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Analysis of Determinants of Agribusiness investment in a Young Economy: Nigeria (1999 -2008)

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Abstract: The study examined determinants of agribusiness investment in Nigeria. Data for the study are time series collected on quarterly basis from publications of Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and National Population Commission (NPC). Some firms' specific data were collected from published and unpublished records of forty (40) agribusiness enterprises randomly selected in Nigeria. Vector Auto Regression (VAR) model was used to analyze the data. Among the determinants of agribusiness investment in Nigeria analyzed by the study, tax paid, market size and exchange rate were found to be statistically significant at 5% probability level. Based on the results, it was recommended that government should enforce the policy on five-year tax holiday for young agribusiness firms and also establish Agribusiness Investment Protection Agency which will be charged with the responsibility of liaising with other relevant agencies to create enabling environment for agribusiness firms.

Keywords: *Analysis; agribusiness; determinants; Investment*.

1. Introduction and Literature Review

Agribusiness investment has been regarded by development economists as a major strategy for achieving a faster rate of economic growth and a higher standard of living in a young economy like Nigeria. The sector is particularly important in terms of its employment generation, contribution to Gross Domestic Product (GDP) as well as export revenue earning (Manyong *et al.,* 2005). Mbanasor and Nwosu (1997) supported that agribusiness is the engine of national growth due to its role in raising the output level of the country in addition to increasing GDP and employment generation.

Agribusiness investment in Nigeria is supposed to thrive more than any other sectors of the economy given the state of the Nigerian investment climate and the encouragement it receives from government. Despite this, agribusiness output is still very low as evidenced by growing food insecurity and rising rate of unemployment with its associated poverty. Moreover, Manyong *et al.* (2005) noted that agribusiness's share of cumulative foreign investment declined almost consistently between 1981-2000 periods, with about 2% in 1981-1985 sub periods to about 1% between 1996-2000 sub periods. Hence there is massive importation of food and other agribusiness consumables (Arizona, 2008). The current state of agribusiness investment in Nigeria is under-developed, inadequate and completely distorted. There is poor quality of inputs and low effective demand for modern inputs which constraints investment in agribusiness. More so, Nigeria is currently not competitive in most of her agribusiness enterprises; even when the sector is supposed to be a dominant economic sector with greatest potentials for growth stimulation and poverty reduction.

Nigeria's agribusiness which consists of heterogeneous commercial enterprises in terms of production systems, product types and management patterns is structurally diverse ranging from micro owner – operated/family units to corporate giants such as the UAC foods, Nigeria Bottling Company, Nigeria Brewery Plc among others. It therefore offers a spring board for investment, with the additional advantage of being scale – neutral, that is, inputs can be used in discrete quantities and investments can be run efficiently. It equally seems to be an economically efficient route towards a reduction in the widespread poverty which is a major feature of the Nigerian economy. It has historically prevented sharp drops in growth and economic welfare and has been a channel of domestic resource utilization because of its low import intensity (Eboh, 2005; CN, 2008 and NIPC, 2008).

However, the potential tendency of meeting the Presidential Initiative on increasing investment and reducing unemployment in Nigeria seems a mirage without a closer look at the pattern of agribusiness investment in

Nigeria. This is because agribusiness has a place in modern Nigeria following its historic role in economic navigation. NIPC (2008) and UNCTAD (2003) noted that Nigeria may have been losing out on the opportunities in agribusiness investment owing to its failure to tap into the region's high profile. This is critical because capital formation in the sector could serve as a platform for economic linkages among agriculture, industry and services, as well as between rural and urban economies. The understanding of this could also provide basis for domestic and international competitiveness in the study area. The situation is not far-fetched considering that Nigeria as a whole is endowed with so many potentials that are expected to encourage both domestic and foreign investment into agribusiness and as such increase output. Some of the potentialities include abundant agricultural and human resources, large market size (over 140 million in population), political stability arising from the enthronement of democracy, and surplus skill and low cost of labour. Moreover, several agribusiness investment - friendly policies and programmes that are hoped to encourage free market economy have been put in place. Manyong *et al.* (2005) noted that despite the above potentials, the country has dropped the ball by not investing in full-blown agribusiness sector which is supposed to propel the nation's economy to stratosphere.

NIPC (2008) reported that in spite of all the policies aimed at improving agribusiness investment in Nigeria, the reverse seems to be the case. It was further reported that of all the foreign direct investment (FDIs) which came into the Nigerian economy by the year 2005, only 9.6 percent went into agribusiness investment while service, non agribusiness manufacturing, and infrastructure accounted for 48.7 percent, 16.5percent and 14.2 percent respectively. Others were gulped in solid mineral, oil and gas and chemical/ pharmaceutical sectors. This is consistent with Eboh (2005) which reported that of about 150 companies quoted on the Nigeria Stock Exchange as at August 2005, only 5 are agribusiness companies.

At the global level, a similar situation can be drawn from the publication of UNCTAD (2003) where Africa's share of global FDI to agribusiness in the mid 1970s was about 6 percent, a level that fell to the current 1 – 3 percent. Also, UNCTAD (2004 and 2005) noted that while Africa remained at a stagnant level of $18 billion between 2003 and 2004 in agribusiness investment; Asia, Oceania, Latin America, Southeast Europe witnessed a significant upsurge during the same period. These indicate that agribusiness sector suffers acute shortage of capital formation and investment. This is ironical in view of the priority status designed for agricultural commercialization in the National Economic Policy document and the Economic Reform Strategy (Kadi 1999 and Eboh, 2005).

However, several empirical studies have been carried out on the determinants of investment. Shimi and Kadhikwa (1999) in a study conducted in Namibia using time series econometrics observed that the determinants of investment in the economy are private saving, real income, real lending rate, inflation and government investment. Mejeha *et al* (2007) showed that the factors which influence farm investments in Abia State of Nigeria are sex, age, household size, and years of education, income and saving of the farmer. The study made use of ordinary least square (OLS). There is no known study that focused on the determinants of agribusiness investment in Nigeria as a whole .Thus policy making for agribusiness investment in Nigeria with the findings of the reviewed literature will be inadequate. This study intends to fill this gap.

2. Methodology

Time series data for the study were obtained for each of the variables on quarterly basis. This was from first quarter of 1999 to the last quarter of 2008 in Nigeria. Data on inflation rate, exchange rate and market size were obtained from publications and statistical bulletins of the Central Bank of Nigeria, National Bureau of Statistics and National Population Commission. Some of the firm specific variables such as amount invested by agribusiness firms in the periods, interest paid, tax paid, retained earnings and income of the agribusiness firm on quarterly basis were updated with average data from forty (40) formal agribusiness firms (that is those Incorporated under Companies and Allied Matters Acts) that were randomly selected from Nigeria. Efforts were made to collect the data from published and unpublished publications of the firms on the variables of interest.

Data were analyzed with vector auto regression model. The vector auto regression model (VAR) which was employed to achieve the objective was explicitly expressed with the most flexible specification of the test equation that includes an intercept and a trend. Thus

$$INVt = \beta_0 + \sum_{J=1}^{Y} \beta_{it} \Delta Q_{it} + \sum_{j=1}^{Y} \alpha_{it} \Delta Q_{it-1} + \sigma \Delta Inv_{t-1} + ui \quad (1)$$

Where:

INVt	=	Agribusiness investment (Naira)
β_0	=	intercept-term
Q_1	=	Market size (Expressed as population of Nigeria).
Q_2	=	Inflation rate (percent)
Q_3	=	Tax paid by each agribusiness firm (Naira)
Q_4	=	Exchange rate (defined as nominal exchange rate with respect to the US$)
Q_5	=	Interest paid by each agribusiness firm (Naira)
Q_6	=	Retained earnings (Naira)
Q_7	=	Income of the agribusiness firm (Naira)
Q_8	=	Real capital stock (Naira)
Y	=	Appropriate lag length
u_i	=	Error term or white noise disturbances.
β_1-β_8	=	Parameters to be estimated

The Augmented Dickey Fuller (ADF) was used to test for stationary (order of integration) of the variables. ADF test procedure is often criticized for the assumption of statistical independence and constant variance of the underlying distribution of errors, so as to allow for fairly mild assumptions regarding the distribution of the errors. Philips – Perron test was adopted to cross check on the result from the ADF tests about the orders of integration of the time series characteristics of the variables of interest under unit root test. This was done with the aid of E-VIEWS software programmes. Co-integration test of the dependent variable with their arguments was conducted using Johansen Test while Akaike Information Criterion was used to determine the lag length of the VAR equation. However, because many of these tests have low powers, the specifications of both first and second order were confirmed by diagnostic test to determine problem of serial autocorrelation in the system. The diagnostic test was done with correllogram of residual (Seruvatu and Jayaraman, 2001; Aliyu, 2009; Mohan, 2006 and Johansen, 1988).

3. Results and Discussion

Determinants of Agribusiness Investment: It has often been observed that macroeconomic data are characterized by a stochastic trend, and if untreated, the statistical behaviour of the estimators is influenced by such trend which will lead to spurious regression result. It is on this note that the analysis of this study started with unit roots test and the order of integration of the variables. This involves differencing the data to determine the level of stationarity was carried out.

Stationarity Test: This test which involves differencing the data to determine the level of stationarity was done using Augmented Dickey Fuller (ADF) and Philips – Perron (PP) tests. The tests were performed with E-views software and the results were summarised and presented in Tables 1 and 2.

Table1: Results of Unit Root Test

Variable	ADF test statistic (Level)	PP test statistic (Level)
Investment	3.122**	4.499*
Market Size	0.267ns	0.091ns
Inflation	-2.823***	-2.378ns
Tax Paid	-2.967**	-2.705***
Exchange Rate	-3.636*	-3.622*
Interest Paid	-1.802ns	-2.140ns
Retained Earnings	0.955ns	1.006ns
Income	2.915***	2.608***
Real Capital Stock	-2.260ns	-2.17ns

Output of sample data from Eview 2010

NB: Critical values of ADF (McKinnon Critical Values) at 1% (*), 5% (**) and 10% (***) are -3.6117 (*),-2.9399 (**) and -2.6080 (***) respectively. Note they are compared based on values disregarding signs. For the PP Test critical values (MacKinnon critical values for rejection of hypothesis of a unit root) at 1% (*), 5% (**) and 10% (***) are -3.6067 (*),-2.9378 (**) and -2.6069 (***) respectively. ns means non stationary.

As presented in Table 1, for all variables tested, market size, interest paid, Retained earnings and real capital stock proved to be non stationary at the level stage of the ADF. The result also shows that market size, inflation rate, interest paid, Retained earnings and real capital stock were non stationary at the level stage of Philip – Perrons (PP).

As presented in table 2, taking the variables in their first difference of ADF, results show that all the variables except "income of agribusiness firm" were stationary. The variables were further subjected to PP test based on tau- statistics and the results indicated that all the variables were integrated of order 1(1). Thus, they were stationary. Hence, any attempt to specify the equation in the level of the series will be inappropriate and may lead to the problem of spurious regression (Johansen, 1988).

Table 2: Results of Augmented Dickey Fuller Test (ADF) and Philip-Perron's Test for Unit Root in the VAR Series at 1st Difference Forms

Variable	ADF test statistic	PP test statistic
Investment	-3.717*	-5.523*
Market Size	-5.091*	-7.538*
Inflation	-4.199*	-5.047*
Tax Paid	-3.893*	-5.331*
Exchange Rate	-4.144*	-5.464*
Interest Paid	-4.481*	-7.871*
Retained Earning	-5.782*	-8.044*
Income	-1.680ns	-6.310*
Real Capital Stock	-5.028*	-5.000*

Output of sample data Eviews, 2010

NB: Critical values of ADF (McKinnon Critical Values) at 1% (*), 5% (**) and 10% (***) are --3.6171 (*), -2.9422 (**) and -2.6092 (***) respectively. Note they are compared based on values disregarding signs. For the PP Test critical values (MacKinnon critical values for rejection of hypothesis of a unit root) at 1% (*), 5% (**) and 10% (***) are -3.6117 (*), -2.9399 (**) and -2.6080 (***) respectively.

Therefore, the results of econometric analysis at the level of the series may not be suitable for policy making (Shahnoushi *et al.,* 2008; Aliyu 2009; Weissuleder and Heckelei, 2008; and Mohan, 2006). For consistency therefore, all the series were considered as 1(1) and taken at their first difference in the analysis.

Co-integration Test: Having established the unit root properties of the variables in the 1(1) series, the study proceeded to establish whether or not there is co-integration of the dependent variables with their regressors in the long run since the main focus of this study is to assess how investment in the long run reacts to changes in the independent variables. This was done with the use of multivariate Johansen test following previous

works (Johansen, 1988; and Shahnoushi *et al.,* 2008). The likelihood ratio test statistics and maximum Eigen value were utilised to determine the number of co-integrating vectors. In order to ensure non-existence of serial correlation problem in the model while applying Johansen test, the procedure was set to the appropriate lag length of the VAR model. This was done with Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) so as to select model with best fit (Mohan 2006). Hence the results of Johansen test, Akaike Information Criterion and Schwarz Bayesian Criterion are presented in Tables 3a and b.

Tables 3a and b showed the Eigen values (0.112242) and log likelihood ratios (4.166983) which tested the number of co-integration equations in the VAR. This means that the hypothesis of at most eight(8) Co-integrating Equations (CE) were accepted at 5 percent and 1 percent significant levels since they were less than the critical values of rejecting the hypothesis of at most 8 CEs (i.e. 3.74 and 6.40 respectively as in Table 3a and b. This follows the reports of Shahnoushi *et al.,* (2008) and Shiimi and Kadhikwa, (1999).

Table 3a: Johansen test for co integration (Series: LOG (INVT) LOG (Q1) LOG (Q2) LOG (Q3) LOG (Q4) LOG (Q5) LOG (Q6) LOG (Q7) LOG (Q8) Lags interval: 1 to 1

Data Trend:	**None**	**None**	**Linear**	**Linear**	**Quadratic**
Rank or	**No Intercept**	**Intercept**	**Intercept**	**Intercept**	**Intercept**
No. of CEs	**No Trend**	**No Trend**	**No Trend**	**Trend**	**Trend**
	Log Likelihood by Model and Rank				
0	162.255	162.255	176.245	176.245	185.206
1	192.589	199.304	213.012	224.885	232.932
2	217.800	228.152	241.248	260.760	268.264
3	240.093	253.121	262.589	287.050	294.553
4	258.265	274.388	279.106	308.339	315.023
5	267.620	287.647	292.123	322.742	327.112
6	274.442	296.898	299.351	334.528	336.840
7	279.168	303.720	304.494	341.697	342.768
8	282.271	306.880	307.651	345.172	345.780
9	282.589	309.963	309.963	347.863	347.863
Akaike Information Criteria by Model and Rank					
0	-4.643	-4.643	-4.928	-4.928	-4.926
1	-5.348	-5.674	-6.000	-6.622	-6.625
2	-5.760	-6.237	-6.586	-7.586	-7.615
3	-6.005	-6.578	-6.776	-8.002	-8.089
4	-6.015	-6.708	-6.692	-8.134	-8.230
5	-5.521	-6.380	-6.407	-7.871	-7.892
6	-4.882	-5.822	-5.791	-7.459	-7.419
7	-4.124	-5.127	-5.057	-6.783	-6.729
8	-3.273	-4.221	-4.208	**-5.896**	-5.873
9	-2.262	-3.312	-3.312	-4.963	-4.963

Output of sample data from Eviews, 2010.

Table 3b: Johansen test for cointegration

Test assumption: Quadratic deterministic trend in the data
Series: LOG(INVT) LOG(Q1) LOG(Q2) LOG(Q3) LOG(Q4) LOG(Q5) LOG(Q6) LOG(Q7) LOG(Q8) Lags interval: 1 to 1

Eigen value	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No. of CE(s)
0.935	325.315	208.970	222.460	None **
0.867	229.862	170.800	182.510	At most 1 **
0.777	159.197	136.610	146.990	At most 2 **
0.690	106.621	104.940	114.360	At most 3 *
0.499	65.681	77.740	85.780	At most 4
0.426	41.502	54.640	61.240	At most 5
0.287	22.046	34.550	40.490	At most 6
0.158	10.190	18.170	23.460	At most 7
0.112	4.167	3.740	6.400	At most 8 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
Output of sample data from, Eviews 2010.

The existence of more than one co-integrating vector indicates that the system under examination is stationary in more than one direction and, hence, more stable. The Johansen test results suggest that there could be a long run steady state relationship among agribusiness investment in Nigeria and the included right hand variables. Therefore, it was proper to select models that have eight CEs. From the Table 3a, AIC was used to select the best models bearing in mind the appropriate rank of CE and information criteria. Among the two models in the same co-integration rank of 8 CEs, the linear model with trend had the lowest AIC (-5.896). Therefore, the linear form of VAR with intercept and trend in the variables were estimated. Co-integration is accepted when the residuals from the linear combination of the non-stationary series 1(1) are themselves stationary (Gujarati, 2004). The acceptance of co-integration indicates that the model is best specified in the first difference of the variables

Diagnostic Test: Having conducted the co-integration test, the next step was the diagnostic test before going into the main estimation and application of VAR model. The diagnostic test was performed on the residuals of cointegration equation to identify whether there is problem of autocorrelation of the second order. The result is presented in Table 4.

Table 4: Correllogram of Residuals of the VAR system

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |. |	. |. |	1	-0.037	-0.037	0.057	0.811
.**|. |	.**|. |	2	-0.256	-0.257	2.815	0.245
. *|. |	. *|. |	3	-0.090	-0.120	3.168	0.366
. |*. |	. |*. |	4	0.159	0.088	4.303	0.366
. *|. |	. *|. |	5	-0.065	-0.112	4.500	0.480
. *|. |	. *|. |	6	-0.115	-0.083	5.126	0.528
. *|. |	. *|. |	7	-0.116	-0.160	5.782	0.565
. |*. |	. |. |	8	0.079	-0.022	6.100	0.636
. |. |	. *|. |	9	-0.007	-0.082	6.102	0.730
. *|. |	. *|. |	10	-0.094	-0.124	6.586	0.764
. |. |	. |. |	11	0.065	0.047	6.824	0.813
. |. |	. *|. |	12	0.022	-0.086	6.852	0.867
. |. |	. |. |	13	-0.033	-0.055	6.919	0.906
. *|. |	. *|. |	14	-0.078	-0.109	7.307	0.922
. |*. |	. |*. |	15	0.160	0.100	8.997	0.878
. *|. |	. *|. |	16	-0.100	-0.178	9.693	0.882

Source: Output of Sample data from EViews, 2010.
The result indicated that Correlogram has ACs (Autocorrelations) at various lags (16 lags) hovering around 0. For a purely white-noise process, the ACs at various lags hover around 0 (Gujarati, 2004). In this VAR system's residuals, none of the ACs or Partial Autocorrelation estimates at any lag had a Q-Stat that is statistically significant at 1%, 5% or 10% alpha level. The p-values are all above 0.10 (Table 4). It was therefore concluded that the vectors for the investment system are white-noise and hence considered stable. There was no reason, therefore, to suspect autocorrelation in the system. Hence, there is no problem of serious autocorrelations among the variables. Thus, the system can be used for VAR analysis and forecasting.

Furthermore, normality test was performed to check the distribution tendency of the variables in the system. The result which is summarized and presented in Table 5 indicates Jargue Bera Values and p values.

Table 5: Normality Test and Other Descriptive Statistics of the Logged VAR variables

	INVT	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Mean	100.506	2.923	11.868	1.038	109.835	1.646	46.578	172.150	4807.300
Median	84.000	2.850	11.750	0.600	125.100	1.540	44.000	175.000	1504.000
Maximum	215.000	4.800	26.400	5.000	137.200	3.120	96.000	350.000	20005.00
Minimum	48.000	1.200	-1.400	0.300	21.800	0.540	12.000	92.000	480.0000
Std. Dev.	48.942	0.871	6.695	1.284	32.470	0.631	27.413	73.147	5073.964
Skewness	1.012	0.183	0.139	2.547	-1.949	0.423	0.401	0.712	0.824098
Kurtosis	2.794	2.403	2.285	7.932	5.772	2.494	1.899	2.630	2.786927
Jarque-Bera	6.900	0.816	0.979	83.785	38.134	1.619	3.094	3.606	4.603
Probability	0.031	0.666	0.613	0.000	0.000	0.445	0.213	0.165	0.100
Observations	40	40	40	40	40	40	40	40	40

Source: Output of Sample data from EViews, 2010

The Jarque-Bera (JB) test gave a better insight about the distribution of variables in the VAR system. Following the result, therefore, it implies that the error term in the system is normally distributed. Thus, the sample size of 40 and data observation points of 360 may be large enough for the VAR analysis. The Jarque-Bera (JB) test, according to Gujarati (2004) is an asymptotic test based on the OLS residuals that tests the assumption that skewness (S) and Kurtosis (K) are 0 and 3 respectively. If the computed p value of the JB statistic in an application is sufficiently low, which will happen if the value of the statistic is very different from 0, one can reject the hypothesis that the residuals are normally distributed and therefore accept, the normality assumption if otherwise. In the case of this VAR system, only three variables have p values that can be regarded as being sufficiently low, ie 0.031 for Investment, 0.000 for Tax paid and Exchange rate. Since there are nine variables on the whole, it can be said that the system has a generally normal distribution considering the fact that about 67% of the variables have an appreciable asymptotic property.

Analysis of Restricted VAR Model: Table 6 shows the determinants of agribusiness investments in the study area with elasticity and coefficient of variation of the estimated VAR model. Following the recommended principle of modeling from large to simple (parsimony of model), the presentation excluded insignificant variables in the VAR estimates. The result shows the investment equation in the system had an R^2 of 0.995 implying that 99.5 percent of variation in the model was due to the variables used as the predetermined variables in the model. The standard error was 0.046 which is remarkably low. Hence, the high R^2 value and low standard error indicate that in the long run, variation in agribusiness investment is largely explained by the variation in the significant variables in the model. Furthermore, the adjusted R^2 which normally "punishes" the econometrician for including more variables in the model gave a low value when compared to R^2. This still indicated a very high 98.9 percent variation being explained by the predetermined variables with a relatively low standard error of 0.054 though higher than that of R^2. The recorded adjusted R^2 implied that only 1.1 percent of the variation in log of current investment in Nigeria over the sample period was determined by factors not included in the model. The result also shows that the significant variables besides the lagged values of log of investment itself which were found to be significant in first and second lags include logs of market size, tax paid, inflation rate, exchange rate and retained earnings.

Table 6: VAR Model in Summary form including only statistically significant variables with their model fit measures

Variables		Coefficients
	Lag 1	Lag 2
Investment	0.337	0.337
	(1.480**)	(1.588*)
Market Size	0.813	-
	(2.764**)	
Inflation	0.045	-
	(1.448*)	
Tax Paid	-0.048	-0.048
	(1.924**)	(1.900**)
Exchange Rate	-0.124	-0.090
	(2.282**)	(1.576*)
Interest Paid	-	-
Retained Earning	0.314	-
	(1.800*)	
Income	-	-
Real Capital Stock	-	-
Intercept	2.098	-
	(2.633**)	
$\underline{R^2}$	0.995	
$\overline{R^2}$	0.989	

S.E regression equation = 0.046.
(**) and (*) mean t-ratio significant at 10 and 5 percent respectively.
Source: Output of Sample data from E View, 2010

The market size was positively significant at 5 percent in its first lag implying that the elasticity of log of agribusiness investment with respect to one percent change in past aggregate market size by one year was 0.813 for the log of market size in the first lag. Invariably, investment is relatively elastic with respect to market size. Past market size therefore is a strong determinant of investment in the economy of the area over the sampled years. Similar study by Weissleder and Heckelei (2008) conducted in Mediterranean countries observed similar positive relationship between agribusiness investment and market size. Hence, size of market explains how massive the product of an agribusiness firm could be consumed.

On the contrary, Shahnoushi *et al*. (2008) noted that small market size is not a constraint to growth in an agribusiness investment. These, they justified by stating that while Nigeria could be classified as a large market, Angola and Ghana received more foreign direct investment into agribusiness sector. However, this reverse in trend could be attributed to other constraints restraining agribusiness investments in Nigeria. Hence, no investor can spend funds in a market where he/she is not sure of the availability of market and large enough for his/her products.

The study also observed that agribusiness investment in Nigeria over the period under review responded by 0.045 percent to every unit increase in inflation rate in two previous years. The coefficient (0.045) was found to be significant at 10 percent probability level. The result, though shows low elasticity, agrees with the findings of Selin (1999) that inflation has significant and positive influence on investment. Shiimi and Kadhikwa (1999) and Shahnoushi *et al* (2008) agreed that inflation rate was significant variable in the determination of investment in any economy. Hence, increase in rate of inflation implies upward pressure on prices of investment stock, thus increasing investible fund. Contrarily, Abuka *et al* (2006) reported a negative relationship between inflation and investment, implying that high rate of inflation could be a discouragement to investment because of erosion on investors' saving. As such, high rate of inflation reduces the efficiency of investment.

The result also indicated that the log of tax paid had a coefficient of -0.048 in its second lag and significant at 5 percent probability level. This implies that increase in tax paid by investors reduced the level of subsequent year's investment by 0.048 percent for every percentage increased in tax paid in the preceding two years. This is in line with *a priori* expectation. It is not surprising since tax is a cost to the investors. Too much of it can increase total cost to investors and hence capable of bringing about loss in their business and can serve as a disincentive to investment. The result however, conformed to Mbanasor and Nwankwo (2001) that agribusiness investment decreases by 3.7 percent following a 1 percent increase in tax rate.

The result in Table 6 also reveals the elasticity of agribusiness investment with respect to log of exchange rate recorded over the period. The result indicated that first and second lags were -0.124 and -0.090 and significant at 5 and 10 percents respectively. The t-statistics were decreasing with time. This implies that investment was more responsive to increase in exchange rate in the first preceding year than in the second year. Hence, increase in past exchange rate decreases the current log of agribusiness investment by 0.124 and 0.090 percent for the first and second lags of exchange rates respectively. Weissleder and Heckelei (2008) noted agribusiness investment depends more on export component. To this end, increase in exchange rate against the host country's currency will negatively affect investment.

The variable, "retained earning" had coefficient of 0.314 and positively significant at 10 percent probability level. This implies that for a percentage change in the variable of retained earnings of agribusiness firms, an increase of 0.314 percentage of investment was experienced. Firms with robust retained earnings are more inclined to re-investment over time from retained earnings.

4. Conclusion

The main objective of this study is to specifically identify the determinants of agribusiness investment in Nigeria. It employed vector auto regression model in analyzing the time series data. It is evident from the findings that there existed bi-directional relationship between agribusiness investment [exogenous] and log agribusiness investment [endogenous]. Other variables which influenced investment in agribusiness are market size, inflation, tax paid, exchange rate and retained earning. From a policy stand point, it is recommended that government should set up Agribusiness Investment Protection Agency [AIPA] which will among other things enforce the implementation of appropriate economic policies aimed at improving the investment climate around agribusiness firms. Such policies include implementation of tax holiday, elimination of export restrictions to expand the market among others.

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