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SUSTAINABLE DEVELOPMENT: NEXUS BETWEEN FINANCE AND ADJUSTED NET SAVINGS IN NIGERIA.

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Abstract
This study examined the Nigerian financial sector and adjusted net savings in Nigeria. Time series data from 1986-2015 were obtained from the World Development Indicators, Central Bank of Nigeria Statistical Bulletin and the annual reports of National Insurance Commission. An Autoregressive Distributed Lag (ARDL) bound test was estimated and findings reveal that: The banking sub-sector has a positive and significant relationship ($\theta = 0.871; P < 0.01$) *with adjusted net savings in Nigeria; the Stock market sub-sector positively and significantly* ($\theta = 0.162; P < 0.1$) *affects adjusted net savings in Nigeria; and the insurance sub-sector has no significant influence* ($\theta = -0.525; P < 0.1$) *on adjusted net savings in Nigeria. This study concluded that the banking and the stock market sub-sectors of the financial system significantly influence adjusted net savings in Nigeria. Study therefore, recommends that the government through its regulatory authorities should pay more attention to the banking and stock market sub-sectors of the financial system in order to make them resilient, effective and efficient towards channelling funds to productive or growth driven sectors, to significantly impact on adjusted net savings in Nigeria thereby propelling sustainable development in Nigeria.*

Keywords: *Adjusted net savings, banking sector, stock market, and insurance sub-sector.*

JEL Classification*: G2, G21, G22, Q01*

1. INTRODUCTION

A unique indicator of a country's sustainable development is its adjusted net savings (ANS) as advanced by the World Bank in 2002, and it indicates how sustainable a country's policies are. ANS measures the true rate of savings in an economy after taking into accounts, investments in human capital, depletion of natural resources and damage caused by pollution. It is the real measure of countries sustainable development.

Recently, there has been a gentle revolution seeking to create a resilient financial industry that can provide the long-term financing requirements of an inclusive, sustainable economy in the face of growing environmental challenges and other volatilities around the globe. A nation is said to be sustainably developed when the needs of its present and future generations are met and this can be indicated with such country's adjusted net savings.

A financial system is a conglomerate of financial institutions, markets, and operations that interact to provide financial services in an economy. A developed financial sector has been argued to restore confidence and strengthen the banking system to facilitate long-term sustainable growth of the economy (Umoh, 2011).Therefore, the role of a nation's financial

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system transcends just an intermediary that allocates savings to investments (Onwumere, Onudugo and Ibe, 2013). The Action Area B point 35 of the United Nations 3rd International Conference on Sustainable Development Financing particularly, recognized a sound financial system as one the major complement to a sustainable national development (United Nations, 2015). However, the Nigerian financial system consists of various sub-sectors to include the banking sub-sector, the capital market, the insurance sub-sector, the pension fund administrators, and other financial institutions. According to Onwumere *et. al.,* (2013); Umejiaku, (2017); and the Central Bank of Nigeria (CBN, 2017), the major sub-sectors of the Nigerian financial industry are the banking sub-sector, the insurance sub-sector, and the capital market. These, major sub-sectors therefore, serve as a focus for this study and represent the Nigerian financial sector.

Nigeria cannot afford to fold her hands as problem still persist with her economic policies particularly, with her economic growth path, income distribution and environmental quality, which are the main pillars of sustainable development. And with just eleven (11) years to her 2030 agenda; poverty is still wide spread coupled with extreme level of income gaps among Nigerians. There are also challenges of different environmental abuses and pollution; and for the past forty years Nigeria's economic growth has failed to keep pace with those of the developed nations (Ogbeide and Agu, 2015; Aigbokan, 2017; World Bank, 2017a; Central Bank of Nigeria, 2017; and World Bank, 2017c). The Sustainable Development Goals (SDG) performance index in 2015, ranked Nigeria 141st out of 149 countries with many other African countries outperforming Nigeria. For example, Tunisia, Morocco, Egypt, South Africa and Ghana were ranked 51st, 64th, 66th, 99th and 104th respectively out of 149 countries (World Economic Forum (WEC) 2015; and Stiftung 2016). This worrisome state of Nigeria's performance therefore, calls for attention in order to achieve its sustainable development goals by year 2030 as targeted. This therefore, serves as the motivation for this study.

2. LITERATURE REVIEW

This section discusses the related empirical studies to sustainable development. For example, using a trivariate vector autoregressive framework Abu-Bader and Abu-Qarn (2008) examined financial development and economic growth in Egyptian economy from 1960 to 2001. Study made use of four variables as proxy for financial sector development such as credit issued to non-financial firms as a percent of total domestic credit, ratio of credit to private sector as percent of GDP, money stock, and ratio of broad money to GDP. The study revealed that financial development and economic growth are mutually causal and that there is need to stimulate investments through financial reforms to bring about long term sustainable growth. However, the variables used in the study are more of banking sector variables leaving out other sub-sectors of the financial system. The study also dwelled on economic growth which is not a sufficient proxy for sustainable development.

Anwar, Shabir, and Hussain (2011) assessed financial sector development and sustainable economic development in Pakistan from 1973 to 2007. The study found that the financial sector positively and significantly affects the sustainable development of Pakistan in both the short and long run. The study did use good indicators to proxy the Pakistani financial sector such as average market capitalization to GDP, ratio of total stock traded to GDP, M2 to GDP, domestic credit to private sector as a percent of GDP, and ratio of assets with central bank to GDP. However, the ratio of external debt to export was used to proxy sustainable development and the use of this measure was not satisfactorily justified nor known among the indicators advanced to measure sustainable development by the World Bank and in the

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literature, see World Bank (2002); Drastichova, (2016); and Blum, Ducoing and Mclaughlin, (2016), among others.

Dauda and Makinde (2014) investigated financial sector development and poverty reduction in Nigeria and reported that credit granted by financial intermediaries as percent of GDP, real GDP per capita and broad money to GDP failed to reduce poverty in Nigeria. Although, the study adopted a better proxy for poverty reduction by using the ratio of the numbers of poor to total population from 1980 to 2010 as against per capita GDP used to proxy poverty in the study of Ogunniyi and Igberi (2014), however, the study omitted the indicators of the insurance sub-sector and stock market among other variables of the financial sector and did not focus on sustainable development.

Balago (2014) studied financial sector development and economic growth in Nigeria from 1990 to 2009, and found that financial development positively and significantly affect growth in Nigeria. The study used three indicators such as banking sector credits, total market capitalization, and foreign direct investment to capture financial sector in Nigeria, however, insurance sub-sector indicators were excluded. Also, foreign direct investment used to capture financial sector development should have been a better indicator for economic growth and not a good proxy of financial sector. Study did not also focus on sustainable development.

Okeke, Izeueke and Nzekwe (2014) opined that energy security guarantees sustainable development in Nigeria. The study however, was not quantitative in nature and did not indicate measures of energy security nor sustainable development. Moldovan (2015) investigated financial system and sustainable development in five developing Eastern European Countries-Bulgaria, Czech Republic, Hungary, Poland and Romania from year 2000 to 2013. Results revealed the presence of weak financial system and showed no correlation between the financial system and sustainable development in the five countries. The study used only two indicators to capture financial system: total market capitalization to GDP and domestic credit to GDP excluding other indicators of other sub-sectors in the financial system. Also, nine indicators where used to proxy sustainable development to include resource productivity, poverty, employment rate of older adults as a share of total employment, healthy life years, greenhouse emissions, renewable energy, real gross domestic product per capita, energy consumption on transportation, and official development assistance as a percent of gross national income. However, the study gave much premium to environmental indicators and leaving out the adjusted net savings.

Applying an autoregressive distributed lag bound testing approach to a time series data from 1970 to 2012, Nwosu and Metu (2015) assessed financial development and economic growth in Nigeria. The study used four indicators of financial development such as broad money, net domestic credit, imports and export. Findings revealed that financial development only affects economic growth in the long run and not in the short run. The limitation of the study stems in that indicators of the stock market and the insurance sub-sector were excluded, as net domestic credit and broad money used in the study are indicators of the banking sub-sector. Also, the study considered only economic growth which is only one dimension of sustainable development.

Using a conceptual approach Ndubuisi-Okolo and Anekwe (2018) investigated strategies for achieving sustainable development in the Nigerian state and found that sustainable development can only be feasible in Nigeria if poverty is drastically reduced, effective leadership is put in place, and youths are empowered to be self reliant. However, the study used a single period and did not indicate how sustainable development was measured. The measurement lapses in this study perhaps, might be due to the conceptual approach used in addressing sustainable development in Nigeria.

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It is evident that most available studies in Nigeria measured sustainable development using real growth rate of gross domestic product (Real GDP growth rate), see: Adegbite and Ayadi (2011); Mojekwu and Ogege (2012); Olusanya (2013); Idoko, Idachaba, and Emmanuel (2015); Ejumudo (2015), to mention a few. It is clear that the real growth rate of GDP is only a good measure of economic growth and not a sufficient measure for sustainable development. This study therefore, deviates from existing studies by measuring sustainable development using 'Adjusted Net Savings' as advanced by the World Bank in 2002. This is also in line with the studies of Dosmagambet (2010); Drastichova (2016); and Blum, Ducoing, and McLaughlin (2016).

2.1 Theoretical Review

The underpinning theories to this research work are the Theory of Intergenerational Altruism (TIA), and the Finance-Led Growth Hypothesis. TIA originates from a French philosopher, Auguste Comte in 1852. The theory focuses on the total well-being of both the present and the future generations and therefore, considers the future consequences of current decisions.. According to Galperti and Strulovici (2017), TIA incorporates full utility (rather than mere consumption utility) of the present and all future generations and also weighs the current economic and environmental consequences on future generations. Relating this theory to this research work, Intergenerational Altruism is seen in the perspective of sustainable development, in which the needs and quality of life (total well-being) of both the present and future generations are protected. This theory was also adopted by Farhi and Werning (2007); Pearce (2008); Schneider, Traegner and Winkler (2012); and Galperti and Strulovici (2017), among others.

The Finance-led Growth Hypothesis was formalized by Goldsmith (1969); Shaw (1973); and Mckinnon (1973), and posits that the financial sector creates enabling conditions for growth. Rajan and Zingales (2003) holds that a large body of empirical investigations supports that a developed financial system spurs economic growth. A developed financial sector has been argued to broaden the access to finance and stimulate production and other economic activities to bring about growth and development (Levine, Loayza and Beck, 2000). The Finance-Led Growth Hypothesis is linked to this research work in that financial system is seen as a critical tool that can drive sustainable development in Nigeria. This theory was also used by Calderon and Liu, 2003; Apergis, Filippidis and Economidou, 2007; and Ehigiamusoe, Umar, Okoro, Jumare, and Ogunyomi, 2014, among others.

3. METHODOLOGY

This section presents the model specification and the analytical review techniques adopted in this study.

3.1 Model Specification

The model of Ogunlokun, Akinfolarin and Adeleke (2018) on financial deepening and sustainable development was modified to achieve objectives 1 to 3 of this study, and to capture the major sub-sectors of the Nigerian financial sector which include: the banking sub-sector, the stock market and the insurance sub-sector based on the submissions of Onwumere, *et. al.*, (2013); Umejiaku (2017); and Central Bank of Nigeria (CBN, 2017). The model is specified as:

$$ANS_t = f(CPS_t, TST_t, ISP_t, GR_t) \quad (1)$$

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The econometric form of the model is stated as:

$$\ln ANS_t = \beta_0 + \theta_1 \ln CPS_t + \theta_2 \ln TST_t + \theta_3 \ln ISP_t + \theta_4 GR_t + \mu_t \quad (2)$$

An ARDL bounds representation of equation (2) is specified as:

$$\Delta lnANS_t = \beta_0 + \theta_0 ANS_{t-1} + \theta_1 lnCPS_{t-1} + \theta_2 lnTST_{t-1} + \theta_3 lnISP_{t-1} + \theta_4 GR_{t-1} + \sum_{i=0}^{q} \beta_i \Delta lnANS_{t-1} + \sum_{i=0}^{r} \gamma_i \Delta lnCPS_{t-1} + \sum_{i=0}^{s} \vartheta_i \Delta lnTST_{t-1} + \sum_{i=0}^{t} \zeta_i \Delta ISP_{t-1} + \sum_{i=0}^{t} \psi_i \Delta GR_{t-1} + \mu_t \quad (3)$$

Where:

$\ln ANS_t$ = log of adjusted net savings.

$\ln CPS_t$ = log of credit to the private sector to as a percent of GDP

$\ln TST_t$ = log of total shares traded as a percent of GDP

$\ln ISP_t$ = log of gross insurance premiums as a percent of GDP

GR_t = government reforms

Δ is the first difference operator, β_0 is the drift component, $\theta_1 - \theta_4$ represent the long run elasticities, $\beta_i, \gamma_i, \delta_i, \lambda_i, \vartheta_i, \zeta_i, and\ \psi_i$, stand for the short run dynamics.

μ_t = white noise residuals

On A priori grounds, it is expected that there will be a positive relationship between financial sector variables and adjusted net savings in Nigeria, therefore, implying that θ_1, θ_2, θ_3, and θ_4, > 0.

3.2 Analytical Review Techniques

Study used secondary data spanning from 1986 and 2015. The year 1986 was chosen because it was the year Structural Adjustment Programme (SAP) was introduced in Nigeria, and the financial sector reform was a major component of SAP; while the choice of the year 2015 is based on data availability as data for adjusted net savings is only available up till 2015. Data were sourced from the World Development Indicators, Central Bank of Nigeria Statistical Bulletin, and the annual reports of National Insurance Commission. Unit root test was applied to check for stationarity in data using the Augumented Dickey-Fuller and Phillips-Perron tests. This was necessary in order to be sure that no single variable was integrated at second difference I(2). Diagnostics tests such as: the Langrange Multiplier (LM) serial correlation tests; Multicollinearity test; Breusch-Pagan-Godfrey heteroschedasticity test; Normality of residuals test; Ramsey's RESET misspecification test; and the stability test were also conducted. While the long run association for all variables were confirmed using bounds test, and the Autoregressive Distributed Lag (ARDL) short run and long elasticities were estimated to see the effect of each of the financial sub-sector indicators on adjusted net savings both in the short and long runs respectively.

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4. FINDINGS AND DISCUSSIONS

4.1 Unit Root Test

The Unit root test was conducted on the model of adjusted net savings using the Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) tests to examine the stationarity of variables at both intercept; and trend and intercept for level I(0) and at first difference I(1).

Table 1: Results of ADF and PP Unit Root Test for the Model of Adjusted Net Savings.

Level I(0)	ADF Unit Root		PP Unit Root	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LNANS	-4.517***	-4.499***	-4.517***	-4.499***
LNCPS	-0.604	-2.495	-0.413	-1.803
LNTST	-0.946	-2.188	-0.995	-2.188
LNISP	-2.811*	-3.161	-2.780*	-2.442
First difference I(1)	ADF Unit Root		PP Unit Root	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LNANS	-8.093***	-7.937***	-18.586***	-18.508***
LNCPS	-4.378***	-4.558***	-5.019***	-8.357***
LNTST	-4.827***	-4.026**	-4.812***	-4.666***

Source: Author's Computation (2019)

Note: 1. ***, ** and * are 1%, 5% and 10% levels of significance respectively. 2. The optimal lag length is selected automatically using the Schwarz Info Criteria (SIC) for ADF test and the bandwidth had been selected by using the Newey–West method for PP unit root test.

Results from Table 4.1 show the unit root test conducted on the model of adjusted net savings using the Augmented Dickey-Fuller test (ADF) and the Phillips-Perron (PP) test. Results at level, reveals that the ratio of gross insurance premium to GDP is stationary at level i.e., I(0) under intercept and is significant at 10% level of significance using both ADF and PP tests; and adjusted net savings is also stationary at level I(0) and significant at 1% level of significance under intercept; and trend and intercept using both ADF and PP tests. However, at first difference, ratio of credit to the private sector to GDP and ratio of total shares traded to GDP are all stationary at first difference i.e., I(1) respectively and are each significant at 1% level of significance (both under intercept; and trend and intercept). These imply that the data is having a mixture of I(0) and I(1) series and therefore, satisfies an assumption for estimating ARDL.

4.2 Diagnostic Tests for the model on Adjusted Net Savings

This section reveal the diagnostics checks on the model of adjusted net savings and include the Serial correlation test, the Heteroskedasticity test, the Normality test, the functional form Misspecification test, and the model Stability test.

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Table 2: Results on Diagnostic Tests for the model on Adjusted Net Savings

(a)	(b)	(c)	(d)
Serial Correlation (Lagrange Multiplier test)	Heteroskedasticity (Breusch-Pagan-Godfrey Test)	Normality (Jarque-Bera Test)	Misspecification (Ramsey's RESET Test)
F-stat. (0.731)	F-stat. (0.382)	Jarque-Bera (1.827)	F-stat. (1.549)
P-values (0.535)	P-values (0.948)	P-values (0.401)	P-values (0.268)

Source: Author's Computation (2019)

Note: ***, ** and * represent 1%, 5% and 10% levels of significance respectively.

4.2.1 Serial correlation Test

Results from Table 4.2 show that Serial correlation was conducted on the model of adjusted net savings using the Lagrange Multiplier (LM) tests noting that Durbin-Watson test is inappropriate to detect the existence of serial correlation when the lagged explained variable is used among the explanatory variables as in the case of ARDL models. The probability value of the f-statistic is 0.535 which is above 10% level of significance and therefore, implies absence of serial correlation.

4.2.2 Heteroskedasticity Test

Results from Table 4.2 reveal that the heteroskedasticity check was conducted using the Breusch-Pagan-Godfrey test. The f-statistic value is 0.382 with an attendant probability value of 0.948 which is not significant at 1%, 5% and 10% level of significance. This therefore, implies absence of heteroskedaticity problem in the model.

4.2.3 Normality Test

The probability of Jaque-Bera of 0.401 as indicated on Table 4.2 reveals that the data for the model on adjusted net savings is normally distributed and therefore, assumes the null hypothesis of normality of residuals which satisfies an assumption for estimating ARDL.

4.2.4 Misspecification Test

The functional form misspecification check on the model of adjusted net savings was conducted using the Ramsey's RESET test. The probability of the test as shown on Table 20 is 0.268 implying that it is above 10% level of significance and therefore, validates the null hypothesis of no misspecification of functional form in the model.

4.3 Structural Stability Test

The stability check was conducted on the model of adjusted net savings using the CUSUM and CUSUM of Square (CUSUMSQ) tests, noting the plots (blue lines) and the critical bounds (red lines) in the graphs of CUSUM and CUSUMSQ.

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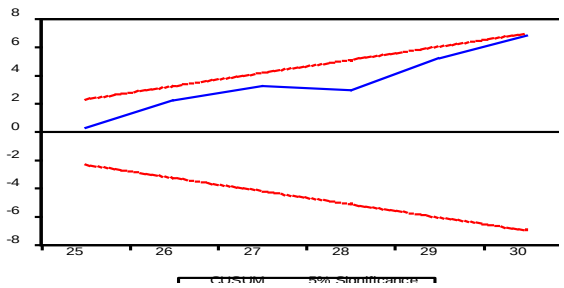
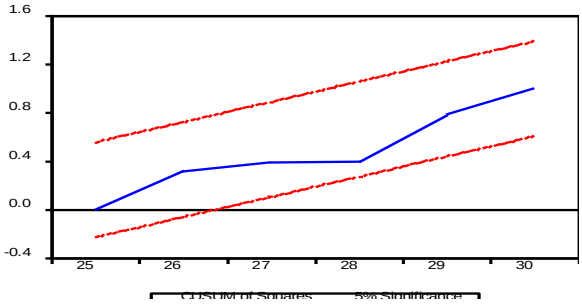
Figure 3: CUSUM and CUSUMSQ

CUSSUM



CUSUMSQ



The graphs on Figure 3 for CUSUM and CUSUM of Square (CUSUMSQ) tests confirm the structural stability of the model on adjusted net savings as argued by Brown, Durbin, and Evans (1975). The blue lines (plots) lie between the two dotted red lines (critical bounds) at 5% significance on the CUSUM and the CUSUMSQ graphs respectively. It is therefore, believed that this model will produce a reliable results for policy makers.

4.4 Cointegration and Long Run Form on model of Adjusted Net Savings

The cointegration test was conducted using Bounds test in order to confirm whether or not long a run association exist among the variables used in the model of adjusted net savings. The norm is to compare the f-statistic value with the critical values of the bounds.

Table 4: Result of Long Run Cointegration on Model of Adjusted Net Savings

Max Lag	Lag order	F statistics	
(4,4)	(4,4,3,4)	17.844	
Critical Values for f-statistic Bounds		Lower I(0)	Upper (1)
10%		2.26	3.35
5%		2.62	3.79
1%		3.41	4.68

Source: Author's Computation (2019)

Results from Table 4.4 indicate presence of long run association among the variables of adjusted net savings in Nigeria. The f-statistic value of 17.844 is larger than the upper and lower critical bounds values at 1%, 5%, and 10% significance level respectively therefore, we fail to accept the null hypothesis of no long-run relationship.

4.5 Short run and Long run Elasticities on the Model of Adjusted Net Savings

The short run and long-run elasticies of ARDL estimation are shown on Table 4.5. The results for the short run elasticities were interpreted based on their current coefficients values only (without lag). Also, the interpretations of the short run coefficients were done with their corresponding long run coefficients to give a clearer picture of their implications both at the short and long-run respectively.

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Table 5: Results on Short run and Long-run Elasticities on the Model of Adjusted Net Savings.

Short run Elasticities		Long run Elasticities	
Variables	Coefficient	Variables	Coefficient
C	1.714***	LNCPS	0.871***
D(LNANS(-2))	1.108***	LNTST	0.162**
D(LNANS(-3))	0.489**	LNISP	-0.525*
D(LNCPS)	0.423**	GR	0.127
D(LNCPS(-1))	2.406*	C	2.758*
D(LNCPS(-2))	0.238		
D(LNCPS(-3))	-4.050**		
D(LNTST)	0.468***		
D(LNTST(-1))	-0.203		
D(LNTST(-2))	-0.689*		
D(LNISP)	0.271		
D(LNISP(-1))	-1.278		
D(LNISP(-2))	-0.645		
D(LNISP(-3))	5.187***		
D(GR)	0.432		
CointEq(-1)	-0.685***		

Source: Author's Computation (2019).

Note: ***, ** and * are significant at the 1%, 5% and 10% levels, respectively.

Findings reveal from Table 4.5 that the first exogenous variable, that is, ratio of credit to the private sector as a percent of GDP has a short run coefficient of 0.423 and is significant at 5% level, while its corresponding long run coefficient is 0.871 and significant at 1% level of significance. These imply that a 1% increase in the ratio of credit to the private sector to GDP increases adjusted net savings by 42.3% in the short run, while in the long run it increases the adjusted net savings by 87.1%. The impact of the ratio of credit to the private sector to GDP on adjusted net savings is positive and significant both in the short and long run; however, the long run impact is higher (87.1%) on adjusted net savings than in the short run. These perhaps, indicate that the credit to the private sector is an important financial sector variable that could significantly impact and drive sustainable development in Nigeria with a greater impact in the long run. This findings corroborates that of Tamazian and Rao (2010), and Ridzuan, Hamat, and Ismail (2017).

The short run coefficient of the ratio of total shares traded to GDP is 0.468 and significant at 1% while, in the long run its coefficient is 0.162 and significant at 5% level. Results therefore, reveal that a 1% increase in the ratio of total shares traded to GDP increases the adjusted net savings by 46.8% in short run while in it increases the adjusted net savings by 16.2% in the long run. These indicate a positive and significant impact in the short and long run respectively and therefore, points that the value of total shares traded is an important financial system indicator that could drive sustainable development in Nigeria, although, with a lower impact of 16.2% in the long run. Finding is in line with that o Ridzuan *et. al.*, (2017).

Results also reveal that the short run coefficient of the ratio of gross insurance premium to GDP is not significant while its long run coefficient is -0.525 and significant at 10%. This implies that insurance sub-sector does not influence adjusted net savings in the

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short run and also has a negative relationship with adjusted savings in the long run. Findings contradict the findings of Marco (2008).

The coefficients of government reform in the short and long run indicate that both are not significant on adjusted net savings and by implication on sustainable development in Nigeria. The error correction term is negative and significant at 1% and therefore, lends support to the existence of long run relationship among the variables of adjusted net savings, which implies that the speed of adjustment that will enable the variables to converge in the long run is at approximately 68.5%.

5. CONCLUSION AND RECOMMENDATION

This study concluded that both the banking and the stock market sub-sectors of the Nigerian financial system positively and significantly influence the adjusted net savings of Nigeria while the insurance sub-sector does the contrary.

However, based on the findings that the banking sub-sector significantly influences adjusted net savings in Nigeria; it is recommended that the government through the Central Bank of Nigeria should come up with appropriate policy that could encourage banks to advance more and adequate loans to the private sector being the largest employers of labour in Nigeria, as this could catalyze its sustainable economic policies as represented by its adjusted net savings.

Furthermore, on the findings that the stock market exerts a significant effect on adjusted net savings in Nigeria; it is recommended that the government through the Federal Ministry of Trade and Investment (FMTI), and the Nigerian Investment Promotion Commission (NIPC) should encourage more investments on the Nigerian Stock Exchange especially in sectors considered as growth driven so as to positively impact growth and reflect how sustainable Nigeria's economic policies are.

Based on the finding that the insurance sub-sector does not impact on the adjusted net savings of Nigeria; it is recommended that the government through the National Insurance Commission should come up with policies that can engender a strong insurance subsector which can meaningfully drive its sustainable economic policies i.e., adjusted net savings in Nigeria.

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