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PRELIMINARY REPORT

Do Labour and Political Will Affect Agricultural Output?: Evidence from Sub-Saharan Africa

Kareem Abidemi Arikewuyo[1*] | Lateef Adewale Yunusa[2] | Babatunde O. Oke[3] | Babatunde Adekunle Okuneye[4]

[1] Southwestern University, Nigeria, Okun-Owa, Ogun State
[2] Olabisi Onabanjo University, Departmen of Banking and Finance, Ago-Iwoye, Nigeria
[3] University of Lagos, Department of Finance, Akoka, Nigeria
[3] Olabisi Onabanjo University, Department of Economics, Ago-Iwoye, Nigeria

ABSTRACT
Agriculture has been at the forefront in employment creation and revenue generation in Africa until there was a shift from the sector to the non-farm or service industry which threatens the economic sustenance despite the growing population of youth in the region. The neglect of the agricultural sector resulted from labour migration and lack of political will in sub-Saharan Africa (SSA), which has severe implications on agricultural output. This study, however, investigated the nexus among labour, political will and agricultural production in SSA from 1998 – 2018 using the dynamic System – GMM estimation technique. The study found employment in the agricultural sector, agricultural raw material, exchange rate, political will, and agricultural material and exchange rate interaction significantly influenced agricultural output in SSA. Therefore, it is recommended that for SSA future to be sustained, the governments should discourage labour migration from the agricultural sector through government supports to boost employment and poverty reduction.

Key words: Labour, Political Will, Agriculture Output, SSA

JEL Classification: J43, O38, O13, N47

INTRODUCTION

African countries are naturally endowed with mineral resources, and this led to Europeans' search for raw materials in which agricultural outputs played a crucial role in this respect. Agricultural results have contributed to the gross domestic product (GDP) of most developing economies across the globe and Africa. Agriculture served as a source of foreign exchange earnings, creating investment outlets both locally and internationally, employment opportunities, and providing the material needed for further productions. Some of the developing economies diversified their income sourced from crop exportation into crude oil exportation, which led to the reduction in crop exportation and gross domestic product of the economy (Adeola & Ikpesu, 2016). The decrease in crop exportation and other agricultural outputs led to divestment by some African nations from agricultural produce into the oil sector, which now reversed the earlier role played by developing countries as major suppliers of raw materials the world over.

The demand for agricultural produce on a large scale became apparent due to an upsurge in the world population. Therefore, it requires massive capital to meet its demand; finance becomes a

* Corresponding author, e-mail: kareem.arikewuyo@yahoo.com

significant problem. Shortage of funds has restricted the progression of the agricultural sector, leading to a decline in the sector's output. That is why Osinubi and Akinleye (2006) opined that the government could promote agricultural sector output in developing economies by providing credit facilities to the sector to facilitate the procurement of modern farm implements and other necessary inputs needed to transform the farm product from subsistence to mechanised farming. This is expected to translate into a reduction in unemployment and poverty across Africa, which have been adjudged to be hindering African development over time. This sector happens to be one of the largest employers of labour in Africa (Ajuwon & Ogwumike, 2013).

According to Africa Agriculture Status Report (2016), over sixty per cent of the African's population under the age of 25 (roughly 220 million young people) will be entering the labour force by 2035. Even under the most optimistic projections, wage jobs in SSA will absorb only 25 per cent of these 220 million prospective new workers. Farming and self-employment will remain to salvage this situation for gainful employment of at least seventy per cent of young Africans entering the labour force (AASR, 2016). The record has it that people in SSA have their means of livelihood from the agricultural sector, and their sustenance is tied directly to earnings realised from the industry. Promoting this sector would improve the income of farmers; industrial raw materials, reduce unemployment, poverty and foreign exchange problem; boost food availability and lower the cost of foods which will transform into the economic development of the region (United States Department of Agriculture, 2013). There is no doubt that agriculture predominantly employs more than two-thirds of people in the area and contributes to regional gross national product (GNP) (Yu & Nin-Prat, 2011). In recent times, employment in agriculture has continued to decline in the SSA economi,es, which portends great danger for the region in the foreseeable future. The shift in the labour force towards non-farm employment would breed unemployment level by the year 2035 as the non-farm or service industry may not be able to accommodate the growing population of youth in Africa (Africa Agriculture Status Report, 2016).

Unemployment and poverty have been the bane of African nations as sub-Saharan African, can mitigate this syndrome by improving human capital development and political will. Labour which forms a more significant part in human capital development in developing economies due to its labour-intensive nature, has continued to decrease as evidence revealed job migration from the agricultural industry to service industry on a large scale (United States Department of Agriculture, 2013; Food and Agriculture Organisation, 2019) and this has greatly affected investment in the sector over time thereby affecting agricultural growth. It is noted that empirical evidence from literature failed to investigate the nexus among labour, political will and agricultural output in SSA, which is very important to the investors, government and regulators. More so, it was discovered that only the study of Ikpesu and Okpe (2019) carried out a single-country research to investigate the relationship between capital inflow, exchange rate and agricultural output in Nigeria. No cross-country study has, to the best of our knowledge, investigated the relationship between/among labour, political will and agricultural output in sub-Saharan African countries, this backdrop informs this study.

LITERATURE REVIEW

Several factors ranging from capital inflow to human capital, evidenced from the empirical and theoretical literature, have been found to influence agricultural output. Recently in Africa, a hike in the prices of agricultural products alongside increasing population, reducing disposable income, unbalanced political and economic situation has awakened not only the national policymakers but scholars across the globe. The hike in agricultural productivity has mostly not been given attention by scholars from the perspective of the political will of the government in conjunction with the fluctuating exchange rates.

Nmadu and Akinola, (2015) investigated the factors affecting the availability of food crop production in Nigeria. Data for the study was obtained from 180 farmers in Niger State via a structured interview. The empirical result shows that the main source of supply of labour are family and hired labour. The regression result further revealed that total farm labour supply, age, household size, non-farm income, farm size, gender, education, health status, agro-chemical, capital and equity investment are positively related to agricultural crop output in Nigeria while wage rate, migrated family, seed and fertilizer are inversely related to agricultural output in Nigeria. However, the labour input model shows that age, household size, wage rate, non-farm income, farm size, gender, farm income, migrated family, health status, seed, capital and equity investment are positively related to labour input while education, agro-chemical and fertilizer are inversely related to labour input.

Dorward (2013) investigated the effect of agricultural productivity and food price on development and poverty reduction. This paper found that recent policymakers usually ignore the role of agricultural productivity sustainability and real food price changes across the globe. This is evidenced by the absence of relevant and accessible indicators for monitoring agricultural productivity sustainability and real food prices across the globe.

Rey et al. (2016) classified the factors affecting agricultural sector negatively as a movement of the youth from village to cities, hostile ecological nature impacting both individual and nature, variation in weather condition. They further identified the factors inversely impact on the effectiveness of labour as technical, natural and technological factors. The study concluded that it is important to generate new jobs and develop the agricultural sector to increase labour effectiveness in the agricultural industry.

Polyzos and Arabatzis (2006) investigated the variation in productivity of labour across 51 the Greek regions. The paper further ascertains the factors that impact the productivity of the agricultural industry. The result shows that employment in the agricultural sector, cultivated agricultural areas., number of tractors, irrigated agricultural areas, degree of divisibility of the cultivated agricultural areas, the level of training and education of the population are positively related to agricultural sector productivity while investments in the agricultural sector and population potential are negatively related to agricultural sector productivity.

Agwu et al. (2013) examined the type of farm labour engaged by farmers in Abia state and also identified the determinants of youths in agricultural sector in Abia. The result shows that the coefficients of occupation of the parents, age, occupation of the parents and farm size are positively related to participation of youths in agricultural sector while education of the respondents, income from non- agricultural sources, education of the father and the rate of mechanization are inversely related to to participation of youths in agricultural sector.

Kimenyi et al. (2014) evaluate the role of the violence in Nigeria and Mali on the agricultural output and investment. The result from survey carried out shows that sustaining investments in conflict-affected areas could be achieved by engaging in small animal production, kitchen gardens and fishery production. The survey result also shows that organizing of trainings and workshops for farmers in safe locations in order to acquaint them with the recent development in farm mechanization.

Olayemi et al. (2021) investigated the political economy of agricultural development in Northern Nigeria. The study investigation revealed that the agricultural sector in Nigeria has been neglected by the government in the past, giving greater attention to the oil sector which has recently recorded reduction in price. The investigation further revealed the factors that impacted on the agricultural development inversely in Nigeria as follows; land tenure systems; rising populations and reducing land for farming; insufficient funding for procurement of farm machines and tools; insurgency in the north; migration of youths from rural area to the cities; low level of education; dishonest government officials; over reliant on oil sector; harsh government policies unfavorable to the agricultural sector and poor infrastructure development.

Naluwairo (2011) compared and analysed the manifestos of the political parties that partook in the presidential elections in Uganda. The paper highlighted some of the areas omitted by the political parties in their manifestoes which will contribute to the success of the agricultural sector in Uganda. The identified areas are good governance and institutional planning the Agric industry; new innovation in the agricultural sector apart from the research and technology development; and the preservation and non-jeopardy usage of Plant Genetic Resources for Food and Agriculture rightly.

Briones and Felipe (2013) examined the variance in agricultural employment and agricultural output in Asia. The study however noted that the successful Asian countries gave investment in agriculture greater attention which led to the agricultural sectors being the largest employer of labour in the Asian economy. The result of the study shows that for the developing Asian countries to experience growth in their agricultural product, they need to key into recent development in the agricultural sector which will in the long-run help to increase the agricultural employment in relation to its output share. To take advantage of the transformation, the Asian countries need to have a long-term productivity growth objective in agriculture and carry out an upgrade of their farm inputs.

Mukasa et al. (2017) investigated the agricultural transformation process in Africa, identifies the regions that needs to be prioritized in the transformation process, as well as identification of the challenges facing African countries in their efforts to overcome structural impediments to agricultural development. The study however concluded that to achieve an increasing productivity in the agricultural sector, financial instrument that will solve the financial needs of the farmers need to be created. Accessibility of modern farm implements by the farmers is also germane in the quest for increasing agricultural output. Organizing of training and workshops for youths and women in agricultural is also important in developing the skills of the farmers. Encouragement of free trade within the region will also help promote the marketing of agricultural output which is part of the political will of the government of the region, this will promote intra-African trade and ensure ease transformation process.

METHODOLOGY

Model specification

This study is hinged on the endogenous growth theory of Solow (1950). The theory opines that output in an economy is a function of Capital, labour and technology. The Solow model is expressed as:

$$y = f(K, L, A) \tag{1}$$

Based on the theory, agricultural output depends on material inputs/farm implements which serve as inputs. These inputs represent technology in our model because farm activities are being executed with the use of modernized technological inputs. More so, procurement of farm input is often affected by appreciation and depreciation of the exchange rate of a nation in relation to its trading partners currency (Yunusa, 2020) which necessitate the incorporation of exchange rate into our model.

In order to attain the effect of labour and political will on agricultural output, the model is modified and expressed as:

$$y = f(K, L, A, Exchange\ Rate) \tag{2}$$

The Solow model is premised on the assumption of Cobb–Douglas production function, the modified Solow model in equation (1) is thus expressed in Cobb–Douglas form and expressed as:

$$y_t = f(K_t^{\alpha}, L_t^{\beta}, A_t, Exchange\ Rate_t) \tag{3}$$

Where y_t is the output at time t, K_t^{α} is the Political Will at time t, L_t^{β} is the Labour at time t, A_t is the Agricultural Input, $Exchange\ Rate_t$ is the exchange rate at time t. The model is restated in panel forms and expressed as:

$$y_{i,t} = \beta_0 + \beta_1 EMP_{i,t} + \beta_2 AMI_{i,t} + \beta_3 EXC_{i,t} + \beta_4 GFC_{i,t} + \mu_{i,t} \quad (4)$$

$$y_{i,t} = \beta_0 + \beta_1 EMP_{i,t} + \beta_2 AMI_{i,t} + \beta_3 PWL_{i,t} + \beta_4 EXC_{i,t} + \beta_5 GFC_{i,t} + \mu_{i,t} \quad (5)$$

$$y_{i,t} = \beta_0 + \beta_1 MEP_{i,t} + \beta_2 FEP_{i,t} + \beta_3 AMI_{i,t} + \beta_4 EXC_{i,t} + \beta_5 GFC_{i,t} + \mu_{i,t} \quad (6)$$

$$y_{i,t} = \beta_0 + \beta_1 MEP_{i,t} + \beta_2 FEP_{i,t} + \beta_3 AMI_{i,t} + \beta_4 PWL_{i,t} + \beta_5 EXC_{i,t} + \beta_6 GFC_{i,t} + \mu_{i,t} \quad (7)$$

$$y_{i,t} = \beta_0 + \beta_1 EMP_{i,t} + \beta_2 PWL_{i,t} + \beta_3 AMI_{i,t} + \beta_4 EXC_{i,t} + \beta_5 AMI * EXC_{i,t} + \beta_6 GFC_{i,t} + \mu_{i,t} \quad ...(8)$$

Where y is the agricultural output, EMP is the employment of labour, AMI is the agricultural raw materials, PWL is the political will, EXC is the exchange rate, GFC is the gross fixed capital formation and μ is the error term.

Data and estimation techniques

This study used annual panel data covering 29 Sub-Saharan African countries from 1990 to 2018, namely, Benin, Burkina Faso, Burundi, Cameroon, Congo Republic, Cabo Verde, Ethiopia, Gabon, Ghana, Guinea, Gambia, Kenya, Liberia, Lesotho, Madagascar, Mauritania, Mauritius, Malawi, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, Togo, Tanzania, Uganda, South Africa, Zambia and Zimbabwe. The data used for this study were obtained from the International Financial Statistics and World Development Indicator (WDI). Data on Exchange rate was obtained from International Financial Statistics while data on agricultural output, political will, employment of labour in agriculture, agricultural raw materials, male employment in agriculture and female employment in agriculture were obtained from WDI.

This study employed the panel estimation technique in order to estimate the impact of the independent variables on the dependent variable. It is to be noted that it is imperative to carry out unit root test in order to ascertain the order of integration of the variables.

This study estimated the dynamic panel data system generalised method of moment (GMM) (Arellano & Bover, 1995; Blundell & Bond 1998) which was based on the prior model developed by (Arellano and Bond 1991) where differencing of all the regressors was introduced and called difference GMM. The model of Arellano and Bond was based on the following assumptions; that the observation is greater than the time (N>T), linearity in relationship, inclusion of lagged value of the dependent variable as independent variable, regressors are not strictly exogeneous, fixed individual effects and problem of autocorrelation & heteroskedasticity within a variable (Roodman, 2009). Imposing the strict exogeneity assumption leading to violations and discrepancy in our fixed-effect model which leads to generation of a single-equation dynamic GMM estimator by using a common factor representation (Blundell & Bond, 1998). The dynamic panel output model is expressed as:

$$y_{i,t} = \rho + \omega y_{i,t-1} + \theta_1 A_{i,t} + \theta_2 K_{i,t} + \theta_3 L_{i,t} + \theta_4 EXC_{i,t} + \theta_5 GCF_{i,t} + \mu_{i,t} \quad (9)$$

$$i = 1 \dots\dots n, t = 1 \dots\dots T$$

ρ is the constatnt parameter, ω and θ are the output elasticities

The violation of the assumption of strict orthogonality led to the introduction of varying parameters by taking the semi-derivatives of the variables to account for variances in units and measurements.

$$\varepsilon_{i,t} = \mu_{i,t} + v_{i,t} \tag{10}$$

The disturbance term $\varepsilon_{i,t}$ comprise of two orthogonal components; the fixed effects that is time-invariant which is $\mu_{i,t}$ and the idiosyncratic shocks which is represented by $v_{i,t}$ which is assumed to be independent and normally distributed with zero (0) mean and constant variance.

Adjustment of the agricultural output is expected to be affected by factors such as political will, employment of labour in agriculture, agricultural raw materials, male employment in agriculture, female employment in agriculture, gross capital formation and exchange rate. Agricultural output adjustment to changes in these factors is dependent on two basic conditions, first is the passage of time which give rise to the introduction of the lagged values of the factors as independent variables, and second is the equilibrium of agricultural output and the previous year actual output which led to the introduction of the dynamic GMM in which lag of the dependent variable is also included as independent variable in the model.

Application of OLS in our estimation could lead to "dynamic panel bias" which occurs due to correlation between the lagged value of the dependent variable and the fixed effects in the error term which leads to the violation OLS assumption which is necessary for attaining an unbiased estimate, leading to endogeneity problem. Introduction of lagged variable as an instrument in the strict orthogonal assumption helps in solving this problem which is incorporated in the system GMM (Blundell and Bond, 1998; Roodman, 2009).

This study therefore estimated the impact of political will and labour on agricultural output in Sub-Saharan African countries using the System GMM based on the satisfaction of some assumptions. The dynamic GMM model is expressed as:

$$y_{i,t} = \alpha + \beta_3 Y_{i,t-1} + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \varepsilon \tag{11}$$

$y_{i,t}$ represents agricultural output
$\beta_3 Y_{i,t-1}$ represents the lagged value of the agricultural output
$\beta_1 X_{i,t}$ represents the independent variables which are political will, employment of labour in agriculture, agricultural raw materials, male employment in agriculture, female employment in agriculture
$\beta_2 Z_{i,t}$ represents the control variables which are gross capital formation and exchange rate.

RESULTS AND DISCUSSION

This section comprises of the descriptive statistics, correlation matrix, the unit root test and the GMM result. The descriptive statistics is revealed in Table 1.

Table 1. Descriptive Statistics of Parameters

$\boldsymbol{Variable}$	$\boldsymbol{Obs}$	$\boldsymbol{Mean}$	$\boldsymbol{Std.Dev.}$	$\boldsymbol{Min}$	$\boldsymbol{Max}$
$\boldsymbol{ago}$	597	9.21549	0.6006536	7.809687	11.06718
$\boldsymbol{pwl}$	607	1.259814	0.3359039	0.3198867	1.89786
$\boldsymbol{emp}$	609	1.630976	0.2840179	0.6627578	1.965216
$\boldsymbol{mep}$	609	1.634259	0.2576385	0.7371131	1.943208
$\boldsymbol{fep}$	609	1.608421	0.3559388	0.4821587	1.985718
$\boldsymbol{ami}$	528	0.0607285	0.2974615	-0.833841	1.266762
$\boldsymbol{exc}$	598	2.136938	0.7692887	-1.625142	9.827566
$\boldsymbol{gfc}$	515	9.321027	0.6282011	7.639185	10.95196

Source: Authors Computation.

Table 1 reveals the descriptive statistics of the datasets, a wide difference exists between the mean and standard deviation of all the variables used in the study. The average value also falls between maximum and minimum values. The correlation coefficients of the variables are shown in Table 2.

Table 2. Correlation Matrix

Variable	ago	pwl	emp	mep	fep	ami	exc	gfc
ago	1.0000							
pwl	0.2433	1.0000						
emp	0.2487	0.8697	1.0000					
mep	0.2599	0.8828	0.9844	1.0000				
fep	0.2551	0.8250	0.9759	0.9253	1.0000			
ami	-0.0145	0.0421	-0.0564	-0.0394	0.0835	1.0000		
exc	0.2001	0.3785	0.4072	0.4363	0.3545	0.0522	1.0000	
gfc	0.7372	-0.3876	0.3024	-0.2988	-0.2669	-0.1245	0.0403	1.0000

Source: Authors Computation.

The correlation coefficients in table 2 revealed that there is no likelihood of occurrence of multicollinearity among the variables used in this study as showed by the correlation coefficients.

The test in Table 3 reveals the traits of the dataset used in the study order to ascertain the level of stationarity of the variables which helps to avoid a spurious result. The Fisher unit root was preferred because the study used an unbalanced panel. The null hypothesis of the Fisher test is that "all panels contain a unit root" while the alternate hypothesis is that "at least one panel is stationary". The unit root result is presented in table three.

Table 3. Fischer Unit Root

Variables	ADF- Fischer	Im-Pesaran-Shin	Order of Integration
ago	109.2393 (0.0001)	-4.2640 (0.0000)	I(0)
exc	90.6557 (0.0039)	-2.3655 (0.0090)	I(0)
gfc	39.4662 (0.9309)	0.1709 (0.5678)	I(1)
pwl	207.9351 (0.0000)	-3.9728 (0.0000)	I(0)
emp	39.0078 (0.9738)	0.9723 (0.8346)	I(1)
mep	38.4457 (0.9777)	0.1473 (0.5586)	I(1)
fep	62.4172 (0.3221)	1.2685 (0.8977)	I(1)
ami	130.4109 (0.0000)	-4.3556 (0.0000)	I(0)

Source: Authors Computation.

Table three (3) shows the ADF- Fischer and Im-Pesaran-Shin unit root test results. The two test results shows that variable ago, exc, pwl and ami are stationary at level I(0) while variable gdi, emp, mep and fep are non-stationary at level but after first differencing, they became stationary at first difference I(1). The unit root test result further helps to reveal the covariance nature of the data set in a study (Adekunle, 2020). The study further estimated the two-step dynamic system generalized method of moment (GMM) because of its ability to capture the uniqueness of the traits of these data and relying on the empirical works of Adekunle (2020) and Roodman (2009) for further consultations. GMM results for the models are presented in the Table 4.

Table 4. *GMM Result*

Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*
$ago_{i,t-1}$	0.8830225 (0.0731397)	0.9426038 * (0.0485049)	0.900545 * (0.0247166)	0.9187858 (0.0525472)	0.958088 * (0.0173555)
$emp_{i,t}$	0.0166305 (0.0139171)	-0.0477362 (0.0525969)			-0.0346398 (0.0389692)
$ami_{i,t}$	-0.0223713 (0.0208141)	0.0096478 (0.0066705)	0.0130232 (0.0085888)	0.0204369 ** (0.0104496)	0.0024863 (0.0193576)
$pwl_{i,t}$		0.0837539 * (0.0292334)		0.1375857 (0.0820593)	0.0388306 (0.0333753)
$mep_{i,t}$			0.1071533 (0.1480049)	-0.0290735 (0.098888)	
$fep_{i,t}$			-0.0562225 (0.0980601)	0.0242645 (0.0756916)	
$ami * exc_{i,t}$					0.0032957 (0.0047626)
$exc_{i,t}$	0.0805739 (0.0541607)	-0.0002586 (0.0245654)	-0.0186452 (0.0223099)	0.0209094 (0.0260658)	0.0617634 (0.0429736)
$gfc_{i,t}$	0.0356914 * (0.0148287)	0.0408081 (0.0210307)	0.0216388 (0.0120304)	0.0709811 ** (0.0318943)	0.0296399 ** (0.0135081)
$\alpha_{i,t}$	0.5559287 (0.4414577)	0.1343522 (0.3029615)	-0.2403711 (0.1520994)	-0.1150769 (0.3119662)	0.1304668 (0.2075649)
Observation	414	414	414	414	494
Number of Countries	29	29	29	29	29
Number of instruments	231	231	231	231	232
Wald chi2	800865.54 *	46624.79 *	702457.65 *	22461.46 *	20323.44 *
AR (1)	0.007	0.023	0.016	0.033	0.005
AR (2)	0.643	0.587	0.616	0.557	0.703
Sargan test Chi (2)	0.560	0.510	0.538	0.483	0.392

*Note: The dependent variable is the agricultural output, natural logarithm of all the variables were used. Standard errors are reported in brackets. Level of significance was reported as * and ** representing 1 and 5 percent respectively.*

The coefficients of the lagged dependent variable ago across the models are positively and statistically significant indicating that the agricultural output has been consistence. An increase in the lagged value of agricultural output increases the present agricultural output in SSA region. Contrarily, a reduction the in the lagged agricultural output worsen the present agricultural output in SSA region which is not good for the region.

Furthermore, the first model shows that employment in the agricultural sector (emp) is positively related to agricultural output thereby increasing the volume of agricultural produce available for consumption in the region. An increase in the level of employment in the agricultural sector increases the agricultural output by 0.0166 in the SSA region. The coefficient of agricultural raw material (ami) shows an inverse relationship with agricultural output, thus, decreasing the agricultural produce available for consumption in the sector. This means a percentage increase in the agricultural raw material reduce the agricultural output in the SSA region by 0.0224. The coefficient of exchange rate (exc) shows a direct relationship with agricultural output, thus, a rise in the exchange rate increases the agricultural output in SSA region. The implication of this is that depreciation of exchange rate appears to increase the agricultural productivity in SSA region. Gross capital formation(gcf) exhibit a significant positive relationship with agricultural output in the region, promoting productivity in the agricultural sector in the SSA region.

Additionally, in the second model, we introduced the political will (pwl) into our model which shows the willingness of the government to support the agricultural sector or not. The coefficient of labour employment and agricultural raw materials are negatively and positively related to agricultural output respectively, thus, decreasing and increasing agricultural output by 0.0477 and 0.0096 respectively. The finding of negative effect of labour employment in agricultural sector contradicts the submission of Polyzos and Arabatzis (2006) whose study found positive impact on agricultural sector productivity. This contradiction may be due to difference in area of studies as well as period of coverage. Also, the coefficient of political will is positively related to agricultural output in the region, thus, increasing the agricultural produce available for consumption in the region as a result of the government support directed towards the agricultural sector. This means a percentage increase in the political will increase the agricultural output in the SSA region by 0.0838. Inclusion of the political will reduced the labour employment but increased the agricultural raw material which represents the level of technology introduced into the agricultural sector.

Also, in the third model was the decomposition of employment in agricultural sector into male employment in agriculture (mep) and female employment in agriculture (fep) but isolated the labour employment, the coefficient of the male employment in agriculture is positively related to agricultural output while the coefficient of female employment is negatively related to agricultural output in SSA region. A unit increase in the male employment increase agricultural output by 0.1072 while an increase in the female employment in agricultural sector decreases agricultural output by 0.0562 in the SSA region. The implication of this is that, without government support (political will), male employment in agricultural sector promotes productivity while female engagement decreases the agricultural output in the SSA region. What could be deduced is that the self-effort of male employment promotes agricultural productivity in SSA when compared to female employment.

However, introduction of political will into model three (3) which gives rise to model four (4) shows that female employment in agricultural sector promotes agricultural output compared with their male counterpart which exert a negative influence, though insignificant, leading to a reduction in the output of the sector. The implication of this is that government support (i.e. political will) in agricultural sector increased the female contribution in the agricultural sector, possibly encouraged more female participation in the sector. The coefficient of the male employment in agriculture is negatively related to agricultural output while the coefficient of female employment is positively related to agricultural output in SSA region. A unit increase in the male employment decrease agricultural output by 0.0291 while an increase in the female employment in agricultural sector increases agricultural output by 0.0243 in the SSA region. The economic intuition of negative influence of male employment on agricultural output revealed the migration of African male youths into non-farm or service industry due to lack of political will towards male counterpart which is a pointer to the fact that the future prospects of agriculture in SSA may become a myth in the year 2035 and this would exacerbate unemployment and poverty in SSA. This is partially in consonance with the submission of Rey *et al.* (2016). Furthermore, the coefficient of political will is positively related to agricultural output, thus, an increase in political will increases the agricultural output by 0.1375 in the SSA region. Government support in agricultural sector has afforded the female farmers more opportunity which resulted in increased agricultural output in the SSA region.

The fifth model which shows the interactive role of agricultural raw material and exchange rate on agricultural output indicates the interaction of these variables has increased the agricultural productivity in SSA region. A unit increase in labour employment in agricultural sector decreased the agricultural output by 0.0347 while increase political will increased agricultural output in SSA by 0.0388. The negative effect of labour employment on agricultural output has a serious economic implication in SSA as this showed the danger looming in the region which may breed high unemployment rate since natural resources in SSA would remain untapped in the foreseeable future. More so, the coefficient of interaction of agricultural raw material and exchange rate increase the agricultural output by 0.0033 in SSA region. The implication of this is that purchase of agricultural input for enhancing the farmers productivity which are mostly imported from developed countries are highly dependent on fluctuation of exchange rate, appreciation of domestic currency is expected to increase the purchasing power of the local farmers while depreciation of the exchange rate limits the number of farms implements that can be imported from the developed nations. Thus, the interaction has enhanced the productivity in the agricultural sector in SSA region. The reliability of the instruments used in the study are shown in $AR(1)$, $AR(2)$ and Sargan test. The serial correlation test $AR(1)$ indicate the existence of serial correlation at first order while the $AR(2)$ shows absence of serial correlation at second order in the three models which informs the acceptance of the null hypothesis of no serial correlation in the second order $AR(2)$. The Sargan test revealed that all the instruments are exogenous which informs the acceptance of the null hypothesis which implies that the instruments used in the study are independent of one and others across the models.

The Pooled Ordinary Least Square (POLS) and Fixed Effect Regression (FER) were further estimated in order to ascertain the validity of the dynamic system GMM leaning on the empirical credence of (Adekunle, 2020; Blundel et al., 2001) they asserted that another way of detecting the validity of dynamic system GMM is by ensuring that the lagged values of the dependent variable in the GMM model falls between estimates of POLS and FER. However, our dynamic GMM result estimates in table 4 lies between the POLS and FER in table 5 and 6 respectively (FER=0.7431<GMM=0.8830<$POLS$=0.9878).

Pooled Ordinary Least Square (POLS) Result

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
ago $_{i,t-1}$	0.9878187* (0.0070345)	0.9640292 * (0.0088824)	0.9860334 * (0.0072066)	0.9638923 * (0.0088908)	0.9642284 * (0.0080784)
emp $_{i,t}$	0.0203721** (.0102896)	-0.0088468 (0.0122064)			0.0078961 (0.010577)
ami $_{i,t}$	0.0120657 (0.0066645)	0.0140009 ** (0.0065456)	0.0119372 * (0.0066886)		0.0421673 ** (0.0081349)
pwl $_{i,t}$		0.0643489 * (0.0151562)		0.063671 * (0.0155406)	0.0461194 * (0.0123285)
mep $_{i,t}$			0.0367449 * (0.0200362)	0.0062738 (0.020964)	
fep $_{i,t}$			-0.0079077 (0.0129036)	-0.0111398 (0.0126481)	
ami $*$ **exc** $_{i,t}$					0.0054065*** (0.0028483)
exc $_{i,t}$	0.0030956 (0.0035217)	-0.0007751 (0.0035688)	0.0019042 (0.0036496)	-0.0012506 (0.0036513)	0.0276185 (0.0059356)
gfc $_{i,t}$	0.0184875 ** (0.0071664)	0.0447401 * (0.0093559)	0.0204132 * (0.0073203)	0.045062 * (0.0093599)	0.0440693 * (0.0082499)
$\alpha_{i,t}$	-0.0884827 (0.0350557)	-0.1390194 (0.0363505)	-0.1015023 (0.0365876)	-0.1456302 (0.0373721)	-0.1396294 (0.0361624)
Wald chi2(5)	106744.47*	111216.99 *	106211.05 *	111083.99 *	99523.40 *
Adjusted R²	0.9962	0.9964	0.9962	0.9964	0.9956
Observations	414	414	414	414	494
Countries	29	29	29	29	29

Source: Authors Computation, 2020.

*NB: The dependent variable is the agricultural output, natural logarithm of all the variables were used. Standard errors are reported in brackets. Level of significance was reported as *, ** and *** representing 1, 5 and 10 percent respectively.*

Fixed Effect Regression (FER)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
$ago_{i,t-1}$	0.7431222 * (0.0330419)	0.7169137 * (0.0321341)	0.7352188 (0.0342829)	0.7132711 * (.0332599)	0.7505996 * (0.0291562)
$emp_{i,t}$	-0.0919474 ** (0.035551)	-0.1676292 * (0.0367595)			-0.1242996 * (0.0363744)
$ami_{i,t}$	0.0017882 (.0100725)	0.0093519 (0.0097851)	0.0006918 (0.0101586)	0.0087522 (0.0098929)	0.0075912 (0.0052057)
$pwl_{i,t}$		0.189204 * (0.0336353)		0.1867616 (0.0337076)	0.1544507 * (0.0293837)
$mep_{i,t}$			0.025671 (0.0912496)	-0.0513294 (0.0889886)	
$fep_{i,t}$			-0.0977443 (0.0703091)	-0.1007528 (0.0677279)	
$ami * exc_{i,t}$					0.0034327 (.0036284)
$exc_{i,t}$	0.0374154 (0.0243881)	0.0319035 (0.0234878)	.0405391 .0246711	0.0334185 (0.0237993)	0.0312976 (0.0024389)
$gfc_{i,t}$	0.0589008 (0.0137736)	0.0807868 (0.0138129)	0.0601983 * (0.013839)	0.0814295 (0.0138704)	0.0959967 * (0.0129259)
$\alpha_{i,t}$	1.89948 (0.2863766)	1.83629 (0.2757941)	1.918594 (0.2865883)	1.836181 (0.2764585)	1.419592 * (0.2504996)
F-Stat	357.04 *	326.61 *	297.47 *	279.18 *	492.82 *
Adjusted R^2	0.9869	0.9918	0.9857	0.9911	0.9918
Observations	414	414	414	414	494
Countries	29	29	29	29	29

*Note: The dependent variable is the agricultural output, natural logarithm of all the variables were used. Standard errors are reported in brackets. Level of significance was reported as * and ** representing 1 and 5 percent respectively.*

SUMMARY AND CONCLUSION

In spite of empirical works on agricultural output, little or no attention has been given to ascertaining the effect of political will and labour on agricultural output in SSA region, making this issue unaccounted for. Scarcity of empirical works on this line of thought makes it crucial to dig deep. This identified lacuna helped to shape our thought and makes forecasting for the stakeholders a seamless task. In this light, this paper investigates the effect of labour and political will on agricultural output in in Sub-Saharan African nations from 1998-2018 using dynamic system-GMM estimation technique consisting of twenty-nine (29) cross-sections with a view of estimating the robustness check and short-run dynamics of the model.

The result shows that employment in the agricultural sector is positively related to agricultural output but after inclusion of political will, employment in agricultural sector reduced the agricultural output. Political will which shows the government willingness to support the agricultural sector is positively related to agricultural output. Agricultural raw material exhibits a positive relation with agricultural output in all the models except model one. The result of the study also showed that male employment in agriculture increases the agricultural output while female employment decreased the agricultural output in SSA region. However, inclusion of political will i.e., government support promotes the contribution of female employment in agriculture, leading to increase in agricultural productivity while the male employment in agriculture reduced the agricultural output in SSA region. The result further revealed that the interaction between agricultural raw material and exchange rate promotes agricultural productivity in SSA region. From the result, it is glaring that the way forward to attain an increasing agricultural output is to engage more people in agriculture and ensure a policy that encourage higher female participation in agriculture in order to achieve continuous increase in the agricultural productivity in SSA. Government support also contributed positively to the agricultural output in the region. This therefore portends a great deal for employment generation that would transform into poverty reduction through large scale supply of agricultural produce in SSA. Importation of farm implements enhances higher agricultural productivity in the region. Our study recommends that more people should be encouraged to participate, particularly, the female in order to harness the female impact on the economy. The government should also support the farmers in acquisition of new farm inputs in order to secure the future of African youthful population through agricultural productivity in SSA.

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