

***ECONOMIC INTEGRATION, TRADE FACILITATION AND AGRICULTURAL
EXPORTS PERFORMANCE IN ECOWAS MEMBER STATES***

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Abstract

This study examined the interaction between economic integration and trade facilitation in ECOWAS and how the regional bloc has performed in promoting agricultural export. Statistical and econometric analyses were utilized to examine the effect of economic integration on trade facilitation as well as the role of trade facilitation and economic integration in promoting agricultural exports in ECOWAS. The findings suggest that on the average, the level of trade facilitation in ECOWAS is below world average. It was also found that ECOWAS members with more bureaucratic processes experience greater costs of exporting/importing. Evidence from the study also reveals a sustained growth in agricultural production and a close relationship between agricultural production and agricultural exports in the region. Results from econometric analyses indicate that economic integration significantly helps in facilitating trade within the ECOWAS sub-region. Economic integration and trade facilitation were also found to be significant in influencing agricultural exports in the ECOWAS sub-region, while agricultural production had direct and significant impact on agricultural exports. Notably, there is a need to create incentives for greater level of implementation of the ECOWAS agricultural policy (ECOWAP) and the ECOWAS Trade liberalization Scheme (ETLS) protocols by individual member states to enhance economic integration in the sub-region.

Keywords: Economic Integration, Trade Facilitation, Agricultural Exports, ECOWAS

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ECONOMIC INTEGRATION, TRADE FACILITATION AND AGRICULTURAL EXPORTS PERFORMANCE IN ECOWAS MEMBER STATES

Introduction

Economic integration (EI), which is an embodiment of custom unions, trade blocs, and free trade area, has the ultimate aim of promoting trade participation of Members and in the long-run enhance economic performance and welfare of their citizenry. EI cannot operate in a vacuum, it requires some sort of components such as transport and communication facilities, critical mass of capital, institutions, and so on to meaningfully realise its objectives (Essien, 2009). It is on this axiom that regional economic communities (RECs) are established across the world, of which Economic Community for West African States (ECOWAS) is a good example.

A cursory observation of some indicators of EI presented in Table 1 indicate that the share of ECOWAS' import ranges from 11.67 per cent to 17.04 per cent between 1999 and 2009; while that of export share was between 8.40 per cent and 14.18 per cent within the same period. This means that ECOWAS sub-region has greater share in world import than export denoting that it is a net importer. It has also been noted that the ECOWAS sub-region meets about 80 per cent of the regional population's food need, which implies that the net food import is about 20 per cent (ECOWAS Commission, 2010). This is crucial given the understanding that food is fundamental to human existence and agricultural sector is expected to provide food, among other things.

Table 1: ECOWAS Trade Share in World Market (%)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
import share	11.67	17.00	16.23	13.50	13.57	18.82	19.94	12.97	11.52	17.04	17.04
Export share	11.53	8.58	9.60	12.83	10.22	8.93	8.40	14.18	10.06	12.46	12.46

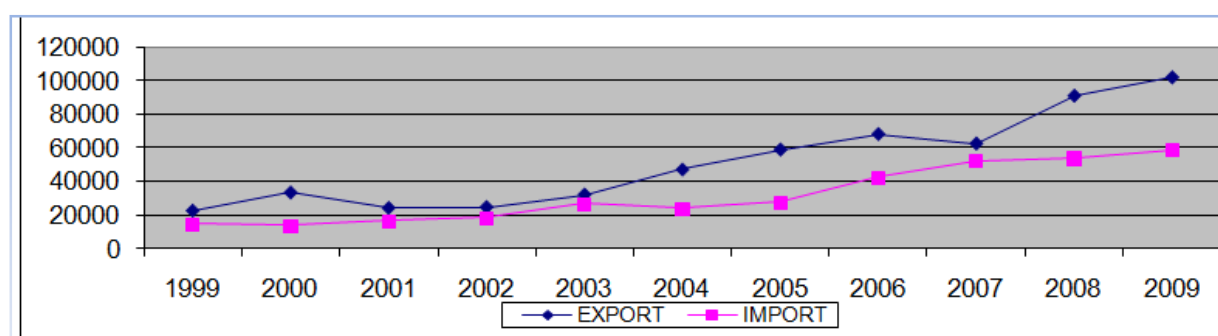
Source: Computed from ECOWAS Trade Data and World Trade Indicators

One of the cardinal objectives of RECs is to promote trade within the region (intra-regional trade) as trade barriers are significantly reduced. The values in Figures 1a and 1b show that the level of ECOWAS' total export and import increased markedly between 1999 and 2009.

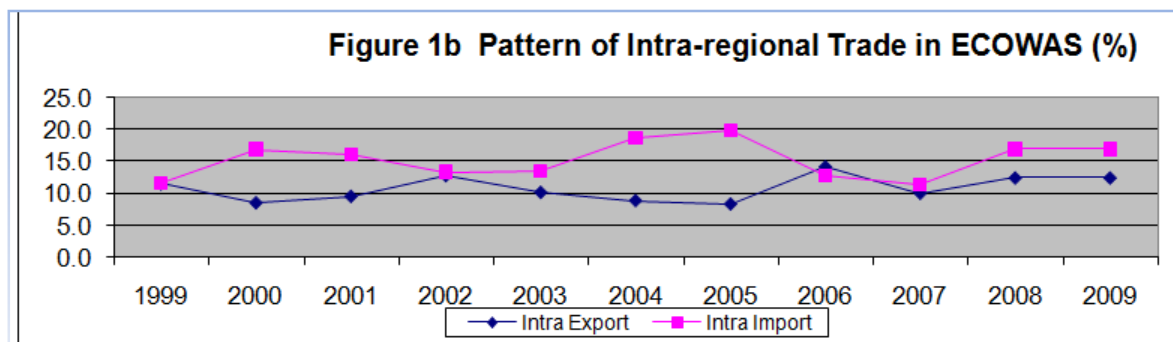
Export increased from USD 20 billion in 1999 to USD 100 billion in 2009 while import increased from USD 18 billion to USD 60 billion. However, as shown in Figure 1b, intra-regional trade (import and export) declined within the period. For instance, intra-regional export fluctuated between 8.4 and 14.2 per cent from 1999 to 2009, while that of import was between 11.5 and 19.9 per cent. Thus, both intra-regional export and import were less than 20 per cent, which implies that more than 80 per cent of trade in ECOWAS sub-region is with other countries in other regions. The export of ECOWAS Members within the region was very low. It was as low as 0.1 per cent in 1999 and 0.4 per cent in 2005 for Cape Verde just like Guinea Bissau that was 0.1 per cent in 2001, 2003 and 2007. For the import of ECOWAS Members from the region, it was also very low, where it was only 0.5 per cent and 2.3 per cent respectively in 1999 and 2007 in Nigeria (ECOWAS Trade Data, 2010). Others have similar patterns with the exception of a few.

Trade facilitation (TF) examines how procedures associated with cross-border trade can be improved through the reduction of transaction costs. TF is believed to enhance competitiveness in world market (ICTSD, 2011). Some other indicators of TF, namely: number of documents required for both import and exports as well as number of days required to process goods for import and export show that it requires about 8 and 9 documents for export and import in ECOWAS sub-region compared to about 7 and 8 of same for the world average (World Bank, 2010). Furthermore, it requires about 30 and 36 days to finish the process of export and import documentation in ECOWAS sub-region unlike 26 to 29 days for the world average (World Bank, 2010). It is equally noted that the average teledensity rate in ECOWAS sub-region in 2007 was 17.98 per 100 inhabitants compared to the averages for SSA and world that were 23.35 and 83.09, respectively (Olayiwola and Osabuohien, 2009).

Figure 1a Trend in Export and Import of ECOWAS (USD 'm)



Source: Computed from *ECOWAS Trade Data* and World Trade Indicators



Source: Computed from *ECOWAS Trade Data* and World Trade Indicators

Agricultural sector in ECOWAS like most African economies occupies prime segment of the society. It is seen as the backbone and mainstay of the economy as it has diverse effects on the society with regard to employment, earnings and food security (ECOWAS Commission, 2010; Efobi and Osabuohien, 2011). Agricultural sector contributes about 35 per cent of the ECOWAS sub-region's gross domestic products (GDP) and it constitutes about 16.3 per cent of total export of goods and services. On the average, over 60 per cent of the active population in the ECOWAS region engaged in agriculture (ECOWAS Commission, 2010). Thus, it is a significant sector that can help poverty alleviation and ensure food security. However, there are some challenges that have bedeviled the performance of the agricultural sector in general and agricultural export in particular in the sub-region. Some of these include: limited local market size, poor and inefficient infrastructure, reliance on rainfall, limited technical know-how, low availability of financial resources, among others.

The operations of RECs are believed to provide some of the solutions of the aforementioned challenges by facilitating intra-regional agricultural products flow through: the transportation from surplus to deficit countries in the sub-region; reducing price fluctuations; supporting regional infrastructure; creating regulatory frameworks; *inter alia*. Thus, RI and TF can help to enhance productivity and competitiveness of agricultural exports by increasing output as well as improving the incomes of farmers. Based on the foregoing this study seeks to examine how economic integration in ECOWAS has improved trade facilitation on one hand, and how agricultural exports has benefited from EI and TF in the sub-region. The main objective of the study is to analyse the interrelationship among economic integration, trade facilitation and agricultural export performance in ECOWAS.

Brief Literature Review

The term Economic integration (EI) has been seen to have several connotations. It usually involves the unification of trade among the Members of a given trade bloc or customs union. It equally includes partial or full removal of tariffs on trade across national boundaries with the purpose of reducing prices and enhancing the welfare of citizens in the Member States (Dalimov, 2009). EI processes can be realised through various stages, namely: Preferential trading area; Free trade area, monetary union; Customs union, Common market; Economic union, Customs and monetary union; Economic and monetary union, Fiscal union; and full/Complete economic integration (Ndulu, Kritzinger-van and Reinikka, 2005). The stages and duration as well as effectiveness depend on both the nature of regulations and the adherence to laid down rules by the Member States. For instance, UNECA (2010) had noted that regionalism has proliferated in post-independence SSA countries but intra-regional trade in SSA is still lower than projected.

The RECs essentially exist to help the region maximise the benefits of engaging in international trade and minimise possible costs that are involved. This is usually pursued through the reduction of trade restrictions and market access. Yang and Gupta (2007) have noted that RTAs in Africa have not been effective in promoting trade due to external trade barriers and low level of resource harmonisation among members. Other possible challenges include: small size of markets, poor transport facilities and high trading costs (UNECA, 2010; Osabuohien, 2011). RECs also strive to achieve the existence of mutually benefitting integration, strong political commitment to the integration and strong institutions among members (McCarthy, 2002; Dalimov, 2009).

With respect to trade facilitation (TF), Wilson, Mann and Otsuki (2005) defined it broadly by quantifying the impact of four different measures, namely: port efficiency, customs environment, regulatory environment and e-business usage. However, Engman (2005) used the WTO definition of TF, which involves the simplification and harmonisation of international trade procedures. This definition considers mainly what happens around the border. Other authors such as Martinez-Zarzoso and M´arquez-Ramos (2008) focused on the effects of the measures of TF including: information technology, port efficiency and institutional quality.

In literature, major approaches of estimating the impact of TF have been examined. Some studies such as Martinez-Zarzoso and M´arquez-Ramos (2008); Wilson, Mann and Otsuki (2003, 2005), among others employed the gravity model of trade augmented with some indicators of TF. For instance, Wilson, Mann and Otsuki (2005) estimated gravity model of trade augmented with some indicators of TF for a group of countries in the Asia-Pacific region. Soloaga, Wilson and Mejía (2006) also used augmented gravity model but with focus on Mexico. Djankov, Freund and Pham (2010) also employed the augmented gravity model using the World Bank’s Doing Business Database but with emphasis mainly on the effects of time delays in the exporting country. Nordas, Pinali and Grosso (2006) had earlier examined how time delays exert probable influence on export. They found that time not only reduces trade volumes, but lengthy procedures for exports and imports reduce the probability that firms will enter the export markets for time sensitive products. This agrees with Persson (2007) who investigated the effect of time delays and transaction costs on trade flows for each of the six groups of African, Caribbean and Pacific (ACP) countries negotiating Economic Partnership Agreements with the European Union (EU). Further, the empirical findings of Martinez-Zarzoso and M´arquez-Ramos (2008) lend support to multilateral initiatives that encourage countries to assess their trade facilitation needs and priorities and to improve them.

TF reforms has been seen as crucial policy measures for reducing the costs of exporting and importing in developing countries, as the international business community has increasingly expressed its concerns for greater transparency, efficiency, and procedural uniformity of cross-border transportation of goods. Freund and Bolaky (2004) noted that gains from trade can lead to welfare, which will emanate from increasing specialisation; however, when the structure of economic activities are not flexible to incorporate nascent changes, the positive impact of trade will be minimal in terms of the allocation of resources across and within industries. It is these rigidities that Economic Integration and TF are meant to address to promote trade flows across regions.

In the African continent, not much has been done in examination of trade facilitation and economic integration. The few studies in this area are briefly reviewed herein. Iwanow and Kirkpatrick (2009) defined TF as reducing the transaction costs associated with the enforcement, regulation and administration of trade policies. The authors used a panel dataset for 124 developed and developing countries (2003-2004) assessed the impact of TF and other trade-related institutional constraints on manufacturing export performance with particular

emphasis on Africa. They estimated a standard gravity model augmented with TF, regulatory quality, and infrastructure indicators and established that TF reforms could contribute to improve export performance in Africa, but other reforms including the quality of the regulatory environment and the quality of the basic transport/communications infrastructures, were noted to be essential. The authors concluded that improvements of *on-the-border* and *behind-the-border* policies will yield a higher return in terms of increasing manufacturing export performance in African countries than in the rest of the world.

Other studies such as Njinkeu, Wilson, and Fosso (2008) and Wilson, Mann and Otsuki (2004) analyzed the impact of reform in four different categories of TF, namely: port efficiency, customs environment, customs regulatory environment, and service infrastructure and established that ports and services infrastructures are the main indicators of TF that affect intra-African trade. Furthermore, Clarke (2005) investigated the factors that affect the export performance of manufacturing enterprises in Sub-Saharan African countries using a cross-country manufacturing survey and noted that manufacturing enterprises are less likely to export in countries with poor customs administrations and restrictive trade and customs regulations. The above is similar to the submission of Eifert, Gelb, Ramachandran (2005) that compared firm-level data on total factor productivity for about 3,000 Sub-Saharan African firms (2000-2004) and found a weak business environment that is reflected in disproportionately high indirect costs which lower the return to labour in production and thereby reducing labour demand and real wages.

On the other hand, Elbadawi, Mengistae and Zeufack (2006) established that after allowing for the effect of geography in terms of physical distance from foreign markets, weak institutions adversely affect the performance of SSA's manufactured exports. In a similar study, Yoshino (2008) observed that *behind-the-border* factors such as electricity and internet services affect how much manufacturing firms can export as well as the geographic orientation of exporters in SSA. Just like Balchin and Edwards (2008) that examined the relationship between business climate, manufacturing productivity, and export performance in eight African countries, and noted that various aspects of business climate and legal environment were important determinants of probability of exporting.

Njinkeu, Wilson, and Fosso (2007; 2008) have noted that dismal performances of African trade can be attributable to several factors traditionally associated with TF, which include

complex customs requirements, lengthy and non-transparent bureaucratic procedures associated with the movement of goods and services across international borders. They also noted that trade impediments could be compounded when countries are parties to several non-functioning regional and bilateral trade agreements, leading to significantly high cost of doing business and competitiveness. Thus, trade facilitation is a comprehensive and integrated approach to reducing the complexity and cost of the trade transactions process, and enhancing the efficiency, transparency and predictability of international trade. The major fallout from the extant studies reviewed, is that the issue of trade facilitation and economic integration has not been related to agricultural export performance with focus on ECOWAS members.

ECOWAS Agricultural Policy and Regional Integration

There are a number of challenges to the free movement of agricultural products in West African sub-region. These challenges include weak institutional frameworks, high cost of transportation, poor communication and infrastructure facilities. The inauguration of the ECOWAS agricultural policy (ECOWAP) and the ECOWAS Trade liberalization Scheme (ETLS) were targeted at addressing these myriad challenges of goods movement in the region.

The importance of the agricultural sector to ECOWAS countries cannot be over-emphasized. The agricultural sector remains a significant contributor to regional GDP, foreign trade, employment, poverty reduction, food security, etc. Despite a very difficult environment for production and hostile trade practices by some developed countries that continue to extend subsidies to their farmers, the resilience of the agricultural sector in ECOWAS countries is never in doubt. The agricultural sector has been highly adaptable and production continues to increase sufficiently to meet the growth in demand. For example, agri-food exports have risen by 95 per cent while imports have only risen by 64 per cent between the period 1988 and 2008 (ECOWAS Commission, 2010). Export crops such as coffee, cotton, cocoa, and so on have performed relatively impressive and thus recorded huge successes over time. It is believed that the agricultural sector of ECOWAS countries will even perform better under a regional development strategy for the sector.

ECOWAS regional agricultural policy (ECOWAP) was adopted by member heads of state and government for the region on 19th January 2005. ECOWAP is the appropriate reference policy initiative when reviewing regional agricultural policy for the agricultural sector in the region. Under the ECOWAP, the sub-region is believed to be the right arena for a new

agricultural development strategy. The general objective of the ECOWAP is “to contribute in a sustainable way to meeting the food needs of the population, to economic and social development, to the reduction of poverty in the Member States, and thus to reduce existing inequalities among territories, zones and nations”. They are consonance with the principle of regional food sovereignty especially as they relate to high regional integration and appropriate levels of border protection, differentiated according to the specific needs of each supply chains in the process. ECOWAP as a policy thrust sets outlines the principles and the objectives for the agricultural sector including the direction that agricultural development is expected to take. The policy of thrusts ECOWAP are categorised into three major policy themes to ensure the expectations are delivered. To increase productivity and competitiveness of agriculture, implement a trade regime within the region and adapt the trade regime with countries outside the sub-region.

In view of the foregoing, an integrated approach to agricultural development at the ECOWAS regional level is unarguably the most viable strategy for agricultural development. The regional dimension of agriculture in ECOWAS should significantly boost agricultural production or at least help sustain the momentum of growth already evident in the sector. The ECOWAP initiative necessarily requires a regional free trade area to achieve the broad objectives of accessing an enlarged local market, realizing economies of scale and strengthening bargaining positions in global trade negotiations.

Methodology

A descriptive analysis was considered appropriate in assessing the level of economic integration in ECOWAS Members. Further, statistical correlation analysis was used to examine the effect of economic integration process in promoting agricultural exports in ECOWAS. The econometric analysis was employed to examine the role of economic integration in trade facilitation. Data utilised were sourced from ECOWAS trade data as well as World Trade Indicators, World Governance Indicators and World Development Indicators.

The Econometric Model

We specify the baseline model for trade facilitation as follows:

$$TF = days_i = f(Institution, Infrastructure, Macro) \quad (1)$$

where:

<i>TF</i>	Trade Facilitation proxied by one of its key indicators – number of days taken to process exports (<i>xdays</i>) or imports (<i>mdays</i>) by country <i>i</i> .
<i>Institution</i>	Political institutional factors proxied by rule of law index and control of corruption index.
<i>Infrastructure</i>	Service infrastructure measured by number of internet users per 100 inhabitants and Telephones lines (fixed + mobile) per 100 inhabitants. Efforts were made to include electricity production/consumption as one of the indicators of infrastructure; however, the data for most ECOWAS members over the study period were not available.
<i>Macro</i>	Macroeconomic factors measured by Per capita real Gross Domestic Products (PCR GDP).
<i>xdays_{it}</i>	number of days taken to process exports by country <i>i</i> to country <i>t</i>
<i>mdays_{it}</i>	number of days taken to process imports by country <i>i</i> from country <i>t</i>

In more explicit form, equation (1) in its static form is decomposed into number of days taken to process exports or imports equations and may be re-written as follows:

$$xdays_{it} = \delta_0 + \delta_1 institution_{it} + \delta_2 infrastructure_{it} + \delta_3 macro_{it} + \epsilon \quad (2)$$

$$mdays_{it} = \beta_0 + \beta_1 institution_{it} + \beta_2 infrastructure_{it} + \beta_3 macro_{it} + \epsilon \quad (3)$$

where:

xdays_{it} = number of days taken to process exports by country *i* to country *t*,

mdays_{it} = number of days taken to process imports by country *i* from country *t*, and

ϵ and ϵ are the disturbance error terms that are subject to the usual assumptions.

A priori we expect: $\delta_j < 0$ and $\beta_k < 0$. Where: *j* and *k* = 0, 1, ..., 3.

Other variables are as previously defined.

Equation (1) may also be explicitly specified in its dynamic form and decomposed into number of days taken to process exports or imports equations as follows:

$$xdays_{it} = \delta_0 + \delta_1 xdays_{i,t-1} + \delta_2 institution_{it} + \delta_3 infrastructure_{it} + \delta_4 macro_{it} + \epsilon \quad (4)$$

$$mdays_{it} = \beta_0 + \beta_1 mdays_{i,t-1} + \beta_2 institution_{it} + \beta_3 infrastructure_{it} + \beta_4 macro_{it} + \epsilon \quad (5)$$

We also expect the following theoretical relationships: $\delta_j < 0$ and $\beta_k < 0$.

Where: *j* and *k* = 0, 1, ..., 4.

Next, the baseline equation for agricultural export is specified in its functional form as follows:

$$agricex = f(integration, institution, infrastructure, TF, agripdtn) \quad (6)$$

where:

<i>agricex</i>	Agricultural export and measured as a percentage of country <i>i</i> GDP.
<i>integration</i>	integration variable and is proxied by intra regional export share of country <i>i</i> .
<i>Institution</i>	Political institution variable and is proxied by the regulatory quality (<i>RQ</i>) indicator for country <i>i</i>
<i>TF</i>	Trade facilitation variable which is proxied here by number of days taken to process exports (<i>xdays</i>). This is because the emphasis is on the influence of trade facilitation on agricultural export
<i>agripdtn</i>	Annual agricultural production of country <i>i</i> .
<i>infrastructure</i>	Service infrastructure measured by number of internet users per 100 inhabitants and Telephones lines (fixed + mobile) per 100 inhabitants.

In more explicit terms, equation (6) in its static and dynamic forms may be re-written respectively as follows:

$$agricex_{it} = \gamma_0 + \gamma_1 integration_{it} + \gamma_2 institution_{it} + \gamma_3 infrastructure_{it} + \gamma_4 TF_{it} + \gamma_5 agripdtn_{it} + \varphi \quad (7)$$

$$agricex_{it} = \pi_0 + \pi_1 agricex_{i,t-1} + \pi_2 integration_{it} + \pi_3 institution_{it} + \pi_4 infrastructure_{it} + \pi_5 TF_{it} + \pi_6 agripdtn_{it} + \omega \quad (8)$$

Where φ and ω are the disturbance terms that are assumed to be purely random and normally distributed.

In terms of theoretical relationship, we expect: $\gamma_0, \gamma_1, \gamma_2, \gamma_3, \gamma_5 > 0$; and $\gamma_4 < 0$

$$\text{and } \pi_0, \pi_1, \pi_2, \pi_3, \pi_4, \pi_6 > 0; \text{ and } \pi_5 < 0$$

Model Estimation Techniques

The study utilizes panel data of variables from the 15 ECOWAS member states which spans through the period 2003 to 2008. Equations (2, 3 and 7) are estimated using the panel fixed effect estimator and equations (4, 5 and 8) are estimated using the system Generalized Methods of Moments (system GMM). The problem of endogeneity in dynamic panel models

is always a major issue in the literature. Instrumental Variable (IV) estimation is often employed to deal with this problem. However, the IV estimation method is only useful if the instruments are good. In other words, the instruments must be strongly correlated with the potentially endogenous variables, and they must be genuinely exogenous to the model. It is usually very helpful to over-identify the model (i.e., include more instruments than potentially endogenous variables); of course, whenever this is possible in IV estimation. This is to allow the researcher to test for instrument exogeneity and excludability.

The two commonly used methods in IV estimation are the Two Stage Least Squares (TSLS) and the Generalized Methods of Moments (GMM). The GMM method produces identical results to TSLS for just identified models, but can give more precise estimates with over-identified models. Besides, the GMM method uses internal instruments unlike the TSLS method where the researcher has to search for suitable external instruments. The GMM method of IV estimation is therefore considered appropriate for estimation in this study. For robustness checks and to account for the presence of time (in)variant explanatory factors in the specified model, the fixed effects method of estimation will also be utilized in this study.

Data Presentation and Analyses

This section presents descriptive data related to agricultural export in the ECOWAS sub-region. Intra-regional trade share of total trade volume within ECOWAS is presented in Table 2. The table shows that imports from ECOWAS as a percentage of total import value range between 8.4 and 12.5 per cent. Similarly, exports from ECOWAS as a percentage of total export value are between 11.5 and 19.9 per cent.

Table 2: ECOWAS Member States Export and Import within the Group

	Imports from ECOWAS (as % of total imports value)						Exports from ECOWAS (as % of total Exports value)					
	1999	2001	2003	2005	2007	2009	1999	2001	2003	2005	2007	2009
1 Benin	11.0	13.7	19.9	26.7	24.9	39.4	13.5	24.0	21.9	22.0	21.3	18.3
2 Burkina Faso	32.2	22.0	87.8	23.8	32.2	25.6	23.8	27.2	44.6	27.6	25.9	25.8
3 Cape Verde	0.1	3.0	0.5	0.4	14.9	1.6	1.4	2.1	8.1	7.2	4.1	1.5
4 Cote d'Ivoire	20.8	24.6	17.5	24.8	28.7	26.1	15.0	20.7	16.2	25.7	5.9	32.8
5 Gambia	52.1	8.0	11.1	55.1	26.5	19.8	7.3	10.7	8.6	15.7	10.0	13.4
6 Ghana	10.4	7.6	11.6	9.7	32.1	7.8	9.9	15.3	18.6	17.5	10.4	14.1
7 Guinea	1.4	1.6	9.8	27.4	10.1	6.1	8.9	18.5	8.8	25.4	3.3	3.5
8 Guinea Bissau	...	0.1	0.1	1.5	0.1	...	...	22.9	18.8	53.9	39.2	...
9 Liberia	...	...	...	...	...	...	...	...	...	...	...	...
10 Mali	19.2	13.0	9.1	10.4	9.0	13.2	29.4	33.7	36.4	35.5	46.6	41.2
11 Niger	39.5	45.1	40.8	30.3	31.3	45.8	30.8	34.1	31.5	29.2	23.5	18.8
12 Nigeria	6.5	4.5	4.6	4.0	4.2	8.0	0.5	4.3	2.4	6.1	2.3	3.3
13 Senegal	16.9	17.1	26.5	30.0	37.4	31.9	10.2	19.9	22.8	21.9	17.3	26.2
14 Sierra Leone	33.0	65.3	28.2	11.6	47.4	91.9	26.7	34.4	28.5	33.6	87.4	44.3
15 Togo	16.0	46.2	46.7	53.5	60.0	68.7	19.9	14.2	14.1	13.3	12.2	14.3
ECOWAS	11.5	9.6	10.2	8.4	10.1	12.5	11.7	16.2	13.6	19.9	11.5	17.0

Source: Compiled from ECOWAS Trade Data and World Trade Indicators

In terms of regulatory environment and service infrastructure, the figures are rather unimpressive as shown in Table 3. The average figures on regulatory quality for ECOWAS were all negative on a scale of between -2.5 and 2.5 suggesting low regulatory quality in the region. Furthermore, the average for ECOWAS sub-region was far lower than the world average as well as the average for WTO members. Data for service infrastructure show that internet users per 100 people in the ECOWAS region range between 0.01 and 4.56 compared to the world average which ranged between 1.46 and 23.38 during the years 1996 to 2008. Similarly, the values for ECOWAS were far lower than the WTO average that ranged between 1.54 and 27.39 for the same period.

Table 3: Indicator of Regulation and Infrastructures

Country	Regulatory Quality							Internet users (per 100 people)						
	1996	1998	2000	2002	2004	2006	2008	1996	1998	2000	2002	2004	2006	2008
Benin	0.17	-0.11	-0.13	-0.40	-0.50	-0.44	-0.46	0.00	0.05	0.23	0.70	1.18	1.54	1.85
Burkina Faso	-0.08	-0.32	-0.08	-0.11	-0.35	-0.44	-0.32	0.00	0.04	0.08	0.20	0.39	0.63	0.92
Cape Verde	-0.75	-0.26	0.12	-0.23	-0.30	-0.15	-0.02	-	0.47	1.82	3.52	5.32	6.81	20.61
Cote d'Ivoire	-0.04	-0.07	-0.42	-0.48	-0.99	-0.94	-0.93	0.01	0.06	0.23	0.50	0.85	1.52	3.21
Gambia, The	-1.77	-0.36	-0.23	-0.55	-0.37	-0.40	-0.44	0.04	0.21	0.92	1.80	3.31	5.24	6.88
Ghana	0.11	-0.10	0.00	-0.40	-0.31	-0.02	0.08	0.01	0.03	0.15	0.83	1.72	2.72	4.27
Guinea	0.19	-0.56	-0.54	-0.95	-0.91	-1.03	-1.15	0.00	0.01	0.10	0.40	0.51	0.64	0.92
Guinea-Bissau	0.13	-1.34	-1.28	-0.97	-1.14	-1.00	-1.22	-	0.02	0.23	1.02	1.81	2.06	2.35
Liberia	-3.13	-2.06	-1.86	-1.79	-1.86	-1.40	-1.32	-	0.00	0.02	0.03	0.03	-	-
Mali	-0.01	-0.28	-0.17	-0.37	-0.46	-0.39	-0.33	0.00	0.02	0.15	0.24	0.44	0.74	0.98
Niger	-1.19	-0.68	-0.61	-0.66	-0.56	-0.60	-0.52	0.00	0.00	0.04	0.13	0.19	0.29	0.55
Nigeria	-1.13	-0.93	-0.67	-1.23	-1.33	-0.99	-0.62	0.01	0.03	0.06	0.32	1.28	5.53	7.27
Senegal	-0.36	-0.19	-0.07	-0.20	-0.26	-0.28	-0.29	0.01	0.08	0.40	1.01	4.39	5.61	8.35
Sierra Leone	-0.92	-1.29	-1.37	-1.29	-1.02	-1.07	-0.86	0.00	0.01	0.12	0.18	0.20	0.23	0.25
Togo	0.58	-0.52	-0.67	-0.72	-0.77	-0.99	-1.05	0.01	0.31	1.91	3.60	3.78	5.21	5.42
ECOWAS														
Average	-0.55	-0.60	-0.53	-0.69	-0.74	-0.68	-0.63	0.01	0.09	0.43	0.97	1.69	2.77	4.56
WTO														
Average	0.19	0.20	0.19	0.17	0.16	0.17	0.19	1.54	4.32	8.99	15.31	20.01	24.34	27.39
World	-0.05	-0.03	-0.03	-0.04	-0.02	-0.02	-0.01	1.46	3.99	8.21	13.89	18.66	23.02	23.38

Source: Compiled from World Trade Indicators

Some basic trade facilitation indicators for the ECOWAS region such as number of documents required for exports/imports and number of days required for processing exports/imports are shown in Table 4. In all the categories, average figures for ECOWAS are higher than the world and WTO members' averages suggesting that trade facilitation in ECOWAS region is low when compared to the rest of the world.

Table 4: Some Trade Facilitation Indicators

Country	No. of documents for export		Days Required for exports		No. of documents for import		Days for import		Cost to export a container (USD)		Cost to import a container (USD)	
	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008
	Benin	7.00	7.00	34.00	32.00	7.00	7.00	41.00	37.00	1167.00	1237.00	1202.00	1393.00
Burkina Faso	11.00	11.00	45.00	45.00	11.00	11.00	54.00	54.00	2096.00	2262.00	3522.00	3830.00
Cape Verde	5.00	5.00	21.00	19.00	5.00	5.00	21.00	18.00	1024.00	1325.00	1024.00	1129.00
Cote d'Ivoire	10.00	10.00	23.00	23.00	9.00	9.00	43.00	43.00	1653.00	1904.00	2457.00	2437.00
Gambia, The	6.00	6.00	23.00	24.00	8.00	8.00	23.00	23.00	889.00	831.00	949.00	922.00
Ghana	6.00	6.00	21.00	19.00	9.00	7.00	42.00	29.00	822.00	1003.00	842.00	1130.00
Guinea	7.00	7.00	33.00	33.00	9.00	9.00	32.00	32.00	570.00	820.00	995.00	1391.00
Guinea-Bissau	6.00	6.00	25.00	25.00	1.00	6.00	24.00	24.00	1445.00	1545.00	1749.00	2349.00
Liberia	-	10.00	-	20.00	-	9.00	-	17.00	-	1232.00	-	1212.00
Mali	9.00	8.00	44.00	38.00	11.00	11.00	65.00	42.00	1752.00	2012.00	2680.00	2902.00
Niger	8.00	8.00	59.00	59.00	10.00	10.00	64.00	64.00	2945.00	3545.00	2946.00	3545.00
Nigeria	10.00	10.00	26.00	25.00	9.00	9.00	46.00	42.00	1026.00	1179.00	1047.00	1306.00
Senegal	11.00	6.00	20.00	14.00	11.00	5.00	26.00	18.00	828.00	1078.00	1720.00	1920.00
Sierra Leone	8.00	7.00	31.00	29.00	7.00	7.00	34.00	34.00	1282.00	1448.00	1242.00	1535.00
Togo	6.00	6.00	24.00	24.00	8.00	8.00	29.00	29.00	872.00	940.00	894.00	963.00
ECOWAS												
Average	7.86	7.53	30.64	28.60	8.21	8.07	38.86	33.73	1312.20	1490.70	1662.10	1864.30
World Average	7.15	6.73	26.86	24.68	8.27	7.51	31.66	27.48	1234.90	1363.40	1422.50	1577.70
WTO Average	7.01	6.55	24.25	22.15	8.04	7.23	29.01	24.76	1155.70	1302.00	1334.00	1512.50

Source: Authors' compilation from World Trade Indicators

Across the ECOWAS member states, Niger recorded the highest number days required for export at 59 days in 2008, which is more than double that of the world, WTO and ECOWAS averages, thereby becoming the least performer in the region. In contrast, it takes 14 days in Senegal to prepare documents for export in 2008 and this is less than the averages for the world, WTO and ECOWAS sub-region. Considering the number of days required to process documents for import, Niger maintained the highest number at 64 days thereby retaining her position as the least performer in the region. Again, this is more than double the World and WTO averages for the same year. This is followed by Burkina Faso where it takes 54 days to process documents for import in 2008. The best performer in the region for 2008, in terms of number of days to process documents for import is Liberia closely followed Cape Verde and Senegal where it takes 17 and 18 days respectively. Interestingly, these are also less than the averages for the world, WTO and ECOWAS sub-region.

Table 5A: Agricultural exports as % of GDP

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
				16.9	16.2	15.6		13.8						
Benin	-	-	-	1	6	1	13.92	7	14.1	12.75	12.17	-	-	-
Burkina Faso	7.39	6.71	6.18	6.11	6.05	6.05	6.54	5.21	6.17	6.65	-	-	-	-
Cape Verde	-	-	1.92	0.94	-	0.73	-	0.42	0.81	0.65	-	-	2.31	-
	28.5	27.9	26.1	25.3	24.1	23.7		30.6	27.3			21.0	20.6	20.4
Cote d'Ivoire	4	8	5	2	1	5	24.05	7	2	24.26	21.86	1	9	4
	19.3	21.6	21.0	25.3	21.5	19.1		17.8	14.9			18.2	16.1	
Gambia, The	8	1	1	5	5	9	21.08	7	4	15.54	18.1	1	5	1.14
		11.6		18.4	15.8	14.4			17.6				14.3	
Ghana	-	2	9.8	8	9	6	12.62	-	5	23.25	11.06	13.1	3	9.97
Guinea	1.34	0.77	1.31	0.82	0.63	1.06	0.51	0.47	-	-	-	-	-	1.75
Guinea-Bissau	9.39	-	-	-	-	-	-	-	-	-	-	-	-	-
Liberia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		13.2	21.2	11.5	10.2									
Mali	-	6	9	7	6	8.49	6.58	6.11	8.49	8.57	6.31	5.96	4.73	3.88
Niger	2.92	5.63	4.02	4.98	5.47	7.66	6.97	5.7	5.33	5.07	3.2	3.83	2.48	2.38
Nigeria	-	1.5	0.1	0.14	0.16	0.06	0.01	0.24	0.01	-	-	0.15	-	0.86
						10.6								
Senegal	-	3.24	2.75	3.99	3.22	2	9.97	4.16	7.44	7.1	5.62	8.19	5.88	3.61
Sierra Leone	-	-	-	-	-	-	-	5.91	-	-	-	-	-	-
	17.4	17.3	16.1	12.6	13.8	11.7		11.3	11.0					
Togo	6	4	5	2	2	1	7.91	5	1	11.55	9.51	-	8.2	-
ECOWAS	12.3	10.9	10.0		10.6							10.0		
Average	5	7	6	10.6	7	9.95	10.01	8.5	10.3	11.54	10.98	6	9.35	5.5
World														
Average	7.87	7.48	7.47	7.29	6.76	6.89	6.69	6.75	6.92	7.18	7.16	7.03	7.19	5.44
WTO														
Average	8.06	7.56	7.74	7.59	6.91	7.01	6.86	6.65	7.04	7.36	7.35	7.14	7.22	5.53

Source: Authors' compilation from World Trade Indicators

Table 5A shows that average agricultural exports as a percentage of GDP for ECOWAS countries is higher than the averages for the world and the WTO members during the period 1995 to 2008. This is indicative of the relative dominance of the agricultural sector in most of ECOWAS member states when compared to the rest of the world. However, an examination of Agricultural Export Share in World Agricultural Export Market in Table 5B shows that the average for ECOWAS region is far below the averages for the world and the WTO members.

Table 5B: Agricultural Export Share in World Agricultural Export Market

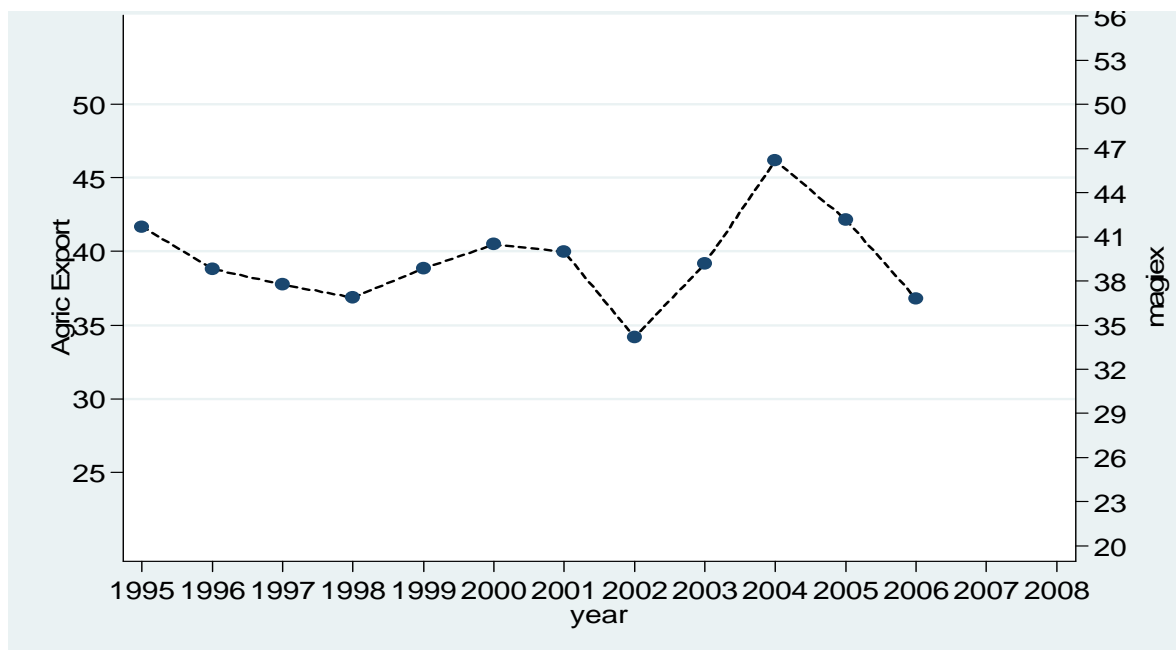
Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Benin	-	-	-	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03	-	-
Burkina Faso	0.02	0.03	0.03	0.04	0.04	0.03	0.03	0.02	0.04	0.05	0.05	-	-	-
Cape Verde	-	-	0	0	-	0	-	0	0	0	0	-	0	-
Cote d'Ivoire	0.45	0.46	0.51	0.58	0.54	0.44	0.44	0.59	0.55	0.48	0.48	0.42	0.37	0.4
Gambia, The	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ghana	-	0.22	0.13	0.14	0.15	0.12	0.12	-	0.19	0.18	0.18	0.16	0.21	0.13
Guinea	0.01	0.01	0.01	0	0	0	0	0	-	-	-	-	-	0.01
Guinea-Bissau	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Liberia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mali	-	0.05	0.05	0.04	0.04	0.03	0.03	0.04	0.06	0.06	0.06	0.04	0.03	0.03
Niger	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Nigeria	-	0.07	0	0.01	0.01	0.01	0	0.03	0	-	-	0.03	-	0.15
Senegal	-	0.01	0.01	0.02	0.01	0.07	0.07	0.02	0.07	0.07	0.06	0.04	0.06	0.04
Sierra Leone	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-
Togo	0.02	0.02	0.02	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.01	-	0.01	-
ECOWAS														
Average	0.07	0.09	0.07	0.08	0.08	0.06	0.07	0.07	0.09	0.09	0.09	0.1	0.09	0.1
World Average	0.83	0.76	0.71	0.71	0.69	0.62	0.62	0.62	0.63	0.64	0.66	0.67	0.76	0.8
WTO Average	0.91	0.83	0.81	0.82	0.78	0.72	0.71	0.72	0.72	0.73	0.76	0.78	0.85	0.91

Source: Authors' compilation from World Trade Indicators

Trends in Agricultural production and Export

This section reports the trend in agricultural value added and agricultural export in the ECOWAS Sub-region. The summary of agricultural share of total export for ECOWAS is presented in Figure 2.

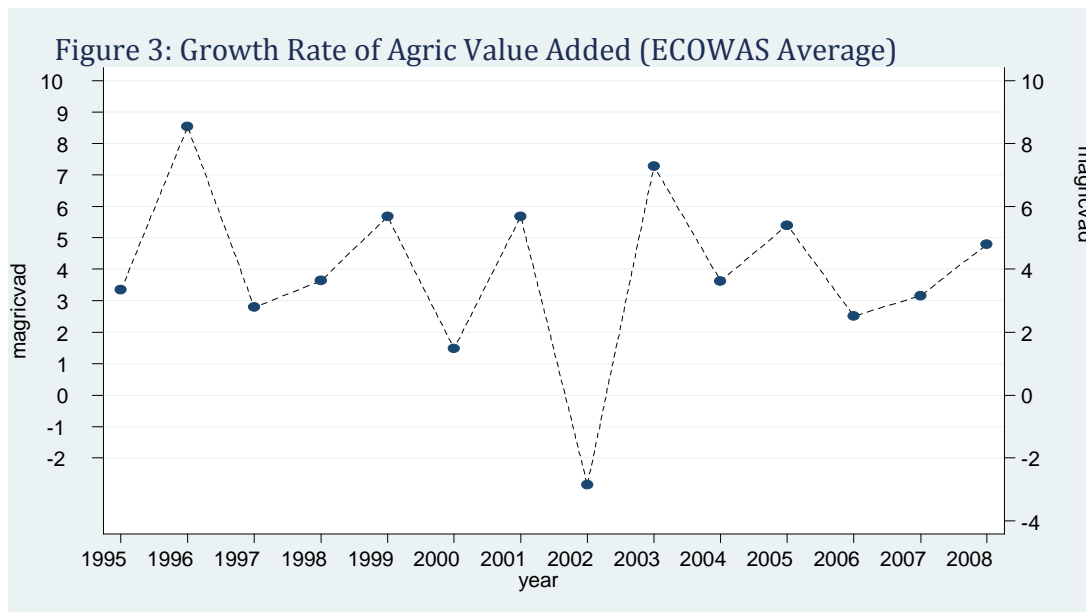
Figure 2: Agric Share in Total Exports (ECOWAS Average)



Source: Authors' Computation using STATA 11.2

Overall, the figure reveals a fluctuation in the relative share of agricultural export over the period. It is noteworthy that while the absolute value of agricultural export is said to have increased by about 95 per cent between 1998 and 2008 (ECOWAS Commission, 2010), its relative share in total export has not experienced similar growth. Precisely, the agricultural share in total export increased from its lowest value 2002 to its peak in 2004 and started declining afterwards.

Figure 3 shows the average growth rate of agricultural value added for ECOWAS. The pattern here is similar to that of relative share of agricultural export in total export.



Source: Authors' Computation using STATA 11.2

The highest recorded average growth rate was in 1996 at about 8.6 per cent and it fluctuated to its lowest growth rate of about -3.1 per cent in 2002. Thereafter, it recovered sharply the following year to about 7.5 per cent and declined again to about 2.5 per cent in 2006. It subsequently increased in 2007 and 2008 to about 3 per cent and 5 per cent respectively. An important observation here is the 2002 values for both agricultural export share in total export and that of agricultural value added when they were at their minimum. This suggests a close link between agricultural value added and agricultural export in the sub-region. Moreover, the correlation coefficient between agricultural production and agricultural export share in total export for ECOWAS is 0.69. This supports the existence of a close relationship between agricultural production and agricultural export in the sub-region.

Econometric Results and Discussion

The results obtained from the estimation of the econometric models are presented and discussed in this section. The static and dynamic panel data model estimation results for equations 2 to 5; 7 and 8 are reported in columns 1 to 6 of Table 6. Two estimators – the fixed effects and the one-step system GMM are employed in estimating models for number of days required to process export and import as well as agricultural export. An underlying advantage of the dynamic system GMM estimation is that all variables from the regression that are not correlated with the error term (including lagged and differenced variables) can be potentially used as valid instruments (Greene, 2008). Optimal set of internal instruments were utilized by

engaging the collapse option in the system GMM results. All estimations are robust to heteroscedasticity or autocorrelation. This is irrespective of whether they are considered under fixed effect or the system GMM. For the dynamic panel data models, the lagged dependent variables (*xdays* and *mdays*) appear as predetermined and endogenous variables. Hence, we control for endogeneity of these variables in its lagged form as regressors by using internal instruments; namely, lagged levels of the standard differenced equation and lagged differences of the levels equation.

Table 6: Estimated Empirical Results

Dependent Variable	<i>xdays</i> (1)	<i>mdays</i> (2)	<i>agricex</i> (3)	<i>xdays</i> (4)	<i>mdays</i> (5)	<i>agricex</i> (6)
Estimator	Fixed effects	Fixed effects	Fixed effects	System GMM	System GMM	System GMM
Regressors						
<i>l.xdays</i>				1.329156* (6.51)		
<i>l.mdays</i>					1.233* (9.47)	
<i>l.agricex</i>						0.655* (3.41)
<i>xshare</i>	-0.233* (-3.15)		0.025 (0.79)	-0.119*** (-1.91)		0.118** (2.28)
<i>mshare</i>		0.031 (0.23)			-0.025 (-0.24)	
RL	-5.211 (-0.72)	-8.275 (-0.86)		-0.662 (-0.15)	-1.274 (-0.28)	
CC	-3.338 (-1.09)	-2.388 (-0.56)		-0.447 (-0.09)	-0.572 (-0.11)	
PCRGDP	-1.054* (-4.52)	-1.216* (-3.72)		0.028 (0.45)	0.027 (0.47)	
ITNET	-0.181** (-2.27)	-0.193*** (-1.73)	-0.099** (-2.44)	0.094 (0.89)	0.052 (0.67)	-0.121** (-2.02)
TEL	-0.064** (-2.26)	-0.031 (-0.79)	0.042** (2.48)	0.049 (0.88)	0.075 (1.34)	0.046** (2.30)
<i>xdays</i>			-0.071* (-3.02)			-0.086* (-2.95)
<i>agripdtn</i>			7.22*** (1.69)			8.65*** (1.65)
RQ			-0.674 (-0.43)			1.219 (0.89)
CONS	98.262* (6.70)	106.875* (5.36)	5.675** (2.65)	-16.884 (-1.39)	-20.209** (-2.41)	1.117 (0.64)
No. of Group	13	13	15	12	12	15
Instruments				12	12	12
Time dummy				Yes	Yes	Yes
rho	0.983	0.980	0.904			
R ²	0.366	0.126	0.003			
F-stat (P-value)	9.03 (0.000)	4.34 (0.003)	5.48 (0.0001)	25.30 (0.000)	28.94 (0.000)	8.89 (0.000)
F-stat (residual) (P-value)	12.40 (0.000)	21.05 (0.000)	25.81 (0.000)			
AR(2) (p-value)				(0.812)	(0.450)	(0.501)
Sargan (p-value)				(0.855)	(0.181)	(0.064)

Notes: *t*-statistics are reported in parenthesis below each coefficient

* (**) *** indicate significant at 1, (5) and 10 % level respectively.

We begin the interpretation of results in Table 6 by examining some specification or diagnostic tests. The estimates of ρ in columns 1, 2 and 3 suggest that almost all the variation in *xdays*, *mdays* and *agricex* are due to differences in number of days required to process exports and imports as well as agricultural exports respectively across ECOWAS countries. The F- tests that the residuals are zero indicate that there are significant country level effects which make the use of the pooled OLS inappropriate.

For the system GMM in columns 4, 5 and 6, the Arellano-Bond test for autocorrelation is applied to the differenced residuals in order to purge the unobserved and perfectly autocorrelated idiosyncratic errors. These results are reported as AR(2) in the lower portion of table 5. The null hypothesis is rejected at a level of 0.05 if $p < 0.05$. If the errors are serially uncorrelated, then the null of no serial correlation will be rejected at order 1 but not at higher orders. This indeed is the case with results in columns 4, 5 and 6. Here, it can be concluded that there is no evidence of serial correlation at the 5 per cent level of significance. Given this results, the estimates can be regarded as consistent.

Next, we employ the Sargan statistic to test for instrument validity by comparing the number of instruments used in each case and the related number of parameters. Given the one-step, non-robust system GMM estimation, the Sargan statistic which is the minimized value of the one-step system GMM criterion function, is applicable. Only the respective p-values are reported for this test results in the lower part of table 6. Here, the null hypothesis that the population moment condition is valid is not rejected if $p - value > 0.05$. The summary statistics in columns 4 and 5 indicate that the one-step system GMM dynamic panel models for the 15 ECOWAS countries have 12 instruments and 10 parameters each. This represents a total of 2 over-identifying restrictions in each case. For column 6, there are 15 instruments and 11 parameters which represent 4 over-identifying restrictions. Hence, the Sargan statistic does not reject the Over-Identifying Restrictions (OIR), but confirms that the instrument set is valid.

The F-statistic is the small-sample counterpart of the Wald (Chi Squared) statistic and it is a measure of the overall significance of the estimated models and the values here in each of the specifications are considerably satisfactory with level of significance being 1 per cent in each case. This of course is indicative that all the exogenous variables jointly explained

significantly, the trade facilitation process and agricultural exports in ECOWAS countries over the study period.

The results of the estimated fixed effect models are broadly and satisfactorily consistent with theoretical expectations. An inspection of these results reveals that with the exception of the political institutional variables (rule of law and control of corruption), all explanatory factors in column one significantly explain variations in the number of days required to process export (*xdays*) across the 15 ECOWAS countries. Precisely, the trade integration variable, *xshare* is correctly signed (negative) and highly significant at the 1 per cent level. A 100 per cent increase in this variable will lead to about 23 per cent reduction in the number of days required to process export across the 15 ECOWAS countries which implies greater trade facilitation.

Similarly, the macroeconomic variable, per capita GDP is negatively signed and highly significant at the 1 per cent level. The coefficient of this regressor suggests that a 100 per cent increase in per capita GDP will give rise to about 105 per cent reduction in *xdays* which also is desirable for greater trade facilitation. The service infrastructure variables *itnet* and *tel* are also correctly signed (negative) and each significant at the 5 per cent level. A 100 per cent increase in the number of internet users per 100 inhabitants will result in about 18 per cent reduction in *xdays*. A 100 per cent increase in the number of telephone users per 100 inhabitants will result in about 6 per cent reduction in *xdays*. These are also desirable for greater trade facilitation in ECOWAS countries. The constant term of 98.26 is highly significant at the 1 per cent level and it suggests that in the absence of all the explanatory factors in this equation, it will take about 98 days to process export across the 15 ECOWAS countries.

A look at the results in column 2 (number of day required to process import across the 15 ECOWAS countries (*mdays*)) reveal that most of the explanatory factors have the expected negative sign. However, only the macroeconomic variable (PCGDP) and the service infrastructure variable (*ITNET*) are significant at the 1 and 10 per cent levels respectively. From these results, it is evident that a 100 per cent increase in PCRGDP will lead to about 121 per cent reduction in *mdays* and a 100 per cent increase in *ITNET* will lead to about 19 per cent reduction in *mdays*. These of course are quite desirable for greater trade facilitation in the ECOWAS region. The constant term of 106.87 is also highly significant at the 1 per cent level

and it indicates that when all the explanatory factors in this model are zero, it will take about 106 days to process import across the ECOWAS countries. The political institutional variables are as in the previous case correctly signed but statistically insignificant. This clearly suggest the need to strengthen political institution across the ECOWAS member states for greater and more significant role in facilitating trade in the region.

In column 3, the agricultural exports equation results are largely consistent with the *a priori* expectations. The trade integration variable (*xshare*) has the expected positive sign but is statistically insignificant. This suggests that more effort towards greater trade integration is still required to boost agricultural exports of ECOWAS member states. The service infrastructure variables *itnet* and *tel* are significant at the 5 per cent level but only *tel* is correctly signed. This result suggests that a 100 per cent increase in the number of telephone users in ECOWAS countries will lead to about 4 per cent increase in agricultural exports of ECOWAS member states. The trade facilitation indicator (*xdays*) has the expected negative sign and is highly significant at 1 per cent level. The coefficient shows that a 100 per cent reduction in the number of days required to process documents for exports will lead to about 7 per cent increase in agricultural exports of ECOWAS member states. Expectedly, agricultural production is positively signed and statistically significant at 10 per cent level. Precisely, the result for agricultural production variable indicates that a 10 per cent increase in agricultural production will lead to about 72 per cent increase in agricultural exports of ECOWAS member states. The political institution factor, regulatory quality is wrongly signed and statistically insignificant. This clearly points at the presence of very poor and counterproductive regulatory environment that are largely due to weak institutions across ECOWAS member states.

Results for the system GMM estimator in columns 4 and 5 of Table 6 are less impressive. Although a number of the variables are with the expected negative signs, they are largely statistically insignificant. An inspection of these results shows that only the trade integration variable, *xshare* and the lagged *xdays* significantly explain variations in *xdays* at the 1 and 10 per cent levels respectively. Specifically, a 100 per cent increase in *xshare* will lead to about 12 per cent reduction in *xdays* thus allowing for more trade facilitation in the region. For the number of days required to process import in ECOWAS countries, only the lagged dependent variable, *L.mdays* and the constant term are significant. Again a good number of the other explanatory variables are with the expected negative sign.

Interestingly, results in column 6, the agricultural exports equation are largely statistically significant and correctly signed. All explanatory variables except RQ in this equation are statistically significant either at the 1 or 5 per cent levels. The trade integration indicator, *xshare* is positive and suggests that a 10 per cent increase in the intra-regional export share of total exports will produce about 1.18 per cent increase in agricultural exports across the 15 ECOWAS countries. The *itnet* variable is wrongly signed but the other service infrastructure variable; *tel* has the expected positive sign. A 100 per cent increase in the number of telephone users will lead to about 4.6 per cent increase in agricultural exports across the 15 ECOWAS countries. The trade facilitation variable, *xdays* has the expected positive sign and a 10 per cent reduction in the number of days required to process exports will lead to about 0.8 per cent increase in agricultural exports of the 15 ECOWAS countries. As expected, the macroeconomic factor measured by agricultural production is positively signed and also statistically significant at 10 per cent level. This result indicates that a 10 per cent increase in agricultural production will lead to about 86 per cent increase in agricultural exports of ECOWAS Member States. The regulatory quality variable is correctly signed but statistically insignificant which again suggest that political institutions are too weak to significantly promote agricultural exports across the 15 ECOWAS countries.

Policy Implication of Findings

From the results presented and discussed above, some implications can be drawn as follows:

First, the study found that in the export equation, the indicator of economic integration had the right negative sign, which was statistically significant at 1 per cent. The implication of this finding is that the level of economic integration has the capacity of facilitating trade within the ECOWAS sub-region. The policy recommendation emanating from this is that when the member states are truly committed to the agenda of economic integration, the extent of trade facilitation will be increased. This is particularly of great importance with respect to the reduction of number of days that will be required for preparing documents for export. Thus, if the sub-region is to enhance trade facilitation, it is crucial that there will be greater commitment to the issue of economic integration among the member countries.

Another important finding from the dynamic panel estimation is that the previous level of trade facilitation is highly significant and it positively influences the current level of trade facilitation in both export and import equations. This implies that to facilitate trade in next

year, the current year level of trade facilitation is essential. This is imperative as there seems to be somewhat path dependence in the process of trade facilitation. In other words, there is room to learn from past experience given the fact that previous level of trade facilitation will increase that of the current level. Thus, commitment to trade facilitation process in the current period will positively and significantly facilitate trade in the coming year.

It was also established that macroeconomic performance using real per capita income was statistically significant in impacting the extent of trade facilitation in both export and import equations especially in the fixed effects model. The implication of this finding is that the level of macroeconomic performance is crucial in determining the level of trade facilitation in ECOWAS sub-region. This lends support to the issue of macroeconomic convergence criteria that when economies in a given sub-region are tending towards convergence, the extent of trade facilitation will be enhanced (McCarthy, 2002). In other words, an improvement in economic growth of the integrating economies (ECOWAS for instance) will have significant influence in facilitating trade.

The study also found that the indicators of service infrastructure especially internet provision had significant impact on trade facilitation. This finding is important given the fact that infrastructural provision is essential for improving trade facilitation. The policy implication of this is that given the advancement in information and communication technology (ICT) there is need for ECOWAS member states to embrace the process of ICT in its operations as it has the ability of facilitating trade especially with respect to reducing the bureaucratic delay that are associated with the time required to prepare documents for export. Thus, the increased use of ICT in the operations of various customs activities in the member states will go a long way in facilitating trade in the sub-region.

It was equally observed in the study that the indicators of institutional quality especially control of corruption and rule of law had the expected negative sign though not statically significant. The implication of this is that strengthening the institutional framework in ECOWAS sub-region especially curbing the menace of corruption and adherence to the rule of law has the potential of facilitating trade. This calls for more commitments on the ECOWAS member governments on the need to intensify the fight against corruption and the adherence to the rule of law in their countries as such efforts has great potential in the process of trade facilitation.

With regards to the role of economic integration and trade facilitation on agricultural exports, it was found that economic integration has positive influence but not statistically significant. This implies that more effort is needed to improve trade integration in order to promote agricultural exports in the sub-region. On the other hand, trade facilitation indicator was found to be highly significant with a negatively signed coefficient. The policy implication of this finding is that policies designed to improve trade facilitation in the region will lead to a significant increase in agricultural exports of ECOWAS sub-region. Furthermore, it was established that agricultural production positively and significantly impact on agricultural export. This means that policies that are targeted towards enhancing the level of agricultural production will in no small measure improve the level of agricultural exports in ECOWAS sub-region.

Conclusion and Recommendations

The study examined the role of trade facilitation and economic integration in promoting agricultural export performance in ECOWAS member states using descriptive, statistical and econometric analyses. Based on the findings, there is a need for incentive to encourage greater level of implementation of the ETLS protocols by individual ECOWAS member states in order to enhance the level of regional integration in the sub-region. As matter of deliberate policy, it is imperative for ECOWAS Commission to assist member states in effectively combining the ETLS and ECOWAP policy initiatives in order to promote agricultural integration, production, and trade within the region. It was observed that few ECOWAS members are doing relatively well in terms of some trade facilitation indicators. Those not doing so well should be encouraged make efforts by relaxing the stringent bureaucratic processes in order to reduce the number of days required to process documents for import/export.

There is also the need to consolidate the observed gains from the ECOWAP policy initiative given the finding that associate the period of highest average growth rate of agricultural production with the post ECOWAP period. Noting that the level of macroeconomic performance was crucial in determining the level of trade facilitation in ECOWAS sub-region raises the need for improvement of macroeconomic performance in ECOWAS member states in order to enhance the extent of trade facilitation within the sub-region. Finally, the results show that agricultural production had direct and significant impact on agricultural export,

which underscores the fact that policies aimed at improving agricultural production will ultimately enhance agricultural exports in ECOWAS sub-region.

The study therefore concludes that trade facilitation and economic integration in ECOWAS have a vital role to play in promoting the performance of agricultural exports in the sub-region. The ECOWAS regional agricultural policy initiative and the ECOWAS free trade area can be strengthened in order to achieve the goals of regional integration and improved trade facilitation as well as agricultural exports performance.

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