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Trade and Foreign Direct Investment nexus in West Africa: Does Export Category Matter?

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ABSTRACT

This paper examines the effect of inward FDI in West Africa on exports to EU countries. It investigates from a host country perspective, the impact of FDI on different export categories: primary, intermediate, and final goods. Contrary to previous studies where multinationals are usually engaged in downstream production in the host country, this study presents a "commodity-proximity" model where multinational presence in upstream activities in resource-abundant host countries can stimulate the export of primary and/or intermediate goods to source countries where downstream activities take place. Results from a theoretically augmented gravity model shows that the effect of FDI in host country's export differs across export categories. Multinational presence in the ECOWAS region is associated with an increase in exports of primary goods, a decrease in exports of intermediate goods, and has no effect on final goods.

The paper suggests that in order to achieve export diversification and commodity based industrialization, ECOWAS members should align their investment promotion priorities with their industrialization policies. More FDI should be encouraged in sectors that are vital to industrialization aspirations.

Keywords: FDI, bilateral flows, multinational presence, gravity equation

JEL Code: F14, F21, F23, C33

1.0   Introduction

Trade and Foreign Direct Investments are the key divers of economic integration and the globalization process. The widely held view is that both trade and FDI are beneficial, as the former can stimulate innovation, productivity, competitiveness, and diversification; and the latter increases the capital stock, provides new job opportunities, and promotes the transfer of technology. Thus there have been profound calls within international organizations for developing countries to encourage both trade and FDI in order achieve robust economic growth and development (see Williamson, 2004). However, critics argue that trade, particularly imports, can create undue competition and stifle indigenous manufacturing; and inward FDI can also displace domestic firms. Similarly, from a source country perspective, outward FDI can lead to loss of jobs as multinationals move job opportunities overseas. While these debates are based on the individual effects of FDI and trade in home or host economy, the more prominent contention is how these two cross-border economic activities interact with each other. Thus, the question of whether FDI substitutes or complements trade has been debated in both economic and political spheres.

Economic and international business theories show that multinationals face the decision to serve a foreign country either through trade or FDI, of which both strategies are competing, and thus substitutes. This inverse relationship between foreign production and trade usually occurs when FDI is horizontal, and thus the same good is produced in both home and host country. On one hand, multinationals either export the goods from the home country to the host country or produce them in the host country through foreign investment. On the other hand, when production is split into different stages, where the upstream and downstream processes are located in different countries, FDI and trade can coexist. For instance, the parent company's investment in the production of final goods in the host country promotes the exports of intermediate goods (typically parts and components) from the home country to the host country. Thus vertical FDI allows for the coexistence of FDI and trade. In addition to the differences in effect on trade as a result of the form of FDI (vertical or horizontal), the existence of multi-product firms allows the coexistence of both strategies. Multi-product firms can alternate between foreign investment for a particular good and exporting for another in serving a foreign market, resulting in combinations of complementary and competing relationships.

Furthermore, there exists a "third party" effect which can yield a combination of complementary and substitution relationship between FDI and trade. This occurs when FDI inflow from a particular source country into the host country stimulates or debars trade between the host country and other countries. As available data to capture this complex interplay of FDI and trade across countries and firms is largely insufficient, the empirical investigation of the FDI-trade association has not reached a consensus. This lack of consensus points to the need for evidence-based research to support policies on trade and FDI promotion. From a policy perspective, it is pertinent to understand the type of FDI inflows prevalent in the country, as well as the source and sector it is channelled to, and its effect on trade.

While much of the investigation of the FDI-trade relationship in literature has been based on the effect of source country outward FDI on its export of final or intermediate goods, little

attention has been given to the effect of inward FDI on host country's exports[2]. The typical north-south trade and FDI pattern involves production of intermediate goods (parts and components) in high-skill abundant countries in the north, and export for final assembly in low-skill abundant countries in the south (predominantly Asian countries). Thus low labour-cost production is the key motivator for such FDI and trade. However, the effect of FDI on the exports of natural resource-abundant host countries of West Africa have not been examined. The present study therefore fills this gap by examining the effect of inward FDI on ECOWAS exports to the EU, which is a major FDI source and export destination in West Africa.

Contrary to previous studies that conceptualize coexistence of FDI and trade when upstream activities[3] in the source country stimulate export of intermediates for downstream production in host countries (Markusen, 1997, 2002), we present a "commodity-proximity" model. This model illustrates how multinationals' presence in upstream production in resource-abundant host countries is likely to stimulate the extraction and/or the processing of raw materials into intermediate goods for onward exporting to source countries where downstream activities takes place.

Thus, using disaggregated exports data, this paper examines the trade and FDI relation between West African countries and the EU. Results from a theoretically augmented gravity model show that the effect of multinational investment activities on host country's exports differ across exports categories. Specifically, while increased inflow of FDI promotes the export of primary goods from ECOWAS to the EU, it reduces exports of intermediate goods and has no significant effect on final goods exports. A similar result was found when the FDI-Trade relation between ECOWAS and the BICS was considered.[4] One plausible explanation for this persistent observation is that FDI into the region remain resource-seeking. Rather than cast doubts on the usefulness of FDI inflows, the result suggest that the sectoral target of such capital inflow is important to the trade performance of recipient economy.[5]

The remainder of the study is organised as follows. Section two examines the trade and investment between ECOWAS and the EU. Section three explores the theoretical foundation of FDI-Trade link while the section four reviews the empirical evidence on the link. Section five describes the methodology and data while section six presents the results of the empirical analysis. Section seven concludes.

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[2]A few studies based in Asian countries, particularly China have investigated the FDI-trade nexus from a host country perspective (See Chunlai, 1997; Zhang and Song, 2000; Liu et al., 2001, Zhang and Felmingham, 2001; and Min, 2010).

[3] These are the initial stages within the production value chain, which includes of extractive activities. While downstream activities refer to the processes that involve the conversion to final goods, as well as the distribution and sale.

[4] BICS means Brazil, India, China and South Africa. We excluded Russia from the analysis due to lack of adequate data.

[5] Sectors in this case refer to primary, intermediate and final goods producing sectors of the economy.

2.0   Stylized facts on ECOWAS-EU Trade

Trade in the ECOWAS region is dominated by few countries namely Nigeria, Ghana and Cote D'Ivoire which together account for about 75 percent of intra-regional exports between 2010 and 2013. However, about 90 percent of the regions' trade are conducted with trading partners outside the region, making it important to investigate the trends and directions of such trade. Figure 1 shows the shares of ECOWAS exports accounted for by the different economic groups between 1995 and 2013. During this period, members of the BRICS, EU-28 and the Free Trade Agreement of the Americas (FTAA) received over 70 percent of ECOWAS' total exports, indicating that these groups comprise ECOWAS' major trading partners.

EU-28 remains the major destination of exports from ECOWAS, accounting for over 30 percent of the region's exports in 2013, although this represents a decline from its share of about 43 percent in 1995. While trade between the EU and ECOWAS can be traced to their colonial affinity, it was arguably strengthened by the EU-ACP Economic Partnership Agreement (EPA).[6] However, the decline in the EU's share of ECOWAS' exports can be attributed to the negative effects of both the global financial crisis and the Euro crisis as well as the emergence of new competitors in global trade. Trade between ECOWAS and these new competitors (i.e. Brazil, Russia, China, India and South Africa, coined as BRICS) has increased significantly in the past decade. This is reflected in the continuous increase in the share of the BRICS in ECOWAS' exports from less than 10 percent in 1995 to about a quarter of total exports in 2013. The trend is not surprising given the increasing contributions of China, India and Brazil to global trade.

A similar trend is observable in ECOWAS imports as depicted in Fig A1 in appendix. While the share of the EU-28 in ECOWAS imports has been reducing over time, the reverse is true for the BRICS. This may imply that the BRICS (especially China) has gained reasonable competitive edge over the EU in exporting to ECOWAS member states. Trade between ECOWAS and other African countries (excluding South Africa) remains very low, accounting for less than 3 percent of both ECOWAS' total imports and exports between 1995 and 2013.

In sum, there is no doubt that the EU remains ECOWAS major trading partner although its contribution has been reducing while ECOWAS' trade with the BRICS (excluding Russia) has increased drastically over time.

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[6] The EU-ACP EPA is an agreement which grants African, Caribbean and Pacific (ACP) countries duty free access to the European market. It started as a non-reciprocal preferential trade agreement but was later replaced by a reciprocal relationship in order to be in compliance with WTO regulations.

Figure 1: Shares of Economic Groups in ECOWAS' Exports, 1995 to 2013
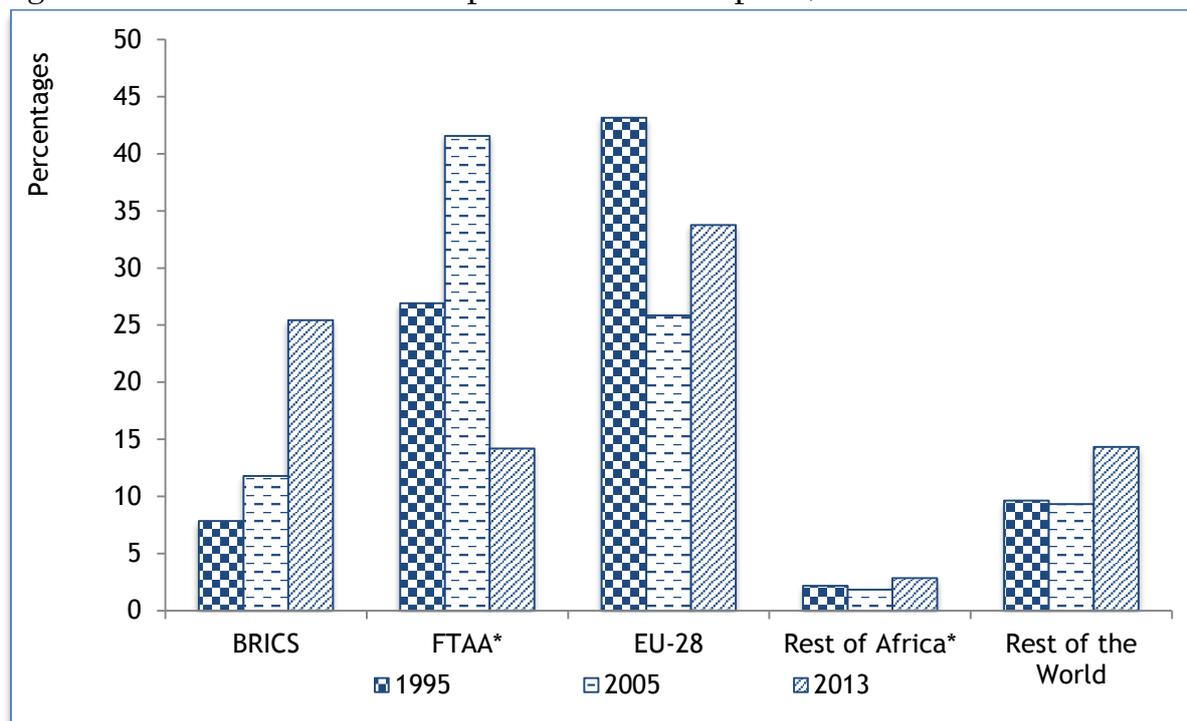
An analysis of a country's trade based on the Broad Economic Categories (BEC) [7]can provide useful information about changes in the economic structure, export sophistication and product value chain development. For example, BEC allows us to see the gradual transition of a country from being a net exporter of primary goods to being a major supplier of intermediate and final goods. However insufficient data has marred and discouraged the conduct of such analysis for African countries. Nonetheless, we maximize the use of available data in examining ECOWAS trade across different export categories.

As shown in Table 1, primary goods remain ECOWAS dominant export category although it declined between 2007 and 2010. The share of intermediate goods in total ECOWAS exports increased from about 10 percent in 2000 to about 30 percent in 2010, while those of final goods remain steady at about five percent.

In terms of trade with the EU, sufficient data are only available for seven out of the EU-28 and these countries are among the top ten EU economies and ECOWAS' major trading partners in the EU.[8] Figure 2 shows the shares of the different exports categories from ten ECOWAS members to the seven EU countries (EU-7). It is evident that primary goods dominate the exports of ECOWAS to the EU as they accounted for over 70 percent of total exports since 2000.

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[7] Given the paucity of data on intermediate goods trade in Africa, the analysis in this section is limited to only 10 members of the 15-member ECOWAS and limited to some years between 2000 and 2010. The 10 members are Benin, Burkina Faso, Cote D'Ivoire, Gambia, Ghana, Mali, Niger, Nigeria, Senegal and Togo.
[8] The seven EU countries are UK, Spain, Netherlands, Italy, Germany, France and Belgium.

Table 1: Shares of Product Categories in Total ECOWAS Exports to the World (in percentages)

Years	Final Goods	Intermediate Goods	Primary Goods
2000	4.2	9.9	85.9
2003	7.6	13.2	79.2
2007	4.8	13.0	82.2
2010	5.0	29.0	66.0

Source: Authors' Computations from UN Comtrade Statistics Database, 2014.

Figure 2: ECOWAS Exports to selected EU countries in terms of BEC
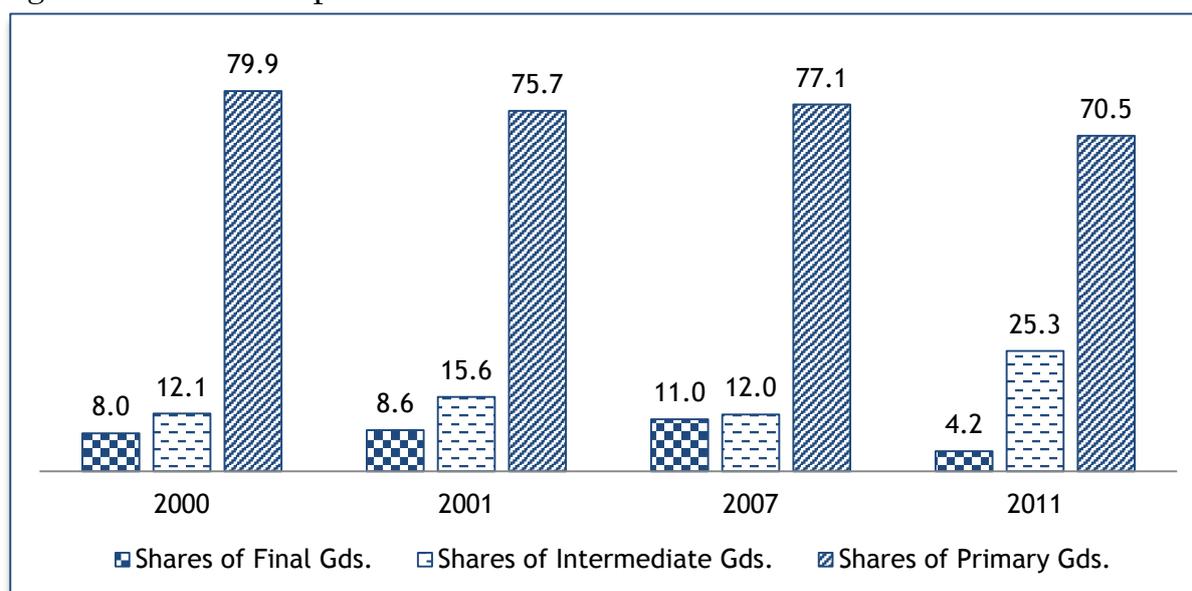
Source: Authors' Computations from UN Comtrade Statistics Database, 2014.

3.0   Theoretical foundations of the FDI-Trade link

The theoretical literature on the relationship between FDI and trade has evolved from models that view them as competing/alternative strategies of firms, to models that allow for their coexistence. Earlier models used tenets of the traditional trade theory to elaborate the substitutability argument. The models that solely predicted substitutability of FDI and trade in the traditional trade theories were both elaborate and intuitively appealing. Based on the Heckscher-Ohlin framework, given two factors of production (capital and labour), two countries, and two perfectly competitive goods (2x2x2 model); trade takes place as differences in factor intensities and thus factor prices leads one country to export capital intensive good, and the other to export labour intensive good. This is based on the key assumption that factors are mobile within countries, but immobile between countries. FDI theory found its way into the standard theory by the relaxation of the assumption of immobility of factors of production across countries. Mundell (1957) showed that in the presence of restrictions to trade, factor returns differentials exists, leading to factor movements (especially capital) from a country of lower return to one of higher return. Thus trade and capital movements were viewed as substitutes, with the latter referred as direct investment (see Kindleberger, 1969).

Further development of the FDI theory reflected on the idea of its substitutability with trade. Dunning (1977) summarized the motives for serving a foreign market in the OLI paradigm/eclectic theory – which states that Ownership, Locational, and Internalisation advantages are necessary conditions for FDI to occur. The ownership advantages consist of intangible assets such as technological ability and managerial skills that will provide some leverage for a firm to compete in a foreign country. These advantages have to be high enough to offset both the fixed costs of setting up new pant as well as the uncertainties of operating in a foreign country, otherwise trade becomes preferred. Locational advantages consist of factor endowments and tariffs that attract a multinational to a specific location. In particular, differences in trade barriers inform the choice of a firm to serve a foreign market either through trade or FDI. Internalisation advantages imply that the choice between FDI and trade are alternative strategies as firms will choose to direct investment abroad rather than exportation or licensing when the transaction and organization costs of these alternative arrangements outweigh the costs of internalizing the market. The OLI eclectic theory states that all three advantages must be present before there will be FDI, and no one of them is sufficient (Sodersten and Reed, 1994). Thus the theory presented a strong case to support the substitutability of FDI and trade.

The observation in the 1970s that most of global trade occurred among developed countries with similar factor intensities and the growing share of intra-industry trade was in striking contradiction with the standard trade theories at the time. Also, the assumption that that trade flows were inter-sectoral and across dissimilar countries which held sway in the theoretical trade literature of most of the 20th century, fell short of realities of an increasing globalized world. Thus the new trade theory that emerged in the early 1980s assumed that

firms operated in imperfect markets, selling differentiated goods and were characterized by increasing returns to scale[9].

The assumptions of the "new" trade theory informed the adjustments to the theory of multinational corporations. Markusen (1984) showed that a firm can concentrate intangible activities (such as R&D) in a location (headquarters), and replicate the production of the same good across plants in different locations. Thus the presence of multi-plant economies of scale motivates a firm to engage in horizontal FDI as an alternative to trade. On the other hand, Helpman (1984) showed that a firm can exploit differences in factor prices (H-O framework) by defragmenting the production process across various locations. Thus the vertically integrated firm that emerges will engage in intra-firm trade in intermediate goods.

The categorization of FDI into horizontal and vertical forms was the key in explaining the coexistence of FDI and trade in theoretical literature. Brainard (1993) provided the "proximity-concentration trade-off" model which shows how variations in transport costs, trade and investment barriers, and scale economies at the plant level affect the decision to export or conduct FDI. The trade-off implies that a firm will engage in horizontal FDI when transport costs and trade barriers are high and investment barriers and plant-level scale economies are low (proximity advantage); and export when the opposite is the case (concentration advantage). However, the study also showed that in a multi-stage production scenario, where there are upstream and downstream activities within an industry, FDI and trade can coexist as the affiliates engage in the production of final goods in the downstream, and production and exportation of intermediate goods occurs in the upstream.

Figure 3 illustrates the Brainard (1993) model. The first configuration shows that the firm chooses to penetrate the foreign market through exports when there are concentration advantages: low transportation costs, low trade barriers, and high investment barriers. The second configuration shows that proximity advantages (opposite conditions for concentration) are associated with horizontal FDI which leads to the displacement of trade. In the third scenario where production is defragmented into stages, the parent in the upstream exports intermediate goods to the affiliate in the downstream engaged in production and sales of final goods. Thus this scenario allows for the coexistence of FDI and trade. To the extent that export of intermediate goods outweighs the loss of export of final goods, multinational activity complements trade. Thus the Brainard framework provided an insightful decomposition of the association between FDI and trade.

The idea that vertical FDI allows for the coexistence of FDI and trade was elaborated by Markusen (1997, 2002). The models showed that relative sizes and factor endowments of countries determine the type of FDI attracted, and thus affect the direction of impact on trade. In the Markusen model, horizontal FDI dominates when the two countries have different sizes and factor endowments in the presence of high trade costs and firm-level scale economies. The country with the parent firm/headquarters is usually small in size and skilled labour dominant, while the host country is larger in size and dominated by unskilled labour. Final goods production occurs in both source and host countries, but the parent firm transfers knowledge

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[9] Krugman (1979, 1980) made profound contributions to the development of the "new" trade theory.

based (intangible) assets to the affiliate. The size of the host country is the key determinant of horizontal FDI as it serves as a market for the final goods. For the vertical model, the parent firm is skilled-labour abundant and exports intermediate goods and intangible headquarter services to the affiliate. The intermediate good usually consists of parts and components which utilize skilled labour, while the assembly of final goods is based in the host country. While some of the final goods are sold in the host country's market, some of it is also exported to the source county. Thus FDI and trade coexist as the establishment of the affiliate leads to the export of intermediate goods and the import of final goods.

A different approach towards explaining the coexistence of FDI and trade was taken by Head and Reis (2004). Their model showed that allowing for multi-product firms clarifies the coexistence of FDI and exports. According to the study, while single product firms have to choose FDI over exporting when the fixed costs of establishing a foreign plant is less than the trade costs, a multi-product firm can alternate both strategies over different products, and thus engage in both FDI and trade. In addition Head and Reis extended the Markusen (1997, 2002) framework to include "branching", which occurs when upstream production based only in the source country, while the downstream production and sales are carried out in both source and host country. Figure 4 shows the configurations of Markusen (1997, 2002) vertical FDI coexistence with trade and Head and Reis (2004) branching model.

In both cases, upstream production is based in the source country and intermediate goods are exported for downstream production in the host country. The main difference being that in the first case, both exportation of intermediate goods and importation of final goods occurs, while in the second case, only the former occurs as final goods production and sales also occurs in source country.

The present study presents an entirely different configuration to the FDI-trade coexistence analysis. The existing models available in theoretical literature do not seem to fit into the interplay of FDI and trade in African countries.

Figure 3: Brainard (1993) Proximity-Concentration hypothesis and Multi-stage production

1. Concentration Advantages – Export

Home

Abroad

National Firm

High plant-level economies of scale

Export final goods abroad, if:

- Low transportation costs
- Low trade barriers
- High investment barriers abroad

No MNC Activities

2. Proximity Advantages – Horizontal

MNC Parent

High firm level economies of scale

Export of final goods displaced, if:

- High transportation costs
- High trade barriers
- Low investment barriers

MNC Affiliate is established

3. Multi-stage production – Vertical FDI & Trade

MNC Parent
(Upstream Activities)

High firm level economies of scale

Export of intermediate goods & loss of export of final goods, if:

- Low transportation costs
- Low trade barriers
- Low investment barriers

MNC Affiliate is established
(Downstream activity)

Figure 4: Vertical FDI models – Vertical Specialization and Branching

Home   Abroad

Vertical specialization (Markusen 1997, 2002)

Export of intermediate

MNC parent – upstream

MNC affiliate - downstream

Export of final goods to source country

Sale of final goods in host country

Branching (Head and Ries, 2004)

Export of intermediate goods

MNC parent - Upstream

MNC plant - downstream

MNC affiliate - Downstream

Supply of intermediate goods to plant

Sale of final goods

Sale of final goods

The major departure from the previous models is that while the abundance of unskilled labour and size attracted multinational activity to the host country, the abundance of natural resources[10] plays a key role in attracting FDI in West African countries in addition to the aforementioned. The implication of the commodity wealth in the region is that unlike previous configurations where the upstream activity is based in the source country, proximity to natural resources will attract multinationals to engage in upstream production in the host country. Upstream production in the region will typically involve primary goods and extraction and mild processing. Thus the model is a "reverse" Markusen-type vertical FDI and trade association model, where the upstream production of a multinational is located in the natural resource-abundant host country, and it exports primary and semi-processed goods for downstream production in the higher-skilled source country. The "commodity proximity" vertical FDI model therefore fits into the West African exports where multinationals engage the upstream production of commodities and export them to source countries.

Thus two scenarios are plausible: The first is the case where resource-seeking multinationals engage mainly in extraction of resources and export them to the source country where other stages of production take place. While resource extraction activities in the upstream are generally capital intensive, the labour component usually involve lower skill than the downstream which involve marketing, distribution and other skill-demanding activities. Thus multinationals engaged in the extractive primary industries will drive the exports of primary goods. A second scenario is the case where multinational presence in upstream production in the region can drive both extraction and subsequent processing into intermediate goods, which are then exported for further processing in the downstream of the source country. Unlike previous vertical FDI models in theoretical literature, where the intermediate goods exports is mostly parts and components, the intermediate goods exports by ECOWAS countries is largely dominated by semi-processed goods (Industrial supplies).

The nature of semi-processed goods inform the idea that the upstream production will be based in a lower skilled country. The raw form of these goods consists mainly of agricultural products and minerals such as coffee beans, rice, wheat, iron ore, and coal. While these raw materials are in abundance in the ECOWAS region, the demand for the finished goods that emanate from them are skewed towards higher income economies such as EU countries. The existence of multinationals in the upstream production of semi-processed goods in the ECOWAS region is likely to be driven by their deficiencies in technical capacity and infrastructure to meet the high demand and standards of EU countries, as well as the relative low cost of labour required for mild processing. Unlike parts and components where the unskilled labour requirement is higher at the final stages of the value chain, the production of semi-processed goods at the initial stages require more unskilled labour, and the final stages are largely automated and consist of knowledge driven activities such as product design, marketing and distribution. Thus the export of semi-processed goods also fits into the "reverse" Markusen-type vertical FDI and trade association model.

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[10] Asiedu (2006) and Asiedu and Gyimah-Brempong (2008) show the primary sector attracts most of the FDI in Africa, and availability of natural resources is a strong determinant of the location of multinationals.

Figure 5 illustrates the "commodity proximity" model, where MNC affiliates in ECOWAS countries with huge natural resource endowment and unskilled labour dominated, engage upstream extraction and exportation of primary goods, as well as upstream mild processing and exportation of semi-processed goods to EU countries.

Figure 5: "Commodity proximity" Vertical FDI model
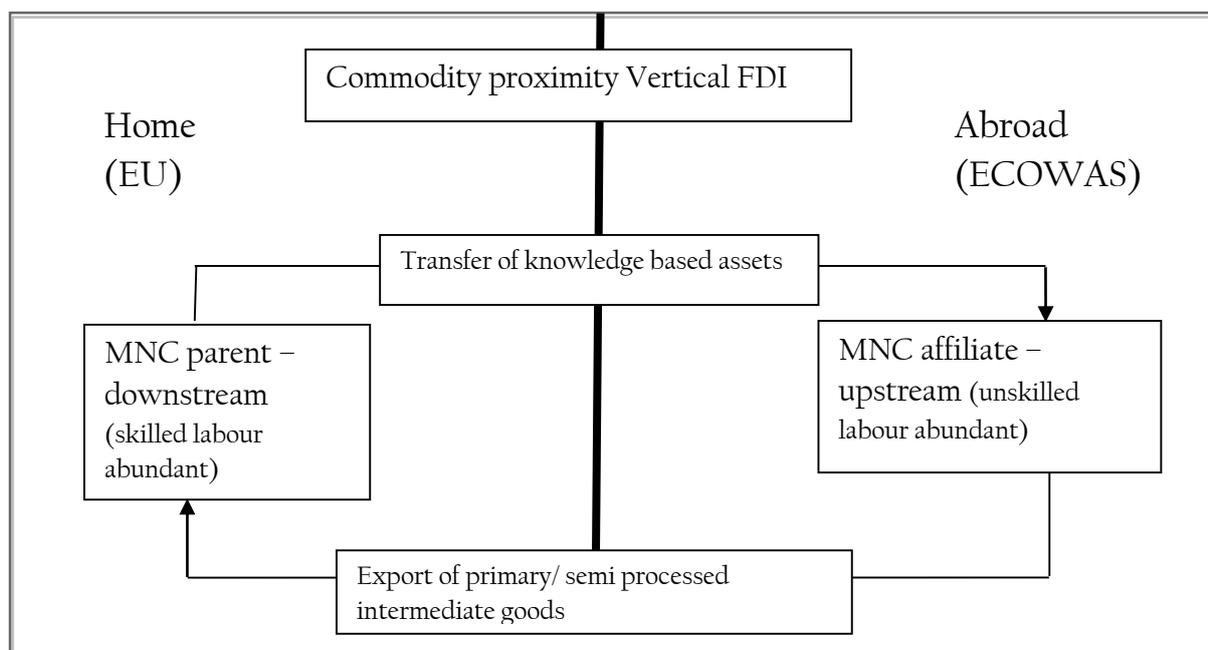
4.0 Empirical evidence on FDI-Trade relationship

The empirical evidence on the positive correlation of FDI and trade in the eighties prompted the revision of the existing trade theories and subsequent development of the "new" trade theories that allowed for their coexistence. It is therefore not surprising that most empirical studies on the effect of multinational activity on trade found complementary relationships. The general approach towards the investigation is to augment a measure of multinational activity into a gravity model. While there are considerable variations in specifications across literature, the main differences in empirical studies lie in the perspective (source/host country) of investigation, of aggregation of the models, nature of data, and proxies for multinational activity. Enquiries from a source country perspective, which investigated how exports of parent firms in a home country are affected by activities of their affiliates in the host countries, dominates the literature, especially the earlier studies. Thus the earlier studies were based on developed countries, particularly the US, as they dominated outward FDI at the time.

In the period when the debate of the FDI-Trade association was rather contentious, Lipsey and Weiss (1981, 1984) provided profound evidence of complementarily between the activities of US affiliates across a cross-section of countries and US exports at both industry and firm level, pointing to the export of parts and components to the host countries as the driver of the

positive association. While the cross-sectional approach to their analyses can be considered limited in hindsight, they provided considerable insight with firm-level and industry-level data which set the tone for further enquiry in the area. In a similar vein, Grubert and Mutti (1991) found a complementary relationship between US affiliates activity in a cross-section of 33 countries and exports of parent firms. However, following concerns of the potential simultaneity between increased FDI and exports, their work introduced tariffs and taxes as more exogenous measures of multinational activity.

With improvements in availability of data, the dimensions of research on the FDI-trade relationship expanded. A detailed and elaborate analysis involving two panel datasets was conducted by Clausing (2000). The study extended the dimension of previous studies at the time to include the effect of activities of affiliates in the US on imports from source countries. Using panel data techniques, the work found positive association of both export of parts and components from parent firms in the US with activities of their affiliates in 29 countries, and imports of the final goods from these countries and activities of affiliates in the US. Amiti and Wakeline (2003) extended the scope of the investigation to include a sample of both developed and developing countries. This allowed for the inclusion of conditionality into the argument. Thus their work found complementary relationship between FDI and trade when countries are different in size and factor endowments, and trade costs are high; while the opposite is the case when the conditions are reversed. In addition, their study contributed to the endogeneity argument reflected in Grubert and Mutti (1991) with the use of more comprehensive measures of costs/price of investment as more exogenous regressors.

Kneller at al. (2005) and Girma *et al.* (2005) extended the country-level study of Amiti and Wakeline (2003) to provide firm-level evidence based on UK multinationals. Unlike Amiti and Wakelin (2003, where complementarity of FDI and trade was dependent on the relative country characteristics and trade costs, Kneller *et al.* (2005) found robust evidence of complementarity across countries irrespective of their relative sizes and endowments. Girma *et al.* (2005), on the other hand, showed that complementarity was conditional upon the level of aggregation of data employed in the model; with the most disaggregated level resulting to substitution and vice versa. Elia (2007) found further evidence of complementarity between exports and vertical FDI among countries with different factor endowments using bilateral trade data of EU-15 exports to 11 CEECs.

Recent studies have increased the dimensions of the investigation, to include both home country and host country perspectives. From a host country perspective, Cieslik (2009) found a positive association between the stock of FDI from OECD countries in Poland and the volume of trade to and fro those countries. Anwar and Nguyen (2011) employed the multi-dimensional approach by examining the link between FDI and exports, imports, and net exports. Their results show that FDI in Vietnam from 19 OECD countries is positively correlated to exports, imports, and net exports to those countries. Similarly, Mullen and Williams (2011) found complementary relationship between inward FDI in Canada from 20 OECD countries and exports to those countries. However, outward FDI from Canada to a particular OECD country was not positively linked to exports to that county, implying that substation might have taken place.

In light of the ongoing debate of the association of FDI and trade, and conditions for complementarity, the present study approaches the enquiry from a host country perspective. As in the case of Cieslik (2009), but with an extended scope, the present study the impact of EU multinationals in ECOWAS region on exports from the region to the EU. In particular, we investigate the impact of FDI in ECOWAS region on the export of primary and intermediates goods to EU countries. Thus does inward FDI in the ECOWAS region affect exports to the EU? And does the category of the exports to the EU affect the direction of the effect of FDI?

5.0 Methodology and Data

Empirical Model

The primary objective of this study is to investigate the relationship between inward FDI into ECOWAS countries and their bilateral trade relations with EU countries, using disaggregated data. For this purpose, the gravity model (henceforth referred to as GM) is the preferred empirical model. The GM has no doubt earned itself a near universal acceptance as it has been applied to a range of academic disciplines since it was first applied by Timbergen (1962). The acceptance of the model stems from its high predictive power and the recent emergence of its theoretical supports after falling into disrepute in the 1970s and 1980s. Therefore, many authors on FDI-Trade relation utilized the approach (e.g. see Clausing, 2000; Amiti and Wakelin, 2003; Mullen and William, 2011, Anwar and Nguyen, 2011).

The conventional form of the GM can be expressed as below;

$$F_{ijt} = R_{ijt} \; \frac{M_i M_j}{D_{ij}} \dots\dots\dots (1)$$

Given the multiplicative form of equation(1), it can be re-specified in a log-linear form as below;

$$ln \, F_{ijt} = \beta_1 \, ln \, M_{it} + \beta_2 \, ln \, M_{jt} + \beta_3 \, ln \, D_{ijt} + \beta_4 \, ln \, R_{ijt} + \varepsilon_{ijt} \dots\dots\dots (2)$$

where F_{ijt} is bilateral trade between countries i and j. M_i and M_j are the GDPs or economic size equivalents of countries i and j respectively. D_{ij} represents bilateral distance between the two trading partners, the proxy for bilateral trade costs and R_{ij} is the multilateral trade resistance term defined as barriers to trade that the country-pair faces relative to those faced with all its trading partners. ε_{ijt} is the error term.

Although authors have attempted to advance the GM (e.g. see Anderson and Van Wincoop, 2003; Carerre, 2006; Baldwin and Taglioni, 2006, 2011; Baier and Bergstrand, 2007), but many empirical studies still mis-specify the model. One major source of severe bias is the omission of the multilateral trade resistance term in the GM equation (see Baldwin and Taglioni, 2006). Other causes include inappropriate deflation and wrong averaging of trade variables. Similarly, when trade is analysed in disaggregated form, estimating the conventional consumer good version of the GM leads to mis-specification of the economic mass variable and thus biases the

estimates (Baldwin and Taglioni, 2011). In the present study, we augment the conventional GM to control for the above mentioned estimation problems. Particularly, our preferred specification is in line with Anderson and Van Wincoop (2003) and Balwin and Taglioni (2006; 2011). The augmented-GM is specified as;

$$ln\,EXPORT_{ijt} = \alpha_0 + \alpha_1 ln\,GDP_{it} + \alpha_2\,ln\,GDP_{jt} + \alpha_3\,ln\,Dist_{ij} + \alpha_4 LANG_{ij}$$
$$+ \alpha_5\,ln\,DPCI_{ijt} + \alpha_6\,ln\,FDI_{it} + \rho_t + \gamma_{jt} + \varepsilon_{ijt} \dots\dots\dots (3)$$

Here $lnEXPORT_{ijt}$ is the log of total exports of goods from country i to country j at time t. $lnGDP_{i(j)t}$ are the logs of the source and partner countries nominal GDPs. The choice of nominal GDP is informed by the need to avoid measurement bias cause by inappropriate deflation of the variables as noted by Balwin and Taglioni (2006).[11] So, following Rose (2000), we allow the year dummies to capture this effect. lnD_{ijt} is the log of bilateral distance between the two partners measured as the distance between their major ports cities. $LANG_{ij}$ is a dummy variable used to capture the sharing of common official language while $lnDPCI_{ijt}$ is the log of differences in per capita income between the two trading partners which is a proxy for differences in relative factor endowment (see Amiti and Wakelin, 2003). $ln\,FDI_{it}$ is the log of foreign direct investment stock into the source country.

γ_{jt} are the nations dummies for all trade flows involving a particular nation and it is included to control for omitted multilateral trade resistance term. Preferences differ on how to control for these terms in panel analysis. While Baier and Bergstrand (2007) suggest the inclusion of year, country and country-pair dummies, Baldwin and Taglioni (2006) prefer the inclusion of both time-varying nation dummies and time-invariant country pair dummies. Applying either of these approaches will require very large number of observations which available data for the present study does not permit. Therefore, we minimize the bias by including nation dummies and year dummies in equation (3). The inclusion of the nation dummies removes the time invariant components of the resistance term (Baldwin and Taglioni, 2006). The correlation matrix shows that no serious multicollinearity issues exist (See Figure A2 in Appendix). However, since there are time series correlations between the resistance term and the included independent variables, it becomes imperative to control for the time-series components of the correlation. Thus, we also include year dummies ρ_t. Finally, since our focus is on disaggregated trade flows (i.e. primary, intermediate and final exports), fixed effects are used to control for economic mass in the preferred specification thereby addressing the mass-variable misspecification noted by Baldwin and Taglioni (2011).

In terms of a-priori expectations, we expect larger economic sizes of trading partners to promote trade between them so that α_1 and α_2 should be positive. The distance variable is a proxy for transportation cost and therefore the larger the distance between trading partners the higher the transportation cost and consequently a reduction in bilateral trade, so α_3 should be negative. α_4 should be positive since sharing common language facilitates bilateral trade especially in the case of ECOWAS countries where language is also an indicator of colonial ties. α_5 is expected to be positive since differences in factor endowment (especially natural

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[11] Baldwin and Taglioni (2006) refer to this bias as the bronze-medal error.

resources differences) promotes North-South trade. α_6 is the main coefficient of interest: if there is a complementary relationship between FDI and a particular export category then it should be positive. On the other hand, if they are substitutes, α_6 should be negative. For all variables included in equation (3), if the relationship between them and trade flows are not strong, then we expect their coefficients to be statistically insignificant.

Data Sources

The data set include disaggregated bilateral trade flow from 10 ECOWAS members to seven EU countries for the period 2000 to 2010.[12] Conducting a more holistic analysis was hampered by dearth in disaggregated data on bilateral exports between members of ECOWAS and EU. This is mainly because many ECOWAS countries export only a few products to the major EU countries. Notwithstanding, bilateral exports based on Broad Economic Classifications (BEC) data were sourced from UN Comtrade Database. Following Gaulier *et al.* (2006) and Ueki (2010), the data were later re-grouped into three (i.e. primary, intermediate and final products) from the BEC five stage classification.[13] Data on bilateral distances and common language are available at CEPII Database while bilateral exchange rate is from IMF International Financial Statistics.[14] Nominal GDP and per capita income were from the World Bank World Development Indicators Database.

One major problem with research involving FDI is the dearth of disaggregated data by sectors especially for developing countries. Due to this problem, we limit our analysis to total FDI data which were sourced from UNCTAD Statistics Database. However, we conduct a sensitivity analysis for the regression by comparing the result for the EU with those of emerging countries including Brazil, India, China and South Africa (BICS).

In terms of the structure, the panel involves unidirectional flow of disaggregated exports from ten source countries to seven partners over eleven years yielding 770 observations. However, in few instances (less than seven percent of the total observation) there are zero observations but this does not pose a serious challenge to the accuracy of our results.

6.0   Empirical Results

We conduct the empirical analysis using the least square dummy variable (LSDV) estimation technique. As reported in Table 2, equation (3) is estimated for three categories of exports namely primary, intermediate and final exports. For each of the three categories, three variants are estimated including one with the pooled regression, one with year effect only and the last one with both year and country effects. These yield Models 1 to 9 in the table. The last variants (Models 3, 6 and 9) are our preferred models and thus form the basis for comparing our variable

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[12] The 10 ECOWAS countries are Benin Republic, Burkina Faso, CoteD'Ivoire, Gambia, Ghana, Mali, Niger, Nigeria, Senegal and Togo while the seven EU members are Belgium, France, Germany, Italy, Netherlands, Spain and UK.

[13] TableA1 in Appendix shows the re-categorization from BEC 5 Stage to 3 Stage product groups.

[14] Find CEPII data at: http://www.cepii.fr/anglaisgraph/bdd/distances.htm

of interest across export categories. We explore the behaviours of other independent variables included in the regression.

For all the equations estimated, both the source country's GDP and sharing of common language are statistically significant with the expected signs. This is a true reflection of the pattern of trade in ECOWAS as explained in section 2. The region's exports (both intra-regional and extra-regional) are dominated by only a few relatively big economies such as Nigeria, CoteD'Ivoire, Ghana and Senegal. In fact, many of the coefficients of exporter country GDP are in line with those of previous studies on ECOWAS trade (e.g. see Agboji, 2008 and Salisu and Ademuyiwa, 2013). Similarly, given that ECOWAS countries are divided into anglophone (English-speaking) and francophone (French-speaking) countries whose trade relation with the EU reflects their strong colonial ties, it is not surprising that language is significant to trade with the EU.

The coefficient of both partner country GDP and distance are mostly insignificant. For the partner country GDP, this can be associated with the fact that apart from France and UK which dominate ECOWAS trade with the EU, there are no significant differences in individual ECOWAS members' trade with the other EU members included in the analysis. In the GM, distance is a proxy for transportation cost. Our result shows that although the coefficient of distance is correctly signed, trade between the ECOWAS members and the EU members are not significantly affected by transportation cost. One possible explanation for this is that transport infrastructure across the EU is well developed and thus transportation cost between EU members and ECOWAS members do not differ significantly. For example, the costs of shipping from Apapa Port (Nigeria) to the busiest ports in Italy and UK (i.e. Port of Gioia Tauro and Port of Felixstowe) are not significantly different even though UK is farther.[15] Furthermore, ECOWAS members major trading partners (France and UK) appear to be farther than many other EU members included in the analysis. For example, the UK is farther than Spain, Italy and Belgium. The coefficient of the differences in per capita income reveals that as the income gap between ECOWAS members and EU countries increases, the trade between them reduces. However, this relationship is found to be non-significant in the preferred model, implying that difference in resource endowment is not a major determinant of bilateral trade between the trading partners.

The main coefficient of interest in this study is the FDI coefficient. We focus on models 3, 6 and 9 in Table 2 since they control for the methodological concerns raised earlier. Results of model 3 in the table show that the inflow of FDI into the ECOWAS region stimulates exports of primary goods to the EU. In fact the coefficient of the FDI variable is about 0.6 implying that a 10 percent increase in the flow of FDI into the region will result in about 6 percent increase in exports of primary goods. We find this complementary relationship not surprising but supportive of the widespread belief that investments into ECOWAS are resource-seeking. In fact, our investigation of the sparse FDI data available show that EU's investments are concentrated in primary sectors of resource-rich ECOWAS members like crude oil (Nigeria and Ghana), uranium (Niger) and cocoa and cotton (CoteD'Ivoire and Mali). Therefore,

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[15] See standard freight rates on http://worldfreightrates.com/

through FDI, natural resources are explored and exported to the rest of the world, including the EU.

The foregoing is supported by the results for model 9 which focuses on the effect of FDI inflows on ECOWAS exports of final products to the EU. We observe that apart from having very small coefficients, FDI is not a significant determinant of final goods exports. This can be associated with the targets of FDI in the region. Very small proportions of total FDI inflows are aimed at production and exportation of final goods. In few instances where such investments occur they are mostly targeted at exporting to the regional market rather than the international market due to low competitiveness.

As depicted under model 6 in Table 2, the exports of intermediate goods reduce as FDI flows into ECOWAS increases. At first glance this result appears contrary to what holds in the literature on trade and investment relation (e.g. see Merkusen, 2002 and Head and Reis, 2004), but there is a difference. In the conventional models the interest is on whether or not multinational investment activities in the recipient country increase the imports of intermediate goods by the recipient country from the source country. But in the present study, our interest is quite the reverse. We investigate whether or not multinational investment activities in the recipient countries (i.e. ECOWAS members) results in increase in the exports of different categories of goods from these recipient countries to the source countries (i.e. the EU). This is important because it reflects the purpose of multinational investments activities; do they invest in order to exploit primary resources or to process them into intermediate and final goods before exporting? In the case of exports of intermediate goods from ECOWAS to the EU, the significant and negative relationship with FDI probably imply that the inflow of investment is moving from intermediate sectors activities to other sectors of the economy.

In sum, our analysis shows that the effects of multinational investment activities on recipient country's exports vary across the different categories of exports.

Sensitivity Analysis

As discussed earlier, we conduct a similar analysis to investigate the trade and FDI relation between ECOWAS countries and selected emerging economies. Due to data limitations, we focus of just seven ECOWAS countries as the source countries while Brazil, India, China and South Africa are the partner countries.[16] The analysis is similar to those conducted earlier and the results are presented in Table 3.

The results are similar to those in Table 2. Models 3, 6 and 9 shows that multinational investments activities is positively correlated with an increase in ECOWAS exports of primary goods to the BICS and negatively correlated with the exports of intermediate goods. For final goods, no significant relationship can be established. Therefore, this sensitivity analysis reinforces the effect of the resource-seeking nature of investments flowing into ECOWAS on the structure of its trade with major trading partners.

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[16] In this analysis, we exclude Burkina Faso, Gambia and Niger Republic and Russia due to a high proportion of zero trade observations

7.0   Conclusion

Much of the investigation of the FDI-trade relationship in literature has been based on the effect of source country's outward FDI on its export of final or intermediate goods with little attention given to the effect of inward FDI on host country's exports performance. For developing countries where FDI remains a major source of bridging their saving-investment gap and promoting exports, the latter relation is more important. Therefore, this study presents a "commodity-proximity" model which conceptualizes this relation in resource-abundant countries in West Africa.

Empirically, the study uses disaggregated exports data to examine the trade and FDI relation between West African countries and the EU. Results from a theoretically augmented gravity model show that the effect of multinational investment activities on host country's exports differ across exports categories. Specifically, while increased inflow of FDI promotes the export of primary goods from ECOWAS to the EU, it is associated with a reduction in the exports of intermediate goods and has no significant effect on final goods exports. A similar result was found when the FDI-Trade relation between ECOWAS and the BICS was considered. One plausible explanation for this persistent observation is that FDI into the ECOWAS remain resource-seeking. These results suggest that the sectoral target of FDI inflow is important to the trade performance of recipient economy. Therefore, we recommend that in order to achieve export diversification and commodity based industrialization, ECOWAS members should align their investment promotion priorities with their industrialization policies. In other words, more FDI should be encouraged in sectors that are vital to their industrialization aspirations.

Table 2: Results for ECOWAS Exports to the EU

Independent Variables	Primary Exports Equations			Intermediate Exports Equations			Final Exports Equations		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
$lnGDP_{it}$	1.249***	1.146***		0.657***	0.852***		0.429***	0.490***	
	0.160	0.162		0.251	0.252		0.115	0.118	
$lnGDP_{jt}$	0.147	0.184		0.227	0.172		0.300**	0.276**	
	-0.147	-0.147		-0.247	-0.242		0.112	0.113	
$lnDist$	-0.660	-0.361	-0.725	-3.967***	-4.414***	-1.121	-0.836	-0.994	-1.498**
	-0.711	-0.711	-0.949	1.195	1.172	-1.587	-0.544	-0.549	0.699
$LANG$	0.559***	0.571***	0.592***	0.605***	0.580***	0.546***	0.839***	0.830***	0.800***
	0.099	0.098	0.094	0.172	0.168	0.162	0.078	0.078	0.071
$lnDPCI$	-1.318***	-0.676	-1.510	-4.833***	-5.588***	-1.320	-2.902***	-3.177***	-2.99***
	0.409	-0.441	-1.075	0.704	0.736	-1.863	0.312	0.337	0.818
$lnFDI$	0.392***	0.694***	0.586**	-0.383**	-0.786***	-1.431***	-0.043	-0.190	0.001
	0.109	0.134	0.229	0.189	0.231	0.390	-0.085	-0.107	-0.168
$Constant$	-9.584**	-9.437**	5.840	-11.688	-12.064**	0.751	-1.280	-1.458	-0.048
	3.833	3.814	-3.107	-6.208	6.048	-5.209	-2.816	-2.821	-2.277
Year Effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Country Effects	No	No	Yes	No	No	Yes	No	No	Yes
Adjusted R^2	0.53	0.53	0.60	0.20	0.25	0.35	0.44	0.44	0.57
F value	102.82***	44.03***	40.27***	29.27***	15.92***	17.39***	81.98***	34.34***	39.56***
No. of Observation	649	649	649	770	770	770	718	718	lS

***, **, * indicate statistical significance at 1%, 5% and 10% levels, respectively

Table 3: Results for ECOWAS Export to BICS

Independent Variables	Primary Exports Equations			Intermediate Exports Equations			Final Exports Equations		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
$lnGDP_{it}$	0.604	0.871		0.338	1.105**		0.435	1.144	
	-0.456	-0.477		-0.471	0.473		-0.431	0.431***	
$lnGDP_{jt}$	2.06***	2.324***		1.454***	1.913***		0.925**	1.346***	
	0.432	0.438		0.436	0.425		0.403	0.391	
$lnDist$	-4.193***	-4.507***	-2.203	3.508***	3.678***	3.772***	2.84**	3.103***	3.504***
	1.326	1.316	-1.228	1.339	1.282	1.319	1.243	1.187	1.238
$LANG$	0.047	0.052	0.322	1.133***	1.164***	0.942***	0.078	0.165	0.294
	-0.33	-0.327	-0.309	0.347	0.332	0.350	-0.326	-0.311	-0.334
$lnDPCI$	-2.474***	-2.291***	-2.06***	0.269	-0.455	-0.272	-1.172***	-1.817***	-1.727***
	0.502	0.507	0.462	-0.517	-0.51	-0.521	0.478	0.471	0.488
$lnFDI$	0.959***	1.233***	0.86***	0.427	-0.388	-2.523***	0.217	-0.59**	-1.358
	0.291	0.323	0.290	-0.3	-0.322	0.725	-0.272	0.298	-0.716
$Constant$	2.813	2.793	-4.417	4.892	4.243	19.583***	1.043	0.259	12.57***
	-5.386	-5.362	-3.124	-5.652	-5.435	3.448	-5.145	-4.929	3.243
Year Effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Country Effects	No	No	Yes	No	No	Yes	No	No	Yes
Adjusted R^2	0.4	0.41	0.55	0.19	0.26	0.3	0.25	0.32	0.39
F value	29.53***	12.3***	16.11***	10.99***	6.64***	6.14***	14.71***	8.26***	6.83***
No. of Observation	262	262	262	254	254	254	247	247	247

***, **, * indicate statistical significance at 1%, 5% and 10% levels, respectively

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Appendix

Fig A1: Shares of Economic Groups in ECOWAS' Imports, 1995 to 2013
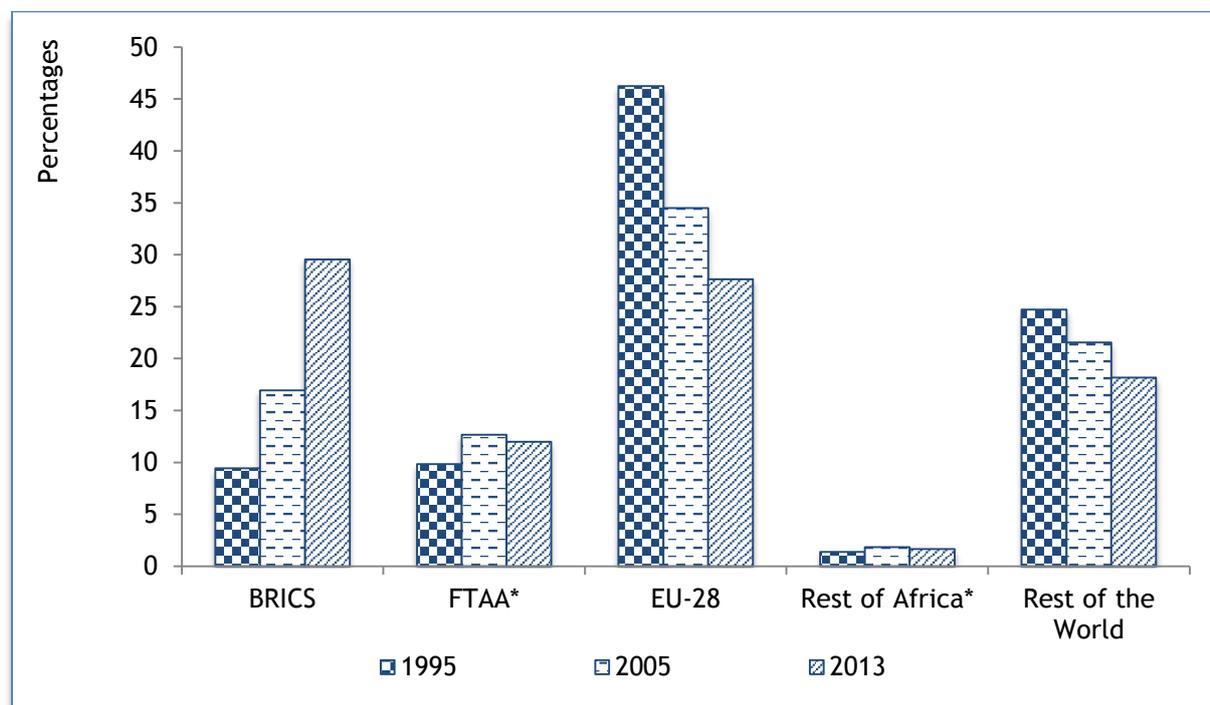
Source: Authors' Computations from UNCTAD Statistics Database, 2014

Table A1: Broad Economic Categories of Exports

5-Stage	3-Stage	BEC	Title in BEC
Primary Exports	Primary goods	111	Food and Beverage, primary, mainly for industry
		21	Industrial supply not elsewhere specified, primary
		31	Fuels and lubricants, primary
Intermediate Exports	Semi-finished goods	121	Food and beverages, processed, mainly for industry
		22	Industrial supply not elsewhere specified, processed
		32	Fuels and lubricants, processed
	Parts and components	42	Capital goods (except transport equipment), parts and accessories
		53	Parts and accessories of transport equipment
Final Exports	Capital goods	41	Capital goods (except transport equipment)
		521	Other industrial transport equipment, parts and accessories
	Consumption goods	112	Food and Beverage, primary, mainly for household consumption
		122	Food and Beverage, processed, mainly for household consumption
		51	Passenger motor cars

	522	Other non-industrial transport equipment, parts and accessories
	61	Durable consumer goods not elsewhere specified
	62	Semi-durable consumer goods not elsewhere specified
	63	Non-durable consumer goods not elsewhere specified

Source: Gaulier *et al.* (2006) and Ueki, (2010)

Figure A2: Correlation matrix

	$ln\,GDP_{jt}$	$ln\,GDP_{it}$	$ln\,Dist_{ij}$	$ln\,DPCI_{ijt}$	$ln\,FDI_{it}$
$ln\,GDP_{jt}$	1.0000				
$ln\,GDP_{it}$	0.9179	1.0000			
$ln\,Dist_{ij}$	0.0712	0.0695	1.0000		
$ln\,DPCI_{ijt}$	-0.7313	-0.6965	-0.1295	1.0000	
$ln\,FDI_{it}$	0.7746	0.7177	0.1797	-0.8086	1.0000