ECONOMIC LIBERALIZATION, ECONOMIC GROWTH, AND ENVIRONMENTAL QUALITY IN NIGERIA (1970-2012)

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DEDICATION

This research work is dedicated to:

Hunsu Kohode Asiki-Posu (Kosimaji)

and

Christiana Oluwakemi Shobanke

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ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AO	Additive Outliers
AR(1)	Autoregressive process of order one
ARCH	Autoregressive Conditional Heteroskedasticity
ARDL	Autoregressive Distributed Lag
ASEAN	Association of South-East Asian Nations
BLUE	Best Linear Unbiased Estimators
BOD	Biochemical Oxygen Demand
BPG	Breusch-Pagan-Godfrey
BRIC	Brazil, Russia, India, and China (countries)
C_2F_6	Perfluorocarbons
CBN	Central Bank of Nigeria
CDIAC	Carbon Dioxide Information Analysis Center
CDM	Clean Development Mechanism
CFCs	Chlorofluorocarbons
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CUSUM	Cumulative Sum (of residuals)
DW	Durbin-Watson
ECM	Error Correction Model
ECT	Error Correction Term
EKC	Environmental Kuznets Curve
EQKC	Environmental Quality Kuznets Curve

ERM	Environmental Resource Management
FCT	Federal Capital Territory
FDI	Foreign Direct Investments
FEC	Nigerian Federal Executive Council
FEPA	Federal Environmental Protection Agency
FGLS	Feasible Generalized Least Square
FGN	Federal Government of Nigeria
FME	Federal Ministry of Environment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GLS	Generalized Least Square
HFCs	Hydrofluorocarbons
ICT	Information and Communication Technologies
IO	Innovational Outliers
IPCC	Intergovernmental Panel on Climate Change
JB	Jarque-Bera
kt	kilotons
LM	Lagrange multiplier
LR	Likelihood Ratio
MDG	Millennium Development Goals
MNCs	Multinational Companies
MPEF	Marginal Productivity of Environment Factor
mt	metric tons
N_2O	Nitrous Oxide
NASA	National Aeronautics and Space Administration
NEPD	Nigerian Enterprise Promotion Decree
NIMET	Nigerian Meteorological Agency

NISER	Nigerian Institute of Social and Economic Development
NNPC	Nigerian National Petroleum Corporation
NOx	Nitrogen Oxide
NPCC-RS	National Policy on Climate Change and Response Strategy
NRND	NISER Review of Nigerian Development
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PHH	Pollution Haven Hypothesis
PIB	Petroleum Industry Bill
PP	Phillips-Perron
ppm	Parts per million
PPP	Purchasing Power Parity
R&D	Research and Development
SAP	Structural Adjustment Programme
SCCD	Special Climate Change Department
SDN	Stakeholder Democracy Network
SDN	Stakeholder Democracy Network
SF_6	Sulphur hexafluoride
SO_2	Sulphur Dioxide
SPDC	Shell Petroleum Development Company
SPM	Suspended particulate matter
SSA	Sub-Saharan Africa
TNCs	Transnational Corporations
TY	Toda-Yamamoto
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change
US	United States

USD	United State Dollar
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VIF	Variance Inflation Factor
VRWT	Vehicle Road Worthiness Tests
WDI	World Development Indicators
WDR	Word Development Report

ABSTRACT

This study investigated the trend in economic liberalization, economic growth, and environmental quality; and appraised environmental policies in Nigeria. The study also examined the validity of Pollution Haven Hypothesis (PHH) and Environmental Kuznets Curve (EKC) in Nigeria with a view to establishing the dynamic inter-relationship among economic liberalization, economic growth, and environmental quality over the period 1970 to 2012.

The study used secondary data. Annual data on real Gross Domestic Product per capita (GDPC), Foreign Direct Investment (FDI), trade intensity, carbon dioxide (CO_2) emissions, energy use, financial development, indirect tax, exports, and imports were sourced from the Statistical Bulletin of the Central Bank of Nigeria, the Carbon Dioxide Information Analysis Centre, and World Development Indicators of the World Bank. The data were analyzed with descriptive statistics and econometric techniques. The econometric techniques used included dynamic ordinary least square, and Vector Error Correction Model (VECM). The results showed significant increase in the magnitude of all the series. Real GDP of Nigeria increased from ₦4.22 billion in 1970 to ₦902.79 billion in 2012. Similarly, CO_2 emissions rose from 21540 kilotons to 81479 kilotons while FDI grew from ₦251 million to ₦50469.9 million. The study also found that Nigeria had enough environmental policies to tackle environmental challenges but the policies were weak to achieve the intended objectives on the environment. The study found no support for the PHH. The coefficient of environmental quality in the parsimonious PHH model was significant ($t=-3.5557$; $p<0.05$). Increase in CO_2 emissions led to decrease in FDI. Conversely, improvement in environmental quality would attract more FDI. The quadratic EKC model established a negative coefficient on

GDPC ($t = -2.9526$; $p<0.05$) but a positive coefficient on $(GDPC)^2$: ($t = 2.7868$; $p<0.05$). The results showed a U-shaped curve for Nigeria, contrary to - ++cthe conceptual inverted U-shaped EKC. Similarly, the cubic EKC model showed alternating signs on the coefficients of GDPC ($t = 3.7248$; $p<0.05$); $(GDPC)^2$: ($t = -1.6613$; $p<0.05$); and $(GDPC)^3$: ($t = 4.0147$; $p<0.05$), implying an N-shaped EKC. Both the quadratic and cubic models showed that GDP growth was associated with high pollution in Nigeria.

The VECMs showed that trade intensity, FDI, and GDPC significantly influenced environmental quality simultaneously both in the current and future periods. In a unidirectional way, GDPC affected both environmental quality and FDI, while FDI affected environmental quality. The impulse response function showed that an innovation in trade intensity generated negative responses on environmental quality over the entire period. The variance decomposition showed that the effect of the shock on environmental quality was greater and increased continuously over the entire period with greater effect in the long-run than the short-run.

The study concluded that FDI, trade intensity, financial development, economic growth, and environmental quality simultaneously influenced pollution levels and GDP growth in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Economic liberalization is generally defined as the loosening of government regulations in a country to allow private sector organizations to operate business transactions with fewer restrictions. It is a concept that explains the trading and investment relationships of an open economy with the rest of the world. It includes a family of policies such as promotion of free trade, deregulation, removal of subsidies, and privatization of public services, trade liberalization, financial development (Woodward, 1992; Kotwal *et al*., 2010; Bekana, 2011). In relation to developing countries, the term refers to the opening of economic borders to multinationals and foreign investment. It is a major driver of international trade and expansion in cross-border investment flows. Similar to economic globalization, Ognivtsev (2005) describes economic liberalization as the freedom to engage in economic activities at home and/or abroad. Ognivtsev (2005) also observes, however, that the freedom to engage in economic activities is subject to institutional and policy constraints necessary to guarantee public interests at large.

Jones (2005) sees economic liberalization as a process leading to increased economic interdependence among various nations, which is driven by national (endogenous) and international (exogenous) factors. Trade liberalization policies are endogenous while advances in Information and Communication Technologies (ICT) and transportation are exogenous. Economic liberalization policies among nations facilitate the elimination of significant national barriers to the international flow of goods, services, capital, finance, information, and trade integration (Bekana, 2011; Korves *et al*., 2011; Narayanan, 2013) in one global market (Kotwal

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et al., 2010). According to Bernal (2008), economic liberalization led to exports of services from developing countries growing more rapidly than the export of manufactured goods.

Economic liberalization increases the level of interaction of an open domestic economy with the rest of the world. An open economy first begins with export and import of goods and services, followed by finance, and investment. Foreign Direct Investment (FDI), openness, and financial development are major components of economic liberalization. Diffusion of technological progress among nations brings about reduction in some costs of production such as communication and computation, and makes it economically feasible for a foreign firm to locate different phases of its operations in different countries (Dean, 1999). Among the effects of economic liberalization and globalization is the global concern with respect to the positive and the negative effects of output growth on the environment.

Classical economic theories on trade argued that trade propels growth. Several developing countries formulate certain policies in order to boost Foreign Direct Investments (FDI) inflows in an attempt to complement domestic investment and to stimulate economic growth. Earth Summit (2002) defines FDI to mean long-term investment greater than 10 percent of a 'parent' enterprise from 'home' economy into a subsidiary, affiliate, or branch enterprise in a foreign 'host' economy. FDI provides finance for the acquisition of new plants and machineries. The Economic and Social Commissions (ECOSOC, 2000) observes that FDI constitutes the largest source of foreign private capital reaching developing countries. FDI creates access to better management techniques, market links, marketing expertise, and technology spillover from relatively more technologically advanced economies. In Nigeria, FDI inflows account for expansion in outputs from the agricultural, manufacturing, construction, and notably, the oil and gas sectors of the economy. The increase in the volume and the mix of Gross Domestic Product

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(GDP) affect the environment by either improving or degrading environmental quality. In order to achieve the main macroeconomic goals of development, developing countries tend to pay greater attention to economic growth than environment quality.

Openness is a measure of the extent to which a domestic economy transacts, or engages in trade with the rest of the world. According to Singh and Jun (1995), increased openness with respect to trade and capital flows is beneficial to the developing countries particularly with respect to increased investment. The UNCTAD (2008) observes that trade and investment will accelerate in countries that have opened up to the global economy. Balasubramanyam *et al.*, (1996) stresses that trade openness is crucial to obtaining the growth-effects of FDI. In the literature, the concept of openness is used interchangeably with degree of openness, trade, or trade intensity. Trade intensity, as adopted in this study, is the Trade-GDP ratio where Trade, as used in the definition, is the sum of exports and imports of goods and services.

Financial development is composed of the processes that lead to improvement in quantity, quality, and efficiency of financial intermediary services (Shahbaz, 2012). Henry (2000) observes that financial development opens up the local capital markets of a country to foreign ownership and operation within and across countries, which could have some implications on economic growth and environmental quality. Asghari (2013) considers financial development as another possible determinant of environmental performance. Financial liberalization and development have been identified as capable of attracting FDI and higher degrees of Research and Development (R&D) investments which, in turn, can speed up economic growth (Frankel and Romer, 1999), and hence affect the dynamics of the environmental performance (Tamazian *et al.*, 2009). Asghari (2013) identifies pronounced differences in financial development among countries as a

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