

Alaa M. Soliman¹
Mohammad Aliu Momoh²
Ibrahim L. Awad³

INFRASTRUCTURE GUARANTEES: MAKING IT SIMPLE

This study offers new insights into fiscal policy management by providing an alternative to the traditional way of estimating guarantee. It therefore takes away the need for guesswork amongst policy makers in estimating contingent liability. The findings confirm the long held belief that fundamental risk consideration should influence the choice of method in calculating value at risk which will be guaranteed by government. The study confirms that political consideration influences the governance risk indicator which is used to calculate the governance risk factor and that a default by government on guarantees for public private partnership transactions will have a negative impact on the debt while also providing a valuable path in the choice of "fundamental risk" indices in determining the value at risk.

JEL: E62; H81; H68

Introduction

The traditional view as to whether and to what extent government should assume responsibility for the provision of public goods has shifted substantially over the past few decades (Calitz and Fourie, 2010). Past experiences have shown that exclusive public sector ownership and provision of infrastructure can lead to inefficient investment decisions, therefore different organisational forms have been increasingly used that would permit more private sector involvement, and can potentially harness the private sector effectively (Sutherland et al, 2009). Unfortunately, the global financial crisis has presented enormous challenge to the delivery of infrastructure requiring a global investment of around 71 trillion US dollars by 2030 to keep up with population growth and demand (Sachs, et al, 2004; Barker et al. 2009).

¹ Alaa M. Soliman is Dr., Senior Lecturer in Economics, Senior Fellow, The Higher Education academy (SFHEA), School of Accounting, Finance and Economics, Faculty of Business and Law, Leeds Beckett University, e-mail: a.soliman@leedsbeckett.ac.uk.

² Mohammad Aliu Momoh is part-time Lecturer in Economics, School of Accounting, Finance and Economics, Faculty of Business and Law, Leeds Beckett University, e-mail: m.momoh7666@student.leedsbeckett.ac.uk.

³ Ibrahim L. Awad is Dr., Senior Lecturer in Economics, Department of Economics, Faculty of Commerce, Zagazig University, Egypt, e-mail: ibrahimphd@yahoo.com.

The need for provision and maintenance of infrastructure requires large investment (Lai and Soumaré, 2009; Price Waterhouse Coopers, 2011; Kateja, 2012), for instance the infrastructure expenditure needs in sub-Saharan Africa is estimated to be between 9 to 13% of GDP for at least the next 10 years but spending on infrastructure is currently at 3% and the cost of maintenance estimated at 7% of GDP for developing countries. Unfortunately fiscal and longer-term structural budget pressure has made it imperative for government to seek private partnership in the provision of infrastructures (Webb, 2004; Wall and Connolly, 2009; Alitheia Capital, 2010; Qiu and Wang, 2011; Foster and Pushak, 2011; Barandiaran, 2011; Kateja, 2012).

The participation of the private participant must however be attractive enough to encourage private financiers and experts to commit their financial resources. This has, in most cases necessitated the government providing some form of incentives like guarantees that have financial implication for the government and its fiscal regime.

Guarantees are a form of government intervention intended to alter the incentives faced by the private sector and other public sector entities (Ter-Minassian, 2005). According to Irwin (2007) the use of government guarantees to help persuade private investors to finance new infrastructure is appealing because it allows the government to get the infrastructure built without paying immediately and to benefit from the skills and enterprise of private firms. But it can cause problems, thus supporting the submission of Ter-Minassian (2005) that the defining characteristic of guarantees and other contingent liabilities is uncertainty. It is the uncertainty as to whether the government will have to pay, and if so the timing and amount of spending.

In estimating the government's exposure for contingent liability (guarantee) on infrastructure, several methods have been suggested (Almeyda and Hinojosa, 2001). The Actuarial methods intended to estimate future loss patterns based on prior loss experience; the Structural Models: Option Pricing Theory which interpret guarantees as a put option and running option pricing models using either the Black and Scholes formulation or the Binomial Tree approaches, and lastly The Defaultable Bond Valuation Methodology, which suggest that guarantee can be estimated from the relationship established as expounded by Merton and Bodie (1992), where a risky (or default able) bond is a composite of a risk-free bond and a full credit guarantee (Almeyda and Hinojosa, 2001).

Unfortunately, these estimates present recurring challenge for emerging economies, which might make it difficult to estimate. These challenges include the fact that these methods do not take into account the obligations from activities of the infrastructure. They are basically mathematical equations and estimation from data, which in most cases are not readily available in emerging economies (Mody, 2000) neither do they take cognisance of the social, economic and political landscape which could have a lot of bearing on the delivery of projects for which guarantee is given. This explains why there has not been any consensus on an appropriate valuation method either by the International Monetary Fund's Government Finance Statistics or the Generally Accepted Accounting Principles for users of government financial report.

This is a gap that urgently needs to be filled given that government alone cannot muster the resources (finance and expertise) to meet these infrastructure needs and or are increasingly

finding them either unwilling or unable to finance the growing number of new infrastructure activities. Therefore, the involvement of the private sector often empowered by governments to build and operate many large projects under the Public Private Partnership arrangement is not just desirable, but necessary (Alitheia Capital, 2010; Qiu and Wang, 2011; Foster and Pushak, 2011).

This study therefore seeks to provide an alternative to estimating guarantee given the challenges associate with the methods earlier identified using Nigeria as a case study. This study is divided into four parts. The Introduction, the second part will examine the concept of infrastructure, then proceed to discuss the proposed alternative for estimating guarantee is estimated, then conclude by examining the implication for Nigeria.

Understanding Guarantee

A guarantee is contingent liability obligations that “do not arise unless a particular, discrete event(s) occurs in the future” (International Monetary Fund, 2011, 4). It is a promise from a government or public institution, to make good on loan payments if the project company defaults (Lai and Soumaré, 2009). According to Magnusson (1999) and Currie (2002), Governments provide guarantees to promote activities and projects considered to be public goods, by providing incentives for the market to finance these sectors or projects. These guarantees may be especially important for projects with special risk characteristics, such as large-scale projects that require long-term financing and unique projects that make market assessment more difficult.

Touray (2008) posited that Sovereign guarantees are given by host governments to assure project lenders that the government will take certain actions or refrain from taking certain actions affecting the project and have proven to be valuable instruments to address market imperfections that may hold up the delivery of PPP programmes and/or projects (European PPP Expertise Centre (EPEC) 2011).

Although Government guarantees are only one of many issues raised by recent financial events, in modern economies, guarantee occurs because the alternative is immediate collapse, with substantial harm to the rest of the economy (Hall, 2008). In fact, Acharya and Kulkarni (2012) contended that in the face of the market crisis, guarantees help public sector institutions with access to explicit and implicit government guarantees outperform private sector firms. These firms survived the crisis or even expanded post-crisis, while the ones without such access have failed or shrunk.

The importance guarantee becomes more pronounced in the face of the current financial crises. According to Jorra (2012), when the financial crisis of the years 2007/2008 endangered the stability of the worldwide financial system, governments stepped in by providing a mixture of generous public guarantees and fiscal stimulus. Moreover, governments often rely on credit guarantees, for instance, to facilitate the flow of funds to businesses, and ensure the repayment of defaulted loans. This has been the most frequently employed policy for SMEs in the OECD countries (Green, 2003; Uesugi et al, 2010).

Chaney and Thakor (1985) however noted that despite these apparent benefits, the size and types of guarantee have caused considerable concern and controversy. One problem is that, though they are sizable contingent liabilities, guarantees do not appear in the state budget and the actual liability that the government has incurred is difficult to measure (Sosin, 1980). There is no doubt that the incentives to switch from direct budgetary support (e.g. grants, subsidies, direct lending) which are explicitly recorded in the budget and hence easily scrutinised and debated to stealth support through contingent liabilities, which under the cash budgeting system have no costs, and bypass the scrutiny built into the budget process has made it attractive to politicians who, in the face of hardened budget constraints, find them to be a “cheap” instrument for achieving their objectives. (Cebotari, 2008).

Burnside (2004) emphasised the danger of contingent liabilities. He argue that the provision of comprehensive guarantees to infrastructure projects generate huge contingent liabilities that must be managed well; otherwise the government will be exposed to substantial payment burdens once a guarantee call is triggered and could spell financial trouble for the government. Thus, a sound framework for contracts requires that the government assumes a level of guarantee that is high enough for the project to be economically feasible, but low enough not to burden the government and society (Llanto et al, 1997; Llanto, 2007; Takashima et al, 2010).

Schich (2009) and Takashima et al (2010) observed that the cost to the government of these guarantees is not in the form of immediate significant upfront fiscal costs but rather in the form of contingent liabilities as well as other potential costs that may arise as a result of potential distortions of incentives and competition. In essence, by offering guarantees for infrastructure projects, the government becomes responsible for all future liabilities that these supports might cause.

Theoreticcal Framework for Contingent Liability

The provision of comprehensive guarantees to infrastructure projects has generated huge contingent liabilities that must be managed well; otherwise the government will be exposed to substantial payment burdens once a guarantee call is triggered. (Llanto et al, 1999; Bernardo et al, 2004; Llanto, 2007). The implication once a guarantee call is triggered is that it exposes the government to substantial payment because the cost of infrastructure is huge and in most cases the government may not have adequate resources to make immediate payments and that automatically results in an increase in the debt stock of the country which if not properly monitored becomes unsustainable and could have serious consequences for the nations economy. Often guarantees are used by governments to reduce the tax-deductible interest payments and thus creates more taxable income for themselves thus, reducing the probability of loss for lenders and the project’s borrowing costs and have proven to be valuable instruments for addressing market imperfection (Sosin, 1980; Chaney and Thakor, 1985; Lai and Soumar’e, 2009; European PPP Expertise Centre (EPEC) 2011; Acharya and Kulkarni, 2012).

Government guarantees serve as second-best instruments in the absence of a stable political environment, effective regulatory bodies, independent judicial systems, and an overall competitive climate Mody (2000). Cebotari (2008) however argued that even if a rationale exists for the government to give a guarantee which will result into contingent liabilities, such a move is justified only if its benefits outweigh the costs and is the most efficient means of achieving a goal. In other words, the cost-benefit analysis is premised on the fact that the public sector is better placed to bear the risks associated with contingent liabilities than the private sector. The argument lies in the need to reduce moral hazard behavior, by giving incentives to those who can mitigate risk to do so because investors are not willing to bear those risks against which they cannot hedge (Das, et al 2002).

The concept of guarantee and contingent liability find accommodation in the normative theory of fiscal policy. According to Berndt et al (2009) public debt serves an essential role providing a fiscal hedge against government spending shocks. Lustig et al (2008), demonstrated that long-term debt helps the government smooth distortions from costly unanticipated inflation in a dynamic model of optimal fiscal and monetary policy with nominal rigidities, and nominal non-contingent debt of various maturities. While Angeletos (2002) argues that if the maturity structure of public debt is carefully chosen ex ante, the ex post variation in the market value of outstanding long-term debt may offset the contemporaneous variation in the level of fiscal expenditure. If the tax system is sufficiently constrained, then the government will wish to smooth inter-state marginal tax rates and the excess burden of taxation by varying the return it pays on its debt (Barro, 1979; Leibfritz, et al, 1997; Berndt, et al 2012)

Barro (2002) opined that optimal debt management can be thought of in three stages, the first being if taxes are lump sums and the other conditions for Ricardian equivalence hold, as expounded by Barro (1974), making the division of government financing between debt and taxes is irrelevant. However, if taxes are distorting, then the timing of taxes will generally matter (Barro, 1979). This consideration tends to motivate smoothing of tax rates over time and thereby can make determine the levels of debt at various dates. Lastly, if there is uncertainty about levels of public outlay, the tax base (e.g. aggregate consumption or GDP), and asset prices, then the kinds of debt that the government issues will matter. In particular, the government may want to smooth tax rates over states of nature, and this consideration may dictate an optimal structure of the public debt

Bixi and Schick (2002) and Kharas and Mishra (2001) suggest that the likelihood of unbudgeted fiscal risks coming due has been a wakeup call to extend fiscal management beyond the budget to all actions and transactions that put the government in financial jeopardy. Empirical analysis of past increases in the stock of government debt confirms that realised government contingent liabilities account for a large share of those increases and, because contingent liabilities often grow from fiscal opportunism, when policymakers seek to hide the real fiscal cost of their decisions and to reduce the reported budget deficit, bringing them under control may become first of all a question of political will. These "hidden deficit" according to Kharas and Mishra (2001) have stemmed mainly from the cost of realised contingent liabilities and realised risks in the government debt portfolio.

Public infrastructure investments are not accidental events, however for a resource deficient economy with strong potential for growth, a fiscal policy that is reliant on long term debt financing and taxes has its challenges because of the difficulties in meeting the necessary conditions for raising funds in the international capital markets as well as expanding the net tax. The option therefore, is develop a model that could attract private participation to invest in infrastructure that will result in economic development. For instance, in Nigeria, declining revenue arising from recurring financial crisis has made it difficult to fund infrastructure-development from the budget. With an infrastructure gap requiring between 12 to 15 billion USD annually for the next six years from a current spend of about 5.9 USD, representing 5% of GDP (Ijaiya and Akanbi, 2009; Alitheia Capital, 2010), a debt service ratio of 20% of the national budget, and the drop in global oil prices, has made it imperative to encourage the private participation to avoid an infrastructure driven arrested-development

To manage the exposure arising from guarantees to infrastructure projects, governments need to adopt modern risk management techniques since guarantees come due only if particular events occur and involve no immediate cost to the government, they rarely appear in the government accounts or have funds budgeted to cover them (Christopher and Moody, 1998).

Estimating Guarantee – Contingent Liability

Although contingent liability is recognised as one of the important causes of fiscal instability in developing countries, it is not easy to quantify and the standards to measure it are still evolving (Brix and Schick, 2002). Neither of the international financial reporting standards nor the Generally Accepted Accounting Principles provides users of government financial reports with much assistance in properly valuing contingent liabilities (Das et al, 2002; McDonald, 2007).

Measuring the impact of contingent liability, for instance, Luc and Valencia (2008) observed that the fiscal bill of financial system bailouts averaged about 13% of GDP in some 40 crisis episodes, but was as high as 55% while Standard & Poor's estimated that the average fiscal exposure to risk from the financial sector, during a reasonable worst case banking crisis, was about 27% of GDP across some 75 countries rated in mid-2008.

According to Brix and Shick (2002), the explicit and implicit government insurance schemes in the domestic banking sector that emerged from the 1997 financial crisis in East Asia added approximately 50% of GDP to the stock of government debt in Indonesia, 30% in Thailand and over 20% in Japan and Korea. Similar schemes in the 1980's generated a fiscal cost of over 40% of GDP in Chile and approximately 25 percent in Cote de Ivoire, Uruguay and Venezuela. In the 1990's, Brazil and Argentina exhibited an escalation in their debt levels as the central government had to bail out commitments made at sub-national government levels. They went further to suggest that Malaysia, Mexico and Pakistan presented a severe deterioration in their fiscal stances due to defaults on government guarantees that had been issued to promote private participation in infrastructure.

Guarantees are given based on the estimated value at risk on the infrastructure project. The calculation of the Value at Risk (VaR) deviates from the traditional methods of guarantee calculation as expounded by Almeyda and Hinojosa (2001) that suggested the actuarial, structural and Defaultable bond valuation methods which rely heavily on historical data which are not readily available in emerging economies like Nigeria. Moreover, given the recent global financial crisis, these methods do not properly capture the country risks which could trigger default given that all other risks would presumably have been assessed and given to the party best situated to manage.

Often, governance indicator is used to derive the governance risk factor while the private participation in infrastructure information is derived from the World Bank database on private participation in infrastructure. The proportion of the private participation in infrastructure when the governance risk factor is applied is the value at risk that needs to be guaranteed.

According to Rijkceghem and Weder (2004) politics are also considered to be relevant in explaining sovereign defaults on external and domestic debt obligations. This view finds support with Kohlscheen (2007), Moser (2007) and Cuadra and Sapriza (2008), who argue that political instability increases the likelihood of sovereign default. The experience of Russia in 1998, Ecuador in 1999, Ukraine in 2000, and Argentina in 2001, among others, and the association of foreign debt problems and political instability has been the rule rather than the exception in emerging market economies (Cuadra and Sapriza, 2008). Moreover Hoti and McAleer (2005) and Andritzky (2006) have argued that scholars have paid insufficient attention to political factors when dealing with sovereign risk. In other words, political, macroeconomic mismanagement, war or labor unrest resulting could well lead to work stoppages, etc. Which are not and within the predictive capacity during the period of contracting.

Therefore, drawing on the existing notions of governance by the (World Bank, 2013), which seek to navigate between overly broad and narrow definitions, we define governance as “the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced, as well as the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them. A total of six dimensions of governance are constructed, as follows;

- a) Voice and Accountability: the traditions and institutions by which authority in a country is exercised Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- b) Political Stability and Absence of Violence/Terrorism: Capturing perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
- c) Government Effectiveness: Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures,

the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

- d) Regulatory Quality: Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permits and promotes private sector development.
- e) Rule of Law: Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- f) Control of Corruption: Capturing perceptions of the extent to which public power is exercised for private gains, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

The contingent arising from PPP guarantees (*clp3*) is the proportion of the private participation in infrastructure that is subject to risk (VaR) and needs to be guaranteed in order to encourage investment by the private sector which is the essence of public private partnerships. It is calculated as a proportion of the private participation in infrastructure when the governance risk index is applied.

$$clp3(Guarantee) = VaR \quad (1)$$

$$VaR = ppi * gri \quad (2)$$

$$gri = Average [PSAV, (1 - VA), (1 - GE), (1 - RQ), (1 - RL), CC] \quad (3)$$

where:

clp3 Contingent liabilities on public private partnership

VaR Value at Risk

ppi Private participation in infrastructure

gri Average (1-VA, PSAV, 1- GE, 1-RQ, 1-RL, CC)

VA Voice and Accountability

PSAV Political Stability and Absence of Violence

GE Government Effectiveness

RQ Regulatory Quality

RL Rule of Law

CC Control of Corruption

Guarantee Estimation

The first step in estimating guarantee will involve determining the risk indicators from the political risk system, the most widely accepted system of completely independent political risk forecasting methodology developed by Coplin and O'Leary with the U.S. Department of State, the Central Intelligence Agency, other government agencies, and major multinational corporations (PRS Group, 2011).

According to Willkin and Minor (2001, 1) "today's political risks are not the classic risks associated with communist takeovers or post-colonial outbursts of anti-foreign sentiment. They are subtler, arising from legal and regulatory changes, government transitions, environmental and human rights issues, currency crises and terrorism. Because these risks are subtle (often occurring at the same time as the government is declaring the country "open for business") they are often hard to manage". Therefore the effective index of political risk must take into account the different dimensions affecting the attractiveness of a country to foreign business (Ferrari and Rolfini, 2008).

These dimensions provide very broad country coverage, greater than that provided by any individual data source on governance; able to conveniently summarise the wealth of existing information on governance; smooth out some of the inevitable idiosyncrasies of individual measures of governance and so be more informative about the broad notions of governance they are intended to measure than any individual data source; and the estimates of governance are (unusually in this field) accompanied by explicit margins of error that transparently indicate the unavoidable degree of uncertainty associated with measuring governance by any means (Kaufmann et al, 2007).

The dimensions/ indicators are Voice and Accountability; Political Stability and Absence of Violence/Terrorism; Government Effectiveness; Regulatory Quality, Rule of Law and Control of Corruption. These dimensions can be categorised into two - risk and compliance indicators. Falling under the risk categorisation are "Political stability and absence of violence" and "control of corruption". While the other components – "voice and accountability", "government effectiveness", "regulatory quality" and "rule of law" can be described as compliance with perception. The risk factors are therefore the deviation from compliance which now has to be derived (table 1). The risk is calculated as

$$\text{Individual Risk Indicator} = 1 - gi,$$

Where *gi* represent the indicator under the compliant categorisation. It is assumed that these factors built-in in the indicator are not and/ or within the predictive capacity during the period of contracting and issuance of guarantee by government for the Public Private Partnership transaction. These constitute fundamental issues that can significantly affect transactions entered into by government especially in emerging economies like Nigeria and fall within the observations of what Llanto (2007) describes as Fundamental Risks.

The second stage is the estimation of the governance risk indicator (gri) equation 3, which is the aggregate of the individual risk indicators as shown in Table 1 below.

Table 1

Estimation of the Average Risk (Governance Risk Index) for Nigeria

Years	Voice and Accountability		Political Stability and Absence of Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption		Average Risk = GRI
	Risk = 1-VA		Risk= PSAV		Risk = 1 - GE		Risk = 1 – RQ		Risk = 1 - RL		Risk = CC		
		Risk		Risk		Risk		Risk		Risk		Risk	
1996	0.17	0.83	0.73	0.73	0.50	0.50	0.36	0.64	0.50	0.50	0.33	0.33	0.590
1997	0.25	0.75	0.74	0.74	0.25	0.75	0.36	0.64	0.50	0.50	0.25	0.25	0.604
1998	0.33	0.67	0.74	0.74	0.00	1.00	0.36	0.64	0.50	0.50	0.17	0.17	0.618
1999	0.42	0.58	0.65	0.65	0.13	0.88	0.36	0.64	0.50	0.50	0.17	0.17	0.569
2000	0.50	0.50	0.56	0.56	0.25	0.75	0.36	0.64	0.50	0.50	0.17	0.17	0.520
2001	0.48	0.52	0.51	0.51	0.25	0.75	0.30	0.70	0.38	0.63	0.17	0.17	0.547
2002	0.46	0.54	0.46	0.46	0.25	0.75	0.23	0.77	0.25	0.75	0.17	0.17	0.574
2003	0.42	0.58	0.61	0.61	0.25	0.75	0.32	0.68	0.25	0.75	0.17	0.17	0.590
2004	0.42	0.58	0.56	0.56	0.25	0.75	0.32	0.68	0.25	0.75	0.17	0.17	0.582
2005	0.50	0.50	0.58	0.58	0.25	0.75	0.55	0.45	0.33	0.67	0.25	0.25	0.534
2006	0.46	0.54	0.55	0.55	0.25	0.75	0.45	0.55	0.33	0.67	0.25	0.25	0.551
2007	0.46	0.54	0.52	0.52	0.25	0.75	0.45	0.55	0.33	0.67	0.25	0.25	0.545
2008	0.46	0.54	0.55	0.55	0.25	0.75	0.50	0.50	0.33	0.67	0.25	0.25	0.543
2009	0.46	0.54	0.56	0.56	0.25	0.75	0.50	0.50	0.33	0.67	0.25	0.25	0.545
2010	0.46	0.54	0.55	0.55	0.25	0.75	0.50	0.50	0.33	0.67	0.25	0.25	0.543
2011	0.46	0.54	0.56	0.56	0.25	0.75	0.50	0.50	0.33	0.67	0.25	0.25	0.545
2012	0.46	0.54	0.54	0.54	0.25	0.75	0.50	0.50	0.33	0.67	0.25	0.25	0.541

Source: Own Computation.

The results of the governance risk index estimation for Nigeria (figure 1) show a high of volatility between 1996 and 2006. With the value at risk estimated at 0.59 in 1996, rising and peaking at 0.618 in 1998, a 5% increase over a two-year period. It however, dropped to an all time low of 0.52 in year 2000. The volatility continued between year 2000 and 2005 rising to the 1996 state but drops to 0.534 in 2005. Subsequently, there was relative stability over the next period to 2012.

The highest risk during the review period was reported in 1998 at 0.618 and the lowest in year 2000 at 0.52. This was the period of transition to civil rule in Nigeria. Interestingly, a similar scenario with a sharp rise and drop were recorded between 2003 and 2005, a period in which the second election after the disengagement of the military regime. The stability after this period could probably be attributed to the stability in the political environment thus supporting the argument of Hoti and McAleer (2005) and Andritzky (2006) that not much attention is paid to political factors when dealing with sovereign risk.

Figure 1



A clearer understanding of the phenomenon surrounding the governance risk index is better appreciate when the various dimension of Voice and Accountability; Political Stability and Absence of Violence/Terrorism; Government Effectiveness; Regulatory Quality and Rule of Law and Control of Corruption are individually assessed.

- **Government Effectiveness**

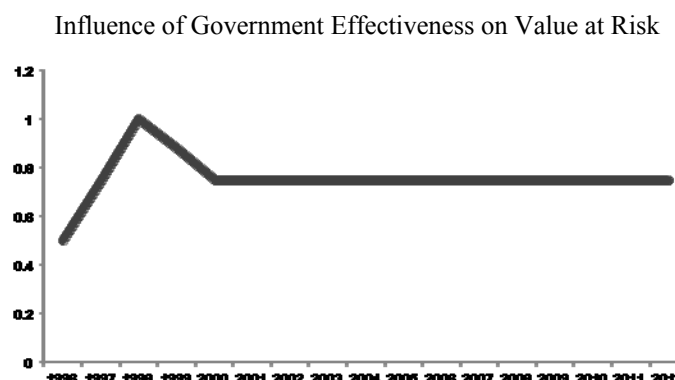
According to Radin (2000, 168), “If there is a single theme that characterises the public sector in the 1990s, it is the demand for performance”. An effective government is one that is capable of protecting the population and providing the necessary infrastructure that makes life comfortable for its citizens. Therefore understanding effectiveness helps a better understanding of the role of accountability in governance (Sacks and Levi, 2007; Lee and Whitford, 2009). El-Rufai (2011) argues that no nation develops beyond the capacity of its public service, and that the quality of public servants and the services they provide in Nigeria are both below expectations. This was the state as at the time of military disengagement in 1999, which is evidenced by the high-risk level in 1998.

Explaining the upward and downward spikes between 1998 and 2000 (figure 2) when the average is disaggregated shows that the quality of the civil service, policy formulation and implementation, degree of its independence from political pressures and the credibility of the government's commitment to policies which measures government effectiveness had an influence in explaining the phenomena as shown in figure 2. This period witness an elaborate civil service reform by the new government, which was inaugurated in 1999.

The reform was necessitated by the state of the service. According to El-Rufai (2011, p. 1) “the civil service was rapidly ageing, mostly untrained and largely under-educated. Their average age then was 42 years, and over 60% were over 40 years. Less than 12% of the public servants held university degrees or equivalent. Over 70% of the service was of the

junior grades 01-06, of sub-clerical and equivalent skills. About 20% of the public service employees were ‘ghost workers’ – non-existent people on the payroll, which goes to staff of personnel and accounts departments” (El Rufai, 2011, p. 22).

Figure 2



Source: Own figure.

In 1998, the level of risk was at the highest at 1.00 dropping to 0.75 in 2000. That was a period in which a new military government took over government and started preparing for the elections which took place in 1999 and eventually settle down to governance after all election cases at the tribunal had been set aside and the effect of the reform resulted in the downward and constant trend witnessed and sustained from between 1999 and the end of the period under review.

• Political Stability And Absence Of Violence

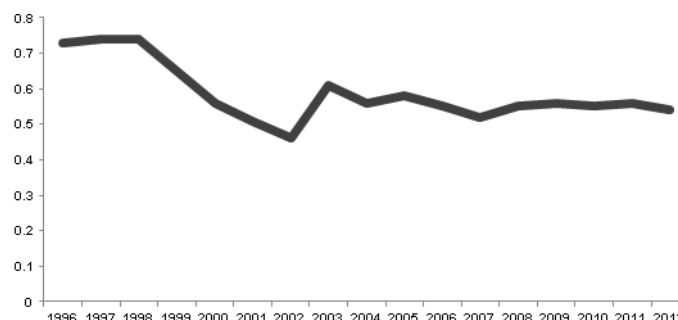
The concept of political stability presumes the absence of violence, Government longevity, the existence of a legitimate constitutional regime, absence of structural change, and a multifaceted societal attribute (Hurwitz, 1973; Okoli and Iortyer, 2014). According to Okoli and Iortyer (2014) cordial civil relations and peaceful socio-political change that forecloses systemic variability, uncertainty, volatility, insecurity, disequilibrium and flux characterise political stability.

The trend as shown in figure 3 depicts relatively a lessened risk that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. This fear was quite prevalent during the period prior to 1999 when the election that ushered in the new civilian government was conducted.

The graph on Political Stability and Absence of Violence shows a risk factor constant at 0.74 during this period and dropping subsequently recording its lowest risk factor in 2002 at 0.46. This shows a similar trend with the aggregate risk profile for the same period. The level of volatility experience between 1996 and 2003 stabilised subsequently.

Figure 3

Influence of Political Stability and Absence of Violence on Value at Risk



Source: Own figure.

The dawn of democracy no doubt provided the atmosphere to ventilate bottled-up frustrations, grievances and fears generously, which was in contrast to the experience of the military years in which these issues were suppressed from exploding into uncontrollable conflagration (Adebanwi, 2004; Joshua, 2013).

This scenario was captured by Joshua (2013) who identified at least 121 cases of conflicts in Nigeria from May 31, 1999 to June 2005 and attributed a strong central government; popular agitation for decentralised structure, dissatisfaction with the distribution of available resources; communal conflicts and demands by some sub-national groups for greater self-determination (Eliagwu, 2005b).

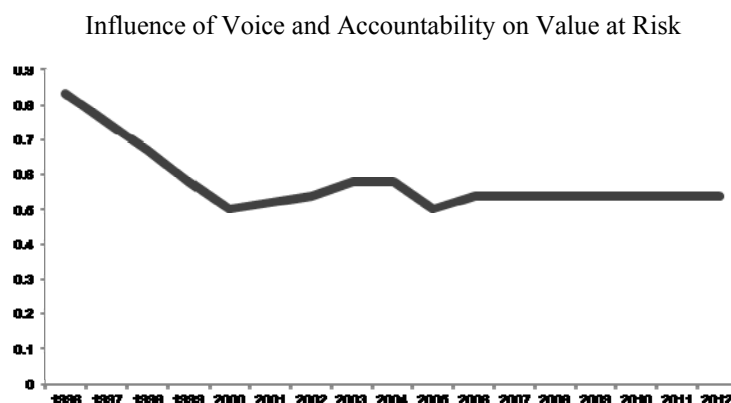
This observation is well represented in the Figure 3. The level of movement was noticeable during this period and subsequently stabilised from 2007 reflecting the stability experienced with the civil rule and the maturity of the political actors over the period under review.

• Voice and Accountability

According to Foresti and Hudson (2007, p. 1) "Voice and accountability are important dimensions of governance. Voice refers both to the capacity to express views and interests and to the exercise of this, usually in an attempt to influence government priorities or governance processes. Accountability exists when those who set and implement the rules (politicians and public officials) are answerable to those whose lives are shaped by those rules and can be sanctioned if their performance is unsatisfactory. Voice and accountability are therefore important indicators of the nature of the relationship between a state and its citizens".

In other words, the capacity of the citizens to hold the government accountable for its actions will greatly influence their response to their needs and demand, influence government priorities and processes (Rocha and Sharma, 2008).

Figure 4



Source: Own figure.

The influence of the Voice and Accountability indicator as indicated in figure 4, measures the ability of citizens to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media also contribute to the volatility experienced in the two periods identified. The graph (figure 4) reflects the political history of Nigeria. The country witnessed a prolong military rule after the termination of the third republic by the military in 1984 with an unending transition programme which never came to fruition till 1999. During that period, the state was misconceived as the clearing-house for jobs and contracts, making politicians and other politically inclined individuals indulge in partisan politics with the functional mindset of desperation, impunity and irresponsibility (Aniekwe and Kushie, 2011; Fagbehun, 2013; Okoli and Iortyer, 2014).

The risk level, which peaked at 0.83 in 1996 gradually, declined during subsequent periods though experienced a slight increase and then stabilised to 0.58 in 2003 and 2004. There was a marginal gradual decline from 0.58 in 2004 to 0.54 in 2012 although, with an exception in 2005, which recorded a risk level of 0.50.

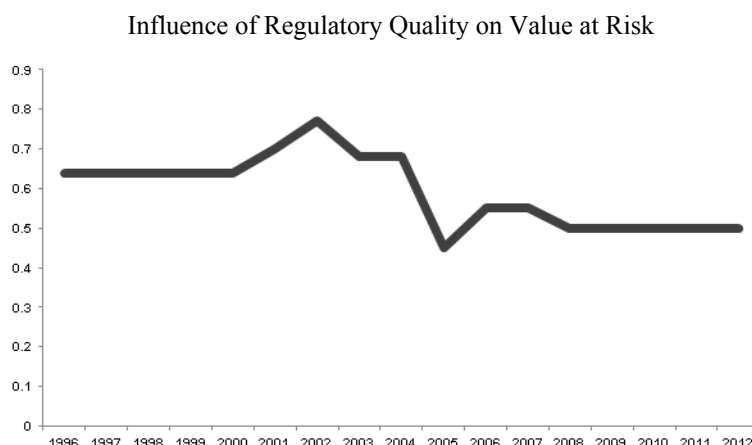
• Regulatory Quality

Cebula and Mixon (2014) argue that long-term economic growth needed for continued prosperity and stimulating the investment are strongly linked to regulatory quality. Likewise, “the quality of a country’s regulatory system depends to a great extent on how regulations are conceived and made. Governments are concerned to ensure that their regulations operate efficiently to boost economic growth, social welfare and environmental standards” (OECD, 2008, p. 2).

According to Organisation for Economic Co-operation and Development (2008, p. 3) “an effective regulatory policy which has three basic, mutually reinforcing components: it should be adopted at the highest political levels; contain explicit and measurable regulatory quality standards and provide for a continuing regulatory management capacity. The extent to which regulatory policies focus on reforming the regulatory framework tends to wax and

wane in most countries, but there has been a progressive expansion in the scope of the policies”.

Figure 5



Source: Own figure.

However, during the period between 2003 and 2005 (see figure 5), aside the voice and accountability indicator whose influence had already been identified in the first phase, the quality of regulation also had impact on the calculated Value at Risk. While the value at risk had peak at 0.59 in 2003, it drops by over 10 percent to 0.53 in 2005. This reflects the improvement in the implementation of sound policies and regulations that permits and promotes private sector development by the government, which is, had the indicator recording it lowest level at 0.45 in 2006 as shown in the regulatory quality graph (figure 5).

The resulting trend exhibited in the regulatory quality reflects what is happening for instance in the financial sector of the Nigerian economy. Banks are directly regulated by government through the Central Bank of Nigeria, which has the power to oversee and discipline banks in every aspect from ownership to types of lending (Barth et al, 2004).

The governance risk factor shows an increase between 2000 and 2003 to 0.68 from 0.64, having peaked to 0.77 in 2002 in showing the quality of regulation in Nigeria. Prior to the suspension of licensing new banks and the increase in capital requirements for banks in 2003, the industry had great challenges ranging from weak corporate governance, inadequate risk asset management, inadequate disclosure, and the influence of the political environment coupled with inadequate macroeconomic policies to stem the tide of the economic downside in the country, inadequate and skilled personnel and weak internal structure of the Central Bank (Davis and Obasi, 2009; Balogun, 2011).

The suspension of licensing of new banks can possibly explains the stability experienced between 2003 and 2004. Interestingly, the effect of the major reform embarked on by the Apex bank in 2004 with an increase in the capital requirement for bank from NGN 2 billion to NGN 25 billion leading to the first massive bank consolidation in Nigeria was reflected in the indicator which dropped sharply to 0.45 in 2005. Between 2005 and 2008, the

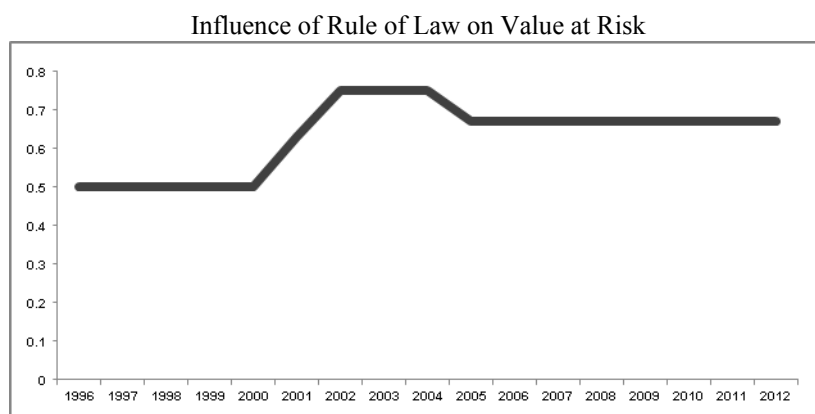
industry witnessed impressive post consolidation growth but had regulators that were not sufficiently prepared to sustain and monitor the sector's explosive growth coupled with the challenges arising from the macroeconomic vulnerability (Sanusi, 2010 Okezie et al, 2011; Ajakaiye and Tella, 2014).

This situation led to the increase experienced in 2006 to 0.55. There was relative stability from 2008 that sustained over the period as a result of the reforms by the Central Bank which saw the creation of the Asset Management Company (AMCON) which purchased the toxic assets of the banks in distress, suspension of the operations and the removal of some bank officials.

• Rule of Law

According to Olatunji (2013) the concept of rule of law can be summaries as “ firstly, no man could be punished or lawfully interfered with by the authorities except for breaches of the law. Secondly, no man is above the law and everyone, regardless of rank, is subject to the ordinary laws of the land; and thirdly, there is no need for bill of rights because the general principles of the constitution are the result of judicial decisions determining the rights of the private persons”. There is no doubt that Nigeria has elaborate provisions in the constitution to promote the rule of law. The opening paragraph of the 1979 Nigerian Constitution, as consolidated in the 1999 Constitution, stated, “We the people of the Federal Republic of Nigeria have firmly adopted this document for the purpose of promoting the good government and welfare of all persons in our country on the principles of freedom, equality and justice, and for the purpose of consolidating the unity of our people” Olatunji (2013, p. 22). Nigeria is also a signatory to several international conventions, charters and treaties that promote and sustain the rule of law. It is, therefore, safe to infer that the rule of law is supreme in Nigeria, at least, in theory (Nwekeaku 2014).

Figure 6



Source: Own figure.

The rule of law within the context of the value at risk estimation captures the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in

particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

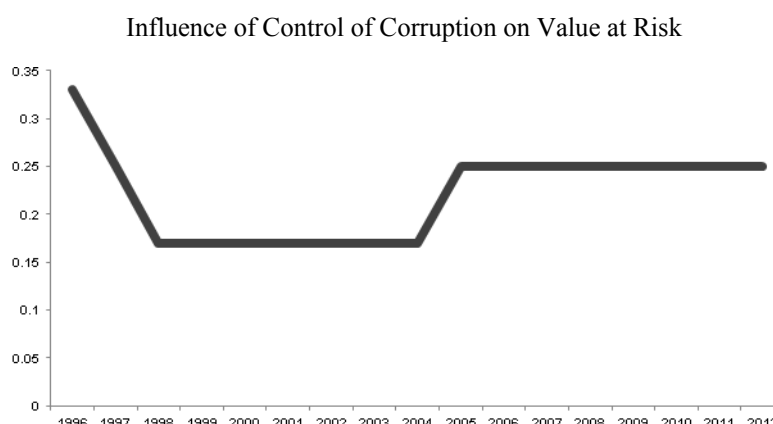
Figure 6, shows a constant risk level of 0.50 between 1996 and 2000, increasing from 2000 and reaching an all time high of 0.75 from 2001 to 2003, dropping to 0.67 and remaining at that level to the end of the review period. The period in which the risk to rule of law was at its peak can be described as the worst when it comes to compliance with the rule of law and was also an embodiment of executive lawlessness in Nigeria (John 2011). Notwithstanding the return to democratic governance in Nigeria, Ali (2014) argues that civilian administrators appear to surpass the military in their open disrespect to the rule of law. Though there appear to have been a reduction in the risk level attributable to the rule of law from 2004, this however did not drop to the level prior to the exit of the military.

• Control of Corruption

World Bank described corruption is the abuse of public office for private gains (Bannon 1999). Public office is abused for private gain when an official accepts edicts or extorts a bribe, when private agents actively offer bribes to circumvent public policies and processes for competitive advantage and profit, through patronage and nepotism, or the diversion of state resources (Ngwube and Okoli 2013). According to Tanzi (1998), it is not difficult to recognise when observed as it reduces economic growth, enhances inequalities and reduces the government's capacity to respond to people's needs.

The period of return to civil rule shows a reduction to the perceptions that public power is exercised for private gain, including both petty and grand forms of corruption, as well as the "capture" of the state by elites and private interests. The lowest level of the control of corruption was between 1998 and 2004. There was a fierce fight against corruption during this period of passing the Economic Financial Crime Commission (EFCC) and the Independent Corrupt Practices and other Related Offences (ICPC) Act, which gave a blow to official corruption.

Figure 7



Source: Own figure.

Unfortunately, the gains recorded during this period gradually faded away especially during the second term of the government and took an alarming dimension from 2014 to the end of the review period assuming eccentric and ludicrous proportions (Amuwo, 2005). According to Transparency International (2014), “Available evidence demonstrates that corruption in Nigeria serves two main purposes: (i) to extract rents from the state, which includes forms of corruption such as embezzlement, bribery, nepotism and cronyism, among others; and (ii) to preserve power, which includes electoral corruption, political patronage, and judicial corruption. Evidence also suggests that these forms of corruption are related to the country’s social norms. Nigeria is assessed as a neo-patrimonial state, where power is maintained through the awarding of personal favours and where politicians may abuse their position to extract as many rents as possible from the state” (Transparency International, 2014, p. 1).

The mounting corruption in Nigeria according to Ayobami (2011) is mostly attributed to officials at all levels of public bodies and also people in both private and even traditional institutions.

The governance risk indicator and the various dimensions that explain it, mirrors the Nigerian political environment with all the associated risk as a result of the event of the period. Therefore, having estimated the governance risk index, the next step is to determine the value at risk which will need to be guaranteed (Equation 2).

Table 2

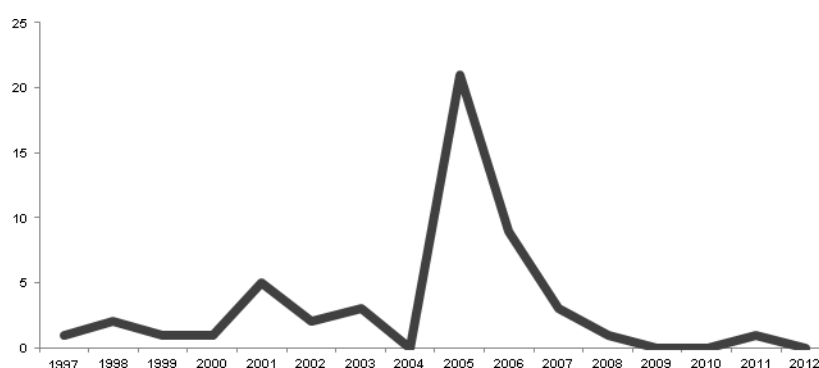
Projects and Investment by Sector for Nigeria

Year	Energy		Telecom		Transport		Water and sewage		Total	
	No	USD (million)	No	USD (million)	No	USD (million)	No	USD (million)	No	USD (million)
1997	-	-	1	22	-	-	-	-	1	22
1998	-	-	2	28	-	-	-	-	2	28
1999	-	-	1	19	-	-	-	-	1	19
2000	-	-	1	76	-	-	-	-	1	76
2001	2	295	3	970	-	-	-	-	5	1,265
2002	1	462	1	848	-	-	-	-	2	1,310
2003	1	34	2	1,674	-	-	-	-	3	1,708
2004	-	-	-	1,070	-	-	-	-	-	1,070
2005	2	828	-	2,312	19	2,355	-	-	21	5,495
2006	-	-	4	2,535	5	322	-	-	9	2,857
2007	1	280	2	2,761	-	40	-	-	3	3,081
2008	-	-	-	2,995	1	382	-	-	1	3,377
2009	-	-	-	3,057	-	-	-	-	-	3,057
2010	-	-	-	3,036	-	-	-	-	-	3,036
2011	-	-	-	1,484	1	259	-	-	1	1,743
2012	-	-	-	2,129	-	-	-	-	-	2,129
Total	7	1,899	17	25,016	26	3,358	-	-	50	30,273

The World Bank private participation in infrastructure projects database (PPIPD) for the period under review shows that less than 5 projects were recorded on any particular year up to 2005 when the nation experience a leap with 21 projects (Table 2) evidenced by the spike as shown in figure 8 and peaking during the period but gradually declining over the second half of the period with 2009, 2010 and 2012 recording no private projects at all. Of all the projects executed during the period, the transport sector contributed over 50 percent with 26 projects followed by the telecommunication sector and Energy sector with 17 and 7 projects respectively. No project was recorded against the water and sewage sectors.

Figure 8

Infrastructure Project through Private Participation in Nigeria 1997 - 2012



Source: Own figure.

Having established the private participation in infrastructure and Governance Risk Index, the value at risk is estimated (table 3). The value at risk which is required to be guaranteed is the proportion of private participation in infrastructure for which government will be liable in the event of default arising from the fundamental risk discussed above. Using the data from the World Bank database from 1997 to 2012 the period of the review, the guarantee was calculated as shown in Table 3.

The exposure of government to risk arising for private participation was high in 2005 with a governance risk index of 0.59 – infrastructure investment of 5.7 billion USD and risk exposure of 3.071 billion USD. The average governance risk index over the review period was 0.55 with the Nigeria experiencing a risk profile below the average in 2000, 2005 and from 2007 to 2012. Interestingly, the value at risk exposure for each of the year was below the period average of 1.66 billion USD apart from 2005 with .071 billion USD. That means for every 1 USD of public private partnership investment in infrastructure being proposed, the government will have to provide guarantee to an amount not less than 0.55 cent.

Charting the result of the computation as depicted in Figure 9 produces an interesting trend over the review period. Showing investment peaking in 2005 with a sharp drop in 2006, it however, shows that as the time goes by, the gap is widened with reduced risk from 0.60

and 0.62 in 1997 and 1998 respectively to 0.55 and below from 2005 to the end of the review period.

Table 3

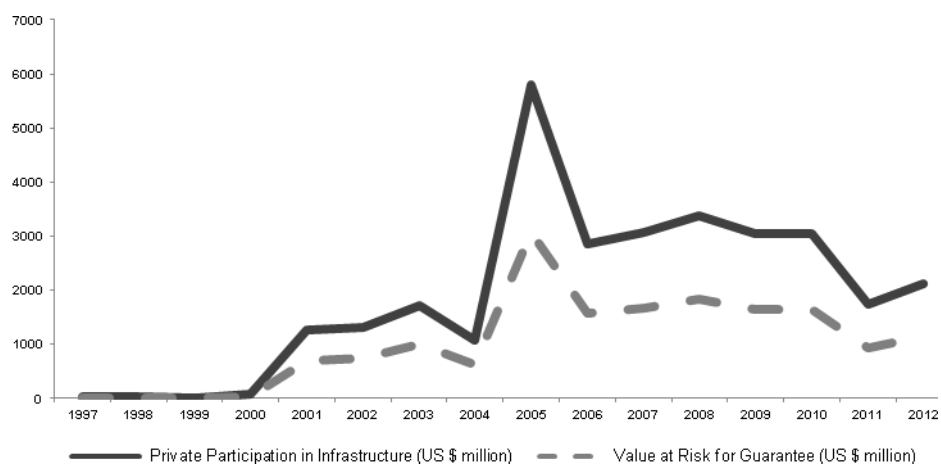
Estimation of Guarantee

Year	Governance Risk Index (GRI)	Private Participation in Infrastructure (PPI) (USD million)	Value at Risk Requiring Guarantee (CLP3) (USD million)
1997	0.6	22	13.2
1998	0.62	28	17.36
1999	0.57	19	10.83
2000	0.52	76	39.52
2001	0.55	1,265	695.75
2002	0.57	1,310	746.7
2003	0.59	1,708	1007.72
2004	0.58	1,070	620.6
2005	0.53	5,796	3071.88
2006	0.55	2,857	1571.35
2007	0.54	3,081	1663.74
2008	0.54	3,377	1823.58
2009	0.54	3,057	1650.78
2010	0.54	3,036	1639.44
2011	0.54	1,743	941.22
2012	0.54	2,129	1149.66

Source: Own computation.

Figure 9

The Relationship between Private Investment in Infrastructure and the Value at Risk



Conclusion

This study results further support the arguments for using fundamental risk in calculating Value at Risk and estimating infrastructure guarantees in Nigeria. We argue that governance indicators are good and robust basis for calculating Value at Risk for infrastructure investments, which require government guarantees. Accurate calculations of Value at Risk also support the process of engaging private sector operators in Public Private Partnership transactions, particularly in emerging economies in which the absence of adequate data has been a challenge for decision makers. Using fundamental risk in estimating infrastructure guarantees provides more reliable evaluation of risk that can also help in lifting up any upper limit on risk and enhance economic growth in less developed countries.

The study findings, support to the arguments of Das et al (2002) and McDonald (2007), and Llanto (2007) that government should provide guarantees only to fundamental Risks, such as sovereign and political risks.

As much as guarantees assure private participants that the government will take or refrain from taking certain actions affecting their investments in infrastructure development, which have proven to be valuable instruments to address market imperfections that may hold up the delivery of PPP programmes, they have however great implications for the debt profile and the fiscal regime of the country in the event of default. Therefore, the government should consider how it could maximise competition, transparency and promote best practice in the allocation of all government-guaranteed debt, to minimise the premium over government issued debt.

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