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Journal homepage: publishing.globalcsrc.org/jbsee**Is Investment in Infrastructure Worth It?**¹Mohammed Aliu Momoh, ²John Emeka Ezike¹University of Lagos, Nigeria. alimomoh@gmail.com¹University of Lagos, Nigeria. john_ezike@yahoo.com**ARTICLE DETAILS****History***Revised format: Nov 2018**Available Online: Dec 2018***Keywords***Infrastructure, Procurement, Public Private Partnership, Growth theory, x-Efficiency, Investment in infrastructure.***JEL Classification:***H54, H57, L33, L39***ABSTRACT**

The argument for investment in infrastructure and its implication for economic development have attracted a robust discourse. This paper adds a voice to the significance importance of the subject matter by examining the theoretical arguments for infrastructure investment. We further developed a framework, which explains the need for investment in infrastructure and its flow both as input for recycling and input for further production as a final output for consumption. The study shows that no one individual can provide infrastructure but rather all the activities of the various industries sit on a platform from which payment for its use is shared amongst all users. It concludes that Investments in infrastructure are not just one off event but planned to achieve a robust economic development.

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Corresponding author's email address: alimomoh@gmail.com**Recommended citation:** Momoh, M. A., Ezike, J. E. (2018). Is Investment in Infrastructure Worth it? *Journal of Business and Social Review in Emerging Economies*, 4(2)197-206**DOI:** 10.26710/jbsee.v4i2.200**1. Introduction**

The increased pressures and demands, driven by major factors of change in the developing countries has necessitated the need to bridge the looming “infrastructure gap”, because the productive capacity of any nation is governed by its infrastructure, with the Infrastructure systems contributing and playing a vital role in economic and social development (Sachs et al. 2004; OECD 2007; Saravanan 2008; Liu and Waibel 2010 and Afeikhena 2011). According OECD (2015), most developing and emerging economies will need to make infrastructure investment of close to USD 71 trillion by 2030, representing about 3.5% of the annual world GDP from 2007 to 2030 to meet social needs and support more rapid economic growth.

This is elucidated by Kandiero (2009) and Frimpong (2013) who reported that less than 50 percent of roads (in 33 countries) in Africa are paved, 40 percent of the population lacks access to safe water; 60 percent of the population lacks basic sanitation, only 30 percent of the rural population in Sub-Saharan Africa has access to all-season roads and electricity. In addition, Sub-Saharan Africa has the lowest telephone penetration of 14 percent and Internet penetration of 3 percent compared to the world average of 52 percent and 14 percent respectively, hence “the unprecedented need for infrastructure investment is not subject to debate” (PwC 2011, 6).

Infrastructure is a broad concept with no universally recognized or common definition. It is largely

perception and subject matter driven (Nijkamp, et al., 2000; Buhr, 2003; UNCTAD, 2008; Torrissi, 2009; and Morimoto, 2010). The difficulty in having a universally accepted or common definition is born out of the need to reconcile the three analytic and not necessarily compatible objectives identified by Buhr (2003) as, the formulation of a concept for the term "infrastructure", the incorporation of theoretic approaches and the description of the reality of infrastructure provision and this has made it difficult to develop uniform policy in the field (Infrastructure Canada, 2007).

Traditionally, "infrastructure" has been applied to permanent installations required for military purposes; however modern general usage of the term is concerned with the necessary economic and organizational foundation of a highly developed economy (Drosdowski, et al. 1997). This, Jimenez (1994) observed, is the foundation on which the factors of production interact in order to produce output and considered to include, "those services without which primary, secondary and tertiary production activities cannot function. In its wider sense, it includes all public services from law and order through education and public health to transportation, communications, power and water supply, as well as such agricultural overhead capital as irrigation and drainage systems" (Hirschman 1958, 83).

There is a significant literature that supports the argument that infrastructure promotes economic development and growth, attracts a significant positive effect on economic growth with increasing returns to scale, foreign direct investment (FDI), reductions in production costs in manufacturing, significantly higher growth rates and poverty reduction, etc. (Dutt and Ravallion, 1998; Elhance and Lakshamanan 1988; Sahoo and Saxena 1999; Sahoo 2006 and Udah 2011). Governments therefore seek to ensure that the stock of infrastructure is adequate because increased infrastructure spending stimulates the economy (Barandiaran 2011 and Webb 2004).

This notwithstanding, opinions differ greatly around the question of both magnitude and causality thus if investments in infrastructure are assumed to be growth enhancing, the question remains whether governments choose the right projects and the right level of investment or the appropriate means of finance, and whether public investment decisions are efficient (Bygrave and Minniti 2000; Kellermann 2007 and Torrissi 2009).

Based on the above, this study seeks to provide an alternative thought especially to the conclusion of Rodriguez (2006) whose study challenged the argument that infrastructure play a major role in growing disparity between the underdeveloped and developed economies. The rest of the paper is organized as follows. The second section explores the theoretical argument for investment in infrastructure, while the third part develops and examines the conceptual framework supporting the argument for investment in infrastructure and the last part draws a conclusion from the framework.

2. Theoretical Argument for Investment in Infrastructure

The prediction of the neo-classicalists of a convergence in economic development has become difficult to achieve and may partially be explained by the difference in key institutions among countries of the world (North, 1990; Tornell, 1993; Knack and Keefer, 1995). Age nor (2010) observed that the dearth of infrastructure continues to be a key obstacle to growth and development in many low-income countries and to alleviate these constraints to growth and poverty reduction, several observers have advocated a large increase in public investment in infrastructure, in line with the "Big Push" view of Rosenstein-Rodan (1943). He argued further that infrastructure services have a strong growth-promoting effect through their impact on production costs, the productivity of private inputs, and the rate of return on capital—particularly when, to begin with, stocks of infrastructure assets are relatively low.

Rosenstein-Rodan (1943) had proposed a state-coordinated big push to kick-start sustained growth, thus increasing economies of scale in each growing industry with spillover into growth opportunities in other sectors, while growth falters because of a range of market failures (Morck and Nakamura, 2007). Rostow (1956) in his five basic stages of development in supporting the submissions of Rosenstein-Rodan

describes economic takeoff as the transition from a low-income to a high-income growth path; and sees big push coordination as lifting countries out of a poverty trap. Kofi Annan's UN Millennium Project in 2005 and Sachs' (2008) shock therapy both echo Rosenstein-Rodan's call for a big push to bring developing countries to Rostow's economic takeoff.

Rosenstein-Rodan argument was premised on the fact that businesses in developed economies rely, usually unknowingly, on multitudinous other firms, each keeping prices near minimal costs (Matsuyama 1992). DeFontenay and Gans (2004) and DeFontenay (2004) however observed that because every firm relies not only on its own suppliers and customers, but on their suppliers' suppliers, customers' customers, suppliers' other customers, customers' other suppliers, and so on; market power, anywhere along a multi-stranded production chain can raise a firm's costs. This network of existential externalities which Morck (2011) described as Gordian knot is absent or seriously incomplete in LDCs (Rosenstein-Rodan 1943), thus necessitating a massive state-coordinated investment in the entire network, each industry coming online and growing as needed by other industries to build a self-sustaining whole (Morck, 2011). Rosenstein-Rodan (1943) concluded that integrating all such interdependencies within a single entity is essentially a call for central planning, and calls for the state to coordinate and subsidize a massive cross-industry surge of capital investment – a big push although Hayek (1945) observed that Rosenstein-Rodan specifically, stressed that governments lack the detailed information needed to coordinate a big push.

Nurkse (1953), Scitovsky (1954), and Fleming (1955) in subsequent studies agreed that simultaneous industrialization of many sectors can be self-sustaining and provided an insight into two important elements. First, the same economy must be capable of both the backward pre-industrial and the modern industrialized state. No exogenous improvement in endowments or technological opportunities is needed to move to industrialization, only the simultaneous investment by all the sectors using the available technology. Second, industrialization is associated with a better state of affairs. The population of a country benefits from its leap into the industrial state.

The Hirschman's framework otherwise known as the "Unbalanced growth" theory while agreeing on the existence of a vicious circle, however argued that industrialization of certain "leading" sectors would pull along the rest of the economy (Hirschman 1958). The unbalanced growth theory is premised on the fact that investment by a firm can, through forward linkages, motivate investment by another firm that uses the first firm's output as an input. Similarly, through backward linkages, one firm's investment can motivate another firm, which provides inputs to the first firm, to invest in a form of backward integration. Instead of industrializing a large number of sectors, he argued that what was needed was the industrialization of the "leading" sectors. Then, through backward and forward linkages these sectors would spark the industrialization of the rest of the economy. Thus, growth is unbalanced, as it does not occur everywhere, only in certain sectors, which then pull others along (Krishna and Pérez, 2004; Agarwalla, 2011).

This notwithstanding, Murphy, et al (1989) and Rodrik (2003) observed that one of the most encouraging aspects of the comparative evidence on economic growth is that it often takes very little to get growth started, and virtually every country that experienced rapid growth of productivity and living standards over the last 200 years has done so by industrializing. Explaining further Murphy, et al (1989) suggested that an important component of industrialization for which pecuniary externalities can be crucial is investment in jointly used intermediate goods, e.g., infrastructure such as railroads and training facilities. To the extent that the cost of an infrastructure is largely fixed, each industrializing firm that uses it helps defray this fixed cost and so brings the building of the infrastructure closer to profitability. In this way, each user indirectly helps other users, and hence makes their industrialization more likely. As a result, infrastructure develops only when many sectors industrialize and become its users.

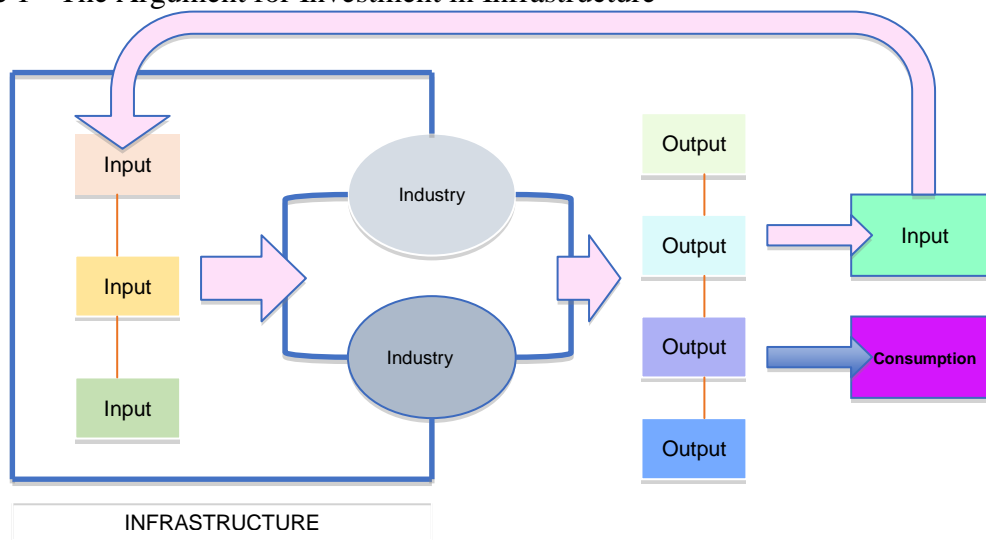
3. A Conceptual framework.

Infrastructure development is one of the major factors contributing to overall economic development, creating production facilities, stimulating economic activities, reducing transaction and trade costs, improving competitiveness, providing employment opportunities and positively affecting the poor directly and indirectly in multiple ways (World Bank 1994; Jones 2004; Estache 2006; Dasha and Sahoob 2010). While it has been established that there is no commonly agreed usage of the term infrastructure, the concept, can in its broadest sense, comprise the physical facilities, institutions and organizational structures of a nation (UNCTAD 2008).

Unfortunately, poor infrastructure is the most binding constraint to growth among emerging nations, impacting negatively on the profitability and performance of micro, small and medium scale enterprises, and distribution of goods and services (Lars-Hendrix and Waverman 2001; Obokoh and Goldman 2016; Olufemi, et al 2013 and Llanto 2012). Manufacturers, investors and industrialists have constantly and consistently highlighted the deplorable state and disrepair of most infrastructural facilities and lack of maintenance due mainly to the drastic reduction in government spending, vandalism, corruption, bureaucratic delays in the construction, maintenance and repair of damaged facilities, concluding that the provision of infrastructure encourages investment in less developed areas, allowing wider movement of goods and people, facilitating information flows and help commercialize and diversify the economy (Ijaiya and Akanbi 2009 and Nwachukwu 2011).

To support development it will be necessary for government to fund the development of infrastructure. Smith (1776) in his Wealth of Nations posited that the duty of erecting and maintaining certain public works and public institutions which can never be for the interest of any individual, or small number of individuals, to erect and maintain falls to the state, because the profit could never repay the expense to any individual or small number of individuals. Thus, the cost of providing infrastructures by the government under the traditional procurement according Calitz and Fourie (2007) is ultimately borne by taxpayers, users or donors Development agencies (loans), Lenders to government or government enterprises (loans or guarantees), which is why infrastructure are often referred to as public goods.

Figure 1 - The Argument for Investment in Infrastructure



Source: Authors' Conceptualization

Figure 1 above explains the role of infrastructure as the couch upon which industrialization efforts sits. Whichever angle the process of development is viewed, whether through Rosenstein-Rodan, Rostow and or Hirschman's framework the need to have a network of existential externalities which infrastructure represents is key to development. Since according to Adams Smith, any one individual cannot provide infrastructure, the framework suggests that activities of all the industries sit on this common platform from which payment is shared amongst all the users. It thus becomes a process in which output are

derived from each industry using this platform. This output is either consumed directly by the final consumer or serve as input for further production. This is the circle that builds up the economy

The flow in the model in figure 1 shows that irrespective of the model for growth, a common dominant factor, which facilitates and induces rapid economic development, is infrastructure. The model depicts a typical production process in which input are fed into the industry whose output are either consumed by the final consumer or serve as input to other industries within the economic chain. This is premised on the fact that the industries are taken for granted as provision of infrastructure, which helps to support the production process.

Infrastructure provision by government enables the various participants in the economy to concentrate on production while taking for granted those production-assisting facilities, which are not directly related, or beyond the ability of the entrepreneur and or the household to provide. DeFontenay and Gans (2004) and DeFontenay (2004) best captured the scenario when they opined that provision of infrastructure by government as depicted in the figure will have taken a substantial part of the expenditure incurred by the entrepreneur but jointly borne by all as argued by Calitz and Fourie (2007).

Although expected to play an important role in the catching-up process of developing and transition countries, with a significant output contributions expectation, disappointingly infrastructure is one of the main concerns for entrepreneurs (Roller and Waverman 2001; Estache et al. 2002; vonHirschhausen, 2002; Calderon, et al 2003; Calderon and Serven 2004; Shiu and Lam 2004; World Bank; 2005; Gonzalez et al. 2007 and Rud 2012). For instance, about 40 percent of the African productivity handicap faced by firms can be eliminated with provision of infrastructure. These benefits are expected to be particularly related to those with a high level of dependence on external trade, and those where conditions require expeditious investment to upgrade their infrastructure (Zhai 2010 and Foster and Pushak 2011).

Often held as a precondition for economic development, investments in infrastructure not only attract capital, but also create the conditions under which domestic companies emerge and invest abroad. Some developing countries, have generally been successful in improving sector performance in terms of higher investment and service availability, efficiency, higher quality of life, and thus are able to attract foreign direct investment (FDI), and have been favorable to the development and implementation of new views, approaches, techniques and practices (List 2001; Smarzynska and Wei 2001; Wheeler 2001; Globerman and Shapiro 2002; Gutierrez 2003; Maiorano and Stern 2007)

However, consensus is achieved around the idea that basic infrastructure facilities are important features related to economic performance. The financial, legal, and physical infrastructure development, are all critical to an economy's ability to support entrepreneurship and share many characteristics of network externalities. Apart from these main ideas, opinions differ greatly, with regards to both magnitude and causality as the main subjects of debate (Bygrave and Minniti 2000; Torrisi 2009)

4. Conclusion

The role of infrastructure is widely considered as very important to both households and firms considering that Infrastructure services are used as final consumption items by households and as intermediate consumption item for firms. Also the impact of infrastructure investments on country development is an important issue for strategic management and development of a country policy especially during the period of economic transition (Snieska and Simkunaite 2009). The support infrastructure provides to firms is quite enormous. It allows them to concentrate on improving process, innovation, diversification, skill development and most importantly increased productivity thus impacting positively on the economy.

In concluding, it will be safe to agree with Timmins (2005), World Bank (2005) McGovern (2011) and Estachea and Iimi (2011) that public infrastructure investments are not random events, and are distinctly different from many other forms of investment. Planners assess the need for and direct investment to

where they consider to be of the greatest need. However in emerging economies, public resources deployable for infrastructure are limited and the best way to find fiscal space for public investment is to eliminate waste and improve technical efficiency in public expenditure. Unfortunately how to use the limited public resources remains an important challenge for governments or public entities, especially under the fiscal pressure. Governments therefore must decide whether to produce infrastructure goods and services in-house (traditional Procurement) or procure them from the outside through collaboration in the form of public private partnership. The determination for the ideal financing option for infrastructure remains an issue for empirical research.

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