

OIL FDI, ENVIRONMENT AND WELFARE ISSUES: EVIDENCE FROM NIGER DELTA REGION

SALAMI DADA KAREEM,
Department of Economics,
Faculty of Social Sciences,
Lagos State University, Ojo
Email: daskareem@gmail.com

&

LAWAL AROGUNDADE SAMOD
Department of Economics,
Faculty of Social Sciences,
Lagos State University, Ojo

&

ATOYEBI KEHINDE
Department of Economics,
Faculty of Social Sciences,
Lagos State University, Ojo

Abstract

The study investigates oil foreign direct investment impacts on the environment and people of Niger Delta oil producing communities, using structural equation models. Structural equation model is adopted because it accommodates multiple dependent variables simultaneously. Evidence shows that oil foreign direct investment has greater adverse impact on the environment than improving the well-being of the people in host communities. By implication, the environment appears to be devastating at a faster rate than well-being. This suggests that the marginal environmental cost of addition exploitation will rise over time. Therefore, there are needs for efficient allocation of resources in production and consumption so as to reduce the degree of environmental degradation.

Keywords: Oil foreign direct investment, environment, well-being, structural equation modeling

Introduction

The quest for self sufficiency, in the production of human wants has tamed the natural environment to his advantage hence the exploitation of solid and liquid mineral resources like oil in the Niger Delta for the benefit of man. This human activity had negative and disastrous implications on the environment and has raise concern about sustaining the health of rural inhabitants in Niger Delta Region Akpamovie (2014); Aghalino (2013), Atoyebi and Olatunbosun (2012), Das Kareem (2014).

Niger Delta as a region is plagued with inadequate infrastructure, social services, non oil industries and even petroleum products. Rather than attract development, oil has actually devastated and under-developed the region (Ikelegbe and Ikelegbe, 2012). Oil exploration, exploitation and distribution have created the huge land and water scarcities and the oil company has disinherited and displaced the local people who dependent on the primary economies of farming and fishing. Owing to this appalling situation in the Niger Delta Region then the need to attract foreign direct investment in the oil industry. Foreign direct investment is significant to the prospect of enhancing Nigeria economy profiles as it is one of the way of increasing the existing capital for savings and growth of the economy that require less deficiency and enhancing the wellbeing of the locals of this community.

Furthermore, foreign direct investment in oil industry improves method of production and skills, improved utilization of existing resources, waste and pollution reduction Peter (2014). The capacity of developing countries particularly Nigeria to have access to FDI in taking full advantage of the related benefits will be

dependent upon the effectiveness of their policies and institutional framework (Kasim, 2013). Past decade had witnessed a dramatic increase of FDI in flow into developing economy and most importantly Nigeria. UNCTAD (2011) reported that FDI inflow to West Africa is reduced through Nigeria's inflow. Quite a number of studies have examined the potentials, structure and determinants of foreign direct investment in Nigeria (Odozi, 1995); Anyawu (1998); Ayanwale and Bamire (2011); Jerome and Ogunkola (2014). However, the empirical evidence from these studies show that the relationship between oil FDI, environment and welfare has been under explored in the literature. Against the background, the study aims to examine the interconnectivity between oil foreign direct investment, environment and welfare of the people in the Niger Delta Region.

Literature Review

The empirical literature on the interconnectivity between oil foreign direct, investment, environment and welfare in Niger Delta Region is very scanty. However, quite a number of studies have provided insufficient evidence on this relationship. Notable among these scholars are (Greenaway, et al. 2007), Anyanwu (2012). They observed that FDI inflow into the oil region has shown postine spill over but the evidence was yet to be proved due to data limitation on these region. But despite some positive growth experienced as a result of FDI inflow into Nigeria since independence the economy is far away from attaining sustainable growth David Stern (2014). This is because Nigeria policy makers have failed to factor environments valuation of the resources in Niger Delta into consideration (Munir, Tadele and Debel 2009). It has been argued that resource stock places a maximum limit upon the extraction rate (Emmanuel, 2015). He observed that the resource externalities that are linked with a firm is social cost possess private cost along with extraction costs and is factored into the firm's optimization problem. He also observed that market prices include the marginal user cost of the resource which is an element of the full extraction cost. Similarly, the user cost is explicitly considered as cost when property rights are not assigned but the emphasis is given to social evaluation of productivity growth.

The modern extractive industry and its environmental effects has been a subject of discourse because of the environmental diseconomies it has generated on the livelihood of the people in Niger Delta region (Onosode, 2013). Empirical evidence revealed that most of the multinationals oil companies operating in the region have been expressing their commitment to sound environmental practice but failed in their promises causing more harms on the locals of these communities (Corubu 2014). In a study conducted by Richard and Kingman (2014) on the environmental resources and cost. They argued that environmental costs are habitually externalized due to lack of clearly defined proper rights. This is so because most environmental resources carve up the traits of public goods and some suffer uncontrolled and excessive exploitation for coming under property right. In secure land tenure system is a panacea for long term investments and this hinders technology choice in favour of short output economic system.

As argued by Collin (2014) that externalities arises as a result of uncompensated spillover effects on the third party, but if externalities are priced and bearers are compensated then they are said to be internalized. A vital argument in favour of FDI inflow into the oil exploration area of Niger Delta Region was potforward by Peter (2014; Kasim, 2015) that since African has been receiving FDI inflow they constrained by human capital, economic stability and liberalized monetary system that could absorbed long term FDI inflows. As a result of these laxities on the part of African policy makers, the study will try to fill the gap of deeping into the interconnectivity between oil foreign direct investment, environment and the well being of Niger Delta Region due to paucity of literature on the subject.

Sample Research Design

The study adopted the social cognitive theory and effects related theory in foreign direct investment and environmental economics in explaining the factors contributing to the welfare of the people and their environment. The objective is to examine the relationship among oil Foreign Direct Investment, environment and well-being of people in Niger Delta oil producing communities. Tabachinick and Fidell (2007) argue that, survey research is suitable in the investigative assessment of psychological constructs where data can be used to review and explain the population understudy of an issue. Therefore, a sample of respondents from a population was selected and a standardized questionnaire was administered. The structural equation modeling was used to investigate and predict the causal attributions that explain the relationships under investigation.

The selection of communities for the research was based on where there is a high level of oil production activities of the oil companies. These were purposively selected communities and the survey applied a semi-structured questionnaires guide to give a high-quality measurement of the differential views of various oil

exploration impacts on the environment and well-being of households and communities as whole. The questionnaire was therefore designed to generate data about the level of awareness of the people as regards air pollution, oil spillages and land degradation as environmental problems. The extent of environmental impact on the well-being of the people and communities, and the perception of the people on operation of oil companies in the communities were addressed.

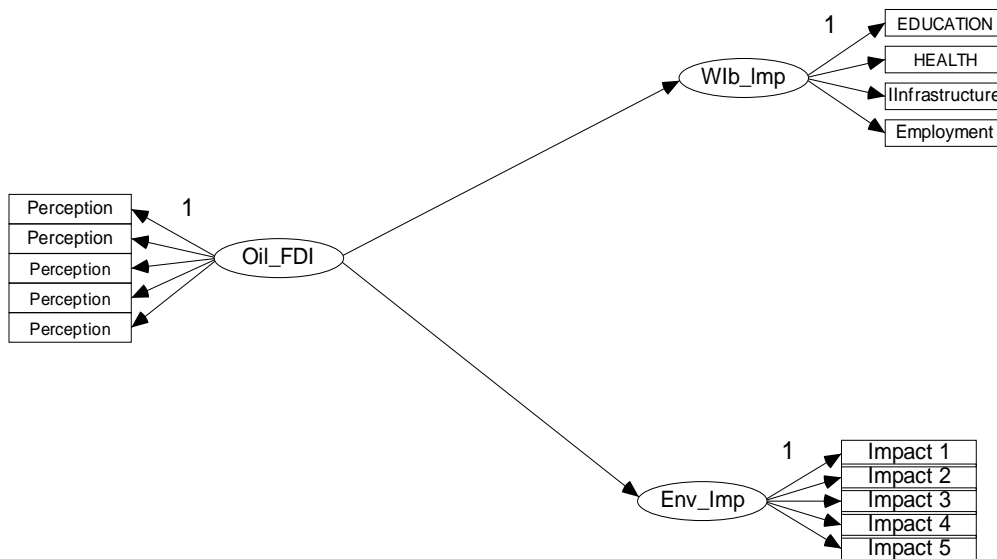
The questionnaire was divided into four sections: i) the demography of the respondent, ii) the environmental impacts of the oil companies on the community; iii) examine the impact of crude oil exploitation on the people and community well-being, and iv) the perception of the people on operation of oil companies in the communities. The study was carried out in two local government areas of the Delta Region, Nigeria. The two communities are Burutu and Ogulagha, these are communities where oil companies' activities are prominent. The total population of the household in the two communities is about four thousand, five hundred (4500). The target respondents are the heads of the household. The questionnaire consists of structured and semi-structured statements. Some of the questions are continuous in nature, while others are in scaled form and on five likert scale. In determining the sample size needed to be a representative of the population, this study adopted the formula given by Krejcie and Morgan (1970). The sample of 354 was obtained. There was a complete response which could be attributed to the direct involvement of the researcher in the administration of the questionnaires.

Model Specification

The analytical power of structural equation modeling (SEM) is appropriate for the integrated model in this study because it can simultaneously examine the influence of several variables on several other variables in the entire scheme of the model. Also, implicit assumptions of unidirectional constructs are made explicit, with the result that theoretical meaningful models can be derived and compared with the existing models (Kline, et al. 2001). Hence, following multiple regression analyses conducted to detect the primary relationships among variables, SEM analyses were computed in the confirmatory mode to examine the role of variables in predicting behavioural intentions (Bollen, 1993).

The responses from the questionnaires were coded and then analysed using SPSS 19 and Further analysis on SEM was performed using Analysis of Moment Structure v16 (AMOS SOFTWARE). Kline (1998) stated that a sample size that exceeds 200 cases could be considered large enough for SEM estimation. However, this study embraces several predictors. The variables used are: Perception of the people on operation of oil companies in the communities (Oil_FDI), Impact on environment (Envr_Imp) and Impact of crude oil exploitation on peoples' well-being (Wlb_Imp).

Figure 1: Path Diagram of Hypothetical IModel



Note:

- Oil_FDI, represents Perception of the people on operation of oil companies in the communities
- Envr_Imp, represents Impact on environment
- Wlb_Imp, represents Impact of crude oil exploitation on peoples' well-being

For the reliability test: The average summated mean scores and all the constructs under study representing standard deviations are presented in table

	Means	Standard deviation	Alpha value
Oil_FDI	3.67	0.58	0.72
Envr_Imp	3.24	0.65	0.74
Wlb_Imp	3.34	1.14	0.82

Note:

Oil_FDI	Extent of stress from Environmental problem in the communities answerable with a 5-point scale range from 1= strongly disagree to 5 = strongly agree
Envr_Imp	Impact on environment accountable on a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree
Wlb_Imp	Impact of crude oil exploitation on peoples' well-being answerable on a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree
N	Sample Size

Table 1. The reliability alpha value and Descriptive statistics of the constructs under study (N=354)

The outcome expressed a positive oil FDI effect on environmental pollution, degradation and poverty in the host communities. Out of a maximum score of 5, the Oil_FDI mean score of the respondents was 3.67. Along a 5- point scale, the mean of Wlb_Imp score was 3.34. To further assess the reliability of the collected data, the Cronbach's alpha reliability test was performed on the foregoing constructs. The test gave alpha values between 0.72 and 0.82. These computed figures well exceeded the threshold of 0.70 for exploratory research. The normality of data deductions from the survey was examined and Skewness and kurtosis values and their individual items were explored. There was no serious skewness or kurtosis problem that required transformation of data. All the data have absolute values of the original skewness less than 0.7 for theoretical variables. Also, absolute value of the original kurtosis was less than 0.6 for theoretical variables (Kline, 1998). In fulfilment of normality assumption, a data set is considered normal if the values of skewness fall within the range of +2 to -2 while kurtosis values do not exceed the range of +7 to -7 (Tabachnick and Fidell 2007). Given the above threshold for justifying the normality of data, it could be said that all observed data for items considered under this study are normal.

Estimation and Results

The overall performance of the proposed model shows the degree to which the present data fit proposed model of various fit indexes. Confirmatory Factor Analysis of the individual construct was used to test the construct validity of the instrument. Specifically, to test the convergent validity, it also entails the assessment of model fit for each instrument. An instrument is believed to have satisfied convergent validity only when the values of the instrument's individual factor loadings and the average variance extracted (AVE) satisfy some benchmarks. According to Fornel and Larcker (1981), when AVE is greater than 0.5, it indicates high convergent validity in defining the threshold for factor loading (Hair et al, 2003). All factor loadings are greater than 0.5. The instrument's AVE of Wlb_Imp, Oil_FDI, Envr_Imp, are computed to assess construct validity. This instrument has high convergent validity because the factor loadings for each indicator > 0.5. The AVE is 0.96, 0.84, 0.78, > 0.5 respectively. Besides, an assessment based on construct validity based on AVE, model fit is also important to evidence the existence of construct validity. Generally, four fit indices are used. The indices generated along with the output including the p-value, RAMSEA, GFI and NFI, all meet the expected range to justify the existence of construct validity. In conclusion, the measures indicated that the proposed model fitted well with the present data set.

Measurement Model

The measurement model, construct is collectively assessed for the establishment of discriminant validity and model fit. This is besides examinations of diagnostics such as multivariate normality. Discriminant validity between any two latent constructs is established when the values of their individual AVE is greater than the squared correlation between them ($AVE > R^2$). Hence, the fulfilment of discriminant validity arises from the low correlation across latent constructs.

Table 2: Assessment of the Validity of Measurement Model

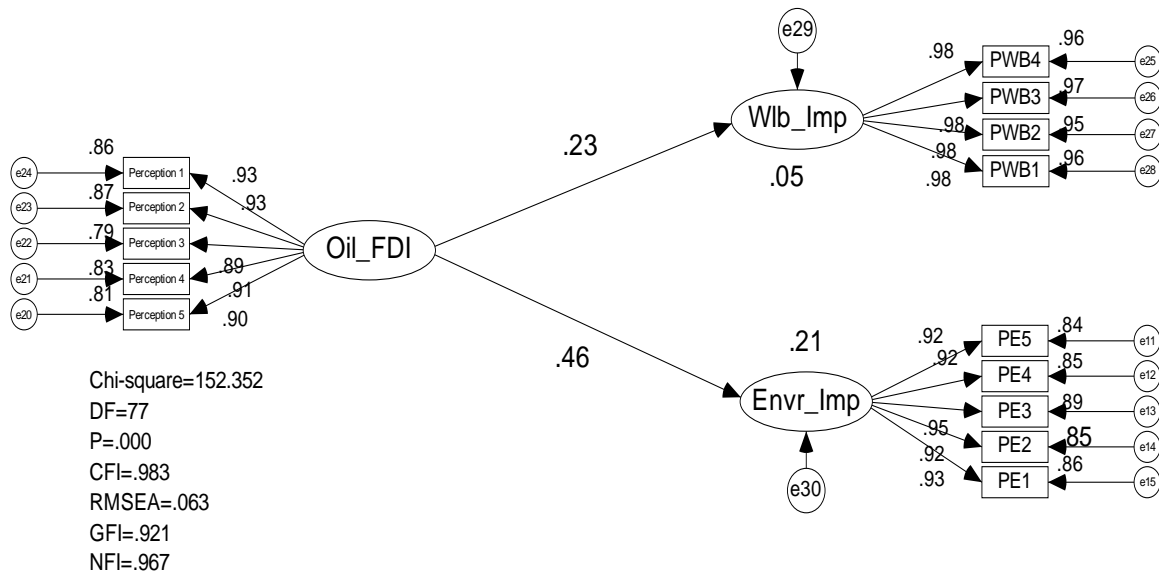
		AVE	R ²	Discriminant validity
1	Env_imp	0.78	0.069	Yes
	Wil_imp	0.96		
2	Env_imp	0.78	-0.019	Yes
	Oil_FDI	0.84		
3	Wil_imp	0.96	0.76	Yes
	Oil_FDI	0.84		

All the model fit indices generated along with the output including the p-value, CFI, RAMSEA, GFI and NFI, meet their expected range to justify the validity of the measurement model.

The Structural Model

The construct measures establish the structural relationships among the constructs and translate them to form suitable SEM analysis. The path diagram used for estimation of the relationships is predicated on a hypothesis that the effect of Foreign Direct Investment into crude oil exploitation in the Niger Delta will affect the environment more than the well-being of the people. That is, the foreign direct investment in crude oil (Oil_FDI) would lead to more impact on the environment (Envr_Imp) than the well-being of the people in the communities (Wib_Imp). The results are expressed in figure 2 in the path diagram showing whether the structural relationships are consistent with theoretical expectations.

Figure 2: Estimated Standardized Path Coefficients of the Construct



Discussion

The model consists of structural equations which accommodate multiple dependent variables simultaneously. It is found to offer statistically valid indications and plausible interpretation suggesting that the model is suitable for interaction and enhance the decision on the environment as well as consequences of production in oil sector in the host communities. The result in the path diagram shows the overall fit statistics. The overall model χ^2 is 152.352 with 77 degrees of freedom. The ρ - value associated with this result is 0.000. The ρ - value is significant using a type I error rate of .05. The rule of thumb suggests that we rely on at least one absolute fit index and one incremental fit index, in addition to the χ^2 result. The value for Root Mean Square Error of Approximation (RMSEA), an absolute fit index, is 0.063. This value is below the 0.08 guideline. And Goodness of fit index (GFI) is 0.921 which reflects good model fitness for this model.

Another absolute fit statistic is normed χ^2 , which is 1.97. This is measured by chi-square value divided by the degree of freedom ($152.352 / 77 = 1.97$). Hence, Kline (1998) suggests that $\chi^2 / \text{d.f.}$, the ratio must be equal to 3 or less as a reasonably desirable alternative indicator of model fit. From the structural model, $\chi^2 / \text{d.f.} = 1.97$ which is less than 3 as suggested by Kline (1998). Thus, the normed χ^2 suggests an acceptable fit for the model. In the incremental fit indices, the Comparative Fit Index (CFI) is the most widely used index. In the result CFI has a value of 0.99, which exceeds the CFI guidelines. Studies have shown that a value greater than 0.90 is needed in order to ensure that a mis-specified model is not accepted (Hu and Bentler, 1999). The other incremental fit indices also exceed suggested cutoff values. Normed fit index (NFI) is 0.967 which reflects good model fit. The result showed reasonably overall model fit and the hypothesis of the relationships were generally supported by the results.

The constructs of Oil_FDI had an impact on the environment (Envr_Imp) and well-being of the people in the communities (Wlb_Imp) are $\beta = 0.46$ and $\beta = 0.23$ respectively. The R^2 for the impact on the environment and well-being is 0.21 and 0.05 respectively. The comparative fit index (CFI) = 0.983 indicates acceptable fit of the model. All the latent variables and their indicators are positive and significant. However, since the path coefficients are standardized values, a higher value for environmental impact $\beta = (0.46)$ relative to that of well-being $\beta = (0.23)$, implied that the communities perceived more destruction of their environment than the direct influence on their well-being from Oil_FDI.

This conforms to realities in these communities as most of them had always lamented that oil exploration by multinational corporations had impacted adversely on resourceful land and fish farming. The direct environmental impact leads to social strain that caused increase in resource scarcity that lead to greater conflict, with the community people being the most likely victims. The crisis in the Niger Delta is believed to have been triggered by environmental stress.

Conclusion

The study has investigated the impact of Foreign Direct Investment into crude oil exploitation on the environment and people of Niger Delta oil producing communities. The study finds that FDI has important implications for rising social crises in Nigerian oil-rich regions. It reveals that the environment appears to be damaging at a faster rate than well-being. This shows that the marginal environmental cost of addition exploitation will rise over time and the people have lost control of their traditional natural resources. This leads to lack of alternatives to sustainable patterns of living and economic necessity often forces farmers to use resources in a way that guarantees short term survival but reduce the future productivity of environmental assets.

The ecological damage is going on virtually unchecked. This is perceived as an obstacle to economic advancement that can frustrate industrial development. Also environmental damage has become so severe that a person's economic advancement is being diminished. There is a reduction in productivity linked to pollution that induced health problems and other damages that limit productivity activities of the people in the Niger delta region. Most of natural resources have been locally unsustainable and has occurred in a manner and scale that often bypasses the poor. The exploration of crude oil has led to the degradation of land, vegetation and farm land/human settlement. There is need for introducing accounting practices which incorporate environmental expenditures and benefits as well as measures the environmental impacts of the firm's activities. Also it is necessary to integrate the financial and ecological consequences of the firms' activities for compensation purposes.

References

- Adam B. Jaffe, et al., (2014) Technological Change and the Environment. NBER Working Paper No. 7970 Issued in October 2000 NBER Program(s) <http://www.nber.org/paper/w7970.pdf>
- Aghalino (2014) The health of Rural Inhabitants in Niger Delta Region. Journal of environment, Vol 5 pp 50-58
- Akpamovie (2015) The environmental destruction in Niger Delta Region 4 (1-2): 53-89
- Baumol, W. J. and Oates, (2008), *The Theory of Environmental Policy (2nd edition)*: Cambridge University Press
- Bjorvatn (2008) The theory of environmental degradation and Economic growth. Journal of environment.
- Byrne, B. M. (1998) Structural Equation Modeling with LISREL, PRELIS and SIMPLIS: Basic Concepts, Applications and Programming Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Catarina Roseta Palma, Alexandra Ferrevra and Tiago Neves Sequeira (2010), Externalities in an endogenous growth model with social and natural capital *Ecological Economics* 69(3): 603-612
- Copeland and Taylor (2015), *Transferring environmental value estimates: Issues and alternatives* Commonwealth Scientific and Industrial Research Organization (CSIRO), Sustainable Ecosystems Division
- Collin Price (2007), Sustainable Forest Management, Pecuniary Externalities and invisible Stakeholder, *Journal of Forestry Policy and Economics* Vol. 9, pp. 120-137.
- Crocker (1966). Economic growth and Environmental Degradation. Journal of Energy policy and environment.
- Daron Acemoglu (2003) Why not a political Coase theorem? Social conflict, commitment, and politics, *Journal of Comparative Economics* (31) 620–652
- Elif -Akboştañcı, Serap Turut- Asik and G. Ipek Tunc (2009), The relationship between income and environment in Turkey: Is there an environmental Kuznets curve? *Energy Policy* 37 (2009): 861–867
- Emeka Nkoro and Emeka Nkoro (2012). The Effect of Global Financial Crisis in Nigerian, Economy, *British Journal of Economics, Finance and Management Sciences* 48 October 2012, Vol. 6 (1)
- Eregha & Nwokoma (2014), The human development index and sustainability: a constructive proposal. *Ecological Economics* 39 (1):101-114
- Eskeland & Harrison (2015). Sustainability and Economic growth. Journal of environment.
- Eweje, G. (2013), The role of MNEs in community development initiatives in developing countries: corporate social responsibility at work in Nigeria and South Africa, *Business and Society*, 45(2):93-129.
- Glenn Fox (2007) The Real Coase Theorems. *Cato Journal*, Vol. 27, No. 3
- Gray (2002) *Panarchy: understanding transformations in human and natural system*. Island Press, New York, pages 11-17
- Hair, J. F., et al (2003), *Essentials of Business Research*. Indianapolis, IN: Willey http://unctad.org/en/Docs/tdr2011_en.pdf
- Hu, L. T. and Bentler, P. M (1999) Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives, *Structural Equation Modeling*, 6(1), 1-55
- Ian Gary (2011) Oil and gas revenues, funds and state budgets: Minimizing leakages and maximizing transparency and accountability in the hydrocarbon value chain, : *Fuelling Poverty Reduction UNDP Discussion Paper No. 6* http://www.un.org.kh/undp/images/stories/special-pages/extractive-industries/docs/revenue_transparency_eng.pdf
- Ite, U. E. (2014) Multinationals and corporate social responsibility in developing countries: a case study of Nigeria, *Corporate Social Responsibility and Environmental Management*, Vol.11, pp.1-11.
- Jacobs M. (1994) “*The limit of neoclassicism: Towards an institutional environmental economics*”. In Redclift M. and Global Environment Routledge; London and New York.
- John A. Dixon (2008), Environmental Valuation: Challenges and Practices, Economics and Conservation in the Tropics: A Strategic Dialogue.
- Judith M. Dean et al. (2009) Are foreign investors attracted to weak environmental regulations? Evaluating the evidence from China, *Journal of Development Economic* 90 (1):pp 1-13
- Kalpana Ambastha, Syed Ainul Hussain, Ruchi Ba (2007) Social and economic considerations in conserving wetlands of Indo-Gangetic plains: A case study of Kabartal wetland, India *The Environmentalist*, 27 (2): 261-273
- Kapp, K. W. (2005), *The Social Cost of Private Enterprise*, Cambridge University Press, Cambridge.
- Kearsley & Riddell (2014). Environmental impact of human health. Journal of environment.

- Kline, Theresa J. B. Dan Joy D. Klammer (2001), Path Model Analyzed with Ordinary Least Squares Multiple Regression Versus LISREL, *The Journal of Psychology*, 135(2):213- 225
- Krejcie, Robert V. and Morgan, Daryle W. (2007), Determining Sample Size for Research Activities Educational and Psychological Measurement, http://eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_ERICExtSearch
- Muran (2011), *Cost, Revenue, and Profit Functions*. In M.A. Fuss and D. McFadden, eds., *Production Economics: A Dual Approach to Theory and Applications*. Amsterdam: North-Holland,
- Munir A. Hanjra Tadele Ferede Debel Gemechu Gutta (2009) Reducing poverty in sub-Saharan Africa through investments in water and other priorities, *Agricultural Water Management*, Volume 96, Issue 7, Pages 1062–1070
- Neequaye & Oladi (2015) Emergence and development of the National Innovation Systems concept, *Research Policy*, 35 (5):745-766
- Norton, B., R. Costanza and R. Bishop, (2008). The evolution of preferences: why “sovereign” preferences may not lead to sustainable policies and what to do about it. *Ecological Economics*, vol. 24: 193-211.
- Nwankwo, A. (2014), “The determinants of foreign direct investment inflows (FDI) in Nigeria”, paper presented at the 6th Global Conference on Business & Economics, Gutman Conference Centre, Cambridge.
- Okaba B. (2011), *Petroleum industry and paradox of rural poverty in the Niger Delta*; Ethiopia Publishing Company Benin City.
- Onosode Gamaliel. (2013) *Environmental Issues and the Challenges of the Niger Delta: Perspectives for the Niger Delta Environmental Survey Process*. CIBN Press Lagos.
- Oren Bar-Gill and Richard A. Epstein (2008) Consumer Contracts: Behavioural Economics vs. Neoclassical Economics, NYU Law and Economics Research Paper No. 07-17 Minnesota Law Review, Vol. 92,
- Orubu, C. O. (2002), *Fiscal undercurrents in the lingering crisis in Nigeria’s oil- producing states*. In: *Fiscal Federalism and Democratic Governance in Nigeria* NCEMA.
- Ramesh C. Kumar (2009) Optimal Domestic Processing of Exhaustible Resource Exports under Stock Uncertainty WEAI, 84th Annual Conference, Vancouver, BC, Canada,
- Rana Ejaz Ali Khan and Muhammad Atif Nawaz (2010) Economic Determinants of Foreign Direct Investment in Pakistan. *Journal of Economics*, 1(2): 99-104
- Richard E. Baldwin and Paul Krugman (2014) Agglomeration, integration and tax harmonization. *European Economic Review* 48(1): 1-23
- Rudolf S. De Groof (2002) A typology for the classification, description and valuation of ecosystem function, good and services. *Journal of Ecological Economics*41(3): 393-408
- Silvana Tordo, Brandon S. Tracy and Noora Arfaa (2011) National Oil Companies and Value creation. The International Bank for Reconstruction and Development/The World Bank vol. 11: www.worldbank.org.
- Stonich, S. (2002) “Struggling with Honduran poverty – the environmental consequences of natural resource-based development and rural transformations”, *World Development*, 20(3) 385-400
- Terrence Casey and Kevin Christ (2014) Social Capital and Economic Performance in the American States, *Social Science Quarterly*, 86 (4): 826–845
- Thomas Berger, Regina Birner and Nancy McCarthy (2014) Capturing the complexity of water uses and water within the multi-agent framework. *Water Resources Management* 21 (1): 9-148.
- UNCTAD (2015). World Investment Report 2005: Transnational Corporations and the Internationalization of R&D. New York and Geneva.
- United Nations Conference on Trade and Development Trade and Development, Report, 2011
- Victor Ojatorotu (2010), The dilemma of justice: Foreign oil multinationals and human rights violation in the Niger Delta of Nigeria, in Liam Leonard, John Barry (Ed.) *Global Ecological Politics (Advances in Ecopolitics, Volume 5)*, pp.43-72
- Weitzman, M. and Lofgren K.G. (2014), On the welfare significance of green accounting as taught by parable, *Journal of Environmental Economics and Management*, 32: 139-153.