Empirical Relationship Between Energy Infrastructure, Project Finance and Other Conventional Sources of Financing Using Generalised Method of Moments to Explain the Variations in Energy Projects in Developing Nations (Nigerian Energy Sector).

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1.1. Introduction

Current funding of infrastructure assets in developing countries (such as Nigeria) using traditional financing as the main/major sources fall far short of the required investment needs (Khmel & Zhao, 2016). Traditional (conventional) financing methods such as government budgets and corporate finance have not been sufficient to provide the finance needed for the development of energy infrastructures (power generation, in the context of this paper) to catalyse socio-economic development in Nigeria[1] (ECREEE, 2012, p. 18; Gnansounou et al., 2007, and Turkson & Wohlgemuth, 2001). In developing countries, investments in infrastructure (energy) assets have been financed using public funds (public sector funding), otherwise known as budgeted funds (Croce et al., 2015). In Nigeria these funds were primarily sourced from government bonds, tax, treasury bills, treasury certificates, domestic borrowings and foreign loans from development finance institutions such as the World Bank and the African Development Bank, or through export credit agencies such as the Afrexim Bank, the OPEC Fund for International Development or through foreign direct investments (Yescombe, 2014). O'Neill (2016, p. 4) points out that, "In the late 18th century, in The Wealth of Nations, the father of classical economics, Adam Smith, assigned responsibility for infrastructure to the sovereign,' and that this is the government. However, reality has shown that this sovereign cannot solely be responsible for the provision or meeting the requirements of the teeming population in the present day. With time and population growth, the deficit in infrastructure assets (power generation plants) started to manifest itself in obsolete equipment, inadequate access to energy products and services, and lack of electricity and clean gas for cooking or fuel to power automobiles, and it thus became imperative to enlarge or build more of those assets. However, due to the limited

[1] Nigeria is a member of the Economic Community of West Africa (ECOWAS). This regional body represents a group of 15 countries which came together for the common good and are situated in the south-west region of Sub-Saharan Africa, which has a population of over 245 million (ECOWAS, 2010)- ECOWAS Bank for Industrial Development- EBID 2010 and (World Bank, 2016).

funding available to the government, it had to look for other sources of finance, such as private or institutional investors (Gnansounou, et al., 2007).

Therefore, as in other developing countries, finance, as a critical success factor, became a central issue for various growth and developmental efforts (economic, socio-political and cultural) in Nigeria. Lack of or inadequate funds have had detrimental effects on Nigerian citizens regarding energy poverty (such as lack of adequate access to electricity and clean cooking gas). It is based on this issue that the government has to look towards the private sector for strategic partnerships (mostly regarding finance) to finance the critical infrastructure needed for human sustenance (UNEP, 2012, p.39 and Gnansounou et al., 2007).

Subsequently, with the advent of private sector investors, ownership is being transferred, gradually, from the government to private individuals, in the form of privatisation, deregulation, and build, own and transfer. With this comes the transfer of the financial burden to these private investors (Yescombe, 2014). Ouedraogo (2013) points out that, although the availability of energy is not the solution to all the problems the citizens contend with in their daily activities, access to sustainable energy is, nevertheless, one of the necessary ingredients for social and economic growth and sustainable development in any country desiring a good standard of living (Kouakou, 2011 and Fritsch, 2011; Brew-Hammond, 2010; Kebede, et al., 2010; and Gnansounou, 2007& 2008).

1.2. Statement of the Research Problem

Given an acute shortage (regarding accessibility and adequacy) of energy in the country, Nigeria, as a developing nation, requires substantial energy infrastructure investment. Sustainable growth and development will always be difficult to achieve in a country such as Nigeria, which that cannot provide minimum access to energy (such as power, petrol and gas) for the majority, of its population: close to 60% of the citizens do not have access to such energy sources (Aliyu, et al. 2013 and Kouakou, 2011).

According to Mensah, et al. (2016) any country experiencing geometric progression in population growth will require an increase in power generation available for citizens' consumption. This has not been achieved in Nigeria, with a population of over 170 million (World Bank, 2016) which currently has a combined power generation capacity of 8,000MW, of which 4,000MW is operable, and with less than 2000 MW of electricity available for consumption (Ogunleye, 2016)**,** less than that of Spain, with a population of 45 million and power generating capacity of 68GW (Eberhard & Gratwick, 2011). This is coupled with power loss of more than 25% of installed generation capacity, which occurs due to many reasons, such as obsolete power transmission lines, power generating plants which are non-functional or are operating with reduced output, or non-availability of gas, as gas flaring is an issue in Nigeria, (Ley, et al., 2015[2] and Aliyu, et al., 2013). Furthermore, both the Central Bank of Nigeria (CBN, 2013, p.209) and the African Development Bank (AfDB, 2014, p.14) argue that the Nigerian energy sector needs investment of between $3.50-10 billion yearly to close the country's energy infrastructure gaps; however, the Nigerian government budgeted only $5.3bn over the past 16 years (Igali, 2015), and not all the appropriated amounts were backed up with cash (the actual sum released was $4.7 billion and $778 millions of intervention funds).

A large number of existing research studies have mainly focussed on power consumption, the impact of electricity consumption on economic growth, the electricity sector and economic growth, regional integration of electricity, and power sector reform/performance in Nigeria. Furthermore, the previous research studies carried out globally have been mostly on project finance and developing countries or financing large scale infrastructure assets; none have specifically focussed on the Nigerian energy sector. To the researcher's best knowledge, there has not been any research work[3] carried out to date looking into energy infrastructure finance in Nigeria using project finance as an alternative (or primary) source of funding or part of the financing mix.

1.3. Main Research Question

As a result of the issues raised in sections 1.1 and 1.2, this research question of interest was identified:

Question One

- To what extent does project finance reduce the gaps in energy infrastructure financing?

Concerning the above research question, the research aim and objectives described in the next subsection (1.4) were developed.

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[2]See Vanguard newspaper: Nigeria loses 50% of power capacity–Envoy http://www.vanguardngr.com/2015/11/nigeria-loses-50-of-power-capacity-envoy/

[3] This is as a result of lack of data (International Monetary Fund- IMF, 2013) and access to information.

1.4. Aims and Objectives

The main aim of this research work is to critically examine the use of project finance as an alternative source of financing energy projects in Nigeria, to contribute solutions to the challenges of deficits in the energy infrastructure that affect economic growth and development in Nigeria. These objectives were developed to accomplish this aim.

1. To critically appraise the use of project finance in financing energy infrastructure projects in Nigeria;
2. To critically appraise the governance structure in Nigeria via an analysis of country risk[4] and how it relates to investment in the energy sector.

1.4.1. Theoretical Framework

The five most common theoretical frameworks that have been used empirically to underpin project finance research are reviewed below: information asymmetry, transaction cost economics (TCE), optimal capital structure, underinvestment, and agency theory (Jensen & Meckling, 1976; Williamson, 1981 & 2007; Myers & Majulf, 1984; Shah & Thakor, 1987; Kleimeier & Megginson, 1998; Esty, 1999 & 2004a; Farrell, 2003; Sufi, 2007; Sawant, 2008 & 2010 and Kleimeier & Versteeg, 2010).

Both Myers & Majulf (1984) and Farrell (2003), explain that asymmetric information relates to firms and their investors: a situation where the companies' managers have access to more details than the shareholders. According to Farrell (2003) and Kleimeier & Versteeg (2010), transaction costs comprise costs of both contracting and monitoring of investment, and these arise as a result of agency problems and asymmetric information. Sufi (2007) suggests that **information asymmetry** is a good source of understanding how firms obtain large amounts of money to finance big projects. The author supports his argument, explaining that this source of funds is through the use of syndicated loans made available by financial institutions. According to Shah & Thakor (1987), one of the advantages of using project financing is the reduction in information cost, because parties to the contract have access to information before signing the agreement.

[4] Hoti and McAleer (2002) argue that country risk is a composition of economic, financial and political risks. This is also corroborated by Hainz and Kleimeier (2012); in their work it is stated that political risk is a part of country level risk, which includes corporate governance, creditors' rights, financial systems, corruption, financial or economic growth and development. They demonstrate that the three are interwoven and mutually affect one another.

Williamson (1981 & 2007) and Sawant (2008) applied **transaction cost economics (TCE)** to study the costs involved in business enterprise activities, especially that of project finance, which require extensive legal agreements. The reason for this is that such transactions are complex, and thus the legal contracts are also difficult to draft, agree, sign off, and monitor for performance. Furthermore, Williamson (1981 & 2007) explains that the need for such extensive legal agreements is due to the parties to the contract being economic agents, who, in the course of the contract, might conduct themselves in a way that may openly or covertly undermine the project operations (for personal or self-interest) and cover up their tracks. Doing this in an environment that is technology-driven could have a high impact, in particular with regard to asset specificity.

In deciding the **optimal capital structure** of firms, the project sponsor will analyse both the conventional financing (primarily bank loans/equity) and project finance (Shah & Thakor, 1987 and Kleimeier & Megginson, 1998). When deciding on the capital structure that is optimal for the sponsors, the selection will be based mainly on two criteria: whether the projects are risky and whether the mode of financing will permit high leverage ratios; if these two criteria are met, then the sponsors will choose project finance. Both Esty (1999) and Sawant (2008) argue that the Modigliani and Modigliani theorem of the irrelevance of capital structure is built on the concept of a perfect capital market, with no transaction cost and free information. This theory does not guarantee default-free debt, as invariably the debts are risky, which makes debtors demand self-payment first, before considering paying other debtors. This is carried out to protect the existing shareholder/debt holder, by not reducing its value or ranking should the firm change its capital structure and also protect the existing shareholder/debt holder should the firm go into liquidation. This leads to leverage-induced **underinvestment**. According to Esty (2004a); Culp & Forrester (2009), and Sawant (2010), leverage-induced underinvestment occurs when existing shareholders and debt holders prefer to let go an investment rather than allow the firm's management to dilute their shareholding structures, or to impose stringent conditions that new debt should not be ranked; this is done in order to protect them during liquidation/bankruptcy. However, Myers and Maluf (1984) argue that underinvestment occurs due to asymmetric information about the value of the firm's current assets and the new assets to be financed.

Jensen & Meckling (1976) argue that **agency cost** arises in an environment where two or more corporate entities engage in joint ventures or public-private partnership, with or without an explicitly stated principal-agent relationship; these agency costs, according to Sawant (2008) are the costs of negotiation, monitoring and enforcement of contracts, which are substantial. This agency cost presents a challenge that leads to a conflict of interest between two or more parties/stakeholders, such as the project sponsors, host government, financiers and guarantors (multilateral agencies) involved in the joint venture of financing large energy assets. Kleimeier and Versteeg (2010) suggest that project finance has unique features that help to mitigate the challenges caused by agency problems, arguing that project finance has an in-built mechanism to navigate a weak institutional environment, such as one with a lack of or inadequate legal framework or weak corporate governance; in such cases, this mode of financing is suitable to finance large energy assets. Furthermore, Esty (2004) found that financing assets using project finance play a disciplinary role by curtailing managerial discretion to misappropriate or misallocate cash inflows, and a proactive role in preventing related parties' transactions and deterring the host government from carrying out creeping or outright expropriation. These positive effects are a result of the high leverage content of the finance, up to 70%, which reduces costly agency problems among financiers, project sponsors, management and host governments, thereby making more cash available to be shared among the participants, especially the financiers, and also for taxes and dividends. Therefore, agency theory will be employed to underpin the propositions or hypotheses of this study, which also uses the Generalized Method of Moments (GMM) estimation technique, with the sole aim of explaining changes in energy infrastructure financing in Nigeria. These two (agency theory and GMM)[5] are combined to explain the effect of project finance and other conventional sources of financing on energy infrastructure financing in developing countries such as Nigeria, facing the above challenges, as identified by Girardone and

[5] Similarly, to Herdinata (2015) and Driffied, et al. (2014), who employed agency theory to underpin their research propositions or hypotheses and also used the Generalized Method of Moments (GMM) estimation technique.

Snaith (2011). This paper is structured as follows: section 2 is a systematic review of the literature, while section 3 discusses the econometric methodology and section 4 presents the estimation models and data analysis, results and discussion. Finally, section 5 suggests policy implications and the conclusions.

2.0. Literature Review

There is a general belief among scholars (Ahmed, 1999; Esty, 2003, and Girardone & Snaith, 2011) that, so far, there is no consensual definition of project finance. However, each of these scholars has attempted to define the concept from different perspectives, the common ground being that project finance involves setting up of a firm/company with equity and debts (including mezzanine debt), financing from one or more project sponsors (for example banks, institutional investors and other main project sponsors), having the fundamental attributes of non-recourse debt or limited recourse, with the sole aim of investing in a firm created in order to finance large scale infrastructure assets, particularly energy (such as building of refineries, power plants or construction of gas pipelines).

Project finance has been demonstrated to be an important part of the global financial market, especially with regard to debt financing, and high quality (including quantity) financial instrument (Kleimeier and Versteeg, 2010; Megginson, 2010; Gatti, 2013 and Kayser, 2013). However, limited empirical and theoretical studies exists for this side of study. Recent reviews of the empirical literature on project finance by Gatti (2013) and Kayser (2013), focused on project risk, contractual/legal aspects, credit structure, globalisation, private-public partnership and renewable energy. Furthermore, it is found in the existing literature that research into project finance has been covered under different strands, for example, as optimal incorporation; as a subset of wider loan syndication; as a nonfinancial contract (risk management and financial decision making) including government guarantees; under a law/contractual framework and as public-private participation (Megginson, 2010 and Corielli, et al., 2010; Kayser, 2013; Gatti, 2013 & 2015). Multiple reasons have been adduced for the setting up of a special purpose firm (optimal corporation) by parties to the project such as project sponsors, amongst which are ease of monitoring and differentiation of the performance of the new entity from that of the sponsors' firm (parties) (Shah & Thakor, 1987;

Sawant, 2008 & 2010, and Yescombe, 2014). For example, if the entity goes bankrupt/is liquidated, the covenant clause empowers debt holders and other creditors (equipment suppliers) to realise the assets, either present or future, to offset outstanding debt (Fabozzi & Nevitt, 2006 and Akbiyikli, et al., 2006).

Girardone and Snaith (2011), analysed data from 1,190 project finance debts, with the host government governance standard as part of the measure used in arriving at the cost of the debt, and found that guarantees from the host country and supra-national bodies played important roles in attracting funding to a developing country. Several authors have argued the advantages of using non-financial contracts in lowering the cost of debt (Corielli, et al., 2010 and Gatti, 2013 & 2015). Corielli, et al. (2010) carried out an analysis of data from 1,093 project finance loans worth close to $195 billion and the results confirmed that non-financial contracts, such as engineering, procurement and construction contracts, off-takers/supply or pay between parties to the contract, operation and asset maintenance contracts could help the project sponsors to source project finance loans at a cheaper spread (interest) rate and with high leverage. Other studies which have reviewed project finance in financing large infrastructure assets are those by Esty (1999, 2002 & 2010), Kleimeier and Megginson (2001), Sawant (2008 & 2010) and Sorge & Gadanecz (2008).

Empirical studies of the link between project finance and energy infrastructure finance in developing countries were carried out by Kleimeier and Versteeg (2010) and La Cour & Muller (2014). Both these studies found that project finance is a good financing source or mix that can be an alternative to or stand in for a well-developed financial market in an environment that lacks good institutions or in a weak institutional environment. In studies of more than 90 and 38 countries, respectively, Kleimeier and Versteeg (2010) and La Cour and Muller (2014), found project finance to be a good driver of economic growth in developing countries plagued with weak institutions and shallow financial markets.

Incorporating a firm as a separate entity enables risks to be allocated to the parties that can best manage or mitigate the effect on the company balance. Project finance combines both financial and non-financial contracts, such as the guarantee provided by the host government, World Bank or the supra national bodies and insurance firms, or in the form of an offtaking agreement, supply or pay agreement (Esty, 2003; Lock, 2003; Bonetti, Caselli and Gatti, 2010; Corielli, 2010; Gatti, 2013 & 2015 and Yescombe, 2014).

Project finance can be viewed from the perspective of being a subset of the syndicated loan market; thus, some studies focused on the differences between project finance debts and debts from other conventional sources such as corporate finances (Kleimeier & Megginson, 2000 and Esty, 2002) Other studies reviewed the syndicated loan spread/interest, coupled with the use of syndication to resolve agency problems (Sorge and Gadanecz, 2008 and Sufi, 2007), the right of creditors or loan providers (financiers) to enforce their right to recovery in a syndicated loan structure (Esty and Megginson, 2003) and the role of certification of borrower quality played by the arranger bank (Casolaro, et al., 2003 and Gatti, et al., 2011).

Studies have found that the costs of monitoring, enforcement, negotiation, bidding, and asset specificity, which arise as a result of transaction cost economics (TCE), together with creeping or outright expropriations, information asymmetry, underinvestment and agency cost between parties to the contract are all mitigated with the use of project finance, which also helps out in the area of optimal capital structure (Williamson, 1981; Pollio, 1998; Kleimeier and Versteeg, 1998 & 2010; Esty, 1999; 2003 & 2004; Sawant, 2008 & 2010 and Gatti, 2013). The outcomes of these studies show that with project finance, the issues of transaction costs arising from investing in large assets, mostly sunk cost, or investing in specific assets (asset specificity) in developing countries with a deficient environment in terms of governance, coupled with having to deal with state-owned enterprises (SOE), who have the tendencies to expropriation[6], could be resolved with the use of limited or non-recourse financing. This is a result of its unique features, which include high leverage 70/30, interest as tax allowable/tax holiday, subsidies, long term loans with strict debt covenants, cash waterfall, and a well-structured legal contract as a special purpose firm being legally independent and guarantees from a multilateral agency (The World Bank) or the host government.

Financing PPP using project finance generates value for the host government (Estache, et al., 2015). This value comes in a variety of forms, such as the funds that the government is supposed to spend on

[6] Sawant (2010) states that in the energy sector there are business relationships between investors and government companies.

the sector being saved so that they can be channelled into other critical sectors of the economy. Financing large energy assets, especially in a developing country, is exposed to country risk, as a result of challenges of governance; however, studies have shown how project finance has been able to overcome such governance obstacles, Esty (1999 & 2003) showed how the use of project finance can be used to resolve country risk, According to Esty (2003), the World Bank is the developing countries' "lender of last resort" as a deterrent to opportunistic behaviour (such as expropriation or change of contractual agreement when the existing contract is still running). This source of finance is used mostly in regulated sectors by developing countries, such as in the energy sector in India, the Philippines, Qatar, and Eastern European countries (Bond and Carter, 1995; Gupta and Sravat, 1998; Esty, 1999; Sawant, 2008 & 2010; Bonetti, Caselli and Gatti, 2010 and Kripa and Xhafa, 2013).

As pointed out earlier, limited finance and the need to improve the living standards of the people have led government and private institutions to collaborate in financing large energy infrastructures through private financing in the mode of Public Private Partnership (PPP) and investor participation through project financing (Fight, 2006; Sorell, 2008; Awodele, 2012 and Yescombe, 2014). Furthermore, although there is a comparison between project finance and other existing conventional sources of financing such PPP, and although a PPP financing structure can best be achieved by financing the acquisition and running the company as an SPE, it should be noted that not all PPPs are PF. However, Esty (2003) and Regan (2014) argue that assets financed using project finance have a limited life; this feature is common with transactions such as build own and transfer or other variants of PPPs. As pointed out earlier, the problems of private financial investors being passive investors who do not participate in running the specially created firm (Gatti, 2013), which discourages investment, are resolved by project finance, being a special purpose vehicle firm with unique features that give it protection from many risks and challenges. (Takashima, et al., 2010). Thus, project finance has the following unique features that make it an excellent source of funding for developing countries, as shown below:

- As a special purpose entity, having a well-detailed contractual structure increases transparency and project governance, reduces misappropriation, incidence of fraud, and misallocation of funds, and also reduces risks such as project risk (Esty,1999;2002 & 2010; Scannela, 2012 and La Cour & Muller, 2014);

- The non-recourse nature of the loan used to finance the assets/project: studies have shown that project finance is a highly leveraged form with a debt to equity ratio of 70/30. This makes it imperative for the fund provider to monitor the investments, through various covenants (debt and cash), to reduce incidence of waste of free cash flow (cash waterfalls), (Nikolic 2011; Hainz and Kleimeier, 2012 and Scannela, 2102);
- Financing large assets through project finance structure can be used to resolve the challenge of inadequate institutions (governance institution such as legal, political, regulatory in the host country, and also used to attract private investors to invest in large infrastructure projects. According to Esty (1999, p.29), "project finance is most valuable as an instrument for mitigating sovereign risks. Indeed, it is the one feature that cannot be replicated under conventional corporate financing schemes''. This point is also endorsed by later authors (Annamalai and Jain, 2013 and Subramanian & Tung, 2016). It has been argued above that most ECOWAS countries lack good (corporate) governance.

3.0. Methodology

This study applies a quantitative method to the analysis of quarterly data for a 31-year period (from 1984 to 2014). The main sources of data are from the Nigerian Deposit Insurance Corporation, the Central Bank of Nigeria, the World Bank, the National Bureau of Statistics, the African Development Bank, the International Monetary Fund, the government budget (including stabilization funds) and International Country Risk Guide (PRS Group).

The GMM estimation method provides a straightforward way to test the specification of there are more moment conditions than model parameters: that is, it allows the parameters to be over-identified, (Hall, 2005). This estimation method is proposed to account for the possibilities of reverse causality (in which energy infrastructure financing affects the financing method used), endogeneity and omitted variable bias in the model (Oladipo, 2013, 2013[7] and Dorrucci, et al., 2009).

3.1. Econometric Models and Data Analysis

[7] See Oladipo (2013) for further advantages of using GMM method.

The variables chosen for this study are drawn from the variables identified in Sawant (2008 & 2010), and Kleimeier and Versteeg (2010); Gemson (2012); La Cour and Muller (2014); Estache, et al. (2015), and Osabutey & Okoro (2015). The variables considered are project finance, country risk, income from oil/gas as percentage of GDP, inflation, energy project (energy cost/size), corporate finance (loan) and government budget. Similarly, to the studies by Sahoo, et al. (2010 & 2012), which used the GMM estimation methodology to study the effect of infrastructure investment and economic growth in China, this research uses GMM estimation to examine the effect of project finance and other conventional financing methods in explaining changes in energy infrastructure financing in Nigeria. To achieve this, I specify the following equations (equations 1-4). The study introduces an element of feedback into the model by including one lag value of the dependent variable $ener_proj_{t-1}$on the right-hand of the equation as part of the explanatory variables. To achieve this objective, a reduced form model was specified:

y=α+β_1 prf+β_2 cof+β_3 gb+β'X --------------------------------------(3.1)

Where y is the energy infrastructure measured using the amount of money spent on energy infrastructure (here referred as to power generation) in Nigeria from 1984 to 2014, α is the constant, prf denotes project finance, a dummy variable that takes the value of 1 if the financing for energy infrastructure in a particular was obtained via project finance and 0 otherwise. cof denotes corporate financing proxied by the aggregate loans and advances given to the oil and gas sector by banks, gb denotes the amount of government budget allocated to the oil and gas sector and X is a vector of control variables, namely, income for oil and gas as a percentage of GDP (igdp), country risk (CR) and inflation (infl). The list of proposed instruments for the GMM model will include lags 1 to 4 of the endogenous regressors. The $J - statistics$ from the GMM model will be used to test the validity or otherwise of the instruments. The J-statistic tests the null hypothesis that the instruments are orthogonal to the error term of the regression.

(a) Descriptive Statistics (Table 3.1)

	Mean	Median	Minimum	Maximum	Std.Dev
Ener_Proj	734.02	100.00	10.000	9373.0	1785.7
Proj_Fin	0.064516	0.0000	0.000	1.000	0.24973
Corp_Loan	952.36	50.000	3.6374	8030.0	2016.7
C_Risk	1.6119	1.5000	1.0000	2.0000	0.38430
Infl	20.158	12.900	5.4000	72.800	18.007
OilInc_GDP	32.405	32.628	10.842	62.207	11.183
Gov_Budg	48.690	42.000	0.47000	339.000	61.130

Key variable information

Ener_proj: Energy project in U.S. dollars ($)

Proj_Fin: Project finance, dummy variable 0 & 1

Corp_Loan: Corporate loan in U.S. dollars ($)

Gov_Budg: Government budget in U.S. dollars ($)

Infl: Inflation in figures (1= low inflation & 100=high)

Oil inc_GDP: Income from oil as a percentage of GDP in percentage

C_Risk: Country risk ranked as high risk-1, low risk=6

(b). Table 3.2. Correlation Matrix

Ener_proj	Proj_Fin	Corp_Loan	C_Risk	Infl	OilInc_GDP	Gov_Budg	
1.0000	0.5436	0.2326	-0.1234	-0.1798	-0.4020	-0.1798	**Ener_proj**
	1.0000	0.1321	-0.1429	-0.1044	-0.1825	0.0245	**Proj_Fin**
		1.0000	-0.1489	-0.2082	-0.2627	0.1622	**Corp_Loan**
			1.0000	4.4208	0.3532	-0.0776	**C_Risk**
				1.0000	0.4809	0.4238	**Infl**
					1.0000	-0.0929	**OilInc_GDP**
						1.0000	**Gov_Budg**

Note: The magnitude of the relationships are relatively not so high to the extent that one could not be substituted for another

(c). Mean Reverting/Unit Root Tests

An augmented Dickey Fuller (ADF) unit root test was also performed to de-trend the time series data (Kebede, et al., 2010, Adkins, 2012 and Cottrell & Lucchetti, 2017). The equation shown below is an adaptation of Adkins (2012) for the ADF test:

$\Delta y_t = \alpha + \gamma y_{t-1} + \sum_{s-1}^{m} a_s \Delta y_{t-s} + V_t$----------------- (3.2)

Table 3.3. Mean Reverting/Unit Root Tests

	Level (Logged)			**1st Difference (of Logged)**	
Variables	t-Statistics	Prob		t-Statistics	Prob
Ener_Proj	-2.15189	0.5161	**LEner_Proj**	-5.05582	0.0001***
Corp_Loan	-2.91714	0.1569	**LCorp_Loan**	-3.2762	0.07019*
C_Risk	-1.63444	0.7796	**LC_Risk**	-4.50866	0.001409***
Infl	-2.927	0.1538	**Linfl**	-5.72189	0.000005293***
OilInc_GDP	-0.849003	0.9598	**LOilInc_GDP**	-5.25104	0.00005668***
Gov_Budg	-2.18285	0.4987	**LGov_Budg**	-4.52099	0.001343***

**this shows the probability level at which the null hypothesis was rejected at 5% level of significance.*

***Notes**: The null hypothesis for ADF test is that the variable contains unit root. The asterisks ***, **, * indicate significance at the 1, 5, 10% levels respectively. For the variable names see descriptive statistics.*

4.0. Results and Discussion

A dynamic (lag) model (Studenmund, 2006 & 2014), using OLS (see Table 4.1) was specified, and with this it was found out that the dependent variable (energy project) is significant for the first lag of itself at 1 percent levels.

Model.1

Δl_Ener_Proj=α + $\Delta\beta_1$l_Ener_Proj$_t$_1 + Ɛ--------------------------------------(4.1)

Table 4.1

Parameters	Energy project
Constant	0.02919
	[0.3630]
ΔL_Ener_Proj_1	0.8362***
	[0.1343]

*Δl_Ener_Proj, α, $\Delta\beta_1$l_Ener_Proj$_t$_1, represent the parameters in the model. Where α represents the constant, Δl_Ener_Proj, is the energy project, $\Delta\beta_1$l_E ner_Proj$_t$_1, is lag 1 of energy project. log ener_pro_1 denotes lag 1 of energy project and e is the error term. The asterisks ***, **, * indicate significance at the 1, 5, 10% levels respectively; the standard error are in brackets.*

4.1. Data Results and Discussion

Table 4.2. Iterated GMM Dependent variable: Δl_Ener_Proj

Parameters	**Coeff-4.2**	**Coeff. 4.3**
constant	-0.0260281*	0.0369372
	[0.0152119]	[0.0299075]
Δl_Corp_Loan	0.278173***	0.128172*
	[0.0828993]	[0.0741672]
Δl_C_Risk	1.31512***	1.47896***
	[0.504134]	[0.519768]
ΔOilInc_GDP	-0.011587**	-0.535104
	[0.00482871]	[0.24306]
Proj_Fin	0.239285***	0.150527**
	[0.07372]	[0.0658501]
Δ_l_Gov_Budg	0.0983651*	
	[0.00544323]	
Δl_Infl_1		-0.00106062*
		[0.000579839]
Δl_Ener_Proj_1	0.69128***	0.791292***
	[0.0807996]	[0.0807996]
J-test	0.94	0.89

Notes

*Δl_Ener_Proj, α, $\Delta\beta_1 l\_Ener\_Proj_t\_1$, $\Delta\beta_2 l\_Corp\_Loan_t$, $\Delta\beta_3 l\_C\_Risk_t$, $\Delta\beta_4 l\_Infl_t\_1$, $\Delta\beta_5 OilInc\_GDP_t$, $\beta_6 Proj\_Fin_t$, represent the parameters in the model. Where α represent the constant, Δl_Ener_Proj, is the energy project, $\Delta\beta_1 l\_Ener\_Proj_t\_1$, is lag 1 of energy project, $\Delta\beta_2 l\_Corp\_Loan_t$ is corporate loan, while $\Delta\ \beta_3 l\_C\_Risk_t$ represent country risk, $\Delta\ \beta_4 l\_Infl_t$-1 is lag 1 of inflation, $\Delta\ \beta_5 OilInc\_GDP_t$, is oil income as a percentage of GDP, and $\beta_7 Proj\_Fin_t$ is project finance. The parameter estimates were obtained using iterated Generalized Method of Moments (GMM), and the estimation weighting matrix used was HAC standard errors, bandwidth 3 (Bartlett kernel). The instruments z used in the model are, a constant, lag of corporate loan ($\Delta\beta_2 l\_Corp\_Loan_{t1-4}$), inflation ($Infl_t$), lag of country risk ($\Delta\beta_3 l\_C\_Risk_{t1-4}$), lag of oil income as a percentage of GDP ($\Delta\beta_5 OilInc\_GDP_{t1-4}$), lag of government budget ($\Delta\beta_6 l\_Gov\_Budg_{t1-4}$), diff of project finance ($\Delta\beta_6 Proj\_Fin_{t1-4}$), project finance (Proj_Fin), and oil income as a percentage of GDP (OilInc_GDP), the last two variables were at levels. Furthermore, difference of logged of inflation (d_l_Infl), difference value of oil income as a percentage of GDP (d_OilInc_GDP) and logged of inflation (l_Infl). J-test stat shows that the probability of the test statistics for over- identifying restrictions, what this connotes is the probability of observing the value of the J- test statistics, if the null hypothesis is true. The J-statistic tests the null hypothesis that the instruments are orthogonal/ uncorrelated to the error term of the regression and they are valid instruments. These asterisk ***, **, * shows significant levels at the 1,5, and 10% levels respectively, while the value in brackets are the standard errors.*

$\Delta l\_Ener\_Proj = \alpha + \Delta\beta_1 l\_Ener\_Proj_t\_1 + \Delta\beta_2 l\_Corp\_Loan_t + \Delta\ \beta_3 l\_C\_Risk_t + \Delta\ \beta_4 l\_Infl_t + \Delta\ \beta_5 OilInc\_GDP_t + \ \beta_6 Proj\_Fin_t + \varepsilon$-------------------------------- 4.2

$\Delta l\_Ener\_Proj = \alpha + \Delta\beta_1 l\_Ener\_Proj_t\_1 + \Delta\beta_2 l\_Corp\_Loan_t + \Delta\ \beta_3 l\_C\_Risk_t + \Delta\ \beta_4 OilInc\_GDP_t + \Delta\ \beta_5 L\_Gov\_Budg_t + \ \beta_6 Proj\_Fin_t + \varepsilon$--------------------------------4.3

Notes

*Δl_Ener_Proj, α, $\Delta\beta_1 l\_Ener\_Proj_t\_1$, $\Delta\beta_2 l\_Corp\_Loan_t$, $\Delta\beta_3 l\_C\_Risk_t$, $\Delta\beta_4 OilInc\_GDP_t$, $\Delta\beta_5 l\_Gov\_Budg$ and $\Delta\beta_6 Proj\_Fin_t$, represent the parameters in the model. Where α represent the constant, Δl_Ener_Proj, is the energy project, $\Delta\beta_1 l\_Ener\_Proj_t\_1$, is lag 1 of energy project, $\Delta\beta_2 l\_Corp\_Loan_t$ is corporate loan, while $\Delta\ \beta_3 l\_C\_Risk_t$ represent country risk, $\Delta\ \beta_4 l\_Infl_t$-1 is lag 1 of inflation, $\Delta\ \beta_5 OilInc\_GDP_t$, is oil income as a percentage of GDP, and $\beta_7 Proj\_Fin_t$ is project finance. The parameter estimates were obtained using iterated Generalized Method of Moments (GMM), and the estimation weighting matrix used was HAC standard errors, bandwidth 3 (Bartlett kernel). The instruments z used in the model are, a constant, lag of corporate loan ($\Delta\beta_2 l\_Corp\_Loan_{t1-4}$), inflation ($Infl_t$), lag of country risk ($\Delta\beta_3 l\_C\_Risk_{t1-4}$), lag of oil income as a percentage of GDP ($\Delta\beta_5 OilInc\_GDP_{t1-4}$), lag of government budget ($\Delta\beta_6 l\_Gov\_Budg_{t1-4}$), diff of project finance ($\Delta\beta_6 Proj\_Fin_{t1-4}$), project finance (Proj_Fin), and oil income as a percentage of GDP (OilInc_GDP), the last two variables were at levels. Furthermore, difference of logged of inflation (d_l_Infl), logged of inflation (l_Infl), difference value of oil income as a percentage of GDP (d_OilInc_GDP) and logged of OilInc_GDP (l_ OilInc_GDP). J-test stat shows that the probability of the test statistics for over- identifying restrictions, what this connotes is the probability of observing the value of the J- test statistics, if the null hypothesis is true. The J-statistic tests the null hypothesis that the instruments are orthogonal/ uncorrelated to the error term of the regression and they are valid instruments. The following asterisks ***, **, * connotes the level of significance at the 1,5, and 10% levels respectively, while the value in brackets are the standard errors.*

4.2. Data Interpretation

In the result shown above it was observed that is a positive and statistically significant relationship between energy project and the various sources of financing such as project finance, corporate loan and government budget (explanatory variables). The result shows that increasing project finance increases the finance available to energy project thus making more funds available to build more power generating plants. This is in line with the first hypothesis that states that, project finance is statistically significant to funding an energy project. Suggesting that using project finance as an alternative source of financing energy project or as part of financing mix will help to reduce the funding gap identified using Hodrick Prescott-output gap (which corroborated what the CBN and AfDB funding gap).

Holding other variables constant, and focussing on our main variable (otherwise called variable of interest), particularly it can be seen that a one percent increase in **project finance** will lead to an increase in funding available to finance energy projects by 15%. Furthermore, by paying attention to other sources of financing such as **corporate loan**, measured by loan and overdraft granted to energy sector by banks operating in Nigeria, we discovered the same trend inform of reactions to funds available to finance energy projects, a one percent increase in corporate loan will lead to an increase in funding available to finance energy projects by 12%. The result as stated above is in linear form, which confirm the positive relationship between energy project and corporate loan holding other variables constant. These findings support the argument that the more money available to finance energy project the more power projects are constructed.

The control variables in the model, that includes **country risk proxied with corruption**, and **income from oil as a percentage of GDP**, while the former have positive coefficient, the latter coefficient is negative including the lag of Inflation are negative. However, all the three variables have statistical significant relationship between energy project, country risk and oil income as percentage of GDP and **lag of inflation.** Inflation and country risk have a linear negative relationship with energy project and are statistically significant. Controlling for corruption it shows that country risk level in this model explains variation in amount of funds available to finance energy project in Nigeria a developing country with its attendant challenges in raising long-term funds to finance capital-intensive power plants. Hence, the effect of country risk in finance and investment decision-making process, such that an increase of one percent in risk level will increase the cost of energy project by one hundred and forty-seven percent (147%). Thereby reducing the number or the capacity of power plants and makes, it difficult to raise the funds needed to build power plant because of country risk elements. This support the 2nd hypothesis that a change in country risk factor leads to a statistically significant change in funding an energy project in Nigeria.

Specifically, it was observed that a one percent increase in inflation would reduce the funds available to finance energy project by 0.10 percent. Inflation having a negative coefficient means that the more money pumped into energy project the less money available because of increasing cost, however as shown in the table above gotten through the result shown in the model. Inflation was lagged, because finance provider does take this into consideration when making finance decisions in developing countries, especially Nigeria that have been double figure inflation level for the close to 24 months. As a result, financier will have to factor in inflation when doing any form of investment appraisal such as Internal rate of return (IRR) etc., also inflation have effect on real interest rate in developing countries. The reality is that finance provided by either the government and corporate loan or both is not sufficient to finance tangible investment in the energy sector, and this funds are also being affected significantly by inflation, purchasing value (what available finance can do) are greatly reduce, (Otti, 2016). The current rate of inflation is 18.3 per cent, having great impact of real interest rate (the rate at which bank), the economy is already feeling the harsh impact of the cost of funds.

Oil income as a percentage of GDP, there is however, a significant inverse non-linear relationship between energy project and Oil income as a percentage of GDP. This shows that increasing income from oil (due mainly to higher oil price), will reduce the amount of money available to finance energy project in the country such that one percent additional increase in oil income will lead to a reduction of funds by 1.59 percent. The norm should have been more money, more funds available for power project. Thus, this support the assertion that country risk measure as corruption has negative effect on the country growth and development, because the country was supposed to benefits from high oil revenue and utilize this income to build infrastructure, but the funds were misappropriated or outright stealing. While oil income as a percentage of Gross Domestic Product (oil % GPD) means the more money Nigeria makes from oil the less the money the country invest in energy project as a result of corruption. It can be seen that when the country was making between 25-35% of its GDP was constituted of income from oil sales, when compare with amount available for investment, there was a lot of disparity.

Despite the fact that oil has been the main stay of the economy, the country has not been able to take the advantage of it in improving its infrastructure's. This is a result of corruption, whatever income that comes in that was supposed to be use for financing energy project are always misappropriated or stolen out rightly, and it is showing that despite the fact that within the last decade oil contributed close to 35% as a percentage of GDP as was shown in the descriptive statistics, yet the country could not increase its power generation, and the existing one not properly maintained leading to system collapse. The main difference between equation 4.2 and 4.3 is the introduction of government budget. As part of the existing sources of financing energy projects in Nigeria is the **government budget**, this source, has been the most dominant source of funding or building of power generation plants in Nigeria. We also observe a positive and statistical relationship between government budget and power generation, proxied as energy project. The results show that should the government decide to increase its yearly appropriation to the power sector by one percent, this increases the funds available to the energy sector by 9.8%.

References

Adkins, L. C., 2014. *Using gretl for Principles of Econometrics, 4th Edition.* [Online] Available at: http://www.learneconometrics.com/gretl/using_gretl_for_POE4.pdf [Accessed 15 February 2017].

African Development Bank, 2014. *Energy sector policy of the AfDB group,* s.l.: African Development Bank- AfDB group, operational resources and polices department..

Ahmed, P. A., 1999. *Project finance in development countries,* s.l.: International Finance Corporation..

Akbiyikli, R., Eaton, D. & Turner, A., 2006. Project finance and the private finance initiative (PFI). *The Journal of Structured Finance.*

Aliyu, A. S., Ramli, A. T. & Saleh, M. A., 2013. Nigeria Electricity crisis: Power generation capacity expansion and environmental ramifications. *Energy policy,* Volume 61, pp. 354-367..

Annamalai, T. R. & Jain, N., 2013. Project finance and investments in risky environments: evidence from the infrastructure sector. *Journal of financial management of property and construction,* 18(3), pp. 251-267.

Awodele, O. A., 2012. *Framework for managing risk in privately financed market projects in Nigeria.,* s.l.: s.n.

Bond, G. & Carter, L., 1995. Financing energy projects experience of the International Finance Corporation. *Energy policy,* 23(11), p. 967–975..

Bonetti, V., Casselli , S. & Gatti , S., 2010. Offtaking agreements and how they impact the cost of funding for project finance deals: A clinical case study of the Quezon Power Ltd Co.. *Review of financial economics*, 19(2), pp. 60-71.

Brew-Hammond, A., 2010. Energy access in Africa: Challenges ahead.. *Energy policy* , Volume 50, pp. 2291-2301..

Casolaro, L., Focarelli, D. & Pozzolo, A. F., 2003. The pricing effect of certification on bank loans: Evidence from the syndicated credit market. *working paper bank of Italy.*

Central Bank of Nigeria, 2013. *Central Bank of Nigeria: Annual economic report,*, s.l.: s.n.

Cottrell, A. & Lucchetti, R. J., 2017. *Gretl User's Guide, Gnu Regression, Econometrics and Time-series Library.* [Online] Available at: http://ricardo.ecn.wfu.edu/pub/gretl/manual/en/gretl-guide-a4.pdf [Accessed 15 February 2017].

Corielli, F., Gatti, S. & Stefano, A., 2010.. Risk shifting through nonfinancial contracts: Effects on loan spreads and capital structure of project finance deals. *journal of money credit and banking,,* 42(7).

Croce, R. D., Paula , J. & Laboul, A., 2015. *Infrastructure Financing Instruments and Incentives,* s.l.: Organisation for Economic Co-operation and Development..

Culp, F. C. & Forrester, J. P., 2010. Structured financing techniques in oil & gas project finance: future flow securitizations, prepaid, volumetric production payments, and project finance collateralized debt obligations. *Energy & environmental project finance law & taxation: new investment techniques, a. s. Kramer & p. c. fusaro, eds., oxford university press..*

Dorrucci, E., Meyer-Cirkel, A. & Santabárbara, D., 2009. *Domestic Financial Development in Emerging Economies Evidence and Implications,* s.l.: European Central Bank..

Driffield, N., Mickiewicz, T. & Temouri, Y., 2014. Institutions and Equity Structure of Foreign Affiliates. *Corporate Governance: An International Review,* 22(3), pp. 216-229.

Eberhard, A. & Gratwick, N. K., 2011. IPPs in Sub-Saharan Africa: Determinants of success. *Energy Policy*, Volume 39, p. 5541–5549..

ECOWAS, 2010. *EBID ECOWAS Bank for Investment and Development.* [Online] Available at: www.bidc-ebid.org [Accessed 2010].

ECREEE, 2012. s.l.: ECREEE- ECOWAS Centre for Renewable Energy and Energy Efficiency. www.ecreee.rg.

Estache, A., Serebrisky, T. & Wren-Lewis, L., 2015. Financing infrastrucute in developing countries. pp. 1-29.

Esty, B., 2004a. Why study large projects? An introduction to research on project finance. *European Financial Management*, 10(2), pp. 213-224.

Esty, B., 2010. An Overview of Project Finance and Infrastructure Finance.

Esty, B. C., 1999. Petrozuata: A case study of effective use of project finance..

Esty, B. C., 2002. The economic motivations for using project finance Harvard business school, working paper..

Esty, B. C., 2003. When do foreign banks finance domestic projects? New evidence on the importance of legal and financial system. pp. 1-40.

Esty, Benjamin C. and William L. Megginson, 2003. Creditor rights, enforcement, and debt ownership structure: Evidence from the global syndicated loan market, Journal of Financial and Quantitative Analysis 25 38, 37-59

Fabozzi, F. & Nevitt, P. K., 2006. *Project financing.* 7 ed. London: Euromoney.

Farrell, L. M., 2003. Principal-agency risk in project finance. *International journal of project management*, Volume 21, pp. 547-561.

Fight, A., 2006. *Introduction to project finance, essential capital markets.* s.l.:s.n.

Fritsch, R., 2011. Comparative financial analysis of electricity utilities in West Africa. *Energy*

Gatti, S., 2013. *Project finance in theory and practise designing, structuring, and financing private and public projects..* s.l.:s.n.

Gatti, S., 2015. *Infrastructure Finance in the Developing World Private Finance for Infrastructure Investments: Analysis and Implications for New Multilateral Development Banks,* Seoul: The Global Green Growth Institute .

Gatti, S., Kleimeier, s., Steffanoni , A. & Megginson, L. W., 2008. Arranger Certification in Project Finance,. *Financial Management.*

Gemson, J. G., Gautami, K. V. & Rajan, T. A., 2012. Impact of private equity investments in infrastructure projects. *Utilities policy,* Volume 21, p. 59–65..

Girardone, C. A. & Snaith, S., 2011. Project finance loan spreads and disaggregated political risk. *Applied financial economics,* 21,(23), pp. 1725-1734..

Gnansounou, E., 2008. Boosting the electricity sector in West Africa. An integrative vision. International association for energy economics.

Gnansounou, E., Bayerm, H., Bednyagin , D. & Dong, J., 2007. Strategies for regional integration of electricity supply in West Africa.. *Energy policy,* 35(8), pp. 4142-4153.

Gupta, J. P. & Stravat, A. K., 1998. Development and project financing of private power projects in developing countries: A case study of India.. *International journal of project management,* 16(2), p. 99–105.

Hainz, C. & Kleimeier, S., 2012. Political risk, project finance, and the participation of development banks in syndicated lending. *journal of financial intermediation,* issue 2(volume 21,), p. pages 287–314.

Hall, A. R., 2005. *Generalized Method of Moments,* Oxford: Oxford University Press.

Herdinata, C., 2015. Interdependence between Institutional Ownership and Leverage of Free Cash Flow: The Development of Agency Theory Model in Balancing Conflict of Interest in Indonesian Company. *Mediterranean Journal of Social Sciences,* 6(3), pp. 1-8.

Hoti, S. & McAleer, M., 2002. *Country Risk Ratings: An International Comparison,* s.l.: https://faculty.fuqua.duke.edu/~charvey/Teaching/CDROM_BA456_2003/Country_risk_ratings.pdf.

Igali, G., 2015. *Power, Obasanjo, Yar-adua and Jonathan-spent-n2-74trn-in-16-years* , s.l.: Vanguard Newspaper (http://www.vanguardngr.com/2015/09/.).

InternationalMonetaryFund, 2013. *Country report, Nigeria: Financial sector stability assessment, no. 13/140,* s.l.: International Monetary Fund.

Jensen, M. C. & Meckling, W. H., 1976. Theory of the firm: managerial behaviour, agency costs and ownership structure.. *Journal of financial economics,* 3(4), pp. 305-360.

Kayser, D., 2013. Recent researches in project finance a commented bibliography.. *Procedia computer science,* Volume 17, pp. 729-736.

Kebede, E., Kagochi, J. & Jolly , C. M., 2010. Energy consumption and economic development in sub-Sahara Africa.. *Energy economics,* 32(3), pp. 532-537.

Khmel, V. & Zhao , S., 2016. Arrangement of financing for highway infrastructure projects under the conditions of Public–Private Partnership. *International Association of Traffic and Safety Sciences,* 39(2), pp. 138-145.

Kleimeier, S. & Versteeg, . R., 2010. Project finance as a driver of economic growth in low-income countries.. *Review of financial economics,* pp. p.49-59..

Kleimeier, S. & Megginson, W., 2000. Are project finance loans different from other syndicted credits?. *Journal of Applied Corporate Finance,* Volume 13, pp. 75-87.

Kleimeier, S. & Megginson, W. L., 1998. A comparison of project finance in Asia and the West. pp. 57-89.

Kleimeier, S. & Megginson, W. L., 2001. An empirical analysis of limited recourse project finance..

Kouakou, A. K., 2011. Economic Growth and Electricity Consumption in Cote D'Ivoire: Evidence for Time Series Analysis.. *Energy Policy* , 39(6), pp. 3638-3644.

Kripa, E. & Xhafa , H., 2013. Project finance and projects in the energy sector in developing countries. *Economics and finance review,* 3(01), pp. 01-11.

La'Cour, L. F. & Muller, J., 2014. Growth and project finance in the least developed countries. *International journal of economics sciences and applied research,* Issue 2, pp. 77-103.

Ley, K., Gaines , J. & Ghatikar, A., 2015. *The Nigerian energy sector an overview with a special emphasis on renewable energy, energy efficiency and rural electrification,* s.l.: s.n.

Lock, R., 2003. The future of project finance: A respite or its demise?. *The electricity journal* , 16(8), p. 35–38..

Megginson, W. L., 2010. Introduction to the special issue on project finance..

Mensah, J. T., Marbuah, G. & Amoah, A., 2016. Energy demand in Ghana: A disaggregated analysis. *Renewable and sustainable energy reviews,* Volume 53, pp. 924-935.

Myers, S. & Majulf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics,* Volume 13, pp. 187-221.

Nikolic, D. M., Jednak, S., Benkovic, S. & Poznanic, V., 2011. Project finance risk evaluation of the electric power industry of Serbia.. *Energy Policy,* 39(10), pp. 6168-6177.

O'Neill, P., 2016. *Capital Projects and Infrastructure in Urban and Economic Development,* s.l.: s.n.

Ogunleye, E. K., 2016. Political economy of Nigerian power sector. *United Nations University World Institute for Development Economics* , Volume 9, pp. 1-31.

Oladipo, S. O., 2013. Macroeconomic Determinant of Foreign Direct Investment in Nigeria (1985-2010): a GMM Approach. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB),* 2(4), pp. 1-17.

Osabutey, E. L. C. & Okoro, . C., 2015. Political risk and foreign direct investment in Africa:The Case of Nigeria Telecommunication Industries. *Thunderbird International Business Review,* Volume 57(Issue 6), pp. 417-429.

Ouedraogo, N. S., 2013. Energy consumption and economic growth: Evidence from the Economic Community of West African States (ECOWAS).. *Energy economics,* Volume 36, pp. 637-647.

Pollio, G., 1998. Project Finance and international energy development. *Energy Policy* , 26(9), pp. 687-697.

Regan, M., 2014. Project finance: Transactional evidence from Australia. *Public Infrastructure Bulletin:* , Vol. 1(9, Article 9.), pp. 1-17.

Sahoo, P., Dash, R. K. & Nataraj, G., 2010. Infrastructure development and economic growth in China. *Institute of developing Economies,* Volume 261, pp. 1-34.

Sahoo, P., Dash, R. K. & Nataraj, G., 2012. China's growth story: The role of physical and

Sawant, R., 2008. The economics of large scale infrastructure project finance: An empirical examination..

Sawant, R., 2010. The economics of large-scale infrastructure FDI: The case of project finance. *Journal of international business studies* , Volume 41, pp. 1036-1055.

Scannella, E., 2012. Project finance in the energy industry: New debt - based financing models. *International Business research,* 5(2), pp. 83-93.

Shah, S. & Thakor, A. . V., 1987. Optimal capital structure and project financing. *Journal of Economic Theory,* 42(2), pp. 209-243.

Sorell, T., 2008. Project financing in developing countries, new corporate social responsibility, human rights, and multinationals. *Essex Human Rights Review,* 5(1).

Sorge, M. & Gadanecz , B., 2008. The term structure of credit spreads in project finance. *International Journal of Finance and Economics,* Volume 13, pp. 68-81.

Studenmund, A., 2014. *Using Econometrics: A Practical Guide (6th Edition).* 6th ed. s.l.:Pearson Education.

Studenmund, A. H., 2006. *Using Econometrics: A Practical Guide, 5th Edition.* 5th ed. s.l.:Pearson Education.

Subramanian, K. V. & Tung, F., 2016. Law and project finance. *Journal of Financial Intermediation,* Volume 25, pp. 154-177.

Sufi, A., 2007. Information asymmetry and financing arrangements: Evidence from syndicated loans. *The journal of finance*, 62(2), p. 629–668.

Takashima, R., Yagi , K. & Takamori, H., 2010. Government guarantees and risk sharing in public-private partnerships.. *Review of financial economics, 19, 78-83.,* Volume 19, pp. 78-83.

Turkson, J. & Wohlgemuth, N., 2001. Power sector reformed and distributed generation in sub-Saharan Africa. *Energy policy,* Volume 29, pp. 135-145.

United Nation Environmental Programme–UNEP, 2012. *Financing renewable energy in developing countries. Drivers and barriers for private finance in Sub-Saharan Africa.,* s.l.: United Nation Environmental Programme –UNEP .

Vanguard, N., 2015. [Online]
Available at: Vanguard newspaper: Nigeria loses 50% of power capacity–Envoy
http://www.vanguardngr.com/2015/11/nigeria-loses-50-of-power-capacity-envoy/
[Accessed 3rd November 2015].
Williamson, O., 1981. The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3), pp. 548-577.

Williamson, O. E., 2007. Transaction Cost Economics: An Introduction. *Open Accessment - e journal,* Volume 3, pp. 1-34.

World Bank, 2016. *West Africa: Facts and Figures.* [Online]
Available at:
http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20179737~pagePK:34370~piPK:42768~theSitePK:4607,00.html
Yescombe, 2014. *Principles of project finance.* 2nd edition ed. s.l.:Consulting .