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EMPIRICAL EVIDENCE OF CAUSAL RELATIONSHIP BETWEEN ECONOMIC EMPOWERMENT AND FINANCIAL SAVINGS: EVIDENCE FROM NIGERIA

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Abstract

This paper examines empirically the long-run relationship between real gross domestic saving (GDS) and economic empowerment as measured by HDI for Nigeria (1971-2007) using a developed approach to cointegration by Pesaran et al. (2001) that performs well with small samples and regardless of the orders of the respective time series [i.e., whether time series are $I(0)$, $I(1)$, or $I(0)/I(1)$]. The empirical results reveal that a long-run relationship exists between the variables. The Granger causality test supports bidirectional causality between economic empowerment and financial saving in Nigeria. This implies that government can either implement enhance saving policies to achieve an improve economic empowerment or use training and financial policies to empower people which will in turn have multiplier effect on savings.

I. Introduction

There exist a positive relationship between savings and economic growth as supported by various studies by Domer (1946) and Solow (1956) models of growth. Empirical works by Alguacil et al. (2004) and Singh (2009), among others provide support for the hypothesis that savings growth promotes economic growth, and that economic growth stimulates savings. This view is supported with the empirical findings of Sinha and Sinha (1998), Saltz (1999), Agrawal (2001), and Anoruo and Ahmad (2001), and Narayan and Narayan (2006), among others. This research will focus on examining the causal relationship between economic empowerment and financial savings in Nigeria in order to provide the policymakers in the country with a planning tool that can help them in formulating their policies to promote real economic empowerment. Thus the major question that this research needs to answer is whether or not financial savings growth promotes economic empowerment in Nigeria.

The purpose of this study is to examine the impact of financial savings on economic empowerment in Nigeria. Using annual data from 1971 to 2007 an Autoregressive Distributed Lag (ARDL) approach to cointegration as proposed by Pesaran et al. (2001).

The rest of the paper is organized as follows. Section 2 consist of conceptual clarification and literature review while Section 3 presents the model, data, and the empirical methodology used in the study. Section 4 discusses the empirical results while section 5 concludes the study.

II Conceptual Clarification and Literature Review

Theories of empowerment include both processes and outcomes, suggesting that actions, activities, or structures may be empowering, and that the outcome of such processes result in a level of being empowered (Swift & Levin, 1987). Both empowerment processes and outcomes vary in their outward form because no single standard can fully capture its meaning in all contexts or populations (Rappaport, 1984; Zimmerman, 1993). A distinction between empowering processes and outcomes is critical in order to clearly define empowerment theory. Empowering processes for individuals might include participation in community organizations. At the organizational level, empowering processes might include collective decision making and shared leadership. Empowering processes at the community level might include collective action to access government and other community resources (e.g., media). Empowered outcomes refer to operationalizations of empowerment that allow us to

study the consequences of empowering processes. Empowered outcomes for individuals might include situation-specific perceived control and resource mobilization skills.

Empowerment suggests that participation with others to achieve goals, efforts to gain access to resources, and some critical understandings of the sociopolitical environment are basic components of the construct. Applying this general framework to level of analysis suggest that empowerment includes organizational processes and structures that enhance member participation and improve goal achievement for the organization. At the community level, empowerment refers to collective action to improve the quality of a life in a community and to the connections among community organizations. Organizational and community empowerment, however, are not simply a collection of empowered individuals.

We may conceptualize empowerment processes as three interwoven processes which complement and contribute to one another. The process of individual empowerment which actually can occur in an immense variety of circumstances and conditions without any connection to the other two processes, but when it occurs in the course of active participation in social change processes in groups and organizations it has a special value for both the individual and the environment. The potential for empowerment, like one's very humanity exists in everyone and the ability to make a difference is a component of human existence.

However, the people use a variety of financial institutions or mechanisms in order to pool save their money. These include the informal mechanisms, semi formal and formal mechanisms. The informal mechanisms in the context of this study include unregistered and unregulated financial mechanisms that are organized by the people for the people. They mainly operate within a closed community of friend's relatives or persons with some common bond. The semi formal mechanisms are formally registered financial institutions but are not regulated and supervised by the Monetary Authority (Narayan and Narayan, 2006). The Micro finance institutions (MFIs), and the Savings and Credit Cooperatives (SACCOs) fall under this category. Although the SACCOs are supposed to be regulated by the Federal Department of Cooperatives, Ministry of Agricultural and Rural Development, there is minimal supervision and regulation hence their being categorized as semi-

formal as well. The formal mechanisms refer to the financial institutions that are registered, supervised and regulated by a legal instrument, either by the central bank or some other financial legislative body. These include banks, insurance firms and pension funds (Mohan, 2006).

Furthermore, the safety of savings is of paramount importance because of daily temptations of attractive consumption alternatives; the ever-present possibility of theft, fire or other calamities; and above all the potential demands from prying relatives who may discover that wealth has been accumulating at an individual's home. The consensus emerging therefore is that households will save in formal financial institutions if the institutions are appropriately structured and offer saving products that meet their specific needs. Robinson and Vogel suggest three features about savings products, which respond to these specific needs namely:

1. Convenience of location
2. A positive real return, and
3. Liquidity, (Alguacil, et al., 2004).

Studies carried out in Bangladesh and Tanzania provided a good summary of the emerging picture. The poor do desire to save (in formal institutions) and what they need is a reasonable mechanism to enable them save and the assurance that they can access those savings when the need arises (Agrawal and Sahoo, 2009). The Tanzanian study observed that most households were dissatisfied with modes of saving that were outside formal institutions. Nearly 75% of all those interviewed rated such modes of saving as either "only fair" or "bad", while 88% of those who save in formal institutions rated that mode of saving as "good". The study concluded that given an option most households would save in formal institutions but emphasizes that such institutions would have to be accessible, and offer their clients a good combination of liquidity, convenience, safety and fair rate of return (Musinga et al., 1997).

III. The Model, Data, and Empirical Methodology

An estimated model used to examine the relationship between financial savings and economic empowerment is given by:

$$S = a_0 + b_1E + \varepsilon \dots\dots\dots (1)$$

where E is log (estimated Human Development Index(HDI) proxy for Economic Empowerment) and S is log (real Gross Domestic Savings). Data on

these variables are annual and obtained from the World Bank's World Development Reports (online) and covers the periods 1971-2007. All the variables are in constant local currency units.

Cointegration Test: The ARDL approach

The study uses the Autoregressive Distributed Lag (ARDL) approach to cointegration that was proposed by Pesaran *et al.* (2001) which estimates the conditional ARDL model for real financial savings and economic empowerment given in equation 1 (considering each variable as a dependent variable) as follows:

$$\Delta E_t = \alpha_{0E} + \sum_{i=1}^k \delta_{1E} \Delta E_{t-i} + \sum_{i=0}^k \delta_{2E} \Delta S_{t-i} + \gamma_{1E} E_{t-1} + \gamma_{2E} S_{t-1} + \varepsilon_1 \quad \dots (2)$$

$$\Delta S_t = \alpha_{0S} + \sum_{i=1}^k \delta_{1S} \Delta S_{t-i} + \sum_{i=0}^k \delta_{2S} \Delta E_{t-i} + \gamma_{1S} E_{t-1} + \gamma_{2S} S_{t-1} + \varepsilon_2 \quad \dots (3)$$

The ARDL approach was used by, among others, Mohan (2006), Oladipo and Akinbobola (2011), Ali *et al.* (2010), Kriekhans (2002), Sinha and Sinha (1998), Narayan and Narayan (2006), argued that the ARDL method proposed by Pesaran *et al.* (2001) can perform well in small samples and irrespective of whether the variables are 1(0), 1(1), or mutually cointegrated, and it is unbiased and efficient. The ARDL approach uses two steps to estimate the long run relationship. First step is to determine whether a long run relationship exist between the variables in equations 2 and 3 by considering each of the variables as a dependent variable. Then we use the F-test for testing the existence of the long-run relationship in equations 2 and 3. That is, the null hypothesis of no cointegration among variables in equation 2 is tested (i.e., $H_0: \gamma_{1E} = \gamma_{2E} = 0$) against the alternative hypothesis (i.e., $H_1: \gamma_{1E} \neq \gamma_{2E} \neq 0$) using the F-test for the joint significance of the lagged levels coefficient in equation 2. In equation 3, when the gross domestic saving is the dependent variable, the null hypothesis of no cointegration among variables is tested (i.e., $H_0: \gamma_{1S} = \gamma_{2S} = 0$) against the alternative hypothesis (i.e., $H_1: \gamma_{1S} \neq \gamma_{2S} \neq 0$) using the F-test for the joint significance of the lagged levels coefficient in equation 3. If the estimated F-statistics is greater than the upper bound critical value, we conclude that the variables in question are cointegrated.

Also, if the estimated F-statistics falls between the lower and the upper bound critical values, the

decision about cointegration among the variables involved is inconclusive. And if the estimated F-statistics is less than the lower critical value, the null hypothesis of no cointegration cannot be rejected. The Second step, if the long-run relationship is established between the variables, the long-run and the short-run coefficients are estimated using the ARDL approach. The optimal lag is determined using Akaike Information Criterion (AIC). In addition, because of the possibility of trend existence in both series, estimations, equations 2 and 3 are estimated taking into consideration case III: unrestricted intercept and no trend and case IV: unrestricted intercept and restricted trend as explained in Pesaran *et al.* (2001).

We use annual data on real gross domestic savings and estimation of Human Development Index (HDI see appendix) for Nigeria for a period covering 1971-2007. All the data are extracted from the World Bank, World Development Indicators online. Both variables were transformed into natural logarithms where E is log (estimated HDI) and S is log (real GDS).

Granger Causality

If the cointegration test results reveal that the variables are cointegrated, we use the Vector Error Correction (VEC) model estimation as in equations 4 and 5. However, if the variables are not cointegrated we use Vector Autoregressive (VAR) model in the first difference in the estimation given that both variables are 1(1). Thus, we use the following VER model to examine the Granger causality between HDI and real GDS:

$$\Delta E_t = \alpha_{0E} + \sum_{i=1}^k \delta_{1E} \Delta E_{t-i} + \sum_{i=0}^k \delta_{2E} \Delta S_{t-i} + \lambda_1 EC_{t-1} + \varepsilon_3 \quad \dots (4)$$

$$\Delta S_t = \alpha_{0S} + \sum_{i=1}^k \delta_{1S} \Delta S_{t-i} + \sum_{i=0}^k \delta_{2S} \Delta E_{t-i} + \lambda_2 EC_{t-1} + \varepsilon_4 \quad \dots (5)$$

Where EC_{t-1} is the lagged error correction term. As equations 4 and 5 show, Granger causality between HDI and real GDS can be revealed by testing the following null hypotheses:

- For short-run Granger causality: ($H_0: \delta_{2E} = 0$ and $H_0: \delta_{2S} = 0$),
- For long-run Granger causality: ($H_0: \lambda_1 = 0$ and $H_0: \lambda_2 = 0$),
- For strong Granger causality: ($H_0: \delta_{2E} = \lambda_1 = 0$, and $H_0: \delta_{2S} = \lambda_2 = 0$).

IV. Empirical Results

a) Unit Root Test

Although unit root test is not required for testing for cointegration using the ARDL approach, it is necessary for verifying that both series are not cointegrated or order higher than one, and also for conducting Granger causality test. We use the Augmented Dickey-Fuller (ADF) test for conducting

the unit root test. The ADF tests the null hypothesis of nonstationarity. Table 1 below shows the ADF test results for both S and E series as defined above. The ADF test results show that both variables S and E are nonstationary in their levels and stationary in their first difference in Nigeria. In addition, the Phillips-Perron test results (not reported here but available upon request) confirm the results that both variables S and E are nonstationary in their levels and stationary in their first difference.

Table 1: The ADF Unit Root Test Results

Variable	Augmented Dickey-Fuller (ADF) Test Statistic:			
	ADF (L) (no trend)	CV	ADF (L) (with trend)	CV
S	-1.3252 (1)	-2.9266 - 3.4302 (0)	-3.5107	
E	-2.3883 (1)	-2.9266 - 2.0938 (1)	-3.5107	
ΔS	-8.6692 (0)	-2.9281 - 8.8685 (0)	-3.5131	
ΔE	-8.8772 (0)	-2.9281 - 10.245 (0)	-3.5131	

Sources: Author's computation 2010

Notes: Variables E and S are, respectively, the log of HDIs and real GDS. L denotes the lag length selected using SIC, and CV denotes critical values at 5% significance level.

b) Cointegration Test: The ARDL approach

The existences of the long-run relationship between the variables involved have been investigated by calculating the F-statistics before estimating equation 1. When estimating equation 3, the computed F-statistics (with trend) $F_E(E/S)$ is 9.08 which is higher than the upper bound critical values of 6.73 at the 1% significance level that is provided by Pesaran et al. (2001). This means that the null hypothesis of no cointegration is rejected when ΔS is the dependent variable and that there is a long run

relationship between the variables involved as shown in Table 2 below. However, when using equation 2, where ΔE is the dependent variable, the null hypothesis of no cointegration cannot be rejected since the computed F-statistics $F_S(S/E)$ is 4.36 and 4.08 with no trend and with trend, respectively, which is less than the lower bound critical values of 4.94 (with no trend) and 4.68 (with trend) at the 5% significance level as provided by Pesaran et al. (2001). This is shown in the table below as Case III and Case IV.

Table 2: Bounds F-Test Results for Cointegration

Dependent Variable	F-Statistics (no trend)	F-Statistics (with trend)	ECT(-1)
ΔY	4.61	3.84	-0.2104**
ΔS	4.21	11.11	-0.3783*

Sources: Author's computation 2010

Notes: E is the log of HDI and S is the log of real GDS. Δ is the first difference operator; *, ** Significant at 1% and 5% significance levels, respectively Also Case III: (unrestricted intercept and no trend) and Case IV: (unrestricted intercept and restricted trend) are shown below.

	Case III:		Case IV:	
	I(0)	I(1)	I(0)	I(1)
Critical values at 1%	6.84	7.84	6.10	6.73
Critical values at 5%	4.94	5.73	4.68	5.15
Critical values at 10%	4.04	4.78	4.05	4.49

Notes: The critical values for the lower I(0) and upper I(1) bounds are taken from Pesaran et al. (2001),

c) Granger Causality

When two variables are cointegrated then Granger causality exists in at least one direction. Like the case of Nigeria, the cointegration test results of the ARDL model reveal that HDIs and real GDS are cointegrated, thus Granger causality will exist at least in one direction between the variables. However, the ARDL cointegration results do not reveal the direction of the causality between HDIs

and real GDS. The results in Table 3 below suggest that there is a statistical evidence of bidirectional Granger causality in its three kinds (i.e., short-run, long-run, and strong Granger causality) between HDIs and real GDS. Thus the results in Table 3 suggest that there is bidirectional causality between economic empowerment and financial savings growth in Nigeria.

Table 3: Granger Causality Tests

Causality Type	F-statistic (p-value)
Short-run Granger causality:	
$\Delta S \rightarrow \Delta E$ ($H_0: \delta_{2E} = 0$)	4.4625 (0.0188)
$\Delta E \rightarrow \Delta S$ ($H_0: \delta_{2S} = 0$)	8.2418 (0.0012)
Long-run Granger causality:	
$\Delta S \rightarrow \Delta Y$ ($H_0: \lambda_1 = 0$)	6.4012 (0.0161)
$\Delta Y \rightarrow \Delta S$ ($H_0: \lambda_2 = 0$)	8.5401 (0.0061)
Strong Granger causality:	
$\Delta S, ECT \rightarrow \Delta Y$ ($H_0: \delta_{2E} = \lambda_1 = 0$)	6.0547 (0.0020)
$\Delta Y, ECT \rightarrow \Delta S$ ($H_0: \delta_{2S} \delta_{2E} = \lambda_2 = 0$)	7.7533 (0.0004)

Sources: Author's computation 2010

Notes: E is the log of HDI and S is the log of real GDS. ECT is the error correction term. Δ is the first difference operator.

IV. Conclusion

This study examines empirically the relationship between financial savings and the economic empowerment in Nigeria (1971-2007) using the newly developed ARDL approach. The results reveal that there is long-run relationship between financial savings and economic empowerment in Nigeria over the period examined. When testing for Granger causality, the results show that a bidirectional causality exist between financial savings and economic empowerment in Nigeria. This finding implies that the government can promote savings to empower people economically which will in turn spoor greater savings in the system via multiplier effect on income. Likewise, the government may train members of household to empower them which will improve savings and

serious public enlightenment against apprehensive consumption to enhance savings which would lead to empowerment. However, these results should be interpreted with cautious since they may be effected if we could have a large data set and it may be useful to disaggregate saving and add other policy variables and see how this affects the economy.

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APPENDIX

ESTIMATION OF HUMAN DEVELOPMENT INDEX PROXY FOR ECONOMIC EMPOWERMENT IN NIGERIA

An illustration of the calculation of the HDI using data from Turkey:

1. Calculating the life expectancy index

The life expectancy index measures the relative achievement of a country in life expectancy at birth. For Turkey, with a life expectancy of 71.4 year in 2005, the life expectancy index is 0.773.

$$\text{Life expectancy index} = \frac{71.4 - 25}{85 - 25} = 0.773$$

Calculating the education index

The education index measures a country's relative achievement in both adult literacy and combined primary, secondary and tertiary gross enrolment. First, an index for adult literacy and one for combined gross enrolment are calculated. Then these two indices are combined to create the education index, with two-thirds weight given to adult literacy and one-third weight to combined gross enrolment. For Turkey, with an adult literacy rate of 87.4% in

2005 and a combined gross enrolment ratio of 68.7% in 2005, the education index is 0.812.

$$\text{Adult literacy index} = \frac{87.4 - 0}{100 - 0} = 0.874$$

$$\text{Gross enrolment index} = \frac{68.7 - 0}{100 - 0} = 0.687$$

$$\begin{aligned} \text{Education index} &= 2/3 (\text{adult literacy index}) + 1/3 (\text{gross enrolment index}) \\ &= 2/3 (0.874) + 1/3 (0.687) = 0.812 \end{aligned}$$

2. Calculating the GDP index

The GDP index is calculated using adjusted GDP per capita (PPP US\$). In the HDI income serves as a surrogate for all the dimensions of human development not reflected in a long and healthy life and in knowledge. Income is adjusted because achieving a respectable level of human development does not require unlimited income. Accordingly, the logarithm of income is used. For Turkey, with a GDP per capita of 8,407 (PPP US\$) in 2005, the GDP index is 0.740.

$$\text{GDP index} = \frac{\log(8,407) - \log(100)}{\log(40,000) - \log(100)} = 0.740$$

3. Calculating the HDI

Once the dimension indices have been calculated, determining the HDI is straightforward. It is a simple average of the three dimensions indices.

$$\begin{aligned} \text{HDI} &= 1/3 (\text{life expectancy index}) + 1/3 (\text{education index}) + 1/3 (\text{GDP index}) \\ &= 1/3 (0.773) + 1/3 (0.812) + 1/3 (0.740) = 0.775 \end{aligned}$$