NATURAL CAPITAL MANAGEMENT AND ECONOMIC GROWTH IN NIGERIA

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Abstract
The study examines the impact of natural capital (natural resource abundance, specifically the abundance of crude oil and natural gas) management on economic growth in Nigeria. It employs the ordinary least squares (OLS) multiple regression technique to analyze the impact of natural capital, domestic economic investments, openness of the economy, inflation, human capital investment and financial deepening on economic growth using five related econometric models for the period - 1981 to 2013. The study finds that the abundance of natural resources (crude oil and gas) in Nigeria had positive impact on the growth of the nation's economy within the period of study. It also notes that the impact of natural resource abundance on growth is enhanced with adequate human capital investments in a financially deepened economy.The study calls for more responsible management of natural resources in Nigeria, to alleviate the pains, miseries, strife and failed expectations the abundance of oil has caused to the people of the Niger Delta region, and to ensure that the benefits of oil get to all Nigerians fairly and equitably. Furthermore, to ensure sustainable growth, it recommends that the resources from oil should be strategically invested in developing other sectors with a view to moving the economy away from a primary to manufacturing and service based economy.

Key words:
Natural capital, natural resources, crude oil, human capital, environmental degradation, and economic growth.

Introduction

For centuries, natural resources were a major source of wealth not only for local communities but for ancient kingdoms and much later for modern nation states. For instance, the scramble for Africa by the Europeans between 1880 and 1900 AD, and the infamous Berlin conference of 1884 were mainly to exploit the vast natural resources of Africa to supply European factories with raw materials. The same can be said of the European exploits to Asia. Today, natural capital remains a source of wealth to many nations, particularly developing ones. When properly developed and managed, natural resources constitute important drivers of sustainable growth. Proper and responsible management of natural resources(herein referred to as natural resource management) "creates jobs and provides governments with revenue to deliver services to their citizens" (Trade and Development Canada, 2014). Indeed, evidence from "resource-rich countries, such as Botswana, Chile and Norway, points to the positive outcomes for local communities and countries when natural resources are developed" (Heymann, 2013)properly,and responsibly managed.

However, poor management of natural resources could have a devastating effect on local communities and the national economies. The negative consequences of poor management of natural resources that are prevalent in many resource-rich countries of Africa, and Asia including Nigeria, Sierra Leone, Burma and Thailand (in her early years of development) are armed conflicts, civil and violent agitations for resource control, inter-tribal rivalries, environmental degradation, corruption and rent-seeking

behaviours by political leaders and other major stakeholders. Undoubtedly, these are detrimental to national economic growth and the welfare of citizens. Indeed, in recent times, the debate is whether or not the abundance of natural resources in many developing countries is a blessing or curse to economic growth in resource-rich nations.

This paper examines empirically the management of abundant natural resources in Nigeria and the impact it has on her economic growth.

The paper proceeds further as follows. The next section presents the theoretical and empirical literature; section 3 contains the research methods; while data presentation and analyses are in section 4. The final section, 5, concludes the work, summarizes and makes appropriate recommendations for policy direction.

THEORETICAL AND EMPIRICAL LITERATURE

The extant literature on natural resources management and economic growth suggests a negative relationship between abundant natural resources in an economy, particularly developing ones, with economic growth. Gylfason and Zoega (2001-02) note four basic links in the literature between abundance of natural resources and the growth of an economy. The first is that abundant natural resources in an economy can lead to what has come to be known as the *Dutch disease* – a condition that arises in a country where the abundance of natural resources leads to increased income that further results in some negative consequences that are harmful to growth and development. According to them, the Dutch disease can manifests in several ways. A reduction in the contribution of manufacturing and service exports to gross national income or in the configuration of total exports due to a number factors. These include a rise in currency real exchange rate due to a boom in the exports of raw materials; increased wages in the primary sector that attracts labour from other sectors and invariably foist high wages on those sectors; exchange rate volatility that is associated with vagaries in prices of primary products in the international markets and in several other forms. In Nigeria, heavy reliance on oil has led to policy misplacement that serves as a disincentive for non-oil producing areas in Nigeria to develop alternative sources that could enhance their fiscal capacity and make equitable contribution to national income (Ikein,2004).

The second link between the abundance of natural resources in a country and economic growth, according Gylfason and Zoega (2001-02), is found where, in the absence of effective institutional and legal governance structures, increased income in an economy encourages businesses and other stakeholders to engage in rent-seeking behaviour and large scale corruption that rob the economy of huge resources that could have been used for more productive activities. For instance, for several years in Nigeria during periods of rising oil prices, governments, apart from engaging in frivolous expenditures such as the alleged purchase of mobile phone handsets for rural farmers, funding of political parties and sharing of oil windfalls among the three tiers of government, also engage in bogus projects that have no bearing with the economic and/or social well-being of the citizens. These are in addition to massive corruption and outright looting of government treasury by top government functionaries. Similar situations exist in the private sector amongst the multinational oil firms that rob the nation of huge export earnings from oil through over-invoicing of imports, understatement of oil production figures, illegal repatriation of capital through transfer pricing and many other subtle rent-seeking behaviours such as import duty waivers and other tax reliefs to influential

individuals and organizations that end up distorting government revenue projections. In early 2014, the Nigerian Minister of Finance reported that Nigeria lost about =N=170.74 billion in waivers and tax concessions to governments and private businesses in three years (2011 –2013) while the Nigerian Customs Services lost =N=627.07 billion as shortfall in budgeted revenues within the same period. The Nigerian situation correctly depicts Tornell and Lane's (1998, 2000) postulation that terms of trade windfalls and booms in natural resources may cause political maneuverings among political interest groups resulting in current account deficits. No doubt, these and other rent-seeking behaviours, cronyism and corruption impede economic efficiency and retard economic growth (Bardhan, 1997; Murphy, Shleifer & Vishny, 1993). In fact, according to Mifsud-Bonnici (2013), huge revenues realized from natural resources can upset not just the economy but the political developments in host countries.

The third link, according Gylfason and Zoega (2001-02), is that the abundance of huge financial resources from natural resources such as high wage income, increased dividends, and low tariffs and taxes may serves as a huge disincentive for human capital development in both private and public sectors. Gylfason, Herbertsson and Zoega (1999) aver that in many countries, school enrollment at various levels is negatively related to natural resource abundance. And education has been generally acknowledged as an important driver of economic growth.

The fourth link between natural resources and growth, according to Gylfason and Zoega (2001-02) is that the availability of huge financial and material resources from abundant natural resources may also lead to a 'false sense of security'that could cause the displacement of proper economic management as a governmental priority. In other words, abundant capital may displace social capital as it does to human capital (Paldam & Svendsen, 2000; Woolcook, 1998).

In addition, poor management of natural resources exposes a country to a number of risks. According to Heymann (2013), such risks include social unrest, corruption, graft, and environmental degradation. Citing UN estimates, he posits that 40% of intrastate conflicts are connected to or driven by natural resources. Similarly, Onigbide (2008) argues that poor management of natural resources that fails to meet the needs of oil producing communities of a country poses serious risk not only to national security but also to sub-regional security. Indeed, as Smith (2013) contends, the abundance of natural resources or its quality is not the issue but how the resources are governed. Hence, the call by The Network of Global Agenda Councils and other interest groups for responsible exploitation of resources is apt. According to Smith (2013), responsible resources exploitation is one that 'sets out to avoid exacerbating those risk factors so that the benefits are shared by the country as a whole'. In that way, natural capital can become a catalyst for economic growth and development. As Mifsu-Bonnici (2013) rightly puts it, "natural resources are currently an irreplaceable source of wealth; natural resources revenue, properly managed, can break the cycle of poverty and kick-start a country on the path to sustainable economic growth". Hence, he advocates a broad based macroeconomic strategy that engendersthe right investment climate capable of stimulating social and economic development through stronger links between natural resources and the entir economy. This, no doubt, would requi the commitment, discipline an cooperation of all interest groups includir the host communities and their you associations, private extractive firm NGOs and governments at all levels. I this manner, the avowed common vision

leaders and delegates at the United Nations conference on sustainable development in Rio de Janeiro in 2012 will be in the front burner of realization. The conference affirmed among others (UN, 2012):

We also reaffirm the need to achieve sustainable development by promoting sustained, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and inclusion, and promoting integrated and sustainable management of natural resources and ecosystems that supports, inter alia, economic, social and human development while facilitating ecosystem conservation, regeneration and restoration and resilience in the face of new and emerging challenges.

Furthermore, the literature on natural resources abundance and economic growth suggests that timing may be a crucial factor in explaining the effect of natural capital on growth. Gylfason and Zoega (2001-02) cite the example of Norway where growth has remained all-time high. The latter had matured social institutions and relatively developed financial system before she discovered oil in the 1970s. Thus, despite the risk of been justifiably accused of representative bias, the evidence from Norway suggests that where a country has strong institutional and legal frames works before the emergence of natural capital on the economic scene, natural resources abundance may have little or no adverse effect on economic growth. This view is also shared by Oyefusi (2007) who avers that where a country puts in place the right sets of institutions and embraces the right policies at the onset of resource discovery, she is more likely to achieve rapid economic growth and perform in many ways better than resource-dependent countries. Fortunately however, apart from Norway, evidence from other resource-rich countries like Botswana and Chile show significant positive outcomes for both local communities and the nation (Heymann, 2013). Although what account for such distinctive successes are subjects of on-going discourse in the literature, these may not be unconnected with proper and responsible management of natural resources.

Review of Empirical Literature

In a study of 97 developing countries between 1970 and 1989, Sachs and Warner (1995) find a statistically significant negative relationship between natural resources exports as a ratio of GDP and GDP growth rate. Similarly, Gylfason and Zoega (2001-02) based on a sample of 85 countries conclude that on the average, the abundance of natural capital may constrain economic growth by crowding out physical capital, slow down the development of the financial sector and thus hurt savings and investment. On the bright side however, they conclude that economic and structural reforms can overcome the adverse effects of natural resources on economic growth. Similarly, Malik, Chaudhry and Hussain (n.d.) in a time series study in Pakistan for the period 1975-2006 finda significant negative relationship between natural resources and economic growth. The result is the same even when human capital development is accounted for in their model.Buch-Hansen, Oksen, and Prabudhanitisarn (2006) also report that during the development era of Thailand from the 1950s, economic growth led to rapid depletion of forest and marine resources due to lack of concern for soil properties or bio-diversity.

Nevertheless, some other works proffer contrary evidence on the relationship between natural capital and economic growth. Stijns (2001) and, Ding and Field (2004) find no evidence of negative impact of natural resources on economic growth. In spite of these, the overwhelming evidence seems to support the view that natural resource abundance with no

responsible management is more of a curse than a blessing to resource-rich countries. Thus, this study proffers an empirical evidence of the impact of natural resource abundance on Nigerian economic growth.

An Overview of Nigerian Resource-Rich Economy

Nigeria is an oil rich country. Oil was discovered in Nigeria in 1956 at Oloibiri in the Niger Delta region while actual production and export commenced in 1958 at an initial production rate of 5,100 barrels of crude oil per day. She became a member of the Organization of Petroleum Exporting Countries (OPEC) in 1977 (NNPC, 2010). It is estimated that between 1999 and 2009, the Nigerian economy earned about 329.7 billion dollars in export of petroleum resources (Igbinosa, 2012). Apart from oil, Nigeria is also rich in agro-based resources like cocoa, oil palm, timber, rubber and groundnuts. Other mineral resources are limestone, bauxite, gypsum, uranium, iron ore, quartz and marble stone to mention but a few. Although many of these are available in commercial quantities they are largely unexploited (Igbinosa, 2002-03).

Oil exploitation takes place in the Niger Delta region (that consists of Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Ondo and Rivers States) of Nigeria. The main occupations of the people of the Niger Delta are fishing, boat building and farming. However, the region is faced with a number of environmental challenges such as oil spillage, gas flaring, land degradation, destruction of aquatic lives, and the flora and fauna of mangrove and tropical forests due to the exploration and exploitation activities (including the several networks of pipelines and flow stations) of multinational oil companies. Indeed, host communities in the heartland of exploitation activities have been displaced in the region and unemployment rate is high and poverty is widespread.

There is high level of corruption in the Nigerian oil industry. Only recently in 2014, the Nigeria government admitted belatedly that about US$10.0 billion was not accounted for by the Nigerian National Petroleum Company (NNPC), the state-owned company that has managed the nation's oil resources on behalf of the Federal government since 1977. Today, civil unrests, violent agitations, thievery cumulating in destruction of oil facilities and pipelines are the order of the day in the Niger delta region of the country. Various armed groups operate in the region as part of the struggle to have some control of the resources of the region. In response, the government established the Joint Military Task force (JTF) to combat the uprisings as well as check the destruction of pipelines, operation of illegal refineries, oil theft, sea piracy, kidnapping, armed robbery and other vices threatening the economic stability and growth of not just the region but of the entire nation.

There is also the strong political agitation by the region to have control of its resources, an issue that is being resentedand resisted by other regions of the country and an 'Achilles hill' on the unity, stability and growth of the nation. In terms of physical development, the Niger Delta region is the least developed in the country. Interstate roads in the upland of the region are few and many roads are dilapidated and few are upgraded to expressways while several communities in the riverine areas are not linked by roads and/or bridges. There are no railway lines in the Niger Delta of Nigeria. In fact, the Niger Delta that is home to the vast oil and gas resources of Nigeria has nothing much to show economically for its enormou wealth of oil resources.

RESEARCH METHODS

To examine the impact of natural resour abundance on economic growth in Nigeri the study employs the ordinary lea

squares (OLS) multiple regression analysis. Specifically, it analyzes the relative impact of natural capital (natural resource abundance), domestic economic investments (INV), openness of the economy (OPEN), inflation growth rate (INF) and human capital investment (EHS) on the economic growth of Nigeria. The study period is 1981 to 2013. All data are sourced from the website of Central Bank of Nigeria (CBN) 2013 statistical bulletin.

$Y = A L^{a}N^{b}K^{1-a-b}$ ..... (1)

Where,
Y=Output
L=Labour resources
N=Natural resources
K=Capital resources
A=Overall efficiency

From equation (1) above, Gylfason and Zoega (2001-02) derive the optimal saving rate as follows:

s=1-a-b ..... (2)

Furthermore, they formulated the seemingly unrelated regression (SUR) models of three system equations where:

1. GDP per capita is a function of the share of gross domestic investment in GDP, gross secondary school enrolment rate, natural capital as a ratio of total capital and the logarithm of initial per capita income.
2. Gross secondary school enrolment rate is a function of natural capital ratio and initial income per capita;
3. Investment is a function of natural capital share of total capital.

Their models reflect some underlying assumptions that may not hold in all situations of natural resource abundance. For instance, that secondary school enrolment is a function of natural capital and initial capital may not hold for a country such as Nigeria where oil has been in existence for over 50 years. The same argument also goes for model 3 where

Previous studies employ different methodologies in evaluating the relationship between natural resource abundance and economic performance. We review two of such studies in this paper because they employ the most commonly used variables in the literature. Gylfason and Zoega (2001-02) employ correlation and multiple regression analyses. Using the Solow model as a starting point in an economy with natural resources, they formulated the Cobb-Douglas production function as follows:
investment is only a function of natural capital share of total capital.

On the other hand, Malik, Chaudhry and Hussain (n.d.) following after Sachs and Warner (1995) use two separate models to analyze the impact of natural capital on economic growth. Their first model did not account for investment in human capital while the second does. Their models are as follows:

$\text{Log (GDP)} = \beta_0 + \beta_1(\text{NRX/GDP}) + \beta_4(\text{INF}) + \beta_5(\text{OPEN}) + \beta_6(\text{INV/GDP}) + u_{1i}$ ..... (3)

$\text{Log (GDP)} = \beta_0 + \beta_5(\text{NRX/GDP}) + \beta_2(\text{EDU/GDP}) + \beta_3(\text{H/GDP}) + \beta_4(\text{INF}) + \beta_5(\text{OPEN}) + \beta_6(\text{INV/GDP}) + u_{2i}$ ..... (4)

Where,

GDP=Gross domestic product (GDP)

NRX/GDP= Natural resource abundance proxy by exports related to agriculture, fuel and minerals as percentage of GDP;

EDU/GDP= Investment in human capital variable 1, proxy by expenditures on education as percentage of GDP;

H/GDP= Investment in human capital variable 2, proxy by expenditures on health as a percentage of GDP;

INF= rate of inflation;

OPEN= trade openness – Total trade as a ratio of GDP

INV/GDP= Investment as percentage of GDP as a measure of the efficiency of government.

Therefore, in this study, we adopt and adapt the Malik, Chandhry and Hussain models (n.d.) which also follow from Sachs and Warner (1995) because the models and their variables are more appealing and approximate the Nigerian economic reality.

The functional forms of our models are:

$LGDP_1=f(NCP, INV, OPEN, INF)$ ..... (5)

$LGDP_{1'}=f(NCP, INV, OPEN, INF, FDEEP)$..... (5')

$LGDP_2=f(NCP, INV, OPEN, INF, EHS)$ ..... (6)

$LGDP_{2'}=f(NCP, INV, OPEN, INF, EHS, FDEEP)$..... (6')

The econometric forms of the above models are:

$LGDP_1=\beta_0+ \beta_1NCP + \beta_2INV + \beta_3OPEN + \beta_4INF + U_1$ ..... (7)

$LGDP_{1'}=\beta_0+ \beta_1NCP + \beta_2INV + \beta_3OPEN + \beta_4INF + \beta_5FDEEPU_1$ ..... (7')

$LGDP_2=\alpha_0 + \alpha_1NCP + \alpha_2INV + \alpha_3OPEN + \alpha_4INF + \alpha_5EHS + U_2$ ..... (8)

$LGDP_{2'}=\alpha_0 + \alpha_1NCP + \alpha_2INV + \alpha_3OPEN + \alpha_4INF + \alpha_5EHS + \alpha_6FDEEP + U_2$ ..... (8')

Where,

GDP = Gross domestic product (GDP) at current prices

$LGDPR_{1,1',2,2'}$=Natural logarithm of Gross domestic product (GDP)

NCP = Natural capital (natural resource abundance) - exports related to oil, gas and other petroleum products as a percentage of GDP;

INF= Inflation growth rate

OPEN= Economic openness - total trade (exports + imports) as a percentage of GDP;

FDEEP= Financial deepening – money supply as a percentage of GDP;

EHS = Human capital investment - total capital expenditures on education, health, and other social/community services by Federal Government as a percentage of GDP;

INV= Domestic economic investments – Federal government capital expenditures on agriculture, construction, transport/communication and other economic services as a percentage of GDP.

β_0,α_0 = constant terms of the regression equations;

β_1, β_2, β_3, β_4, β_5,α_1, α_2, α_3, α_4, α_5 and α_6 are coefficients or slopes of the model equations – to be estimated; and other variables are as previously defined above.

Arising from the review of literature, the *apriori* or theoretical expectations of the models are:

β_1, β_4, α_1, $\alpha_4 < 0$;β_2, β_3, β_5, α_2 α_3, α_5, $\alpha_6 > 0$

The study actually begins with econometric models (7) and (8) adopted after the manner of Malik, Chandhry and Hussain models (n.d.) (whose results agree with previous studies) to enable us investigate if we can arrive at similar results based on Nigerian data. Furthermore, we adapt their models to include financial deepening (FDEEP) in order to have a more inclusive model to verify if the results vis-à-vis the impact of natural capital on growth will remain the same. We do this by adding models (7') and (8') both of which include financial deepening variable as adaptations of Malik et al. (n.d.) models (3) and (4).

DATA PRESENTATION AND ANALYSES

To avoid spurious regression, we first conduct the unit roots tests to verify the null hypothesis that the series have unit roots. Using the Augmented Dickey-Fuller (ADF) test at 95% level of significance, the results show that we could not reject the null hypothesis that the variables have unit roots (that is, they were not stationary at levels) (the absolute values of the ADF test statistics were lower in most variables than the ADF critical values (absolute) at 95% level of significance). Details of the tests are contained in Table 1a.

TABLE 1A: UNIT ROOTS TESTS FOR NATURAL CAPITAL AND OTHER VARIABLES AT LEVELS

VARIABLE	ADF TEST STATISTIC	ADF CRITICAL VALUE @5% LEVEL	REMARK
LGDP	-0.7687	-2.9571	NON-STATIONARY
NCP_GDP	-1.8589	-2.9571	NON-STATIONARY
INV_GDP	-2.9733	-2.9571	STATIONARY
OPEN	-1.6971	-2.9571	NON-STATIONARY
INF	-1.2139	-2.9718	NON-STATIONARY
EHS_GDP	-5.1858	-2.9571	STATIONARY
FDEEP	-0.0044	-2.9571	NON-STATIONARY

As we show on table 1a above, all the variables were not stationary at levels. Thus, they are transformed to their first differences and the unit roots tests are repeated thereafter on the first differenced values. Tables 1b show the test results at first difference.

TABLE 1B: UNIT ROOTS TESTS FOR NATURAL CAPITAL AND OTHER VARIABLES AT FIRST DIFFERENCE

VARIABLE	ADF TEST STATISTIC	ADF CRITICAL VALUE @5% LEVEL	STATUS	ORDER OF INTEGRATION
DLGDP	-4.9689	-2.9604	STATIONARY	I(1)
DNCP_GDP	-6.6855	-2.9604	STATIONARY	I(1)
DINV_GDP	-7.6981	-2.9604	STATIONARY	I(1)
DOPEN	-8.3502	-2.9604	STATIONARY	I(1)
DINF	-5.1978	-2.9719	STATIONARY	I(1)
DEHS_GDP	-10.0038	-2.9604	STATIONARY	I(1)
DFDEEP	-4.7818	-2.9604	STATIONARY	I(1)

Table 1b above shows that the ADF test statistics are greater than their respective 5% critical values (absolute) for each variable at the first difference. These indicate that natural capital data series are stationary at first difference. Hence, we reject the hypothesis of the existence of unit roots (non-stationarity) for the data series. Thus, the variables are stationary at their first difference and they are integrated of order one [I(1)]. Therefore, the regression analysis on the transformed data will produce non-spurious results.

Furthermore, we employ EViews 8.0 econometric package to analyze the two ordinary least squares (OLS) regression equations and their two adaptions for the Nigerian time series data of 33-year range, 1981 to 2013. Details of the OLS results are on tables 2a, 2b, 3a and 3b.

The first regression equation (7) expressing the impact of natural capital on GDP without human capital investment (EHS_GDP) and financial deepening (FDEEP) shows the absence of autocorrelation with Durbin Watson statistic (DW) =1.55 and R^2 statistic of 0.83. The detailed OLS regression results are contained on table 2a below.

Table 2A: Ordinary Least Squares Multiple Regression Analysis Showing Impact of Natural Capital on Growth without Human Capital Investment and Financial Deepening

DEPENDENT VARIABLE: LGDP	COEFFICIENT	T-STATISTIC	PROBABILITY
C	1.2943	4.8973	0.0000
NCP_GDP	-0.0220	-0.7391	0.4660
INV_GDP	0.0146	0.2582	0.7981
OPEN	0.0627	3.1005	0.0044*
INF	-0.0005	-0.1305	0.8971
R^2	0.825	Akaike info criterion	1.18
Adj. R^2	0.800	Schwarz criterion	1.41
F-Statistic	33.09	Hannan-Quinn crit.	1.26
Prob(F-stat)	0.0000	Durbin Watson Stat	1.55

Source: Author's computation using EViews 8.0, August, 2014

¥ - For the sake case of brevity and ease of comprehension, we dispense with the letter 'D' before each variable that indicates they are integrated of order, [I(1)], on this and other tables and in the remaining part of this paper.

* Indicates statistical significance at 1% level.

In table 2a above, the coefficient of determination (R^2) is 0.83 while the adjusted coefficient of determination (adj. R^2) is0.80. The later indicates that the independent variables of the model explain about 80% of the systematic variations in gross domestic product (DGDP) within the period of study, 1981 to 2013. The Durbin Watson statistic (DW) of 1.55 (approx. 2.0) also indicates the absence of autocorrelation among the explanatory variables of the model. Similarly, the F-statistic is 33.09 and it is significant at 1% level (0.0000).This confirms the linearity of the model. Thus, this model satisfies appropriate diagnostic and statistical criteria. Therefore, the results of the OLS regression equation (7) analyzing the impact of natural capital on GDP without the influence of human capital investment (EHS_GDP) and financial deepening (FDEEP) are reliable and the effects of the explanatory variables on the dependent variable is significant. Other details of the OLS multiple regression results are contained on the table.

To analyze the Nigerian time series data of 33-year range, 1981 to 2013 in model (7') which include financial deepening as an extension of model (7), the adaptation of Malik et al. (n.d.) model (3), the EViews 8.0 econometric package is also employed to execute the OLS regression procedure. The results indicate the absence of autocorrelation with DW=1.59. The detailed results are on table 2b below:

Table 2B: Ordinary Least Squares Multiple Regression Analysis Showing the Impact of Natural Capital on Growth withFinancial Deepeningbut no Human Capital as a Variable

DEPENDENT VARIABLE: LGDP	COEFFICIENT	T-STATISTIC	PROBABILITY
C	0.7327	2.6975	0.0118
NCP_GDP	0.0090	0.3428	0.7344
INV_GDP	0.1045	1.9510	0.0615***
OPEN	0.0349	1.8702	0.0723***
INF	0.0043	1.1509	0.2599
FDEEP	0.0355	3.5784	0.0013*
R^2	0.882	Akaike info crit.	0.86
Adj. R^2	0.860	Schwarz criterion	1.13
F-Statistic	40.19	Hannan-Quinn crit.	0.95
Prob(F-stat)	0.0000	Durbin Watson Stat	1.59

Source: Author's computation using EViews 8.0, August, 2014

* and*** indicate statistical significance at 1% and 10% level respectively.

Table 2b above shows that R^2 is 0.88 and the adjusted R^2 is 0.86. Thus, the latter implies that the independent variables explain about 86% of the systematic variations in gross domestic product (GDP) within the period of study, 1981 to 2013. The F-statistic, 40.19, is significant at 1% level (0.0000), showing the overall good fit of the model. The Durbin Watson statistic of 1.59 (approx. = 2.0) shows the absence of autocorrelation. These diagnostic and statistical criteria give good indications that the regression model is a good fit and that the OLS regression outputs for model (7') which include financial deepening as an extension of model (7) for the Natural capital data series are reliable.

Similarly, we employ the OLS regression analysis and EViews 8.0 econometric package for econometric model (8) which includes investment in human capital after the procedure of Malik, et al. (n.d.); and our extended model (8') with financial deepening as an additional variable to analyze the impact of natural capital on growth for 33 year range, 1981 to 2013. The results are on table 3a and 3b respectively:

Table 3a: Ordinary Least Squares Multiple Regression Analysis Showing the Impact of Natural Capital on Growth with Human Capital Investment as a Variable

DEPENDENT VARIABLE: LGDP	COEFFICIENT	T-STATISTIC	PROBABILITY
C	1.5652	4.5442	0.0001
NCP_GDP	-0.0230	-0.7818	0.4411
INV_GDP	0.0264	0.4649	0.6457
OPEN	0.0611	3.0415	0.0052*
INF	-0.0015	-0.3593	0.7221
EHS_GDP	-0.3641	-1.2120	0.2360
R^2	0.83	Akaike info crit.	1.19
Adj. R^2	0.80	Schwarz criterion	1.46
F-Statistic	27.21	Hannan-Quinn crit.	1.28
Prob(F-stat)	0.0000	Durbin Watson Stat	1.54

Source: Author's computation using EViews 8.0, August, 2014
* Indicates statistical significance at 1% level.

On table 3a above, the R^2 is 0.83 and the adjusted R^2 is 0.80. Therefore, we conclude that the independent variables explain about 80% of the systematic variations in gross domestic product (GDP) within the period of study, 1981 to 2013. The F-statistic is 27.21 and it is significant at 1% level (0.000000), thus, showing the overall good fit of the model. The Durbin Watson statistic of 1.54 (approx. = 2.0) shows the absence of autocorrelation. These diagnostic and statistical criteria are good indications that the regression model (8) with human capital investment as additional control variable is a good fit and that the OLS regression outputs are reliable and can be useful for policy direction. The same is true of its extension, regression model (8') with both human capital investment and financial deepening as extra control variables on table 3b below. The table indicates that the regression model meets all diagnostic and statistical criteria (R^2 of 0.91 and adjusted R^2 of 0.89; F-statistic is 42.84 and significant at 1% level [0.0000] and Durbin Watson statistic of 1.88 [approx. = 2.0]) and we conclude that the regression model is a good fit and that the OLS regression outputs are reliable and useful for policy direction.

Table 3b: Ordinary Least Squares Multiple Regression Analysis Showing the Impact of Natural Capital on Growth with Human Capital Investment and Financial Deepening as additional control Variables

DEPENDENT VARIABLE: LGDP	COEFFICIENT	T-STATISTIC	PROBABILITY
C	1.1094	3.9651	0.0005
NCP_GDP	0.0129	0.5447	0.5906
INV_GDP	0.1424	2.8476	0.0085*
OPEN	0.0269	1.5810	0.1260
INF	0.0035	1.0368	0.3094
EHS_GDP	-0.6483	-2.7426	0.0109**
FDEEP	0.0422	4.5684	0.0001*
R^2	0.91	Akaike info crit.	0.66
Adj. R^2	0.89	Schwarz criterion	0.98
F-Statistic	42.84	Hannan-Quinn crit.	0.77
Prob(F-stat)	0.0000	Durbin Watson Stat	1.88

Source: Author's computation using EViews 8.0, August, 2014
*and ** indicate statistical significance at 1% and 5% level respectively.

Discussion of Findings

Table 2a above shows that natural capital (NCP_GDP) is negatively related to gross domestic product (LGDP) (our proxy for economic growth) in Nigeria. This agrees with theory and prior studies (see Gylfason and Zoega, 2001-02; Malik, et al., n.d.). However, the relationship between natural capital and growth is not statistically significant at 5% level. The t-value with the associated probability value is -0.74 (0.466). To enable see the strength of the negative relationship between resource abundance and growth, we introduce financial deepening (FDEEP) in our second model represented on table 2b. In both models, the directional relationship between resource abundance and growth becomes mixed although it remains statistically not significant. The relationships between other variables and GDP in the two models are: domestic investment (INV_GDP) is

positively related to growth but is not statistically significant in both models (with t-value/probability of 0.26/0.80 and 1.95/0.06 respectively); trade openness of the economy (OPEN) is also positively related to growth. Trade openness is statistically significant with growth at 1% level in the first model represented on table 2a, (with t-value/probability of 3.10/0.004) but it is however not significant in the second model. Also, inflation has a mixed directional impact. From table 2a, inflation is negatively related to GDP in consonance with *apriori* expectation but the relationship turned positive with the introduction of financial deepening in the second model on table 2b. However, the relationship inflation has with growth is not statistically significant in both models. Meanwhile, financial deepening (FDEEP) in the second model on table 2b has a positive and statistically significant relationship with GDP (with t-value/probability of 3.58/0.001). So far, the results suggest that natural resource abundance may not necessarily have a negative impact on economic growth if the financial sector is deep. Notice that model (7') represented on table 2b is a better model (with R-square values of 88%/86% compare to 82%/80% and with lower information criteria) than model (7) represented on table 2a.

Furthermore, table 3a represents model (8) which extends model (7) by including investment in human capital without the financial deepening variable yet. Again, like in table 2a, the relationship between natural capital (resource abundance) and economic growth (GDP) is a negative one. The result is similar to that obtained by Malik, et al. (n.d.) from where we adopt the model. Again, the relationship between natural capital (NCP_GDP) and growth (LGDP) is not statistically significant (with t-value/probability of -0.78/0.44). Like in table 2a, inflation (INF) is negatively related to growth; same as investment in human capital (EHS_GDP) and both relationships are not statistically significant. Like in model (7), both domestic economic investments (INV_GDP) and trade openness (OPEN) are positively related to growth. Again, only the relationship between trade openness and growth is statistically significant at 1% level (with t-value/probability of 3.04/0.005). In this model, investment in human capital has no moderating influence on the relationship between natural resource abundance and economic growth.

To further investigate the influence of financial depth of an economy on the relationship between natural capital and growth, we extend model (8) to include financial deepening (FDEEP). Model (8') is an extension of model (8) and is represented on table 3b. The model captures all variables of the study including human capital investment (EHS_GDP) and financial deepening (FDEEP). The results show that natural capital (resource abundance) is positively related to economic growth although the relationship is, as before, not statistically significant. In this model, domestic economic investments (INV_GDP), human capital investment (EHS_GDP) and financial deepening (FDEEP) have statistically significant relationships with economic growth (with t-values/probabilities of 2.85/0.009, -2.74/0.011 and 4.57/0.0001 respectively). However, while the relationships between domestic economic investments and financial deepening with growth are positive that of human capital investment with the latter is a negative one. These results strengthen our earlier proposition that financial deepening has a positive moderating influence on the relationship between natural resource abundance in an economy and the growth of that economy. It further shows that the combination of financial deepening and human capital investment positively enhance the impact of domestic economic investments on national economic growth (the reader will notice that it is only in model [8'] where financial deepening and human capital investment variables are jointly included that domestic economic investment is positively and significantly related to economic growth). In this model as in model (7') on table 2b

where financial deepening is a variable), inflation is positively related to economic growth. Although this is contrary to our *apriori* expectation, it agrees with theory. It is an indication of sound monetary policy and alludes to the positive impact of financial deepening on growth. A cursory look at the four models of this study, shows that model (8') analyzed on table 3b is the most efficient and represents the 'best goodness of fit' for the sample data within the study period. Model (8') has the highest R-squared statistics (with R^2 of 91% and Adj. of R^2 87%) and the lowest informationv. criteria (Akaike=0.66; Shwarz=0.98 and Hannan-Quinn=0.77) compared to the other three models. This is the main model of this study.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The study examines the impact of natural capital (natural resource abundance, specifically the abundance of crude oil and natural gas) on Nigeria economic growth. The study adopted and adapted some previous econometric models in the literature to analyze four sets of related econometric models. Based on the application of the ordinary least squares (OLS) multiple regression analysis on aggregate times series data sourced from the Central Bank of Nigeria (CBN) 2013 statistical bulletin in a study period of 33 years (1981 to 201), the summary of findings are as follows:

i. Natural capital is positively related to Nigerian economic growth contrary to theory and some previous studies (Gylfason & Zoega (2001-02); Malik, et al.; and Sachs & Warner, 1995;). Our finding strengthens the position of Stijns (2001), and Ding and Field (2004) who find no evidence of negative impact of natural resources on economic growth. Therefore, the abundance of natural resources (crude oil and gas) in Nigeria had positive impact on the growth of her economy from 1981 to 2013;
ii. ii. The impact of natural resource abundance on growth is enhanced in the presence of human capital investments in a financial deepened economy; and
iii. iii. An economy with adequate domestic economic investments will experience higher growth than others without such investment.
iv. Iii. The level of investments in human capital in Nigeria has not adequately supported the growth of the nation's economy. It is likely that the quantity and quality of such investments were not made in the relevant sector, particularly in the oil industry.

The above findings lead to the following conclusion. Natural resource capital, particularly the abundance of crude oil and gas in Nigeria has positively impacted the growth of the nation's economy. However, such impact is not statistical significant and this may have implication for national economic development, particularly the welfare of the citizens in the host communities in the Niger Delta region and other Nigerians (a subject that is beyond the scope of the present study).

Arising from the above and the overview of the Nigeria oil-rich economy, we call for more responsible management of the oil resources of the nation. This is not just to ensure that natural capital significantly impacts the growth of the nation's economy but more fundamentally to alleviate the pains, miseries, strife and failed expectations, the abundance of oil has caused to the people of the Niger Delta region, and to make the benefits of oil get to all Nigerians fairly and equitably. Furthermore, the resources from oil should be strategically invested to develop other sectors to move the economy away from a primary one to manufacturing and service economy - the surer path to sustainable growth and develop.

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