# Capital Market Development and Agricultural Sector Output in Nigeria

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## A B S T R A C T

The capital market is a segment of the financial system that creates the framework and mechanism for harnessing, generating, managing and channeling funds into capital intensive production-oriented long-term projects and business ventures to support the productive sector. In developing economies as Nigeria, the capital market has been fraught with smallness of size, liquidity issues, low trading activities, poor infrastructural facilities, stringent operational requirements to smaller companies and low level of public awareness that culminate to hamper market efficiency. Financial market development theories suppose that the capital market should prop up and drive the productivity and growth of the economy. This study investigated the effect of capital market development indicators on the agricultural sector output in Nigeria. Four capital market development indicators (market capitalization, turnover ratio, all share index and new issues) are the independent variables while real sector output from agriculture is the dependent variable. The data were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and CBN Annual Report and Accounts. The Auto-regressive Distributive Lag (ARDL) technique was used for model estimation since the Unit roots confirmed the presence of both level I(0) and first difference I(1) stationarity among the variables.

The results showed that Capital market development indicators have significant long and short run effect on agricultural sector output in Nigeria; but no causal relationship between capital market development and agricultural sector output. It is recommended that the regulatory authorities and government should encourage the private sector by making policies that will further boost private sector participation in Nigeria.

## 1. Introduction

The agricultural sector is the first and very important sector that supports production of food and raw materials for industrial production. Agriculture is an enterprise, activity or practice, that is synonymous to farming, that often involves the cultivation of the soil to grow plants and the raising of animals for the production of food, feed, fibre and other goods by the systematic growing and harvesting of plants and animals (Okafor, 2020). The primary sector that sustains food and materials for industrial and even technological advancement is the agricultural resources. For instance, man grows crops, plants and herbs for vegetables, medicine, food, fiber and industrial raw materials; and animal husbandry for meat and fish (Kehinde, 2012; Victor & Eze, 2013), for economic benefits.

Agriculture is an important sector of Nigerian economy. It is a sector that establishes the industrialization framework through supplying raw materials for industries, example, timber for paper manufacturing industry, skin and hides for leather making industry. The sector generates foreign exchange through the export process of agricultural products. It also creates a source of employment to the population through farming, business and research activities thereby raising the standard of living of individuals. Before the discovery of oil in the country in the late 1950s and early 1960s, agriculture was the dominant sector of Nigeria economy, providing over 65% of the country's Gross Domestic Product (GDP) and provided the bulk of the foreign exchange earnings through the export of cash crops. With the emergence of oil as a major source of government revenue and foreign exchange earner the sector was neglected and hence led to the decline (Ugwu, 2010). Despite several bottlenecks in the sector, it remains a resilient sustainer of the populace. In the last two decades, its impact may not have been so prominent because of the dominating effect of the oil sector which annually contributed not less than 96% of the nation's total export earnings (CBN, Annual Report and Statement of Accounts, various Issues).

Report from CBN statistical bulletin reveals that the agriculture is the largest contributor to the Nigerian GDP. The agricultural contribution from 2017 to 2021 are 23,952.55; 27,371.30; 31,904.14; 37,241.61; and 41,126.06 for years 2017 to 2021 respectively, constituting over 21% of the national GDP, makes that agriculture the largest contributor and mainstay of economic productivity in Nigeria.

The nexus between capital market development and sectoral output has been well documented in theoretical and empirical literature. Sectoral output as the contributor of each of the real sectors to the cumulative national output has often being discussed as offshoot of economic growth. The capital market has the potential to funds from the surplus units and channels same to the deficit units of real sector. The intent for such funds is to boost productive activities by making funds available to enterprises. This ultimately creates employments, enhance welfare and economic growth. The intensifying demand for capital from the private sector, occasioned by high rate of growth and development in the economy necessitates the need for efficient and proper functioning of the capital market.

Capital market is an essential part of an economy which encourages industries, trade and commerce to

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flourish without any resource or capital hindrance because, it plays a crucial role in the growth and development of business firms, and it is a healthier platform for business entities and investors with expansion plans or new project that are in dire need of funding (Idris, 2020). The development of the capital market ensures that there are prospects for greater funds mobilization, enhanced efficiency in resource allocation as well as providing relevant information for appraisal (Inanga & Emenuga as cited in Enaruna & Okene, 2019). As well, a vibrant capital market helps in savings mobilization for economic growth and development, and ensures proficient allocation of resources through changes in wealth ownership and composition, accelerating formation of a healthy private sector, and aiding the promotion of rapid capital formation (Iyoha as cited in Enaruna & Okene, 2019). Esian and Ebipre (2020) envisage that many profitable enterprises require long-term capital, but investors are often reluctant to relinquish control of their savings for long periods, hence the capital market serves as a veritable avenue for investors and businesses to achieve their goals has not been without impediments over the years.

Any forward-thinking nation seeks an optimum industrial base to move the economy from a traditional and low level of production to a more automated and efficient system of mass production and processing of goods and services (Idris, 2020), and this is made possible by the activities of the real sector of the economy oiled by the availability of fund from the capital market. The real sector of the economy is concerned with actually producing goods and services as opposed to the part of the economy that is concerned with buying and selling the financial markets (Mazeli, Adigwe & Ananwude, 2020). According to the Central Bank of Nigeria (CBN) (2021) statistical bulletin, the real sector of Nigeria's economy, one of which is the agriculture, has arguably been the engine of the country's economic transformation over the years. Importantly, the sector has metamorphosed into an emerging industrial workhorse from a hitherto rudimentary agrarian economy that can hardly be ignored. This study has examines the effect of capital market development indicators (market capitalization ratio, turnover ratio, all-share index, and new issues ratio) on variations in agricultural sector output in Nigeria.

## 2. Theoretical Review

The ideology of this study is hinged on the supply leading hypothesis of the finance theory. The supply leading hypothesis is premised on the seminal work of Schumpeter (1911). It postulates that a well-functioning financial sector is necessary to facilitate growth in the real sector which resultantly leads to economic growth. In other words, economic growth is reliant on how well the financial sector is deepened or developed. As the financial sector deepens, there is increase in the supply of financial services. Supply-Leading Hypothesis states that capital market development stimulates and drives outputs to the economy.

This supposes that capital market development can promote growth through a number of channels which include mobilization of savings through attractive instruments, efficient allocation of capital, reduction of cost of information gathering, and a better access to investment information among others. This study hence postulates that capital market indicators can influence the agricultural sector output. The influence takes effect via two different but complementary channels: the accumulation channel and the allocation channel. The accumulation channel occurs through the impact of physical and human capital on economic growth (Pagano, 1993); while the allocation channel occurs through efficient resource allocation as a result of financial deepening that drives growth (King & Levine, 1993). The capital market encourages support for the agricultural sector through the efficient allocation provided by the capital market. The capital market can provide safety, liquidity, and marketability of capitals. These

features the reasons that capital market development could drive enhanced sectoral output. Hence a well-functioning capital market system is considered necessary for economic growth.

## 3. Empirical Studies

In the agricultural sector, the crop production sub-sector has been found as the most active. Most studies on this sector has taken the agricultural sector in aggregate as one sector. Such studies include the very recent work of Obialor, Ibe and Offor (2022) that examined the effect of capital market on agricultural sector output in Nigeria, with specific objectives of finding out the effects of market capitalization, value of transactions and share index on agricultural sector output in Nigeria within the liberalised economic era spanning 1987 to 2019. The Autoregressive Distributive Lag approach was adopted for data analyses wherein it was found that market capitalization and share index had a positive effect on Agricultural sector output while value of transaction had negative effect on agricultural sector output in Nigeria. It further revealed no long run effects among the variables. The study thus suspected that Nigerian capital market have not invested adequately to boost the agricultural sector.

In another study, Ngong, Kesuh, Asah, Ibe and Onwumere (2022) carried out a study that investigated the relationship between stock market development and agricultural growth in African emerging economies from 1990 to 2020. The study used the agricultural value added to the gross domestic product as proxy for agricultural growth while the market capitalization and stock value traded were measures of stock market development. Twelve African economies covered in the study were Botswana, Egypt, Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania, Tunisia, Uganda and Zambia. Agricultural value added (AGRVA) to GDP is the measure for agricultural growth. Market capitalization (MCAP) and stock value traded (SVT) are proxies for stock market development. The broad money supply ratio (M2/GDP), physical capital (PHKAP) and labour (LAB) are control variables. The study employed the fully modified ordinary least squares (FMOLS), dynamic ordinary least squares (DOLS) and Granger causality tests and found that market capitalization negatively affects agricultural growth while stock value traded positively affects agricultural growth in the fully modified and dynamic ordinary least square techniques. The findings also showed bidirectional causality between labour and agricultural value added with unidirectional causality flow from agricultural value added to market capitalization and stock value traded.

Uwajumogu, Ogbonna, Chijioke and Agwu (2013) investigated the capital market growth-induced impact on agricultural sector in Nigeria from 1980 to 2012 using co-integration approach. The study agricultural sector was measured by agricultural growth rate and capital market was proxied by market capitalization ratio and all-share index. Electricity, inflation rate and gross capital formation were control variables. The results indicated that market capitalization ratio and all-share index statistically and insignificantly affected Nigerian agricultural output in the long run.

Agbaeze and Onwuka (2013) estimated capital market option to finance agriculture in Nigeria adopting a qualitative research design. The findings showed that economic down turn shifted the tide of economic policies and research focus towards agriculture. The oil sector retrogressive earnings performance highlighted the need for economic diversification alongside the revenue base.

Using a simple regression model, Ugwuanyi (2012) examined the effect of the new issues market on agricultural productivity in Nigeria from 1990 to 2009, based on the Beck, Demirguc-Kunt, Levine and Maksimovic (2001) and Levine (2000) growth function model. An OLS regression result showed that new issues had a positive and significant effect on agricultural output in Nigeria.

## 4. Methodology

The study employed the *ex-post facto* design to capital market development indincators and agricultural output from reputed CBN Annual Report and Statistical Bulletin, for period covering the liberalised era in Nigeria economy spanning 1987 to 2021.

The dependent variable is sectoral output of agriculture in Nigeria. The proportion of the GDP to agricultural output was used (ASO). The independent variables are selected capital market development indicators. These will be the market capitalization ratio (MCR), turnover ratio (TOR), all-share index (ASI), and new issues ratio (NIR).

A number of capital market indicators are employed to proxy for the capital market performance that the specific objectives represented. These include

1. Market Capitalization Ratio (MCR) is proxy for stock market size. Market capitalization in Nigeria comprises government securities, corporate bonds, Exchange Trade Funds and equities. The value is computed as total market capitalization divided by Real GDP. This is market capitalization ratio. The sectoral market capitalization will be used against the sectoral Gross Domestic Products for each selected sector.

2. Turnover ratio (TOR) is used as proxy for stock market liquidity. It is obtained as the total value of traded shares divided by total market capitalization. The variable in this study is the total value traded for the selected sector divided by the market capitalization for the given sector. Thus, the TOR is an industrial sector ratio and not the aggregate of all sectors.

3. All Share index (ASI) is used as proxy for stock market volatility. It measured the stock market riskiness. The sectoral ASI will be obtained for each sub-sector. The data will be expressed as the log of the index values.

4. New issues Ratio (NIR) is used as proxy for the mobilization and injection of new funds into the real. This is obtained as the total value of new shares issues and subscribed to for capital investment of quoted firms in Nigeria. It is obtained by dividing the New Issued Amount by Real GDP. The values will be sector specific.

The model for the study is based on the assumption that capital market development indicators will enhance the productivity in the agricultural sector. The model was adapted from the works of Ayodeji and Ajala (2019). The work of Ayodeji and Ajala used a disaggregated GDP of agriculture, industry, building & construction, wholesale & retail trade, and services sectors as dependent variable of growth. The functional model Ayodeji and Ajala (2019) is expressed as:

GDP = f(MCAP, ASI, NLE, NOD, VOD, VTRAN, SMT)          (1)

Where:

GDP = Gross Domestic Product (broken down into agriculture, industry, building & construction, wholesale & retail trade, and services sectors)

MCAP = Market Capitalization

ASI= All Share Index

NLE = Number of Listed Equities

NOD = Number of Deals

VOD = Value of Deals

VTRAN = Value of Transactions

SMT= Stock Market Turnover

The modified version of the model is developed to remove NLE and NOD as measure of size, and VOD and VTRAN as measure of liquidity. This is premised on the trend that market capitalization (MCR) and TOR were most acceptable proxies for size and liquidity, respectively (Alajekwu & Ezeabasili, 2012). The present study then added new issues ratio to factor in capital accumulation and injection of funds into the economy.

The functional model of the present study is as follows:

**Model:** ASO = f(MCR, TOR, ASI, NIR)                    (3)

Where:

ASO = Agricultural sector output, represented by proportion of agricultural sector contribution to Real GDP

MCR = Market capitalization ratio as proxy for market size

TOR = Turnover ratio as proxy for market liquidity

ASI = All-Share index as proxy for market riskiness

NIR = New issues ratio as proxy for primary market efficiency

The model is rewritten in econometric form as:

$$ASO = \alpha_0 + \alpha_1 MCR + \alpha_2 TOR + \alpha_3 ASI + \alpha_4 NIR + \varepsilon \qquad (4)$$

Where:

$\alpha_0$= constant coefficient

$\alpha_1 - \alpha_4$ = coefficients of the independent variables

$\varepsilon$ = error term

Theoretically, all the variables of capital market development are expect6ed to have positive relationships with growth, inline with the the assumption of the Supply-Leading Hypothesis. This means the coefficients of the measures of capital market development should be greater than zero.

## 5. Data Analysis And Interpretation

The study employed two unit root techniques to determine the stationarity or otherwise of variables used in the study. The Augmented Dicker Fuller (ADF) and Philip Peron (PP) tests are done on level series, first and second order differenced series. It is expected that the result of one will validate the other.

## Table 1: Summary of Unit Root Test for Stationarity

| Variables | At Level | | First Difference | | Order of Integration |
|---|---|---|---|---|---|
| | t-Statistic | Prob. | t-Statistic | Prob. | |
| **Augmented Dicker Fuller Test** | | | | | |
| MCR | -1.7175 | 0.4137 | -6.5132 | 0.0000 | 1(1) |
| TOR | -2.4521 | 0.1358 | -7.7394 | 0.0000 | 1(1) |
| LogASI | -2.4235 | 0.1431 | -4.4107 | 0.0014 | 1(1) |
| NIR | -3.0293 | 0.0424 | -3.8244 | 0.0067 | 1(0) |
| ASO | -1.8539 | 0.3488 | -6.5292 | 0.0000 | 1(1) |
| **Philip Peron Test** | | | | | |
| MCR | -1.5302 | 0.5065 | -9.4978 | 0.0000 | 1(1) |
| TOR | -2.3595 | 0.1603 | -8.1893 | 0.0000 | 1(1) |
| LogASI | -3.0110 | 0.0439 | -4.0764 | 0.0033 | 1(0) |
| NIR | -2.0240 | 0.2756 | -5.4696 | 0.0001 | 1(1) |
| ASO | -2.5317 | 0.1172 | -8.6076 | 00000 | 1(1) |

The results showed presence of both level and first differenced stationarity among the variables, in a mixed order. The variables for MCR, TOR, and ASO are not stationary but become stationary at the first difference for both ADF and PP statistics. Thus, these variables are found to e stationary at 1(1). However, LogASI is seen as stationary at first difference 1(1) for ADF statistics but at level 1(0) for PP statistics. Then NIR become stationary at level 1(0) but stationary at first difference 1(1) in the PP statistics. These behaviours depict presence or of traces of 1(0), and 1(1) in the same model. Considering the presence of combined stationarity status, the most suitable tool of analysis is the Autoregressive Distributive Lag technique (ARDL).

## Table 2: Estimation of long run relationship and cointegration for agricultural sector model

ARDL Long Run Form and Bounds Test

Dependent Variable: D(ASO)

Sample: 1987 2021

Included observations: 31

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| MCR | -1.024184 | 0.214481 | -4.775163 | 0.0002 |
| TOR | 0.117312 | 0.213277 | 0.550046 | 0.5904 |
| LOGASI | 15.98163 | 4.701210 | 3.399470 | 0.0040 |
| NIR | 6.235029 | 2.523207 | 2.471073 | 0.0259 |
| C | -37.72224 | 19.61609 | -1.923025 | 0.0737 |
| EC = ASO - (-1.0242*MCR + 0.1173*TOR + 15.9816*LOGASI + 6.2350*NIR - | | | | |
| 37.7222) | | | | |
| F-Bounds Test | | Null Hypothesis: No levels relationship | | |
| Test Statistic | Value | Signif. | I(0) | I(1) |
| | | | Asymptot | |

| | | | ic: n=1000 | |
|---|---|---|---|---|
| **F-statistic** | **4.095197** | 10% | 2.2 | 3.09 |
| K | 4 | **5%** | **2.56** | **3.49** |
| | | 2.5% | 2.88 | 3.87 |
| | | 1% | 3.29 | 4.37 |

The result of the bound test shows F-value of 4.0952 which is greater than both the i(0) and i(1) values at 0.05 level of significance. Since the F-value is higher than i(1), we reject null hypothesis and conclude that long run relationship and cointegration exist. Thus, study posit that capital market development indicators had significant effects on agricultural sect output in Nigeria. The nature of the long run relationship is captured in the ARDL Long Run Form as shown on equation below.

**EC = ASO - (-1.0242\*MCR + 0.1173\*TOR + 15.9816\*LOGASI + 6.2350\*NIR - 37.7222)**

From the results on Table 2, MCR has a long run regression coefficient of -1.0242 which indicates a negative relationship. The TOR, LogASI and NIR coefficients are 0.1173, 15.9816 and 6.2350 respectively, indicating positive long run relationship with ASO. The p-values of the coefficients are: MCR (0.0002), TOR (0.5904), LogASI (0.0040), and NIR (0.0259). At 0.05 level of significance, the coefficients for MCR, LogASI and NIR are less than 0.05 while that of TOR is greater than 0.05. Thus the study rejected null hypotheses for MCR, LogASI and NIR and cannot reject hypothesis for TOR. It thus conclude that MCR has a negative and significant effect on agricultural sector output, whereas LogASI and NIR had positive and significant effects on the long run agricultural sector output in Nigeria. TOR did not shows a positive but no significant effect on ASO.

This study further estimated the Error Correction Model (ECM) on Table 3 to explain the short run dynamism in the study. The results shown on Table 3 explains the speed of adjustment to equilibrium as well as the nature of short run relationship between capital market development indicators and agricultural sector output in Nigeria.

### Table 3: Estimation of short run dynamics for capital market development and agricultural sector output

ARDL Error Correction Regression

Dependent Variable: D(ASO)

Sample: 1987 2021

Included observations: 31

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(ASO(-1)) | 0.509805 | 0.153139 | 3.329034 | 0.0046 |
| D(MCR) | -0.208087 | 0.112876 | -1.843508 | 0.0851 |
| D(MCR(-1)) | 0.518058 | 0.119419 | 4.338174 | 0.0006 |
| D(MCR(-2)) | 0.226380 | 0.081935 | 2.762924 | 0.0145 |
| D(MCR(-3)) | 0.157910 | 0.083124 | 1.899698 | 0.0769 |
| D(LOGASI) | -3.318519 | 5.271296 | -0.629545 | 0.5385 |
| D(NIR) | 0.004875 | 1.127534 | 0.004324 | 0.9966 |

| | | | | |
|---|---|---|---|---|
| D(NIR(-1)) | -4.559010 | 1.014602 | -4.493396 | 0.0004 |
| D(NIR(-2)) | -3.399761 | 0.971118 | -3.500874 | 0.0032 |
| D(NIR(-3)) | -2.889115 | 0.962517 | -3.001626 | 0.0089 |
| CointEq(-1)* | -0.927601 | 0.163060 | -5.688724 | 0.0000 |
| R-squared | 0.713978 | | | |
| Adjusted R-squared | 0.570966 | | | |

* p-value incompatible with t-Bounds distribution.

The result of the Cointegration Equation Error Correction (CointEq(-1)*) is used to determine the speed of adjustment of the long run deviation to equilibrium. The Coefficient is rightly signed with a negative value of -0.9276 with a p-value of 0.0000. Since the coefficient has a negative sign it implies that capital market development indicators have an error correction effects. This shows that any deviation from the economic trends will eventually return to normally in the short run. Since the p.value is less than 0.05 level of significance, it indicates that the coefficient has significant effect. The study thus posit that the speed of adjustment to equilibrium is 92%. This means that about 92% of the changes from equilibrium will be adjusted to normalcy within the short run period of one year.

The results on Table 3 depict that ARDL ECM analyses of the short-run effect of capital market development indicators (MCR, TOR, LogASI and NIR) on agricultural sector output in Nigeria. The coefficient of the endogenous ASO variable is positive (0.5098) and significant (t = 3.3290, p.value = 0.0046) in the period after current year. This indicates that agriculture sector output is an endogenous variable in the model.

The coefficient of Market Capitalisation Ratio (MCR) has a negative relationship at current period (-0.208087), and positive relationship at lag 1 (0.518058), lag 2 (0.226380) and lag 3 (0.157910). This suggests that a unit change in MCR would first result in about 0.21 unit fall in agricultural output and eventual rise by 0.51 unit, 0.23 unit and 0.16 unit from year 1 through 3 years of the change. However, the p.value of MCR coefficient only had a statistically significant effect on agricultural sector output in the period of lags 1 and 2. Thus, MCR shows positive and significant effects on agricultural output after the first year and second year lags.

The coefficient of regression for All Share Index (LogASI) is -3.3185 with a t-value (t = -0.629545, p.value = 0.5385) in the current period of the study. Since the p.value is greater than 0.05 level of significance, it posit that All Share Index has a negative and insignificant effect on agricultural output in the short run.

The coefficient of New Issues Ratio (NIR) has a positive relationship at current period (0.004875), and negative relationship at lag 1 (-4.559010), lag 2 (-3.399761) and lag 3 (-2.889115). This suggests that a unit change in NIR would first result in about 0.0048 unit rise in agricultural output and eventual fall by 4.55 unit, 3.39 unit and 2.89 unit from year 1 through 3 years of the change. However, the p.value of NIR coefficient is 0.9966 for current period, 0.0004 at lag 1, 0.0032 at lag 2 and 0.0089 at lag 3. The p-value is greater than 0.05 level of significance at the current year and less than 0.05 at lags 1, 2 and 3 period. Since the p.value is less than 0.05 in the lags 1 to 3 periods, the study rejects the null hypothesis and posit that NIR shows negative and significant effects on agricultural output in the lag periods from one to three years of change. The study further investigated the causal direction of the effects in the models with the pairwise granger causality result on Table 4.

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## Table 4: Estimation of causal relationship between capital market development indicators and agricultural sector output

Pairwise Granger Causality Tests

Sample: 1987 2021

Lags: 2

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|---|---|---|---|
| MCR does not Granger Cause ASO | 33 | 0.22598 | 0.7992 |
| ASO does not Granger Cause MCR | | 0.12551 | 0.8825 |
| TOR does not Granger Cause ASO | 33 | 1.31214 | 0.2853 |
| ASO does not Granger Cause TOR | | 1.50589 | 0.2392 |
| LOGASI does not Granger Cause ASO | 33 | 3.11216 | 0.0602 |
| ASO does not Granger Cause LOGASI | | 0.34750 | 0.7095 |
| NIR does not Granger Cause ASO | 33 | 1.17105 | 0.3248 |
| ASO does not Granger Cause NIR | | 0.78560 | 0.4656 |

The granger causality result are as follows: at 0.05 level of significance, the F.statistics for MCR → ASO (F.value = 0.22598, p.value = 0.7992) and ASO → MCR (F.value = 0.12551, p.value = 0.8825). Since the p.values are greater than 0.05 level of significance, the study posit that there is no causal relationship between MCR and ASO.

Also, the pairwise granger causality result for TOR and ASO are as follows: TOR → ASO (F.value = 1.31214, p.value = 0.2853) and ASO → TOR (F.value = 1.50589, p.value = 0.2392). Thus the study posit that there is no causal relationship between TOR and ASO.

The F-values for LogASI and ASO have p.values greater than 0.05 level of significance. Thus both the causal relationship from LogASI → ASO and ASO → LogASI are not statistically significant. The study posit that there is no causal relationship between LogASI and ASO.

Also, the F-values for NIR and ASO have p.values greater than 0.05 level of significance, showing that both the causal relationship from NIR → ASO and ASO → NIR are not statistically significant. The study posit that there is no causal relationship between NIR and ASO. Overall, the study posit that capital market development indicators do not have causal relationship with agricultural sector output in Nigeria.

### Discussions

The analysis has revealed that capital market development indicators have significant long and short run effect on agricultural sector output in Nigeria; but no causal relationship exist between capital market development and agricultural sector output. The hypothesis tested concluded that the market capitalisation ratio has a negative and significant effect on agricultural sector output, whereas all share index (depicting riskiness) and new market issues had positive and significant effects on the long run agricultural sector output in Nigeria., but the turnover ratio (depicting liquidity) did not shows a positive but no significant effect on agricultural sector output in Nigeria.

The outcome of the study implies that capital market development has effect on the output of the agricultural sector in Nigeria. However, this effect holds in both long and short runs. In the long run,

injecting new funds through new issues and he perceived market riskiness (all share index) boosts the output while existing capitalization significantly arose the national outputs with the liquidity not having effect on the outcome of the agricultural sector activities.

The positive effect of the market capitalization persists from short to very long run whereas the new issues appears to show negative influence in the short run before picking up to boost outputs in the long run. This supposes that the long run effect in the agriculture sector is driven by new issues market and the all share index (which is the movement of firm performance for time). This implies that a well performing agricultural sector in the capital market as well as the injection of new funds are the driers of growth in the agricultural sector output in Nigeria. Nonetheless, market capitalization had shown to discourage the market output. The short run issues is such that about 92% speed of adjustment is attributed to the market dynamism. It is thus apt to posit that capital market activities is capable of stabilising and enhancing a sustainable agricultural sector for Nigeria.

Even at that, further analysis showed that capital market development indicators do not have causal relationship with agricultural sector output in Nigeria. This insinuates that there are other factors responsible for the agricultural sector outcomes and capital market development activities that are not related to the respective conditions of the dependent and independent variables of this study. It means that neither the supply leading nor the demand following hypotheses holds for the agricultural sector in Nigeria. Hence the capital market is a self-reliant market that serves the economic agents without recourse to its survival. This tends to suppose that the agricultural sector have survived in the Nigerian economy with ir without inputs from the capital market. This tends to suggest that agriculture in Nigeria has been run with predominantly with funds from other sources other than the capital market such as direct financing and bank loans.

The theoretical review has shown that the risky nature of the agricultural sector endears it to the capital market as a suitable financing mix. However, Modigliani and other theorists agree that the reason for lack of causal relation is that agricultural sector does not survive that high cost of funding available in the financial sector. The government have created a special credit scheme that factors low interest as the capital market to encourage the agricultural sector.

The outcome of this study with long and short run effect supports the extant studies of Ubiakor, Ibe and Offor (2022), Ugwuanyi (2012) but disagrees with Uwajumogu Ogbonna and Chijioke (2013). The causal relationship does not support the work of Nkong, Kessuh, Asah, Ibe and Onwumere (2022) with causal effects for even capital market variables and agricultural sector output.

As new issues and all share index engenders improvement on agricultural sector productivity, this study recommends that stock market investing public should consider the agriculture as a viable sector for speculative investing prospect. The government should encourage the private sector into agriculture by making policies that will further boost private sector participation in Nigeria. Such policies may include extension of tax holidays, improving the power and energy sector, removing high import tariff on equipment used for production, ensuring safe and secure investment climate among others.

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