

## **BETWEEN FOREIGN DIRECT INVESTMENT (FDI) AND OUTSOURCING: WHICH POLICY STRATEGY WILL ENHANCE THE COMPETITIVENESS OF THE NIGERIAN RICE SECTOR?**

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### **Abstract**

*The dawn of the global economy which ushered in trade liberalization has been greeted with mixed feelings among developing countries. This is because liberalization rarely brings about a zero-sum welfare gain among asymmetric participating countries. However, one critical aspect of globalization that can benefit developing countries is the encouragement of foreign sourcing. Outsourcing and foreign direct investment (FDI) will bring about strategic linkages with local buyers, suppliers and other institutions. Against this background, this study makes a case for foreign sourcing in the rice sector vis-à-vis the absorptive capacity of the sector over a projected 10-year (2013-2023) period in Nigeria. It subsequently modelled the welfare implication of FDI and outsourcing on the host nation. This study emphasized the need for increased investment that will enhance technological spillovers to the local producers. The model suggests that at a low level of human capital and high absorptive capacity, it benefits the country to first encourage FDI and subsequently encourage more of outsourcing as it is a better welfare enhancing strategy. The study concludes by recommending the setting up of attractive investment environments and the formulation of sound domestic and macroeconomic policy that would make the country more attractive for investors.*

**Key words:** Globalization, Grossman and Helpman, efficiency and rice

### **1. Introduction**

Rice (*Oryza sativa*) is a major staple cereal consumed by millions of people in West Africa. In Nigeria, rice is an important annual crop and a vital food commodity which provides an average of 2400 calories per person per day (FAO, 2009). Rice can be favorably grown in all the agro ecological zones of the country. Local production estimates are put at

between 2.7 million tons and 3.1 million tons, which is mainly concentrated in the hands of the small-scale farmers who operate an average of 1-2 ha of land (USDA, 2012; USDA, 2013). The increasing penchant for rice coupled with rising global food prices brings an ever-mounting and unsustainable rice import bills of about USD 3 billion on the nation's foreign reserves yearly (USDA, 2013). With the increasing population growth and changing demand patterns, demand for rice may likely double over the next 10 years. In view of this, a paradigmatic shift is imperative in the rice sector as massive importation would no longer be sustainable.

Over the years, the country has responded to a growing wave of rice importation and insufficiency by enacting a series of reform strategies some of which borders on protectionist regimes (Daramola, 2005; Daily Times, 2013, 2012; USDA, 2013). Although these policies, as commendable as they are, have not done much to enhance the competitiveness of the local rice sector; as the country still resolves to massive rice importation. Quite the contrary, it created an avenue for the proliferation of illegal and informal smuggling of rice into the country leading to a loss of revenue to the government through the evasion of duty payments and disincentives to producers due to uncompetitive price offered in the market (USDA, 2012; Akpokodjeet *et al.*, 2001; Food Security Ghana, 2010). Therefore, tackling the challenges of competitiveness and self-sufficiency, given the small-scale nature of local rice producers, require the sound use of transparent and predictable policy options.

Nigeria is believed to possess potential towards achieving rice self-sufficiency and even contributing to export. The realization of this potential must have informed the rekindled commitment geared towards rice transformation in the country. Currently, the federal government of Nigeria, under the Agriculture Transformation Action Plan (ATAP) wants to significantly increase rice production so as to attain self-sufficiency in the rice sector. This will be done by increasing funding for domestic production to more than double production of paddy rice to 7.4 million metric tons by 2015 (USDA, 2012). However, with the dismal and less than the CAADP recommended budgetary allocation of 10% to the agricultural sector in the country (Cleaver, 2012), the attainment of this goal may be unrealized without tapping the benefits of trade liberalization and globalization especially as it relates to sourcing of funding and investment through FDI and outsourcing (Brzeska *et al.*, 2012; Cleaver, 2012).

In line with this international partnership arrangement, vis-à-vis FDI and outsourcing of rice production and processing, quite a number of the major international rice importers in Nigeria have invested in milling capacity. Examples of these private sector initiatives are: Veetee Rice in Ogun State; Olam in Lagos, Benue, Nasarawa and Kwara States; and Stallion in Lagos (USDA, 2013). As part of a backward integration and internationalization program, some of the companies have developed nucleus estates that would use local farmers as out growers to supply rice to the mills.

However, the majority of studies on international partnering arrangements are silent on the welfare consequences of the organizational mode of vertical production transfer (Goswami, 2011), and in case where it does, it does not endeavour to specify it to agricultural related international partnering arrangements (Goswami, 2011). On the same note, none of the existing models which differentiate between FDI and outsourcing discuss their effect on welfare in the host country (Antràs, 2003, 2005), Grossman and Helpman (2002, 2003, and 2004) determine the tradeoff between VFDI and outsourcing but do not deal with their relative welfare implications on the host country. While attracting FDI and embarking on massive internationalization efforts are seen as right moves, gaining in this arrangement may not necessarily come from the amount of such companies the country attracts or the number of MOUs signed, but rather how to derive the most benefits from the investment by ensuring technology spillover to the local producers and local capacity development through skills upgrading. This can be achieved by recognizing the appropriate type of international sourcing that will optimize welfare gain for the country. Thus, there is a

pressing need for stakeholders in the host countries to specifically examine what they stand to gain in terms of the contribution to skills and technology dissemination they stand to gain by allowing FDI and outsourcing and to recognize which mode would enhance optimum technology transfer.

Furthermore, the effects of international partnering arrangement have been very much debated, and there is still some controversy regarding their impact on host economies, as can be seen in the active anti-globalisation movements. Although strands of literature exist on their impact on wages, foreign trade and on productivity, the empirical studies seem rather inconclusive regarding many of their effects on the host economies. Facing such a fragmented literature, it seems difficult to obtain an economy-wide evaluation of their impact. Therefore, there is a justified need for the any country embarking on FDI to examine the welfare implication critically. This study aims at presenting a nascent and preliminary finding which would open the way for more appropriate analyses using the computable general equilibrium (CGE) models to examine the effect of encouraging FDI on the welfare of the host nation.

Against this background, this study explores the potential contribution of the FDI and outsourcing options to the rice sector development in Nigeria. First, it examines the current trends and makes a future projection of rice production and consumption in the country to make a case for foreign intervention. Secondly, it draws deeply from Grossman and Helpman ladders (2003) using static equilibrium models as used by Goswami (2011) to compare the competitiveness of the models of FDI and outsourcing in terms of enhancing the skills of local producers of rice in the country. The findings generated from this study though nascent, would hopefully herald a more detailed analyses on the competitiveness of the FDI and outsourcing on the welfare, wages and productivity of the host nation with particular emphasis on agro-based industries.

## **2. Literature Review**

Despite the skepticism expressed by developing and underdeveloped countries of the world that trade liberalization may not bring about equal benefits partly due to development paradigms and to the asymmetries of these economies, (OXFAM, 2005; Aniekwe, 2010), international sourcing, an offset of liberalized trade (UN, 2001), measured in but not limited to, the Foreign Direct Investment (FDI), outsourcing, international mergers and acquisitions, and cross-border firm linkages *via* joint venture or license agreements has been on for several decades. It is argued that it would facilitate the much needed investment and funding of the agricultural sector, encourage competition, technology transfer, increased access to world markets due to spillovers to local firms, and human capital development in the host economy (Moir, 2011, Deininger *et al.*, 2011; Rakotoarisoa, 2011). Contrary to optimism attributed to foreign sourcing, Aniekwe (2010) argues that agricultural trade liberalization has retrogressed small-holder rice farmers' development in West-Africa.

The first set of theoretical formalizations of FDI as a capital movement tended to model it as capital moving across countries and responding to the differences in the expected rates of return on capital. This view, therefore, predicted that FDI would go from capital abundant countries (where its return was low) to capital scarce countries (where its return was high). Two early theoretical contributions in this line are Mundell (1957) and MacDougall (1960).

Using a (2×2×2) Heckscher-Ohlin model, Mundell (1957), analysed the effects of factor movements in a two-sector, two countries and two factors. Under this framework, the capital inflow reduces imports, i.e., trade and capital movements are found to be substitutes. This is why his contribution has been summarized in the idea that "*trade in factors is a substitute for trade in goods*". MacDougall (1960) on its part focuses on simplest case of a capital inflow into a one-sector economy. FDI inflows in this setting lower the capital rent in the receiving

economy, but also increase labour productivity. The latter effect predominates, increasing welfare for the receiving economy. Some findings from the models above on the potential substitution between trade and FDI are genuine intuitions. However, this theory does not seem to be convincing as an explanation of FDI (Latorre, 2008).

The seminal contribution of Agarwal in the 1960s and 1970s examined the empirical relationship between FDI, the rate of return and risk (Agarwal, 1980). The so called *portfolio theory* predicts a positive relation of FDI with respect to the rate of return and a negative one with respect to risk. Portfolio diversification involves risk reduction by ensuring that firm reduces risks by undertaking projects in more than one country. However, the portfolio theory is an extension of a vision of FDI as capital movements. In this sense, it is still incomplete (Latorre, 2008). FDI involves more than capital movement. In fact it is the transferring of a unique bundle of factors, competencies and procedures to foreign operations. Therefore, FDI is best thought of as movements of firms, rather than simple movements of capital (Graham, 1992; Lipsey, 2002; Markusen, 2002; Feenstra, 2004). This idea had appeared earlier. Indeed, some authors abandoned the emphasis on FDI as capital movements.

Dunning's work (1977, 1979, 2000) put together already existing elements to form a coherent and unified framework on FDI. He suggested that for a firm to become global three conditions must be present. This forms the basis of the eclectic or OLI paradigm, where OLI stands for "ownership, location and internalisation". Ownership means the sort of advantages that MNEs should have in the same line of what has just been explained when talking about Hymer's contribution. Location gives the idea that for a MNE to establish a new plant in a foreign country, this country must have some advantages compared to the home country of the MNE. These advantages may be cheaper factors of production, better access to natural resources, a bigger market, and so on. Finally, the internalisation idea had also been noted by Hymer, when he dealt with transaction costs. It may be more beneficial for a firm to exploit its ownership advantages within its subsidiaries than to sell or license them to other independent firms. Location advantages are related to the host country (factor prices, factor endowments, and distance measured as transport costs). Ownership advantages are captured from technological aspects of the firm, such as economies of scale, R&D efforts and transport costs.

Within this framework of location and ownership advantages, a latest approach is a line of research which incorporates R&D decisions into theoretical models of the FDI. FDI's are generally characterized by a strong effort in R&D activities. However, the intangible nature of many of these assets makes it difficult to incorporate them into theoretical (and empirical) models.

The theoretical models proposed by Sanna-Randaccio and Veugelers (2003, 2007) analysed the costs and benefits of undertaking R&D activities in a subsidiary of the FDI versus keeping those activities within the headquarters. The empirical evidence on this shows that R&D activities are mostly done in the headquarters, however we also have evidence that subsidiaries are increasing the scope of this sort of activities (Sanna-Randaccio and Veugelers, 2003). The authors obtain two important conclusions. First, the more technologically advanced the host economy is, the more likely it will benefit from the presence of foreign subsidiaries performing R&D activities. Second, the potential harmful effects of FDI are likely to diminish if they are not direct competitors in the same market of the local firm. In other words, vertical (or inter-industry) relationships between foreign and local firms (i.e., backward and forward linkages) are more beneficial than horizontal (or intra-industry) ones.

However, there still exist a gap in literature on why firms produce abroad but do not explain why foreign production will occur within firm boundaries (i.e., within FDI), rather

than through arm's-length subcontracting (i.e., contracts with independent firms, a phenomenon known as *outsourcing*).

It may be that when choosing between arm's-length subcontracting versus internalizing, the foreign firm as well as the local firm, faces a trade-off. On the one hand, if the foreign firm decides to internalize its foreign operations it will have to pay the higher costs involved in setting up and running a wholly owned plant in a foreign country; on the other hand, if the firm decides to outsource it will have to face some market failures affecting contractual relationships with local firms. Local firms tend to have more information about their market than a foreign firm has. If there were no contractual problems, firms would decide to outsource activities to local suppliers to profit from their experience.

Market failures arising from the difficulty of coordinating and controlling the local firm which in most cases arises from a high rent to local firms and a corresponding glower profit. Others include hold-up problem. This problem has two components. One is the difficulty of writing contracts covering all possible contingencies in the relationship between a firm and its external supplier. The other one is that the local supplier has to do some specific investments to produce the components demanded by the firm it serves, or from a different angle, that the goods he will produce for its customer are very specific, which makes it difficult to sell them to other customers. Under these circumstances, local suppliers are likely to under invest, compared to what they would do if there were no market failures. This inefficiency of suboptimal investment reduces the total return to outsourcing. Incomplete contracts also arise from the difficulty of protecting intangible assets. To avoid this, the firm facing the outsourcing versus VFDI decision needs to design an optimal licensing contract. In this case, the contract should promise important rents to the local supplier to make defection unprofitable. But these high rents may be too costly to the firm, again incentivizing internalization.

The study of Grossman and Helpman (2002) presents several anecdotal evidence which suggest that international outsourcing and foreign direct investment (FDI) have been growing in leaps and bounds as several firms in many countries sub-contracting abroad an expanding range of activities, from product design and the production of intermediate inputs to assembly, marketing, and after-sales service. (Audet, 1996, Campa & Goldberg (1997), Feenstra (1998), Hummelset *al.* (2001) and Yeats, 2001). Specifically, the literature distinguishes between horizontal FDI (Markusen (1984), Horstmann and Markusen (1992), Markusen and Venables (1998,2000), De Santis and Stahler (2004), which is undertaken to place production closer to foreign markets, and vertical FDI (Helpman (1984), Helpman and Krugman (1985), which is undertaken to exploit lower production costs in order to serve both the domestic and the foreign markets. In the same way as differentiation is done between FDI and outsourcing. The sourcing firm maintains control over its subsidiary in FDI, while it has little control in the host country in outsourcing. In addition, as shown by Teece (1977), Goswami (2011), FDI involves greater technology transfer to their subsidiary which may inform the decision to protect their technology from leaking to other firms makes them hire less skilled workers (Goswami, 2011). Outsourcing on the other hand will hire more skilled labor to substitute for technology and may facilitate the training and upgrading of the skills of existing workers. Thus, FDI can substitute for trade, when production in the host country replaces exports and can also be complementary to trade, when a part of the production in the host country is shipped back to the home country (vertical FDI).

Further review of past inquiries on international sourcing reveal that there are different perspectives to the benefits that could be derived by the host nation participating in international sourcing. Using a model of production sharing in a general equilibrium model with oligopolistic industries, Glass and Saggi (1999) and Balcão Reis (2001), questioned previous works on the welfare impacts and economic prospects of offshoring. They argue that offshoring essentially reduce cost of production by shifting labor demand to a low wage

host country which however comes at a cost to the domestic (host country). As firm's profits increase, the demand for labour in the host country rises thereby raising domestic labor demand and wage. Welfare in the host country may thus be compromised resulting from a fall in the domestic entrepreneur's profit (Goswami, 2011). Furthermore, a tradeoff between innovation and the quality available to the consumers due to offshoring would enhance the speed of product development for the sourcing firms and enables quicker access to higher quality products for all consumers but at the same time, it lowers the rate of innovation and profit of domestic entrepreneurs. Hence welfare may fall in the host country if the utility loss from latter is more than the benefit from higher quality consumption (Goswami, 2011; Balcão Reis, 2001).

The study of Goswami (2011), argues that under certain conditions and depending on the absorptive capacity of the host country, outsourcing leads to a higher level of real GDP and welfare. Using a quality ladder model that focuses specifically on the events in the host country, the models conclude that, the host's level of absorptive capacity would determine the benefits to be derived from international sourcing. Specifically, it argues that if the absorptive capacity of the host is higher than a given threshold, then, outsourcing certainly leads to higher welfare, however, if the absorptive capacity of the host country is below this derived threshold, then, VFDI may lead to higher welfare (Goswami, 2011).

Grossman and Helpman (2003) studied the trade-off between FDI and outsourcing in a foreign country. They assume that the producers of final goods, located in a Northern region, find it convenient to buy inputs from a Southern region, since wages in the South are lower than wages in the North. In addition, Grossman and Helpman (2003) assume the local suppliers in the South to be more efficient with respect to a production unit may eventually set up in the Southern region for the final producers through a vertical FDI. However, with time, a trade-off arises between the greater efficiency gained through outsourcing, and the contract incompleteness they might avoid if they produce their required inputs through an FDI.

Feenstra and Hanson (1996a) model also indicates that outsourcing is a skill intensive activity from the point of view of the host country (as well as the source country). Xu (2000) suggests that a relative increase in skilled biased demand shifts in all the sectors does not necessarily imply skill-biased demand shift in the country because 'FDI may be unskilled labor-intensive activity in the host country'. This implies that FDI may not be skill-intensive relatively to domestic activity while outsourcing according to Feenstra and Hanson (1996a) is. Thus, it may be concluded that outsourcing is perhaps more skill intensive than FDI (Goswami, 2011).

### **3. Materials and Methods**

The study area is Nigeria. Nigeria is in West Africa between Latitudes 4° to 14° North and between Longitudes 2°2' and 14° 30' East. The country is the most populous country in Africa with an estimated population of 170.5 million inhabitants (2013 estimate, International Futures, 2013) and an annual average annual growth rate estimate put between of 2.5 % to 3 (USDA, 2013). Secondary data were used for this study. Data were sourced on previous local rice production, rice sectoral growth rate and population growth rate of the country in 2013 from published sources from USDA and reliable sources from the internet.

As shown in previous studies, rice consumption is strongly influenced in the country by population growth rate and rising income (Daramola, 2005). For this study, income was assumed to be constant and an estimate of projected rice consumption was done using population growth rates of 2.5% and 3% respectively. The average of the estimated consumption from these two scenarios was used in determining the true estimate for the period under review. For local rice production, estimate was projected using the 3.25%.

Average sectoral growth rate from 2011 to 2013. To allow for comparison, three production estimate scenarios were presented at 3%, 3.25% and 4% rice growth rate respectively. An average of the three scenarios was used as the final estimate of local rice production in the country for the period under review. The difference between the projected consumption and production trends for the years under review were used in estimating the gap or deficit observed in the nation's drive towards rice self-sufficiency and to make a makes a case for foreign investment in the rice sector.

The study further makes a comparison between two types of foreign investment; the FDI and outsourcing following the north-south framework proposed by Grossman and Helpman (2003).

**The model and its basic assumptions**

The approach applied in this study builds on the north-south framework proposed by Grossman and Helpman (2003) and used by Goswami (2011). The foreign source country is referred to as “north” while the host country is called “south”. It makes the following assumptions:

**Consumers:** Consumers' problem is modeled in the spirit of Grossman and Helpman (1991) quality ladders model. Consumers live in one of the two countries, North or South respectively, belongs to one of the two labor types, unskilled or skilled labor respectively. Consumers are rational and take market variables as given. The utility function of a representative consumer is given by:

$$U = [X]^{\gamma} [y]^{1-\gamma} \tag{1}$$

Where  $y$  is the homogeneous perfectly competitive locally produced rice and is chosen to be the numeraire while  $X$ , the aggregate vertically differentiated imported rice. A representative consumer in either country maximizes utility as given by the utility function (1) subject to the budget constraint:

$$y + P_x X = E \tag{2}$$

Where  $E = E^N + E^S = E^N + w_1 L_1 + w_2 L_2$

$E$  is the aggregate income of the world.  $E^h$  is the income in country  $h$ . As mentioned before, south being small cannot influence  $E^N$ .  $L_l$  denotes the stock of type  $l$  labor in south and  $w_l$  the corresponding wage.  $P_x$  is the composite price of the imported rice. Maximizing (1) subject to (2), we get the aggregate demands for  $y$  and  $X$  as:

$$y = (1 - \gamma)E$$

$$P_x X = \gamma E$$

**Producers:** There are two kinds of firms in the north that can potentially produce foreign rice ( $X$ ) – the leader and the followers. The leader firm or the northern national firm has the ability to produce a quality of  $X$  closer to the frontier. We assume that the frontier quality of good  $X$  can be produced only by the leader firm while the standardized quality of this good is produced by many follower firms. The quality of  $X$  produced by the follower firms is one level lower than the one produced by the leader firm. These follower firms offshore the basic stage of good  $X$  production to a low cost nation (either through FDI or outsourcing) to lower its production cost.

In the south, there are two types of firms, the domestic sector or the southern indigenous firms which produce the homogeneous good  $y$  and the foreign sector or supplier firms, which import the basic stage of production of good  $X$ .

Following Goswami, 2011, we assumed that the production of a sourcing firm can be separated into two stages – the basic stage of production and the advanced stage, and to produce one unit of a final good, a sourcing firm must combine  $1/a$  units of output from basic stage of production with  $1/1 - a$  units of output from advanced stage of production produced in the north. Furthermore, production of good  $X$  is given by neoclassical function,  $f^A(.)$  and  $f^B(L_1, L_2)$  respectively. We represent the production technology for final good  $X$  produced by the sourcing firm as:

$$X^M = \text{Min}((1 - a)f^A(.), af^B(L_1, L_2))$$

**Resource Constraints:** Southern skilled labor required by southern firms for good  $y$  production is  $a_2^D(\omega)[(1 - \gamma)E]$ . The derived demand for skilled labor by the intermediate good of  $X$  is  $\alpha a_2^B(\omega)\left(\frac{\gamma E}{MCM}\right)$ . Thus, skilled labor market equilibrium in south is represented by an equality of supply with demand (Goswami, 2011).

$$L_2 = a_2^D(\omega)[(1 - \gamma)E] = \alpha a_2^B(\omega)\left(\frac{\gamma E}{MCM}\right) \quad (3)$$

Similarly, in equilibrium, unskilled labor demand in south is equal to the given unskilled labor supply:

$$L_1 = a_1^D(\omega)[(1 - \gamma)E] + \alpha a_1^B(\omega)\left(\frac{\gamma E}{MCM}\right) \quad (4)$$

The derived demand for labor in the foreign sector should be determined by the share of market captured by the follower firms (Goswami, 2011). Without loss of generality, this study work with the case where it is equal to 1. This is because production is less costly when assembling is transferred to countries where the combinations of factor prices shows relatively lower labor cost. Component production is instead transferred abroad where the relative cost of capital is lower.

#### 4. Results and Discussion

Estimating the Production and consumption deficit over a 10-year period in Nigeria (2013-2023), the result of the 10 year projection of rice demand and local production and estimated growth rate to meet up with the deficit is presented in Table 1.

As revealed in Table 1, rice consumption is expected to be on the increase given the increasing growth rate expected in the nation's population. It is expected to reach an all high 7.22 million metric tons by 2023. Average production, on the other hand, based on an average of 3.41% rice sectoral growth is estimated to reach 3.92 million metric tons by the year 2023. In order to achieve rice self-sufficiency by 2023, the local rice sector is expected to increase annual growth from the current projected 3.41% to an average of 90% annum. To this view, there appears to be huge absorptive capacity in the sector which justifies the need for increased investment in the sector so as to enhance her productive capacity.



**Table 1.** A-10 year Futuristic Estimates of Consumption, Local Production and Growth Deficit in Rice Sector in the Country (2013-2023)

Year	Annual Rice Consumption Estimate (million metric tons)			Annual Rice production estimates (million metric tons)				Shortfall (million metric tons) (%)	
	@2.5% population growth rate	@3% population growth rate	Estimated Average consumption	@3% growth rate	@3.25% growth rate	@4% growth rate	Average production estimates	Deficit	Estimated growth rate to meet deficit
2013*	5.50*	5.50*	5.50*	2.8	2.8	2.8	2.80*	2.70	96.43
2014	5.64	5.67	5.65	2.88	2.89	2.91	2.90	2.76	95.17
2015	5.78	5.83	5.81	2.97	2.98	3.03	2.99	2.81	93.98
2016	5.92	6.01	5.97	3.06	3.08	3.15	3.10	2.87	92.58
2017	6.07	6.19	6.13	3.15	3.18	3.28	3.20	2.93	91.56
2018	6.22	6.38	6.30	3.25	3.29	3.41	3.31	2.99	90.33
2019	6.38	6.57	6.47	3.34	3.39	3.54	3.43	3.05	88.92
2020	6.54	6.76	6.65	3.44	3.50	3.68	3.54	3.11	87.85
2021	6.70	6.97	6.83	3.55	3.62	3.83	3.67	3.17	86.38
2022	6.87	7.18	7.02	3.65	3.73	3.99	3.79	3.23	85.22
2023	7.04	7.39	7.22	3.76	3.86	4.14	3.92	3.30	84.18

**Source:** Data were from authors' extrapolation using base estimates adopted from USDA (2013); population growth rate was adopted from International Futures (2013), NPC (2013); \* Baseline year used in computation

The required investment to sustainably raise production level may not be fully met from local source alone, hence, the need for facilitating contact and investment from the foreign source. Such guaranteed partnership will offer a win-win situation for both the investor and the host nation. A potentially important benefit, as shown by Deininger *et al.* (2011) that could be derived from this arrangement is a transfer of farming technologies and best practice in the rice sector (Deininger *et al.* 2011). This could enhance the stock of her human capital and local content development which is a key driver of productivity. Foreign investment equally has the potential of supplementing low domestic savings and adding to the capital stock, and hence raising productive capacity. All of these will potentially lead to productivity gains via technology transfer, skill acquisition, increased competition and expansion of exports. Evidence of foreign investment in the fruit and vegetable sector in East Africa seems to attest to these benefits (Rakotoarisoa, 2011). Ultimately, this arrangement could facilitate the formulation of sound macroeconomic policy regimes and domestic institutional stability in the recipient developing countries which in most cases are required for the successful take-off of foreign investment in the host country (Mlachila and Takebe, 2011).

#### 4.1. Equilibrium in host country and the welfare comparison

Consider that after a while, the market is relatively thick with imported rice, as it currently witnessed in Nigeria, then, the country may decide to invite foreign investors with the aim of assisting in upgrading the local content capacity (which is what the country is currently embarking on). With time, the rice policy may decide to combine between production sharing contract from FDI mode to outsourcing mode if it can increase the local skill level and, hence, the productivity of the local producers.

As a change from FDI equilibrium to the outsourcing steady state occurs, there would be an exogenous increase in the efficiency as a result of increase in the quality and quantity of skill requirement in the basic stage of production in the host country (note outsourcing is known to employ more skilled labour than FDI). This is based on the assumption that the subsidiary is less efficient and less skill intensive and hence a regime change to outsourcing will facilitate training and skill acquisition of the local producers (Grossman & Helpman, 2004). As this happens, it will impact on the skill requirement of the local producers. Intuitively, when the skill intensity of production increases, it was expected that the skill premium increases and wages of unskilled labor falls (Goswami (2011) and subsequently, an increase in the productivity of the local producers due to the spillover effect and would enable the local producers to compete favorably with imported rice.

Let the exogenous rate of change in marginal labor requirements of  $l$  type of labor with regime switch in south be represented by

$$\hat{a}_l^B = \frac{da_l^B(\text{exogenous})}{a_l^B} \quad l = 1, 2$$

Furthermore, as the regime changes from VFDI to outsourcing, wages also change, which impact the skill requirement endogenously after the regime shift.

$$\hat{a}_l^k = \frac{da_l^k(\omega)}{a_l^k} \quad l = 1, 2 \text{ and } k = D, B$$

Both exogenous and endogenous changes in marginal labor requirement entail a change in marginal cost of production with a shift from FDI equilibrium to outsourcing equilibrium.

$$M\hat{C}^B = \theta_2^B \hat{w}_2 + \theta_1^B \hat{w}_1 + \theta_2^B \hat{u}_2 + \theta_1^B \hat{u}_1(5)$$

The second way through which a switch from FDI to outsourcing can impact on the competitiveness of the local producers is if the local demand for the product in the host country is above this threshold (Goswami, 2011). Given that there is a high proportion of rice consumption, this may warrant a higher threshold absorptive capacity. The intuition can again be explained by the fact that a higher proportion of rice consumption implies greater demand and use of the basic inputs and factors of production and hence a greater increase in skill requirement and skill premium.

Thus, FDI *may* lead to a higher welfare relative to outsourcing if the host country has a skill level premium. To see the rationale behind this result, we note that, with FDI, the demand for skilled labor is not high (Goswami, 2011). So, if FDI is matched with high skill premium, the low demand for skills pushes the wages of skilled labor to lower levels. This reduces welfare because a greater proportion of (skilled) labor earns this lower level of skill premium. On the other hand, outsourcing may still lead to higher welfare vis-à-vis FDI even if it is matched with lower skill abundance in the host country provided the rise in skill premium due to outsourcing is not too high to crash the unskilled labor wages (Antràs, 2005). At low levels of development of a host country, when the availability of human capital is also short, it benefits the host country to have FDI. With time, as its skills level grows then it is welfare improving to host outsourcing contracts.

## **5. Conclusion and Recommendations**

This study examined the relative the gap to be filled by rice production in order to meet with rice consumption in the Nigeria. The study observes that given the current growth practices upon which estimates were based, the local sector has to increase by an average of 90% per annum in order to meet with projected consumption in the country. It therefore concludes by affirming the relative importance of foreign investment that will enable technology transfer and training of local producers in the rice sector of the country. Depending on the rate of initial skill level of the host country, both FDI and outsourcing will lead to a better welfare gains as measured by its expected upward shift in the productivity of its local producers. However, this has varied implications:

- If the country has a low level of human capital and skill level, it favors her to intittally seek for FDI as this may be more beneficial; and
- On the other hand, as the skill level gets upgraded and if the domestic consumption of the product is above the threshold defined, then, the host country certainly gains from outsourcing contracts rather than FDI as its assists in upgrading the local content capacity through technology transfer and training of local producers to meet up with international competitors and thereby, satisfying the local demand for rice.

In view of these, this study advance the following recommendations:

- given the need to fully develop her local content capacity and to meet up with international competition, it may be beneficial for the country to set up attractive investment environments and the formulation of sound domestic and macroeconomic policy that would make the country an attractive hub for foreign investors who would be interested in setting up outsourcing factory in all the value chain activites of rice production in the country; and
- though it is not immediately clear how to go about testing the relative strengths of these implications in a real-life sceneriors, future studies could however, with

appropriate data, validate the predictions associated with the FDI and outsourcing in the rice sector in Nigeria.

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