Infrastructure Finance System: A Comparative Analysis of3 Developing Countries and Lessons for Nigeria

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Abstract

The current level of infrastructure deficit in Nigeria is believed to be one of the major constraints towards achieving national economic development. This paper looks into three emerging economies - India, Brazil and Chile and identifies solutions that may be applicable to infrastructure financing in Nigeria. The study found that the Nigerian system runs in a similar way to that of India and Brazil, in that the public sector plays a major role in the provision of funds for infrastructure in the country. In Chile, privatization is the main means by which the government has improved on infrastructure financing. Going by Chile's experience, privatization seems to be the best option for Nigeria because it devoid the evil of corruption and mismanagement which appears to be the bane of infrastructure development in the country. However, privatization in Nigeria should be practiced (like Chile) on transparency, openness, dialogue and decision-making processes for achievements to be recorded.

Introduction

The importance of infrastructure in any economy is clearly evident in the way the well being of the economy is affected by its deficit or deplorable state. Scholars have established that there is a relationship between infrastructure development and economic growth as supported in several literatures; they all concluded that improvement in a wide range of various categories of infrastructure lead to faster growth. Calderon and Serven (2003) found positive and significant output contributions of transport, telecommunications and power in some Latin American countries. Roller and Waverman (2001), in their work found evidence of a significant positive relationship between telecommunication infrastructure and economic growth. Canning and Pedroni (2008) showed in their study that infrastructure contributes positively to economic growth on the long run despite substantial diversities across countries. Donaldson (2010) found that railroad development in India between 1870 and 1930 increased real income, reduced trade cost and bolstered trade. Mohommad (2010) noted that physical infrastructure developments lead to faster growth in manufacturing industries. Also, Walsh, Park and Yu (2011), concluded that financial and fiscal conditions, and savings, tend to improve during periods where infrastructure investment is on the increase.

For low income countries, where transportation, communication andpower generation are inadequate, investment in infrastructure or provision of infrastructure has alluring benefits to boost productivity and growth but with huge cost. This tends to affect the financial resources needed to undertake infrastructure investments which are difficult to mobilize because income and productivity are depressed by inadequate infrastructure. With inadequate infrastructure limiting finance and inadequate finance limiting infrastructure, countries can find themselves in a low−level equilibrium trap from which it is difficult to break out (Eichengreen, 1995). In the same vein, infrastructure development facilitates economic growth; economic growth increases demand for more infrastructure, and more infrastructure leads to more economic growth. Thus, development of adequate and quality infrastructure is a necessary condition to maintain growth momentum in any economy.

The current state of infrastructure in Nigeria poses a significant problem; so beyond reasonable doubt, Nigeria's sustainable growth and development depend largely on the availability and maintenance of infrastructure. The non availability of long term funds, lack of clarity about the governance of the PPP structures, absence of risk sharing guidelines, and shortage of expertise to help banks and other firms involved in infrastructure financing, are some of the challenges specific to Nigeria development efforts (Sanusi, 2012).

However, infrastructure development is generally characterized by huge capital outlay,long term finance and low operating costs from long gestation period of project, procedural delaysand returns spread over a long period of time. These specific characteristics of infrastructure development raise some questions which are specific to the infrastructure financing.

This paper seeks to identify solutions in the financial system of other countries that may be applicable and useful in the Nigerian system, using a comparative analysis of the infrastructure finance system of three emerging economies – India, Brazil and Chile.

Infrastructure Finance

The utmost importance placed on developing infrastructure across the globe has made sourcing for finance to embark upon this capital intensive project imperative. As a result, countries in the world over have either expressly or impliedly fashioned out various ways suitable to them depending on the sources of finance they can come up with in tackling the daunting task of infrastructure development in their countries. Traditionally, infrastructure projects are solely financed by the public sector (i.e. the government) in most countries, since the provision of infrastructure is a public service provision and it is among the 'three duties' Adam Smith (1776) attributed to the government for its citizen. Whereas, in most developing countries especially African countries, infrastructure development is financed by the public sector and from foreign borrowings or private finance sourced from abroad (i.e. international private investors) (Irving &Manroth, 2009).

According to Platz (2009), theoretically there are five options opened to public providers to raise funds for infrastructure investments. First, for those providers that their outflows exceed their costs of development for consecutive periods, they may have to save in advance for such investments. Second, providers may restrict capital investment to current receipts in a given period. In this case, providers do not borrow or safe, but only make use of current receipts. The third option is referred to as financing mechanisms. Here providers take loan and pay back with current receipts. In the fourth option, providers rely on grants or intergovernmental transfers. Public providers may also decide to privatize part of their operations.

The involvement of private sector in infrastructure financing cannot be underestimated. The decision to diversify the sources of infrastructure finance, open up the opportunities for private sector financing in many countries. In the 19th century, a lot of infrastructure projects were financed by the private sector. Many of these privately financed projects required government support and subsidies. These moves towards private ownership, private finance and private provision pre date the economic crisis in the 1990s. The loose monetary and fiscal policies (the low income rates) provided a debt based cash flows,with infrastructure funds flowing into the markets. At this time, the role of the private sector lead to high quality infrastructure compared to the deterioration of infrastructure quality that had prevailed under public management. Further recognition given to the private sector was based on the consideration for cost efficiency, equity consideration, allocation efficiency and fiscal prudence (Mor and Sehrawat, 2006).

Characteristics of Infrastructure Finance

Long Maturity: Infrastructure finance has a long maturity period; this is reflected from both the length of construction period and the life span of the asset created.

Large Amount: Infrastructure finance often requires huge capital for the creation of the infrastructure asset.

Higher Risk: Since infrastructure finance requires large amount invested for a long period of time, it is not surprising that the underlying risks are also quite high. The risks arise from a variety of factors including demand uncertainty (in infrastructure finance it is often possible to predict base demand with a high degree of certainty associated with the price level), environmental surprises e.g. hydrology risk in Hydro-electric Power projects, technological obsolescence (usually in the telecoms industry) and more importantly, political and policy related uncertainties.

Fixed and Low (but positive) Real Returns: annual returns from infrastructure investment are low (often near zero in real terms) but positive, given the importance of the investment and its cascading effect of higher pricing on the rest of the economy. Like in demand, where real returns could be near zero but they are unlikely to be negative for extended period of time, returns here need to be measured in real terms because usually, the revenue streams of the project are a function of the underlying rate of inflation.

Infrastructure Finance System

Infrastructure finance system is the broad pattern of financing infrastructure in any locality or country. The structure or the system highlights modalities, sources, rules and participants involved in seeing to the capital outlay needed to finance infrastructure development. The infrastructure finance systems of three emerging economies namely: India, Brazil and Chile are discussed with the aim of deducing steps taken to achieve positive result.

India

In India, infrastructure investment had its finance coming almost entirely from the public sector. Recently, in the last ten years, the private sector has come to be a significant player in infrastructure investment which now constitutes about 20 per cent of infrastructure investment in the country (Lall & Anand, 2010). This has resulted in the infrastructure finance system of India to be Central Government budget finance, debt finance and equity finance. The public sector remains the major player yet in the financing of infrastructure development in India. Debt finance mainly comes from the country's commercial banks and specialized Non-Bank Finance Companies (NBFCs), while other sources of finance include the External Commercial Borrowings (ECBs), equity, Foreign Direct investment (FDI), and insurance companies. A breakdown of India's infrastructure finance system as described above will present as follows:

About 45 per cent of the total investment in infrastructure is financed from monies from the Central government budget. 41 per cent are used for debt financing while 14 per cent goes to equity financing. This accounts for the remaining 55 per cent. Within the debt financing, 21 per cent is financed by commercial banks alone and the remaining 10 per cent financed by the NBFCs. Other sources of financing include equity, FDI, ECBs and insurance companies financed less than 10 per cent of the overall infrastructure development each (Bank for International Settlements).

The system described above is expected to deliver on financing for infrastructure development which will see to economic improvement on the basis of infrastructure provision in India. Despite this structure the country has put in place to ensure the target set for the infrastructure provision is met, a number of challenges were encountered. These challenges are:

Funding Gap: The most evident issue faced in the system is the funding gap, which is a phenomenon that occurs when there is a short fall in the needed funds as against the available funds. The funding gap challenge in India was aggravated by the slowdown experienced in the Indian economy around March, 2010. The crisis in the Euro zone, which led to a serious debt overhang made accessing external resources by way of ECBs difficult and this has further accentuated the funding gap. Table 1 below highlight the gaps encountered in the various sources of infrastructure funding in the country.

Table 1.Funding gap in infrastructure finance during 2010–11 and 2011–12(Rs.crore)

Source of Funds	Estimated Requirement*	Estimated Availability#	Funding Gap
Commercial Banks	2,67,480	2,02,027	1,25,685
NBFCs@	1,24,699	1,00,651	
Insurance Companies	52,046	42,330	
ECBs	76,984	50,515	
Total Debt Funds	5,21,208	3,95,523	
Equity$	1,86,456	1,84,571	1,885
Total	7,07,664	5,80,094	1,27,570

Source: Planning Commission (2010), Conference on "Building Infrastructure: Challenges and Opportunities – Financing of Infrastructure",

March 2010.

Fiscal Burden: As earlier said, the central government of India is the major player in the financing of infrastructure development, but government fund has competing demands such as education, health, employment creation amongst many other demands, these alongside infrastructure development. For this reason, the government has a limit to financing of infrastructure; hence they need to consider other outlets for infrastructure financing.

Asset-liability mismatch of commercial banks: India's commercial banking sector is the second player in the financing of infrastructure, it however has an imbalance on both sides of giving out loan and expectations from loans for infrastructure. Commercial banks primarily leverage on short-term loans and, as such, their ability to give more long-term loans to the infrastructure sector is limited. This is so because these banks may get into serious asset-liability mismatches if they over stretch their loan limit.

Investment obligations of insurance and pension funds: Insurance and pension funds leverage on long term loans and this from the point of view of asset-liability mismatch, they are the best suited institution to invest its funds in infrastructure sector. However, they are compelled to devote a substantial part of their income in Government securities; thereby limiting their direct investment in the infrastructure sector. Although, they still supports the funding of gross fiscal deficit of the Central Government thereby assisting the Central Government to increase its investments.

Need for an efficient and vibrant corporate bond market: The corporate bond market is still not developed due to over reliance on the commercial banks for funding. A corporate active bond market can provide long term funding for the infrastructure sector.

Insufficiency of user charges: User charges levied on infrastructure project is usually insufficient, this negatively affects the servicing of the infrastructure loans. Hence, the collection of appropriate user charges becomes essential for financial viability of infrastructure projects.

Legal and procedural issues: Infrastructure development involves long gestation periods, and many legal and procedural issues. These factors create an uncertainty which affects the risk appetite of investors as well as the banks' commitment to extend funds for the development of infrastructure.

Brazil

Brazil's infrastructure finance system is somewhat more balanced than that of India's, earlier discussed. This is because funds from other sources such as equity, debt etc plays a substantial role in infrastructure development. Thus, the infrastructure finance system of Brazil is patterned to be government financed and the private sector financed. The public sector of Brazil plays an important role in infrastructure finance through *BancoNacional de Desenvolvimento Econômico e Social* (BNDES), which is a publicly-owned development bank and is a dominant player in long-term private sector corporate finance. BNDES provides loans directly to firms for infrastructure development with very low lending rate, but also provides securities and warrants. BNDES secures financing from retained earnings and some foreign sources (multilateral and bilateral lenders), but also from various taxpayers and workers' income (pension funds).

Infrastructure in Brazil is also equity financed as evident in Eletrobras where the national government holds shares in the company. The national government retains 52 percent of ordinary shares, with minority shareholders holding 22 percent. The balance of the ordinary shares is kept by Brazilian public funds, including pension funds.
Concessioning is another visible means of funding of infrastructure in Brazil. The government has embarked on concessioning since the 1990s. Concession is one of the private sector participation in infrastructure finance which usually involves no public financing; however majority of the concessions embarked upon by the Brazilian government is on road infrastructure. It is noteworthy that the government passed a law in 2004allowing Public-Private Partnership (PPP), this law requires the national and state government involved in PPPs to set up guarantee funds to make sure private concessionaires are funded regardless of project difficulties. The size of these funds is limited depending on federal or state government's total annual revenues.

Foreign Direct Investment (FDI), equity, and debt financing of infrastructure are clearly evident in a number of concessions in the country. Their involvement in funds provision for infrastructure development through concessioning could be particular to one or a combination of two or the three of them.FDI funding is evident in the concessioning activities in the country, for example Brisa, a Portuguese infrastructure company holds a large

share in CCR. The Spanish company OHL, also has as its subsidiary OHL Brasil; with a substantial shares holding of 60% of the company. Most of these concessionaires also use debt financing in funding infrastructure by selling both short and long term bonds in the local market. The above explains how the Brazilian system is run regarding infrastructure financing. It is of importance to note here that even though all stated above is put in place there is still some level of infrastructure deficiency in Brazil, this mainly due to their need for increase infrastructure being the host nation for World cup 2014 and Olympics 2016.

Chile

The country represents one of the best climates in the whole world for private investment in infrastructure this is due to her definite information on transparency, openness of statistics publications, policy changes, and dialogue and decision-making process. This improvement has come about since the privatization of the public system in 1981.

As stated above, privatization is the country's fulcrum of infrastructure development. Though there is clear evidence of debt, equity and FDI funding in the system but these are through the privatized companies.
Debt financing is visible in the Chilean infrastructure financing system as can be seen in all the Chilean energy companies through their issuance of both domestic and foreign bond. Apart from bonds, one other source of debt financing is lines of credit from international banks which are usually on short term basis. Many Chilean energy firms have secured credit from Canadian, United States, Japanese and Spanish banks in recent years. Chilean road projects have also been largely debt financed. With preconstruction financing relatively risky, concessionaires employmonoliners, generally from very large insurance companies or investment banks, secure domestic Chilean ratings, and allow the securities and guarantees to be purchased by the country's large pension fund and insurance companies.

It is noteworthy to state that concessioning is only evident in the road constructions in Chile where the highway was auctioned off to concessionaires between 1995 and 1998, and were all completed by 2002. PPPs are used to finance the construction of major road infrastructure in the country. Infrastructure financing in Chile is also aided through equity financing has evident in their energy companies; Endesa, Gener and Colbún are 3 of the 4 major energy companies which are listed in the Chilean stock market and all actively issue equity in the market for investment purposes. FDI through equity is seen in Chile's PPP program which attracted substantial FDI. Road construction in the 1990s attracted about US$250 million in foreign equity investment, with participating companies from Mexico and Spain.

Findings from the Three Systems

Going by the brief analysis of the three developing countries' infrastructure financial systems i.e. India, Brazil and Chile, it is evident that Chile's privately financed system is ahead of the others. Although the three countries adopt the same tools of equity, debt and FDI funding using privatization, concessioning/PPP in achieving their set target. The level of involvement of the public or private sector is very different amongst these countries and this has in no small way affected the management and efficiency of infrastructure provision.

For instance India's infrastructure finance is largely financed by the public sector i.e. government. Although the country is near succeeding in meeting her set target for the five year plan, equity financing and FDI in the country is not developed, as their contribution towards infrastructure provision in India as earlier stated above is stumpy. This pattern as affected the development of their financial sector and thus inhibiting the involvement of the private sector as can be seen by the minimal participation of commercial banks, private investors through FDI and equity. As earlier illustrated, less than 10% contribution from FDI, equity and Insurance companies goes into infrastructure finance, which is a far cry from the contribution of the public sector which is about 45% of total funds going into infrastructure. This heavy reliance on government is a distraction to government as regards other aspect of governance.

In the case of Brazil, their infrastructure finance system creates little opportunity for private investors as the lending rates in most of the commercial banks in the country are high thereby fostering a situation where most banks only fund private sector lending in the short term. Long-term lending only comes from the *BancoNacional de DesenvolvimentoEconomico e Social*(BNDES), a publicly-owned development bank. In addition, the country's pension funds are relatively small with assets of around 15 percent of GDP and though other institutional investors, such as insurance firms, are growing but the sector is still under developed. This clearly shows that

even though the Brazilian system of financing infrastructure is both private and public sector involved, the private sector is constrained and thus plays a limited role in infrastructure financing in the country.

Chile offers Nigeria a great lesson to be learnt being that the secret to Chile's infrastructure progress is mainly privatization which is the direction the Nigerian government is toeing. Chile's financial sector is relatively well developed, with a reasonably well developed corporate bond market, a stock market capitalization of around 144 percent of GDP, and a liquid market in interest rate derivatives.

With the privatization of the pension system, making a large flow of funds go into AFPs (these are Chile's pension fund administrators) which has led to sustained increase in the assets under the management of insurance and pension fund companies. Thus, privatization of the pension system is an important catalyst to the growth and development of the fixed income market in the country. This system has helped in the financing of infrastructure development which has led to great improvement of infrastructure provision in Chile.

Conclusion

The Nigerian story

The Nigerian system runs in a similar way to that of India and Brazil mentioned above, in that the public sector plays a major role in the provision of funds for infrastructure in the country. The importance of infrastructure in any economy cannot be over emphasized especially in aiding economic growth and human development, and when a country has a short fall in infrastructure it will have a retrogressive effect on the economy. There is the need for Nigeria to bridge her infrastructural gap for sustainable development and growth in the country. According to the Infrastructure and Regulatory Commission (ICRC, 2009), approximately 70 per cent of the 193,000km of roads in the country are in deplorable condition, whilst only 20 per cent are paved. Currently, the country generates less than 3,000MW of electricity, feeding a population of over 150million. Today, Nigeria can no longer boast of a functionally productive railway system for either passengers or freight. With the present state of infrastructure decay and inadequacy, there is no gain saying that the present system practiced is not working.

As a result of the present situation of infrastructure decay in Nigeria, the Nigerian government in a bid to solve the situation tends to toe the line of privatization and concessioning. The government actually started off with the idea of commercialization leading to privatization. The concept here is that public assets are first commercialised, where ownership of the assets remains in government hand, but the government allows these infrastructures to run commercially by charging appropriate commercial rates and in some cases there is change in management. However, at the commercialization stage, the idea was met with public disapproval; most of the populace did not want to pay commercial rate for government owned assets because of inefficient services amongst other reasons. The government then decided to skip the commercialization stage and go straight to Privatisation; where ownership of the public assets changes from the government hands to private hands. In order to establish the decision, a public enterprise – The Bureau of Public Enterprise (BPE) was set up to oversee the privatization procedure. The outcome of this establishment ran foul of its intents as revealed in the probe of BPE set up by legislators. It was found out that many of the privatised public asset bought by investors were undervalued and sold far less than what should obtain, above all most of the investors buying into the public asset ended up engaging in asset sharing of the investment bought.

Concessioning is another option the Nigerian government sought to use in her bid to resolve the infrastructure deficit in the country. A typical example is the award of the concessioning of Murtala Mohammed Airport in Lagos and the Lagos-Ibadan Express Road by the government to Bi-Courtney Ltd, but there had not been much use of concessioning by the Federal government.

Lessons for Nigeria

Nigeria unarguably needs prompt actions to resolve her infrastructure deficit particularly with regards to financing. According to Sanusi (2012) in his paper; he reiterated that the country requires an annual investment of US$10 billion over the next ten years in order to reduce its infrastructural deficit; an amount the Nigerian government cannot solely provide. To address these challenges, the country needs to look beyond traditional approaches to financing her infrastructure development; taking lessons from an emerging economy like Chile.

Going by Chile's experience, privatization seems to be the best option for Nigeria because it devoid the evil of corruption and mismanagement which appears to be the bane of infrastructure development and maintenance in the country today. However, the main lesson that can be drawn from Chile's system is that the way privatization

is practice in Nigeria needs to be improved upon. Privatisation in Nigeria should be practiced (like Chile) on transparency, openness, dialogue and decision-making processes for achievements to be recorded.

With Chile's privatized pension system, contributions to pension funds are made automatically and more efficiently, which led to a large flow of funds into the AFPs (Chile's pension fund administrators), where these funds are used for equity and debt finance in infrastructure investments, hence fund is provided for infrastructure development.

In Nigeria, the pension system is being regulated by a government agency – Pension Commission (PENCOM), and can still boast to have accumulated over N2.3 trillion (over US$14 billion) in the last seven years of the commencement of the pension reform. However, these huge accumulated funds cannot be used on infrastructure investment in the country because of the legal constraint that restricts pension contributions investment options. The government should take a cue from Chile that allows her pension fund to be used in infrastructure financing of her country.

These funds yield predictable streams of income which can match long-term liabilities and in addition, they hedge against inflation and are less volatile and therefore can be used in the financing of infrastructural investment in the country, through equity or debt financing. If privatization of infrastructure in Nigeria is efficiently practiced like in Chile, financing of infrastructure investment will show more improvement and thereby infrastructure development and maintenance will be efficient.

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