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GJMBR-B Classification: *JEL Code: F15, F43, P33, Q18*

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Assessing the Impact of Regional Integration and International Trade on Economic Growth and Food Security in Ecowas

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Abstract- This study analyzes the potential of regional integration through the potential of global value chains in accelerating economic growth and achieving food security with a focus on ECOWAS. Some strategies that regional integration can promote to stimulate economic growth and increase food security are compared. This study examines whether countries must develop strategies to raise international trade through increasing openness degree or whether countries must develop policies to reinforce community or regional trade through the potential of value chains inside the regional integration. Three instruments are investigated (trade openness, intra-regional trade and the community insertion to value chains). Two models are estimated with panel fixed effects using data from 1995 to 2012. The findings support that regional integration needs to be strengthen and better promoted in order to stimulate the potential of each country to move from discontinuous growth to sustained growth. International trade is not the better solution for ECOWAS countries to boost economic growth but regional trade linked to creation of value chains among each country can be the engine of the region growth and food security.

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I. Introduction

Food security and economic growth constitute the two major challenges of contemporary economy particularly in developing countries. Despite the improvement of the performance of African countries these recent years, the economic growth rate is still low. In fact, the report of Africa Growth Initiative (2016) illustrates that African countries are characterized by low economic growth rate, weak industrial development, growing poverty rate due to poor human development, growing population living in urban slums with no access to basic services, raise of corruption and disadvantage in global trade. In the case of ECOWAS countries, the GDP per capita increased very slowly ($954 in 2010, $1,051 in 2011, $1,057 in 2012, and $1,137 in 2014) but the economic growth gap among Africa and other regions is not new and started to be structural between 1970 and 2000. While all other developing countries and the world experienced remarkable progress in reducing extreme poverty, in African countries the percentage of the population under poverty increased. This was the starting point of the fundamental contrast between Africa and the rest of the world. In addition, Ndulu and O'Connell (2006a) note that this divergence augmented sharply when the continent missed out on the economic structural transformation that took place in the developing world, making poverty in Africa mainly a growth challenge. The economic growth rate in African countries has always been too low to initiate the development process. Subsequently,

Maddison (2007) identifies the erratic growth performance of African countries as the most important reason behind its lagging position in eradicating poverty.

Several approaches based on country case studies followed each other since 1990s (World Bank, 2005; Berthelemy and Soderling, 2002; Azam *et al.*, 2002) to investigate growth pattern and identify the major constraints in order to implement sustained growth. This period has been marked by the design and the implementation of various development program schemes and macroeconomic stability program that failed to tackle poverty and generate a sustain growth. A summary of the large number of study on Africa's slow growth (Glaeser *et al.*, 2004; Calderon, 2009; Collier, 2007; Ndulu *et al.*, 2007; Chandra and Kolavalli, 2006; Comin and Mestieri, 2013) reaches the same conclusion that some factors (long distances from markets, geographical fragmentation, tropical climates and soils, small markets, demographic pressure, natural resource curse, aid, external economic shocks vulnerability, weak institutional capacity, low financial sector, poor information technology, risks and uncertainty of macroeconomic policies, political instability and conflict) are key dangers in achieving and sustaining growth. However, all these key factors influencing growth and channels through which these run, can be addressed by regionalism accompanied by transparency, innovation, sound policies and effective leadership. In fact, regional

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integration through the potential of regional trade offers enormous opportunities to boost economic growth.

Regional integration by enlarging the size of the market stimulates the efficient allocation of resources, increases human capital (education, labor skills, health) because of the high mobility of labor, develops agricultural research and development related activities, diversifies agricultural production and improves manufacturing sector, manages population growth, increases domestic saving and investment, improves infrastructure and reduce the need of foreign debt. Thus, regional integration directly affects economic growth by raising the economy competitiveness and accelerating industrialization, and by creating better employment opportunities which lead to poverty reduction in the region. However African economies are not strongly advanced in the insertion of global value chains which represent a key asset. Therefore, linking regional integration to global value chains can expand trade, create comparative advantage in world trade and strengthen regional partnerships opening the way to a faster economic growth rate.

In the same order, regional integration through its spill-over effects on agriculture, food prices and macroeconomic policies affects food security. FAO (2003) reports that "food security will be affected by international trade in general and agricultural trade in particular. To the extent that increased intra-regional trade fosters economic growth and increases employment prospects and the income-earning capacities of the poor, it will enhance access to food. Increased intra-regional agricultural trade could also promote food security by augmenting domestic food supplies to meet consumption needs and by reducing overall food supply variability". More specifically macroeconomic policies play important roles in influencing food security directly or indirectly by affecting poverty, food production, prices, foreign exchange, employment and wages. Reduce poverty among countries requires to raise food availability and at the same time food accessibility at national and household level. Integration is a better tool to address food security challenge because of the opportunities targeting trade and market integration, investment in agricultural resources, investment in agricultural and trade infrastructure, sophistication in improved agriculture technologies, reducing of domestic and foreign policy distortions, and economies of scale. It is well-established that integration substantially affects the agricultural sector performance by stabilizing food prices, strengthening regional market and reducing the dependence on international market, improving exports and decreasing imports which in turn influence the countries income distribution, rural development, employment creation and competitiveness of the economy, and the development of technologies against bad harvests or natural disasters. Consequently, all these channels target malnutrition, hunger and famine, create an enabling environment to increase consumption and improve population nutritional well-being which directly address poverty reduction. However, the impact of regional integration on food security goes beyond food and agriculture dimension and encompass non-agricultural economy that has various implications on countries trade policy, fiscal and monetary policy, interest rate policy, foreign exchange policy, balance of payments stability, debt and financial policy, food aid policy, food reserve stocking policy and support from international agencies.

Regional integration offers a space for "learning to compete" and for "self-discovery" to firms and organizes them for the greater rigor and competition in global value chains. Global value chains being in infant stage in most African countries, what can be the potential of a regional integration oriented on regional trade value chains promotion on food security? Several indicators assessing food security have been conceived but per capita daily dietary energy supply is mostly used to measure national food security. Consistent with the literature, per capita daily dietary energy supply is used in this study as food security indicator.

This study analyzes the potential of regional integration in accelerating economic growth and achieving food security with a focus of ECOWAS. The study analyzes whether countries must develop strategies to raise international trade through increasing openness degree or whether countries must develop policies to reinforce community or regional trade. Three particular strategies or instruments are investigated in ECOWAS integration (such as each country international trade openness, each country intra-regional trade openness and the community insertion in value chains) to identify the best way for economic growth and food security raising.

The remainder of the paper is organized as follows. Section 2 presents the literature review on empirical research between regional integration, economic growth and food security. The model specification, methodology and data are described in section 3. Section 4 shows the empirical results, interpretations and evidence based on policy recommendation and section 5 concludes.

II. Literature Review

The literature presented in this study is organized into two main part. The first part investigates some researches on regionalism, industrialization and growth, and the second part explores food security aspects. The relation between trade liberalization and economic development has been widely studied. Literature in international trade provides a lot of evidence on how trade liberalization positively influences economic performance of economies which have

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liberalized trade to world economy (Herath, 2010; Leamer, 1988; Dollar, 1992; Sachs and Warner, 1995). Trade liberalization is assumed to be a driving force of economic development in a country. Svatoš and Smutka (2010) show that international trade has become an important instrument in building external economic links among world economies. Grossman and Helpman (1992) show that openness to international trade increases domestic imports of goods and services which include new technologies. Through learning by doing and the transfer of technology, the most open economies are growing at a faster pace than most protectionist. However, the authors add that these gains depend on several factors, including the initial situation. The latter determines the nature of the specialization of the country in the long run and therefore its growth rate. The openness of a small country may lead her to specialize in a low-growth sector, contributing instead to leave the country in underdevelopment. In this case, the country should adopt protectionist policies during the early stages of its development, then opt for appropriate opening policies.

According to Levine and Renelt (1991), the causal relationship between openness and growth is through investment. A country liberalizing its trade will attract foreign investment flows. However, they may cause a decline in domestic investment due to stronger international competition and the net effect then remains ambiguous. Grossman and Helpman (1992) also argue that a country protecting its economy can stimulate growth. This is possible if government intervention encourages domestic investment according to the comparative advantages of the country.

Dollar (1992), Barro and Sala-I-Martin (1995), Sachs and Warner (1995), Edwards (1998) and Greenaway *et al.* (1998), using cross-sectional regressions, found that trade distortions due to the intervention of the State led to low growth rates. Ben-David (1996) has also shown that it is only in open economies that we could observe an unconditional convergence. Frankel and Romer (1999) use a method of instrumental variables including geographical features, and confirm that international trade has an important and significant impact on growth. Harrison (1996) reaches similar conclusions using a variety of indicators of openness. By using different methods (cross-section fixed effects, five-year average, first differences), the results suggest a positive relationship between openness and growth. However, not all the opening measures were significant, even though they were mostly a positive sign. Rodriguez and Rodrik (2000) criticize the measure of trade openness. They find that the positive correlation between openness and growth was not robust and the methodology used by other authors lacked important control variables to have a decisive effect on growth.

Jin (2004) analyzes the co-movement between openness and growth in China. He checks if the relationship openness-growth was also valid at the provincial level, and if we could detect a difference between the coastal provinces and those isolated. The results obtained are those expected: the effect for coastal provinces is significant and positive for four of them, and negative for the majority of landlocked provinces. Noguer and Siscart (2005) leading a study on a sample of 98 countries, find a positive relationship between international trade and economic growth, but also that international trade improves the income segments of the population who engage in production activities.

Hubert and Satoshi (2016) analyze East Asian trade and focus on global value chains effects on industrial networks. Using graph theory and input-output data to measure value-added, they show that trade value chains foster regional integration so that the inter-industry network moved from a simple hub-and-spokes cluster to a more complex structure with the rise of China and the specialization of several countries as secondary pivots. The intensification of value chains reduced variance among countries tariffs duties and lowered transaction costs which promote export-led growth accompanied by an industrialization based on domestic markets. It also improved logistics services and cross-border administrative procedures, lessened anti-export bias and enhanced the competitiveness of national suppliers. Their results prove the importance of global value chains in shaping industrial development based on trade.

Baldwin (2008, 2011b) examines the relationship between regionalism, trade and industrialization in East Asia, and why building a supply chain is crucial. He demonstrates that compared to the past where successful industrialization (South Korea and Taiwan) took decades and involved building a domestic supply chain, today intra-regional trade has the potential to bring countries in industrialization in only few years by joining directly supply chains. He discusses that the emergence of the international supply chain has fundamentally reduced the complexity and time required for developing countries to industrialize. Therefore, it is much easier to join an existing supply chain than to build one from scratch domestically, as earlier industrializers like South Korea and Taiwan did.

ESCAP (2015) provides stylized facts on participation of Asia-Pacific economies in regional and global value chains and explores the relationship between global value chains and regional integration processes, in particular the linkages between different types of preferential trade agreements and the evolution of global value chains. The study found that expansion of global value chains has opened opportunities for deeper integration in Asia and the Pacific by allowing

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countries to pursue the division of labour and specialization. Using gravity model and intercountry input-output tables, the impacts of regional integration on global value chain-related exports of the region are methodically investigated. The results confirm the potential of value chains. First regional trade agreements have a positive association with global value chain-related exports of Asia-Pacific countries. Second, the impacts on intraregional exports appear to be stronger than exports to the rest of the world. The reduction of trade barriers from the perspectives of both exporters and importers seem to be associated with an increase in global value chain-related exports from Asia-Pacific countries. Third, trade facilitation through the improvement of ICT, logistics and transportation systems, and removing behind-the-border obstacles can enhance global value chain-related trade between countries and make them major players in global value chains.

If numerous studies can be found on regionalism, integration and their spill-over effect on economic growth, only few empirical works have been done on regionalism and food security. Most of the studies done are limited to statistical analysis (FAO, 1996; Sen, 1981; Maxwell, 2001; FAO, 2009; Kakwani and Son, 2016). The links between regional trade, international trade and food security are complex and multiple. The debate that whether trade liberalization improves food security is hypothetically ambiguous. Based on studies, the nature and magnitude of the food security effect of liberalization depends on various factors such as the extent of adaptability of the poor to changing economic conditions; the degree of exposure of the country to food imports; the presence of favorable initial conditions and accompanying measures, such as adequate regulatory and export capacity, non-trade domestic policies and infrastructure; and the time horizon considered.

Chand and Jumrani (2013) explain the paradox of "hunger amidst plenty" prevailing in India and show that the income growth is a necessary but not a sufficient condition for reducing undernourishment and malnourishment because historical and cultural factors are linked to food security. Dorosh (2004) argued that trade liberalization has contributed largely to enhance national food security of Bangladesh by increasing the level of available foods for domestic consumption during the domestic production shortfalls and therefore stabilizing market prices benefitting poor consumers. Chen and Ducan (2008) report that an increase in real GDP resulting from trade in India improves the food security status of the poor. Herath *et al.* (2014) capture the effects of trade liberalization on food security in South East Asia. Their findings support that discriminatory trade liberalization policies have positively influenced food security. They found that after the formation of the Association of South East Asian Nations' Free Trade Agreement (AFTA), the level of per-capita daily dietary energy supply of the member countries has been increased moderately over time. Thomas and Morrison (2006) show that the food security outcomes of liberalization varied by country and the food security indicator used.

Bezuneh and Yiheyis (2014) investigate whether trade liberalization has improved food security of developing countries. By applying multiple regression analysis on panel data, they found that trade liberalization exerted a negative short run effect on food availability but the overall results fail to support the view that from the medium to long run, the effect of trade liberalization on food availability is favorable. Their results provide evidence on the ambiguity of the effect of trade liberalization on food security. Grant and Lambert (2005), Seck *et al.* (2010), Korinek and Melatos (2009), Nin-Pratt *et al.* (2008) show that regional integration has not led to substantial allocation effects and the expected decrease in food prices caused by efficiency gains. Hence, the direct effect of integration on food security seems to have been small. Taking into account that allocation effects have been small, accumulation effects have also been limited. The evidence on the mixed and inconclusive relationship between trade liberalization and food security is confirmed by McCorriston *et al.* (2013).

Maertens and Swinnen (2015) analyze the contribution of trade value chain in developing regions through the significant increase in foreign investment. The results show that the demand for high-value products raises rural incomes and creates opportunities for developing countries to realize economic growth through expanding and diversifying their agricultural exports. Jaud and Kukenova (2011) find similar results which is explained by the potential of labor-intensive production systems implemented. Xiang *et al.* (2012) simulate the general equilibrium effects of the trade growth on household welfare. Their findings confirm the benefit of value chain.

Beghin *et al.* (2015) and Maertens *et al.* (2011) explain that trade value chains directly and indirectly affect food security by impacting smallholder producers. Smallholders when included in value chains through contract-farming schemes across sectors and countries can increase their income, raise their production and improve their competitiveness and in the long term better insert themselves in global market. Along this process of insertion of smallholders in value chains, some authors (Negash and Swinnen, 2013; Dries and Swinnen, 2010; Minten *et al.*, 2009) show that the improved access to inputs lead to rise in technology transfer. This generates significant productivity increases both for the product itself and for other production activities at the farm level and has important spillovers on household food security. In the same

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perspective, Mano *et al.* (2011) illustrate that value chains enhance labour market by creating substantial employment and diversifying off-farm employment opportunities for women. The implications on gender and rural poverty are empowerment of women and more access to income which allow more spending on food.

III. Methodology

a) The impact of regional integration and international trade on economic growth

The theoretical frameworks used to assess the effect of regional integration and international trade on growth can be drawn to the endogenous and neoclassical growth (Solow, 1956) theories. Under neoclassical growth theory, institutional characteristics, policy regulations and economic integration, are useless in disturbing the equilibrium growth rate, which is exclusively fixed by the exogenous degree of technological evolution. Changes in investment, institutional innovations or increases in efficiency succeeding regional integration have just transitory impacts on the growth rate. Transitory growth impacts occur as a result of changes in the overall level of efficiency imputed to the formation, enlargement or extending of the regional integration agreement. The efficiency change induces faster physical capital formation that progressively decreases to the long run equilibrium. Therefore, regional integration is seen as any other crucial economic policy disturbing growth solely on the transition process leading to the steady state (Njoroge, 2010). The endogenous growth theory (Walz, 1997) on the contrary, by presuming increasing returns to the growth of capital considers long term or permanent effects of regional integration. The long-term effect is based on the insertion of human capital which will maintain investment and disseminate knowledge. In turn, economic growth can accelerate due to the integration agreements disseminating technology on a large scale. The theory also explains how international trade fosters economic growth through human capital which is seen as the engine of growth (Lucas, 1988).

Based on Bezuneh and Yiheyis (2014) and Herath *et al.* (2014), panel data with fixed effects is recommended. However, all preliminary tests and Hausman test are checked to validate if fixed effects or random effects are appropriate. The dependent variable is represented by real GDP per capita. The keys interest variables are trade openness which measures international trade, intra-community export trade which measures intra-regional trade and per capita domestic value added which measures global value chains performance. Per capita domestic value added captures the gains associated with exporting which accrue to domestic labor and capital. Domestic value added is the share of exported products that are not finished product and will be imported from other countries to be processed before being exported.

According to literature (Andersen and Babulal, 2008; Pam, 2017; Yaya, 2017), some control variables which are significant in determining economic growth are included such as gross capital formation, foreign direct investment and inflation rate. Gross capital formation and Foreign direct investment measure the level of investment in the country. Both are used to dissociate the mitigated effect of investment in economic growth discussed in literature review. Gross capital formation appreciates domestic investment which is connected to the industrial development of the country and therefore stimulate growth. In contrast, foreign direct investment is linked to technology transfer, transport and infrastructure, the level of the country attractiveness and also has a crucial impact on growth. Inflation measured by consumer prices index provides an indication of the economic stability of the country. The reduced model takes the following form:

$$\text{Log}\,(y_{it}) = \beta X_{it} + v_i + \varepsilon_{it} \qquad \text{(I)}$$

where yit is the real GDP per capita, εit is the stochastic error term, vi is the country specific effect, Xit is the set of explanatory variables such as trade openness, intra-community export trade, per capita domestic value added, inflation as a proxy of monetary policy, gross capital formation and foreign direct investment.

The data cover ECOWAS countries (Mali, Benin, Sierra Leone, Ivory Coast, Burkina Faso, Guinea-Bissau, Cabo Verde, Ghana, Togo, Niger, Guinea, Liberia, Gambia, Nigeria and Senegal) from 1995 to 2012. Real GDP per capita, trade openness, inflation and gross capital formation come from the World Development Indicator (2017). Intra-community trade and foreign direct investment come from UNCTAD (2017). Per capita domestic value added are provided by OECD TiVA (2016).

b) The impact of regional integration and international trade on food security

Based on literature (McCorriston *et al.*, 2013; Thomas and Morrison, 2006; IFPRI, 2006; Herath *et al.*, 2014; Darshini, 2012), direct and indirect channels are identified through which regional integration or trade influences food security. Food security can be affected by growth in national income and employment. It is widely accepted that economic growth is a required stage for sustainability of poverty reduction and food security, even if in the short-run, growth may not be fast enough to achieve food security. Growth raises incomes and the ability of the poor to gain access to food and health and can lead to improved food security. Economic growth also develops infrastructures, services

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and opportunities for a raise in the overall level of income.

Secondly food security is associated to regional integration's capability to rise global supply of production available (through a mixture of imports and domestic production) and to stabilize variations in food prices. Where local price of food was expensive compare to the rest of world due to trade barriers or tariffs, importing country will reduce domestic food at the same price to increase the level of food consumed. However, the decrease in domestic commodity prices and cheaper imports would negatively affect domestic production and thereby the poor food security status whose key source of income and employment is food production. The third channel is through improved foreign exchange earnings. With the improvement of exports market access via multilateral liberalization, and a more competitive production process based on comparative advantage, the export sector develops. The subsequent raise in foreign exchange gains improves the potential of the economy to expand domestic production and finance food imports. The fourth channel is reducing variability and uncertainty of food provision. Opening up the economy lessens the unpredictability of staple foods supply by helping offset negative domestic production shocks. Finally, market prices affect food accessibility and represent the purchasing power in the economy. The effect on the purchasing power is correlated to the magnitude of money supply which impacts local prices of goods and services and can also import inflation.

Per capita dietary energy supply is adopted to measure the food availability which approximates food security. The keys interest variables are trade openness, intra-community export trade and backward integration which assesses the extent to which a country is integrated and correspond to the country's place in the value chain. Backward integration is the share of the imported value added from foreign suppliers upstream that will be found in the country's exports. Increasing backward integration is associated with more competitive export, higher per capita domestic value-added in exports and increasing income. A higher share of backward participation is also linked to access of competitive inputs and a more-sophisticated export bundle and greater diversification of exports over time.

To take into account the theoretical direct and indirect channels through which regional integration or trade influence food security (McCorriston *et al.*, 2013; Thomas and Morrison, 2006; IFPRI, 2006; Herath *et al.*, 2014; Darshini, 2012), we introduce a set on independent variables such as real GDP per capita to measure growth effect, average value of food production to measure the overall supply of food available, reserves to measure foreign exchange effect, political instability to measure uncertainty effect, domestic credit provided by financial institution to measure market price and purchasing power effect. Even though these variables are the most important used, agricultural land irrigated and population growth are added which greatly influence African economies and their food security level.

$$Log(s_{it}) = \beta Z_{it} + v_i + \varepsilon_{it} \qquad \text{(II)}$$

where sit is per capita dietary energy supply as a proxy of food security, vi is the country specific effect, εit is the stochastic error term, Zit is the set of explanatory variables such as trade openness, intra-community export trade, backward integration, foreign direct investment, gross capital formation, real GDP per capita in logarithm, average value of food production in logarithm as a proxy of food variability, foreign reserves in logarithm, political instability, domestic credit provided by financial institution, agricultural land irrigated in percentage, and population growth.

Data on political instability, agricultural land irrigated, per capita dietary energy supply and the value of food production (constant 1$ per person) come from FAO (2016). Foreign reserves, domestic credit provided by financial institution and population growth are provided by World Development Indicator (2017). Backward integration is computed with OECD TiVA database (2016).

IV. Empirical Results and Discussion

The result of the Hausman test (Table 1) after the estimation with fixed effects and random effects for Model (I) and (II) rejects the null hypothesis that there is a no difference between the coefficients obtained by fixed effects and random effects. The correct specification for both Model (I) and (II) is the fixed effects.

Table 1: Specification test

Hausman Test		
	Ho: difference in coefficients not systematic	
	Model (I)	Model (II)
Dependent Variables	Real GDP per Capita (log)	Per capita dietary energy supply (log)
chi2	9.43***	117.21***
Prob>chi2	0.0027	0.0000
Number of observations	270	270

Note: *** significant at 1 %, ** significant at 5 %, and * significant at 10 %

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The estimation results for Model (I) and Model (II) are summarized in Table 2.

Table 2: Econometric Results

Variables	Model (I) Real GDP per Capita (log)		Model (II) Per capita dietary energy supply (log)	
	Coefficient	Prob	Coefficient	Prob
Trade Openness	-0.08306 (0.07460)	0.2668	0.03620** (0.01761)	0.0410
Intra-Community Trade	2.63028** (1.32824)	0.0489	0.37977 (0.33449)	0.2574
Per capita Domestic Value Added	1.38619*** (0.20036)	0.0000		
Backward			0.35605*** (0.12674)	0.0054
Foreign Direct Investment inflows	0.29282*** (0.09450)	0.0022	0.00679 (0.02162)	0.7538
Gross capital formation	0.543962*** (0.18045)	0.0029	0.14002*** (0.04233)	0.0011
Inflation	-0.3617*** (0.13236)	0.0068		
Real GDP per Capita (log)			0.04183*** (0.01433)	0.0039
Average value of food production (log)			0.24431*** (0.02332)	0.0000
Foreign reserves (log)			0.02442*** (0.00496)	0.0000
Domestic credits			0.03633** (0.01429)	0.0117
Agricultural land			3.18013*** (0.51138)	0.0000
Population growth			0.87490** (0.36240)	0.0166
Political instability			-0.00444** (0.00200)	0.0282
Constant	5.90854*** (0.04317)	0.00000	3.05299`*** (0.11481)	0.0000
Number of observations	270		270	
F-test	222.9256	0.00000	65.3645	0.0000
R-squared	0.94807		0.87850	

Note: *** significant at 1 %, ** significant at 5 %, * significant at 10 %, standard errors in parentheses

The coefficients for Model (I) are all significant except trade openness, and also have the expected sign according to theory. In the case of ECOWAS, trade openness which assesses the opening degree of each country to international trade does not affect economic growth. This result seems to be paradoxical but tend to support the viewpoint of some researchers (Noguer and Siscart, 2005; Rodriguez and Rodrik, 2000) who conclude after studies done in other developing countries that the relationship between openness and growth is inconclusive. Moreover, Grossman and Helpman (1992) and Levine and Renelt (1991) already discussed that the effect of trade openness on economic growth remains ambiguous. In ECOWAS, even if trade openness has an effect on growth, this effect is trivial which explains that in our estimation the coefficient is insignificant. Another explanation of this result in the specific case of ECOWAS is that countries

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trade more with world market than with regional market, and ECOWAS imports are not oriented to capital and industrial equipment which pulls economic growth. Trading with developed countries, the openness of ECOWAS countries which are small countries leads them to specialize in a low-growth sector, mainly the exports of primary products. The consequence is that the opening of each country to international trade is characterized by more imports than exports. To highlight this particular effect, international trade theory demonstrates that trade among countries with different levels of development does not benefit the poorest countries. For international trade to push countries, exchanges must be done among similar countries. In addition, opening to international trade is not a necessary and sufficient condition to increase economic growth, other factors such as infrastructure, investment, comparative advantages, industrial development, protectionist policies and technology progress need to be effective. However, in ECOWAS countries those factors are missing.

In contrast, intra-community trade and per capita domestic value added positively influence economic growth. Even if ECOWAS intra-trade is low, it affects the economic growth of each country. This result shows that intra-regional trade is crucial for economic growth. The more regional trade increases the more per capita income raises and the more economic growth can be boosted. This finding supports that regional integration needs to be strengthen and better promoted in order to stimulate the potential of each country to move from discontinuous growth to sustained growth. In fact, intra-community trade within ECOWAS is estimated only at 9 percent in 2015. It is clear that if trade agreements are put in place to motivate countries to trade with each other, the impact will be different for producers and households in term of improving income, raise of investment and increase of consumption. In addition, if the intra-regional trade is focused on the promotion of goods and services resulting from the consolidation of value chains among the different countries, economic growth can be exponential. A large domestic value added is associated with high volume of trade which will raise the competitiveness and diversification of exports, enhancing each country place in global value chains. Therefore, comparing the results, intra-regional trade and per capita domestic value-added boost more economic growth than international trade (trade openness).

International trade is not a solution for ECOWAS countries to boost economic growth but regional trade linked to the creation of value chains among each country can be the engine of the region growth.

An examination of other control variables shows that they significantly contribute to economic growth as indicated in literature. Foreign direct investment provides positive and significant effect on GDP. Klasra (2011) finds similar result in Pakistan. Ercakar (2011) shows that in African economies, openness cannot achieve economic growth without foreign direct investment. However, gross capital formation is even more important than foreign investment for countries. It affects positively more economic growth, showing the important role of domestic investment in the development process. This effect of domestic investment on economic growth is also highlighted by Pam (2017) in the case of sub-Saharan Africa.

Positive changes in inflation are associated with negative changes in economic growth, thereby suggesting that price volatility reduces growth because of the unpredictability of the macroeconomic environment and the challenge for individual to have rational expectation. This finding is in line with Kremer *et al*. (2009), Jafari *et al*. 2012) and Pam (2017) results.

In Model (II), all explanatory variables except foreign direct investment and intra-community trade significantly influence food security. International trade positively affects per capita dietary energy supply while intra-regional trade is not significant. This finding has two major implications; (i) even if trade openness does not affect growth in ECOWAS countries, it significantly raises food security status because ECOWAS trade with developed and emerging countries is focused on imports of consumer goods. Therefore, an increase in trade openness improves food security. Trade between ECOWAS and the rest of the world is characterized by imports of primary products mainly agricultural goods and services, raw materials, imports of foods and foodstuffs coming from Asian countries such as Thailand, China, Vietnam, South Korea, Malaysia and Latin America (UNCTAD, 2016). By not importing more capital and industrial equipment, the degree of openness is unusual to draw economic growth; (ii) intra-regional trade which significantly improves economic growth does not influences per capita dietary energy supply due to the weakness of trade among ECOWAS countries. The findings are consistent with Ivica (2016) results which suggest that international trade improves food security. Nevertheless, backward integration has a positive effect on food security thereby suggesting that integration in the value chain has spillover effects on countries food security.

In fact, the strengthening of trade value chains among ECOWAS countries can organize the production and manufacturing of goods in chains and concentrate the retail sector, the demand for higher quality products will increase followed by the increasing of prices in international food markets. Expansion and diversification of agricultural products generate opportunities for people in the region and raise rural incomes which will allow rural and urban households to access more adequate and nutritious food. Consequently, a joint

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effect of integration and value chains boosts food security.

Similarly, positive changes in economic growth and domestic investment translate into positive changes in per capita dietary energy supply while a growing of political instability in ECOWAS is seen to have a negative impact on food security. Economic growth improves food security, showing that a raise of household income directly targets the consumption of foods. This finding in line with Timmer (2005) confirms that food security in ECOWAS is mainly a growth challenge contrary to others developing countries where economic growth alone does not solve the problem of food security. In ECOWAS countries, economic growth is essential for food security, and strategies at regional and national level need to be investigated. The promotion of trade value chains may be the bottom line to design these strategies because of the effectiveness of per capita domestic value added on sustaining economic growth. Value chains need to be implemented across countries and across sectors and the development program of ECOWAS must only target this goal. As expected, the incidence of political instability negatively affects food security. Political instability creates unfavorable condition on food security through the decrease of investment and its impact on food supply from domestic production. Some researchers find similar results for ASEAN (Herath et *al.,* 2014) and for developing countries (Bezuneh and Yiheyis, 2014).

A growth in food production is associated with a raise in national food security. An enabling environment needs to be created by ECOWAS countries to encourage producers by increasing domestic consumption, improving the environment of the farm household, making them able to cope with risk, uncertainty and sources of technical change, and raise industrial development to make food cheaper. In addition, some measures must be taken by governments to improve market efficiency such as communications, transportation and storage facilities, legal codes to enforce contracts, credit availability to finance short-run inventories and processing operations, a market information system to keep all market participants from farmers to consumers fairly and accurately informed about market trends.

Positive changes in domestic credits, population growth, foreign reserves and agricultural irrigated land are associated with positive changes in per capita dietary energy supply. Domestic credits increase the consumer purchasing power and allow to access various and qualities commodities (Baldwin, 2011b). National food security can be improved if countries allocate more domestic credits for the segment of the population who needs it. It is well established that domestic credits in most developing countries go directly to consumption and are used as an asset to smooth people's income (Ivica, 2016). Furthermore, domestic credits act on food production and food prices which is linked to food security. The amount of foreign reserves in ECOWAS countries contributes to food security. Foreign reserves enhance the ability of food importation of countries and is a channel to buy the capital machinery to accelerate production to achieve self-sufficiency. Also, the development of industrial sector is mainly correlated to the earning of foreign exchange and the ability of people to buy food staples. The percentage of land irrigated significantly contribute to food security through its positive impact on domestic food production. The more households have access to land for growing crops the more food production and availability increase. An extension of agricultural land reduces prices and diversifies different cropping patterns that provide nutrient diversity and more stability of output.

Contrary to the findings of studies (Bezuneh and Yiheyis, 2014) obtained for some region where population growth undermines food production, the results shows that for ECOWAS countries, population growth affects positively per capita dietary energy supply. These results can be explained by the fact that in African countries, most of the labour force are affected to the agricultural sector. This sector employs more than fifty percent of the workforce. Therefore, a growing population raises food production, enlarges the variety of goods and improves the competitiveness of domestic market (Xiang *et al.*, 2012). The final result is a raise of food security due to more availability of food. However, stable population growth is better than rapid population growth which constitutes a danger.

V. Conclusion

International trade of agricultural products appeared very early as an enrichment factor of Nations. Through the development of exports, the precursors have demonstrated the strength of international trade to drive the economic growth of a country. On the basis of the international division of labor, international trade relies on trade liberalization. The promise of trade liberalization is that by creating incentives for producers from different States to specialize in the products or services in which they have a comparative advantage, it will benefit all the trading partners, since it will lead to efficiency gains within each country and to overall increase of world production. Therefore, comparative advantage suggests that economic growth and poverty alleviation may result.

However, international trade for African countries has not bring the expected results. This study focuses on ECOWAS and attempts to responds to the inconsistency of the economic policies in African

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countries that turn away from the regional integration for the benefit of foreign markets. Three particular strategies are investigated in ECOWAS integration (such as each country international trade openness, each country intra-regional trade openness and insertion to value chains) to identify the best way for economic development in term of economic growth and food security raising. Two models are estimated with fixed effects over the period 1995-2012.

The results show that the relationship between openness and growth is not robust, while intra-community trade and per capita domestic value added appear to positively influence economic growth. This finding supports that regional integration needs to be strengthen and better promoted in order to stimulate the potential of each country to move from discontinuous growth to sustained growth. International trade is not a solution for ECOWAS countries to boost economic growth but regional trade linked to creation of value chains among each country can be the engine of the region growth. Countries should move more to regional integration than international trade.

Furthermore, international trade positively affects per capita dietary energy supply while intra-regional trade is not robust. This irrelevance impact of regional trade on food security can be justified by the weakness of trade among ECOWAS countries. Nevertheless, backward integration of countries has a positive effect on food security, thereby suggesting that integration in the value chain has spillover effects on countries food security. A joint effect of intra-regional trade and value chains trade can boost food security. This strategy optimizes economic growth and food security.

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