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DOES FINANCIAL SECTOR DRIVE SUSTAINABLE DEVELOPMENT IN NIGERIA?

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Abstract

This study examines the major segments of the financial sector on the three main pillars of sustainable development (SD), which include: economy, social, and environmental sustainability in Nigeria. The long run associations for variables were confirmed using bounds test, while the Autoregressive Distributed Lag was estimated. Time series data from 1986-2020 were obtained based on data availability. Findings reveal that the banking sub-sector positively affect economic sustainability, betters social sustainability but negatively contributes to environmental quality in Nigeria. As for the stock market sub-sector, it was found to exact significantly on economic sustainability, lower social sustainability, and improve environmental stewardship in Nigeria. However, the insurance sub-sector showed no significant impact on both economic and social sustainability, and also negatively affects environmental safety in Nigeria. To achieve a sustainable Nigeria, it is therefore, important that regulatory authorities must pay attention to the banking and stock market sub-sectors of the financial sector.

Keywords: sustainable development; economic sustainability; social sustainability; environmental sustainability; financial sector; Nigeria

1. Introduction

Nigeria was among the 193 nations that signed the United Nations General Assembly (UNGA) pact for sustainable development in 2015, aiming to be among those nations that will be sustainably developed by year 2030, which implies a rapid development in the three main pillars of sustainable development: higher adjusted net savings (sustainable economic development), reduction in income inequality (sustainable social development), and environmental safety for all Nigerians (sustainable environmental development). According to Ridzuan, Ismail, and Hama (2017a; 2018), Sustainable development can only be achieved when countries strike a balance among these three dimensions of development (economic sustainability, social sustainability, and environmental sustainability).

There has been a revolution since 2015, 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. Particularly, 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). A developed financial sector has been argued to restore confidence and strengthen the banking system to facilitate long-term sustainable growth of the economy (Nnanna, 2004). Therefore, the role of a nation's financial sector transcends just an intermediary that allocates savings to investments (Onwumere, Onudugo & Ibe, 2013).

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 & Ezie (2017); and the Central Bank of Nigeria (CBN) (2017), the major sub-sectors of the Nigerian financial system are the banking sector, the insurance sector, and the capital market, and despite the financial intermediation roles of these sub-sectors, problem still exist in the three main pillars of sustainability: economy, income inequality, and environmental safety in Nigeria. More importantly, with just ten (10) years to 2030 achieving a sustainable Nigeria seems a mirage. Therefore, these major sub-sectors were assessed as potential drivers of sustainable development in Nigeria.

2. Literature Review

The path to sustainable growth goes back to the work of Hartwick (1977) who showed that intergenerational equity can be achieved by reinvesting the rents or proceeds of resource extraction into economic capital to maintain a constant level of consumption over time (Mulder, et al. 2001). They further argued that proceeds used for investment purposes depends on substitutability of natural capital by economic capital, referred to as "weak sustainability" as opposed to "strong sustainability" where natural capital cannot be substituted for economic capital.

Further, there are arguments in the literature that the financial sector is critical to achieving sustainable development which implies increase in economic sustainability (economy), improved income distribution

(social sustainability), and environmental quality (environmental sustainability). The link between finance and sustainable growth was established by the finance-led hypothesis formalized by Goldsmith (1969); Shaw (1973); and Mckinnon (1973). The hypothesis holds that a developed financial sector spurs growth thereby, establishing a positive correlation between financial sector development and real per capita (Goldsmith 1969; Levine, Loayza, & Beck 2000; Rajan & Zingales 2003; and Apergis, Filippidis, & Economiduo 2007). Also, building on the Kuznet's Curve of Simon Smith Kuznet's of 1955; Jeremy Greenwood and Boyan Jovanovic in 1990 established a relationship between the financial sector and income inequality thereby, establishing an inverted U-shape curve showing that income inequality rises at the early stage of financial sector development but decreases when the financial sector fully develops. This study is therefore, revolved around these theories.

Empirically, studies that are closely related to the first pillar of sustainable development-economy are numerous. For example, evidence from Sri lanka, Pakistan and Indian economies showed that the financial sector propels economic growth as revealed in the study of Ahmed and Ansari (1998) using a panel data from 1973-1991. However, the study used variables such as quasi money to GDP, domestic credit to GDP, and ratio of broad money to GDP to proxy the financial sector of the three South Asian economies, which are known to capture the banking sub-sector only leaving out other sub-sectors of the financial sector. Calderon & Liu (2003) used the Geweke Decomposition test of 1982 to examine the direction of causality between financial sector development and economic growth among 109 developing nations from 1960 to 1994. Study found that the direction of causality from financial development to economic growth; and economic growth to financial development both co-exist. The study also observed that financial deepening leads to economic growth through productivity than capital accumulation. Although, the study distinct itself by using the Geweke Decomposition test to test for both the degree of dependence and the linear feedback between financial development and economic growth, however, only two measures for financial sector development which are: ratio of intermediation to the private sector to GDP, and ratio of broad money to GDP were used in the study, thereby, omitting other financial sector variables which captures the stock market and the insurance sub-sector among other sub-sectors. Also, the study did not capture sustainable development in its entirety as it only focused on economic growth, which is only a pillar of sustainable development. Abu-Bader & Abu-Qarn (2008) used a trivariate vector autoregressive framework to assess financial sector development and economic growth in Egypt from 1960 to 2001. Study used four variables as proxy for financial sector development such as: money stock, ratio of credit to private sector as percent of GDP, credit issued to non-financial firms as a percent of total domestic credit, and ratio of broad money to GDP. Findings 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 neglecting other sub-sectors of the financial sector. The study also centered on economic growth, which is only an aspect of sustainable development. In contrary, a study of fifteen Middle East and North African (MENA) countries by Kar, Nazliogu & Agir (2010) shows no clear direction of causality between financial sector development and economic growth and therefore, deviates from the findings of Ahmed & Ansari (1998); Calderon & Liu (2003); and Abu-Bader & Abu-Qarn (2008) among others. Although, the study employed five indicators of financial sector development which include ratio of domestic credit to income, ratio of banks liabilities to income, ratio of M2 to income, ratio of quasi money to income and ratio of narrow money to income but however, did not include the indicators of stock and bond markets in these selected MENA countries. Also, the study considered economic growth, which is only a component of sustainable development. The study of Ogwumike & Salisu (2009) lends support to the supply-leading hypothesis in the case of Nigeria and concludes that financial sector reforms, stock market, and credit to the private sector positively and significantly affects economic growth in Nigeria. However, this study only focused at an aspect of sustainable development, which is economic growth measured as real growth rate of gross domestic product leaving out the two other major pillars of sustainable development. The study of Solarin & Jauhari (2011) also lends support to the supply leading hypothesis and concluded that the financial sector is crucial to achieving sustainable economic development but failed to examine this in their study. Nonetheless, the study provided a useful insight to examining the financial sector and sustainable development in the case of Nigeria

Evidences also exist on studies that have empirically considered the second pillar of sustainable development-social sustainability, which is widely proxy as poverty or income inequality. For example, Jalilian & Kirkpatrick (2002) assessed financial development and poverty reduction in some selected developing countries and found that a developed financial sector contributes to poverty reduction in developing nations. The study used two indicators for financial development which are net foreign assets over GDP and bank deposit money assets over GDP in line with King & Levine (1993), and Levine, Loayza & Beck (2000). However, the study did not capture the insurance, capital market, and other sub-sectors of the financial sector. Further, the study only considered the social dimension of sustainable development usually proxy as poverty or income inequality. Shahbaz, Loganathan, Tiwari, & Sherafatian-Jahromi (2014) assessed financial development and income inequality in Iran. The study confirms the Greenwood-Jovanovich hypothesis in the case of Iran and concludes that a developed financial sector reduces income disparity. The limitation of the study is similar to Jalilian &

Kirkpatrick (2002) in that it only considered the second pillar of sustainable development alone for the Iranian economy. Dauda & Makinde (2014) assessed financial sector and poverty reduction in Nigeria and revealed 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, however, the study was only based on a single dimension of sustainable development-social sustainability. The finding is also in tandem with the findings of Dabwor & Abimiku (2016), who examined the relevance of financial deepening on poverty incidence in Nigeria. The study considered five financial deepening indicators and found that value of total shares traded as a percent of GDP and credit to the private sector as a percent of GDP worsened poverty in Nigeria.

Based on the third pillar of sustainable development, Zhang (2011) studied financial development and carbon emissions in China using variance decomposition test from 1980 to 2005, and found that financial sector development drives carbon emissions with the banking sector variables scaling up more emissions than the stock market variables. The study apart from using banking indicators such as ratio of credit to GDP, and efficiency of financial institutions to GDP also, included stock market variables such as stock market turnover to GDP, and stock market capitalization to GDP. The study however, included real GDP per capital and foreign direct investment as financial sector development variables but these two indicators are more related measures of economic growth rather than the indicators of financial development. Furthermore, the study focused only on the third pillar of sustainable development-environmental quality, proxy as carbon emissions. Islam, Shahbaz, Ahmed & Alam (2013) investigated the link between financial development and energy consumption in Malaysia. Findings revealed that financial development both in the short and long run affects energy consumption significantly and positively. However, the only indicator used to capture financial development in this study is domestic credit to private sector as a percent of GDP at the expense of other indicators of financial sector development. Energy consumption also as used in the study tends to support the third pillar of sustainable development excluding two other critical pillars.

Moghadam & Lotfalipour (2014) investigated financial development and environmental quality in Iran from 1970 to 2011. Study found that financial development indicators accelerate environmental degradation in Iran. However, the study focused on environmental quality, which is only an aspect of sustainable development. Okeke, Izeueke & 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. The study also, focused more on environment which is just a dimension of sustainable development. Dar & Asif (2017) studied financial development and carbon mitigation in India from 1971 to 2013 and opined that financial development degrades the environment in India. The study adopted only one indicator-credit to the private sector as a percent of nominal GDP as a proxy for financial sector development in India excluding the stock market and the indicators of other sub-sectors in the Indian financial system. However, the study majored on only the third dimension of sustainable development-environment.

3. Methodology

Three econometric models were specified in this section to fully capture sustainable development in Nigeria and the models were adapted and modified to capture the desired variable of this study. The models represent economic sustainability, social sustainability and environmental sustainability respectively.

3.1 Model of Economic Sustainability

The model specification of Ridzuan et al. (2017a) was adapted and further modified to attend to the first pillar of sustainable development in this study. The model specification of Ridzuan et al. (2017a) is expressed as follows:

$$logGDP_t = \beta_0 + \beta_1 LNLAB_t + \beta_2 LNDI_t + \beta_3 LNFDI_t + \beta_4 LNHC_t + \beta_5 LNTO_t + \beta_6 LNFD_t + \mu_t \qquad (1)$$

Ridzuan et al. (2017a) captured sustainable development with economic growth measured in logarithm transformation of GDP. This has been argued to be an inadequate measure of overall sustainable development, in fact, not the best measure of economic sustainability which is the first pillar of sustainable development. In addition, only money supply was used as proxy for financial sector development leaving out other financial sector indicators. The model was therefore, modified to holistically capture the desired variables of sustainable development and to cater for 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 & Ezie (2017); and CBN (2017). Foremost, the logarithm form of GDP was replaced with adjusted net savings, which is a better measure of economic sustainability; while variables such as labour, capital formation, and human capital, secondary school enrolment, trade openness, and foreign direct investment were also excluded and replaced with financial sector variables such as ratio of gross insurance premiums to GDP to capture the insurance sub-sector of the Nigerian financial system; domestic credit to the private sector as a percent of GDP (banking sector variable) to account for the level of intermediation in the economy; ratio of broad money to GDP (banking sector variable), which accounts for the degree of monetization in the economy;

ratio of total shares traded to GDP (stock market variable) to account for the level of stock market liquidity in an economy; ratio of market capitalization to GDP (stock market variable) to measure the size of stock market relative to the Nigerian economy. This study also included government reform as a control variable as it is believed that government participation in forms of policies and reforms could increase a healthy competition among the players in the financial sector, propel intermediation level, and encourage growth and development. The modified model is specified in the below equation as:

$$ANS_t = f(CPS_t, BM_t, MCAP_t, TST_t, ISP_t, GR_t) \quad (2)$$

This can then be expressed in a structural econometric form as follows:

$$ANS_t = \gamma_0 + \gamma_1 CPS_t + \gamma_2 BM_t + \gamma_3 MCAP_t + \gamma_4 TST_t + \gamma_5 ISP_t + \gamma_6 GR_t + \epsilon_t \quad (3)$$

Where: ANS is adjusted net savings; CPS is domestic credit to the private sector as a percent of GDP; BM is broad money supply as a percent of GDP; MCAP is stock market capitalization as a percent of GDP; TST is total shares traded as a percent of GDP; ISP is gross insurance premiums as a percent of GDP and; GR is government reforms

3.2 Model of Social Sustainability

The second model of this study specifies social sustainability, measured by the level of income inequality (Gini coefficient), as a function of the considered financial sector indicators, government reforms and other control variables. The inclusion of these control variables stem from the adaption of the model proposed by Mah (2003) which is given as follows:

$$GINI_t = f(Y_t, Y_t^2, FDI_t, TO_t) \quad (4)$$

Where: GINI is Gini coefficient; Y is per capita income; Y^2 is per capita income squared; FDI is foreign direct investment inflows and; TO is trade openness. Mah (2003) intends to validate the existence of Kuznets Curve that is why he included Y^2 which was therefore, excluded from the model of this study, and while the financial sector variables were included alongside their squared values. This was done in line with the Greenwood-Jovanovich hypothesis that income inequality has a quadratic relationship with financial development. Equation (5) therefore, represents the relationship as follows:

$$IND_t = f(Y_t, FDI_t, TO_t, CPS_t, CPS_t^2, BM_t, BM_t^2, MCAP_t, MCAP_t^2, TST_t, TST_t^2, ISP_t, ISP_t^2, GR_t) \quad (5)$$

This can then be expressed in a structural econometric form as follows:

$$IND_t = \delta_0 + \delta_1 CPS_t + \delta_2 CPS_t^2 + \delta_3 BM_t + \delta_4 BM_t^2 + \delta_5 MCAP_t + \delta_6 MCAP_t^2 + \delta_7 TST_t + \delta_8 TST_t^2 + \delta_9 ISP_t + \delta_{10} ISP_t^2 + \delta_{11} Y_t + \delta_{12} FDI_t + \delta_{13} TO_t + \epsilon_t \quad (6)$$

Where: IND is income inequality (measured as Gini coefficient)

3.3 Model of Environmental Sustainability

The third model of this study relates environmental sustainability to financial sector indicators by adapting the model specified by Shahbaz (2013). Shahbaz (2013) measured environmental quality by carbon emissions metric ton per capita and relates it to GDP per capita, financial development, energy consumption, and trade openness. Shahbaz (2013) model is expressed in the below equation as:

$$CO_{2t} = f(Y_t, F_t, E_t, TR_t) \quad (7)$$

Where: CO_2 is carbon emissions metric ton per capita; Y is real GDP per capita; F is financial development; E is energy consumption per capita and; TR is trade openness. This study therefore, modifies the model by replacing financial development (F) by the financial sector indicators. The model is then specified in a functional relationship as thus:

$$EQ_t = f(Y_t, E_t, TO_t, CPS_t, BM_t, MCAP_t, TST_t, ISP_t, GR_t) \quad (8)$$

This can then be expressed in a structural econometric form as follows:

$$EQ_t = \theta_0 + \theta_1 CPS_t + \theta_2 BM_t + \theta_3 MCAP_t + \theta_4 TST_t + \theta_5 ISP_t + \theta_6 GR_t + \theta_7 Y_t + \theta_8 E_t + \theta_9 TO_t + \epsilon_t \ldots..(9)$$

Where: EQ is environment quality measured by carbon emission in metric ton per capita; CPS is domestic credit to the private sector as a percent of GDP; BM is broad money supply as a percent of GDP; MCAP is stock market capitalization as a percent of GDP; TST is total shares traded as a percent of GDP; ISP is gross insurance premiums as a percent of GDP; GR is government reforms; Y is real GDP per capita; E is energy consumption per capita and; TO is trade openness.

3.4 Data

The annual data used for this study covered 1986-2020 and were obtainable from various databases. The data ratio of credit to the private sector (CPS) as a percent of GDP, and data on broad money (BM) as a percent of

gross domestic product were obtained from the Central Bank of Nigeria's Statistical Bulletin (CBN's Statistical Bulletin); While data on gross insurance premiums as percent of gross domestic product was obtained from both the CBN's Statistical Bulletin and the National Insurance Commission (NAICOM) annual reports. Data on economic growth; adjusted net savings (ANS); total stock market capitalization (MCAP) as a percent of gross domestic product; total shares traded (TST) as a percent of gross domestic product, foreign direct investment, and trade openness were obtained from the World Bank's World Development Indicators (WDI) database. Also, the data on Environment quality (EQ) was obtained from the Emissions Database for Global Atmospheric Research (EDGAR); while data on income distribution, proxy as Gini coefficient was obtained from the database for the Global Consumption Income Pattern (GCIP) database.

4. Empirical Findings: This sub-section presents the findings of this study, and begins with the summary statistics of the variables employed in this study.

Table 1. Descriptive Analysis

	ANS	IND	EQ	CPS	BM	MCAP	TST	ISP	LNY	E	FDI	TO
Mean	-4.918	0.569	0.56	10.94	14.27	11.14	898.74	328.68	5.381	8.658	3.34	54.22
Median	-2.495	0.587	0.574	8.2	12.9	7.209	466.2	328.52	5.3	9.597	2.883	57.9
Maximum	18.53	0.601	0.857	20.7	21.3	39.95	4288.1	832.29	5.586	10.48	10.83	81.81
Minimum	-34.45	0.488	0.325	6.2	9.2	3.053	40.618	130.26	5.238	5.635	0.65	21.12
Std. Dev.	13.04	0.041	0.158	5.163	3.784	8.733	1042.8	132.9	0.123	1.864	2.284	15.45
Skewness	-0.346	-1.43	0.049	0.984	0.651	1.368	1.7154	1.6456	0.538	-0.49	1.681	-0.45
Kurtosis	2.722	3.152	1.856	2.195	1.946	4.914	5.6072	8.0549	1.559	1.485	5.852	2.539
Jarque-Bera	0.695	10.2	1.648	5.65	3.505	13.93	23.211	45.481	4.04	4.093	24.3	1.287
Probability	0.707	0.006	0.439	0.059	0.173	0.000	0.000	0.000	0.133	0.129	0.000	0.525

Note: Std. Dev is standard deviation

Table 1 above shows that the Adjusted net savings averaged -4.918 with standard deviation of 13.04, and minimum and maximum values of -34.45 and 18.53 respectively. Gini index averaged 0.569 with standard deviation of 0.041, and minimum and maximum values of 0.488 and 0.601 respectively. Environmental quality averaged 0.56 with standard deviation of 0.158, and minimum and maximum values of 0.325 and 0.857 respectively. Credit to private sector as percent of GDP averaged 10.94 with standard deviation of 5.163, and minimum and maximum values of 6.2 and 20.7 respectively. Broad money supply as percent of GDP averaged 14.27 with standard deviation of 3.784, and minimum and maximum values of 9.2 and 21.3 respectively. Stock market capitalization as percent of GDP averaged 11.14 with standard deviation of 8.733, and minimum and maximum values of 3.053 and 39.95 respectively. Total stock traded as percent of GDP averaged 898.74 with standard deviation of 1042.8, and minimum and maximum values of 40.618 and 4288.1 respectively. Insurance sector premium as percent of GDP averaged 328.68 with standard deviation of 132.9, and minimum and maximum values of 130.26 and 832.29 respectively. Log of GDP per capita averaged 5.381 with standard deviation of 0.123, and minimum and maximum values of 5.238 and 5.586 respectively. Energy consumption averaged 8.658 with standard deviation of 1.864, and minimum and maximum values of 5.635 and 10.48 respectively. Foreign direct investment as percent of GDP averaged 3.34 with standard deviation of 2.284, and minimum and maximum values of 0.65 and 10.83 respectively. Trade as percent of GDP averaged 54.22 with standard deviation of 15.54, and minimum and maximum values of 21.12 and 81.81 respectively. The Jarque-Bera statistic shows that income inequality, adjusted net savings, environmental quality, broad money supply, GDP per capita, energy consumption, and trade openness are normally distributed while income inequality, credit to private sector, market capitalization, total stock traded, insurance sector premium, and foreign direct investment are not normally distributed. This is indicated by the Jarque-Bera statistic value not being significant for the former variables, implying rejection of null hypothesis of normality, and the Jarque-bera statistic value being significant for the later variables, implying non-rejection.

Table 2. Correlation Matrix of variables

Variable	ANS	IND	SQ	CPS	BM	MCAP	TST	ISP	LNY	E	FDI	TO
ANS	1.0											
IND	-0.569614	1.0										
	(0.0010)											
SQ	0.350869	-0.125452	1.0									
	(0.0573)	(0.5089)										
CPS	0.545805	-0.808400	0.189861	1.0								
	(0.0018)	(0.0000)	(0.6579)									
BM	0.572048	-0.739126	0.205071	0.849878	1.0							
	(0.0010)	(0.0000)	(0.2818)	(0.0000)								
MCAP	0.522072	-0.526851	0.248986	0.663124	0.684874	1.0						
	(0.0051)	(0.0029)	(0.1846)	(0.0001)	(0.0000)							
TST	0.473028	-0.354102	0.335211	0.501505	0.680254	0.68875	1.0					
	(0.0083)	(0.0549)	(0.1702)	(0.0013)	(0.0001)	(0.0000)						
ISP	-0.404870	0.152946	-0.430298	0.087151	0.114676	0.156457	0.140586	1.0				
	(0.0226)	(0.7809)	(0.1073)	(0.6475)	(0.5462)	(0.7651)	(0.8281)					
LNY	0.653740	-0.757809	0.228582	0.674654	0.652096	0.622574	0.622560	0.102857	1.0			
	(0.0001)	(0.0000)	(0.2244)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.5462)				
E	-0.677445	0.768040	-0.327451	-0.669265	-0.653855	-0.584505	-0.620262	0.158254	-0.677762	1.0		
	(0.0000)	(0.0000)	(0.1452)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7595)	(0.0000)			
FDI	-0.553717	0.491319	-0.404544	-0.296346	-0.279090	-0.258493	-0.200165	0.634482	-0.362577	0.556452	1.0	
	(0.0015)	(0.0058)	(0.0227)	(0.2118)	(0.1353)	(0.1678)	(0.2889)	(0.0002)	(0.1483)	(0.1852)		
TO	-0.215460	0.552356	-0.174536	-0.402481	-0.275820	-0.015710	-0.146400	0.202152	-0.575119	0.458109	0.308289	1.0
	(0.2761)	(0.0016)	(0.3562)	(0.0235)	(0.1411)	(0.5855)	(0.8076)	(0.2841)	(0.0194)	(0.1019)	(0.1874)	

Note: p-values in parenthesis

Table 2 presents the correlation analysis in order to examine the relationship that exists among the variables of the models. The major aim of conducting the correlation analysis to determine if their relationships are not high as such that can result to severe multicollinearity in the models of the study. Result indicates that even though there are many significant relationships among all variables, none of the relationships among the explanatory variables is as high as 0.8 which is a rule of thumb above which the models would have problem of multicollinearity.

Table 3. Results of ADF and PP Unit Root test

VARIABLES	STATIONARY	ADF	PP	Order of Integration
ANS	Level	-3.4623*	-3.4493*	I(0)
IND	Level	-1.8958	-1.8904	I(1)
	First Diff.	5.5160***	-6.8287***	
EQ	Level	-2.3743	-2.4967	I(1)
	First Diff.	-5.7811***	-5.7811***	
CPS	Level	-2.2887	-1.6669	I(1)
	First Diff.	-4.7145***	-6.9614***	
BM	Level	-2.9528	-2.3532	I(1)
	First Diff.	-4.3765***	-5.1570***	
MCAP	Level	-3.2172	-3.1925	I(1)
	First Diff.	-5.7708***	-7.7979***	
TST	Level	-2.9754	-2.9088	I(1)
	First Diff.	-4.8821***	-8.5357***	
ISP	Level	-2.8430	-2.7591	I(1)
	First Diff.	-5.0461***	-5.7872***	
LnY	Level	-2.0937	-2.0937	I(1)
	First Diff.	-5.2308***	-5.2131***	
E	Level	-1.7007	-1.7007	I(1)
	First Diff.	-4.8502***	-4.8502***	
FDI	Level	-4.0781***	-3.9963***	I(0)
TO	Level	-2.5820	-2.5662	I(1)
	First Diff.	-7.8410***	-8.0047***	

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.

Table 3 presents the unit root test in order to ascertain the stationarity of the variables, which is a pre-requisite when conducting a time series analysis. The Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) procedures reveal that income inequality (IND), environmental quality (EQ), credit to private sector (CPS), broad money supply (BM), stock market capitalization (MCAP), total stock trade (TST), insurance sector premium (ISP), GDP per capita (lnY), energy consumption (E), and trade openness (TO) are not stationary at level at 5% significance level while adjusted net savings (ANS) and foreign direct investment (FDI) are stationary at level. This is indicated by each of the p-values of the former variables being greater than 0.05 and each of their ADF and PP test statistics being less than the 5% critical value as well as each of the p-values of the latter variables being less than 0.05 and each of their ADF and PP test statistics being greater than the 5% critical value. The result also reveals that each of former variables became stationary at first difference (i.e. when each of them is differenced once). This is indicated by each of their t-statistics being greater than the critical values and their respective p-values being less than 0.05, suggesting the rejection of null hypothesis that there is unit root and accepting the alternative that there is no unit root. This indicates that income inequality (IND), environmental quality (EQ), credit to private sector (CPS), broad money supply (BM), stock market capitalization (MCAP), total stock trade (TST), insurance sector premium (ISP), GDP per capita (lnY), energy consumption (E), and trade openness (TO) are stationary at first difference, hence, regarded as I(1) series while adjusted net savings (ANS) and foreign direct investment (FDI) are stationary at level, hence, regarded as I(0) series.

The implication of the unit root test result is that a cointegration test is warranted for the models of this study. Given the order of integration of these variables being combination of I(0) and I(1) series, the appropriate cointegration test procedure is the ARDL bounds test approach developed by Peseran et al. (2001). In addition, the ARDL short and long run coefficients become necessary as estimation procedure if the bounds test procedure reveal that the variables of the models are cointegrated.

Table 4. Result of ARDL Bounds Test Approach to Cointegration

Model	F statistics	
Model of Adjusted Net Savings	17.844	
Model of Income Distribution	7.251	
Model of Environmental Quality	48.058	
Critical Value Bounds	**Lower I(0)**	**Upper I (1)**
10%	2.26	3.35
5%	2.62	3.79
1%	3.41	4.68

Note: 1. # The critical values are based on Pesaran et al. (2001). *, **, and *** represent 10%, 5% and 1% level of significance, respectively.

Table 4 shows the result of the cointegration test conducted using Bounds test, in order to confirm whether or not long a run association exist among the variables used in the models of this study. The null hypothesis of the test is no long run relationship, and the norm is to compare the F-statistic value with the critical values of the bounds. The decision rule is to reject the null hypothesis if the F-statistic is greater than the critical bounds, and not to reject the null hypothesis if otherwise. Results from Table 4 however, confirm the presence of long run association among the variables of adjusted net savings model, income distribution model, and environmental quality model. The F-statistic value of 17.844, 7.251, and 48.058 are respectively larger than the upper and lower critical bounds values at 10%, 5%, and 1% significance level therefore, there is sufficient evidence to reject the null hypothesis of no long-run relationship.

The next test before proceeding to the short and long run elasticities estimate of the models is to check if the models of this study are free from econometrics problems, and this is revealed in Table 5 below.

Table 5. Results on Diagnostic Tests

Model	(a)	(b)	(c)	(d)
	Serial Correlation [*p*-Value]	Heteroskedasticity [*p*-Value]	Normality [*p*-Value]	Misspecification [*p*-Value]
Model of Adjusted Net Savings	0.731 [0.535]	0.382 [0.948]	1.827 [0.401]	1.549 [0.268]
Model of Income Distribution	4.933 [0.269]	2.097 [0.373]	0.102 [0.950]	7.205 [0.253]
Model of Environmental Quality	4.208 [0.288]	0.588 [0.795]	0.392 [0.821]	0.161 [0.757]

Note: 1. The *p*-value values are in brackets []. 2. The diagnostic test was performed as follows (a): Lagrange Multiplier test for serial correlation; (b): Breusch –Pagan-Godfrey test for heteroskedasticity checks; (c): Normality based on Jarque-Bera test; (d): Ramsey's RESET test to check for functional form misspecification in the models respectively.

Results on table 5 show various econometric checks conducted on the models of adjusted net savings, income distribution, and environmental quality. The serial correlation test was conducted using the Langrange Multiplier test noting that Durbin-Watson test is inappropriate to detect the existence of serial correlation when lagged explained variable is used among the explanatory variables as in the case of ARDL. The Breusch-Pagan Godfrey test was used to check for the problem of heteroskedasticity in all models while, Jarque-Bera and Ramsey's RESET tests were used to ascertain the normality of data and to check for functional form misspecifications in all model respectively. Results as indicated on Table 5 show that probability of the F-statistics are all above 10% level of significance for all models and therefore, imply a failure to reject the null hypotheses of no serial correlation, absence of heteroskedasticity problems, normality of residuals, and validation of null hypotheses of no misspecification of functional form in the models respectively.

Figure 1. CUSUM (**left**) and CUSUMSQ (**right**).

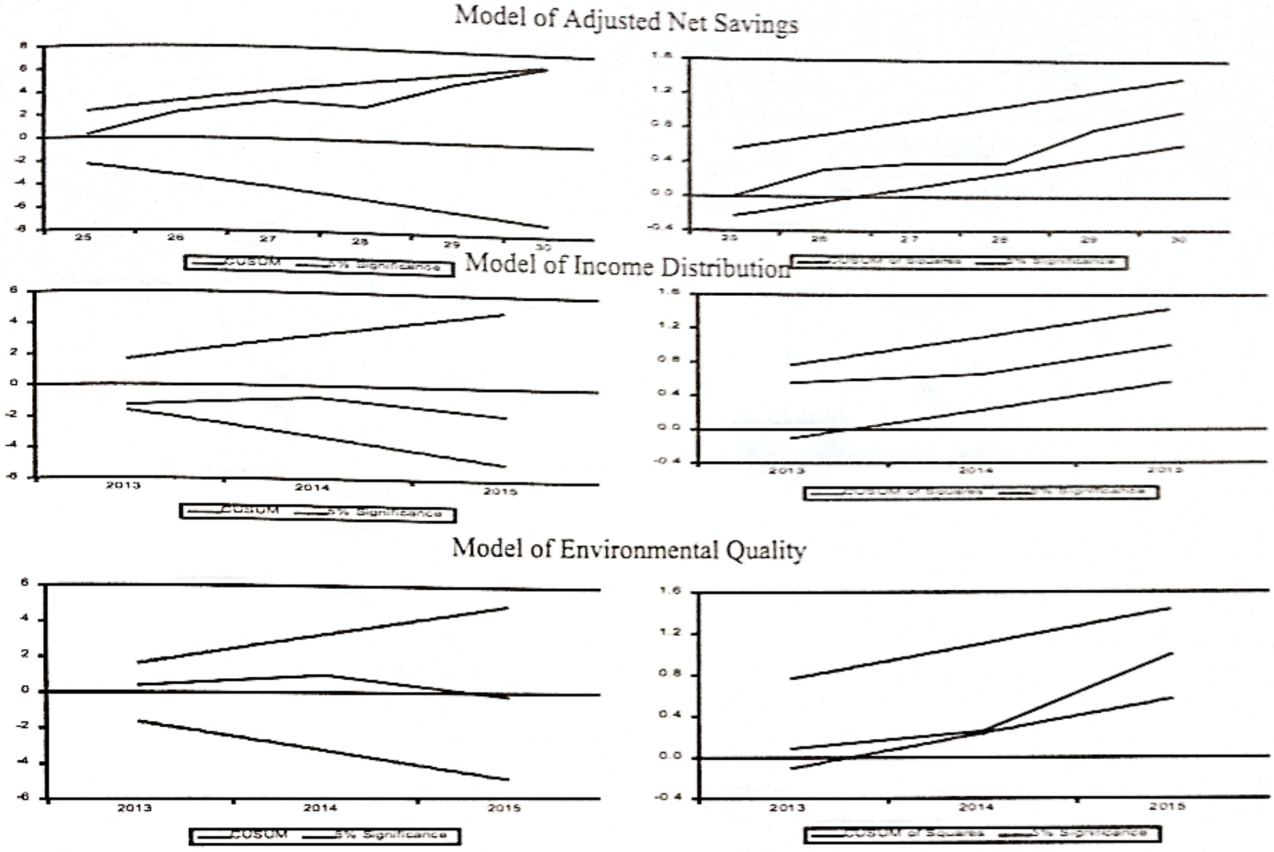


Figure 1 confirms the stability check for all models used in this study using the CUSUM and CUSUM of Square (CUSUMSQ) tests, noting the plots (blue lines) and the critical bounds (red lines) in the graphs. The graphs in Figure 1 for CUSUM and CUSUMSQ tests confirm the structural stability of the models of this study since the blue lines (plots) lie between the red lines (critical bounds) at 5% significance level. It is therefore, believed that the models will produce reliable results for policy makers in line with Brown, Durbin, and Evans (1975).

Table 6. Results on Long run Elasticities

Model of Adjusted Net Savings		**Model of Environmental Quality**	
Variable	Coefficient	Variable	Coefficient
LNCPS	0.872***	CPS	-1.603*
LNTST	0.162*	BM	-1.147
LNISP	-0.53	MCAP	-3.528**
GR	0.128	TST	0.743***
C	2.758	ISP	-0.486**
		E	0.566**
		LNY	13.99**
		TO	0.026**
		GR	0.009
		C	-79.66**

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

Model of Income Distribution

Variable	(1)	(2)	(3)	(4)	(5)
LNY	-0.213**	-0.017	-0.213	-0.141	-0.182*
FDI	0.0012	0.0019*	-0.004	0.008	0.008
TO	-0.0051***	0.0004*	0.001	0.0002	0.001
CPS	0.015				
CPSSQ	-0.023***				
BM		0.0184*			
BMSQ		-0.0009***			
MCAP			-0.009		
MCAPSQ			0.0002*		
TST				0.151	
TSTSQR				-0.031	
ISP					0.018
ISPSQR					-0.021
C	-0.0001	0.559**	1.722	1.113	1.540

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

Table 6 shows the results from the long run elasticities for each of the models of this study and are explained below as follows:

(a) Credit to Private Sector

The result presented in Table 6 for the model of adjusted net savings, reveals that domestic credit to private sector as a percent of GDP has a long run coefficient of 0.871 and is significant at 1% level of significance. This implies that a percent point increase in the ratio of credit to the private sector to GDP increases adjusted net savings by 0.871 percent points. The impact of the ratio of credit to the private sector to GDP on adjusted net savings is positive and significant 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 economic development in Nigeria in the long run.

Based on the model of income distribution, Table 6 reveals that domestic credit to private sector as a percent of GDP and its squared term have a long run coefficients of 0.015 (not significant) and -0.023 (significant at 1% level of significance). These imply that a percent point increase in the ratio of credit to the private sector to GDP does not initially increase income inequality but causes it to subsequently decline by about 0.023 percent points. The impact of the ratio of credit to the private sector to GDP on income inequality revealed an evident G-J hypothesis in Nigeria which states that income inequality increases at the earlier stage of financial development, then become reduced when the financial sector fully develops. This also implies credit to private sector can help boost the sustainable social development at the long run in Nigeria.

For the model of environmental quality, results on Table 6 indicate that the coefficient for the long run estimate of the ratio of credit to the private sector as a percent of GDP is -1.603 and is significant at 10% level of significance. This implies that a percent point increase in ratio of credit to the private sector to GDP leads to decreases in carbon emission (an increase environmental quality) by about 1.603 percent points in the long run. Results therefore, show that the credit to the private sector reduces carbon emission in the long run and imply that the development of the financial sector will neeessitate financing industries to buying improved technologies that are eco-friendly either directly or tangentially in Nigeria.

(b) Total Share (Stock) Traded

The results from the model of adjusted net savings as depicted on Table 6 reveal that the long run coefficient of the ratio of total shares traded to GDP is 0.162 and is significant at 5% level of significance. Results therefore, reveal that a percent point increase in the ratio of total shares traded to GDP increases the adjusted net savings by 0.162. This point that the value of total shares traded is an important financial system indicator that could drive sustainable economic development in Nigeria although, with a lower impact of 0.162 in the long run.

Based on the model of income distribution, results on Table 6 indicate that the long run coefficients of the ratio of total shares traded to GDP and its squared term are 0.151 and -0.031 respectively which are both not significant.

Results from Table 6 for the model of environmental quality indicate that the long run coefficient of the ratio of total shares traded to GDP is 0.743 and is significant at 1% level of significance. This implies that a percent point increase in the ratio of total shares traded to GDP increases emissions (and decreases environmental

quality) by about 0.743 percent points in the long run. Although, the damage by stock traded to environment quality is only felt in the long run, this may perhaps, represent investments in large companies which contributes to environmental pollution in Nigeria.

(c) Broad Money Supply

The results from the model of income distribution as presented on both Table 6 reveal that broad money supply as a percent of GDP and its squared term have long run coefficients of 0.0184 (significant at 10%) and -0.0009 (significant at 1% level of significance). These imply that a percent point increase in the ratio of broad money supply to GDP initially increases income inequality by about 0.0184 percent points but later causes it to decline by about 0.0009 percent points. The impact of the ratio of broad money supply to GDP on income inequality revealed there is evidence of G-J hypothesis in Nigeria in the long run but not in the short run. This also implies broad money supply can help boost the sustainable social development in Nigeria through reducing the level of income inequality in the long run.

For the model of environmental quality, result indicates that the coefficient for the ratio of broad money to GDP in the long run is -1.147 and not significant at the conventional level of significance. This implies that ratio of broad money to GDP does not affect the level of carbon emission (environmental quality) in the long run.

(d) Stock Market Capitalization

Based on the model of income distribution, results presented on Table 6 reveal that stock market capitalization as a percent of GDP and its squared term have long run coefficients of -0.009 (not significant) and 0.0002 (significant at 10% level of significance). These however, imply that the quadratic effect is not evident in the long run.

Results on Table 6 for the model of environmental quality indicate that the long run coefficient of the ratio of stock market capitalization to GDP is -3.528 and is significant at 5%. This implies that a percent point increase in the ratio of stock market capitalization to GDP decreases carbon emissions (and increases environmental quality) by 3.528 percent points. This implies that stock market capitalization is a useful tool which can be employed to improve environmental quality in Nigeria in the long run.

(e) Gross Insurance Premium

For the model of adjusted net savings results also reveal that the long run coefficient of the ratio of gross insurance premium to GDP is -0.525 and is significant at 10%. This implies that insurance sub-sector has a negative effect on adjusted savings in the long run.

Based on the model of income distribution as indicated on Table 6

The long run coefficients of the ratio of gross insurance premium to GDP and its squared term are 0.018 and -0.021 respectively which are both not significant. Results therefore, reveal that the ratio of gross insurance premium to GDP does not determine the level of income inequality in Nigeria; hence, there is no evidence of G-J hypothesis through the volume of shares traded in the long run. Also, of all the control variables included in this model, only the coefficients of GDP per capita and trade openness significantly cause a decline in income inequality. This implies that increase in the level of per capita income and trade openness will reduce income inequality in Nigeria.

Results from Table 6 on the model for environmental quality revealed that the coefficient of the ratio of gross insurance premium to GDP in the long run is -0.486 and is significant at 5% level of significance. This implies imply that a percent point increase in the ratio of gross insurance premium to GDP decreases emissions (and increases environmental quality) by about 0.486 percent points in the long run. Results therefore, hold that the insurance sub-sector reduces environmental damages in the long run in Nigeria. This perhaps, might be due to the nature of insurers as loss fixers (indemnifiers) in as much as premiums are paid by policy holders. Also, the results show that of all the control variables included in the model, only energy consumption and trade openness are significant both in the short and long run (with short run coefficient values of 0.067 and 0.015 and long run coefficient values of 0.566 and 0.026 respectively) while GDP per capita is only significant in the long run (with coefficient value of 13.99). On the other hand, the level of trade openness, energy consumption and income per head, have been detrimental to environmental quality through carbon emissions.

(f) Government Reforms

The coefficient of government reform for the model of adjusted net savings confirms a no significant impact on adjusted net savings and by implication a no significant impact on sustainable economic development in Nigeria in the long run. Based on the model of environmental quality, the coefficient for government reforms in the long run have no significant effect on environmental quality. This implies that the government policy has not been able to serve as a catalyst to the Nigerian financial system to reduce carbon emissions in the long run. Perhaps,

by ensuring that the financial system through appropriate policies lend to industries to acquire eco-friendly technologies, in order to reduce environmental pollution and pave way for sustainable environmental development in Nigeria

(g) Error Correction Term

For the model of adjusted net savings, 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 the model, which implies that the speed of adjustment that will enable the variables to converge in the long run is at approximately 68.5 percent in each period. Based on the model of income distribution, the error correction terms in the models are negative and significant at 1% and therefore, lends support to the existence of long run relationship among the variables of the models, which implies that the speed of adjustment that will enable the variables to converge in the long run regarding credit to private sector, broad money supply, stock market capitalization, total share traded, and gross insurance premium is at approximately 47.6 percent, 81.1 percent, 47.6 percent, 32.4 percent, and 42.5 percent respectively in each periods. For the model of environmental quality the coefficient of the error correction term is negative and confirms that the variables of environmental quality are to converge in the long run at a speed of 59.3 percent per period.

Table 7. Results on Short run Estimations

Model for Adjusted Net Savings		**Model of Environmental Quality**	
Variable	Coefficient	Variable	Coefficient
D(ANS(-2))	1.108***	D(CPS)	-1.63***
D(ANS(-3))	0.489**	D(CPS(-1))	-1.522***
D(CPS)	0.423*	D(BM)	-1.798***
D(CPS(-1))	2.407	D(BM(-1))	-0.247
D(CPS(-2))	0.239	D(MCAP)	-0.239**
D(CPS(-3))	-4.051**	D(MCAP(-1))	-1.617***
D(TST)	0.468**	D(TST)	-0.076
D(TST(-1))	-0.203	D(TST(-1))	0.557***
D(TST(-2))	-0.69	D(ISP)	-0.709***
D(ISP)	0.272	D(ISP(-1))	-0.84***
D(ISP(-1))	-1.279	D(E)	0.067*
D(ISP(-2))	-0.645	D(E(-1))	0.455***
D(ISP(-3))	5.188***	D(LNY)	-0.254
D(GR)	0.433	D(LNY(-1))	8.88***
CointEq(-1)	-0.686***	D(TO)	0.015***
		D(GR)	0.007
		CointEq(-1)	-0.593***

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

Model for Income Distribution

Variable	(1)	(2)	(3)	(4)	(5)
D(LNY)	-0.101***	-0.014	-0.101	-0.046	-0.077*
D(FDI)	0.001	0.0015	0.001	0.003	0.003
D(FDI(-1))			0.002		
D(TO)	-0.0001	0.0003*	0.0003	0.0004	0.001
D(TO(-1))				0.0003	
D(CPS)	0.0003**				
D(CPS(-1))	-0.006***				
D(CPSSQ)	-0.011***				
D(BM)		-0.005			
D(BM(-1))		-0.020***			
D(BMSQ)		0.0002			
D(BMSQ(-1))		0.0009***			
D(MCAP)			0.001		
D(MCAP(-1))			0.011***		
D(MCAPSQ)			-0.00001		
D(MCAPSQ(-1))			-0.0002***		
D(TST)				0.005	
D(TST(-1))				-0.184*	
D(TSTSQR)				-0.001	
D(TSTSQR(-1))				0.039**	
ISP					0.008
ISPSQR					-0.009
CointEq(-1)	-0.476***	-0.811***	-0.476***	-0.324***	-0.425***

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

Table 7 shows the results from short run elasticities for each of the models of this study and are explained below as follows:

(a) Credit to Private Sector

The result presented on Table 7 for the model of adjusted net savings, reveals that domestic credit to private sector as a percent of GDP has a short run coefficient of 0.423 and is significant at 5% level of significance. This implies that a percent point increase in the ratio of credit to the private sector to GDP increases adjusted net savings by about 0.423 percent points in the short run.

For the model of income distribution, domestic credit to private sector as a percent of GDP and its squared term have short run coefficients of 0.0003 and -0.011 and are significant at 5% and 1% levels respectively. These imply that a percent point increase in the ratio of credit to the private sector to GDP increases income inequality initially by about 0.0003 percent points in the short run and later cause it to decline by about 0.011 percent points. This also implies credit to private sector can help boost the sustainable social development at the short run in Nigeria.

Based on the model of environmental quality, results on Table 7 reveal that the coefficient for the short run estimate of the ratio of credit to the private sector as a percent of GDP is -1.63 which is significant at 1% level of significance. This implies that a percent point increase in ratio of credit to the private sector to GDP leads to decreases in carbon emission (and increases environmental stewardship) by about 1.63 percent points in the short run.

(b) Total Share (Stock) Traded

Based on the model of adjusted net savings, the short run coefficient of the ratio of total shares traded to GDP is 0.468 and is significant at 1% level. Results therefore, reveal that a percent point increase in the ratio of total shares traded to GDP increases the adjusted net savings by 0.468 percent points in short run. The positive and significant impact in the short run points that the value of total shares traded is an important financial system indicator that could drive sustainable economic development in Nigeria in the short run.

For the model of income distribution, results on Table 7 showed that the short run coefficients of the ratio of total shares traded to GDP and its squared term are-0.184 and 0.039 which are both significant at their first

period lag. Results therefore, reveal that a point increase in ratio of total shares traded to GDP will initially lead to about 0.184 points decrease in income inequality and a subsequent increase in income inequality by about 0.039 points in the short run.

Results on Table 7 reveal for the model of environmental quality that the short run coefficient of the ratio of total shares traded to GDP is 0.076 and is not significant at the conventional significant levels, implying that the ratio of total shares traded does not affect environmental sustainability at the short run in Nigeria.

(c) Broad Money Supply

Based on the model of income distribution, results presented on Table 7 reveal that broad money supply as a percent of GDP and its squared term have short run (first period lag) coefficients of -0.020 and 0.0009 and are both significant at 1% levels. These imply that a percent point increase in the ratio of broad money supply to GDP decreases income inequality initially by about 0.020 percent points in the short run and later causes it to rise by about 0.0009 percent points.

For the model of environmental quality, results on Table 7 reveal that the coefficient for the ratio of broad money to GDP in the short run is -1.798 and is significant at 1% level of significance. This implies that a percent point increase in the ratio of broad money to GDP in the short run decreases carbon emission (and increases environmental quality) by about 1.798 percent points. Results therefore, holds that ratio of broad money to GDP has a significant impact on carbon emissions only in the short run in Nigeria. This implies that broad money supply can be used as a financial tool to reduce the rate of emissions and improve the quality of the environment though, in the short run.

(d) Stock Market Capitalization

The results from the model of income distribution as presented on Table 7 reveal that stock market capitalization as a percent of GDP and its squared term have short run coefficients of 0.011 and -0.0002 and are both significant at 1% levels. These imply that a percent point increase in the ratio of stock market capitalization to GDP increases income inequality initially by about 0.011 percent points in the short run and later causes it to decline by about 0.0002 percent points. The impact of the ratio of stock market capitalization to GDP on income inequality revealed that there is evidence of G-J hypothesis in Nigeria only in the short run. This also implies stock market capitalization can help boost the sustainable social development in the short run in Nigeria.

Based on the model of environmental quality, results reveal on Table 7 that the short run coefficient of the ratio of stock market capitalization to GDP is -0.239 and is significant at 1%. This implies that a percent point increase in the ratio of stock market capitalization to GDP decreases carbon emissions (and increases environmental quality) in the short run by about 0.239 percent points.

(e) Gross Insurance Premium

Results from the model of adjusted net savings reveal that the short run coefficient of the ratio of gross insurance premium to GDP is not significant, and implies that insurance sub-sector does not influence adjusted net savings in the short run.

Based on the model of income distribution, the short run coefficients of the ratio of gross insurance premium to GDP and its squared term are 0.008 and -0.009 which are not significant. Results therefore, reveal that the ratio of gross insurance premium to GDP does not determine the level of income inequality in Nigeria in the short run.

For the model of environmental quality, the coefficient of the ratio of gross insurance premium to GDP in the short run is -0.709 and is significant at 1%, implying that a percent point increase in the ratio of gross insurance premium to GDP decreases emissions (and increases environmental quality) by about 0.709 percent points in the short run. Results therefore, suggest that the insurance sub-sector reduces environmental damages in the short run in Nigeria.

(f) Government Reforms

For the model of adjusted net savings, the coefficient of government reform in the short run indicates that government reform is not significant on adjusted net savings in the short run in Nigeria.

Based on the model of environmental quality, the coefficient of government reforms in the short run has no significant effect on environmental quality implying a weak or ineffective policy towards ensuring that the financial systems propel a sustainable environmental quality at the short run in Nigeria.

The summary of the major findings of this study is discussed and presented as follows based on the sequence of the explanatory variables of interest which are the financial sector indicators.

(a) The Influence of the Ratio of Credit to the Private Sector to GDP on Sustainable Development in Nigeria

Results revealed that the ratio of credit to the private sector as a percent of gross domestic product has a significant and positive effect on sustainable development; a significant and positive effect on adjusted net savings; a significant and negative on income inequality; and a significant and negative effect on environmental quality. Findings of this study corroborates those of Levine (1997); Frankel & Rose (2002); Tamazian & Rao (2010); and Ridzuan *et. al.* (2017b). This study also confirms the finance-led growth hypothesis and the Greenwood-Jovanovich hypothesis, since the credit to the private sector which is an indicator of the banking sub-sector revealed that the financial system spurs economic growth but reduces income inequality in Nigeria.

(b) The Effect of the Ratio of Broad Money to GDP on Sustainable Development in Nigeria

The ratio of broad money as a percent of gross domestic product which is another indicator of the banking sub-sector of the Nigerian financial system was found to have a significant and positive effect on sustainable development; a significant and negative effect on income inequality; and a significant and positive effect on environmental quality in Nigeria. This is consistent with studies of Clarke, Xu, & Zou (2006); and Ogunlokun *et. al.* (2018). Result also lends support to the Finance-Led Growth Hypothesis and the Greenwood-Jovanovich hypothesis.

(c) The Impact of the Ratio of Stock Market Capitalization to GDP on Sustainable Development in Nigeria

Findings showed that the ratio of stock market capitalization as a percent of gross domestic product, which is an indicator of the stock market sub-sector of the financial Sector has a significant and positive effect on sustainable development; a significant and negative effect on income inequality; and a significant and negative effect on environmental quality in Nigeria. Results uphold both the finance-led growth hypothesis and the Greenwood-Jovanovich hypothesis. This finding corroborates that of Ridzuan et al. (2017a); and Ogunlokun *et. al.* (2018).

(d) The Influence of the Ratio of Total Shares Traded to GDP on Sustainable Development in Nigeria

Results revealed that the ratio of total shares traded as a percent of gross domestic product, which is also an indicator of the stock market sub-sector of the financial system has a significant and positive effect on sustainable development; a significant and positive effect on adjusted net savings; a significant and negative effect on income inequality; and a significant and positive effect on environmental quality. This is in line with Ridzuan et al. (2017a). Result also lends support to the finance-led hypothesis and the Greenwood-Jovanovich hypothesis.

(e) The Effect of the Ratio of Gross Insurance Premium to GDP on Sustainable Development in Nigeria

Findings revealed that the ratio of gross insurance premium as a percent of gross domestic product which is an indicator of the insurance sub-sector has a significant but negative effect on sustainable development; a significant but negative effect on adjusted net savings; a no significant effect on income inequality; and a significant and negative effect on environmental quality. Results however, contradicts the submissions of Beck, Thornstern & Webb (2003); and Marco (2008), and also, does not lend support to the finance-led and the Greenwood-Jovanovich hypotheses in the case of Nigeria.

5. Conclusions

This study assessed the main segments of the financial sector on economic sustainability, social sustainability, and environmental sustainability in Nigeria. Findings suggest that the banking sub-sector favorably affect both sustainable economic development and sustainable social development, but negatively contributes to sustainable environmental development in Nigeria. The stock market was found to favorably exact on sustainable economic development, sustainable social sustainability, and sustainable environmental development in Nigeria. However, the insurance sub-sector did not significantly affect the three dimensions of sustainable development in Nigeria. Based on these findings, the government is therefore, advised to pay considerable attention to the banking and stock market segments of the Nigerian financial sector to enable them channel funds to productive sectors of the economy while engaging lower emission technologies for environmental safety. This could catalyze sustainable development in Nigeria through the financial sector.

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