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## PROSPECTS TO INCREASE FOOD PRODUCTION FOR FOOD SECURITY IN CAMEROON: ASSESSING THE ROLE OF AGRICULTURAL FOREIGN DIRECT INVESTMENT

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### ABSTRACT

*The objective of this study was to investigate the effect of agricultural Foreign Direct Investment inflow on food production in Cameroon. The post SAPs period of 28years spanning from 1991 to 2019 was considered and the autoregressive distributive lag bound test to co-integration estimation technique was employed. Findings from the study revealed that in the short run, agricultural FDI, agricultural labour force and arable land had positive and significant effect on food production, while fertilizer consumption had a negative and significant effect on food production. But in the long run, agricultural FDI, agricultural labour force, and arable land had negative and significant effect on food production, whereas fertilizer consumption had a positive and significant effect on food production. The study thus concluded that inflow of agricultural FDI into the agricultural sector of Cameroon has a net effect of total reduction in food production with implication of increasing food insecurity in the country. Therefore, we recommend that agricultural FDI should flow into the economy not to replace other sources of agricultural finance but to complement domestic sources of financing agriculture to boost food production output. The government should also implement policies to ensure there is no land grabbing by foreign corporations which deprives small farmer of agricultural land for food production. Appropriate adapted technologies as well should be provided to small farmers to increase the productivity and reduce hunger in the economy.*

**KEYWORDS:** *Agricultural Foreign Direct Investment (FDI), Food security, Structural Adjustment Programs (SAPs), and Cobb-Douglas production function.*

## 1. INTRODUCTION

Food security is a prime macroeconomic concern which is plaguing developing countries and has attracted a lot of attention from international bodies like governments and organisations globally. Developing countries can only solve this food security crisis by relying on methods of increasing agricultural output for food supply in their economies. Food security predominantly depends on food production. Food production includes food crops that can be eaten directly and indirectly which contains nutrients but excludes coffee and tea because they don't contain nutritive value though edible (World Bank, 2022). According to FAO (2012), there is food security when everyone and at all times have sufficient physical and economic access to nutritious food which is safe to satisfy both their dietary needs and food preferences in order to be active and healthy in life. Difficulty in improving food production in Africa results from limited investment in the agricultural sector both from the private sector and the public sector. Gunasekera et al. (2015) suggest that domestic investment in African agriculture remains constraint due limited available domestic savings and the problem of heavy reliance by African economies on foreign aid funding in many sectors of the economies including agriculture. Also, most governments in Africa invest less than 10% of state budgets in the agricultural sector (Cleaver, 2012). Therefore it is not only difficult but also not strategic to galvanise additional agricultural financing only from domestic sources (Brzeska et al. 2012).

One important source of agricultural finance which research has given much attention to is agricultural Foreign Direct Investment (FDI). To promote economic growth and development, FDI is a critical strategy because it integrates receiving countries into global capital flows, giving countries opportunities to expand employment, increase export bases, transfer technology and benefit domestic firms with efficiency spillovers (Edeh et al., 2020). Developing countries have therefore implemented policies which will help attract foreign direct investment into their various economies where agriculture is one of the important sectors benefiting from it (Djokoto et al., 2022). There is however strong argument in research on the impact of Foreign Direct investment on the host country especially developing countries. Some opine that FDI crowd out private domestic investment in developing economies while other arguments hold Foreign Direct Investment complements and reinforce domestic investment. According to Lileeva (2010), FDI causes repressive and enslaving tendencies on the host economy. Agricultural FDI expands agricultural output potentials of the receiving economy; it takes different forms such as investments in land, investment in agribusiness or investment in water entitlement (Moir, 2011). Others views say agricultural FDI in developing countries leads to land grabbing (Deming, 2011; Escresa, 2014; Rashid et al., 2016; Fraser, 2019). This negatively impact food production output of the host country causing food security challenges. This is because land grabbing from foreign investors leads to increase cost of rents on domestic farmers reducing their ability to increase farm outputs causing a repressive effect on food production.

Cameroon just like other developing countries rely on foreign Investments to develop it's the economy. Spanning from the advent of economic crises from mid 1980s to the deteriorating political environment of the early 1990s, foreign investors saw Cameroon to be highly risky to invest in the economy causing foreign investment to drop to its lowest level (Fambon, 2013). To solve these economic crises, Cameroon in the midst of other developing

countries adopted and implement the World Bank – IMF Structural Adjustment Programs (SAPs) in which policies to attract inflow of foreign investment was an important program. After SAPs, the government of Cameroon still embarked on policies to further attract foreign direct investment. The Cameroon 2002 Investment Charter made provision that will encourage not only domestic investments but also foreign investments into the economy (Bang, 2009). With this initiative, foreign direct investment into the economy has increased considerably. According to FAO (2021), the total Foreign Direct Investment flow into the agricultural sector amounted to \$88.89million. It therefore necessitates to empirically investigate how post SAPs policies to attract Foreign Direct Investment is affecting food production in the economy of Cameroon. Therefore the objective of this study is to find out the effect of agricultural FDI on food production in Cameroon establishing whether it a promoting factor or a disincentive factor of food production for food security in the economy.

## 2. LITERATURE REVIEW

### 2.1 Theoretical Framework

The most celebrated theory of Foreign Directed Investment is Dunning's theory known as the electric paradigm. Dunning (1979), was not satisfied with existing theories of international investment. The three main theories of international investment which were the product-cycle theory, the Hymer-Kindleberger approach and the internalisation theory were seen by Dunning as partial explanation of the reasons investors decide to produce abroad. Hence, he developed an approach that integrated the existing theories into what is called the electric paradigm which gave a comprehensive explanation of the extent and pattern of international production.

Dunning suggested that a firm will undertake FDI if three conditions are met known as Ownership Location Internalise (OLI): When it has the advantage of possessing net ownership (O-) given that there are firms from other countries; If it is profitable to internalise (I-advantages) those advantage it possess instead of using the market to transfer them to foreign firms; If there are some location (L-) advantages which it can use its ownership advantage from the foreign location rather than locating at home. Later, Dunning (1993) added the fourth specific condition to the 1979 three basic conditions; the configuration of the Ownership Location Advantage (OLI) by a particular firm will depend on the extent to which the firm believes that producing in a foreign country is consistent with its long-term management strategy.

Dunning distinguished two categories of ownership advantages: (i) advantages resulting from exclusive access to inputs and intangible assets or markets; (ii) and the advantages the firm enjoys because of going multinational. This concept of ownership advantage is what distinguishes the electric paradigm from the international theory therefore very important in the model (Casson, 1987). Thereafter in 1983, he modified the Location advantages concept making it slightly different and clearer. He differentiated the ownership advantages which comes from the ability to own specific assets as a proprietor of the firm - asset(Oa) referred to as asset ownership advantage which the firm can decide to internalise or not; and those ownership advantages which can only be exploited if the firm internalise them because they result from various superior hierarchies alongside other external market that commonly govern all assets networks found in different countries, also known as- transaction(Ot) ownership advantages.

The main criticism of the electric paradigm is that it has so many variables included which make operationalisation difficult. Dunning (1991) acknowledged this weakness but looked at it to be inevitable because it is difficult to integrate firms' different motivations in a single general theory that explains why they invest in foreign countries. However, this theory explains the pull factors behind FDI such as locating closer to factor inputs which eliminate importation of resources and reduce cost of production. Also enjoys tax concessions and the ability to monopolise foreign resources and foreign market.

## 2.1 Empirical Literature

Foreign Direct Investment into various sectors of the economy especially in developing countries is an area of focus that has attracted the attention of researchers and policy makers. FDI impact on an economy is just as diverse and the financial sector of every economy as its contribution can be felt on any sector which it is directed to. In the agricultural sector, the contribution of FDI is predominantly on agricultural output, food security which depends on food production, agricultural processing and agribusiness. A lot of studies have been carried out to assess how FDI is affecting these areas in agriculture in various economies. Some of these empirical underpinnings include the work of Djokoto (2012) who investigated the effects of Foreign Direct Investment into agriculture on food security in Ghana. The ARDL bound test to co-integration estimation techniques was used. He found out that FDI inflow into agriculture negatively and significantly affects daily energy consumption (hunger) both in the short run and the long. In the same like, FDI negatively and significantly affect daily protein consumption (nutrition) both in the short run and in the long run. Therefore, agricultural FDI exhibit a detrimental effect on food security in Ghana. He recommended that agricultural FDI flow into the economy should not be ignored for the sake of benefits but interventions should be made to ensure these FDI do not cause small farm holders to be side-lined in production. Also, the government has to support the small farm holders with appropriate technologies which they can easily adopt.

Edeh et al. (2020) studied the impact of FDI on the agriculture sector of Nigeria between spanning from 1981–2017. The Autoregressive Distributed Lagged (ARDL) bound test, Johansen test for co-integration, and Dynamic Ordinary Least Squares (DOLS) and Fully Modified Least Squares (FMOLS) estimation techniques were used. Results showed that FDI positively and significantly impacts the agricultural sector output of Nigeria. They recommended an emergency short and medium term FDI funding framework to address the financial needs of the agricultural sector of the economy. Gunasekera et al. (2015) examined the key issues surrounding FDI and the effects of foreign direct investment on agriculture in African. The dynamic Global Trade Analysis Project model (GDyn) was used. Their findings concluded that there is a combined effort to improve the productivity of agricultural land in Africa and increase inflow of FDI can boost global agricultural output and exports of the continent especially the cases of oil seeds, sugar, and cotton. Slimane et al. (2015) assess the direct and indirect effects of foreign direct investment on food security in 63 developing countries. They made use of fixed effect model with robust standard errors. Their findings indicated that sectoral foreign direct investment does not directly affect food security in these countries. However, foreign direct investment positively affects agriculture and the secondary sector thereby increasing agricultural production. But there is a negative effect of FDI on the tertiary sector and no effect found on the mining sector.

Djokoto et al. (2022) studied the impact of agricultural Foreign Direct Investment in 51 developing countries from 1990 to 2019. Using unbalanced panel with fixed effect estimator, they found that agricultural FDI promotes welfare in developing countries. They proposed that to attract FDI, developing countries governments should improve human capital, infrastructural development in their economies and earmark on trade openness policies. In Cameroon, Bang (2009) studied the effect of Foreign Direct Investment in Cameroon focusing on both on macro and micro economy. The chi-square test of independence was used to analyse the results. It was discovered from the macro-economy; a large inflow of Foreign Direct Investment does not have a large positive impact on the Cameroonian economy. However, at microeconomic level, FDI significantly contributed to some industries. Another study was conducted by Fambon (2013) to investigate the impact of Foreign Aids and Foreign Direct Investment on the on economic growth in Cameroon. Using time series data from 1980 to 2008, he employed the Autoregressive Distributive Lag (ARDL) bound test to co-integration method of analyses. Findings indicated that domestic capital stock and FDI both positively and significantly impact economic growth in the short run and long run. But labour force negatively and significantly impacts economic growth. Thus, he suggests that negative relationship between labour and economic growth may be because Cameroon is a developing country with unlimited supply of labour possessing a detrimental effect on economic growth of the country.

Some of the studies reviewed above like the works of Djokoto (2012) and Edeh et al. (2020) were on Ghana and Nigeria respectively. The implications of the finding can not necessarily reflect the situation of the Cameroon economy. The investigations of Gunasekera et al. (2015), Slimane et al. (2015) and Slimane et al. (2015) were on Africa and other developing countries including Cameroon. However, panel investigation globalises findings and recommendations whereas the degree of implication of the findings varies from one country to another. The Works of Bang (2009) and Fambon (2013) were carried out in the Cameroonian economy but focused on economic growth. Findings do not show the specificity of the agricultural sector of the economy. More so, the effect of FDI on food production which is the main concern for food security is left uninvestigated equally taking into consideration the Post SAPs era whether policies implemented that have led increase agricultural FDI is beneficial to food production for food security in the economy. Therefore, this research comes in to fill this gap that exists in literature.

### 3. METHODOLOGY

#### 3.1. Scope of the Study

This study is carried in Cameroon with time series data spanning from 1991 to 2019 which is delimited to post Structural Adjustment Programs (SAPs) period. It does not take into account the entire agricultural output but focuses on food production that is the dependence of food security. Also, only Foreign Direct Investment (FDI) inflow specifically into the agricultural sector is considered.

#### 3.2. Methods of data collection and sources

Time series data was collected from secondary sources on all the variables considered in the study. Data on food production, employment in agriculture, fertilizer input and arable land were all collected from WDI (2021); while data on agricultural FDI was collected from FOODSTAT (2022).

### 3.3. Model Specification

This study looks at the relationship between Food Production (FP) which is the dependent variable and Agricultural Foreign Direct Investment (AFDI) which is the main explanatory variable. Food Production (FP) is measured using Food production Index, Agricultural Foreign Direct Investment (AFDI) is measure from yearly quarterly data. The means of quarter one and quarter two are calculated for all the years under study to represent AFDI yearly statistics. Since man power is involved in food production, employment in agriculture is included known as Labour-force (L). Fertilizer input known as Fertilizer Consumption (FC) as well as agricultural land called Arable Land (AL), are all needed for food production. The Cobb Douglas Production function is used as the base line model for the study which is as follows

$$Y_t = AK^\alpha L^\beta$$

Where  $Y_t$  is that output of food produced at time  $t$ .  $A$ , is the technical progress,  $K$  indicates capital in the agricultural sector which is represented by Agricultural FDI complemented by Fertilizer input and  $L$  is labour input which is employment in the agricultural sector.  $\alpha$  and  $\beta$  are the elasticities of  $K$  and  $L$ . Decomposing this function into an econometric model and adding arable land gives:

$$FP_t = \beta_0 + \beta_1 AFDI_t + \beta_2 L_t + \beta_3 FC_t + \beta_4 AL_t + \varepsilon_t \dots \dots \dots 3.1$$

Where  $A = \beta_0, \alpha = \beta_1, \beta = \beta_2$

Logging this model gives

$$\ln FP_t = \beta_0 + \beta_1 \ln AFDI_t + \beta_2 \ln L_t + \beta_3 \ln FC_t + \beta_4 \ln AL_t + \varepsilon_t \dots \dots \dots 3.2$$

Where  $\ln$  = Natural Log,

- $\beta_0$  = Constant term
- AFDI = Agricultural Foreign Direct Investment
- L = Agricultural Labour Force
- FC = Fertilizer consumption
- AL = Arable Land
- $\varepsilon$  = Then error term

Specifying the econometric model in the log-linear form provides efficient results compared to simple linear specification according to Bowers and Pierce (1975) and Layson (1983). This is because the relationship between variables is explained in terms of percentage changes when logged which is better than unit changes which is most often difficult to be exact in the case of simple linear specification. It also solves the problems of outliers and influential points in data.

### 3.4 Estimation and Validation Techniques

#### 3.4.1. Test for Unit Root

The unit root test is used to determine whether variables are stationarity or not. This study adopted the Phillips-Perron (P-P) test by Phillips and Perron (1988) to test for unit root which is state below for food Production.

$$\Delta FP_t = \beta_0 + \beta_1 t + \delta FP_{t-1} + \sum_{i=1}^T \alpha_i \Delta FP_{t-i} + \mu_t \dots \dots \dots 3.3$$

Where: FP is Food Production at time t;  $\beta_0$  is the constant;  $\beta_1$  represents the time trend coefficient;  $\delta$  shows the presence of unit root and  $\mu_t$  is the independent residual term which is normally distributed. In conducting the Phillips-Perron test, the null and the alternative hypotheses are stated as follows:

$H_0$ : The time series has a unit root or is non-stationary

$H_a$ : The time series has no unit root or is stationary.

According to Gujarati and Porter (2009), when the absolute value of the calculated statistic exceeds the critical value at 5% level, we reject the null hypothesis and conclude that the time series is stationary.

#### 3.4.2 Test for Co-integration

To establish long run relationship between Food production, agricultural Foreign Direct Investment, agricultural labour force, fertilizer input and arable land, the Autoregressive Distributive Lag (ARDL) bound test to co-integration developed by Pesaran et al. (2001) is used. The advantage of bound test to co-integration over other methods of co-integration test is that its applicability is unrestricted whether the variables are co-integrated at levels I(0) or at first difference I(1) or simply at different levels. Also, the ARDL bound test technique can estimate both short run and long run co-integration together without losing any long run information by incorporating a dynamic Unrestricted Error Correction Model (UECM) in the ARDL bound test model, (Shahbaz at al., 2011). It is also a more accurate estimation technique when the sample size is relatively small. The ARDL-error correction model general equation is stated as follows;

$$\Delta LnPF_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta LnFP_{t-i} + \sum_{i=0}^q \alpha_{2i} \Delta LnAFDI_{t-i} + \sum_{i=0}^q \alpha_{3i} \Delta LnL_{t-i} + \sum_{i=0}^q \alpha_{4i} LnFC_{t-i} + \sum_{i=1}^q \alpha_{5i} LnAL_{t-1} + \gamma ECT_{t-1} + \mu \dots \dots \dots 3.4$$

$\Delta$  is the difference operator

$\varepsilon_t$  is the error term which is assumes to be independently and normally distributed.

*ECT* is the error correction term which measures the speed of adjustment when there is a shock in the model. Its parameter  $\gamma$  must be negative indicating convergence to the equilibrium. If the parameter is positive, the shocks in the system will be explosive and will never converge to the equilibrium. The ARDL is conducted in consideration of two asymptops; the lower asymptop called the lower critical bound and the upper symptop called the upper critical bound. When the F-Statistic is greater than the upper critical bound, it is concluded that there exist long run co-integration and if the F-Statistic is less than the lower critical bound, then there is no co-integration. However, if the F-Statistic falls between the lower and upper critical bounds, there is indecision. If integrated is at  $I(1)$ , decision is made based on the upper bound and if integration is at  $I(0)$ , the decision is based on the lower bound.

### 3.4.3 Validation of Results

The robustness of the co-integration results is checked using some diagnostic tests which include: Tests for serial correlation, homoskedasticity and heteroskedasticity. The stability of the results is also checked using the Cumulative Sum Squares (CUSUMSQ) test proposed by Borensztein et al. (1998).

## 4. PRESENTATION OF RESULTS AND DISCUSSION

### 4.1. Unit Root Test

**Table 4.1. Phillips-Perron Unit Root Test**

Variable	PP (at Level)	PP (at first difference)	PP (at second difference)	Order of Integration
LFoodP	0.981	-3.274 **	-	I(1)
LFDI	-2.143	-11.478***	-	I(1)
LLab	1.744	-1.616	-3.956***	I(2)
LFC	-1.472	-9.621***	-	I(1)
LAL	-0.685	-5.207***	-	I(1)

Source: Author Computation 2023

Table 4.1 show the results of Philip-Perron unit root test result, from which all the variables are non stationary at levels, but stationary at first difference except agricultural labour force that is stationary at second difference. Therefore, we conclude there is integration at  $I(1)$  and  $I(2)$ , hence necessary to conduct co-integration test to find out whether there exist a long run relationship among variables.



## 4.2. Co-integration Test

**Table 4.2. ARDL Bound Test for Co-integration**

Null Hypothesis: No long run relationship exists		
Test Statistics	Value	
<b>K</b>		
<b>F-Statistics</b>	<b>8.052</b>	
<b>5</b>		
Critical Value bound	Lower	Upper
Significance	I(0)	I(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

**Source:** Authors' Computation 2023

Table 4.2 above represents the ARDL Test for Co-integration result. The F-test is used to test if there is co-integration amongst variables. If the computed F-Statistics is above the critical value upper bound, the null hypothesis of no co-integration is rejected and if it is below the critical value lower bound the null hypothesis is not rejected. However, if the F-Statistics is between the upper and the lower bound, the results are inconclusive about co-integration (Pesaran et al., 2001). The computed F-Statistic for the bound is 8.052 which is greater than the upper bound critical values at 10%, 5%, and 1% significant levels. Thus, the null hypothesis of no long run relationship (no co-integration) is rejected. The bound test shows the existence of co-integration or long run relationship amongst the variables. This implies that both long run and short run model of ARDL should be estimated to analyse the effect of the explanatory variable's food production.

## 4.3. Presentation of Regression Results

Table 4.3 ARDL Regression Results

VARIABLES	(1) ADJ	(2) LR	(3) SR
LD.LnFoodP			0.164 (0.138)
D.LnFDI			0.00824*** (0.00209)
LD.LnFDI			0.00286** (0.00128)
D.LnLab			2.283** (1.017)
LD.LnLab			-3.636*** (1.139)
D.LnFC			-0.507*** (0.142)
D.LnAL			2.03e-05*** (5.30e-06)
LnFDI		-0.0171*** (0.00440)	
LnLab		-3.209*** (0.151)	
LnFC		0.736** (0.305)	
LnAL		-2.07e-05** (8.74e-06)	
L.LnFoodP	-0.580*** (0.143)		
Constant			219.0*** (45.36)
Observations	27	27	27
R-squared	0.893	0.893	0.893

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Source: Authors' computation 2023

Table 4.3 represents the ARDL regression results estimated from the model. These results indicate both the short run and long run scenarios of the between food production and independent variables included in the model. From short run result, Agricultural FDI is positively and significantly related the food production. This implies that a 1% increase in Agricultural FDI will lead to 0.00824% increase in food production. This is statistically significant at 1% level of significance. It is however significant at 5% at level of significance with lag difference. Agricultural labour force is positively related to food production. This mean a 1% increase in agricultural labour force will lead to 2.283% increase in food production which is significant at 5% level of significance. But considering a lag difference, agricultural labour force becomes negatively relate to food production where a 1% increase in labour force will lead to a reduction in food production by 3.636%. This is statistically significant at 1% percent level of significance. The short run coefficient of fertilizer consumption shows a negative relationship with food production. That is a 1% increase in the use of fertilizer will reduce food production by 0.507% and is statistically significant at 1% level of significance. Arable land is positively related to food production and significant at 1% level of significance. This shows that if arable land increases by 1%, food production will increase by 2.03%.

From the long run scenario, the model indicates convergence with an Error Correction Term (ECT) of -0.580. This explains that in the situation where the economy of Cameroon experiences shocks in food production, adjustments back to the equilibrium will be done at a speed of 58% annually. Also, the independent variables included in the model were good determinants of food production in the economy justified with an R-Squared of 0.893. This means, variations in food production in the economy is 89.3% explained by variations in the explanatory variables included in the model. Then only 10.7%, variations in food production in the economy is attributed to other variables not included in the model. Looking at the long run coefficients of the regression model, agricultural FDI is negatively related to food production and it is significant at 1% level of significance with a p-value of 0.002. The coefficient indicates that a 1% increase in agricultural foreign direct investment will reduce food production by 0.0171%. The implication means that increase in agricultural FDI inflow into the economy of Cameroon has a long-term consequence of reduction in food production in the economy which causes food insecurity in the country. This goes in line with the study of Djokoto (2012), whose findings showed that inflow of agricultural foreign direct investment has negative impact on food security on the economy Ghana. This situation may be caused by land grabbing where small farmers have their farming lands reduced by big foreign corporations with consequences of net total reduction in food production in the economy. Also, inflow of FDI into the agricultural sector crowds-out other investment sources in the sector as other stakeholders like the government and domestic private investors reduce finance to food production and rely more on foreign financing. The outcome is net reduction in food production financing, reduction in food production output and increase in food insecurity in the economy.

The long run coefficient of agricultural labour force indicates a negative relationship with food production in the economy. That is a 1% increase in agricultural labour force will lead to a 3.209% reduction in food production in the economy and it is significant at 1% level of significance with a p-value of 0.000. This result agrees with the work of Fambon (2013) investigate and found out that labour force is negatively related to economic growth in the economy of Cameroon. This could be resulting from the fact that the number of people employed in

agriculture is over saturated because of high level of unemployment in the economy that causes more people to seek farming as a means of survival. It also implies that the productivity of agricultural labour force of the country is low. Next is fertilizer consumption which is positively related to food production in the long run. If fertilizer use increases by 1%, food production will increase by 0.736% in the economy. This result is significant at 5% level of significance with p-value 0.030. This in line with the research of Stewart and Roberts (2012), who found that fertilizer use increases agricultural yield in the temperate region between 40% to 60% and even more in the tropics. This signifies that if fertilizer use increases in the agricultural sector of Cameroon, food production will increase and consequently food insecurity will be reduced in the economy. Last is arable land which is inversely related with food production and is significant at 5% percent level of significance with a p-value of 0.033. If arable land increases by 1%, food production will reduce by 2.07%. This agrees with the study of Fitton et al., (2019). This can be attributed to global warming and deforestation alongside unsustainable farming systems like slash and burn method of farm cultivation reducing the fertility of arable land in the country. The validity of findings from the ARDL model is indicated by the robustness of the result shown by some diagnostics as seen in appendices. From appendix 1, the P-value (0.3003) of Breusch-Godfrey LM test for autocorrelation is insignificant thus null hypothesis of no serial correlation cannot be rejected, thus no autocorrelation in the model. In the same manner, appendix 2 shows that the p-value (0.4093) of White's test of heteroskedasticity is insignificant thus the null hypothesis of homoskedasticity cannot be rejected showing no problem of heteroskedasticity on the model. Appendix 3 is stability test of the model shown by the cumulative sum squared curve which indicates a stable movement within the critical bounds from short run to long run, thus results are sustainable.

## 5. CONCLUSION AND RECOMMENDATIONS

The main aim of this study was to investigate the effect of agricultural Foreign Direct Investment (FDI) inflow on food production and the implication on food security in Cameroon. The post Structural Adjust Programs (Period) 1991 to 2019 was considered and the ARDL Bound test estimation technique was employed to analysed long run relationship amongst variables. Findings from regression analysis showed that, agricultural FDI, agricultural labour force and arable land all negatively and significantly affected food production in the long run. But fertilizer use positively and significantly affected food production in the long run. This implies that an increase in the inflow of FDI in to the agricultural sector of the Cameroon economy has a net effect of a reduction of food production output of the economy consequently increasing food insecurity in the country. Therefore there is a crowd-out effect were increase in agricultural FDI eventually leads to a net total reduction of agricultural finance for production in the economy.

We recommend that agricultural FDI should flow into the economy not to replace other source of agricultural financing but to complement domestic finance to boost agricultural sector output especially food production for food security. The government of Cameroon should implement policies that will encourage large food producers in the country for balanced agricultural investment so that foreign corporations should drive out some small food producers in the country. Also, there should be agricultural land policy to protect small farmers from land grabbing by foreign large corporation which have a net effect of reducing food production and increasing food

insecurity in the country. Also, government should promote small farmer by providing and equipping them with appropriate technologies to increase their productivity in order to improve on their welfare and reduce hunger.

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