World Journal of Entrepreneurship and Sustainable Development
ISSN: 2767-6961
Volume 2, Issue 1, 2024 (pp 17-38)

# IMPACT OF CAPITAL MOBILIZATION ON THE PERFORMANCE OF AGRICULTURAL COOPERATIVES SOCIETIES IN RIVERS STATE OF NIGERIA

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**Cite this article:**

Okere, Akara Udochi. (2024), Impact of Capital Mobilization on the Performance of Agricultural Cooperatives Societies in Rivers State of Nigeria.. World Journal of Entrepreneurship and Sustainable Development, 2(1), 17-38.

DOI: 10.13140/RG.2.2.32342.25924

**Manuscript History**

Received: 29 Aug 2024

Accepted: 31 Aug 2024

Published: 02 Sep. 2024



## ABSTRACT

This study sought to assess the relationship between capital mobilization among agricultural cooperatives in rivers State and their performance between 2004 to 2018 . The following were the independent variables employed for this study: share capital, savings deposit, thrift savings, external loan debt, loan outstanding, capital assets while the dependent variable performance of cooperative enterprises was proxied by net-worth. The study employed quasi-experimental research design due to its suitability for dealing with multivariate explanatory variable relationship with a singular dependent variable. The nature of the data were secondary data which were sourced from the books of accounts and records of primary cooperative societies within the study area. Six (6) Agricultural cooperative enterprises selected from eight (8) local government area randomly made up the sample that represented the population of the study. Collated data from the 48 agricultural cooperative enterprises was arrange in panel data form and was analyzed using both STATA and E-views 9.0 software. The Im, Pesaran and Shin (IPS) stationary test showed that the variables in the study were stable at first difference. Similarly, the Kao and Pedroni cointegration test confirmed the presence of long run relationship among the variables employed in the study. The models were subjected to Fixed Effect, Random Effect Linear regression and Hausman Test. The findings showed Agricultural cooperatives in Rivers State mobilize capital mainly through share capital, internal loans, capital assets and thrift savings. They performed poorly on special deposits, internal equity capital and external loans**.**It also revealed that the impact of share capital, thrift savings, outstanding loans and capital assets were positive and significant on the Net-worth (performance) of Agricultural cooperatives in Rivers State while the impact of saving deposit and external loan debt were insignificant, negative and positive respectively. Thus, we can conclude that the impact of share capital, thrift savings and outstanding loans were significant in improving the financial performance of Agricultural cooperatives in Rivers States. On the basis of the empirical findings, the study recommended that the Directors of Cooperatives in Rivers State should provide specialized training and workshop for Agricultural cooperatives to equip them with the knowledge on how to efficiently build up their equity capital consistently.

**Keywords:** Agricultural cooperatives, capital mobilization, networth, performance

World Journal of Entrepreneurship and Sustainable Development
ISSN: 2767-6961
Volume 2, Issue 1, 2024 (pp 17-38)

## INTRODUCTION

Successive Nigerian governments in the past decade have rolled out various developmental agendas with the aim of diversifying the Nigerian economy. The diversification of the economy is been clamored for due to the series of adverse effects of oil shock on the growth of the Nigerian economy. The main focus of the diversification agenda is on increasing the contribution of Non-oil sectors mainly Agriculture & Mining to the Gross Domestic Product (GDP) of the country. Hence, to increase Agricultural production, there is need for increased participation and support for the Nigerian Agricultural sector. However, due to a lack of interest and poor management issues bewildering the Nigerian Government, most scholars and economists has supported the use of the cooperative Agricultural production business model as a solution to attaining increased participation for achieving increased Agricultural Production.

The cooperative Agricultural business model can assist small scale farmers who produce about 80% of Agricultural produce in Nigeria to increase production and earn a decent living; which is a reality most of them cannot achieve solely on their efforts alone. Similarly, Nda (2021) noted that rural farmers are characterized by low income, low resources utilization, small farm holdings and scattered nature of farmland, thus they find it difficult to mobilize financial resources on their own to raise their farm income and substantially improve their living conditions. Thus, Agricultural cooperatives whose basic functions include input supply, storage, processing, bulking up or aggregation, selling produce, provision of credit, training, member education and political action can assist rural farmers increase production and earn a good living thereby successfully equipping the Agricultural sector solve some of the macroeconomic problems currently militating against the sustainable development of the Nigerian economy.

The importance of finance to any business enterprise cannot be overemphasized. Thus, Agricultural cooperatives need funds to finance their fixed and working capital for services and for making interest-yielding investments. As a generalization, capital is required to provide better services to members and to grow and develop in modern market economies (Binuyo, Oluwatimilehin, Edy-Ewoh & Binuyo, (2019). The fact is that in the 21$^{st}$ century the need for fund to finance the operations of Agricultural production is higher than ever before. This is because of the need to adopt agro-based technological innovations designed to mechanize

farming, automate agricultural processing and bio-engineer agricultural production to surpass domestic needs and contribute to export diversification of the Nigerian foreign trade profile.

Studies by Drisu, Okpo & Sharomo (2019); Etunim (2020) and Adewale, Lawal, Aberu & Toriola (2022) asserted that most commercial banks do not provide efficient credit services to Agricultural cooperatives. This situation caught the attention of the Nigerian government which led to the creation of specialized financial institutions such as the Nigerian Agricultural Cooperative and Rural Development Bank to cater for the credit need in the Agricultural sector. However, Ikenga, Oyita & Gbigbi (2024) has reported that it is ineffective in credit delivery. Thus, Agricultural cooperatives in Nigeria need to mobilize adequate capital to meet the needs of its members. Hence this study seeks to evaluate how well capital is mobilized by Agricultural cooperatives in Rivers State and its relationship with their performance. The objectives of the study are enumerated below:

- Examine the level of equity capital (internally generated) contributions of members to the Agricultural cooperative societies' funds in Rivers State.
- Assess members' access to production (loans) capital using agricultural cooperatives in rivers State.
- Determine the impact of share capital, thrift savings, special deposits and loans issued to members on the performance of agricultural co-operatives in Rivers State;

## 2.0 LITERATURE REVIEW

According to Babalol & Tiamiyu (2013), cooperatives across the world are tools for creating employment, opportunities and mobilization of resources for income generation. While the cooperative business model offers a lot of opportunities for success, reports indicate that their sustainability and success is tied to capital mobilization (Okere, 2020), thus the sustainability of Agricultural cooperatives has been low and inconsistent. Due to the possibilities abound in the cooperative model, cooperative economists and other scholars continue to carry out several research to address the issue of capital mobilization which is the greatest problem of Agricultural Cooperatives in Nigeria. This section thus reviews some of the concepts related to this work and the most recent and related empirical studies to lay a solid foundation for this study.

### 2.1 Conceptual Review

#### 2.1.1 Cooperatives

Generally, a cooperative may be defined as an association of persons who pool their resources together on mutual basis to solve specific socio-economic problems which income generating activities. According to Okoli (2018), Cooperative Societies are an association of persons usually of limited mean who have joined together to achieve common economic goals through the formation of democratically controlled business organization, making equitable contribution to the capital required and accepting a fair share of risk and benefit of undertaken. Thus, Agricultural cooperatives is an association of either a group of small scale rural farmers, a mixture of small and medium scale rural farmers, medium scale or large scale Agricultural enterprises who have adopted the cooperative business model since they are faced with similar problems and possess similar interest. Agricultural cooperatives play a crucial role in the development of rural economies and in promoting food security thus they are usually a delight for rural farmers and investors as they provide a valuable potential for equitable distribution of returns. According to Yunusa, Michael & Joseph (2018), agricultural cooperatives can be classified into service or production cooperatives. Production cooperatives are made up of farmers who operate the cooperative on jointly owned agricultural plots (Effiom, 2014). While Service Cooperatives operate a system where members carryout their activities independently and the cooperative provide them with a range of services including machinery, processing, transport packaging, distribution, marketing and information (Yunusa, Michael & Joseph, 2018). Another important category of service cooperative is credit cooperative which allows members to jointly finance their investments or working capital. That is, through credit unions, farmers can pool funds to be loaned to members and at the same time loans can be raised at better interest rates than those offered by commercial banks.

### 2.1.2 Capital Mobilization

Capital mobilization is the generation of financial resources by concerted efforts of individuals and/or institutions for investment and other purposes. Capital mobilization for agricultural cooperatives refers to both external and internal capital formation to carry out the activities of the cooperatives t meet members' needs.

### 2.1.3 Forms of Capital Mobilization for Agricultural Cooperatives

This study covers three forms of capital mobilization observed to have been generally accepted and in use by agricultural cooperatives in Nigeria. They are

(1) Member Capital

(2) Debt Capital

(3) Institutional Capital

Member capital remains the bloodline of capital mobilization for agricultural cooperatives. This refers to the financial contributions of members of the cooperatives which is accumulated for procurement of farm machinery and equipments, provide capital for loaning at interest rate favourable to all members e.t.c. An increase in member capital increases the performance of Agricultural cooperatives provided financial resources are efficiently managed and invested.

Debt capital refers to interest accrued from on-lending of capital from membership contributions. Debt capital is a unique source of capital for agricultural cooperatives since it is generated from member capital.

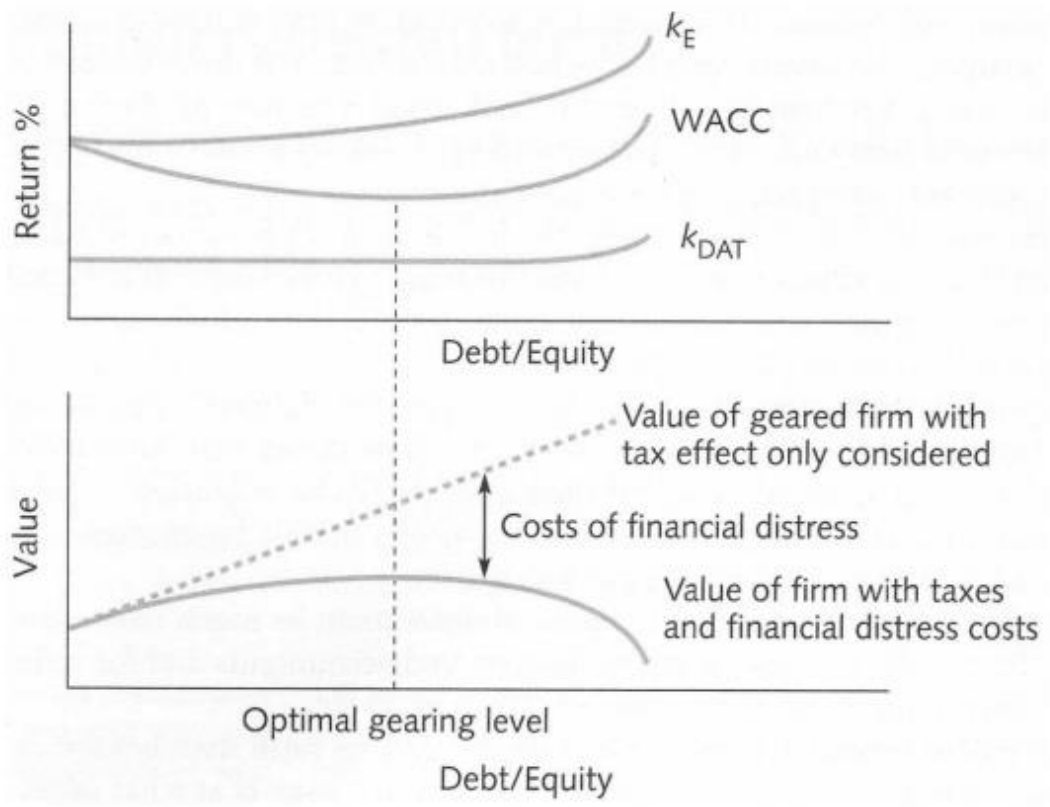
Institutional capital is external capital mobilization from financial institutions and/or donor agencies whether privately owned or not. This capital can be gotten as grants or loans thus they are usually sourced for capital projects to be embarked collectively as a cooperative or at an individual basis. This is usually the fastest means of meeting crunch capital needs of Agricultural cooperatives within a short time. However, institutional capital in form of grants is in decline as reported by Tang & Sun (2022)). They noted that Government and donor funding is shrinking because these agencies now face budget constraints and new priorities and because former supporters have become discouraged with cooperative performance after several years of donations. For Nigeria, the situation is no better as even subsidies for agricultural cooperatives are fast disappearing (Iwedi, Okey-Nwala, Ibebi & Nwosi, 2020). Similarly, the issue of corruption has affected agricultural cooperatives capacity to mobilize institutional capital for their operators. Thus, to survive and grow in an increasingly competitive business climate, cooperatives must raise more capital from their members and also possibly from commercial ventures even if there is need to adapt the nature of agricultural cooperatives in Nigeria.

## 2.2 Theoretical Review: Capital Structure Theory

One of the basic theory that have dominated the capital structure theory which recommends that optimal level of the debt is where the marginal benefit of debt finance is equal to its marginal cost. Trade off theory postulate that all firms have an optimal debt ratio at which the tax shield equal the financial distress cost. This theory eliminate the impact of information asymmetry and

World Journal of Entrepreneurship and Sustainable Development
ISSN: 2767-6961
Volume 2, Issue 1, 2024 (pp 17-38)

incorporating the different information on conflicts between insiders and outsiders Pecking Order Theory proposed (Abeywardhana, 2017). Firms can achieve an optimal capital structure through adjusting the debt and equity level thereby balancing the tax shield and financial distress cost. There is no consensus among researchers on what consist the benefit and costs. Theis (2009) confirmed Myers suggestion in 1977 that the use of debt up to a certain level offset the cost of financial distress and interest tax shield. Similarly, Michalkova, Stehel, Nica & Durana (2021) posited that optimal capital structure can be identified through the benefits of debt tax deductibility of interest and cost of bankruptcy and agency cost.




Source: Arnold (2008)

Arnold (2008) explains how is the increase in debt capital in the capital structure effect the value of the firm in the Figure 1. As debt capital increase WACC of the firm declines until the firm reaches the optimal gearing level and cost of financial distress increases along with the debt level. This is confirmed by Nishihara & Shibata (2021) that the optimal debt to equity ratio shows the highest possible tax shield that the company can enjoy. Further consistent with Beck,

Stanton & Zechner (2009), Nishihara & Shibata (2021) confirmed the fact that firms increase the risk of bankruptcy due to the debt capital in their capital structure. Brounen et. al., (2005) states that the presence of optimal capital structure or target capital structure increase the shareholder wealth and thus depicts why this theory is often used in studying cooperatives and large corporations.

### 2.3 Empirical Review

Agricultural Cooperative Societies are often utilized for capital mobilization in Nigeria to carryout small scale farming activities. This was confirmed by Otto & Ukpere (2011), they noted that thrift and credit cooperatives can become great sources of employment and thus increase GDP through contributions from small and medium enterprises. Also, Kareem, Arigbadu, Akintaro & Badmus, (2012) posited that co-operative societies have effect on member's welfare and the role of co-operative society in poverty reduction and capital formation is significant in rural economies. Research has shown that improper management of cooperatives often lead to poor results that accounts for a reduction in the number of operational agricultural cooperatives in Rivers State and Nigeria. A good understanding of the determinants of financial performance of cooperative and a management focused on balancing the factors is what most agricultural cooperatives in Nigeria needs. Anigbogu & uzondu (2018). For Farmers' cooperative who operate as thrift and credit cooperative, capital structure has been identified as the key determinant to optimal financial performance. This is confirmed by Kimeto & kimani who observed that cost of finance (debt), internal control practices (working capital management), risk management and social capital influences financial performance of agricultural cooperative societies. They also found that the level of interest rates as elements of costs of finance affected performance. There was positive relationship between risk management and financial management. Therefore, they concluded that proper risk management practices could enable the cooperatives to reduce chances of losses thus improving returns from their operations. The study recommended for proper capital structure financing by cooperatives to maximize their equity. Debt and working capital are key elements of capital structure of firms, very few studies have isolated these elements to examine their impact on financial performance of cooperatives, however, Anigbogu, Nwaogu & Abbas (2023) examined working-capital management and

performance of agricultural cooperative societies in Imo State, Nigeria. The study revealed that account receivables affect cooperative profitability and size of dividend and welfare package. It was also revealed that accounts payable on cooperative performance ensures delivery of orders, increases credit worthiness, brings about sustainable stakeholder relations and increases inventory size. The study strongly suggested that cooperatives should adopt efficient control measures to preventing stock outs and increase profit margins.

Since it is undeniable that capital structure influences the performance of cooperatives, there has been a focus on capital mobilization practices among cooperatives. Azeez (2020) examined the resource mobilization strategy as regards to its impact on the financial development of the ICSs in the south western Nigeria. Three major checks were carried out, this include; members share capital in relation to the total assets of the ICSs, growth in savings rate and loan management of the societies. The result indicated a positive asset management, growth in savings and good loan management, which jointly determined economic development of the societies in the studied area. Similarly, Duguma & Han (2020) using balanced panel data of 457 RuSACCOs from Ethiopia over the period 2014–17, showed how deposit mobilization affects technical efficiency. First stage efficiency estimate by Data Envelopment Analysis (DEA) Window model shows the average efficiency of RuSACCOs gradually increased over time. The second stage Tobit censored estimation and bootstrapped truncated regression results indicate that focusing on rapid expansion during the early life cycle affects technical efficiency, also a high percentage of women membership in cooperative enterprises advances technical efficiency. Furthermore, attracting and including all segments of the local entrepreneurial class as a membership opens the possibilities for mobilizing more deposits to become efficient.

If capital mobilization generally has a positive impact on the organizational and financial performance of cooperatives, how then do cooperatives more especially agricultural cooperative mobilize capital resources for profit maximization. Saoudatou et al. (2012) carried out a study to determine the problems associated with the mobilization of financial resources among farmers' organization. A group of vegetable growers in Kindia, Guinea known as Union group of Maraichers was selected as a case study. The result revealed that the key problems encountered while trying to mobilize financial resources among farmers' organizations are non-transparency in resource management, delay in payment of contributors and inadequate management tools.

Ikpefan (n.d) looked at the challenges and prospects of financing Agricultural Cooperatives in Nigeria. The results of the study confirmed that there is no significant preference in the extension of loans to Agricultural Cooperatives by financial institutions and that there is a significant relationship in the factors affecting the performance of Agricultural Cooperatives and Non-Agricultural Cooperative. The study identified among others lack of credit facilities, loan default, lack of basic infrastructure, lack of securities, and technical expertise as the challenges of agricultural cooperatives financing in Nigeria. Consequently, we observe a lack of literature on capital mobilization among agricultural thrift and credit societies in Nigeria and more especially in Rivers State, thus, this gap in research is what this study is focused in exploring.

## 3.0 METHODOLOGY

This study adopted the quasi-experimental research design. Data used for this study were secondary data and were extracted from the books (ledgers, cashbooks and analysis) of functional agricultural cooperative societies purposively selected from six local government areas in Rivers State. The data generated for analyses in the course of this study covered the period 2004 to 2018. Specifically, the business records of 8 cooperative societies in each of the following LGAs in Rivers State, viz: Ahoada East, Oyigbo, Etche, Obio-Akpor, Ogba-Egbema-Ndoni and Tai were the sources of the research data. The data were extracted on total membership, share capital paid up, savings contributions, special deposits paid into the coffers of each society, loans issued to members and outstanding for payment by the end of the financial year and loans received from external sources for on-lending to members. The balance of each society's other assets was also extracted for the purposes of accessing the society's total assets and its net-worth

Data generated in the course of the study were subjected to regression analysis. However prior to the analysis, The Im-Pesaran-Shin(IPS) procedure for unit root test was employed in determining stationarity status using STATA software. Similarly, the Pedroni Panel Cointegration and Kao cointegration test were applied to test for possibility of cointegration among the variables of the study. Also standard post-estimation tests such as normality (Jarque Bera) and autocorrelation (Hausman) Tests were carried out to determine suitability of model for estimation and forecasting purposes. Specifically, the study relied on the Panel Regression Model techniques

which are a more appropriate analytical tool in the investigation of the links between such related microeconomic variables as savings, share capital and loan disbursement, growth and sustainability over cross-sectional and time-series space (Koutsoyiannis, 1977). The Random Effect Model (REM or Error Component Model- ECM) and the Fixed Effect within-group models of panel data analysis were employed in data analysis. However actual data analysis of the study was implemented using E-Views 9.

### 3.1 Model Specification

The following model, in notational form is shown below:

$$Y_{rs} = f(sh, Ss, Sd, Lex, Ln, Cas) \quad (1)$$

This mathematically transformed into a relationship defined by the equation:

$$Y_{rs} = b_0 + b_1 Sh + b_2 Ss + b_3 Sd + b_4 Lex + b_5 Ln + b_6 Cas \quad (2)$$

The regressional econometric model, therefore, generically became:

$$Y_{rs} = b_0 + b_1 Sh + b_2 Ss + b_3 Sd + b_4 Lex + b_5 Ln + b_6 Cas + U \quad (3)$$

Where:

Yrs = cooperative performance (net-worth) measured in ₦ ;

Sh = Share Capital paid up in ₦;

Ss = Thrift Savings Contributions in ₦;

Sd = Special Deposits in ₦;

Ln = Loans Issued to Members in ₦;

Lex = External Loans received by the society in ₦

Cas = Cooperative's own (other) assets in ₦

U = Error term

bo, = Intercept of the function

b1, b2, b3, b4, b5, b6 = coefficients of variables of the function.

### 3.2 Apriori Expectations

The apriori expectations define the expected signs of the estimates of the regression coefficients arising from economic theory. Expected signs of the regressors' estimates in this study are as presented in table 1. below.

**Table 1 Expected signs of the regressors' coefficients**

| Estimate of the Regresssor | Expected sign |
|---|---|
| b0 | + |
| b1 | - |
| b2 | - |
| b3 | - |
| b4 | - |
| b5 | + |
| b6 | + |

Source :Author's compilation, 2019

## 4.0 RESULTS

The results of the various analyses carried out are presented in this section.

### 4.1 Descriptive Statistics

Summary statistics shown in table 2 indicate the mean, standard deviation, minimum and maximum values of each of the variables during the period covered.

**Table 2: Summary of Descriptive Statistics**

| Variable | Mean | Median | Maximum | Minimum | Std. Dev. | Skewness | Kurtosis | Jarque-Bera | Probability |
|---|---|---|---|---|---|---|---|---|---|
| **Networth (₦)** | 3.09 E+07 | 2.52 E+07 | 79907501 | -1.82 E+05 | 2.65 E+07 | 0.569166 | 2.106083 | 1.309306 | 0.519622 |
| **Share capital (SH) (₦)** | 1.53E+08 | 1.29E+08 | 3.77E+08 | 6.70 E+06 | 1.24E+08 | 0.455052 | 1.899466 | 1.274665 | 0.528701 |
| **Special deposits (SD) (₦)** | 9.50 E+05 | 6.00 E+05 | 4.40 E+06 | 0 | 1.25 E+06 | 1.574725 | 4.798377 | 8.220743 | 0.016402 |
| **Thrift savings (SS) (₦)** | 1.84 E+07 | 1.93 E+07 | 3.76 E+07 | 1.99 E+06 | 1.13 E+07 | 0.045546 | 1.873987 | 0.797627 | 0.671116 |
| **Loan outstanding (LN) (₦)** | 1.33E+08 | 1.46E+08 | 2.83E+08 | 8.85 E+06 | 8.99 E+07 | 0.071635 | 1.767356 | 0.962462 | 0.618022 |
| **External Loans (LEX) (₦)** | 2.44 E+07 | 1.55 E+07 | 6.82 E+07 | 0 | 2.48 E+07 | 0.570939 | 1.747002 | 1.796181 | 0.407347 |
| **Capital Assets (CAS) (₦)** | 9.47 E+07 | 9.67 E+07 | 2.18E+08 | 6.67 E+05 | 7.69 E+07 | 0.135048 | 1.610114 | 1.25296 | 0.53447 |
| **Internal Equity Capital (IE) (₦)** | 1.72E+08 | 1.49E+08 | 4.15E+08 | 8.69 E+06 | 1.35E+08 | 0.413293 | 1.877704 | 1.214245 | 0.544916 |

**Source: Author's Computation Using E-views 9.0**

The descriptive statistics were presented to get an insight into the distribution of the series for the period. In table 2, comparing the means and standard deviation for each of the variable indicated that Net worth, co-operative assets, external loans, loan outstanding, share capital and thrift savings cluster around their means while special deposits was divergent from its means. This means that inflow cash was more stable than special deposits. This knowledge is quite important in prediction, forecasting and assessing certain risks associated with making and implementing financial decisions aimed at improving financial efficiency and strength of the cooperatives. In terms of skewness, the table indicated that Net worth, co-operative assets, external loans, loan outstanding, special deposits and thrift savings are normally skewed, while share capital is negatively skewed. In terms of kurtosis, all the variables in the study are leptokurtic in nature clearly indicating a higher value time plots. From the Jarque-Bera statistic, all variables in this study are normally distributed.

### 4.2 Time Plot Analysis

Figure 1 below is the time plots of the various variables of interest in the study.

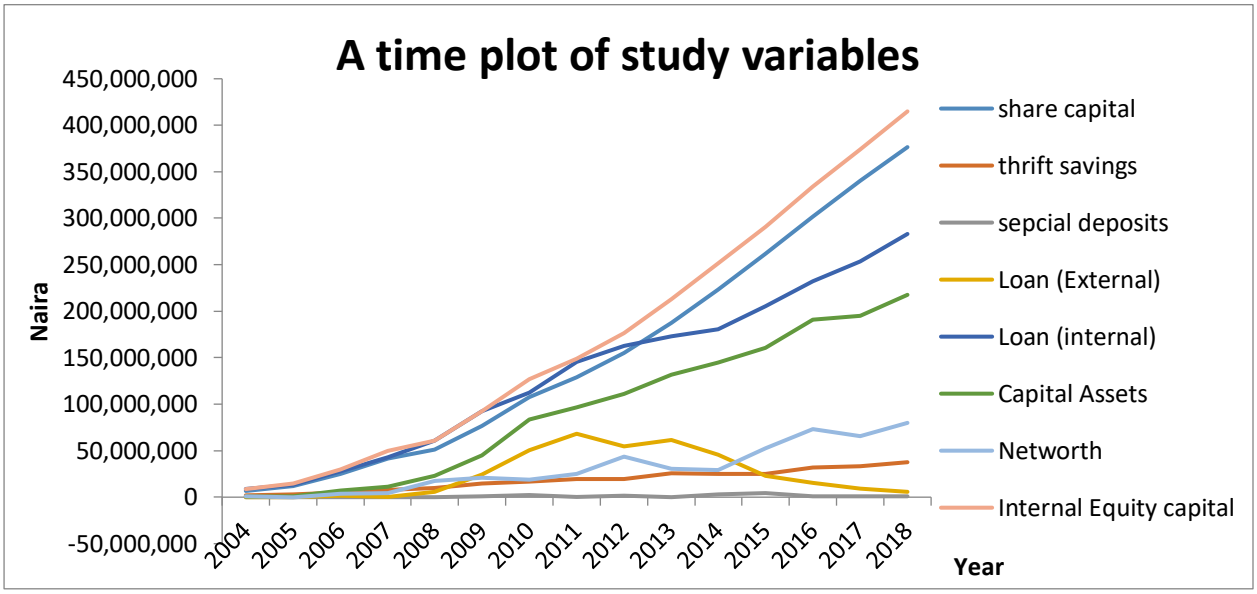



**Figure 1: Time plot of study variables**

A preliminary analysis of the time plots in figure 1 shows gradual and consistent increase in internal equity capital, share capital, production capital or capital asset and net-worth from 2004 to 2018 indicating that increase in internal equity capital improved performance or net-worth of Agricultural cooperatives in Rivers State. The key findings here is that Agricultural cooperatives in Rivers State mobilize capital mainly through share capital, internal loans, capital assets and thrift savings. They performed poorly on special deposits, internal equity capital and external loans.

World Journal of Entrepreneurship and Sustainable Development
ISSN: 2767-6961
Volume 2, Issue 1, 2024 (pp 17-38)

### 4.3 Panel Unit Root Test

IPS test was employed in testing the presence of a unit root in the heterogeneous panel. The results of the panel unit root test to confirm if the variables are stationary or non-stationary is presented below in table 3.

**Table 3: Panel Unit Root test – Im, Pesaran and Shin (IPS)**

| variables | Level I(0) | | First Order Difference I(1) | |
|---|---|---|---|---|
| | Constant | Status | Constant | Status |
| **CAS** | 0.33019 | Not stationary | -5.8695 | Stationary |
| | (0.6294 | | (0.0000) | |
| **NETH** | 1.8252 | Not stationary | -2.4963 | Stationary |
| | (0.8815) | | (0.0063) | |
| **SC** | 0.5534 | Not stationary | -1.9364 | Stationary |
| | (1.0000) | | (0.0264) | |
| **TH** | 1.5406 | Not stationary | -2.36398 | Stationary |
| | (0.9383) | | (0.0090) | |
| **SD** | -1.1187 | Not stationary | -1.71329 | Stationary |
| | (0.1316) | | (0.0433) | |
| **LEX** | -0.8270 | Not stationary | -2.1693 | Stationary |
| | (0.2041) | | (0.0150) | |
| **LN** | 1.7333 | Not stationary | | Stationary |
| | (0.9585) | | | |
| **IEC** | 4.5198 | Not stationary | | Stationary |
| | (1.0000) | | | |

**Source: Author's Computation from STATA**

Results of the Im, Pesaran and Shin (IPS) panel unit root test presented in Table 3 showed that the dependent and independent variables at constant time plots did not show stationarity at level. Consequently, a first difference of the IPS test was carried out which showed the series to be integrated of order one since they had probability values that were statistically significant (Gujarat et al, 2013). On this basis, the null hypothesis of the presence of a unit root was rejected and so, at first difference, the series did not presence unit root and this makes it adequate for long-run relationship testing using Pedroni panel co-integration test.

### 4.4 Panel Cointegration Test

Pedroni and Kao co-integration tests for pooled data were employed in testing the existence of long-run correlation among the variables in the panel data. Pedroni and Kao panel co-integration tests are based on Engle-Granger (1987) methodology which is quite restrictive when analyzing the co-integrating properties of an n-dimensional vector of I(1) variables where several co-integration relationships may arise. It is often the practice to use two cointegration methods to

establish with certainty the presence of a long-run relationship among the variables of interest. The results are as shown in Tables 4a and 4b.

**Table 4a: The Pedroni Panel Cointegration test**

| Test | Statistic | probability | Weighted Statistics | Probability |
|---|---|---|---|---|
| **Panel v-statistic** | 0.2957 | 0.6163 | 0.4542 | 0.6752 |
| **Panel rho-statistic** | 0.9094 | 0.8184 | 1.5778 | 0.9427 |
| **Panel PP-statistic** | -5.6939 | 0.0000 | -2.4153 | 0.0079 |
| **Panel ADF-statistic** | -6.2824 | 0.0000 | -1.9231 | 0.0272 |
| **Group rho-statistic** | 2.0647 | 0.9805 | | |
| **Group PP-statistic** | -2.5790 | 0.0050 | | |
| **Group ADF-statistic** | -2.9625 | 0.0015 | | |

**Source: Author's computation from STATA**

Table 4.4a indicates that four (4) of the test statistics indicate the presence of a long-run relationship while three (3) did not. Another co-integration test was carried out to validate the result of Pedroni panel co-integration test of outcome are indicated in Table 4.4b below.

**Table 4b: Kao Co-integration test**

| | T-statistic | Probability |
|---|---|---|
| **ADF** | -3.6105 | 0.002 |
| **Residual variance** | 1.48E+16 | |
| **HAC Variance** | 1.15E+16 | |

**Source: Author's computation from STATA**

Table 4.4b shows the presence of a long-run relationship as the probability value 0.002 for the ADF statistic is below 0.5.

Results obtained show two (2) panel statistics and two (2) group panel statistics out of the 7-statistic having probability values less than 5%. Consequently the null hypothesis of zero co-integration at 5% level of significance for the panel-statistic and group-statistics. However, to validate the results from the Pedroni Panel co-integration test, the Kao co-integration test was carried out and the results in table 4.4b show. Probability of the ADF statistic was below 5%, therefore, the null hypothesis of zero co-integration among the variable was rejected. Hence, there is co-integration among the variables in the two states. That is to say that networth has a

long relationship with share capital, savings deposits, thrift savings, external loan debt, loan outstanding, capital assets and internal equity capital.

### 4.5 Analysis of Model Estimation

The Analysis of the models employed in this study using Fixed and Random Effects method with Hausman Test are presented in tables 5.

**Table 5: Results of Fixed Effects Vs Random Effects and Hausman test for Model 1**

| Variables | Fixed Effect | Probability | Random Effects | Probability |
|---|---|---|---|---|
| **Constant** | -2278381 | 0.0748 | -2157991 | 0.4858 |
| **Share Capital (SH)** | -1.0353 | 0.0000 | -1.0208 | 0.0000 |
| **Deposit Savings (SS)** | 2.1019 | 0.1818 | 2.2092 | 0.1440 |
| **Thrift Savings (TS)** | -0.7079 | 0.0255 | -0.7607 | 0.0186 |
| **External Debt (Lex)** | -0.2337 | 0.0959 | -0.1999 | 0.1474 |
| **Loan Outstanding (Ln)** | 1.3344 | 0.0000 | 1.3082 | 0.0000 |
| **Capital Assets (Cas)** | 0.5987 | 0.0005 | 0.5957 | 0.0004 |
| **$R^2$** | 0.8372 | | 0.7368 | |
| **Adjusted $R^2$** | 0.8142 | | 0.7177 | |
| **F-Test** | 36.45 | | 38.72 | |
| **Prob** | 0.0000 | | 0.0000 | |
| **Durbin Watson** | 0.4820 | | 0.4734 | |
| Hausman Test | | | | |
| | **Chi-sq stat** | **Df** | **Prob** | |
| **Cross-section random** | 4.9234 | 6 | 0.5537 | |

**Source: Author's computation from E-views**

Results from table 5 indicate the variables in the model: share capital, thrift savings, external loans have a negative impact on net-worth, while special deposits, loan outstanding, capital assets have positive impacts on the net-worth of cooperatives across the selected LGAs in Rivers. Also, the probability of the Hausman test is not statistically significant as shown by the p-value of 0.5537. The R-square value of 0.8372 and adjusted R-square value of 0.8142 for Fixed Effect estimation and R-square value of 0.7368 and adjusted R-square value of 0.7177 were statistically significant as shown by their probability value of 0.0000 from the F-Test.

Hence the regression model that describes the performance of Agricultural cooperatives in Rivers State is statistically significant and thus has a good fit for forecasting purposes.

## 5.0 DISCUSSION

The results obtained in section 4 are discussed in much detail in this section.

### 5.1 Discussion of Time Plots Analysis

Figure 1 shows a steady rise of share capital for cooperatives in Rivers from 2004 to 2018. The highest share capital was recorded in 2018. However, the generally low capitalization of cooperatives results in too meager funding for cooperatives in the state and the nation at large as noted by Okoye (2001). A steady rise of Thrift Savings for Agricultural cooperatives in Rivers States from 2004 to 2018 was observed. The highest share capital was recorded in 2018 while drops in Thrift Savings were recorded between 2008 and 2015. The sliding of thrift savings by cooperators resulted in a paucity of funds in the societies. This is a major challenge to cooperatives as corroborated by Ohen et al (2018). To avert this trend, Okonkwo et al (2018) advised cooperatives to base their loan policy on thrift savings payment.

Figure 1 shows that the highest amount for special deposit savings for Rivers State was recorded in 2015 while the lowest amount was recorded in 2011. This can be attributed to the efficiency of cooperative management in Rivers State based on the fact that special deposits (savings) are usually brought in on account of high confidence of cooperators on the ability of the cooperative management team. This agrees with the findings of Kareem et al. ( 2012). This may also mean that the educational level of farmers and exposure to civilization or urbanization may be poor as time plots may also mean that they had little realization of the use for special deposits owing to the rural nature of their businesses. From figure 1, the highest amount for External loan debt for Rivers State was recorded in 2013 while the lowest amount was recorded in 2004 and 2005. After a period of a short rise between 2008 and 2013, the amount of external loan continued to reduce drastically for Agricultural Cooperatives in Rivers State. As Chunilal (2014) noted, the ability of cooperatives to reasonably access loans externally depends on the sufficient internal management of their own funds.

Figure 1 shows the highest amount for Production Capital for Rivers State was recorded in 2018 while the lowest amount was recorded in 2004. The time plots show an upward rise in the production capital from 2008 to 2018. This may be attributed to an increase in share capital and thrift savings due to the increase in membership and possibly due to receipt of external loans which would have allowed for an increase in capital assets. These notwithstanding, and when compared to other conventional firms, these and other cooperatives in Nigeria suffer from a dearth of enterprise capital assets as observed by Kareem et al ( 2012). Also, Figure 1 shows the highest amount for Internal Equity Capital for Rivers State was recorded in 2018 while the lowest amount was recorded in 2004. The time plots show a linear curve indicating an upward rise in the internal equity capital from 2008 to 2018. The rise in internal equity capital can be attributed to the continual rise in share capital and thrift savings irrespective of the fluctuations

recorded in special savings for the period under study. Nwankwo et al (2013) observed the impactful nature of cooperatives on the savings habits of rural dwellers and how this can affect development. This can also explain why outstanding loan repayment is significantly high. Low-interest rates combined with a reasonable level of internal equity capital attracted new members and increased the financial operations of the agricultural cooperatives. Kareem et al (2012) also noted low equity capital as a key challenge to the progress of cooperatives as they observed high correlation between deposits (internal equity) and the society's ability to fund members' activities.

Figure 1 shows the highest amount for Net-worth for Rivers State was recorded in 2018 while the lowest amount was recorded in 2005. The time plots show a gradual rise in net-worth from 2006 to 2016 before a sharp decline between 2014 and 2017. In nominal terms, the study shows Rivers cooperators having a share of #50,928.94 and Delta cooperators ₦46,584.45 of their respective state's net-worth values. This is a far cry from the findings of Okere (2017) wherein cooperators in Ogba-Egbema-NdoniLGA of Rivers State had net-worth of ₦112,661.62. The value of an enterprises' net-worth determines how it is perceived by outsiders. This is in line with the observations of Ikpefan et al (2015) that the more assets the cooperative owns (higher net-worth) the more others are willing to lend additional funds to it.

Figure 1 shows the highest Equity contributions of cooperative members in Rivers State was recorded in 2018 while the lowest amount was recorded in 2004. The time plots show a steady rise in equity contributions of members in rivers state for the period under study. This is due to increased membership in the Agricultural cooperatives in Rivers State. The time plots are indicative of equity contributions of cooperators to the capitalization of their cooperative enterprises and show an average investment of ₦267,000.00 from Rivers State in 2018. However, this generally low level of contribution makes it difficult for cooperatives to qualify and fully access funds from other sources (Okoye, 2001).

Figure 1 shows the highest internal loans given to cooperative members in Rivers State was recorded in 2018 while the lowest amount was recorded in 2004. The time plots show a fluctuating rise in internal loans received from 2007 to 2012 before a gradual steady rise in loans received can be observed. This is consistent with the findings of Otto and Wilfred (2011). Figure 10 also addresses the question raised in objective (ii) of the study raising issues on the access of members to production credit funding of the agricultural activities of the membership. Rivers cooperators were only able to access credit from their societies in 2018 for the sum of only ₦ 178,000.00. This could be considered significant when considering ₦ 6,451.00 received by cooperators in Kogi State in 2012 (Ibitoye, 2012). It is, however, poor when compared with the ₦ 302,856.32 credit received by cooperators in Anambra State in 2019 (Nwankwo et al, 2019).

### 5.2 Discussion of Fixed Effect Vs Random Effects and Hausman Test for Model 1

The results from Table 5 indicate that the variables in the model: share capital, thrift savings, external loans have a negative impact on net worth, while special deposits, loan outstanding, capital assets have positive impacts on net worth of cooperatives across the selected LGAs of

Rivers State. Also, the probability of Hausman test is not statistically significant as given p-value of 0.5537.R-square value of 0.8372 and adjusted R-square value of 0.8142 for Fixed Effect estimation and R-square value of 0.7368 and adjusted R-square value of 0.7177 were statistically significant as shown by their probability value of 0.0000 from the F-Test. Hence the regression model that describes the performance of Agricultural cooperatives in Rivers State is statistically significant and thus has a good fit for forecasting purposes. The criteria for choosing the best method to explain the model is determined by the Hausman Test, the Hausman test sets its null hypothesis as accepting random effect method and the alternative is to reject random effect method in favour of Fixed Effect method. Since the Hausman statistic does not show significance we reject the null hypothesis. Interpretation of results for model 2 was based on the Fixed Effect Model estimation method.

The (R2) is 0.8372 showing that 83.72% of the total variations in Net-worth (proxy for the performance of cooperative organizations) is accounted for, by the explanatory variables: Share capital, savings Deposits, Thrift Savings, External loans, loan outstanding, and capital assets and it is significantly strong and satisfactory since $R^2$ value of 83.72% is above 50%. Durbin Watson statistics is 0.4820 showed the slight presence of positive autocorrelation among the residuals. However, since the residuals are normally distributed, the presence of positive correlation should not be a major problem as the panel data appears to be well-behaved and does not violate an important assumption underlying regression modelling. Thus, the problem of collinearity is considered not encountered in the model.

Result of the Fixed Effect method revealed that the regression coefficient of share capital is -1.03 meaning that a unit increase in share capital decreases Net-worth by 1.03 units. From the probability value, it is statistically significant indicating that share capital exerts a negative and significant impact on Net-worth of Agricultural cooperative organizations of Rivers State. The negative sign conforms to the prior expectation in line with economic theory. The result of the Fixed Effect method revealed that the regression coefficient of savings deposits is 2.10 meaning that a unit increase in savings deposits increases Net-worth by 2.10 units. From the probability value, it is statistically insignificant indicating that savings deposits have a positive but very low impact on Net-worth of Agricultural cooperative organizations in Rivers State. The positive sign does not conform to the a priori expectation in line with economic theory.

The result of the Fixed Effect method revealed that the regression coefficient of Thrift savings is -0.71 meaning that a unit increase in thrift Savings decreases Net-worth by 0.71 units. From the probability value, it is statistically significant indicating that Thrift savings have a negative and strong impact on Net-worth of Agricultural cooperative organizations of Rivers State. The negative sign does not conform to the a priori expectation in line with economic theory.

The result of the Fixed Effect method revealed that the regression coefficient of external loan debt is -0.23 meaning that a unit increase in external financing decreases Net-worth by 0.23

units. From the probability value, it is statistically insignificant indicating that external loan debt has a negative and insignificant impact on Net-worth of Agricultural cooperative organizations in Rivers State. The negative sign conforms to the apriori expectation in line with economic theory.

The result of the Fixed Effect method revealed that the regression coefficient of outstanding loans is 01.33 meaning that a unit increase in outstanding loans increases Net-worth by 1.33 units. From the probability value, it is statistically significant indicating that outstanding loans have a positive and strong impact on Net-worth of Agricultural cooperative organizations within Rivers State. The positive sign of the coefficient conforms to the a priori expectation in line with economic theory.

The result of the Fixed Effect method revealed that the regression coefficient of capital assets is 0.60 meaning that a unit increase in capital assets increases Net-worth by 0.60 units. From the probability value, it is statistically significant indicating that capital assets exert a positive and significant impact on Net-worth of Agricultural cooperative organizations of Rivers State. The positive sign conforms to the a priori expectation in line with economic theory.

### 6.1 Conclusion

Agricultural cooperatives have over time been playing coordinating roles in the facilitation of production activities for rural farmers all over the world especially in providing access to markets as well as ensuring they have competitive returns as independent producers (Okoli, 2018). This study set out to assess the relationship between capital mobilization among agricultural cooperatives and their performance between 2004 to 2018 in Rivers State, Nigeria. In accordance with the specific objectives, the study created a model with share capital, savings deposit, thrift savings, external loan debt, outstanding internal loan, capital assets (productive capital) and internal equity capital as explanatory variables while Net-worth was used as the dependent variable aimed at capturing the performance of Agricultural cooperatives in the state. The Im, Pesaran and Shin (IPS) unit root test was employed in testing stationarity and the results show that series in the panel data were stationary at first difference. Pedroni Panel and Kao cointegration tests were used in determining the presence of long-run relationship; both test results confirm the presence of some degree of long-run relationship among the variables. Models of the study were subjected to Fixed Effect, Random Effect Linear regression and Hausman tests.

The findings showed that the impact of share capital, thrift savings, external loan debt were negative and significant on the Net-worth (performance) of Agricultural cooperatives in Rivers State while the impact of saving deposits, outstanding loans and capital assets were positive and of strong significance on the Net-worth (performance) of Agricultural cooperatives in Rivers State. Thus, we can conclude that the impact of loan outstanding and capital assets was significant in improving the performance of Agricultural cooperatives in Rivers.

### 6.2 Recommendations

Based on empirical findings, the study here advances under-listed recommendations.

1. There should be collaborative efforts from the Director of Cooperatives, the Central Bank and Microfinance Banks in Rivers States to provide access to special loans with a reduced interest rate for Agricultural Cooperatives in both states, using the carrot and stick approach so as to attract more membership, strengthen their savings consciousness and increase their equity capital base. This shall, in addition, qualify the cooperative societies to more easily attract external funds (loans) for their productive use.

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