Social, Health, and Environmental Infrastructures for Economic Growth

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Chapter 10
Public-Sector Project Abandonment Decision:
A Test of the Ricardian Equivalence Theory on the Failed Lagos Metroline in Nigeria

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ABSTRACT

This chapter examines the implications of projects abandonment with test of the Ricardian Equivalence on the failed Lagos metro line project in Nigeria as case study. The main variables used are Rail and Pipeline Output, Budget Deficit, Interest Rate, Corruption Index, Savings and some others. The study results on the Ricardian Equivalence hypothesis on deficit financing of projects using Vector auto-regression model from 1980-2012 indicate that no causal influence holds in Nigeria. Results show that poor planning, corruption, political factors, poor support infrastructures, poor quality of local resources, etc. were attributable. The results of the Impulse Response tests reveal that Rail and Pipeline output and a few others responded positively to shocks in the short run (years 1-2), and negatively to others. The result affirms that Government should privatize the railway system, legislate against project abandonment and ensure that projects are adequately planned, funded, insured and insulated against corruption.

INTRODUCTION

One of the fundamental challenges facing developing economies globally is the need to fill huge infrastructural gaps limiting the transformation of their economies and ensure sustainable development. Lofty social and economic policies and planned goals to improve living standards are handicapped due to lack of disciplined use of development capital. Public capital investment remains strategic policy deci-

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sion that falls within the purview or domain of the highest government authority. Hall and Jones (1997) argue that differences in economic successes across countries are attributed to institutions, government policies and infrastructure that shape the economic environment in which people produce and transact. A government that engages in fund raising from investors for the purpose of capital investment decision must ensure that optimal social returns are obtained on the funds. Dwivedi (2008) regards investment as committing money, time and labour to create assets that can generate income for the long-term or which enhance returns on the existing asset. When technical, financial and political feasibilities are shoddy, project failure or abandonment becomes inevitable. Dean (1951) suggested that capital project should be examined in terms of economic behaviour rather than in terms of "accounting convention". Public projects are usually of social dimension for development and improvement in the living standard of the people.

Capital project decisions are normally irreversible, with expectation of immense future benefits over a reasonable long period in the future; otherwise it could result in time, capital and social welfare loss. Projects benefits may be pecuniary, non-monetary or partially monetary. Olowe (2011) identified the following as critical to a successful capital investment decision process: identifying possible investment project; identifying possible alternatives to the projects being evaluated; acquiring relevant data to the project under consideration; evaluating the project from the date assembled; project selection; project execution; and project monitoring and control. Before implementing these criteria, it is assumed that probable funding obstacles and other reasons that could result in abandonment would have been taken care of *ex ante*. Yescombe (2014) defines project abandonment as when the sponsor fails to continue construction or project operations; arguing that project abandonment clearly exposes the lender and the investors to much higher risk, such that there may not be real market upon a sale decision. Meir and Sepe (1989) argued the valuation effects of abandonment on the entity: that abandonment can be by termination or by sell-off. In a sell-off, the project assets are sold to outsiders, while in a termination assets remain with the firm. However, this chapter sees it as discontinuance of project with direct loss of capital, non-optimization of economic resources, and with indirect negative implications on outputs, employment, tax, and human welfare, etc. Thus the chapter examines the implications of public-sector project abandonment.

Lagos and the Metro-Line Project of 1981: The Case Study

Lagos state is the smallest state in the Nigerian federation and yet the most populous, being a coastal city. The current estimated population figure is put at 18 million and increasing at 3.2% per annum (*Businessdayonline*, 2014). Lagos's share of Nigeria's urban population is also a hefty 27.4%.As a result of overpopulation, the city is however severely challenged with poor infrastructure, particularly in the area of public transport. As at 2010, the size of the Lagos economy was estimated at ₦12.091 trillion ($80.61 billion), accounting for 35% of Nigeria's GDP (Lagos State GDP Report, 2010).

Lagos had been the political and commercial capital of Nigeria since the colonial years up to 1990 when the administrative capital moved to Abuja. The city is characterized by perennial transportation problem, dominated by inefficient land transit resources. On the average the city daily witnesses broken down trucks, a major means of movement of goods and people. Though an oil producing economy, over 80% of refined petroleum are imported through its two main seaports and hauled by road through the city to other parts of the country. According to the project publication on the ill-fated transport system, the Lagos State Ministry of Public Transportation (LSMPT) Final Report (1981) Phase 1 on the failed Lagos Metroline project, the rapid growth in population of Lagos metropolitan area, then estimated at

four (4) million in 1979, was to be thirteen (13) million by 2000, required higher capacity transport system beyond what the then road infrastructure could sustain. The Lagos master plan of the Federal government had recommended intensification of intergraded road and rail transport system, one of which is the Lagos metro-line (LML). The recommendation was to make the Lagos metro-line a pioneer, and to be extended to Africa.

Despite the importance of rail infrastructure to economic development, Nigeria's rail infrastructure tracks as at 2012 was 3,528kilometres, while the population per kilometre track was 49. It consists of only two (2) main routes, linking the seaports of Lagos and Port-Harcourt with the hinterland, extending to Kano (northwest) and Maiduguri (northeast) respectively. In comparison with selected peers (Table 1), Nigeria rail infrastructure can be assessed as abysmally poor.

The successes achieved by Brazil and Mexico may be attributable to appropriate economic policy formulation and implementations, institutions, and systems, which otherwise may have been responsible for Nigeria's poor performance. It may therefore be imperative to consider advancing public-private investment policy options, and progressing to full privatisation of the Nigerian rail sector.

Objectives of the Metroline Project

A major objective was to alleviate the congestion on road usage which at peak periods reduced available speed movement. The LSMPT (1981) report had analysed that while the average operating speed of an average bus was estimated at 18km per hour, the master plan estimated the peak operating speed at less than 10 km per hour. Another objective was the need to alleviate the air pollution problems of the period and the future Lagos. The success of the scheme was not expected to drastically reduce vehicular traffic largely, however the operational condition of the vehicles on the road was supposed to be improved by the reduction of road traffic demand and concentration on the major road section. Further, the construction of the scheme and its extension was expected to attract a sizeable number of old and new passengers, thereby bringing in a large part of the steadily increasing traffic demand and volume by private vehicles on the highway system.

Immediate cause and financial consequence of metro-line project failure: The ex-governor Kayode Jakande (1979-1983) who initiated the project in 1981 blamed the failure and abandonment on the administration of the then President, Shehu Shagari (1979-1983) inferring that his administration's action defied logic. Thus the cause of the failure was entirely political, as the rivalry between the ruling defunct National Party of Nigeria (NPN) at the Federal level and the ruling Unity Party of Nigeria (UPN) in Lagos state stalled the release of the initial ₦70 million ($50.7million) (estimated at ₦14,837.4 billion

Table 1. Rail length of selected African and other MINT Countries as at 2012

Countries	Nigeria	S Africa	Egypt	Algeria	Brazil	Mexico	Indonesia	Turkey
Rail (Km)	3,528	20,500	6,700	4,691	29,817	26,704	8,529	12,000
Popu. per Km track	49	3	12	8	7	5	29	6
Status	Nationalized	Nationalized	Nationalized	Nationlized/priv.	Private	Private	Nationalized	Nationlized

Sources: The World Bank, data.worldbank.org; International Union of Railway(IUR), World Population 2012, www.unpopulation.org, population per kilometre was computed by author, accessed May 15 and 18, 2015.

at 2014 inflation adjusted Naira) by the Central Bank of Nigeria to the Japanese and French consortium of contractors as mobilisation payment. In the court case instituted by the foreign consortium following the failure of the project, Nigeria had no legal representation. The judgment was severe on the country with financial claim by the contractors in excess of $600 million. This subsequently became part of the Paris Club debt with the Federal government as guarantor of the debt, the state had to pay from its monthly statutory allocations.

Report of Abandoned Projects in Nigeria

The Presidential Projects Assessment Committee (PPAC) that was set up identified 11,886 total uncompleted (on-going or abandoned) Federal Government projects all over the country, resulting in loss of capital and social welfare to the economy costing over ₦7.78trillion (El-Rufai, 2012; Omotosho, 2012). Multi-billion dollar abandoned projects in Nigeria included the multibillion dollar Ajaokuta steel complex project. If projects abandoned by state governments were added to the list, the figure would be higher. The reasons for this sad state of affairs are many, the most immediate being insufficient planning for the projects. Then there is the factor of inadequate budgetary provision to compete them from onset. Moreover delays in funding, sometimes deliberately done to increase the mark-up fees for corrupt officials, add to the costs of execution, causing frequent reviews of the original contract terms.

Secondly, many projects are corruption-driven. Consequently, there is a rush to come up with as many projects as possible even when there is no money to execute them. Government officials and legislators are often inundated with proposals from contractors proposing one project or the other regardless of whether or not such projects are beneficial to the country. Contractors and government officials tend to conjure projects, not with the public interest in mind, but, as a conduit for looting. By colluding with contractors, government officials compromise themselves and are unable to contractually deal with contractors when they fail to perform their obligations. Many projects are listed every year in annual budgets, with little to show on the ground each year though sums were advanced.

Thirdly, it has become routine for contractors to collect mobilisation fees, often in amount almost equal to the full cost of contract, and thereafter abscond and go scot-free, a reflection of the pervasive culture of impunity in the country. Unless those responsible for saddling the country with abandoned projects are prosecuted, there may be no end to the problem.

Fourthly, lack of quality products manufactured locally for the construction industry also affects the execution of contracts; so do the inadequate supply of electricity, water, etc., which add to the costs of construction. Other reasons include inadequate planning, inadequate finance inflation, delayed payment and political factor, incompetent project manager, wrong estimate, faulty designs and inadequate cost control.

Abandonment and Failure Decision: Remote Causes and Events

Failure and abandonment of a project can occur in several ways. Ubani and Ononuju (2013) believe that project failure occurs when it cannot meet up with the scope, time, quality and cost goals. Also, projects fail when they do not meet or satisfy the customer/sponsor main objective coupled with no concerted effort to resuscitate the project. Schwable (2006) however sees the potential conflict between intents of the project manager and the project sponsor as responsible for failure asserting that good project managers should assume same definition of project success with the sponsor. Corroborating this claim, Okoroafor

(2004) as cited in Ubani and Ononuju (2013) contend that while the private entrepreneur sees project work from the profit maximization perspective, the public administrator thinks in terms of social cost or benefit. Elinwa and Joshua (2001) claim that in Nigeria, cost and time overrun are most responsible for most public projects abandonment.

Generally, the following are the reasons for project failures. First, an inflationary economy distorts capital budgeting decisions, with the presence of inflation resulting in lower real rate of project returns and less incentive for business to undertake capital projects.In estimating cash flows for a project, it is important that government take anticipated inflation into consideration. Often there is tendency to assume that price level will be unchanged through the life of the project. Secondly, information to analyse fundamental acquisition for capital projects is vital. Capital and technological equipment for a capital projects are not necessarily generally internal sourced, requiring detail information of the sources of all prospective facilities for the project as construction progress. Thirdly, one of the constraints state governments in Nigeria have always faced in their effort at raising long term funds is their inability to service such loans comfortably. It is suggested that such loans and bonds should be limited to projects that can pay back from future cash flows derived there from. Information from the failed metro-line project is that the Lagos state government is currently subjected to first charge from the federation account, to pay the external creditors, as the debt was converted to foreign loan account. Fourthly, the absorptive capacity for any type project: with respect to the Lagos metro-line, a past governor, added that government realized that the initiative then failed because it did not have the capacity to provide the kind of results desired in terms of sustainability for the vehicles that it would be managing.

REVIEW OF THEORETICAL LITERATURE

Theoretical issues on project failures and abandonment are widely documented in project development literature. Studies by Kerzner (2004), Telsang (2004), and Stephenson (2007) cited in Ubani and Ononuju (2013) discuss the systemic approach to project management and success factors. The authors see project failure from dysfunctions or lack of effective management of the dynamic interrelationship among subsystems on the project success chain such as planning, finance, control, procurement/purchasing, operations and implementation units. Meir and Sepe (1989) argue the normative and behavioural approaches to project abandonment claiming that projects can be abandoned if the expected present value of cash flow given abandonment today is greater than the expected present value of cash flow given that the project is continued for at least one additional period, bearing sunk costs. Odufalu and Loto (2008) argue that a fundamental obstacle to rapid economic development in developing countries is paucity of well-prepared and analysed projects, as many projects often turned white elephants because of improper planning, analysis and appraisal. Several obstacles to project success in Nigeria are as follows: lack of pre-investment studies; wrong location; over-ambitious projects; manpower constraints; financial constraints; feeder stock problem; inadequate support infrastructure; political instability and institutional challenges. Evidently, Diji (2004) provided ample analyses for the failure and sub-optimal operations of the Nigerian iron and steel companies (Aladja and Delta Steel and the Jos, Oshogbo and Katsina steel rolling mills) to politically motivated choice of location, inappropriate technology and wrong investment layout. Yescombe (2014) examined project failures and argued for solutions on early sign of project failure that can be dealt with by deductions or penalties rather than termination such as compensation for the contracting authority; ‘walk away’ by the off taker/contracting authority; transferring the project to the

off taker/contracting authority without payment of any termination sum; payment of termination sum equal to the outstanding debt by the off taker/contracting authority; sale of the project with its project agreement in the open market; payment by the off taker/contracting authority of the termination sum based on the estimated value that would be achieved by a market sale.

Similarly, problems of unquantifiable uncertainties of contracts prompts input suppliers to terminate input-supply contracts that impact negatively on the project. Such events are failure by the project company to pay for supplies; signs of abandonment of the project; and insolvency of the project company or when its debt keeps accelerating. Otherwise, termination might arise from the project company itself arising from failure of input supplier to make delivery; insolvency of input supplier; and where there arise default by a guarantor of the input supplier. Another cause for concern is principle of 'optimism bias'. Yescombe (2014) argued that project *force majeure* event is usually a possibility, with the need that insurance contract be taken to cover project companies and lenders against unexpected losses. This key success factor in project contracting is however often neglected in project development and may result in underestimation of the project cost and a lack of guarantee against failure. Substantial evidence exists between corruption and project abandonment in Nigeria. Ingwe *et al.,* (2012) believes that project abandonment was encouraged by many administrations starting with Yakubu Gowon (1966-1975) with the practice of sharing unspent budgeted capital funds among top government functionaries of the respective Ministries, Departments and Agencies (MDAs) at every fiscal year end. This was discouraged by the Yar' Adua administration in 2007 policy measures towards curbing corruption when it began the practice returning unspent budgeted funds back to the nation's treasury.

EMPIRICAL REVIEW OF LITERATURE

Bangsung *et al.* (1997) assessed the private and public economic impacts of railroad abandonment in the rural economies of North Dakota in the United States, using input- output quantitative measure. Specifically, the study examined the cost of moving freights by truck compared to cost by rail, cost of increased traffic on local road system, and the consequences of local property tax revenue of rail line abandonment. The outcome of the variables included increased transport cost. It was also discovered that other media compared to rail-shipping, highway and local road cost, reduction in business and workers' income; employment implication, tax revenue reduction and general economic downturn.

Citkara (2006) studied project failure and abandonment in India and attributed the causes to the following: inadequate project formulation such as poor field investigation, inadequate project information, poor cost estimation, lack of experience, poor investment decision; poor planning and implementation, lack of project management experience during execution, *etc*. Ubani and Ononuju (2013) used 'opinion and judgmental sampling' method to capture the key factors responsible for civil project abandonment in Nigeria. Analytical tools used on the primary data are the Severity Index (SI) and Spearman rank correlation. The study reveals that most critical factors for project abandonment and failure include frequent change of government and political power, deficient financing methods and non-payment for completed work, including influence of political contracting. Ingwe *et al.,* (2012), examined project abandonment, corruption, and recovery of unspent budgeted public funds in Nigeria. The study noted abandonment consequences of project resources waste in time, human skills, and development opportunity cost. The paper used sampled survey and descriptive methods and found that a high rate of project delay and abandonments were discovered in critical sectors of the economy – power supply, road construction,

petroleum, oil and natural gas development and in service sectors- education, health, representing huge opportunity costs with abundant spin-off impact on economy. The paper also found that the project management culture is defective, partly arising from inadequate human management.

Garrett (2004) studied the pros and cons of metro-line and light rail project in the United States. The paper advanced the argument that rail transit system transforms the well-being of the people, increases income by boosting property value, reduce health risks of pollution, traffic congestion and improve the income base of the poor. However, Garrett (2004) claims that excessive cost of the rail system greatly annoying to the economy and that citizens generally have preference and more value for automobile to rail as it grants personal space and a sense of independence, including the freedom in the time to commute. Apanisile and Akinlo (2013) studied the link between rail transportation and economic growth in Nigeria between 1970-2011 using error correction mechanisms (ECM). The study discovered long run relationship with correct negative signing of the ECM coefficient, the relationship between rail output and economic growth was negative. This significantly provides empirical evidence that the non-development of the rail transport system has been inimical to Nigerian economic growth.

Musgrave and Musgrave (2004) contend that under certain circumstances the market mechanism is sometimes better placed to produce social goods rather than evolving budgetary process, particularly where there is attributes of 'non-rivalry in consumption' but 'exclusion' is possible, e.g. education. It is the case that private supplier may provide the good to various consumers at differentiated prices, exacting from successive units the maximum amount each consumer is willing to pay. While the supplier appropriates the consumer surplus, derived by the buyer, an efficient outcome however ensues, since at the margin, the price paid equals the benefit derived (Musgrave & Musgrave, 2004).

Due to market failure attributes, pure public projects are generally provided by governments. Varian (2002: 644) reveals that public good possess troublesome kind of externality; with a particular kind of consumption externality, where everyone must consume the same amount. For example, people cannot purchase different amount of public defence. In this light, Musgrave and Musgrave (2004) contend that the theory of social/public good provides rationale for the allocation function of budgetary policy. The demand for pure public good cannot therefore be determined via the market system. Odufalu and Loto (2008) argue that a discussion of the need rather than the demand of these services, while the volume of the services placed at the disposal of the users are determined by the decision of general government policy. Be that as it may, the level of service that the government can comfortably place at the disposal of the consumers is generally a function of budgetary constraints and the competing requirements for public expenditure.

In practice, where the service is of direct benefit to the consumer (e.g. hospitals and education) a market analysis is a crucial step in the preparation, analysis and appraisal of projects. The analysis is crucial to determining the size and location of the project, and dictates the sales effort and sales budget. Odufalu and Loto (2008: 90) provide quantitative approximate estimation process for possible future demand for a public project to establish the probable level of need.

Funding Public Projects

Although, taxation is the commonest source of public project financing for most sub-units of a country, other alternatives are: statutory allocations; the use of debt; equity project finance; donations; user charges; and government–run enterprises such as state lotteries. Debt project finance has wide range of financing features of various packages. The essence of debt and equity project finance is to bring in

private sector participation (in a public –private partnership), hence establish robust financing structure. Merna and Al-Thani (2008) argue that a common feature in project finance is that financing is not primarily dependent on the credit support of the sponsors or value of the physical assets being undertaking. Thus most road infrastructure is provided by the government at least in most developing countries fall into one of these categories.

Hellewel (2001) argues that transport is a lubricant of commerce, adding value to goods: the greater the economic activities the greater the demand for movement by all modes; while traffic congestion is symptom of failure of investments to keep up demand. An efficient transport system minimizes four time elements in the transport chain: access, waiting, in-vehicle, and egress. Kavanagh et al., (2005) argue that "traffic is a leading source of air pollution", requiring that initiatives which reduce traffic volume would have potential benefits to environmental health.

Economic Burden of Public Project Abandonment

The efficient functioning of any economy could be weakened by project abandonment, as loss of multiplier proportion on capital and by implication on welfare. The economics of financing public sector projects through taxation and debt is highly consequential to the consumption and savings power of the citizen. Although the theories in the literature of inter-generational equity of deficit and tax financing for public project is highly controversial, a theory of public-sector financing says that government merely acquire the right to private resources as individuals are made to give-up their rights over resource use in order for the government to provide goods and services (Hyman, 2002).

It is a requirement as acceptance criterion for financial evaluation of projects to compare the internal rate of return with a required (the hurdle) rate of return, and therefore to accept a project on the condition that the IRR exceeds the required return. However, Miller (1988) cited in Van Horne and Dhamija (2012) reasons that for capital-expanding projects such as Metrorail line which is highly related to the level of the nation's economic activity and capable of producing cash flows as the economy become prosperous require that such capacity-expanding investment projects adopt different return in line with prevailing systematic risks. Besides, since output values of social infrastructural projects are rather difficult to evaluate, knowledge from cost effectiveness and cost utility analyses reveal the measuring and valuation mechanism of public projects. At best, it is the relative net present costs of various options and interventions that may be accurate while benefits and outcomes are arrived at often through non-monetary criteria such as a defined quality adjusted life year of the citizens - a combination of the duration of life and health related quality of life. Jhingan (2007) also reasons that in developing countries the knowledge of factors which influence demand and supply of capital is imperfect, hence in a mixed economy, the price of inputs such as capital in development planning and project evaluation can better be determined in accordance with shadow prices.

In either way of financing (by tax and debt), citizens would be forced to reduce their consumption and saving (investment) power. For debt financing of huge capital project, the burden of capital and interest repayment is postponed to future period and paid for from future taxation- an inter-generational transfer of burden. All things being equal, the increased tax revenues necessary to pay interest and principal in future redistribute income from the taxpayer to the holders of public debt. A prudent use of debt however, would mean government taxing its citizen as the facility is being constructed and after completion during use. If facilities are however, financed immediately by taxation, individuals would be forced to forgo

Table 2. Trend in Nigeria's Economic indicators (1980-2013)

Yrs	1980	1985	1990	1995	2000	2005	2010	2013
BD(₦'b)	1.97	3.04	22.1	0.0	103.8	161.0	1,105.4	266.2
INRT (%)	9.0	11.75	27.7	20.79	21.55	19.49	21.51	24.75
SVN(₦' b)	5.7	12.5	29.6	108.5	385.2	1,317.0	5,954.3	8,659
Infl.(%)	10	5.5	7.5	72.8	6.9	17.9	11.8	8.0
HDI	0.19	0.22	0.28	0.31	0.40	0.43	0.46	0.47

Source: National Bureau of Statistics: Legend Budget deficit (*BD*), Interest rate (*INRT*); Gross Private savings (*SVN*); Inflation rate (*INFL*); Human development Index (*HDI*)

consumption and savings opportunities equivalent to the entire capital cost of the facility, without any benefits accruing until the facility was fully constructed and functioning. Therefore, to Hyman (2002) where debt finance is prudentially and efficiently deployed, it can improve the economics of scarce resources by linking cost of public investments to the streams of benefits produced by those investments.

When capital project is abandoned, the welfare and well-being impact is enormous on the future generation paying the debt. The economic effects of debt repayment consequent upon abandoned project also affect interest rates, national savings and investment. The inter-generational equity to this implies that budget deficit increases national debt and thus increases the future interest costs, which affects welfare, as it denies provision of goods and service to the citizens.

OBJECTIVES OF THE STUDY

The basic objective of this chapter is to test the Ricardian Equivalence Hypothesis on public sector abandonment decision on public projects using the Lagos Metroline that failed project in 1982 as a result of the politics between Lagos State and the Federal Government of Nigeria as case study by showing the impacts of the important direct variables on development factors.

THEORETICAL FRAMEWORK AND METHODOLOGY

This study follows the models developed by Ubani and Ononuju (2013); Apanisile and Akinlo (2013) with some modifications. Following Ubani and Ononuju (2013) study on the failure and abandonment of civil engineering projects in the public sector in Nigeria which the authors concluded to have resulted in sizeable waste of scarce resources, with adverse implications on environmental degradation, unemployment, aggravated deterioration and decay of road and infrastructure, ravaging flood, displacement of homes, destruction of buildings and other settlements, etc. Clunies-Ross *et al.,* (2009) argue that economic appraisal of projects follows similar logic to financial appraisal, in which the net benefits is estimated per period of the project's prospective life rather than the net cash flows; they are then discounted for time, with the result summed up to give expected net present value(NPV). This study intuitively establishes a link between public projects abandonment and worsening macroeconomic variables. The discounted economic benefits and costs of the project to the society are usually arrived at as follows:

$$NPV = \sum_{t=0}^{n} \left[(B_t - C_t) / (1+i)^t \right] \tag{1}$$

Where: NPV is the net-present value of the project; $t = 0, 1, 2..., n$ is the number of years from the original investment; n is the lifetime of the project in years; i per year is the discount-rate for time; B_t and C_t are the society's benefits and costs respectively in year t.

However, for efficient management of capital resources, periodic reappraisal for continuity, termination, or sell-off decisions is appropriate using the present value of cash flow (PVCF) approach. A modified form of Ubani and Ononuju's (2013) framework is presented here:

$$PVCF = \sum_{n=1}^{T} \frac{NC_n}{(1+i)^n} + \frac{SV_T}{(1+i)^T} \tag{2}$$

Where T is the estimated remaining life of the project; NC_n is the new forecast net cash flows reassessed periodically; SV is salvage value in time T. Decision rule suggest that a project could be abandoned (termination or see-off) when the net present value of cash flows associated with it is higher than for continuity. Deficit budgets for capital projects are financed by borrowings from domestic and global financial markets. When projects are abandoned, capital is wasted but borrowed fund must be repaid contractually. Analytically, subsequent interest rates in the economy could be affected, resulting in adverse consequences on national growth.

The theory of Ricardian equivalence claims that should interest rate remain stable overtime when capital projects are financed either by debt or taxation it will have no future effect on the economy and no impact on future economic growth. Hyman (2002) states that when government increases borrowing, it invites increased savings by forward-looking tax payers and hence keep the level of interest rates in the economy fixed. Given the Ricardian equivalence, the associated variables to the theory can be tested using the restricted VAR model for want of degree of freedom, with each variable treated symmetrically. Popularized by Sims (1980), it proposes that linear interdependent relationship exist among variables such that all variables in a model can be treated as endogenous plus their lags. Asteriou and Hall (2011: 321) reveal that a unique merit of the VAR model is that forecasts obtainable are better than those of simultaneous equation models.

In a simple form by Maddala and Kim (1998), the VAR model is a multiple time series generalization of the AR model, whose matrix specification can be presented as follows:

$$Y_t = A_1 Y_{t-1} + ... + A_p Y_{t-p} + U_t \tag{3}$$

Where $Y_t' = (y_{1t}, y_{2t}, ..., y_{kt})$ and $A_{1,} A_2, ..., A_p$ and k x k matrices. U_t represents k-dimensional vector white noise process, that $E(ut) = 0$, $E(u_{tk}, u_{sk}) = 0$ *for* $t \neq s$, $E(u_t, u_t') = \Omega$ *for* k x k positive semi-definite matrix, and $\sum$ is positive definite. L as lag operator, the model can be compactly represented as:

$$Y_t = A(L)Y_t + U_t \tag{4}$$

In the VAR (1) model specification of variables, Rail and pipeline output (*RPO*),economic growth (*GDP*), interest rate (*INRT*), budget deficit (BD), private savings (*SVN*), corruption index (*CDX),*and Human development index (*HDI*) are treated symmetrically as follows:

$$\begin{aligned} lGdp_t &= \alpha_t + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i lInrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i lCdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t1} \end{aligned} \tag{5}$$

$$\begin{aligned} lRpo_t &= \alpha_t + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i lCdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t2} \end{aligned} \tag{6}$$

$$\begin{aligned} lBd_t &= \alpha_t + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i lCdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t3} \end{aligned} \tag{7}$$

$$\begin{aligned} Int_t &= \alpha_{it} + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i lCdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t4} \end{aligned} \tag{8}$$

$$\begin{aligned} lSvn_t &= \alpha_{it} + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i Cdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t5} \end{aligned} \tag{9}$$

$$\begin{aligned} lCdx_t &= \alpha_{it} + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i Cdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t6} \end{aligned} \tag{10}$$

$$\begin{aligned} Hdi_t &= \alpha_{it} + \beta_i lRpo_{t-1} + \gamma_i lBd_{t-1} + \tau_i Inrt_{t-1} + \xi_i lSvn_{t-1} \\ &+ \zeta_i Cdx_{t-1} + \psi_i lHdi_{t-1} + \omega_i lGdp_{t-1} + u_{t7} \end{aligned} \tag{11}$$

Where $\beta, \gamma, \tau, \xi, \zeta, \psi, \omega$ are parameters, α is constant term, while $u's$ is the stochastic error. *GDP, RPO, BD, INRT, SVN, CDX* and *HDI* are transformed into log form values. They are as earlier defined. The estimation technique assesses how shocks in the model variables reverberate through the entire system.

RESULTS AND DISCUSSIONS

Data and Descriptive Statistics

Data for 32 years (1981-2012) were sourced from the National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN) Statistical Bulletin. The data for gross domestic product (*GDP*), Budget deficits (*BD*), Rail and Pipeline output (*RPO*) were sourced from the NBS; total private savings (*SVN*) and nominal interest rate (*INRT*) were sourced from CBN. Data on corruption index (*CDX*) was sourced from Transparency International (*TI*) organization. The TI index sums up the perceptions of the degree of corruption as seen by business people and country analyst, and range between zero (0) representing highest corrupt, and ten (10), which is least corrupt (Transparency International, 2014). The *HDI* is sourced from United Nations Development Programme (UNDP).

Descriptive Statistics

The descriptive statistics are presented in Table 3 revealing the first to fourth moment statistics and the test of normality of individual variable's residuals. *GDP's* highest and lowest values were achieved in 2012 (₦4.54 tn) and 1981(₦47.6 bn) respectively. *RPO*'s highest and lowest values were achieved in 1986 (₦138.5Bn) and 1995 (₦2.4bn) respectively; while *BD*'s highest and lowest values were achieved in 2011(₦1.2tn) and 1995(₦1bn) respectively. On the *RPO*, it implies the subsector started dwindling in contribution to national productivity in 1986 up to 1995 when it started improving. Interest rates highest and lowest statistics occurred in 1993 (36%) and 1981 (10%) respectively. *SVN* and *HDI* highest and lowest values were achieved in 2012 and 1981 respectively; Corruption's highest value occurred in 2009, 2012, while the lowest value occurred in 1981, implying that corruption is progressive in Nigeria.

Since the value of the $\chi^2 crit.$is higher than the Jarque-Bera (J.B) statistics in each variable, at this instance, we cannot reject the null hypothesis that their residuals are normally distributed. In addition,

Table 3. Descriptive statistics of Variables

	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
Mean	14.23143	2.860043	10.72512	2.990581	12.11056	0.316677	-1.128608
Median	14.81082	2.351457	10.92526	3.041178	11.94845	0.222343	-1.001463
Maximum	17.51790	4.930870	13.96265	3.586016	15.90278	0.993252	-0.761426
Minimum	10.77100	0.875469	6.907755	2.302585	8.789142	-0.356675	-1.619488
Std.Dev.	2.309684	1.408641	1.963758	0.307502	2.256140	0.369540	0.311486
Skewness	-0.157251	0.234699	-0.087299	-0.58791	0.193389	0.280858	-0.216368
Kurtosis	1.629590	1.448957	2.012521	2.942483	1.800867	2.206527	1.349518
J.Bera	2.635913	3.501426	1.340799	1.847816	2.116691	1.260166	3.881802
Probability	0.267682	0.173650	0.511504	0.396965	0.347029	0.532548	0.143575
Sum	455.4059	91.52137	343.2038	95.69859	387.5378	10.13365	-36.11545
SSq.D.	165.3738	61.51235	119.5468	2.931286	157.7951	4.233358	3.007725

Source: Authors' estimation from Data

the *p*-values are higher than the 5% chosen level of significance, which also concludes that we cannot reject the null hypothesis of normality.

The unit root test examines the extent of stationarity of the data employed using the Augmented Dickey Fuller (ADF) processes. While *GDP* and *BD* were stationary at level *I*(0); *RPO,INRT, SVN, CDX* and *HDI* were stationary at first difference *I*(1), all with constant term and drift parameter, and significant at 5% and 1% respectively (Table 4). As a necessary precondition to testing for co-integration, it implies that being stationery at level and *I*(1) the variables might be suitable for co-integration test.

The Granger causality test was applied to the model as inference test requiring dropping variables that are insignificant. It examined the standard VAR model that expresses both unidirectional bi-directional and no-directional feedback relationship between two variables Y_t and X_t estimated (Granger 1969, Sims, 1980).The results of the short run predictive and causal mechanism of variables are presented in Table 5 which suggest that we reject the hypothesis that bi-directional or feedback relations were found to exist between *HDI* and *GDP*. Similarly, we also reject the null hypothesis to suggest that unidirectional causal relations run as follows *RPO*to*GDP; INRT*to*GDP; GDP*to*CDX; RPO*to*BD; INRT*-to*RPO; RPO*to*HDI; SVN*to*BD; CDX*to*BD; HDI*to*BD; INRT*to*HDI, SVN*to*CDX* and *CDX* to*HDI.*

RESULTS AND DISCUSSION OF FINDINGS

Impulse Response Function (IRF)

The *IRF* is the vector moving average (VMA) representation of each equation, which provides information on the time part of various shocks on the variables in the VAR system. It is an essential and categorical tool in empirical causal analysis for testing policy effectiveness. It visually represents the behaviour of the variables followings various innovations. From equation 1(Table 6 and 7 and Figure 1) *GDP'*s response is positive to its own shock in the ten periods (years) examined. On *RPO*'s impulse, *GDP*'s response was negative in years 2 and 3, and zero (0) level reactions through the remaining innovation periods; and to *BD*'s innovation, no obvious effect occurred as *GDP* remain steady at zero level and negative the very long run. On interest rate *(INRT*) innovation, *GDP*'s reaction is zero and negative it returns to

Table 4. Unit Root Test Results

Variables	ADF test: Level and First difference (Intercept and Trend)	Remark: Order of Integration	% Level of Significance
LGDP	-3.5807	I(0)	5
LRPO	-5.67148	I(1)	1
LBD	-4.58879	I(0)	1
LSNR	-3.99726	I(1)	5
LINRT	-6.23162	I(1)	1
LHDI	-4.49368	I(1)	1
LCdx	-5.38663	I(1)	1

Source: Authors' output estimates; MacKinnon (1996) one-sided *p*-value. Note: variable critical values at 1 and 5 percent are -4.296729 and -3.568379 respectively.

Table 5. Granger Causality Test

Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
LRPO does not Granger Cause LGDP	**30**	**6.95855**	**0.0040**
LGDP does not Granger Cause LRPO		0.02921	0.9712
LINRT does not Granger Cause LGDP	**30**	**5.39636**	**0.0113**
LGDP does not Granger Cause LINRT		0.00816	0.9919
LCDX does not Granger Cause LGDP	30	0.72055	0.4963
LGDP does not Granger Cause LCDX		**3.95506**	**0.0322**
LHDI does not Granger Cause LGDP	**30**	**3.65976**	**0.0404**
LGDP does not Granger Cause LHDI		**3.52972**	**0.0446**
LBD does not Granger Cause LRPO	30	0.27205	0.7640
LRPO does not Granger Cause LBD		**11.0812**	**0.0004**
LINRT does not Granger Cause LRPO	**30**	**5.83619**	**0.0083**
LRPO does not Granger Cause LINRT		0.00037	0.9996
LHDI does not Granger Cause LRPO	30	0.41663	0.6638
LRPO does not Granger Cause LHDI		**8.75616**	**0.0013**
LSVN does not Granger Cause LBD	**30**	**3.34922**	**0.0514**
LBD does not Granger Cause LSVN		0.00934	0.9907
LCDX does not Granger Cause LBD	**30**	**6.42885**	**0.0056**
LBD does not Granger Cause LCDX		2.39578	0.1117
LHDI does not Granger Cause LBD	**30**	**5.04687**	**0.0144**
LBD does not Granger Cause LHDI		0.30062	0.7430
LHDI does not Granger Cause LINRT	30	0.36632	0.6969
LINRT does not Granger Cause LHDI		**3.56151**	**0.0436**
LCDX does not Granger Cause LSVN	30	0.66042	0.5254
LSVN does not Granger Cause LCDX		**3.93496**	**0.0327**
LHDI does not Granger Cause LCDX	**30**	**3.25246**	**0.0555**
LCDX does not Granger Cause LHDI		0.69206	0.5099

Source: Author's estimation using Eviews 7.0

positive in long run (years 7 to 9).On *SVN* impulse, *GDP* responds remain at zero level through to period 6 and negative in the long run. Its response to *CDX* is zero in the first 3 years, negative in years 4 and 5 and thereafter remained at zero level in the long run. Its response to *HDI*'s innovation was of negative impact in the entire 10 year period. The entire equation's summary is that the economy is positively driven largely by its own shocks.

The Rail and pipeline output (*RPO*) response positively to its own innovation in the short run and thereafter negative through years 4 to 10. Its response to innovations from *GDP, BD* and *INRT* are revealing. On *GDP*, except in year short run (year 2), it responded negatively to *GDP*'s shock through the

Figure 1. Impulse Response Function
Source: Author's Estimation Using Eview 7.0

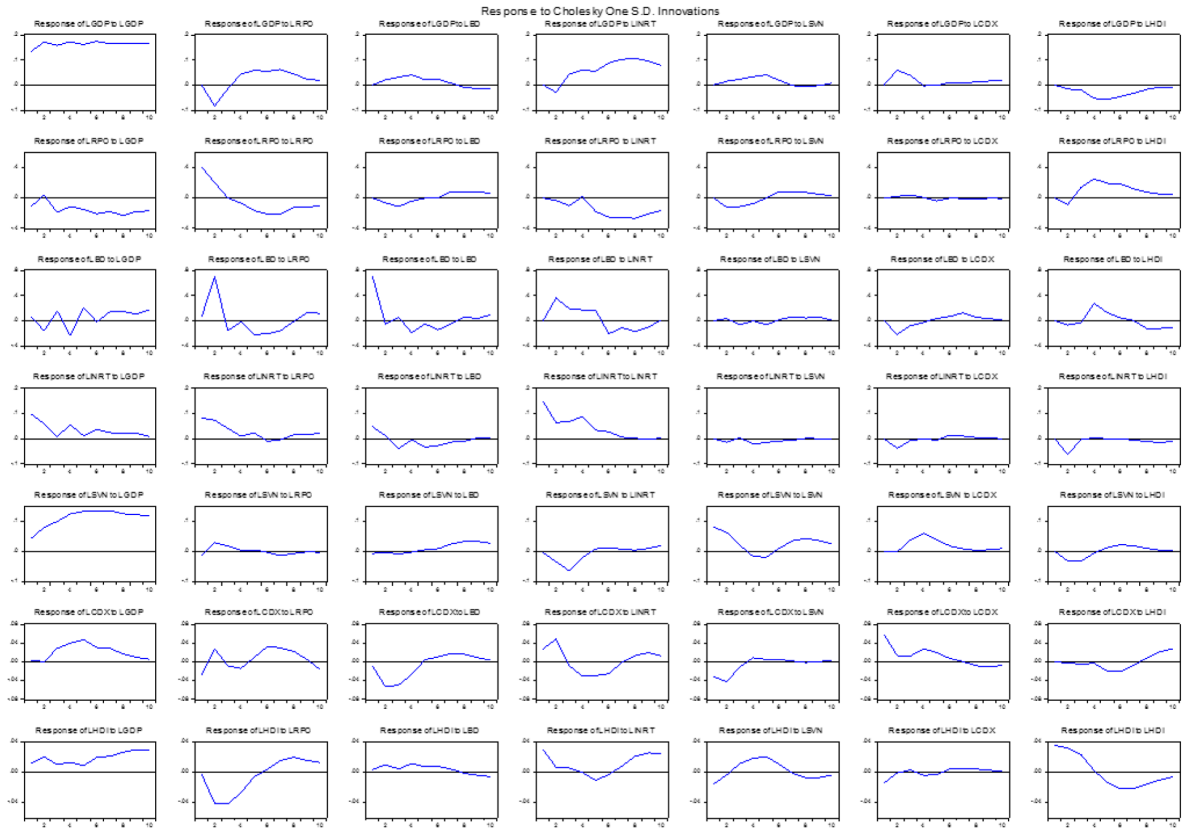

Table 6. Impulse Response Function

Response of LGDP: Period	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	0.133623	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.171495	-0.083596	0.020499	-0.028775	0.015171	0.059961	-0.016589
3	0.158549	-0.015085	0.031576	0.043850	0.022950	0.038764	-0.018916
4	0.172150	0.043872	0.040091	0.059310	0.032272	-0.003701	-0.053221
5	0.161470	0.058760	0.021544	0.055141	0.040250	-0.001913	-0.057798
6	0.174216	0.055418	0.022596	0.088796	0.018246	0.010113	-0.046591
7	0.164152	0.062416	0.006840	0.102759	-0.002317	0.007502	-0.033061
8	0.167246	0.044560	-0.010427	0.106760	-0.006590	0.012024	-0.017560
9	0.168031	0.022817	-0.014101	0.095407	-0.002114	0.016015	-0.008970
10	0.163440	0.018716	-0.013684	0.077838	0.007350	0.016705	-0.009258

continued on following page

Table 6. Continued

Response of LRPO: Period	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	-0.112362	0.411905	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.036054	0.203785	-0.064300	-0.033288	-0.125620	0.018881	-0.087305
3	-0.192759	0.001003	-0.113969	-0.101273	-0.112550	0.039376	0.142679
4	-0.109476	-0.067555	-0.040433	0.015898	-0.075569	0.004776	0.254020
5	-0.150307	-0.166055	-0.003111	-0.176623	-8.24E-05	-0.037154	0.195499
6	-0.209880	-0.215933	0.001316	-0.251909	0.083677	-0.003783	0.186768
7	-0.181150	-0.209547	0.086696	-0.254829	0.079451	-0.004788	0.122995
8	-0.228807	-0.128236	0.074883	-0.270712	0.074063	-0.018966	0.075629
9	-0.180154	-0.123582	0.078193	-0.211963	0.050514	-0.002331	0.052921
10	-0.170974	-0.102217	0.067791	-0.164177	0.027549	-0.006023	0.047181
Response of LBD: Period	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.069460	0.059891	0.715444	0.000000	0.000000	0.000000	0.000000
2	-0.157352	0.696192	-0.055989	0.362227	0.032785	-0.215849	-0.067389
3	0.157022	-0.158934	0.055308	0.192341	-0.065340	-0.076749	-0.030842
4	-0.237045	-0.018778	-0.193059	0.172182	-0.001893	-0.025922	0.278826
5	0.212644	-0.217522	-0.049335	0.168808	-0.061998	0.038757	0.129925
6	-0.018478	-0.206937	-0.142003	-0.205740	0.021694	0.069909	0.043664
7	0.140992	-0.159181	-0.049303	-0.107622	0.060636	0.127258	0.002970
8	0.144534	-0.011746	0.060851	-0.168559	0.044483	0.054676	-0.121302
9	0.106524	0.129483	0.035821	-0.106117	0.059451	0.032164	-0.122276
10	0.172336	0.119267	0.095828	0.017720	0.007879	0.015409	-0.103720
Response of LINRT: Period	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.099146	0.082305	0.047564	0.148471	0.000000	0.000000	0.000000
2	0.059713	0.073908	0.012854	0.064691	-0.014224	-0.037583	-0.062850
3	0.008288	0.040944	-0.039598	0.067569	0.004441	-0.007241	-0.002999
4	0.056050	0.010139	-0.003352	0.089102	-0.020676	-0.001121	0.003137
5	0.011886	0.023340	-0.033349	0.034300	-0.014969	-0.005138	0.000186
6	0.036996	-0.009483	-0.027306	0.027479	-0.008646	0.014846	0.000717
7	0.024049	-0.003275	-0.012942	0.006043	-0.006037	0.010346	-0.005933
8	0.019540	0.015912	-0.009907	0.001612	0.001267	0.005323	-0.010686
9	0.022422	0.014827	0.002243	-0.002166	0.000606	0.003456	-0.016195
10	0.008683	0.022608	0.002422	0.002885	-0.000585	-0.000288	-0.009094

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Table 6. Continued

Response of LSVN: Period	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	0.042552	-0.013140	-0.006802	-0.003777	0.080806	0.000000	0.000000
2	0.079863	0.029156	-0.003025	-0.034093	0.062405	-0.001676	-0.031321
3	0.099244	0.018390	-0.008603	-0.063953	0.021108	0.038220	-0.032600
4	0.124193	0.004494	-0.002252	-0.021474	-0.016119	0.059945	-0.005223
5	0.133681	0.004725	0.005710	0.008886	-0.018916	0.039026	0.013288
6	0.134690	-0.002905	0.009280	0.012637	0.011015	0.017941	0.022207
7	0.136066	-0.013879	0.024982	0.008006	0.035896	0.008472	0.018680
8	0.125028	-0.006487	0.033199	0.004309	0.043386	0.003860	0.010365
9	0.121173	-0.001566	0.033172	0.010149	0.036411	0.005803	0.004077
10	0.119186	-0.002888	0.026678	0.019751	0.025402	0.009827	0.004223
Response of LCDX: Period	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.002651	-0.028113	-0.008722	0.026944	-0.031964	0.058451	0.000000
2	0.000445	0.027883	-0.052484	0.049155	-0.041757	0.013565	-0.002469
3	0.029002	-0.008944	-0.049584	-0.008984	-0.011265	0.012753	-0.004515
4	0.039602	-0.013857	-0.027025	-0.029823	0.008686	0.027845	-0.003485
5	0.047662	0.009448	0.004888	-0.029235	0.005359	0.019993	-0.019407
6	0.030574	0.033102	0.010604	-0.025141	0.005052	0.007066	-0.020517
7	0.029154	0.030019	0.017594	-0.000977	0.001652	0.000396	-0.007575
8	0.017029	0.022324	0.016525	0.013693	-0.001187	-0.008368	0.008494
9	0.009670	0.005497	0.008885	0.019808	0.000354	-0.010658	0.022140
10	0.005818	-0.016171	0.003847	0.013277	0.003185	-0.007528	0.027794
Response of LHDI: Period	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.011281	-0.002491	0.003480	0.030189	-0.015465	-0.014092	0.035662
2	0.020699	-0.041006	0.009900	0.006766	-0.003585	-0.000865	0.031773
3	0.010332	-0.041760	0.004512	0.005527	0.011540	0.002918	0.023204
4	0.013006	-0.027313	0.011608	-0.000307	0.018249	-0.003932	0.002430
5	0.008852	-0.005654	0.006910	-0.010675	0.020560	-0.003163	-0.013573
6	0.019854	0.003724	0.007870	-0.002960	0.010468	0.004528	-0.021966
7	0.021167	0.015685	0.004060	0.008222	-0.001431	0.005548	-0.021422
8	0.026627	0.019680	-0.001416	0.021300	-0.007135	0.004441	-0.015651
9	0.030044	0.015724	-0.004018	0.025715	-0.007118	0.002697	-0.010067
10	0.029541	0.012701	-0.005648	0.025115	-0.003594	0.001438	-0.005648

Source: Author's estimation using Eview 7.0

Table 7. Variance Decomposition

Variance Decomposition of LGDP: Period	S.E.	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	0.133623	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.244137	79.30110	11.72465	0.705019	1.389237	0.386168	6.032105	0.461715
3	0.300458	80.20306	7.993109	1.569931	3.047202	0.838378	5.647137	0.701183
4	0.361729	77.98282	6.985628	2.311506	4.790665	1.374381	3.906560	2.648444
5	0.410904	75.87644	7.458633	2.066238	5.513429	2.024602	3.029640	4.031020
6	0.461808	74.30290	7.345061	1.875240	8.062109	1.758974	2.446512	4.209208
7	0.505835	72.46244	7.644677	1.581295	10.84667	1.468199	2.061158	3.935564
8	0.545736	71.64530	7.234339	1.395017	13.14545	1.275936	1.819320	3.484633
9	0.579850	71.86068	6.563000	1.294839	14.35148	1.131550	1.687833	3.110611
10	0.608238	72.52988	6.059359	1.227405	14.68079	1.042991	1.609385	2.850195
Variance Decomposition of LRPO Period	**S.E.**	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.426955	6.925844	93.07416	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.504104	5.479715	83.10771	1.626999	0.436037	6.209818	0.140283	2.999441
3	0.590845	14.63231	60.49730	4.905048	3.255320	8.149008	0.546248	8.014767
4	0.661660	14.40542	49.28313	4.284720	2.653536	7.802444	0.440790	21.12996
5	0.747507	15.32990	43.54822	3.358815	7.662021	6.113225	0.592408	23.39542
6	0.868793	17.18440	38.41537	2.486701	14.07932	5.453145	0.440445	21.94063
7	0.962000	17.56166	36.07670	2.840345	18.50020	5.129737	0.361709	19.52965
8	1.041488	19.80973	32.29601	2.940286	22.54028	4.882299	0.341765	17.18963
9	1.090333	20.80466	30.75190	3.197045	24.34522	4.669304	0.312287	15.91958
10	1.123867	21.89600	29.77133	3.372949	25.04805	4.454902	0.296801	15.15997
Variance Decomposition of LBD: Period	**S.E.**	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.721299	0.927353	0.689438	98.38321	0.000000	0.000000	0.000000	0.000000
2	1.102844	2.432400	40.14507	42.34234	10.78781	0.088374	3.830635	0.373374
3	1.147757	4.117389	38.98220	39.32559	12.76836	0.405681	3.983850	0.416934
4	1.232569	7.268853	33.82530	36.55319	13.02309	0.352009	3.498690	5.478862
5	1.290317	9.348681	33.70732	33.50078	13.59507	0.552072	3.282755	6.013324
6	1.333356	8.774088	33.97505	32.50715	15.11247	0.543477	3.349147	5.738618
7	1.362700	9.470795	33.89215	31.25317	15.09238	0.718325	4.078566	5.494614
8	1.389164	10.19590	32.62028	30.26562	15.99513	0.793755	4.079564	6.049742
9	1.410657	10.45780	32.47635	29.41485	16.07730	0.947365	4.008181	6.618141
10	1.433329	11.57523	32.14946	28.93865	15.58800	0.920654	3.893942	6.934066

continued on following page

Table 7. Continued

Variance Decomposition of LINRT: Period	S.E.	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	0.202262	24.02814	16.55880	5.529939	53.88312	0.000000	0.000000	0.000000
2	0.244649	22.38064	20.44432	4.055784	43.82147	0.338049	2.359945	6.599790
3	0.260409	19.85490	20.51664	5.891978	45.41042	0.327456	2.160246	5.838369
4	0.281862	20.90186	17.64174	5.043350	48.75410	0.817615	1.845501	4.995835
5	0.287527	20.25732	17.61242	6.191882	48.27521	1.056754	1.805437	4.800978
6	0.293132	21.08284	17.04988	6.825088	47.32521	1.103724	1.993553	4.619706
7	0.294785	21.51263	16.87155	6.941521	46.83799	1.133321	2.094441	4.608549
8	0.296274	21.73197	16.99087	6.983750	46.37144	1.123789	2.105730	4.692453
9	0.297968	22.05176	17.04578	6.910214	45.85084	1.111458	2.095302	4.934647
10	0.299114	21.96748	17.48676	6.863955	45.50971	1.103346	2.079381	4.989373
Variance Decomposition of LSVN: Period	**S.E.**	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.092593	21.11983	2.013734	0.539645	0.166349	76.16044	0.000000	0.000000
2	0.147822	37.47523	4.680356	0.253613	5.384381	47.70422	0.012855	4.489343
3	0.197919	46.04882	3.474194	0.330405	13.44458	27.74835	3.736288	5.217365
4	0.242823	56.75137	2.342336	0.228107	9.713993	18.87530	8.576468	3.512436
5	0.281113	64.95788	1.775948	0.211462	7.347840	14.53625	8.326439	2.844171
6	0.313619	70.63489	1.435466	0.257463	6.065994	11.80252	7.017136	2.786536
7	0.345631	73.65446	1.343114	0.734400	5.048023	10.79607	5.837565	2.586361
8	0.371833	74.94572	1.190926	1.431729	4.375066	10.68956	5.054603	2.312396
9	0.394366	76.06685	1.060299	1.980335	3.955620	10.35536	4.515150	2.066387
10	0.414246	77.21921	0.965832	2.209582	3.812402	9.761313	4.148459	1.883202
Variance Decomposition of LCDX: Period	**S.E.**	**LGDP**	**LRPO**	**LBD**	**LINRT**	**LSVN**	**LCDX**	**LHDI**
1	0.077702	0.116368	13.09051	1.259877	12.02393	16.92260	56.58671	0.000000
2	0.117982	0.051896	11.26313	20.33514	22.57352	19.86657	25.86596	0.043784
3	0.133004	4.795543	9.314776	29.89907	18.21869	16.34968	21.27255	0.149696
4	0.148098	11.01817	8.388248	27.44499	18.74935	13.53078	20.69234	0.176127
5	0.161176	18.04752	7.425845	23.26385	19.12024	11.53463	19.00935	1.598560
6	0.171024	19.22483	10.34152	21.04631	19.14266	10.33177	17.05392	2.858987
7	0.177119	20.63389	12.51465	20.60947	17.85091	9.641637	15.90091	2.848539
8	0.181007	20.64198	13.50384	20.56699	17.66454	9.236158	15.43881	2.947687
9	0.184289	20.18861	13.11610	20.07341	18.19622	8.910478	15.22826	4.286922
10	0.187851	19.52605	13.36438	19.36118	18.01217	8.604452	14.81672	6.315038

continued on following page

Table 7. Continued

Variance Decomposition of LHDI: Period	S.E.	LGDP	LRPO	LBD	LINRT	LSVN	LCDX	LHDI
1	0.052597	4.599815	0.224300	0.437654	32.94391	8.645661	7.178591	45.97007
2	0.077739	9.195533	27.92700	1.821977	15.83828	4.170458	3.298535	37.74822
3	0.092871	7.680643	39.78715	1.512618	11.45165	4.466206	2.409916	32.69181
4	0.100147	8.291787	41.65409	2.644329	9.849045	7.161215	2.226604	28.17293
5	0.104492	8.334294	38.55530	2.866373	10.09083	10.44982	2.136937	27.56644
6	0.109589	10.85904	35.16738	3.121575	9.246874	10.41261	2.113512	29.07902
7	0.115237	13.19465	33.65703	2.947205	8.871698	9.432328	2.143153	29.75393
8	0.123074	16.24862	32.06420	2.597068	10.77301	8.605424	2.009104	27.70258
9	0.130896	19.63282	29.78961	2.390165	13.38337	7.903381	1.818603	25.08205
10	0.137395	22.44224	27.89280	2.338370	15.48869	7.241842	1.661586	22.93447

Source: Author's estimation using Eview 7.0

remaining 9 years. Similarly, it responded negatively to *BD* in the short run and zero impact from year 6 on; and to *INRT*'s shocks, zero level impact occurred in year 1 and 4, the rest 8years periods witness negative impacts. Savings innovation generated negative impulse in the first half period while the rest half of the period resulted in zero response. *CDX* innovation has zero impact in the short run while the long run was of negative impact. *HDI*'s impulse resulted in positive response from year 3 through to the 7th year, while the 8th to 10thyear produces zero response. The summary of the output is that while its performance is weakened by its history, other macroeconomic variables like *GDP*, *INRT,* and *SVN*do not drive the rail system while *CDX* impacts negatively on it.

BD's response to shocks in *GDP, RPO, INRT, SVN, CDX, HDI* and itself result in fluctuations from positive value to zero level and negative values. On to itself, negative outcome occurs within years 2 and 7 while the rest of the periods are of negative consequence. On *GDP* shock, *BD* response is negative in years 2, 4 and 6, while the long run is of positive outcomes. On *INRT* shock, the response is mixed through the innovation period, with positive response in the short run but negative in the long run. On saving, the response was zero in year 1 and 2; negative in years 3-5 and zero in the long run. It implies that the saving rate is not encouraging for deficit financing. The shock from *CDX* induces negative impact in the short run and zero level impact in the long run, short of period 7 with positive impact. On *HDI* shock, except for period 4 and 5 with positive impact the rest innovation periods are of negative ad zero impacts. On *RPO* shock, *BD* records high positive response in year 2, low positive response in year 9 and 10, the rest periods are of negative response. In summary, the equation's outcome is that GDP's shock significantly drives *BD*, while *INRT* enhances it in the short run.

The interest rate (*INRT*) responses to the model's innovations were also unique. On shock from *GDP, INRT* maintained zero response through the entire 10 year period. On *RPO* and *BD's* impulses, it is largely zero level response in the short run and negative in the long run. Its responds to its own shock is positive in year 1 to year 4, but maintain zero level response thereafter while from *SVN* and *HDI* negative responses are revealed, an apparent weakness of the Ricardian hypothesis. In summary, *INRT*'s response to variables in the model is weak; Ricardian hypothesis did not hold between *SVN* and *INRT*.

SVN responds positively to *GDP*'s impulse in the entire ten innovation period. Its response to innovations from *RPO, BD* and *HDI* fluctuate around zero level in the entire 10 year period. Its response to *INRT* is negative in the years 1 to 5, and thereafter remains negative through the long run. Its response to self-innovation is negative in year4 and 5 thereafter assume zero state to the 10th period. Its response to *CDX*'s shock remains of zero response in the entire period. In summary, *SVN* is driven by *GDP*'s innovation and not to *BD* as Ricardian hypothesis claims.

CDX's responses to shocks in all the variables in the model were negative and zero level in short and long run period. Given the context of estimating the corruption index, it suggests that corruption is encouraged by the variables as *CDX* responded negatively to short run shocks in *RPO, BD, INRT* and *HDI*; and zero level response in the long run.

Similarly, *HDI*'s responses to innovations were of zero impact from itself and BD in the short-run, and for GDP in the 10 years period. It responded negatively in the short run to shock in RPO and *CDX,* while the long run period experienced zero level response. This suggests that given level of innovations in the studied variables the living standards might remain at same level in the short run and deteriorate further in the long run.

Variance Decomposition (VD)

The decomposition of Cholesky's standard deviation in *GDP, RPO, BD, INRT, SVN, CDX* and *HDI* (see *table 9*) produced interesting revelations. The *GDP*'s forecast error is largely attributed to itself, *INRT* and *RPO*. While *GDP* generated average of 64% of the forecast error in the 10 year period, both *INRT* and *RPO* accounted, on average for 14% and 7% of the errors respectively. The Statistics of the *RPO*'s forecast error variance show that it is attributed to self in the short run by about 70%; while the long run forecast error is attributed to self (33%), *INRT* (22%), *HDI* and *GDP* (18%) respectively. The forecast error for *BD* is attributed to itself by 98% in year 1 and thereafter from years 2 to 10 by 53%; *RPO*(34%) and *INRT*(20%) respectively. The rest variables produced marginal influence to the forecast error.

The decomposition of the *INRT* error in the 10 year forecasts is generally patterned as follows: to self, 45%, *GDP* 21% and Rpo18%, implying that high interest rate problem is both self and economy wide induced. The *SVN*'s forecast terror is attributed to itself by 90% and 62% in years 1 and 2 respectively while *GDP* absorbed average of72% of the error from year's 3 to 10 innovation period, implying that long term ability to grow saving is a function of the economy. Corruption's forecast error is due to self by 56% in year 1 declining marginally to 14% in year 10. From years 5 to 10 the pattern on average is as follows: *BD* 22%, GDP 19% and *INRT*, 15%.The *HDI*'s forecast error is attributed to itself, *RPO* and *INRT* by average of 30% in the short run, while in the long-run itself and *RPO* absorbed the larger of the forecast error more than any other variable in the model.

Policy Implications and Recommendations

The result of Granger causality test that Rail and Pipeline output (RPO) significantly predicts GDP, indicate that economic growth can be influenced by RPO, if the sector is appropriately managed. Government investment in rail and pipeline transport can ignite rapid growth, giving its linkage effect on growth inspired sectors such as agriculture and industrial transportation. Full privatization should be the lasting solution to a sound rail industry as practiced in Brazil and Mexico. Interest rate also significantly granger

causes GDP implying that interest rate regime can be managed to create favourable credit economy and thus a pointer to high economic growth.

That *HDI* and *GDP* is bi-directly causal is accordance with economic growth theories which postulates that indices of standard of living-per capita income, knowledge economy, and life expectancy are potent determinants of economic growth. Hence, investments in *HDI* indicators and *GDP* are bound to produce symmetrical growth in the average citizen and the country. Interest rate granger causes *RPO* means that the interest rate as an investment instrument can effectively improve the fortunes of the rail and pipeline sector investment and hence boost productivity.

CDX granger causes *BD* implies that budget deficit (*BD*) policies might not be growth induced but borne to advance corrupt practices. *HDI* granger causing *CDX* may partly be attributed to poverty induced corruption. However, the non-significance of *CDX* and *RPO* imply that corruption might not be responsible for poor state *RPO*.

RPO significantly granger causes *HDI* indicating influence of rail and pipeline output in poverty reduction. Developed rail and pipeline transport produces cheaper, efficient and effective transportation of goods and services which increases access of the rural and urban poor to cheaper mode of transportation (Bangsund *et al.*, 1997). The result also shows that *SVN* significantly granger causes *BD* indicating that improved savings can reduce Budget deficit. The non-causal influence from *BD* to *SVN* suggests that the Ricardian hypothesis does not suffice in the Nigerian case. The non- causality from *SVN* to *INRT* further put doubt on the efficacy of the Ricardian hypothesis in Nigeria fiscal system.

Interest rate granger causes *HDI* implies that interest rate influences standards of living. Nigeria's relative experience of high interest rate regimes (persistence of availability and cost doctrine) makes credit accessible only at high cost, easily transmitted to inflation, hence a deterrent to improved living standard. Government through the Central Bank can improve the credit system by lowering its monetary rate below 5%, boost credit towards the productive sector.

The Impulse Response function (*IRF*) results show that *GDP* maintains improved positive growth behaviour following improvements in the economy's growth variables generally. On the *RPO*'s innovation *GDP* maintenance of zero response in the greater part of the innovation period, shows the weak link in *RPO* and growth, indicating that the rail and pipeline sector needs more investments inputs for it to impact *GDP*.

RPO's negative response to *GDP*, *BD, SVN* and *INRT* in the innovation period shows that the sector was adversely affected by the economy's growth trend. *BD* financing should be directly invested in critical infrastructures like the rail and pipeline sector as catalysts, generating reproductive investment mechanism that permeates all sectors of the economy. The savings and interest rate shock to which *RPO* responds negatively indicates weak policies that are counterproductive to rapid rail and pipeline growth process.

The negative responses in years 1 to 5 on *SVN* for innovation from *BD* while other years are of zero impact suggests weakness of the Ricardian hypothesis in Nigerian case, as *BD* does not positively invite savings. It implies that the theory of savings on account of *BD* does not hold in Nigeria in the context of study. Impulses from *RPO, GDP, BD, INRT* on *HDI* and *CDX* were both of zero and negative response suggesting that living standards and corruption matters are not being encouraged by these variables. Government should review its policies dealing with *BD, RPO, INRT* and growth to positively impact *HDI* and reduce *CDX*.

The dynamic decomposition of forecast error variance produces implications as follows: the *LGDP* forecast error is attributed to itself and exogenous shocks in BD and INRT. For future improvement in *GDP, BD* and *INRT* mechanism and process might need to often examine for greater impact on the

economic growth potential. Similarly, the *RPO*'s forecast error from year 4 to 10 is attributed to external shocks from *LBD, INRT and HDI*, indicating strong relationship between Rail and pipeline growth, budget deficit, interest rate and living standard. Government should regularly re-examine its policies on budget deficit and interest rate to impact on rail output growth.

Budget deficit (*BD*) forecast error is highly absorbed by external shock from interest rate and *RPO*. Government's fiscal and monetary policies should be increasingly examined towards low interest rate regime. The *BD* should be strictly applied to productive infrastructure such as the *RPO*, since the quantity of *BD* often crowd out the private sector credit, which impacts on high lending rate, and inflation in the economy. This *BD* result is symmetrical to the forecast error variance of interest rate which is highly attributed to external shocks from *RPO* and *BD*.

Real Options in Public Capital Investments

It is normal practice for investors to make changes that affect subsequent cash flows over the life of the project (Van Horne & Dhamija, 2012). The presence of real options enhances the worth of an investment project. It's worth becomes the net present value (NPV) originally computed plus the value of the option. Real option can be of three important types: the option to vary output; the option to abandon; option to postpone. Option to vary entails either to expand production if conditions turn favourable, otherwise called growth option and to contract production if condition turn bad, which involve shutting down. Option to abandon would be viable if the project has abandonment value which effectively represents a put option to the option writer. Option to postpone, also known as investment timing option evolves from the option that the project should wait to obtain new information (Van Horne & Dhamija, 2012). Abandonment option may be preferred when the project goes awry, necessitating selling the assets. However, selling the assets may not be best option to realizing abandonment value as the asset may simply be employed in another area. In either case the abandonment value should be estimated.

Financial Lessons learned

First, information from interviews with senior members of the State Ministry of Transport reveals that the state had to pay penalty due from judgment debt on the contract cancellation totalling over ₦600 million as cost and penalty to the foreign consortium. Secondly, the non-availability of rail transport as envisioned by the government since the failure in the early 1980s has increased the average cost of transportation, freight and passengers in the state, impacting negatively on citizens' health and welfare; reduced the productive time for business and productivity and the nation's GDP. Ochonma (2015) estimated at ₦500 billion the annual losses due to lack of functional freight rail services that would have assisted in transporting goods from the country's two busiest seaports to other parts of Nigeria. Thirdly, the financial cost (on litigations and demolishing physical structures) to reclaim the original routes for reconstruction, having been encroached on, as promised by current Governor would be enormous.

CONCLUSION

The economics of abandoning a project needs to be considered seriously as part of the project planning process. Successful project requires careful and elaborate planning from inception. Decisions must be

taken upon information supplied by competent professionals, not only on the technical, economic, commercial viability of the project but on the political feasibility. Prompt payment for work done, inflation financing should be effectively managed while changes in government should not affect on-going project. Legal instruments should be put in place as a policy to avoid project abandonment or flimsy excuse of not continuing with inherited projects. Project insurance should be considered as part of any successful project to cover project companies and lenders against unpredictable losses.

The study used VAR model to examine the behaviour of *GDP, RPO, BD, INRT, SVN, CDX* and *HDI* as proposed by theory and literature. The responses of *RPO* from shocks in *GDP, BD, INRT* and *SVN* are either zero (0) or negative, suggesting that the variables do not impact *RPO* growth. Similarly, *CDX* innovation has zero impact in the short run while the long run was of negative impact. *HD*I's impulse however resulted in positive response from year 3 through to the 7th year, while the 8th to 10th year produces zero response. The summary of the equation's output is that while *RPO*'s performance is weakened by its history, other macroeconomic variables like *GDP, INRT* and *SVN* do not drive the rail system while *CDX* impacts negatively on it. Since *RPO* is highly significant in the tests carried out, its abandonment speaks of possible the negative impact the GDP and other variables of importance would suffer.

The Ricardian hypothesis tested reveal that it does not hold as *BD* did not granger cause *SVN*, while *SVN* also failed to granger cause *INRT* as the theory suggests. The variance decomposition result of *RPO'*s forecast error variance show that it's variance is attributed to self in the short run by about 80%, *GDP* (10%) and *HDI*(5%); while the long run forecast error is attributed to self (33%), *INRT* (22%), *HDI* and *GDP* (18%) respectively. Apart from the impact of *RPO* on the major macroeconomic variables, project abandonment economic implications are enormous if the benefit to be derived by investment in is taken into account. Such investment becomes sunk are consequently cost in addition to the incalculable loss in welfare effects on the populace generally.

Government investment in rail and pipeline transport can ignite rapid growth, giving its linkage effect on growth stimulating sectors such as agriculture and industrial transportation. Full privatization would be the lasting solution to a sound rail transport industry as practiced in Brazil and Mexico and elsewhere.

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REFERENCES

Apanisile, O. T., & Akinlo, T. (2013). Rail transport and economic growth in Nigeria (1970-2011). *Australian Journal of Business and Management Research*, *3*(5), 18–24.

Asteriou, D., & Hall, S. G. (2011). *Applied Econometrics* (2nd ed.). Palgrave Macmillan.

Bangsund, D. A., Leistritz, F. L., & Honeyman, J. S. (1997). *Assessing Economic impacts of Railroad Abandonment on Rural Communities*. Retrieved from www.handystevenson.com

Bashir, O. K. (2013). Growth-Effects of Macroeconomic Stability Factors: Empirical Evidence from Nigeria. *Developing Country Studies*, *3*(14), 47–55.

Chitkara, K. K. (2006). *Construction Project Management: Planning, Scheduling and Controlling*. New Delhi: Tata McGraw-Hill Publishing Company.

Clunies-Ross, A., Forsyth, D., & Hug, M. (2009). *Development Economics* (1st ed.). McGraw-Hill Higher Education.

Dean, J. (1951). *Capital Budgeting*. New York: Columbia University Press.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, *74*, 427–431.

Diji, C. J. (2004). Constraints to Industrialization: An Ex-Post Evaluation of the Iron and Steel Industry in Nigeria. *Challenges of Nigerian Industrialization: a Pathway to Nigeria Becoming a Highly Industrialized Country in the Year 2015, Selected papers for 2004 Annual Conference of the Nigerian Economic Society*, 493-519.

Dwivedi, D. N. (2008). *Managerial Economics* (7th ed.). Vikas Publishing House PVT Ltd.

El-Rufai, N. A. (2012). *The Tragedy of Abandoned Projects*. Retrieved from www.nigeriaintel.com

Elinwa, A. U., & Joshua, M. (2001). Time-Overrun Factors in Nigeria Construction Industry. *Journal of Construction Engineering and Management*, *127*(5), 419–425. doi:10.1061/(ASCE)0733-9364(2001)127:5(419)

Garrett, A. T. (2004). *Light-Rail Transit in America Policy Issues and Prospects for Economic Development.* Federal Reserve Bank of St. Louis.

Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and Cross Spectral Methods. *Econometrica*, *35*(3), 424–438. doi:10.2307/1912791

Granger, C. W. J. (1986). Development in the Study of Co-integrated economic variables. *Oxford Bulletin of Economics and Statistics*, *48*, 3.

Hall, R. E. & Jones C. I. (1997). Level of Economic Activities Across countries. *American Economic Review*, *87*(2), 173-177.

Hellewel, D. S. (2001). Toward the year 2000 Transport for our cities. In Global Issues (vol. 3). I.B. Tauris Publishers.

Hyman, D. N. (2002). *Public Finance: A Contemporary Application of Theory to Policy* (7th ed.). Harcourt College Publishers.

Ingwe, R., Mbato, W. A., & Ebong, E. (2012). *Project Abandonment, corruption, and Recovery of Unspent Budgeted Public Funds in Nigeria*. Retrieved from www.revecon.ro/articles/2012-1/2012-1-2.pdf

Interstate Commerce Commission, Rail Services Planning Office. (1975). *Rail Service Continuation Subsidy Decisions: Intent to Establish Criteria.* Academic Press.

Jhingan, M. L. (2007). The Economics of Development and Planning (39th ed.). Vrinda Publications.

Kavanagh, P., Doyle, C., & Metcalfe, O. (2005). *Health impacts of Transport: A Review*. Institute of Public Health in Ireland.

Kerzner, H. (2004). *Production Management: A system Approach to planning, scheduling and controlling* (2nd ed.). CBS Publishers and Distribution.

Lagos State G. D. P. Survey. (2010). *Lagos State Gross Domestic Product (GDP) Survey: 2010.* Lagos State Bureau of Statistic, Ministry of Economic Planning and Budget, Alausa, Ikeja. Retrieved from www.lagosstate.gov.ng

Lagos State Government (LSG). (1981). Ministry of Public Transportation (LSMPT). Lagos Metro Line Project Phase 1 Final Report (1981). The Japanese Consortium.

LAMATA. (2015). *Lagos Rail Mass Transit*. Retrieved from www.lamata-ng.com

Maddala, G. S., & Kim, I. (1998). Unit Roots, Co-integration and Structural Change. Cambridge University Press.

Meir, S., & Sepe, J. F. (1989). Project termination announcements and the market value of the firm. *Financial Management*, *18*(4), 74–81. doi:10.2307/3665799

Merna, T., & Al-Thani, F. F. (2008). *Corporate Risk Management* (2nd ed.). John Wiley Sons, Ltd.

Miller, M. E. (1988). On the Systematic Risk of Expansion Investment. *The Quarterly Review of Economics and Business*, *28*(Autumn), 66–77.

Musgrave, R. A., & Musgrave, P. B. (2004). Public Finance in Theory and Practice (5th ed.). Tata McGraw Hill Education Private Ltd.

Nairaland Forum. (2014). *Lagos, emerging cities hold promise of 50% world growth*. Retrieved from www.businessdayonline.com

National Bureau of Statistics. (2014). *Nigerian Gross Domestic Product Report, Quarter four*. National Bureau of Statistics. Retrieved from www.nigerianstat.gov.ng

Ochonma, M. (2015). *Nigeria loses ₦500bn yearly to failed freight rail service*. Retrieved from www.businessdayonline.com

Odufalu, O., & Loto, M. A. (2008). *Project Analysis and Evaluation Principles and Techniques* (3rd ed.). Concept Publications.

OECD. (2012). *Debt and Macroeconomic Stability.* OECD Economics Department Policy Notes, No. 16.

Okorafor, G. F. (2004). *Impact Analysis of Federal Highways on the Local Economy- A case of selected highways in Nigeria* (Unpublished PhD Thesis). Federal University of Technology Owerri.

Olowe, R. A. (2011). *Financial Management, Concepts, Financial System and Business Finance* (3rd ed.). Lagos: Brierly Jones Nigeria Ltd.

Omotosho, K. (2012). *About 12,000 federal projects abandoned across Nigeria*. Retrieved from http://www.premiumtimesng.com/news/108450-about-12000-federal-projects-abandoned-across-nigeria.html

Rojas-Rueda, D., Nazelle, A., Teixidó, O., & Nieuwenhuijsen, M. J. (2013). Health impact assessment of increasing public transport and cycling use in Barcelona: A morbidity and burden of disease approach. Preventive Medicine, 57(5), 573-579.

Schwable, K. (2006). *Introduction to Project Management.* Thomson Course Technology. Retrieved from www.thomsonrights.com

Sims, C. (1980). Macroeconomics and Reality. *Econometrica*, *48*(Jan), 1–49. doi:10.2307/1912017

Stevenson, W. J. (2007). Operations Management (9th ed.). McGraw-Hill Irwin. Retrieved from www.mhhe.com

Telsang, M. (2004). *Industrial Engineering and Production Management*. S. Chand and Company Ltd.

Ubani, E. C., & Ononuju, C. N. (2013). A study of failure and abandonment of public sector-driven civil engineering projects in Nigeria: An empirical review. *American Journal of Scientific and Industrial Research*, *4*(1), 75–82. doi:10.5251/ajsir.2013.4.1.75.82

Van Horne, J. C., & Dhamija, S. (2012). Financial Management and Policy (12th ed.). Pearson.

Varian, R. H. (2002). *Intermediate Microeconomics A modern Approach* (6th ed.). New York: W.W. Norton & Company.

Vittas, D. (1999). *Pension Reform and Financial Markets*. Harvard Institute for International Development, Harvard University.

Yescombe, E. R. (2014). Principles of Project Finance (2nd ed.). Elsevier.

KEY TERMS AND DEFINITIONS

Abandonment Decision: Any option to discontinue projects that have earlier been appraised and undertaken by an investor, usually after difficult and impossible conditions force the investor to discontinue such projects. Since most projects are capital intensive, the losses can be substantial.

Capital Projects: These are the type of projects that are proposed to be revenue and return yielding, either by the private or public sector. Appraisals of these types of projects are technical.

Lagos: The former capital city of Nigeria, noted for its bustling economic activities and population congestion.

Metroline: The type of railways services that is built to serve the public in cities and metropolitan centres.

Public-Sector Project: Public sector projects are the type of capital projects that are to be executed for the benefit of the public either for the people to derive benefits or to save costs. Capital projects in the public sector is not necessarily to yield revenue for the government.

Ricardian Equivalence: A theory that shows how the people internalise the budgets deficits caused by a high expenditure on public sector project by possible surpluses in the future since the expenditure was incurred for the people's benefits today.