INSURANCE INTERMEDIATION AND AGRICULTURAL OUTPUT IN NIGERIA

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Abstract

Effective insurance intermediation is an essential financial instrument intended to reduce risks, especially in an industry like agriculture that is thought to be extremely volatile. Nigerian agricultural output is threatened by a number of risks, such as market volatility, pest infestations, and climate change, despite the efforts of the country's insurance companies. In light of this, this study looked at how insurance intermediation affected Nigerian agricultural production. Financial records from the Nigerian Agricultural Insurance Corporation and the Central Bank of Nigeria Statistical Bulletin provided time series data from 2005 to 2021. The data was analysed using Ordinary Least Square (OLS) regression as an estimation technique. According to the study, the assets of insurance companies (ICA) have no effect on crop output or fishing (coeffs. 3.16 & -4.89; p-values 0.43 & 0.90), but they have a considerable impact on agriculture, livestock, and forestry (coeffs.7.52, 1.62, and 8.67; p-values 0.00, 0.00, and 0.00). Additionally, all forms of agriculture are unaffected by Agricultural Insurance Premiums (AIP) (coeffs.1.92, 8.78, -3.92, -4.41 & 3.23; p-values 0.43, 0.78, 0.61, 0.19 & 0.80).According to the study's findings, ICA has an impact on agriculture, livestock, and forestry but no influence on crop production or fishing. Not all forms of Nigerian agriculture are impacted by AIP. According to this study, the Federal Government should establish beneficial policies for its agencies, such as the Nigerian Agricultural Insurance Corporation (NAIC), in order to encourage ICA to enhance other agricultural sub-outputs in Nigeria, such as crop production and fishing. In order to influence all agricultural varieties, which will then translate into their contributions to Nigeria's GDP, NAIC must constantly make sure that insurance premiums are reinvested in the agricultural sector.

Keywords: Insurance, Agricultural Insurance, Agricultural Output

1.0 Introduction

Globally speaking, agricultural production is essential to human survival. The production of industrial raw materials, the supply of wholesome food, the creation of jobs, increased citizen incomes, the creation of foreign exchange earnings, and the provision of a market for the industrial sector's outputs that can be used by a growing population are just a few of its numerous benefits to any economy (Zakaria, Jun & Khan, 2019).

Over the ages and generations, agriculture has been recognised as one of the earliest economic pursuits of the human race. In the Central African Economic and Monetary Community (CEMAC), there are two types of agriculture: commercial agriculture and subsistence farming. Subsistence farming is the type of farming in which the farmer and his family grow food on a small scale just for their own consumption. Unlike commercial cultivation, which requires a significant amount of capital, subsistence agriculture is a labour-intensive process. Because it enables individuals to be self-sufficient in terms of food production, subsistence agriculture provides food security. Lawal, Ogundipe, Ezenwoke, Popoola, and Asaleye (2018).

Therefore, it should be highlighted that risk is a necessary but controllable aspect of agriculture that can cause significant variations in agricultural output from year to year due to unanticipated weather, disease or pest infestation, and/or market conditions that cause large swings in yields and commodity prices. The aforementioned causes have led to the

identification of insurance as a significant non-banking financial intermediation that is dedicated to mobilising funds primarily for investment purposes from the premiums paid by all insured individuals, including those for life and non-life insurance. Generally speaking, insurance has remained a significant risk management strategy whose contribution spans the entire real economy and its subsectors. Insurance is essentially the equitable transfer of a risk of loss from one entity to another in exchange for a premium or a guaranteed and quantifiable small loss to prevent a large and potentially devastating loss.

According to Ehiogu and Joseph (2019), agricultural insurance focusses on stabilising price, income, employment, and agricultural output through regular savings and fund accumulation in small installments by individual farmers during favourable times to support agricultural activities during unfavourable ones. In summary, farmers frequently spread their bets by cultivating a variety of crops and crop kinds, delaying crop planting dates, and distributing crops among fields with varying risk exposures in the landscape in order to lessen their exposure to possible losses. By using these strategies, the likelihood of a significant crop loss in a single season might be decreased.

Even with the Nigerian government's efforts to establish the Nigerian Agricultural Insurance Corporation (NAIC) and the crucial role insurance companies play in reducing the risk associated with agriculture, agricultural output was still insufficient to support the country's population, and credit was still a constraint.Therefore, this study looks at how insurance intermediation affects Nigerian agricultural productivity.

2.0 Literature Review

Insurance Intermediation and Agricultural Output

In the agriculture industry, insurance companies typically serve as financial intermediaries by controlling risks and enabling the flow of capital. In this intermediation process, policyholders (farmers) pay premiums, and the money is then reinvested in financial instruments or agricultural initiatives. Insurance companies increase the agricultural sector's resilience and productivity by combining risks and offering liquidity. In order to reduce risk, insurance is a financial strategy that makes up for losses brought on by specific events (Bunni & Bunni, 2022). Insurance is essentially a contract wherein the insured and the insurer agree that the insurer will compensate the insured in exchange for premium payments. Levantesi and Piscopo (2022) define insurance as a method that allows risk to be transferred from one party to another, where the insurer commits to pay for any losses coming from preset risks. This definition highlights the primary function of insurance as a tool for risk mitigation.

According to additional research, insurance is a social tool wherein a group of people assign risk to an insurer in return for the assurance of monetary damages for losses (Bassey and Uwadinma, 2022). In this instance, the focus is on risk pooling, which enables the insured population to share financial losses fairly. In industries like agriculture, where risks are systemic and frequently outside the control of individual farmers, this risk-pooling aspect is especially important.

Insurance is a vital risk management instrument in the agriculture industry, assisting farmers in reducing the monetary risks connected to crop failures, livestock deaths, and natural disasters. According to Madaki, Kaechele, and Bavorova (2023), agricultural insurance is a type of financial instrument that shields farmers from unfavourable agricultural occurrences that have an adverse effect on crop or livestock output, such as drought, pests, or illnesses. In places like Nigeria, where agriculture is threatened by a variety of environmental issues, this product is essential.

Crop production, livestock, forestry, and fishing are Nigerian sub-agricultural outputs, according to the Central Bank of Nigeria Statistical Bulletin (CBN, 2022), which also confirmed that agricultural output is a representation of the outputs produced in the country's agricultural sector. Additionally, agricultural labour, capital, and land—collectively referred to as control variables—were hypothesised to be factors that influence agricultural output. For the sake of clarity, land—which, in accordance with agricultural production theory, refers to all arable and cultivated land—is anticipated to consistently have a favourable and noteworthy influence on agricultural output. The percentage of land area that is arable, planted with permanent crops, and used for pastures is known as land, according to World Bank Indicators (2022);While capital is defined as cash or liquid

assets held or obtained in order to be used for investment or day-to-day business operations, labour is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job or working-time arrangement. It can be broadened to encompass a company's assets with monetary value, such as inventory, real estate, and equipment. However, cash flow is capital in the context of budgeting.

Theoretical Review

In order to model the impact of insurance intermediation on agricultural output in Nigeria, this study employed the Cobb–Douglas production function, which Shahbaz et al. (2013) used, including land as one of the elements of production in addition to capital and labour.

$Q = A(t)\, L^{\beta 1}\, K^{\beta 2}$ …… (2.1)

where $A(t) = Ae^{\partial}$. A and δ are constants. δ is a measure of the proportionate change in Q that results from technological advancement, or the proportionate change in output per time period when input levels are held constant. Neutral technical change is included in this definition; the marginal rate of labor-capital substitution is unaffected. According to this definition, technical change is disembodied and exogenous. Typically, equation (3) is calculated as follows:

$\ln Q = \alpha + \delta T + \beta_1 \ln L + \beta_2 \ln K + \mathcal{E}$ ……. (2.2)

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where $\mathcal{E}$ is an error term. Because of the log-linear specification, the estimates of β_1 and β_1 are elasticities, and a hypothesis test on the sum of β_1 and β_1 is all that is needed to evaluate CRS.

In order to model the impact of financial development and its interaction with governance indicators on agricultural output, Shahbaz et al. (2013) chose the Cobb-Douglas production function, based on the theoretical premise that land is a factor of production in addition to capital and labour. Along with the aforementioned, the Cobb-Douglas (CD) production function is worthy of being used for production process analysis due to its benefits rather than because it is viewed as an easy-to-use tool or a crude solution to estimation problems (Murthy, 2014). Its generalised form's ability to handle many inputs accounts for the aforementioned benefits. This prevents it from creating its own distortions, even when the market is flawed. Because so many variables are involved, this study deems it more appropriate.

Empirical Review

The material that is now available has continuously emphasised how agricultural insurance improves Nigerian agricultural productivity. According to Olomola and Nwafor (2018), insurance successfully lowers the financial risks associated with climatic unpredictability, allowing farmers to invest in more productive crops and cutting-edge farming practices. Similarly, Aina et al. (2024) verified that agricultural insurance ensures a more constant output by mitigating yield changes caused by unanticipated weather circumstances. Moreover, recent research has shown that farmers who have access to insurance are more likely to implement sound farming techniques, which would support agricultural productivity over time (Fawole & Aderinoye-Abdulwahab, 2021; Zakaria, Jun & Khan, 2020).

According to a research study on livestock insurance in Nigeria by Aina et al. (2024), although awareness of the product is rising, real adoption is still constrained by high premiums and the lack of customised products. Recent studies that highlight the difficulties Nigerian farmers encounter in obtaining appropriate insurance options, especially for livestock, which is still underinsured in comparison to other agricultural sectors, support this sentiment (Olowu & Vyas-Doorgapersad, 2023; Ehiogu & Chidiebere-Mark, 2019). Nigerian livestock agricultural output might be greatly increased by addressing these problems and creating more easily available and reasonably priced insurance solutions.

In their analysis of the insurance market in the fishing industry, Maltby et al. (2023) came to the conclusion that, notwithstanding the low adoption rate, fisheries insurance has substantial potential advantages. The researchers underlined that insurance may be essential in reducing risks associated with market volatility and environmental concerns, which commonly impact aquaculture. Increasing the availability of insurance products could help fish farmers stabilise their revenue streams so they can invest in sustainable practices over the long run (Prince et al., 2023; Bature, 2021).

Furthermore, increasing fisheries insurance will strengthen the economies of areas

that depend on aquaculture. According to recent research, fisheries insurance may also promote environmentally friendly behaviours by incentivising investments in technology like disease prevention and water filtering (Obialor, 2023; Oyebola & Olatunde, 2019). More strong fisheries would follow, increasing the industry's contributions to both economic stability and food security.

3.0 Methodology

The Central Bank of Nigeria Statistical Bulletin and the Nigerian Agricultural Insurance Corporation Annual Financial Reports were the sources of secondary data used in the study, which ran from 2005 to 2021. As an estimation method, Ordinary Least Square (OLS) regression was used. In accordance with the literature review, the study's model is as follows:

$$AGRIC = f(AIP, ICA, LD, LAB, CAP) \ldots. (3.1)$$

By log-linearising Equation (3.1) and adding the intercept and error terms, it gives:

$$\ln AGRIC_t = \beta_0 + \beta_1 \ln AIP_t + \beta_2 \ln ICA_t + \beta_3 \ln LDt + \beta_4 \ln LAB_t + \beta_5 \ln CAP_t + U_t \ldots.(3.2)$$

Where U is the error term, β_0 is the intercept and β_1 to β_5 are the slope parameters. AGRIC = agricultural production, as indicated by the proportion of GDP that comes from agriculture; LD stands for agricultural land as a percentage of total land area; LAB stands for agricultural labour as a percentage of total labour force; AIP stands for agriculture sector insurance claims in Naira; and ICA stands for insurance firms' assets in Naira. CAP is the valuation of the public capital stock in real naira. The time period is denoted by the t subscript, and U is the stochastic error term.

4.0 Data Presentation and Discussion of Results

Table 4.1: Descriptive Analysis

Variable	Mean	Median	Std Deviation	Minimum	Maximum
AGRIC: Agricultural Output: 2010 constant Naira value, in billions.	14,584.76	14,750.52	296.72	9,516.99	18,738.41
CROP: Crops Production Output: 2010 constant Naira value, in millions.	13,099.97	13,247.80	2,685.75	8,524.15	16,920.52
FISH: Fishing Output: 2010 constant Naira value, in billions.	299.91	317.47	72.03	183.43	384.45
LIVE: Livestock Output: 2010 constant Naira value in billions.	1,032.93	1,030.94	175.95	707.87	1,240.22
FORE Forestry: 2010 constant Naira value, in billions.	151.95	154.31	30.18	101.55	192.22
LD: Agricultural land (sq. km)	74.05	74.05	0.828	72.75	75.36
CAP: Agricultural machinery, tractors per 100 sq. km of arable land.	800.43	767.24	110.34	689.70	1053.17
LAB: Employment in agriculture (% of total employment)	31.68	29.98	3.46	28.35	38.36
ICA: Insurance Companies' Assets: 2010 constant Naira value, in billions.	2,241.17	8.94	2,859.00	3.70	6,823.90
AIP:	69,514.76	17,321.00	112,737.44	0.00	452,022.00

Source: Author's Computation, 2024.

Aggregate agricultural output, or AGRIC, had a mean of 14,584.76 billion naira from 2005 to 2021, a median of roughly 14,750.52 billion naira, and a standard deviation of 296.72 billion naira. The highest value was 18,738.41 billion naira, and the lowest was 9,516.99 billion naira, according to Table 4.1. With minimum and highest values of 8,524.15 and 16,920.52 billion naira, respectively, the crops production output, or CROP, had a mean value of 13,099.97 billion naira, a median value of 13,247.80 billion naira, and a standard deviation of 2,685.75 billion naira. Additionally, the average value of fish production output, or FISH, was 299.91 billion naira, with a median of 317.47 billion naira and a standard deviation of 72.03 billion naira. The lowest and largest values were

183.43 and 384.45 billion naira, respectively. Similarly, during the study period, Nigeria produced 1,032.93 billion naira in livestock output, or LIVE, on average, with a median of 1,030.94 billion naira and a standard deviation of 175.95 billion naira. The lowest and maximum production values were 707.87 billion and 1,240.22 billion naira, respectively.

According to Table 4.5, the average amount of forestry output, or FORE, produced in Nigeria throughout the study period was 151.95 billion naira, with a median of 154.31 billion and a standard deviation of 30.18 billion. According to Table 4.1, the average agricultural land (LD) in Nigeria during the reviewed period was 74.05, with a median value of roughly 74.05 and a standard deviation of 0.828. The lowest and greatest agricultural LD values were 72.75 and 75.36, respectively. With minimum and highest values of 689.70 and 1,053.17 per 100sq. km, respectively, Capital, CAP, had a mean value of 800.43 per 100sq. km, a median value of 767.24 per 100sq. km, and a standard deviation of 110.34 per 100sq. km. During the period under review, the average percentage of employment in the agricultural sector was 31.68 percent, with a median of approximately 29.98 percent and a standard deviation of 3.46 percent. The lowest and maximum percentages of employment in the agricultural sector were 28.35 percent and 38.36 percent, respectively.

Similarly, the assets of insurance companies (ICA) ranged from a minimum of 6,823.09 billion naira to a maximum of 3.70 billion naira, with a mean of 2241.17 billion naira, a median of 8.94 billion naira, and a standard deviation of 2,859.01 billion naira. The average value of agricultural insurance premiums, or AIP, was 6, 9514.76 million naira, according to Table 4.1. The median value was approximately 17,321.00 million naira, with a standard deviation of 112,737.44 million naira. The highest value was 452,022.00 million naira, and the lowest was 0.00 million naira and so on.

Results of Correlation Analysis

Table 4.2 presents the correlation matrix, which shows the logarithmic form of the simple or Pearson correlations between each pair of the used variables.

4.1: Pairwise Correlation Analysis

Variable	1.AGRIC	2.CROP	3.FISH	4.LIVE	5.FORE	6.LD	7.CAP	8.LAB	9.ICA	10.AIP
1.AGRIC	1									
2.CROP	0.999 (0.00)	1								
3.FISH	0.988 (0.00)	0.987 (0.00)	1							
4.LIVE	0.988 (0.00)	0.998 (0.00)	0.991 (0.00)	1						
5.FORE	0.988 (0.00)	0.987 (0.00)	0.978 (0.00)	0.989 (0.00)	1					
6.LD	-0.132 (0.62)	-0.127 (0.68)	-0.190 (0.60)	-0.119 (0.71)	-0.181 (0.60)	1				
7.CAP	0.998 (0.00)	0.997 (0.00)	0.986 (0.00)	0.998 (0.00)	0.983 (0.00)	-0.079 (0.88)	1			
8.LAB	-0.915 (0.00)	-0.913 (0.00)	-0.939 (0.00)	-0.913 (0.00)	-0.917 (0.00)	0.129 (0.72)	-0.893 (0.01)	1		
9.ICA	-0.764 (0.02)	-0.766 (0.02)	-0.819 (0.02)	-0.762 (0.02)	-0.697 (0.04)	0.230 (0.71)	-0.768 (0.02)	0.762 (0.02)	1	
10.AIP	0.803 (0.02)	0.806 (0.02)	0.744 (0.02)	0.802 (0.02)	0.763 (0.02)	0.318 (0.69)	0.830 (0.02)	-0.515 (0.06)	-0.559 (0.06)	1

Source: Author's Computation, 2024.

Explanatory notes: The following are the Meanings of Acronyms:AGRIC =Agricultural Output; CROP = Crops Output; LIVE = Livestock Output; FORE = Forestry Output; FISH = Fishing Output; ICA = Insurance Companies' Assets; LD = Land; CAP = Capital; LAB = Labor; AIP = Agricultural Insurance Premium.

Table 4.2's Column 1 shows that aggregate agricultural output (AGRIC) has a positive correlation with each of the following variables: CROP, LIVE, FORE, FISH, CAP, and AIP; a negative correlation with each of LAB and ICA; and no correlation with any of the other variables used in the study. This is based on the correlation coefficient's cutoff statistical significance of 0.05. The table's Column 2 and Row 2 show that crop output (CROP) has a positive correlation with each of the following variables: AGRIC, LIVE, FORE, FISH, CAP, and AIP; a negative correlation with each of LAB and ICA; and no correlation with any of the other one (1) variables listed. This is based on the statistical significance level of 0.05. According to the table's Column 3 and Row 3, fishing output (FISH) has a negative association with LAB and ICA, a negative correlation with AGRIC, FORE, LIVE, CROP, CAP, and AIP, and no correlation with any of the study's variables. Additionally, Table 4.2's Column 4 and Row 4 demonstrate that livestock production (LIVE) has a negative association with LAB and ICA, a negative correlation with AGRIC, FORE, LIVE, CROP, CAP, and AIP, and no correlation with the study's other (1) variable.

Forestry output (FORE) has a negative association with each LAB and ICA, a negative correlation with each of AGRIC, CROP, FORE, LIVE, CAP, and AIP, and no correlation with the other (1) variable used in the study, according to Table 4.2's Column 5 and Row 5. Going on to the table's Column 6 and Row 6, it is evident that land (LD) has no correlation with any of the variables it contains. Capital (CAP) shows positive relationships with each of the following: AGRIC, CROP, LIVE, FORE, FISH, CAP, and AIP, as indicated by Column 7 and Row 7 of the table. Zero association with the other two factors that were studied. In a similar vein, Table 4.2's Column 8 and Row 8 demonstrate that labour (LAB) has a positive association with ICA, a negative correlation with each of the following variables: AGRIC, CROP, FISH, FORE, LIVE, CAP, and AIP, and no correlation with the research's other one (1) variable.

As can be seen in Column 9 and Row 9 of Table 4.2, the assets of insurance firms (ICA) have a positive correlation with LAB, a negative correlation with AGRIC, CROP, FISH, FORE, LIVE, CAP, and AIP, and no correlation with any of the other variables included in the study. Agricultural insurance premium (AIP) has a positive association with each of the following variables: AGRIC, CROP, FISH, FORE, LIVE, and CAP. It has no correlation with any of the other three variables in the table, as seen in Column 10 and Row 10.

Results of the Regression Analysis

The regression findings are shown and discussed in this section. The study provides five (5) equations for the five different types of agricultural outputs in Nigeria in Table 4.3. These equations are all variations of Equation 2 in the section above. With all variables in actual 2010 naira values, the estimates are for the Ordinary Least Square regression result, which is shown in Table 4.6. If the calculated test statistic's p-value is less than or equal to the 5% critical significance level, the coefficient is deemed statistically significant.

Table 4.2: Results of Estimation of the Models for the Effect of Non-Deposit Money Banks Financial Intermediation on Agricultural Output in Nigeria

	AGRIC			CROP			LIVE			FISH			FORE			VIF
Variable	Coeff.	T-Stat	P-Value	Coeff.	T-Stat	P-Value	Coeff.	T-Stat	P-Value	Coeff.	T-Stat	P-Value	Coeff.	T-Stat	P-Value	
ICA	7.52	4.25	0.00	3.16	0.84	0.43	1.62	7.94	0.00	-4.89	-0.13	0.90	8.67	5.69	0.00	9.71
AIP	1.92	0.83	0.43	8.78	0.29	0.78	-3.92	-1.46	0.61	-4.41	-1.47	0.19	3.23	0.26	0.80	5.96
LD	0.20	5.40	0.00	0.22	4.47	0.00	0.29	6.66	0.00	0.28	5.81	0.00	0.22	11.08	0.00	2.65
LAB	-0.02	-3.26	0.01	-0.01	-1.33	0.22	-0.00	-0.62	0.55	-0.020	-2.30	0.06	-0.02	-4.60	0.00	2.84
CAP	-5.56	-1.15	0.28	-0.04	-0.68	0.52	-0.00	-0.07	0.61	-4.48	-0.68	0.52	-2.61	-0.96	0.37	7.83
C	-4.93	-1.68	0.13	-5.85	-1.60	0.15	-14.22	-4.22	0.00	-14.22	-3.78	0.01	-10.77	-6.90	0.00	
R^2	0.99			0.99			0.99			0.99						
Adjusted R^2	0.99			0.99			0.99			0.99						
F-statistics	813.65		0.00	342.67		0.00	462.57		0.00	608.70		0.00				
Jacque Bera Test	1.04		0.59	2.12		0.35	1.34		0.51	0.78		0.68				
(?) for Autocorrelation	0.65		0.55	0.03		0.97	0.27		0.77	0.82		0.49				
(?) for Heteroskedaticity	0.59		0.71	1.54		0.29	2.40		0.08	1.08		0.45				

Source: Author's Computation, 2024.

*Explanatory note: The following are the meanings of the acronyms:AGRIC = Aggregate Agricultural Output; CROP = Crops Output; LIVE = Livestocks Output; FISH = Fishing Output; FORE= Forestry Output; ICA = Insurance companies Assets; AIP = Agricultural Insurance Premium; LD = Land, LAB= Labour, CAP= Capital, VIF = Variance Inflation Factor; P-value are provided in the third column under each model. A variable's coefficient is adjudged to be statistically significant in the study if the p-value is not more than 0.05. The Jacque Berra Test, (□) for Autocorrelation and (□)for Heteroskedaticity are Jacque-Berra residual normality test, The Breusch-Pagan-Godfrey LM test for autocorrelation.*According to the results in Table 5, the R2 value for each model falls between 0.99 and 0.99, meaning that changes in the explanatory variables that were part of the model accounted for between 99% and 99% of the changes in the dependent variables. Additionally, because all of the p-values are significantly less than 0.05, the results in the same table demonstrate that all of the F-statistics for the R^2 values are statistically significant at 5%. This suggests that the models are generally well-fit and have a high explanatory power.

Furthermore, the results of the Variance Inflation Factor (VIF) test, which was used to identify multicollinearity issues, show that the average VIF statistic was not higher than the generally accepted cutoff of 10, above which multicollinearity may be an issue (Dimitrios and Stephen, 2016). Similarly, the Breusch-Pagan test findings show that the model is not experiencing a heteroscedasticity issue because all of the calculated test statistics' p-values are higher than the threshold, which in this paper is assumed to be 5%. Additionally, because the p-values of the Chi-squared test statistics are higher than the selected level of significance (in this paper, 5%), the results of the Breusch-Godfrey LM test show that there is no autocorrelation in the model. Lastly, since all of the p-values of the Jacque-Berra test statistics are higher than the predetermined 5%

significance level, the results of the test that was performed to ascertain whether the residuals' distribution was normal or non-normal show that the residuals are normally distributed. After assessing the results of the numerous diagnostic tests, the performance of each of the particular variables contained in the model is now covered below.

The coefficients for the five model estimations of the insurance companies' assets (ICA) performances are 7.52, 3.16, 1.62, -4.89, and 8.67, respectively. The corresponding p-values for the AGRIC, CROP, LIVE, FISH, and FORE models are 0.00, 0.43, 0.00, 0.90, and 0.00. This indicates that ICA has no effect on the CROP and FISH models but a positive effect on the AGRIC, LIVE, and FORE models. The output of AGRIC, LIVE, and FORE will therefore increase by roughly 7.52, 1.62, and 8.67 naira for every naira increase in ICA, and vice versa. The coefficients for the agricultural insurance premium (AIP) are 1.92, 8.78, -3.92, -4.41, and 3.23, respectively, while the corresponding p-values for the AGRIC, CROP, LIVE, FISH, and FORE models are 0.43, 0.78, 0.61, 0.19, and 0.80. This suggests that AIP has no impact on Nigeria's total agricultural output or any of its subsectors.

For the AGRIC, CROP, LIVE, FISH, and FORE models, the corresponding p-values are 0.00, 0.00, 0.00, and 0.00, whereas the agricultural land (LD) coefficients are 0.20, 0.22, 0.29, 0.28, and 0.22, respectively. This indicates that both the overall agricultural output and the output of each agricultural subsector benefited from LD as anticipated. Thus, for every square kilometre of more agricultural land, the corresponding increases in AGRIC, CROP, LIVE, FISH, and FORE would be 0.20, 0.22, 0.29, 0.28, and 0.22, and vice versa. The coefficients of agricultural labour, or LAB, are -0.02, -0.01, -0.00, -0.02, and -0.02 correspondingly, and the corresponding p-values for the AGRIC, CROP, LIVE, FISH, and FORE models are 0.01, 0.22, 0.55, 0.06, and 0.00. This suggests that the FORE model is negatively impacted by LAB, but the AGRIC, CROP, LIVE, and FISH models are unaffected. Similarly, for the AGRIC, CROP, LIVE, FISH, and FORE models, the corresponding p-values are 0.28, 0.52, 0.61, 0.52, and 0.37, whereas the coefficients for agricultural capital, or CAP, are -5.56, -0.04, -0.00, -4.48, and -2.61. As a result, CAP has no impact on any of Nigeria's agricultural output variations.

5.0 Conclusion and Recommendations

Based on the results, this study came to the conclusion that the assets of insurance companies (ICA) significantly and favourably affect agriculture, livestock, and forestry. This is due to the fact that the results showed that a rise in ICA in naira will result in increases in AGRIC, LIVE, and FORE, respectively. Additionally, Nigerian agricultural output is not much impacted by agricultural insurance premiums. This is because it has no impact on any of the sub-agricultural and overall outputs taken into account in this study. Land has a favourable impact on both total and sub-agricultural production. Thus, for every square kilometre of additional agricultural area, there would be corresponding increases in AGRIC, CROP, LIVE, FISH, and FORE, and vice versa.Only land, out of all the control variables taken into account in this study, has an effect on agricultural output in Nigeria. This was demonstrated by the results, which showed that an increase of one square kilometre in agricultural land would result in an increase in each of the following: AGRIC, CROP, LIVE, FISH, and FORE, and vice versa. Nigerian agriculture output is negatively and completely unaffected by other factors like labour and capital. Therefore, this study suggested that the Federal Government implement beneficial policies for its agencies, such as the Nigerian Agricultural Insurance Corporation (NAIC), in order to boost the assets of insurance companies and other sub-outputs of Nigerian agriculture, including crop production and fishing.In order to increase productivity and influence all agricultural varieties, Nigerian Agricultural Insurance Corporation must constantly make sure that insurance premiums are reinvested in the agricultural sector. This will ultimately result in its contributions to the GDP of Nigeria. Lastly, to facilitate farming and development, land (LD), a key component of production, should always be accessible and reasonably priced for all farmers.

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