COINTEGRATION ANALYSIS OF INFORMAL CREDIT MANAGEMENT: ASSESSING THE IMPACT OF INFORMAL FINANCE ON THE WELFARE OF RURAL DWELLERS (A STUDY OF DELTA NORTH RURAL COMMUNITIES IN DELTA STATE, NIGERIA)

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ABSTRACT

This study applied the co-integration procedure to examine the extent of influence of informal credit on the welfare of rural dwellers. A field survey using the instrumentality of a structured questionnaire and in-depth interview was conducted to generate wide range of information on the operations of informal finance in Delta North region in Nigeria. 200 daily contributors (Adashi/Alero) were focused on from 16 districts of the regions in Delta State. From this population a sample of 4 local communities covering 2000 contributors to rotating savings and credit associations (ROSCAs) were selected through stratified sampling procedure. A model that profiles contributors’ social well-being was utilized, LM Test, Ramsey Test and Augmented Dickey Fuller techniques were used for data analysis for the period January 2009 to December 2010. Findings revealed that income excreted more significant effect on growth of informal finance in the rural communities during the review period. The other two variables consumption expenditure and property assets, as shown by the result, have negative effect on growth of informal finance, this thus implies that they are withdrawals to rural deposits. We, thus, recommend the need for aggressive improvement on rural income base through policy stimuli that is rural poor driven. This could enhance cash flow and create an incentive for improved mobilization of informal finance in Nigerian rural communities.

Keywords: informal finance, rotating savings and credit, co-integration, credit man management
1.0 INTRODUCTION

The informal sector in developing countries is large, resilient and dynamic. It also occupies an important position in the overall development of an economy. The informal sector in Nigeria covers a wide range of activities; these include small and unregistered sole proprietor businesses and joint partnership businesses in the rural and urban areas. The Nigerian informal sector has two major components - the economic and financial segment and the administrative/political segment. The economic and financial segment comprises large number of highly competitive but poorly capitalized small-scale operators and the informal financial institutions, which they have developed to sustain their businesses.

Informal finance consists of individuals, groups and associations that mobilize local savings and grant credits, mainly in cash and on principles which are different from those of regular formal banking institutions and credit institutions. The essential characteristic of informal financial intermediaries and markets is that they are indigenous, more loosely organized, monitored and regulated than the formal financial system despite informal control they are well organized with their own rules and discipline. They flourish in rural and urban areas; cater for both the rich and the poor workers, professionals and people with and without a regular income (Ojo, 1994; Ijaiva, 2002)

Poverty in Nigeria is widespread and deep-seated. The worsening state of the economy has caused the middle-income to slide down to the lower income group, and available social indicator have confirmed the impending poverty situation on average Nigeria (FOS, 2004; Odita et al, 2006). For poverty alleviation programme to be effective and sustainable, they must reflect a systematic understanding of the perception of the rural poor. The poor best understand poverty and it is the poor who must escape from poverty.
Thus, managing the resource base of rural communities presents an optional method for poverty alleviation.

The Nigeria Government as far back as 1971 had identified poverty as the bane of rural development in the country. Poverty was found to be a rural phenomenon with 8.4 million of the 10 million extremely poor people being from rural areas (World Bank, 1995). The rural sector is made up of small-scale poor farmers, food processors, informal traders and other micro entrepreneurs who are said to account for about two-thirds of the population living in poverty. Most of the poor people are trapped in a vicious cycle of poverty, which can be broken by micro credit/informal finance. Thus, pertinent literature reveals a vibrant debate on microcredit as poverty alleviation tool and a viable instrument of rural resource management (Hulme and Mosley, 1996; Johnson and Rogaly, 1997; Ogwumike, 2001; Hazel et al, 2001).

Thus from human development perspective, such a perception of managing resource of rural based communities presupposes that there is an access to training in efficient management and organizational practices as well as training relating to the acquisition and/or provision of productivity-enhancing skills and technology, all of which promote effective use of credit (Robb, 2000; Christen et al, 1994; Richardson, 2001; Taimni, 1994).

The new global call for sustainable development has coincided with an emphasis on efficient rural resource management in the decades of 1990s. Rural Poverty is one of the main symptoms or manifestation of under development and its reduction is generally considered synonymous with development of the affected countries. Thus as an area of research and action-oriented subject, rural resource management as an answer to poverty eradication is currently attracting varying degrees of attention (Anyanwu, 1997; World Bank, 2004, 2005; Mead and Liedholm, 1998).
Therefore the fact that because small-scale economic activities are largely concentrated in the informal sector, a dynamic link may be established with the development of local urban and rural markets and thereby with economic growth (Teszler, 1993). Furthermore, it may be argued that small-scale enterprise activities have impact on poverty alleviation insofar as they are primarily serving a lower-income bracket using dormant capital and indigenously available technology (Koishorn and Tomecko, 1992).

Thus, the economic rationale presented above requires that support for these enterprises be effectively incorporated in development strategies (‘Wilson, 2001; Teszler, 1993), a point reiterated in recent United Nations report on microcredit and poverty. Given the link between this scale of enterprise activity and the informal sector, there is a need to address the fundamental socio-economic structural changes required to effectively incorporate this sector into the formal economy (Buckley, 1997).

Conclusively, thus, effective mobilization of informal sector savings should be given priority in view of the problem of increased number of people requiring credit and the need to channel financial resources into farming and the small enterprises development.

2.0 THE LITERATURE
In the light of the devastating nature of poverty in Nigeria, the issue of poverty and its reduction as a first step in rural resource management has been very topical over the years. The Nigerian economy began to experience recession from the early 1980’s as a result of which she moved from middle level income and a developing industrial nation,
to become one of the poorest nations in the world. Specifically, the incidence of poverty has been high and upward swinging since 1980. Data from the Federal Office of Statistics (FOS, 2004) on Poverty Profile in Nigeria (1999) showed that the incidence of poverty rose from 28.1 percent in 1980 to 46.3 per cent in 1985 but dropped slightly to 42.7 per cent in 1992 before rising to 6.6 per cent in 1996.

Based on its low Gross national Product (GNP), Nigeria, since 1990, has been classified as a “poor nation”. The United Nations Development Programme (UNDP), using its Human Development Index (HDI), ranked Nigeria 142 among the 172 countries listed in 1997 and 156th out of 179 in 2001 (CBN Briefs 2003).

Comparatively, the incidence of poverty is more pronounced in the rural areas where over 60 percent of the population live with about 65 per cent of them engaged in agriculture production. Rural poverty rose from 29.3 per cent in 1980 to 51.4, 46.0 and 69.8 per cent in 1985, 1992 and 1996 respectively. Similarly, urban poverty rose 17.2 percent in 1980 to 52.8 percent in 1996.

Despite the growth of monetization and commercialization in the subsistence sectors, informal credit markets have remained important. This has been due to the maladaptation of formal financial policies, lack of innovative measures and instruments to integrate informal and formal markets, the often lower transaction costs of certain informal market intermediaries, coupled with the dynamism and other virtues inherent in the informal system. The essential characteristic of informal markets is that they are far more loosely monitored and regulated than formal finance markets (Odita et al, 2006). Ogwumike (2001) noted that as in Nigeria, India has a well-developed system of intermediaries, lenders and borrowers in informal credit markets. They include
indigenous bankers who take deposits loans; commercial financiers who mediate between customers and commercial financiers; and the rotating savings and credit associations (ROSCAs).

The informal markets are estimated to cover a large portion of the needs of rural and small produce. Interest rates may or may not be higher than the bank lending rates, depending on the type used. Whenever formal credit facilities are available, very small and rural enterprises may pay 10 per cent higher than formal bank rates. Thus, availability rather than cost of credit determines demand and supply of funds. The transaction costs and defaults rates of informal markets can, by and large, be lower than for commercial banks, as in Nigeria.

Udry (1990) observes in many countries, ROSCAs, such as the esusu in Nigeria, play a prominent role in the informal system. ROSCA participants make regular periodic contributions; the sum collected being shared by each member in turn. Personal relationships are the dominant factor in the setting-up and functioning of these mutual aid groups, and they are often based on village or ethnic origin, or consist of workers in the same trade area. There is a great deal of trust between lenders and borrowers, and social pressures reduce or eliminate moral hazards. ROSCAs display a high degree of flexibility and versatility. They fulfill the three functions of consumption, insurance and investment, the first two being more important.

Germidis (1990) stated that informal credit markets (ICMs) are generally complementary to formal market to both mobilize and allocate savings; they are characterized by a smaller scale of operations, which enables direct contact between borrower and lender. ICMs need to be carefully integrated into the overall capital market structure in order to be effective and efficient in providing services to the informal
market and to smaller enterprises. It has been observed that past policies of financial depression and recent deregulation in Nigeria have led to the growth of informal credit institutions despite the growth of formal institutional finance due to financing problems such as an increasing number of borrowers and limitations to deposit mobilization. ICMs have met a large part of the requirements of small enterprises in urban and rural areas because of their ability to assess risk, ensure repayment and achieve lower loan transaction costs.

3.0 METHODOLOGY

3.1 Method
A field survey using the instrumentality of a structured questionnaire and an in-depth interview as conducted to generate a wide range of information on issues bordering on operations of indigenous/informal/micro financing. For the purpose of data collection, systematic random sampling was used to select from 200 daily thrift collectors (Adashi/Alero) in sixteen districts of the territorial region of Delta North province in Delta State Nigeria. (As specified in Table 1). The activities of the 200 daily collectors cover 24,000 contributors across the region under investigation. These are active participants in the scheme.

3.2 Data Source
In addition to the use of secondary data, a survey aimed at generating primary data on the impact of Rotating Saving and Credit Associations (ROSCAs) on welfare changes of rural dwellers in Delta North communities conducted between the months of January 2009 and December 2010, using a set of questionnaire and participatory poverty assessment method. The questionnaire was based on the World Bank Living Standards Measurement Study (LSMS); International Labour Organization’s Rapid Assessment Surveys of Poverty (RASP); World Bank Household Priority Surveys (HPSs) and the
Federal Office of Statistics’ National integrated Surveys on Households (NISHs) methods, which among other things provided a comprehensive monetary measure of welfare and distribution and the description of the patterns of access to and use of social services e.g. education and health care services. The Participatory Poverty Assessment (PPA) method was used to obtain information from key informants who are also members of ROSCAs on their perception of the impact of ROSCAs on welfare state of members.

3.3 Sample Selection Method

A stratified sample method was used in the selection of the respondents. To have an unbiased selection of samples the study area was divided into 4 geographical strata — Delta North North, Delta North Central, Delta North East and Delta North South. Through lucky dip, one rural community was chosen from each strata to give a sample of 4 rural communities (Illah from delta north north, Issele-uku from delta north central, Oko from delta north east and Ogwashi-uku from delta north south). In accordance to these sample units, a structured questionnaire was distributed to about 500 operators in the informal sector of each sample community (translating to a total of 2000 operators). The issues raised in the questionnaire included; the background of the respondents i.e. martial status, educational status, employment status, household size and composition, income, consumption-expenditure, their membership and type of ROSCAs they belong, their monthly contribution to ROSCAs, the amount of credit collected from ROSCAs for various economic activities like for purchase of foods, for purchase of land, vehicle, machineries, house or building of a house, for finance of health care and education, other capital assets and the problems encountered as members of the ROSCAs in the last 24 months.
Table 1: Survey of Thrift Collectors and Contributors in Asaba and Environs

<table>
<thead>
<tr>
<th>District</th>
<th>No of Daily Collector</th>
<th>Total No of Contributors</th>
<th>Average No of Contributor Per Collector</th>
<th>Deposit Size N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta N.E</td>
<td>Asaba</td>
<td>28</td>
<td>7,236</td>
<td>258</td>
</tr>
<tr>
<td>Delta N.E</td>
<td>Asaba</td>
<td>23</td>
<td>1270</td>
<td>716</td>
</tr>
<tr>
<td>Delta N.E</td>
<td>Oko</td>
<td>3</td>
<td>65</td>
<td>50</td>
</tr>
<tr>
<td>Delta N.E</td>
<td>Okwe</td>
<td>1</td>
<td>65</td>
<td>16</td>
</tr>
<tr>
<td>Delta N.S</td>
<td>Ugbolu</td>
<td>4-</td>
<td>184</td>
<td>46</td>
</tr>
<tr>
<td>Delta N.S</td>
<td>Ibusa</td>
<td>20</td>
<td>538</td>
<td>106</td>
</tr>
<tr>
<td>Delta N.S</td>
<td>Ogwashi-Uku</td>
<td>26</td>
<td>515</td>
<td>208</td>
</tr>
<tr>
<td>Delta N.S</td>
<td>Ubulu-Uku</td>
<td>6</td>
<td>95</td>
<td>62</td>
</tr>
<tr>
<td>Delta N.S</td>
<td>Ubulu-Unor</td>
<td>-</td>
<td>47</td>
<td>10</td>
</tr>
<tr>
<td>Delta N.N</td>
<td>Akwukwu-Igbo</td>
<td>15</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>Delta N.N</td>
<td>Illah</td>
<td>63</td>
<td>295</td>
<td>250</td>
</tr>
<tr>
<td>Delta N.N</td>
<td>Atuma</td>
<td>-</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Delta N.N</td>
<td>Ebu</td>
<td>-</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Delta N.C</td>
<td>Okpanam</td>
<td>8</td>
<td>146</td>
<td>60</td>
</tr>
<tr>
<td>Delta N.C</td>
<td>Isele-Uku</td>
<td>50</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Delta N.C</td>
<td>Onicha-Ugbo</td>
<td>2</td>
<td>67</td>
<td>53</td>
</tr>
<tr>
<td>Delta N.C</td>
<td>Iselle-Azagba</td>
<td>5</td>
<td>56</td>
<td>35</td>
</tr>
</tbody>
</table>


3.4 Model Specification

Our empirical model for this study is functionally specified as:

$$RO = \beta_0 + \beta_1 YA + \beta_2 PA + \beta_3 CE + \varepsilon_1 \quad 1$$

Table 2: Breakdown of Contributors by Occupational Category

<table>
<thead>
<tr>
<th>District</th>
<th>Wholesale Traders</th>
<th>Artisans</th>
<th>Labourers</th>
<th>Market women</th>
<th>Retail Traders</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta N.E</td>
<td>Oko</td>
<td>8</td>
<td>683</td>
<td>85</td>
<td>1.8M</td>
<td></td>
</tr>
<tr>
<td>Delta N.E</td>
<td>Ugbolu</td>
<td>10</td>
<td>810</td>
<td>82</td>
<td>1.8M</td>
<td></td>
</tr>
<tr>
<td>Delta N.E</td>
<td>Okwe</td>
<td>13</td>
<td>822</td>
<td>63</td>
<td>1.5M</td>
<td></td>
</tr>
<tr>
<td>Delta N.E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibusa</td>
<td>13</td>
<td>2,374</td>
<td>183</td>
<td>3.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oghwashi-Uku</td>
<td>16</td>
<td>3,100</td>
<td>194</td>
<td>6.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ubulu-Unor</td>
<td>9</td>
<td>607</td>
<td>67</td>
<td>0.85M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ubulu-Uku</td>
<td>11</td>
<td>1197</td>
<td>109</td>
<td>1.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta N.N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illah</td>
<td>15</td>
<td>1,240</td>
<td>83</td>
<td>2.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akwukwu-Igbo</td>
<td>9</td>
<td>519</td>
<td>58</td>
<td>1.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atuma</td>
<td>8</td>
<td>424</td>
<td>53</td>
<td>0.8M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ebu</td>
<td>9</td>
<td>535</td>
<td>59</td>
<td>1.1M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta N.S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Okpanam</td>
<td>12</td>
<td>765</td>
<td>64</td>
<td>1.75M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isele-Uku</td>
<td>17</td>
<td>2,370</td>
<td>136</td>
<td>3.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onicha-Ugbo</td>
<td>12</td>
<td>612</td>
<td>51</td>
<td>2.0M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iselle-Azagba</td>
<td>10</td>
<td>706</td>
<td>71</td>
<td>0.9M</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>24,000</strong></td>
<td></td>
<td><strong>36M</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The survey took into consideration the diverse occupational base of the various contributors to the scheme. A breakdown of the occupational base of contributors is given in Table 2. The bulk of the contributors are market women, which represent 47% of the population of contributors. Other that came closely as shown by the table are artisans, Retail traders and labourers with percentage proportions of 16%, 13% and 68.6% respectively.

at lag 2

\[
RO_{t+1} \beta_0 + \beta_1YA_{t-2} + \beta_2PA_{t-2} + \beta_3CE_{t-2} + u_{t-1} + \varepsilon_{t-1} \ldots \ldots \ldots 2
\]

\(\beta_0\) is the regression constant, \(\beta_{1s}\) measure the regression co-efficient, \(u_{t-1}\), is the VAR model error term Var(-2) and \(\varepsilon\) is error term by apprior assumption to be normally independent and identically distributed with mean value 0 and variance 1.

The dependent variable (RO), rotating saving and credit is measured by the volume of mobilized finance in the rural communities. The independent variables YA, average income is measured by the average stream of income to rural contributors, PA, property assets is measured by the value of acquired properties (houses, land, vehicles etc) of
contributors, and CE, consumption expenditure is measured by the average volume of consumption expenditure of rural contributors.

By the application of Engle and granger(1987) the model is to be tested using VAR to investigate the impact of Rural Rotating Saving and credit on the Welfare changes of rural dwellers is written as in the model below:

$$\Delta RO_{t+1} = \beta_0 + \beta_1 \Delta YA_{t-2} + \beta_2 \Delta PA_{t-2} + \beta_3 \Delta CE_{t-2} + \delta_1 \mu_{t-2} + \varepsilon_{t-1} \ldots \ldots \ldots \ldots \ldots 3$$

4.0 PRESENTATION AND INTERPRETATION OF RESULT

4.1 Model Estimation and Results

The data sourced primarily is analyzed electronically via the application of econometrics software (E-views version 3.1), the results of the analyses were shown in the tables as follows:

**Table 3: OLS result for model estimation**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>I-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>YA</td>
<td>12035.94</td>
<td>6487.992</td>
<td>1.855111</td>
<td>0.0810</td>
</tr>
<tr>
<td>PA</td>
<td>-0.040900</td>
<td>0.501200</td>
<td>-0.081605</td>
<td>0.9359</td>
</tr>
<tr>
<td>CE</td>
<td>-16948.63</td>
<td>6145.040</td>
<td>-2.758099</td>
<td>0.0134</td>
</tr>
<tr>
<td>C</td>
<td>29653489</td>
<td>35348678</td>
<td>0.838885</td>
<td>0.4132</td>
</tr>
</tbody>
</table>

R-squared 0.354826 Mean dependent var 18285952
Adjusted R-squared 0.240972 S.D. dependent var 21248245
SE. of Regression 18511947 Akaike info criterion 36.47537
Sum squared 5.83E+15 Schwarz criterion 36.67433

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The analysis revealed that the independent variables are statistically significant at 5% critical level. This is evidenced by the F-cal (3.11)>Prob(F-stat) value. However, in terms of the individual variable significant at 5% level, the YA is statistical significant while PA and CE were statistically insignificant at 5% level test.

The degree of accuracy of the analysis is adjudged at 35.5% indicating low level of analysis and that the independent variables can only explain the dependent variable by 36% while 64% can not explain which could be captured by error, structural changes, condition of services and facilities among the rural dwellers. The correlation result show both positive and negative relationship among the variable.

**Model Estimation Result is represented:**

\[
RO = \beta_0 + \beta_1 YA + \beta_2 PA + \beta_3 CE + \varepsilon_i
\]

\[
RO = 29653489 + 12035.94YA - 0.0409PA - 16948.63CE
\]

\[
se = (35348678) (6487.94) (0.5012) (6145.04)
\]

\[
t = (0.83) (1.86) (-0.08) (-2.76)
\]

\[
R^2 = 0.3548 \quad r = 0.5957 \quad dw = 2.2856
\]

\[
F_{cal} = 3.11 \quad Prob = 0.005
\]

The estimated model revealed that there is relationship among the variables at 59.6%. In addition, a unit change in the independent variables (YA, PA and CE) would result in 1203594%, 4.1% and 16948.63% change in RO respectively. This result indicated presence of serial correlation as the DW-test (2.29) is greater that dl and du value at 5% level and 3df.
Table 4a:

Breusch-Godfrey Serial Correlation LM Test:

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>Probability</th>
<th>Obs*R-squared</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.414917</td>
<td>0.059952</td>
<td>6.570206</td>
<td>0.037437</td>
</tr>
</tbody>
</table>

b. White Heteroskedasticity Test:

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>Probability</th>
<th>Obs*R-squared</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30.42760</td>
<td>0.000000</td>
<td>150432</td>
<td>0.003392</td>
</tr>
</tbody>
</table>

c. Ramsey RESET Test:

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>Probability</th>
<th>Log likelihood ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1325.800</td>
<td>0.000000</td>
<td>126.2849</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

Source: E-views 3.1

The series tested for serial correlation conform the data to be serially correlated by accept null hypothesis in the table 2a LM test result. There is presences of unequal variance using table 2b and the model is stable and in functional form as revealed in table 4c.

4.2 Cointeration Test: Long-Run Analysis

Unit Root Test for Residual from the Estimated Regression at Level

Table 5a: Unit Root for RO

At Level

<table>
<thead>
<tr>
<th></th>
<th>ADF Test Statistic</th>
<th>1% Critical Value*</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.630637</td>
<td>-3.8877</td>
<td>-3.0521</td>
<td>-2.6672</td>
</tr>
</tbody>
</table>

*Mackinnon critical values for rejection of hypothesis of a unit root.

1st order Difference
ADF Test Statistic & -5.845839 & 1% Critical Value* & -3.9635  
& & 5% Critical Value & -3.0818  
& & 10% Critical Value & -2.6829  

*Mackinnon critical values for rejection of hypothesis of a unit root. 

2\textsuperscript{nd} order Difference 

| ADF Test Statistic | -6.408941 | 1% Critical Value* | -4.0681  
| & | 5% Critical Value & -3.1222  
| & | 10% Critical Value & -2.7042  

*Mackinnon critical values for rejection of hypothesis of a unit root. 

b. Unit Root Test for YA 

At level 

| ADF Test Statistic | -1.059222 | 1% Critical Value* | -3.7856  
| & | 5% Critical Value & -3.0114  
| & | 10% Critical Value & -2.6457  

*MacKinnon critical values for rejection of hypothesis of a unit root. 

1\textsuperscript{st} order Difference 

| ADF Test Statistic | -4.589719 | 1% Critical Value* | -3.8067  
| & | 5% Critical Value & -3.0199  
| & | 10% Critical Value & -2.6502  

*Mackinnon critical values for rejection of hypothesis of a unit root. 

2\textsuperscript{nd} order Difference
ADF Test Statistic  -1.107000  1% Critical Value*  -3.7856  
                    5% Critical Value  -3.0114  
                    10% Critical Value  -2.6457  

*MacKinnon critical values for rejection of hypothesis of a unit root.

c. Unit Root Test for PA
At Level
ADF Test Statistic  -1.107000  1% Critical Value*  -3.7856  
                    5% Critical Value  -3.0114  
                    10% Critical Value  -2.6457  

*MacKinnon critical values for rejection of hypothesis of a unit root.

1\textsuperscript{st} order Difference
ADF Test Statistic  -1.107000  1% Critical Value*  -3.7856  
                    5% Critical Value  -3.0114  
                    10% Critical Value  -2.6457  

*MacKinnon critical values for rejection of hypothesis of a unit root.

2\textsuperscript{nd} order Difference
ADF Test Statistic  -4.252552  1% Critical Value*  -3.8304  
                    5% Critical Value  -3.0294  
                    10% Critical Value  -2.6552  

*MacKinnon critical values for rejection of hypothesis of a unit root.

d. Unit Root Test for CE
At Level
ADF Test Statistic  -2.288000  1% Critical Value*  -3.7856  
                    5% Critical Value  -3.0114  
                    10% Critical Value  -2.6457  

*MacKinnon critical values for rejection of hypothesis of a unit root.
1st order Difference

<table>
<thead>
<tr>
<th>ADF Test Statistic</th>
<th>1% Critical Value*</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5.391159</td>
<td>-3.8067</td>
<td>-3.0199</td>
<td>-2.6502</td>
</tr>
</tbody>
</table>

*Mackinnon critical values for rejection of hypothesis of a unit root.

2 order Difference

<table>
<thead>
<tr>
<th>ADF Test Statistic</th>
<th>1% Critical Value*</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.392798</td>
<td>-3.8304</td>
<td>-3.0294</td>
<td>-2.6552</td>
</tr>
</tbody>
</table>

*MacKinnon critical values for rejection of hypothesis of a unit root. **Source:** E-views 3.1

The stationality test tables above revealed that the variables tested were not stationary at level for all critical value of 1%, 5% & 10%. The RO is statistically significant at order 2 for all critical level value, YA is significant in the ADF 2’ order test at 5%, PA is significant at 2 order and CE is statistically significant at order2 at 5% critical value. Hence, the variables are cointegrated then we apply unrestricted VAR model.

4.3 **Co-integration Results and Causality Test**

Table6a: Co-integration Analysis

Date: 07/23/11 Time: 23:29

Sample: 1986 2009

Included observations: 17

Test assumption:
Linear deterministic trend in the data

Series: DRO DYA DPA DCE Laqs interval: No laqs

Eigenvalue
Likelihood 5 Percent 1 Percent Hypothesized

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Ratio</th>
<th>Critical Value</th>
<th>Critical Value</th>
<th>No. of CE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.999779</td>
<td>212.6356</td>
<td>47.21</td>
<td>54.46</td>
<td>None **</td>
</tr>
<tr>
<td>0.877881</td>
<td>69.57437</td>
<td>29.68</td>
<td>35.65</td>
<td>At most 1 **</td>
</tr>
<tr>
<td>0.739124</td>
<td>33.82745</td>
<td>15.41</td>
<td>20.04</td>
<td>At most 2 **</td>
</tr>
<tr>
<td>0.475936</td>
<td>10.98441</td>
<td>3.76</td>
<td>6.65</td>
<td>At most 3 **</td>
</tr>
</tbody>
</table>

*(**)* denotes rejection of the hypothesis at 5%(1 %) significance level.
L.R. test indicates 4 cointegrating equation(s) at 5% significance level.

DRO    DY A    DPA    DCE    C
1.000000 0.000000 0.000000 163.5234 5531333.
(1.93116)
0.000000 1.000000 0.000000 -1.059709 75.23428
(0.22217)
0.000000 0.000000 1.000000 8067.972 -4194288.
(2010.35)

Log likelihood -778.9826

Source: Eviews 3.1

The variables are cointegrated at most 3 and have 3 cointegrating equations. The variable are normalized except DCE. The VAR model is shown below:

```
b. VAR Model:
RO = C(1,1)*RO(1) + C(1,2)*RO(2) + C(1,3) + C(1,4)*YA + C(1,5)*PA + C(1,6)*CE
```
VAR Model - Substituted Coefficients:

\[ RO = 0.5837341242 \times RO(1) + 0.01950269616 \times RO(2) - 473255.5132 + \\
244.0171805 \times YA + 0.06300856908 \times PA - 81.1801462 \times CE \]

Table 7. Pair wise Granger Causality Tests
Date: 07/23/11 Time: 23:32
Sample: 19862009
Laqs: 2

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>YA does not Granger Cause RO</td>
<td>17</td>
<td>3.51999</td>
<td>0.06267</td>
</tr>
<tr>
<td>RO does not Granger Cause YA</td>
<td></td>
<td>1.36961</td>
<td>0.29123</td>
</tr>
<tr>
<td>PA does not Granger Cause RO</td>
<td>17</td>
<td>4.09698</td>
<td>0.04403</td>
</tr>
<tr>
<td>RO does not Granger Cause PA</td>
<td></td>
<td>0.21 570</td>
<td>0.80904</td>
</tr>
<tr>
<td>CE does not Granger Cause RO</td>
<td>17</td>
<td>11.0225</td>
<td>0.00192</td>
</tr>
<tr>
<td>RO does not Granger Cause CE</td>
<td></td>
<td>12.6904</td>
<td>0.00109</td>
</tr>
<tr>
<td>PA does not Granger Cause YA</td>
<td>21</td>
<td>11.8394</td>
<td>0.00070</td>
</tr>
<tr>
<td>YA does not Granger Cause PA</td>
<td></td>
<td>4.99959</td>
<td>0.02057</td>
</tr>
<tr>
<td>CE does not Granger Cause YA</td>
<td>21</td>
<td>1.22320</td>
<td>0.32038</td>
</tr>
<tr>
<td>YA does not Granger Cause CE</td>
<td></td>
<td>12.8883</td>
<td>0.00046</td>
</tr>
<tr>
<td>CE does not Granger Cause PA</td>
<td>21</td>
<td>2.92461</td>
<td>0.08269</td>
</tr>
<tr>
<td>PA does not Granger Cause CE</td>
<td></td>
<td>- 10.5084</td>
<td>- 0.00122</td>
</tr>
</tbody>
</table>

To measure the level and degree of impact of rotating savings and credit on welfare of contributors, the Granger causality tests in the table 7 revealed that YA, PA and CE granger cause the RO in the investigation of the study both at the short and long run effect.

5.0 CONCLUSION AND RECOMMENDATION
The empirical analysis using Johansen co-integration procedure have revealed a functional relationship between rotating savings and credit and average income, rate of properties acquisition and average consumption expenditure of rural contributors. The results of the estimated model revealed that income exerted more significant effect on growth of informal finance in the rural communities during the review period. The other two variables consumption expenditure and property assets, as shown by the result, have negative effect on growth of informal finance, this thus implies that they are drains to rural deposits. This revelation fits prior expectation in that income is an injection to informal finance deposit while consumption expenditure and properties acquisition are withdrawals from the deposit.

From this research study, it can be concluded that rural income constitute the most significant influence on growth of informal finance in rural communities. Therefore, it is thus recommended that there should be an aggressive improvement on the rural income base by defining a workable fiscal policy stimuli that is rural poor driven to enhance cash flow and create an incentive for improved mobilization of informal finance in Nigerian rural communities.

REFERENCES

Adera, A. (1995); Instituting effective linkages between the formal and the informal financial sectors in Africa: A proposal. Saving and Development Quarterly Review 1(19)


Gemidis, D. (1990); Interlinking the formal and informal sectors in developing countries. Savings and Development Quarterly Review 1 (4).


World Bank (1995); Advancing Social Development. The International Bank for Reconstruction and Development, Washington D. C.