

Funding challenges of infrastructures in developing countries' economies

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ملخص: تهدف هذه الدراسة الى تقييم مشاكل تمويل البنى التحتية في الدول النامية، حيث أن إنشاء إطار تمويل سليم للاستجابة لاحتياجات البلدان النامية والمتزايد من البنية التحتية، لا يزال يمثل تحديا كبيرا لهذه الدول. تمثل البنية التحتية عجلات النشاط الاقتصادي والاجتماعي لأنها الوسيلة والأداة والتقنية لتنفيذ مشروع أو برنامج أو استراتيجية، وهي المكون الرئيسي لمناخ الاستثمار، وتشجع التجارة والاندماج في الأسواق العالمية، وهي مفتاح التنمية البشرية؛ بما في ذلك تقديم الخدمات الاجتماعية مثل الصحة والتعليم. إن الطلب على البنية التحتية أعلى، والموارد المستخدمة في توفير البنية التحتية محدودة في البلدان النامية وفقاً لتقديرات اونكتاد (UNCTAD) على معظم البلدان النامية مضاعفة مستويات الاستثمار الحالية في مشاريع البنية التحتية التي تقل عن 3 % من الناتج المحلي الإجمالي إلى من لا يقل عن 6%.

كلمات مفتاحية: . تحديات التمويل، البنى التحتية، الدول النامية.

تصنيفات JEL : O11, E22, H76

Abstract :

The main aim of this study is to evaluate the problems of financing infrastructures in developing nations, as founding a sound funding framework to respond to developing countries' growing infrastructure needs, continues to be the key challenge. Infrastructure represents the wheels of economic and social activity as it is the medium, the tool and technique of executing a project or program or strategy, the key component of the investment climate, it promotes trade and integration into world markets, and is a key to human development; including the delivery of social services such as health and education. The demand for infrastructural is higher and resources used in provision of infrastructure are limited in developing countries as estimated by l'UNCTAD that most developing countries must double current investment levels in infrastructure projects of less than 3 % of gross domestic product (GDP) to at least 6%.

Keywords: Funding challenges, infrastructures and developing countries.

JEL classification codes: O11, E22, H76

1. INTRODUCTION

UN-Habitat State of World Cities Report (SWCR) 2014 features the five pillars of cities prosperity, that is, (i) Environmental Sustainability, (ii) Urban Infrastructures (Road, Telecommunications, and Urban Mobility), (iii) Quality of life, (iv) Manufacturing and Productivity, and (v) Equity and Social Inclusion (Good Governance). The infrastructures play a vital role in nation development, to employment generation and wealth creation as well as quality of life.

The infrastructure term typically refers to the technical and organization structures that support a society, such as roads, sewers, water supply, telecommunications, electrical national grids, good governance, services and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" (Fulmer, 2009). Infrastructure is the underlying base or foundation especially for an organization or system. The basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, hospitals, courts, airports, post offices, and prisons (American Heritage Dictionary, 2019). In military parlance, the term refers to the buildings and permanent installations necessary for the support, redeployment, and operation of military forces (Department of Defense Dictionary, 2005).

Infrastructure has strong links to growth, poverty alleviation and environmental sustainability. Researches on the infrastructure-growth relationship have concluded that the role of infrastructure in growth is substantial (see Cavallo and Daude, 2011; Calderon and Servèn, 2010), as the infrastructure improvement promotes the productivity and stimulate the private investment thereby boosting the sustainable growth.

Infrastructure services such as power, transport, telecommunication, provision of water and sanitation and safe disposal of wastes, are central to the activities of households and economic production. Providing infrastructure services to meet the demands of business, households and other users is one of the major challenges of economic development. Infrastructure represents the wheels of economic and social activity. Broadly the benefits of infrastructure development are numerous and may be classified into three categories:

- Economic development and human welfare
- Reduction of poverty
- Improvement of the environment.

The relationships of infrastructure with economic growth are multiple and complex. Not only does infrastructure affect production and consumption directly, it also creates many direct and indirect externalities. It also involves large flows of expenditure, thereby creating additional employment. Studies have shown that infrastructure can have a significant impact on output, income, employment, international trade, and quality of life. Infrastructure development can reduce stress and promote good health; it will also reduce crime level. Infrastructure services are

used in the production process of nearly every sector. Infrastructure development is one of the bases of assessing the achievements of leaders and it is the foundation of good governance. Agitation for infrastructural development is higher in developing nations than in developed countries. This is because the resources for provision of infrastructure are scarce. The cost of infrastructure development in developing nations is outrageously high due to corruption. Infrastructure development in developing nations is more challenging; moreover, the challenges are numerous

and include finance, technology for development, maintenance and design.

2. Infrastructures in developing countries (some facts)

The word infrastructure has been used in English since 1927 according to Online Etymology Dictionary (2012), originally meaning "the installations that form the basis for any operation or system ". There are two kind of infrastructure "Hard and soft" infrastructures. Soft infrastructure refers to all the services which are required to maintain the economic, health, and cultural and social standards of a population. It includes both physical assets such as highly specialized buildings and equipment, and non-physical assets, such as the financial system, the education system, the health system, the governance system, and judiciary system, as well as security; whereas the "hard" refers to the large physical networks necessary for the functioning of a modern industrial nation such as roads, bridges, airports, rails ect (Kumar, 2005). Infrastructure can also be classified into horizontal and vertical. Roads, bridges, dams, buildings, rail and telecommunication are horizontal, while policies, laws, rules and orders are vertical.

Infrastructure covers a complex of distinct sectors that together represent a large share of country's economy. The services associated with infrastructure are account for about 7-11 % of GDP. Infrastructure typically represent about 20 % of total investment and 40- 60% of public investment in most developing countries.

The state of infrastructure is directly related to the quality of life of people, for instance "according to recent statistics, the quality of life for most people in Africa appears to have either not improved or only done so marginally" (Eregba, 2007). Access to at least minimal infrastructure services is one of the essential criteria for defining welfare. To a great extent the poor can be identified as those who are unable to consume a basic quantity of clean water and who are subject to unsanitary surroundings, with extremely

limited mobility or communications beyond their immediate settlement. As a result, they have more health problems and fewer employment opportunities. The burgeoning squatter communities surrounding most cities in developing countries typically lack formal infrastructure facilities.

Different infrastructure sectors have different effects on improving the quality of life and reducing poverty. Access to clean water and sanitation has the most obvious and direct benefit in reducing mortality and morbidity. It also increases the productive capacity of the poor and can affect men and women differently. For example, in some countries in Africa, the poor women must commit large shares of their income or time to obtaining water, as well as to carrying crops to market. This time could otherwise be devoted to high-priority domestic duties, such as child care, or to income earning activities. Access to transport and irrigation can contribute to higher and more stable income, enabling the poor to manage risks. Both transport and irrigation infrastructure have been found to expand opportunities for non-farm employment in rural areas. By raising the productivity of farms and of rural transport, both an increase in the incomes of rural worker and reduction in food prices for the urban poor can be achieved. The benefit of transport and communications include the access they provide to other goods and services, especially in cities. Where the poor are concentrated on the periphery of urban areas, as in many developing countries the cost and availability of public transport become a key factor in their ability to obtain employment.

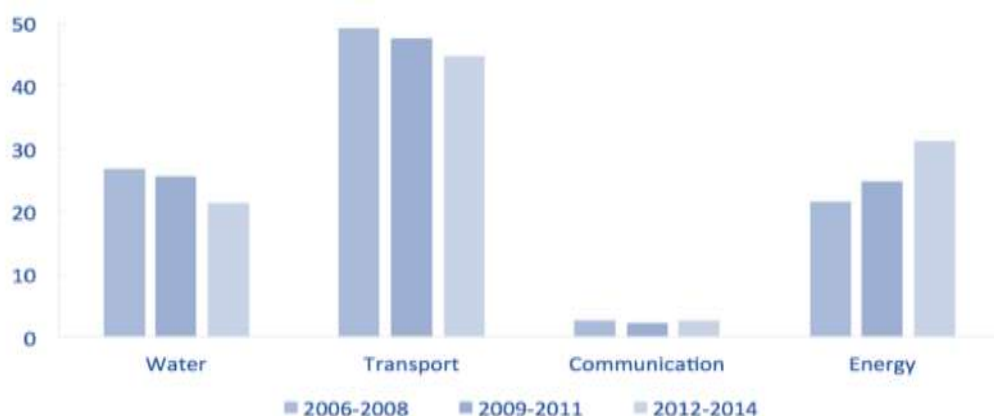
The horrible state of affairs in most developing countries led to untold devastation of economies in these states; people had to live below the poverty line with food insecurity, no shelter to accommodate them and no medical or educational facilities to give them some hope for the future. In each case, the oppressive conditions in which they live with no basic infrastructure led these

people to evolve gradually into a class of disgruntled citizens desperate for change. In Africa the civil wars in some countries have led to the neglect of provision of infrastructure such as education facilities and health buildings, and in some cases, agricultural services and transport facilities were destroyed. School buildings have been converted to military use. Civil wars in Africa undermined the continent's productive capacity, destroyed or severely weakened social structures, distorted economic policy, polluted the value-systems of the people and perpetuated prolonged poverty (Elu, 2000: 60). The world population is 7.5 billion in 2018, with more than 80% living in developing countries. The United Nations estimates that over 1 billion people living in developing countries lack access to safe water and over 2.4 billion lack basic sanitation. In addition to this lack of basic water and sanitation facilities, many people live in substandard housing; transportation and communication links are poor or non-existent; and fuel for heating, lighting and cooking is in short supply. A higher proportion of the population in developing countries does not have access to decent levels of infrastructure services, and this proportion is increasing. The developing countries suffer from a significant infrastructure deficits, as estimated by the G20 about \$1.5 trillion will be required annually to plug these deficits and that the money will largely need to come from private sources.

Despite the remarkable increase in the private investment in infrastructure in developing countries over the past 10 years, major challenges remain. The first is that private investment has been concentrated in commercially attractive sectors and countries, so has not always matched development needs, as for example the Low-income countries (LICs), have received less than 2% of total private investment financing in the last decade. The second, the sectors vital to development, such as urban infrastructure, have seen insufficient funding. As shown in the figure 1, the transportation sector accounted for about half of total investment in economic

infrastructure, consistent with what is found in other analyses (e.g., UNCTAD, 2014). Water and sanitation account for 22 %, the energy sector for 19 % and ICT for the residual 6 %. The relatively low share of energy is somewhat troubling, since access to electricity is frequently identified as a key constraint to development in LIDCs (see Payne, 2010, for a review of the literature, and Di Bella and Grigoli, 2016, for an application to Haiti and Nicaragua).

Figure 1: Sectoral Allocation of Infrastructure 2006–2014 (Percentage of total)



Source: Authors' elaboration based on IMF staff estimates

The flows of private finance into infrastructure in developing countries, is estimated \$1.5 trillion being invested between 2008 and 2017, according to institutional data (Figure 2). From the figure, the 'standalone' private financing (financing devoid of any public policy support) has dominated, accounting for 80 % of total financing over the past decade, with just 20% being co-financed with IFIs.

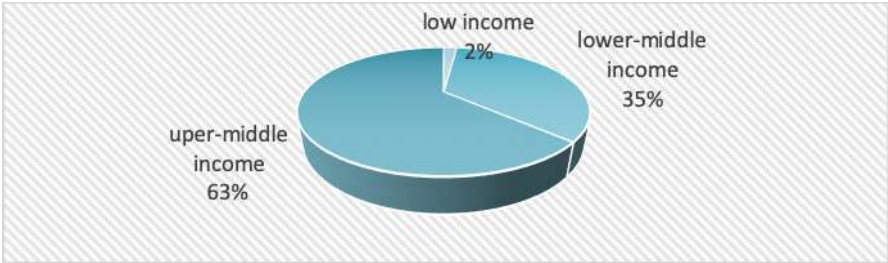
Figure 2:Private infrastructure finance to developing countries (2008–2017)



Source: World Bank PPI Database; International Bank for Reconstruction and Development (IBRD); International Development Association (IDA); Asian Development Bank (ADB); African Development Bank (AfDB)

Private financing to Middle Income Countries (MICs) has been strongest: these received an estimated 98% of all private infrastructure financing between 2008 and 2017. Of this, 63% went to Upper Middle-Income Countries (UMICs) and 35% went to Lower Middle-Income countries (LMICs) (Figure 3). Some countries have the advantage over others in receiving the investment such: Brazil, China, Indonesia, India and Turkey, all are recorded large investment flows.

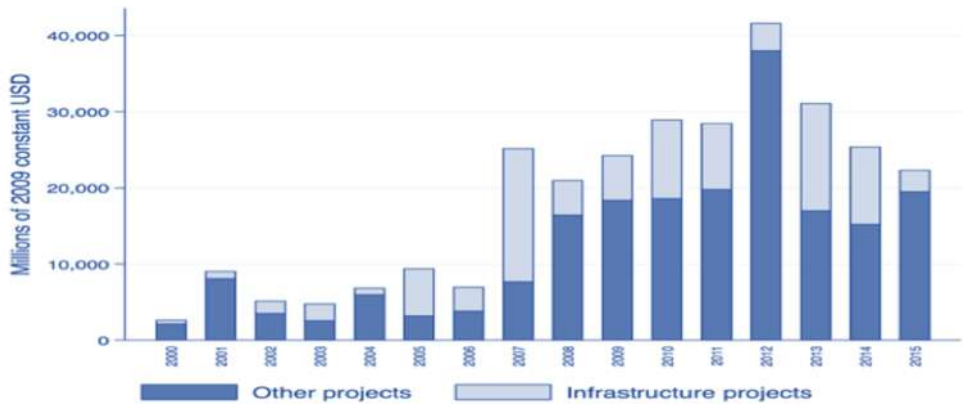
Figure 3: Private finance to LICs and MICs (2008–2017)



Source : Authors ‘elaboration based World bank PPI database

For the financing of the infrastructure in developing countries the public sector remains dominant in covering the infrastructure needs, the private sector participation in financing infrastructure still weak; for instance, the cross-border bank lending which is one of the external source of financing the infrastructure projects in developing countries (private sector) has a small contribution in financing infrastructure compared with other projects (figure 4).

Figure 4: cross-border bank lending



Source: World Bank PPI Database

3. The problems of infrastructure financing in developing countries

The problem of infrastructural development can be: political, economic, financial, social, technology, legal, and environmental. Political environment has to do with the political stability, policy formulation and politics of the project environment both within and without. Economic environment deals with issues like interest rate, inflation, currency exchange rate, price fluctuation etc. financial has to do with the limited sources of the domestic revenue, tax base and the tax administration; funds are spent inefficiently. Social environment has to do with workforce diversity including cultural difference, age difference etc. Technology environment deals with

the machineries which are used for the execution of projects. Physical environmental issues like site topography, geology and climatology is also essential. In the present study we focus on the Evaluation of the financing challenges for infrastructure in developing countries.

➤ **Tax base:** The aggregate value of the financial streams or assets on which tax can be imposed. In the case of income tax, for instance, the tax base is determined by what the tax authorities state as the minimum amount of annual income that can be taxed (taxable income). A **tax base** is the total amount of assets or revenue that a government can tax. For example, to calculate the tax base for a sales tax, you may consider the total spending power of the adults in the community as the tax base. Revenue streams from a gas tax might consider total gas station revenue as the tax base.

The size and growth (or lack of growth) of the tax base is crucial to the planning efforts of any local, state. Because the size of the tax base influences the taxable revenues that are available to a government, there is a direct correlation between the economic condition of a city as a whole and the budget of the government that serves it. Accordingly, governments must always consider how their decisions will affect their tax base. In most developing countries the tax base for some kind of private business is determined randomly or in inclusive way; in other word the tax authorities fixe an amount of tax to some private business without taking in consideration their real revenues. this lead to the reduction of the government revenue and therefore the required capital to finance the infrastructures.

➤ **Capital:** capital flight, capital sink and capital stagnancy is also one of the big challenge that face the infrastructure development projects in most developing countries. A lot of materials and managerial services are procured outside of the developing countries. The contracts are full of loop-holes that allow leakages of funds. In some cases, there are over-design for the

designers to earn more professional fees which are percentage of the contract sum. Capital stagnancy due to abandoned projects is also rampant.

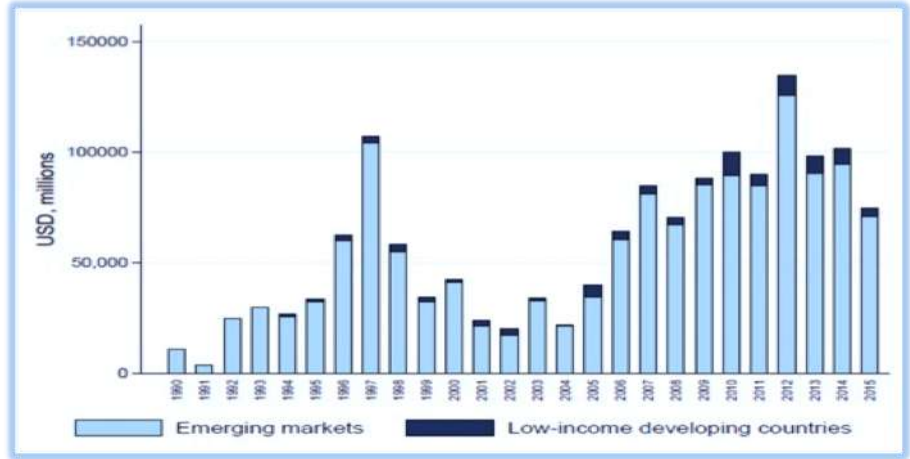
➤ **Poverty and lack of capital:** in developing countries: the challenge of financing and management of infrastructure projects is evident from demographic figure and trends. Poverty, lack of capital and national debt further complicates the challenge facing the infrastructure development in many developing countries, data from the United Nation show over 1.2 billion people in developing countries are poor. Over two-thirds of world's population live in countries whose income per head is below £100 a year, and together these countries account for less than 13% of world income. At the other extreme, 7% of the world's population living in countries where income per head is over £500 a year enjoy no less than 36% of world income.

➤ **The low levels of savings:** as it mentioned above most serious handicap facing infrastructure development in developing countries is the grave shortage of capital. Because in these countries the incomes are low, savings are low and because saving are low, investment is low. Hence such countries persist in unsophisticated traditional methods of cultivation, their manufacturing industries tend to be technologically inferior to those of the developed countries and their infrastructure system are inadequate. There is a vicious circle of poverty from which developing countries can hope to break out only by massive development programs financed from external investment from wealthier countries. Despite the broad increase in infrastructure investment, a strong case exists for further, as several studies find large gaps between infrastructure investment needs and actual spending (see Foster and Briceño-Garmendia, 2010). UNCTAD (2014) estimates that the developing countries would require increasing spending on economic infrastructure by USD 0.8 to 1.7 trillion a year from current levels.

- **Debt:** The high level of debt is another obstacle facing many developing countries, as stated by the UK department for International Development, "the developing countries by trying to pay back the money they owe to richer countries, they no longer have enough resources to spend on vital infrastructure services, including health, education, water and sanitation".
- **Corruption:** Corruption does not only raise the price of infrastructure, it can also reduce the quality of, and economic returns from, infrastructure investment. The corruption in most of the developing countries is very high and unbearable for effective infrastructural development. The Bureau of Public Procurement (BPP), the Independent Corrupt Practices Commission (ICPC) and Economic and Financial Crimes Commission (EFCC) have not been able to eradicate corruption in these countries.
- **Lack of the public investment management institution** which play a role in organizing, following and improving the efficiency of public investment. In addition, mobilizing domestic revenues and prioritizing expenditures could provide more sustainable and reliable sources of development funding.
- **Monopoly of public sector in infrastructure investment:** the private participation in infrastructure investment is quite limited. Its accounted for 6.5% in the value of all project and 10.5 % of the total number of the infrastructure projects; means that the private participation in the Public-Private Partnership (PPP) projects in all emerging market and developing economies is very weak (see figure 5). The figure show that only after the 1993 that the PPP flows to the low income developing countries, and the volume was very low for all the period. Based on the statement of the Infrastructure Consortium for Africa (ICA, 2017) for recent data, from the USD 100 billion in public-private partnership projects, more than half has been invested in Asia and one third in Sub-Saharan Africa. Vietnam and Bangladesh have the largest number of projects, while Lao PDR is an undisputed leader in terms

of volume. Public-private partnerships have also been used to finance regional projects. Across Africa there are several examples of regional infrastructure projects, especially in the energy and transport sectors (UNCTAD, 2016). For example, the Central Corridor is an integrated transport program across five countries (Burundi, DR Congo, Rwanda, Tanzania, and Uganda) with an investment of about USD 18 billion involving local and international actors from the public and private sectors (WEF, 2015).

Figure 5: Flows of PPPs to LIDCs and Ems



Source: World bank PPI database

4. Political and macroeconomic risk: the fluctuations in the exchange rate and interest rates, inflation and wide variety of political and regulatory uncertainties constitute the key political and macroeconomic risks, the managing of these risks poses significant challenges for the investors as many emerging markets are lack of liquid and suitable hedging instruments. Even where such markets exist, hedging is expensive and the instruments are limited (African Private Equity and Venture Capital Association (AVCA), 2017; World Economic Forum (WEF), 2016). For instance, 32% of private-equity investors and 65% of institutional investors indicate that the political and macroeconomic risks constitute barriers to their investment decision (AVCA, 2017; WEF, 2016). Taking in consideration these circumstances investors prefer small-scale

renewable opportunities, such as rooftop solar panels and wind farms, which are less politicized, or companies with high levels of exports, which are less exposed to domestic currency risk. Following this approach means that investors' willingness to invest in large-scale, public projects has been constrained or even limited (AVCA, 2017; WEF, 2016).

5. Conclusion

Infrastructure challenges in developing nations are complex and many. The demand surpasses the supply for infrastructure as well as the absence of the finance that will stimulate the rapid provision, this made a wide gap between provision and needs in all sectors. The political situation in developing nations does not encourage investors to invest in the infrastructure of these countries. In addition, the governments do not set the priority right in infrastructure strategy. High cost of materials for infrastructure development is also a challenge. The local content of production of goods and services must be increased to reduce production cost. Corruption level in developing countries is too high which allows incompetent hands to handle projects, which also cause the high cost of achieving the infrastructure.

Recommendations

- The cost of governance and recurrent expenditures are so high, leaving few resources for capital spending, so the good governance is crucial for ensuring the effective and efficient provision of infrastructure. This is because, good governance means that resource allocations will reflect national developmental priorities and thus respond to societal demands.
- The political risk of infrastructure development is also high and needs the attention of government.
- There should be effort oriented toward the mobilization of both public and private sector financing resources that are critical for infrastructure development.

- The challenges faced by the infrastructure in developing countries can be met by well-conceived and well-managed projects with active participation of both the public and the private sectors.
- Petrie (2010) documented eight key elements to strengthen public investment management and thereby increase the efficiency of public investment: Strategic guidance and preliminary screening, Appraisal, Independent review of appraisal, Project selection and budgeting, appraisal, and have been independently reviewed, should be selected for funding in the budget, Project.
- To enable the rapid structural transformation, the policymakers should focus on planning and that relates between infrastructure and transformation which is best forged when infrastructure projects are clearly designed and made part of a wider development strategy that recognizes and actively fosters the positive feedback loops between infrastructure, productivity and growth.
- There is a need to follow a holistic approach to infrastructure financing, including development of domestic financial markets in developing countries, which constitutes regulatory reform for pension and insurance institutions to enable funds to invest in infrastructure whilst retaining appropriate fiduciary standards. This also requires governments and international financial institutions (IFIs) in low income countries (LICs) to guarantee that any such investments are carefully scrutinized and.
- Finally, from the last statement of G20 which state that 'Mobilizing private investment toward infrastructure is crucial ... This is a win-win objective and it requires international cooperation... Developing infrastructure as an asset class holds great promise to channel the savings of today into public infrastructure, efficient transportation services, basic sanitation, energy flows and digital connectivity that will make each person of today a global citizen and worker of tomorrow.

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