjustment factor to account for insurance and freight. These inconsistencies and high estimates of the unrecorded trans-border trade (UTT) are attributed to high tariff rates on trade among the African states and socio-cultural affinity between countries with a common border. Related to this is lack of policy harmonization, especially trade and fiscal policies.

Notwithstanding the problem with African trade-flow data, trade flow figures for this study (984 trade flows, or a 41 by 24 trade flow matrix) expressed in US\$ million are extracted from the IMF's *Direction of International Trade*. The GDP data measured in US\$ million are constructed as follows: Conversion factors from the *World Tables* and GDP in various currencies (also from the *World Tables*) are used to obtain GDP in US\$ dollar (all figures are expressed in US\$ billions). The population figures expressed in millions are obtained from the *World Tables*. Geographical sizes of the countries are obtained from the *World Development Report* (no. 92, 1992) and expressed in thousand square kilometres. Distances between trading partners are straight line distances obtained from PC Globe. They are expressed in nautical miles (1 nautical mile = 1.15 land mile).

The choice of distance as proxy for transportation costs deserves some explanation. Although most gravity models used distance instead of transportation costs (see, for example, Wang and Winters, 1991; Harrylyshyn and Pritchett, 1991; Bergstrand, 1985; 1989; Foroutan and Pritchett, 1993; Erzan et al. 1992), efforts at generating transportation cost met various constraints. Notwithstanding these constraints, the use of transportation costs yielded some interesting results that tend to suggest that the use of distance as a proximate variable for transportation costs may not significantly bias the empirical findings presented in this report.

Apart from the problem of lack of comprehensive information on the transportation costs, other problems include economies of scale in transportation cost, the composition of goods being transported, which are usually not the same though distance involved may be the same. The type of goods involved (luxury versus necessity) may affect the cost of transportation. These factors informed efforts like that of Prewo and Geraci (1977) in search of an alternative to distance. However, the suggested approach by Prewo and Geraci (1977) is not found in recent empirical analysis, possibly because of the additional efforts (compared with distance between two points) required to obtain necessary information as well as consideration of the cost-benefit of improving the data base.

The approach in this study is slightly different. Indeed, we asked, what is wrong with using distance as proxy for transportation cost? As cost of transportation differs not only from trader to trader and time to time, it varies with composition of merchandise, weights and volume. More importantly, the timely arrival of some commodities is non-negotiable. We therefore consider parcel express as an indicator of transportation cost. This indicator takes care of the variation in transportation cost as a result of the different weights involved. The time element is also incorporated. Also, it is assumed that almost all international transactions involve shipment of documents and parcels. It is also believed that the cost of passenger air flight is another indicator for transportation cost of merchandise.

The procedure involved analysis of data on five major categories of transportation costs. Four of them involve shipment cost based on different weights: 0.5 kg, 1 kg, 5 kg and 10 kg. The cost of passenger air flight was also assessed. Information on corresponding distances between different cities was obtained and this was analysed with the categories of transportation costs. (See Appendix A for a breakdown of these costs.)

The use of descriptive statistical data (correlation coefficient and simple regression) was adopted to explain the relationship between these two groups of data sets. A high correlation coefficient is an indication that distance and cost of transportation are substitutable. The result of the analysis is presented in Table 6. The estimated coefficients of distance on different categories of transportation costs are significantly different from zero. They are all positive, implying that the wider the distance between two cities the higher the transportation cost. Also, the effect of marginal increase in the distance between two cities increases, though at a decreasing rate with the weight of the document. For example, an increase of 1 nautical mile will increase the transportation cost of 1 kg and 5 kg by 0.0572% and .1505% respectively.

**Table 6: Estimates of the relationship between distance and transport cost**  
**Independent variable: Distance**

Dependent variable	Constant	Estimated coefficient	Correlation coefficient	R <sup>2</sup>	F	DW
Shipment cost of 0.5 Kg	796.7 (62.60)	0.0455 (14.01)	0.915	0.8336	196.6	1.600
Shipment cost of 1 kg	998.3 (64.26)	0.0572 (14.42)	0.920	0.8414	207.9	1.611
Shipment cost of 5 kg	2611.0 (68.29)	0.1505 (15.42)	0.929	0.8586	237.7	1.635
Shipment cost of 10 kg	4628.0 (69.35)	0.2672 (15.68)	0.931	0.8626	245.9	1.641
Passenger air fare	311.9 (4.53)	0.3190 (18.89)	0.960	0.9199	356.9	2.193

Source: Author's calculations.

The correlation coefficients for all the pairs are very high—all are above 91%. This relationship indicates that transportation costs and distance are substitutable. Our analysis suggests that a gravity model that uses distance as a proximate variable for transportation cost may not be all that biased.

Although we have applied data on Nigeria in our analysis, it is believed that similar analysis based on different countries would support the findings of this report. Availability of this type of data for all the countries in the sample would require substitution of transportation cost for distance and re-estimation of the model. This is desirable for gravity modeling; however, such an analysis would be at best an indicator of transportation cost as other factors that affect transportation cost, such as the type of items shipped, are not easy to incorporate.

## V. The estimates

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Two periods are covered in this study: the pre-integration and post-integration periods. The pre-integration period is chosen to be the average of figures for 1970–1972 just before the oil crisis. The post-integration is the average of 1978–1980, again on the assumption that three years is enough to solve “teething problems” and to avoid bias that might be due to the oil crisis of the early 1980s. Moreover, 1977 through 1979 is classified by ECOWAS as a formative period. The list of countries covered in this study is included in Appendix B.

Different specifications were generated mainly by using trade figures at origin (exports) and at destination (imports). Substituting population for per capita GDP also generated some scenarios. Since all the specifications yielded similar results we present in Table 7 the result of the model for both the pre-integration and post-integration periods, with trade flows measured as average of total trade flows (average of the imports and exports) as the dependent variable. The variant that is reported and analysed here uses population figures and not per capita GDP as one of the explanatory variables.

A cross-section estimation of the model was carried out using LIMDEP. Due to the special characteristic of the dependent variable—0-positive values—we treat the zero trade flows as unobserved data points. Ordinary least squares (OLS) estimation in this case will be biased towards zero, hence we applied Tobit maximum likelihood estimate. This estimator treats zero or unrecorded trade flows as unobserved data points. The modeling approach also incorporated the possibility of heteroskedacity.

### Pre-integration

Most variables came up with expected signs; thus the model provides a reasonable theoretical fit to the data. The income measured by the GDP of both the importer and the exporter exhibited a strong positive relationship with the average trade flow between the trading partners, the estimates with t-statistic of 8.97 and 7.41, respectively, are statistically significant at 5%. The elasticities on GDP are 0.936 and 1.1 for the exporter and importer, respectively, implying that the effect of a 1% change in GDP of the importer generates about 1.1% change in demand for foreign goods. This elasticity is higher than the effect of a corresponding change in GDP of the exporter on the supply of foreign goods.

The other variables that jointly with GDP determine the capacity to demand and supply foreign goods—the population of the exporting and importing countries, respectively—are not statistically different from zero.

**Table 7: Maximum likelihood estimates of the Tobit gravity model for ECOWAS: Average data for 1970–1972 (pre-integration) and 1978–1980 (post-integration) (full sample)**

Dependent variable: Log of average exports

	Pre-integration		Post-integration	
	Estimate	t-ratio	Estimate	t-ratio
Constant	4.6049	2.04	2.2408	0.76
Capacity variables				
Exporter's Income	0.9359	7.41	0.7603	5.46
Importer's Income	1.0986	8.97	1.0701	7.58
Importer's Population	-0.0935	-0.86	-0.1340	-1.01
Exporter's Population	-0.0895	-0.82	0.3650	2.05
Transportation variable				
Distance between Importer & Exporter	-1.6851	-6.41	-1.0394	-4.23
Trade Preferential variables				
MARIUN	1.6292	0.35	0.9687	0.11
CEAO	0.53110.38		1.3023	0.95
ECOWAS	-0.2560	-0.56	-0.2089	-0.42
ASEAN	1.5518	0.84	1.7923	1.13
Others				
Common language	1.5738	2.84	1.2258	2.32
Common border	1.2338	0.93	1.0022	0.87
Physical area of exporter	-0.182	-1.76	-0.2472	-2.29
Physical area of importer	-0.304	-3.27	-0.3658	-3.52
Linder effect	0.0291	0.19	-0.0926	-0.73
Sigma ( $\delta$ )	7.7972	5.64	15.099	4.29

Source: Author's calculations.

The elasticities on them are also very low. Thus, the populations of the importing and exporting countries exert insignificant effect on trade flows between trading partners over the period under consideration.

The effects of transportation costs as summarized by distance between trading centres not only came up with the appropriate sign, its elasticity is high (1.69) and significantly different from zero at 5%. This implies that transportation costs in terms of delays in the supply of foreign goods, costs of transportation and other costs of transaction are major

inhibiting factors to trade flows among the countries in our sample for the period between 1970 and 1972.

Language effect on trade flows, as expected, came up with a positive sign. It is also significant at 5%. This suggests that common language tends to exert a positive effect on trade flows among the countries in the sample. The common border effect, which with language captures the impact of cultural ties, common taste and other proximity advantages on intra-regional trade flows, did not come up, with significantly positive sign. The advantage in common border is eroded by unprecedented level of unrecorded trans-border trade in the subregion. The effect of land mass on the amount of trade flows across the border came up with expected signs. However, they are both not statistically different from zero.

On the artificial trade barriers, pre-integration dummy variables for all the regional arrangements identified came up with the positive sign except for ECOWAS, which came up with low negative coefficient. All the coefficients in this group are statistically not different from zero. The model suggests that trade barriers in ECOWAS as a whole are significantly higher than in the other groups of countries in the sample.

## Post-integration

Post-integration results are shown in columns 4 and 6 of Table 7. The elasticities of the GDP of the exporter and that of the importer are with positive sign and highly significant. Taken jointly, this suggests that there is capacity to import from each other by the countries in the sample while the constraints seem to be lack of capacity to meet the demand. The population effect of the exporter is positive and significantly different from zero while the population of the partner is negative and insignificant at 5% level. Therefore, the model suggests that among the factors that could be used to explain trade flows between the countries in our sample, the GDPs of the importer and exporter and the population of the exporter are very important.

The estimate of the effect of natural trade barriers turned out as expected. It shows that intra-trade flows decreased with the increase in the effect of natural trade barriers. For example, it suggests that the longer the distance between two countries the less the amount of bilateral trade between them. The estimate of common border effect is not statistically different from zero. The estimate of cultural effect on trade flows turned up with expected sign and is statistically different from zero.

As expected, the coefficients for the physical size of the importer and exporter suggest an indirect relationship with trade flows. The coefficients, though low, are statistically different from zero. The Linder effect, which is a proxy for the effect of economic similarity, is negative and statistically insignificant.

## Effectiveness of ECOWAS

Since ECOWAS is geared mainly towards promoting intra-regional trade, the effects of artificial intra-regional trade barriers—which are mainly policy induced—are examined. The model reveals that these activities have marginal effects on the intra-regional trade

flows, while other regional bodies identified in the model have positive, though statistically insignificant, impact on their respective intra-regional trade flows. The negative coefficient for the ECOWAS variable may not imply that ECOWAS efforts have not affected the intra-regional trade flows; rather, it may suggest that the regional body started from a very high intra-regional trade barriers and its efforts so far have been able to reduce such barriers to what was captured by the model, an insignificant trade restraint. Also, the coefficient for ECOWAS may also suggest that there is no potential trade among the members, implying that the regional efforts so far have not affected intra-regional trade because trading potential is absent. If this is the case, even if all the intra-regional barriers to trade are removed, intra-regional trade flows will still be low. Irrespective of the interpretation given to the estimate, the effects of ECOWAS on its intra-regional trade is at best minimal.

On the relative effectiveness of the identified regional bodies, though not statistically significant, the magnitude and direction of estimates show that ASEAN and the CEAO performed better than ECOWAS. Indeed, all the regional bodies except ECOWAS positively affected their respective regional arrangements.

## Simulated trade flows

Although the estimated model indicated that capacity to trade variables are positively related to intra-regional trade flows, the estimates do not allude to the presence or otherwise of trading potential among the members. While the insignificant impact of ECOWAS on the intra-regional trade flows corroborates the trade ratio approach, unlike the trade ratio approach, our gravity model provides further insight into estimating trade potential analysis. Thus, apart from indicating the progress of integration, the gravity model is a useful tool for the measurement of trade potential.

The sample used for the estimation of Equation 2 was partitioned into ECOWAS members and non-ECOWAS members. The non-ECOWAS members was used to estimate a gravity model that was then applied to predict intra-ECOWAS trade flows. These estimates, presented in Appendix C, are combined with the independent variables from ECOWAS data to generate potential intra-regional exports for the ECOWAS members. Thus, non-ECOWAS countries in the sample provide a comparative underlying socioeconomic structure for the ECOWAS countries.

The predicted trade flows are presented in Table 8. The table shows that total exports and actual intra-regional exports for the period amounted to about \$23.87 billion and \$877 million, respectively. Thus, actual share of intra-regional exports in total exports was 3.67% for the period. The model, however, predicted the intra-regional trade flows at about \$5.35 billion. The dominant countries at intra-regional exports are Nigeria, Ghana, Côte d'Ivoire, Benin, Togo and Senegal. The predicted value of intra-regional trade for Nigeria was about 85% of the total intra-regional trade. This is unconnected with the dominant share of the country in the GDP and population of West Africa, which were about 56% and 62%, respectively. Although in value terms the predicted intra-regional trade flows for Nigeria look big, they amounted to only about 26% of the total exports of the country.



**Table 8: Average actual and predicted trade flows of ECOWAS (1978–1980)**

	Total exports (\$ million)	Actual intra-regional exports (\$ million)	Predicted intra-regional trade (\$ million)	Actual share of intra-regional trade (%)	Predicted intra-regional trade (%)	Ratio of predicted share of actual share
	(1)	(2)	(3)	(4) = (2)/(1)	(5) = (3)/(1)	(6) = (5)/(4)
Benin	45.33	11.51	95.24	25.39	210.11	8.28
Cape Verde	2.67	0.59	0.35	22.10	12.94	0.59
Gambia	43.00	5.67	3.26	13.19	7.58	0.57
Ghana	1071.67	45.04	367.78	4.20	34.32	8.17
Guinea	354.67	7.21	16.05	2.03	4.52	2.23
Guinea Bissau	11.67	3.04	1.42	26.05	12.19	0.47
Côte d'Ivoire	2659.00	232.92	133.21	8.76	5.01	0.57
Liberia	541.00	8.63	13.21	1.60	2.44	1.53
Mali	158.33	57.49	8.81	36.31	5.56	0.15
Mauritania	154.67	12.93	2.61	8.36	1.69	0.20
Niger	432.00	44.04	13.51	10.19	3.13	0.31
Nigeria	17396.67	218.59	4554.43	1.26	26.18	20.78
Senegal	487.00	86.55	34.42	17.77	7.07	0.40
Sierra Leone	174.67	27.76	17.90	15.89	10.25	0.65
Togo	264.33	66.07	65.89	25.00	24.93	1.00
Burkina Faso	70.00	48.96	20.20	69.94	28.86	0.41
Total	23866.68	877.00	5348.27	3.67	22.41	6.11
Total without Nigeria	6470.01	658.41	793.84	10.18	12.27	1.21

Source: Author's calculations.

Apart from Benin, with over 200%, the predicted shares of exports of other countries in total exports of the region were below 35% for each member. Indeed, the predicted shares of other ECOWAS members ranged between 1.69% (Mauritania) and 34.32% (Ghana), with a median of 7.58%. The average predicted share of intra-regional trade was about 22%.

The ratio of predicted share to the actual share is interpreted as the potential trade; this was calculated as 610% suggesting that the observed intra-regional trade for the period is capable of increasing by this factor. However, given the skewedness of the predicted value to Nigeria, the potential excluding Nigeria was estimated at 121%. The dominant capacity of Nigeria also pointed to the important role of intra-regional compensation of net losers by the net gainers in the process of preferential trade arrangements. While the estimated potential may serve as an encouragement in the implementation of agreed programmes and policies, the realization of the potential demands not only collective implementation efforts but also a sound compensation scheme.

## VI. Policy implications of the findings

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The model using ASEAN as a comparator predicted that the share of intra-regional exports in the total exports of ECOWAS is capable of being a multiple of its level in the period under consideration. Put differently, the Community is capable of raising intra-regional exports from about 3.67% to about 22% given the structural relationship that obtains in the ASEAN.

A brief overview of developments in ASEAN is called for here. The regional body was established in 1967 to promote regional industrial cooperation and a free trade area. The economic fortunes of the member countries have been used as indicators of effective regional integration, and indirectly for promoting regional integration especially by creating a conducive atmosphere for country-specific development. The spillover effects of virile economies of members are the substantial intra-regional shares. Intra-ASEAN regional trade has been between 15% and 20% since 1970, which is higher than the intra-regional trade of any of the identified regional arrangements in SSA. The minimum interference by the regional body in sovereignty of members demonstrates the congruence of regional developmental objectives with different national objectives.

The comparison of performance of ASEAN with ECOWAS and the need for ECOWAS to emulate ASEAN is not new. This paper, however, demonstrates empirically that if the experience of the ASEAN is imbibed, intra-regional trade will increase. Succinctly put, the ASEAN formula of relevance is the promotion of limited regional cooperation and policy harmonization in infrastructure, power and communications as a prelude to preferential trade arrangement. The gradual approach to regional integration in ASEAN is noted. It will be recalled that the body, though established in 1967, did not set up a secretariat until 1977. The establishment of the ASEAN free trade area (AFTA) came about only in 1992. Another instructive characteristic of the ASEAN is the promotion of country-specific growth and development that are consistent with increase in intra-regional trade and cross-border investments. The roles of export oriented strategies and country-specific multilateral trade liberalization are also useful lessons for ECOWAS. More importantly, policy coordination in external economic relations, a unique feature of ASEAN, needs to be studied by ECOWAS.

For ECOWAS and other regional bodies in developing countries, two main lessons are identified. First, a gradual approach to regional integration that does not directly emphasize an increase in intra-regional trade flow, but views such trade as a derivative of economic growth and development of members, should be considered. Thus limited cooperation, policy coordination and harmonization should be considered by ECOWAS. Second, the role of the ASEAN as an interlocutor for external economic issues relating

to the region should be considered by the regional integration arrangements in sub-Saharan Africa. The introduction, in the early 1980s, and the implementation of economic reforms at country level by the SSA countries are not as credible as a regional-base reform mainly because of persistent reversibility at country level. Regional integrating bodies in the SSA could have done what ASEAN did for its member countries.

## Notes

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1. This study was completed in September 1994 but the reviewers' comments were not received until the first half of 1998. Between 1994 and 1998, various developments in the regional integration in the subregion occurred. First, the treaty establishing ECOWAS was revised, among other things setting up an external tax for the Community. This tax is to be charged on the international transactions by members with non-members. Another major development was the establishment of UEMOA (West African Economic and Monetary Union), which brings together UMOA (West African Monetary Union) and CEAO (Community of West African States). The treaty establishing UEMOA was signed some weeks after the revised treaty of ECOWAS was signed. The compatibility of UEMOA with ECOWAS is a subject of debate to which we will allude in this study. According to Fine and Yeo (1997), UEMOA is incompatible with ECOWAS.
2. Other objectives of the Community aimed at supporting these listed objectives included: harmonization of agricultural policies and the promotion of projects notably in the fields of marketing research and agro-industrial enterprises; implementation of schemes of joint development of transport, communication, energy and other infrastructural facilities; harmonization of economic and industrial policies; and harmonization of monetary policies.
3. The Community is in the process of establishing a single monetary zone in the subregion.
4. It should be noted in the long run, investment is likely to adjust on the basis of comparative advantage. Notwithstanding, the structure of demand for and supply of goods in general and in international markets in particular is likely to respond to the effect of trade liberalization scheme. The envisaged changes in the long run are likely to manifest in the consumption pattern, too.
5. With a total GDP of \$64 billion and population of about 195 million in 1985, the subregion is comparatively less buoyant when compared with a country such as Belgium.
6. Three studies on ECOWAS can be identified. These are Foroutan and Pritchett (1992), Mansor et al. (1989), and Kourouma (1989). While the first two are on sub-Saharan African (SSA), the latter focused on West Africa. Mansor et al. (1989)

and Kourouma (1989) were reviewed in Foroutan and Pritchett (1992), whose major criticism with respect to trade potential is the inadequacy of their approaches.

7. See Mendes (1986) and Verdoorn and van Bochove (1972) for different versions of these groups of methods.
8. Although the theoretical foundation of the gravity model is being justified (see Bergstrand, (1985, 1989); Anderson, (1979); Prewo, 1980), its empirical power is more appealing than its theoretical roots.
9. Chenery (1960), Balassa (1986) and Aitken (1973) have shown that due to the effects of economies of scale, a positive correlations exist between population and geographical size. Large countries tend to be self-sufficient and hence tend to trade less with other countries.
10. The cif, fob factor could not be used given the poor database. For further discussion on the trade database of African countries see Yeats (1990).
11. In West Africa, the independent states adopt the official language of their colonial countries; indeed some of them still have their currency tied to these colonial countries. Hence, this dummy captures more than just official language.
12. The African countries in the group are Algeria, Cameroon, Central African Republic (CAR), Congo, Egypt, Ethiopia, Gabon, Kenya, Libya, Morocco, Sudan, Tunisia and Uganda. With 16 West African countries, the total number of African countries in the sample is 29. The South American countries included in the sample are Argentina, Brazil, Colombia and Mexico. The East Asian countries are China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand.
13. In West Africa, for example, the partitioning was done without due consideration given to the socio-culture relationship that existed among the states prior to the colonization. This neglect led to a situation where family members are divided into separate countries.
14. PC Globe is a computer software copyright of PC Globe Inc., USA.
15. Periods were used as opposed to yearly figures to limit the effect of temporary shocks and distortions.
16. Put simply, the predicted intra-ECOWAS trade flow is equal to vector of coefficients of the non-ECOWAS multiplied by the vector of explanatory variables in ECOWAS. For the Tobit model, however, the prediction is not straightforward; adjustments were made for the zero-positive nature of the dependent variable.
17. The selection of non-ECOWAS countries was based on the comparative level of development with countries of ECOWAS and on the availability of data. While developed countries would have offered an upper bound estimate, the selection is limited to those countries whose development is not that far from that of ECOWAS.

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## Appendix A: Shipment cost used in the analysis of cost of transportation and distance

Destination	Shipment of .5 kg	Shipment of 1 kg	Shipment of 5 kg	Shipment of 10 kg	Distance	Passenger air fare
Lagos-Porto Novo	800	1005	2645	4695	65	NA
Lagos-Praira	900	1125	2925	5175	1918	NA
Lagos-Banjul	800	1005	2645	4695	1450	729
Lagos-Accra	800	1005	2645	4695	263	145
Lagos-Conakry	800	1005	2645	4695	1194	691
Lagos-Bissau	800	1005	2645	4695	1355	NA
Lagos-Abidjan	800	1005	2645	4695	520	330
Lagos-Monrovia	800	1005	2645	4695	977	735
Lagos-Bamako	900	1125	2925	5175	889	723
Lagos-Nouakchott	800	1005	2645	4695	1537	775
Lagos-Niamey	900	1125	2925	5175	498	418
Lagos-Dakar	800	1005	2645	4695	1527	874
Lagos-Freetown	800	1005	2645	4695	1155	700
Lagos-Lome	800	1005	2645	4695	147	126
Lagos-Ouagadougou	800	1005	2645	4695	536	530
Lagos-Beijing	1100	1380	3620	6420	7113	2048
Lagos-Victoria	1100	1380	3620	6420	7346	2674
Lagos-New Delhi	1100	1380	3620	6420	5017	2136
Lagos-Jakarta	1100	1380	3620	6420	7168	2699
Lagos-Seoul	1100	1380	3620	6420	7701	3394
Lagos-Kuala Lumpur	1100	1380	3620	6420	6753	2504
Lagos-Manila	1100	1380	3620	6420	7909	2726
Lagos-Singapore City	1100	1380	3620	6420	6916	2554
Lagos-Bangkok	1100	1380	3620	6420	6576	2273
Lagos-Algiers	900	1125	2925	5175	2098	NA
Lagos-Yaounde	800	1005	2645	4695	582	450
Lagos-Bangui	800	1005	2645	4695	1051	730
Lagos-Brazaville	900	1125	2925	5175	1096	710
Lagos-Cairo	900	1125	2925	5175	2430	449
Lagos-Addis Ababa	900	1125	2925	5175	2425	1475
Lagos-Libreville	800	1005	2645	4695	586	471
Lagos-Nairobi	900	1125	2925	5175	2361	964
Lagos-Tripoli	900	1125	2925	5175	1923	905
Lagos-Rabat	900	1125	2925	5175	2015	1290
Lagos-Khartoum	1050	1305	3345	5895	2065	NA
Lagos-Tunis	NA	NA	NA	NA	2140	1490
Lagos-Kampala	900	1125	2925	5175	2050	NA
Lagos-Buenos Aires	1100	1380	3620	6420	4924	NA
Lagos-Brasilia	1100	1380	3620	6420	3832	NA
Lagos-Bogota	1100	1380	3620	6420	5393	NA
Lagos-Mexico City	1100	1380	3620	6420	6880	2105

Source: DHL tariff schedule.



## Appendix B: Reporter and partner countries in the sample

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### Reporter Countries

1. Benin
2. Burkina Faso
3. Côte d'Ivoire
4. Mali
5. Mauritania
6. Niger
7. Senegal
8. Guinea
9. Liberia
10. Sierra Leone
11. Cape Verde
12. Gambia
13. Ghana
14. Guinea Bissau
15. Nigeria
16. Togo
17. Indonesia
18. Malaysia
19. The Philippines
20. Singapore
21. Thailand
22. China
23. Hong Kong
24. India
25. Korea
- 26.
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- 42.

### Partner countries

- Benin
- Burkina Faso
- Côte d'Ivoire
- Mali
- Mauritania
- Niger
- Senegal
- Guinea
- Liberia
- Sierra Leone
- Cape Verde
- Gambia
- Ghana
- Guinea Bissau
- Nigeria
- Togo
- Indonesia
- Malaysia
- The Philippines
- Singapore
- Thailand
- China
- Hong Kong
- India
- Korea
- Algeria
- Cameroon
- CAR
- Congo
- Egypt
- Ethiopia
- Gabon
- Kenya
- Libya
- Morocco
- Sudan
- Tunisia
- Uganda
- Argentina
- Brazil
- Colombia
- Mexico

**Appendix C: Maximum likelihood estimates of the Tobit gravity model for non-ECOWAS: Average data for 1978–1980**

Dependent variable: Log of average exports		
	Estimate	t-ratio
Constant	2.9977	0.76
Capacity variables		
Exporter's income	0.5593	5.46
Importer's income	1.0023	7.58
Importer's population	-0.1488	-1.01
Exporter's population	0.4376	2.05
Transportation variable	-1.6515	-3.29
Distance between importer and exporter		
Trade preferential variables	0.7812	0.49
ASEAN		
Others		
Common language	1.4139	1.75
Common border	-0.9133	-0.53
Physical area of exporter	-0.0495	-0.33
Physical area of importer	-0.2539	-2.27
Linder effect	-0.0506	-0.27
Sigma (Y)	8.8447	3.27

Source: Author's calculations.

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