Investing in Infrastructure: Building for the Long Term

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"Developing countries need new infrastructure, developed countries need rebuild infrastructure and almost every country is struggling to finance the infrastructure it needs."

Prime Minister Tony Abbott,
World Economic Forum, Davos, January 2014

Abstract

Infrastructure is the engine of growth, especially, for the developing economies.Considering this idea, all the countries in the world are very much anxious for the future investment in infrastructure. Over the last 18 years (before 2013) global infrastructure investment was 36 trillion USD. According to a report from consultant McKinsey & Co., about $57 trillion will be needed to finance infrastructure development around the world through 2030. But if 3% of total Global GDP is spent for infrastructure, then the total shortage is $8.4 trillion, that is, yearly more than 500 $billion. As infrastructure is public goods in nature, as well as large volume of financing is involved and return of capital is comparatively low and slow (though reliable), market mechanism does not function efficiently.For this reason, to fulfill this shortage national and international organization has to launch special incentives or measures to attract the private investment in infrastructure.

1. Introduction

Infrastructural Investment is essential for the long term economic development of a country. Key infrastructure assets create additional economic benefits by supporting urbanisation and industrial growth and providing better access to adjoining countries and stronger trade links. This, in turn, accelerates growth in GDP per capita and therefore the ability to derive greater financial returns. Sensible investment has a much higher better chance of paying dividends when macroeconomic policies are sound, but at the same time, high-return infrastructure investment is harder to identify and implement in developed countries where most obvious investments have already been made (Rajon, 2015). So, to improve the understanding of project selection and finance is a very important matter. Infrastructure development creates the linkage between developed and undeveloped nations. Due to the characteristics of positive spillover effect of the infrastructure, undeveloped nation's infrastructural investment should get the top priority for the creation of the better world.

Key Words: Infrastructure, Public Goods, Public Private Partnership

2. Literature Review

Henckel (2010) explains that although infrastructure is widely recognized as a key ingredient in a country's economic success, many issues surrounding infrastructure spending are not well understood. In order to better understand these issues, a conference was convened in March 2010 in Sydney, Australia, with leading international experts to explore the many aspects of infrastructure. The discussion at the conference was divided into six themes: the returns to infrastructure, the role of the private sector, the evaluation and delivery of infrastructure in practice, the nature of network industries, pricing and regulation, political economy considerations of infrastructure provision, and infrastructure in developing countries. In this presentation he concluded that Indeed, although there are potentially large theoretical gains of infrastructure investment for economic growth, the efficacy of infrastructure spending in practice is at best mixed.

Wehinger (2011)in his study on OECD countries, Covered the topics of financial reform to foster stability and long-term growth, the contribution of institutional investors to long-term growth, and creating a better environment for the financing of business innovation and green growth. With stressed public sector finances, private capital needs to fill the funding gap for infrastructure and other long-term projects. Appropriate regulatory incentives to overcome short-termism, as well as risk-sharing arrangements e.g. via public- private partnerships, are needed in order to encourage market-based, long-term investment and risk capital financing. Better transparency, information and investor education can also play a role in enhancing long-term savings and investment.

ARCADIS (2014), prepared the Second global Infrastructure Investment Index 2014. To support this growing sector ARCADIS has created its second Global Infrastructure Investment Index, which highlights the most dynamic and attractive markets for infrastructure investment worldwide. The Global Infrastructure Investment Index ranks the world's 41 most dynamic countries with the greatest potential for growth and investment in their economic infrastructure. Economic infrastructure comprises the infrastructure that makes business activity as possible, such as transportation, communication, distribution and energy assets. A total of 26 individual criteria in five key areas (Economy, Business, Risk, Infrastructure, Finance) are analysed and given a weighting which then creates an overall score for each market. The indicators selected are those most pertinent to investors when making an investment in infrastructure. Most weighting goes to indicators of dynamism, but the overall blend creates the final ranking. There are, of course, specific risks in each market and the analysis in this report offers insight into the characteristics and opportunities in these countries. The most attractive markets for investment in infrastructure combine strong growth potential and high levels of investment with low risk, business friendly environments. In general terms, as the index falls away the risk profiles of the countries increase, so therefore, must the returns sought by investors.Among the 41 comparing countries, Singapore places the first position and Venezuela is in the last position.

Deau(2011) mentions that Mobilising private sector funding is essential in bridging the infrastructure funding gap. This can be done by appropriate regulation, targeted public financial support, and active involvement by institutional investors. Creating an appropriate policy framework and lifting regulatory constraints on long-term investments will foster financial stability of retirement savings systems and enable the development of strategic infrastructure projects that contribute to long-term growth. As capital markets and bank funding have dried up as sources of infrastructure financing after the global financial crisis, finding alternative long-term debt sources is critical. Private infrastructure financing can be promoted by targeted public measures and by building an infrastructure management culture amongst asset managers. Infrastructure investments also require long-term policy planning, with long-term strategic policy frameworks that exceed political cycles and are built on wide political consensus. Stable and accessible programmes of infrastructure projects and public-private partnerships (PPPs) are key in attracting private sector investors, complemented by adequate regulation.

Coelho, studied on infrastructural investment in Bangladesh as a case study. He tries to explore, Does it play role as sustainable development? The paper reports on ethnographic case studies of the impacts of rural road improvement in Bangladesh, outlining the implication of such a shift. The case studies also outline pattern of rural urban, national linkages facilitated by improved roads, and the effect of integration into urban, national and global economies and rural livelihood. They suggest that sustainable infrastructure assets does not always accompany the sustainable development process.

Blanc-Brude, Matching the huge demand for capital investment in infrastructure projects around the world with the available supply of long-term funds by institutional investors -- be they pension funds, insurers or sovereign wealth funds -- has never been so high on the international policy agenda. This policy momentum, illustrated by the recent focus on long-term investment in infrastructure by the G20, coincides with the steadily growing investment appetite from institutional investors for unlisted and illiquid assets. However, solid evidence supporting the infrastructure investment narrative is still missing, and full-fledged investment solutions demonstrating the benefits of infrastructure investment for institutional investors remain elusive. Today, documenting the investment characteristics of long-term investment in infrastructure has become a pressing question.

Loayza et al. (2010) presented that in the past half a century, Egypt has experienced remarkable progress in the provision of infrastructure in all areas, including transportation, telecommunication, power generation, and water and sanitation. Judging from an international perspective, Egypt has achieved an infrastructure status that closely corresponds to what could be expected given its national income level. The present infrastructure status is the result of decades of purposeful investment. In the past 15 years, however, a worrisome trend has emerged: Infrastructure investment has suffered a substantial decline, which may be at odds with the country's goals of raising economic growth. Improving infrastructure in Egypt would require a combination of larger infrastructure expenditures and more efficient investment. The analysis provided in this paper suggests that an increase in infrastructure expenditures from 5 to 6 percent of gross domestic product would raise the annual per capita growth rate of gross domestic product by about 0.5 percentage points in a decade's time and 1 percentage point by the third decade. If the increase in infrastructure investment didnot imply a heavier government burden (for instance, by cutting down on inefficient expenditures), thecorresponding increase in growth of per capita gross domestic product would be substantially larger, infact twice as large by the end of the first decade. This highlights the importance of considering renewedinfrastructure investment in the larger context of public sector reform.

The basic theoretical framework of the impact of public capital on economic growth was developed first by Arrow and Kurz (1970). Based on this framework, the endogenous growth literature shows that an increase in the stock of public capital can raise the steady state growth rate of output per capita, with permanent growth effects (Barro 1990, 1991, and Barro and Sala-I-Martin, 1992). Other studies focus on the differential impact of capital and current components of public spending on growth (Devarajan et al., 1996), showing a positive effect from capital expenditures and often negative effects of current or consumption expenditures.

Calderon and Serven (2008) analyze the impact of infrastructure on economic performance of African countries. Using panel data for a large sample of countries for the period 1960-2005, they employ growth regressions estimated through a Generalized Method of Moments estimator and evaluate the impact of several types of infrastructure assets, as well as measures of quality of their services.Their findings suggest that both infrastructure stock and quality are positively and significantly related to real GDP per capita growth. In addition, the latter study evaluates the impact of a higher infrastructure development in African countries over the last 15 years (comparing 2001-05 to 1991-1995). At the country level, Egypt has attained the largest contribution of infrastructure development to growth (1.51%) among Northern African countries, with a rate higher than the average of the Africa region (0.99%).

Bivens, J., (2014) shows that the short- and long-term economic and employment impacts of infrastructure investment. It examines three possible scenarios for infrastructure investment and estimates their likely impact on overall economic activity, productivity, and the number and types of jobs, depending on how the investments are financed. The data show that by far the biggest near-term boost to gross domestic product and jobs comes from financing the new investment through new federal government debt rather than a progressive increase in taxation, a regressive increase in taxation, or cuts to governmenttransfer programs. Our research also shows that this debt-financed impact is greater than that deriving from increases in infrastructure investment that are driven not by direct public investments but through other actions, such as regulatory mandates.The study reveals three types of Infrastructural investment scenario . Under scenario one, a debt-financed $18 billion annual investment in infrastructure yields a $29 bil-lion increase in GDP and 216,000 net new jobs by the end of the first year, with the increased levels then sustained over the next decade. Under scenario two, a debt-financed package of green investments totaling $92 billion annually boosts GDP by $147 billion and generates 1.1 million net new jobs by the end of the first year, with the increased levels then sustained over the next decade. Under scenario three, a debt-financed $250 billion annual investment boosts GDP by $400 billion and overall employment by 3 million net new jobs by the end of the first year, with the increased levels thensustained over the seven-year life of the investment.

National Center for APEC published a report that it seeks to provide greater context and understanding of many of those factors, explaining in more depth why they are important and how economies can improve their infrastructure planning, implementation, and financing to better attract investment flows. The five factors identified are: (i) Augmenting government planning and implementation of infrastructure projects; (ii) Embracing financial market prerequisites for infrastructure finance; (iii) Developing robust Public-Private Partnerships (PPP), mechanisms and frameworks; (iv) Creating and maintaining a strong investment climate to attract Foreign Direct Investment (FDI); and (v) The future of infrastructure and technology.

Helm (2009) considers the role of infrastructure in improving economic performance, and its comparative neglect relative to traditional macroeconomic and macroeconomic policies. It explains why infrastructure matters, why Britain's infrastructure performance has been poor, and summarizes the scale of the challenge for the coming decade. Privatization, liberalization, and competition have focused on monopoly market failure and private incentives, but they have neglected the time inconsistency problem which confronts investors in networks with high fixed and sunk costs. The failure to commit which has characterized British approaches to infrastructure has been partially addressed through the creation of regulated asset bases (RABs), backed up by the duty on regulators to ensure that functions can be financed. The paper considers how the RABs can be developed to provide credible long-term contracts over a wide range of activities, and how the financial regulatory regime can complement this commitment, notably through the split cost of capital and the indexation of the cost of debt approaches. The paper concludes by setting out the building blocks of a credible regulatory framework for infrastructure, together with the impacts on reducing the cost of capital. The role of the State in reinforcing this commitment and the associated institutions is also set out.

Ahmed et al. (2013) stated the role of infrastructure in economic growth and welfare has been studied extensively across the literature over the past three decades. We use a dynamic CGE model linked to a micro simulation model to estimate the macro-micro impact of public infrastructure investment. Two approaches to public investment are considered in our

simulations. In the first, production taxes finance the additional public infrastructure investment and in the second, foreign borrowing provides resources. Our results reveal that public infrastructure investments have the same direction of impact, whether funded by taxation or international borrowing, particularly when looking at macroeconomic gains and poverty reduction in the long run. However, in the very short run, tax financing puts a strain on the output in the industrial sector and thus reduces economic growth in the short run. The financing from international borrowing has a Dutch disease-like impact in the short run, as indicated by a decline in exports.

The report of Infrastructure in the EU, confirms that there is a positive relationship between the growth of transport and electricity infrastructure and economic growth. Policies that promote spending in these areas have a positive impact on growth, provided they do not create excess capacity, as overprovision of infrastructure has been shown to create inefficiencies by diverting resources away from more productive investments.

Canning et al. (2014), investigate the long run consequences of infrastructure provision on per capita income in a panel of countries over the period 1950-1992.The approach is applied to explore an optimal level of infrastructure whichmaximizes the growth rate; if infrastructure levels are set too high they divert investment awayfrom other capital to the point where income growth is reduced. Simple panel based tests are developed which enable us to isolate the sign and direction of the long run effect of infrastructure on income in a manner that is robust to the presence of unknown heterogeneous short run causal relationships. The results provide clear evidence that in the vast majority of cases infrastructure does encourage long run growth effects. But the study also finds a great deal of variation in the results across individual countries. Taken as a whole, the results demonstrate that telephones, electricity generating capacity and paved roads are provided as close to the growth, maximizing level on average, but are under-supplied in some countries and over-supplied by others. These results also help to explain why cross section and time series studies have in the past found contradictory results regarding a causal link between infrastructure provision and long run growth.

Warner (2014), looks at the empirical record, whether big infrastructure and public capital drives have succeeded in accelerating economic growth in low-income countries. It looks at big long-lasting drives in public capital spending, as these were arguably clear and exogenous policy decisions. On average the evidence shows only a weak positive association between investment spending and growth and only in the same year, as lagged impacts are not significant. Furthermore, there is little evidence of long term positive impacts. Some individual countries may be exceptions to this general result, as for example Ethiopia in recent years, as a high public investment has coincided with high GDP growth, but it is probably too early to draw ultimate conclusions.

Aschauer (1989) pioneered the research on the impact of the infrastructure investment on output and productivity growth. He found that relatively slower growth in the public capital accumulation in the United States during the 1970s and 80s was largely responsible for the private sector productivity slowdown. He found that the private output elasticity with respect to public capital was about 0.42 indicating a sizable level of sensitivity.

Following Aschauer (1989), Lynde and Richmond (1993) also investigated the causes for the decline in the US output and productivity growth since the early 1970s. They found that the

services of the public capital are an important part of the production process and that about 40% of the productivity decline in the United States was explained by the fall in public capital-labour ratio. Furthermore, Ford and Poret (1991) suggest that cross-country differences in productivity growth might also be explained partly by differences in levels of infrastructure spending.

Aschauer (1993) argues further that the public infrastructure such as streets and highways, mass transit, water and sewer systems, and the like should be considered as a factor of production, along with labour and private capital, in the private sector production process. Therefore, to raise productivity growth countries must boost the rate of capital accumulation on the tangible capital such as plant and equipment, or intangible capital such as that generated by research and development expenditures.

Economic theory identifies five channels through which infrastructure can positively impact on economic growth: (i) Infrastructure may simply be regarded as a direct input into the production process and hence serve as a factor of production; (ii) infrastructure may be regarded as a complement to other inputs into the production process, in the sense that its improvements may lower the cost of production or its deficiency may create a number of costs for firms, (iii) infrastructure may stimulate factor accumulation through, for example, providing facilities for human capital development; (iv) infrastructure investment can also boost aggregate demand through increased expenditure during construction, and possibly during maintenance operations; and finally, (v) infrastructure investment can also serve as a tool to guide industrial policy; Government might attempt to activate this channel by investing in specific infrastructure projects with the intention of guiding private-sector investment decisions (Fedderke and Garlick, 2008).

Bhattacharyay, (2010) mention thatproperly designed infrastructure can also make growth more inclusive by sharing its benefits with poorer groups and communities, especially by connecting remote areas and small and landlocked countries to major business centers. Inadequate infrastructure can hamper the potential economic growth of Asian countries, weaken their international competitiveness, and adversely affect their poverty reduction efforts. Regional infrastructure enhances competitiveness and productivity, which could help in the economic recovery and in sustaining growth in the medium to long-term. Regional infrastructure also helps increase the standard of living and reduce poverty by connecting isolated places and people with major economic centers and markets, narrowing the development gap among Asian economies. This paper estimates the need for infrastructure investment, including energy, transport, telecommunications, water, and sanitation during 2010-2020, in order to meet growing demands for services and facilitate further rapid growth in the region. By using “top-down” and “bottom-up” approaches, the paper provides a comprehensive estimate of Asia’s need for infrastructure services. The estimates show that developing countries in Asia require financing of US$776 billion per year for national (US$747 billion) and regional (US$29 billion) infrastructure during 2010-2020 to meet growing demand.

Donaubauer, (2014), constructed comprehensive and comparable indices on the most relevant components of economic infrastructure. An unobserved components model is employed to cover the largest possible number of developing and developed countries over the period 1990-2010. They map major findings from the new indices of infrastructure and provide country rankings, which we also compare with subjective assessments of infrastructure in the World Economic Forum’s Global Competitiveness Report. Finally, they exemplify possible applications related to

trade and FDI. By overcoming several data limitations, this new global index can help assess the links between infrastructure and economic development more systematically.

3 Objectives of the Study

The objective of the study is embedded in the name of the article. The specific objectives of the study are:

a. To explore the global infrastructural Scenario
b. To explain the justification of the infrastructural investment for the long term

4.Methodology and Data

The methodology used for this study is literature survey. Secondary data were collected through content analysis from various published sources, including books, online journals, newspapers, magazines, government/ non-government organizations, super organizations like WB, OECD, previous works on the related issue and reports. The publication manual of APA (American PsychologicalAssociation, 2001) was used for citation of the sources of references that have been used in the study.

5. Defining long-term investment in infrastructure

Infrastructure means those basic facilities and services which facilities different economic activities and thereby help in the economic development of the country, education, health, transport, and communication, banking and insurance, irrigation and power and science and technology etc. are the example of infrastructure. They are also called social overhead capital. These do not directly produce goods and services, but induce production in the agriculture industry and trade by generating external economies.

It is often argued that there is no universally accepted definition of infrastructure. One well-known attempt reads (Gramlich 1994): "The definition that makes the most sense from an economics standpoint consists of large capital intensive natural monopolies such as highways, other transport facilities, water and sewer lines, and communications" (in Wagenvoort et al. 2010). For a long time, the energy sector (coal and gas-fired power plants, wind power, etc.) was considered to be separate from infrastructure, understood as network utilities (water, road and gas networks).

Infrastructure and Economic Growth Infrastructure is a heterogenous term, including physical structures of various types used by many industries as inputs to the production of goods and service (Chan et al., 2009). This description encompasses "social infrastructure" (such as schools and hospitals) and "economic infrastructure" (such as network utilities). The latter includes energy, water, transport, and digital communications. They are the essential ingredients for the success of a modern economy and the focus of this paper (Stewart, 2010).

Finally, we define infrastructure investment as being invested in assets that provide sustainable services that are essential for a functioning economy. The services provided are typically monopolistic or quasi-monopolistic in nature as a result of geography or regulation. Demand for these services is often inelastic to price changes and these investments can therefore provide predictable and sustainable cash flows.

6. Types of Infrastructure

Infrastructure is a complex field with so many different components under it; but all of them can be categorized into two main types of infrastructures. They are the hard and the soft infrastructure. Each type will be briefly discussed below.

Hard Infrastructure: This refers to the physical network that keeps an industrialized nation smoothly functioning. Among the components that are classified under the hard infrastructure are the capital assets like the utilities, transport vehicles, telecommunication systems, roads, highways, railways, subways, traffic lights and street lights, dams, walls and culverts, drainage systems, the airports and bus terminals, and bridges, among others.For private infrastructure, these are the land, the buildings and other improvements, the electric posts and the water systems, the warehouses and storage facilities, and the vehicles, just to name a few.Hardware infrastructure is further classified into transportation, energy, communication, water management, measurement networks, and waste management.

Soft Infrastructure: The soft infrastructure, on the other hand, is the framework required to keep and maintain the different institutions. This can also include both the physical and the non-physical assets. Examples of physical assets are the buildings that house the network and the equipment used to maintain the institution. For non-physical assets, this includes the software and programs, the governing rules and regulations, the financial system, and the organizational structure. In essence, the soft infrastructure embodies the system of delivery of services to the people. If you want to create a corporate culture within the company then you must have a soft infrastructure for that specific culture for the workers to follow.

Broadly infrastructure can be divided in another two categories:

(i) Economic Infrastructure: Economic infrastructure means those basic facilities and services which directly benefit the process of production and distribution of an economy. Irrigation, power, transport and communication are the examples of economic infrastructure. It may be categorises as: (a) Irrigation and Power (b) Transport (c) Communication

(ii) Social Infrastructure: Social Infrastructure:Social infrastructure means those basic activities and services which, in addition to achieving certain social objectives, indirectly help various economic activities. For example, education does not directly affect economic activities like production and distribution, but indirectly helps in the economic development of the country by producing scientists, technologists and engineers. So education, health service, sanitation and water supply etc. are the examples of social infrastructure. It may be categorises as: (a) Education (b) Health, sanitation and water supply (c) Housing

7. Infrastructure and Public Goods

Infrastructure is typically defined as a large investment that affects many aspects of the economy and exhibits substantial economies of scale. Costs decline as more people use the infrastructure and the value of the economic activity it supports expands. Given the size of the investment and the need to expand consumption over a long time horizon, it is difficult for private actors to realize an adequate return on such projects. It is highly unlikely that multiple suppliers will enter the field, so the probable outcome is a natural monopoly, at best a duopoly. Public goods are

defined as goods that are non-rivalrous and non-excludable. By non-rivalrous, economists mean that consumption or use by one person does not exclude consumption or use by another person. Non-excludable means it is difficult to prevent people from using the good without paying for it. As a result, there is a tendency for people to free ride and for private actors to under invest. In other words, the private market under-supplies the public good, even though it is good for the public.

As an empirical matter, there are several clear linkages between infrastructure and public goods from the development economics point of view- First, infrastructure generates positive externalities by stimulating economic activity and public goods solve the problem of the inability to internalize externalities in private, market transactions. Second, as a practical matter, when infrastructure projects are first deployed and for a large part of their economic life, they tend to be uncongested and therefore non-rivalrous. This is particularly true in low density areas and at low levels of income. Third, infrastructure industries have generally been networks, connecting people and places. They have always exhibited network effects, where the value of the network grows as more people are connected to it. Information infrastructures in the digital age exhibit very strong network effects and all the positive externalities that result. Fourth, Infrastructure are important projects that society really needs, but they are not likely to be provided by private parties in adequate quantity or on terms of access that sustain the level of activity that is desirable.

8. The economic impact of Infrastructure

Since Aschauer's seminal work (1989a) on the USA, there has been almost 25 years of academic research on the impact of infrastructure on growth. Understanding these long lasting debates is essential to have a balanced quantitative view on the relevance of infrastructure for growth (Estache et al. 2012).

Debates on the proper econometric modeling have a tendency to dominate the disagreements among academics and other researchers on how much infrastructure matters. Part of the challenge, when interpreting this literature, is to make sure that the results are really comparable. A large number of empirical papers have tried to assess the impact of infrastructure on economic growth. The findings vary considerably, in terms of both the sign and magnitude of the impact. Many studies find a positive and important contribution of infrastructure provision to economic growth, but quite a few studies have found a weak or negligible impact (IE, 2014).

Two recent surveys show that public infrastructure has a positive effect on growth. Romp & de Haan (2007) conclude that "there is more consensus than in the past that public capital positively affects economic growth, but the impact seems to be lower than previously thought." Bom & Lighthart (2009) also point out that early estimates had the right (positive) sign but may have been to optimistic. Focusing on research on the output elasticity of public capital, they conduct a meta-analysis of all comparative studies and find it to average across studies at around 0.08—i.e. a 1% increase in the stock of public capital would lead to a 0.08% increase in GDP. Most of the research regarding the poverty and infrastructure can be translated into an assessment of the infrastructure investment requirements to achieve the growth needed to reach the reductions in poverty demanded by the MDGs (Estache et al. 2012). For well-planned and delivered public infrastructure projects, the World Economic Forum estimates that every dollar invested will

generate an economic return of between 5 and 25 per cent (https://g20.org/wp-content/uploads/2014/12/Infrastructure%20investment%20policy%20note.pdf).

Economic theory identifies four channels through which infrastructure can have a positive impact on economic growth. First, energy and transport are used as inputs in firms' production function and hence influences their production cost, directly or indirectly, and ultimately their competitiveness from an international and national perspective (Pradhan and Bagchi, 2013). Second, investment in infrastructure may boost capital accumulation by providing opportunities for capital developments. Third, it can stimulate construction and maintenance operations (Wang, 2002; Esfahani & Ramirez, 2003; Phang, 2003; Short & Kopp, 2005; Pradhan, Bagchi, 2013). Finally, it may induce other investments by providing signals to key sectors in the economy (Fedderke and Garlick, 2008).

According to researchers at the overseas development institute (http://www.odi.org/), the lack of infrastructure in many developing countries represents one of the most significant limitations of economic growth and achievement of the millennium development goal (Kingombe, 2011). Infrastructure investments and maintenance can be very expensive, especially in, such as areas as landlocked, rural and sparsely populated countries in Africa (Kingombe, 2011). It has been argued that infrastructure investments contributed to more than half of Africa's improved growth performance between 1990 and 2005, and increased investment is necessary to maintain growth and tackle poverty. The returns to investment in infrastructure are very significant, with on average thirty to forty percent returns for telecommunication (ICT) investments, over forty percent of electricity generation, and eighty percent of the road.

Conceptually, infrastructure may affect aggregate output in two main ways: (i) directly, considering the sector contribution to GDP formation and as an additional input in the production process of other sectors: and (ii) indirectly raising total factor productivity by reducing transaction and other costs thus allowing a more efficient use of conventional productive inputs. Infrustructure can be considered as a complementary factor for economic growth.

The empirical is far from unanimas, but a majority of studies report a significant positive effect of infrastructure on output, productivity, or long-term growth rate. Infrastructure investment is complementary to other investment in the sense that insufficient infrastructure investment constrains other investment, while excessive infrastructure investment has no added value. To the extent that suboptimal infrastructure investment constrains other investment, it constrains growth (Newbery, 2012).

Empirical estimates of the magnitude of infrastructures contribution display considerable variation across studies. Overall, however, the most recent literature tends to find smaller (and more plussible) effects than those reported n the earlir studies (Aschauer, 1989, Calderon et al, 2011), likely as a result – at least in part – of improved methodology approaches that also allow better estimates of the relationship.

Infrastructure Development vs. Economic Development: Rob Mooren, Global Director, Infrastructure, ARCADIS prepared the 2nd Global infrastructure index in 2014, among the 41 countries. In his index, Singapore scored 1st and Venezeula scored 41st position. Among the 41 countries, 30 countries are high income countries but no LDC. In the position of the top16

countries, all are high income countries (see, Appendix-C). On the other hand, Donaubauer et al. (2014) constructed a new global Index of Infrastructure in 2014, among the 140 countries. In this index, top 34 countries, all are high income countries except China (28th position). In the 50 bottom countries, from 90 to 140, most of the countries belong to low income, very few countries belongs toupper income countries and among these 50 countries, there are no high income countries(see Appendix-D). This scenario gives us a clear picture that here is a positive relation between infrastructure investment and economic development.

9. Optimum Infrastructure Expenditure

Key questions for project planning include the following: what is the optimum level of investment in infrastructure? Which projects should be given priority? How can appropriate projects be prepared?

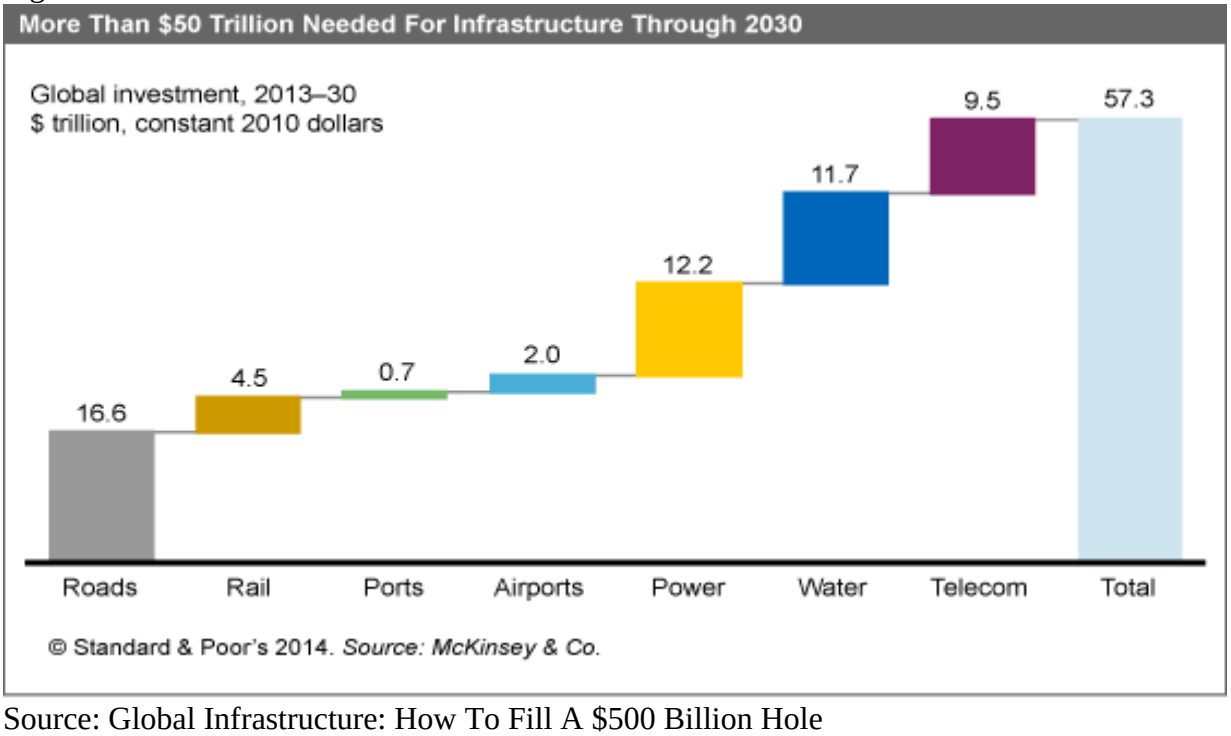
It has not been easy to decide on the optimum level of infrastructure in a particular country at any given time. A rough rule of thumb is that total investment needs appear to be more than 7 per cent of gross domestic product (GDP) in low-income countries and about 3 per cent of GDP in upper middle-income countries (McCawley, 2010). Apart from noting these broad guidelines, however, it is probably not useful for policymakers to announce specific 'top-down' targets for investment levels in infrastructure. A better approach would be to approve only individual projects that meet rigorous investment criteria.

10. Required Infrastructural Investment

Infrastructure is the engine of growth, especially, for the developing economies. Considering this idea, all the countries in the world are very much anxious for the future infrastructural investment. Over the last 18 years (before 2013) global infrastructure investment was 36 trillion USD (McKinsey Global Institute/ McKinsey Infrastructure Practice, January, 2013). The demand for infrastructure, both by consumers and by companies is much higher than the amount invested (Kingombe, 2011). There are severe constraints on the supply side of the provision of infrastructure in Asia (McCawley, 2010).The organisation for Economic Co-operation and Development estimates that around $40 trillion of investment in new and existing infrastructure will be required globally between now and 2030 (Source: OECD: Infrastructure to 2030, 2006-2007) and the World Bank estimates that an additional US$1-1.5 trillion each year will be required through 2020 to meet growth targets in emerging and developing economies. But, due to the financial crisis, the World Bank indicates that in advanced economies, total investment from both public and private sources as a share of GDP is the lowest in 50 years in 2014. A major shift in infrastructure spending is under way. Even before 2008, developing country spending had overtaken developed country spending on infrastructure, and the global financial crisis has accelerated this shift. While developed economies will continue to increase their spending on infrastructure, according to Oxford Economics their share of the global total will shrink from nearly half today to about one-third by 2025. (Source: ttps://g20.org/wp-content/uploads/2014/12/Infrastructure%20investment%20policy%20note.pdf)

According to a report from consultant McKinsey & Co., about $57 trillion will be needed to finance infrastructure development around the world through 2030 (See Figure 1). Given the many budgetary constraints burdening governments globally, and with banks' long-term lending restricted by regulatory requirements, nontraditional lenders such as insurers and pension funds are poised to take a larger share of the infrastructure investment pie. From 2013 to 2030, that is, in the 16 years, total $57 trillion or yearly $3.5625 trillion is required for infrastructural investment. But if 3% of total Global GDP is spent for infrastructure, then total shortage is $8.4 trillion, that is, yearly more than 500 $billion. Institutional investors' allocations to infrastructure could rise to an average of 4%, potentially providing about $200 billion per year in additional funding for the sector. If banks continue to lend to projects at current levels of about $300 billion per year, these private sector inflows could fill the gap left by disappearing governments. Public policy decisions and investment incentives will play a big part in determining whether private sector institutions get more heavily involved.

Figure: 1



Source: Global Infrastructure: How To Fill A $500 Billion Hole (http://www.standardandpoors.com/spf/upload/Ratings_EMEA/HowToFIllAn500BillionHoleJan162014.pdf)

The Gap: Scenarios For Global Infrastructure Investment Needs Versus Public Sector Funding

Bhattacharyay, (2010) estimates that During the ten-year period of 2010-2020, the 32 ADB developing member countries covered in his paper are expected to need almost US$8.22 trillion (in 2008 US$) for infrastructure investment. This amounts to US$747 billion in annual investment needed over 2010-2020. Around 68% of this is needed for new capacity investments in infrastructure and around 32% is needed for maintenance or replacement of existing assets. In general, the total projected infrastructure investment requirements are equal to about 6.5% of Asian estimated 2010-2020 GDP. Of the total investment, approximately 49% is estimated to be needed for energy infrastructure, 35% for transport, 13% for ITC, and 3% for water and sanitation. Among the countries included in the study, People's Republic of China (PRC), India, and

Indonesia represent the top three countries in terms of the amount of infrastructure investment needed. Overall, the top 11 countries constitute 97% of Asia's total infrastructure investment needs, most of which are in Southeast Asia and South Asia.

Bhattacharyay, (2010) mentions that from 2010 to 2030, for maintaining the desired growth, Bangladesh needs 144,903 Billion USD and yearly 13,173 billion USD for infrastructural investment where 54% is for new capacity and 44% for maintenance.

Table 1: National Infrastructure Investment Needs in Asia, 2010-2020: Per Sub-region and Per Sector (2008 US$ billions)

Sector / Subsector	East and Southeast Asia	South Asia	Central Asia	The Pacific	Total
Electricity	3,182.46	653.67	167.16	-	4,003.29
Transportation	1,593.87	1,196.12	104.48	4.41	2,898.87
Airports	57.73	5.07	1.41	0.10	64.31
Ports	215.20	36.08	5.38	-	256.65
Rails	16.14	12.78	6.03	0.00	34.95
Roads	1,304.80	1,142.20	91.65	4.31	2,542.97
Telecommunications	524.75	435.62	78.62	1.11	1,040.10
Telephones	142.91	6.46	4.45	0.05	153.87
Mobiles	339.05	415.87	71.97	0.95	827.84
Broadband	42.78	13.29	2.21	0.11	58.39
Water and Sanitation	171.25	85.09	23.40	0.51	280.24
Water	58.37	46.12	8.60	0.14	113.22
Sanitation	112.88	38.97	14.80	0.36	167.02
Total	5,472.33	2,370.50	373.66	6.02	8,222.50

Source: Bhattacharya (2010), pp13

In Latin America, three percent of GDP (around US$71 billion) would need to be invested in infrastructure in order to satisfy demand, yet in 2005, for example, only around two percent was invested leaving a financing gap of approximately US$24 billion (Kingombe, 2011). In Africa, in order to reach the seven percent annual growth calculated to be required to meet the MDGs by 2015 would require infrastructure investments of about fifteen percent of GDP, or around US$93 billion a year (Kingombe, 2011).

From the ADB and ADBI (2009) Study presented the quality of infrastructure in Asian and other developed economies. The quality of Asian economies is around the world average, but significantly lower the G7 countries. Among the 5 infrastructural sectors (like Rail, Road, Ports, Air and Electri) Rail, ports and electrics quality is below quality than the world average. For maintaining G7 quality standards more investment in infrasrructure is essential. As a result, The infrastructure financing gap between what is invested in Asia-Pacific (around US$48 billion) and what is needed (US$228 billion) is around US$180 billion every year (Kingombe, 2011). Moreover, various studies have also shown that the quality and extensiveness of infrastructure networks greatly impact economic growth and reduce income inequalities and poverty (ADB/ADBI 2009).

Table2: Comparison of Asian infrastructure quality with the world, 2008

Selected countries						
Region/country	**Road**	**Rail**	**Ports**	**Air**	**Electric**	**Overall**
Country groupings						
World	3.8	3.0	4.0	4.7	4.6	3.8
G7	5.7	5.4	5.4	5.8	6.4	5.7
Asia	3.7	3.6	**3.9**	**4.6**	**4.1**	3.8
Asian regional averages						
East Asia	4.7	4.8	4.8	5.1	5.3	4.6
Southeast Asia	4.2	3.2	4.3	5.1	4.7	4.2
Central Asia	3.1	3.6	3.2	4.2	3.6	3.5
South Asia	3.1	2.8	3.4	4.2	2.8	2.9
Selected countries						
Singapore	6.6	5.6	6.8	6.9	6.7	6.7
Hong Kong	6.4	6.2	6.6	6.7	6.7	6.3
Malaysia	5.7	5.0	5.7	6.0	5.8	5.6
Korea	5.8	5.8	5.2	5.9	6.2	5.6
Taipei, China	5.6	5.7	5.5	5.7	5.9	5.5
Thailand	5.0	3.1	4.4	5.8	5.5	4.8
Brunei Darussalam	5.1	n.a.	5.0	5.6	5.4	4.7
China	4.1	4.1	4.3	4.4	4.7	3.9
Azerbaijan	3.7	4.0	4.2	5.2	3.9	3.9
Kazakhstan	2.5	3.6	3.2	3.7	4.3	3.5
Georgia	3.5	3.5	3.9	4.2	4.4	3.2
Tajikistan	2.6	3.3	1.6	3.5	1.7	3.2
Pakistan	3.5	3.0	3.7	4.2	2.5	3.1
Cambodia	3.1	1.6	3.4	4.2	4.2	3.1
India	2.9	4.4	3.3	4.7	3.2	2.9
Philippines	2.8	1.8	3.2	4.1	4.2	2.9
Indonesia	2.5	2.8	3.0	4.4	3.9	2.8
Viet Nam	2.6	2.4	2.8	3.9	3.2	2.7
Bangladesh	**2.8**	**2.3**	**2.6**	**3.4**	**1.9**	**2.2**
Nepal	1.9	1.3	2.9	3.5	1.7	1.9
Mongolia	1.4	2.1	2.4	2.7	2.9	1.7
n.a. = not available.						
Scores: 1 = underdeveloped; 7 = extensive and efficient by international standards.						

Source: ADB and ADBI. 2009.

11. Private Participation in Infrastructure to Fill-up the Gap

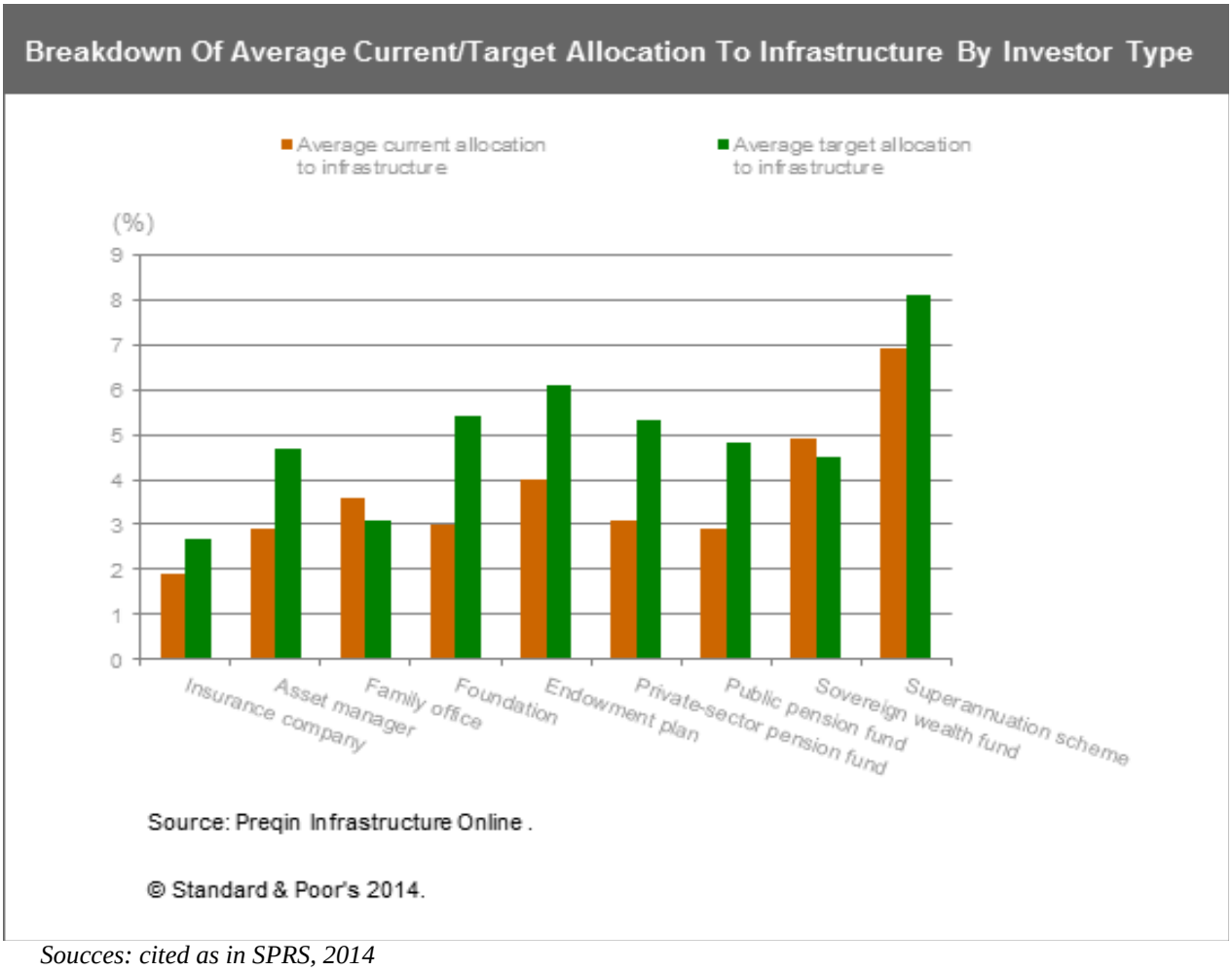
Before the recent financial crisis, capital markets were a significant source of (project) debt financing. Before the recent financial crisis, capital markets were a significant source of (project) debt financing, made all the more attractive by monoline insurers' credit enhancements, especially in the UK and other European capital markets. Bank funding was abundant, with the provision of loans designer to each project, very long tenors and low margins. The dramatic weakening in the credit ratings of the monolines as a result of the crisis saw such funds disappear. The resulting increase in the cost of interbank lending and the expectation of tighter

regulations, have constrained long-term debt funding by banks and also reduced the potential for loan syndication.

It is already shown that, from 2013 to 2030, yearly shortage of infrastructural investment is more than 500 $billion. Institutional investors' allocations to infrastructure could rise to an average of 4%, potentially providing about $200 billion per year in additional funding for the sector. If banks continue to lend to projects at current levels of about $300 billion per year, these private sector inflows could fill the gap left by disappearing governments. Public policy decisions and investment incentives will play a big part in determining whether private sector institutions get more heavily involved.

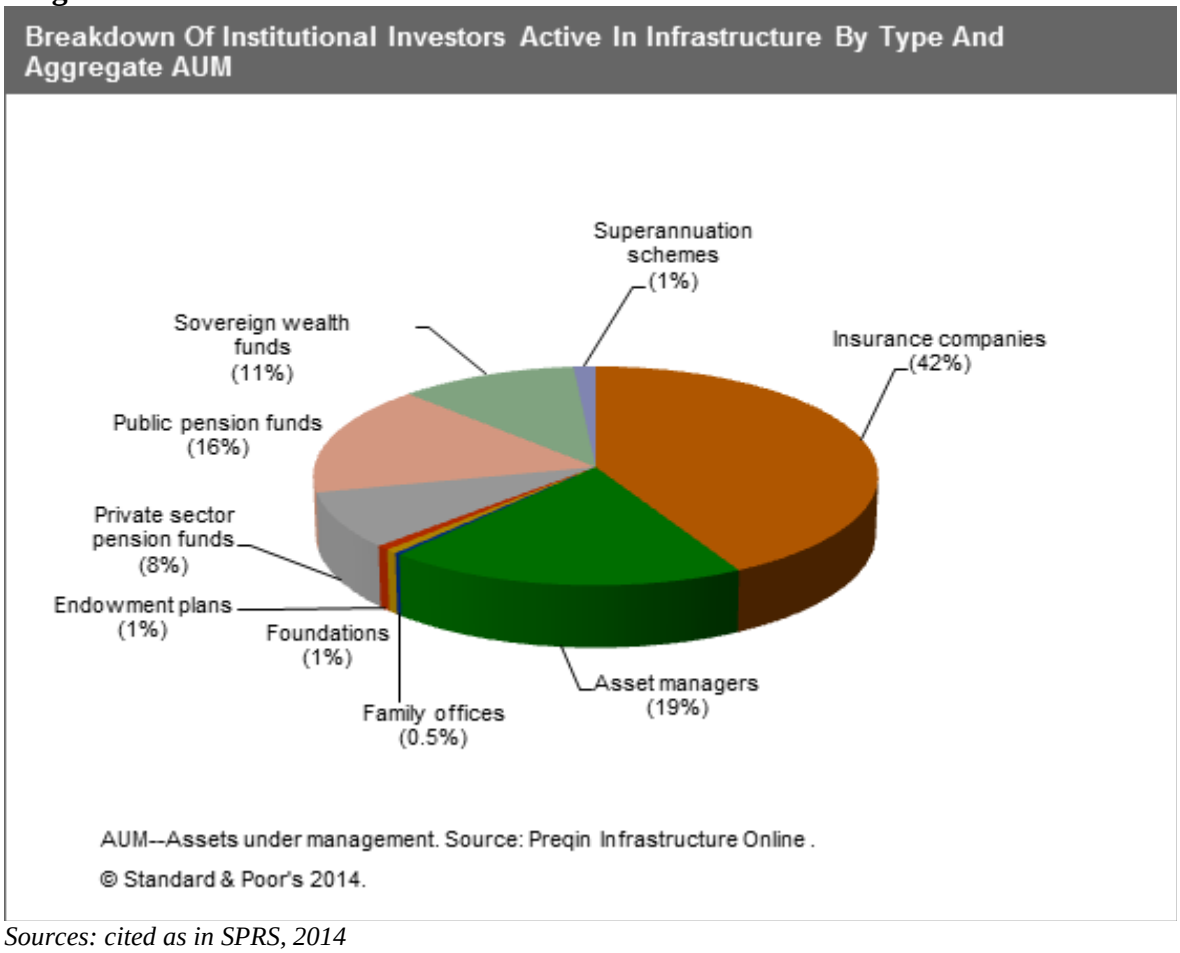
According to the statement of SPRS (2014), amid this opportunity for nontraditional lenders to take on a greater share of the investment, recent developments show that some have already begun to take up the responsibility. In the U.K., for example, six large insurers have said they will invest £25 billion ($40.9 billion) in the British government's National Infrastructure Plan, which plans to pump £375 billion into energy, transportation, and waste and water projects in the next five years and beyond (SPRS, 2014). Institutional investors' allocations could rise to a weighted average of 4%, which could provide about $200 billion per year in additional funding for the sector. Based on figures from the OECD and infrastructure data and research firm Preqin, as well as recent statements from institutions, Standard & Poor's[1] estimates that such investors are targeting an allocation of 3% to 8% of their assets under management over the next five years--a significant increase from what we've traditionally seen (see Figure 2 and 3). This could equate to as much as $3.2 trillion in new money held in reserve for an asset class that is showing steady upward growth.

Figure: 2



Soucces: cited as in SPRS, 2014

Figure: 3



Sources: cited as in SPRS, 2014

As it stands, the long-term global project finance market consists of a handful of banks and various capital markets players, including insurers, infrastructure fund managers, and investors in public bonds. Of these competing businesses, institutional investors have shown the biggest increase in the desire for such investments. A September 2013 Preqin[2] survey showed that 58% of investors plan to increase their funding allocation for infrastructure in the long term. Almost two-thirds of respondents said they plan to allocate more capital to the sector in the next 12 months than in the previous year.

As it stands, the long-term global project finance market consists of a handful of banks and various capital markets players, including insurers, infrastructure fund managers, and investors in public bonds. Of these competing businesses, institutional investors have shown the biggest increase in hunger for such investments (see table 2). A September 2013 Preqin survey showed that 58% of investors plan to increase their funding allocation for infrastructure in the long term. Almost two-thirds of respondents said they plan to allocate more capital to the sector in the next 12 months than in the previous year.

12. Private Infrastructure Funding Strategy

Infrastructure investments are typically relatively low-risk and low-volatility, with regular, long-

term revenue streams that are often inflation-linked, and the industry is well regulated (Wehinger, 2011). These characteristics are particularly appealing in the current environment, which offers historically low yields for other fixed-income investments such as government bonds. Infrastructure funds are thus attractive investment vehicles for pension funds and other institutional investors, since they provide diversified portfolios of infrastructure businesses.

With the right policy framework, investors can make retirement savings systems more sustainable and foster long-term growth: A carefully designed policy framework should encourage institutional investors (many of which have to match their liabilities to long-term assets) to take advantage of long-term investments, such as infrastructure, which can provide inflation-linked and stable cash flows. The implementation of such a framework could generate a double benefit for governments: fostering the financial stability of retirement-savings systems (which would be relying more on "tangible" assets) and enabling the development of strategic infrastructure projects that contribute to long-term growth.

Capital markets and banks, once major sources of debt financing, are now constrained: Before the recent financial crisis, capital markets were a significant source of (project) debt financing, made all the more attractive by monoline insurers' credit enhancements, especially in the UK and other European capital markets. Bank funding was abundant, with the provision of loans designer to each project, very long tenors and low margins. The dramatic weakening in the credit ratings of the monolines as a result of the crisis saw such funds disappear. The resulting increase in the cost of interbank lending and the expectation of tighter regulations, have constrained long-term debt funding by banks and also reduced the potential for loan syndication.

Targeted public measures can support private infrastructure financing: Some OECD countries have implemented targeted actions that have played a key positive role for infrastructure financing, such as the Transportation Infrastructure Finance and Innovation Act (TIFIA) and a tax exemption for private activity bonds (PAB) in the United States. In Europe, the European Investment Bank (EIB) has also supported infrastructure by allowing banks to adapt their lending capacity to longer maturities, and recently launching a consultation regarding an instrument directed at facilitating access to project bonds by institutional investors. These experiences show that targeted financial support of the public sector can facilitate access to long-term debt for projects, matching long-term investors looking for stable cash flows with long-term assets such as infrastructure projects

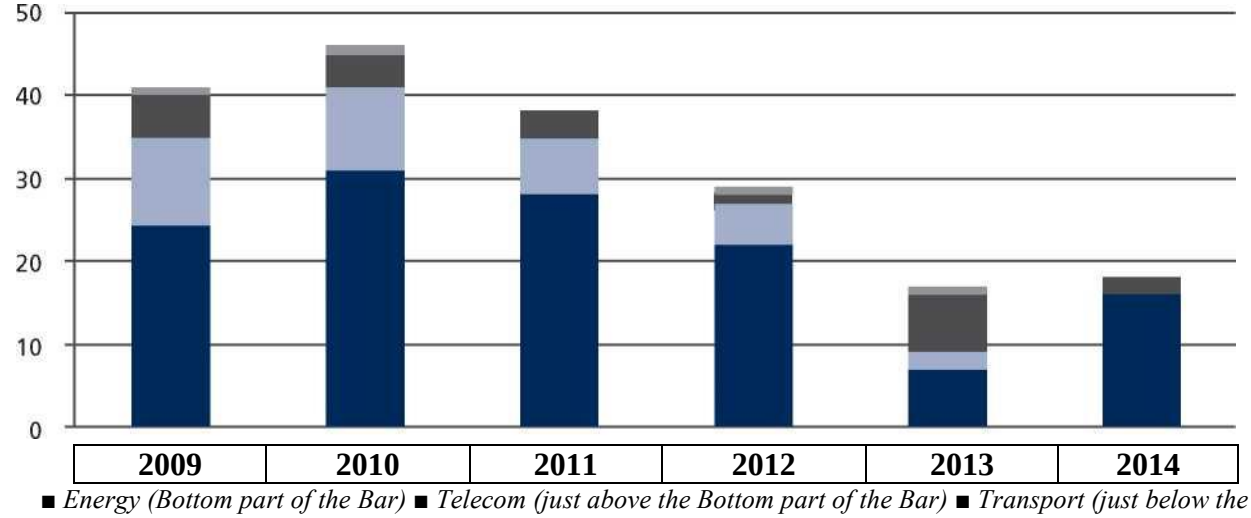
Long-term policy planning, complemented by adequate regulation, is key to attracting private investors to infrastructure investments: Infrastructure investments require long-term policy planning. To be credible, strategic policy frameworks should exceed the duration of political cycles and be built on wide political consensus. Stable and accessible programmes for infrastructure projects and public-private partnerships (PPPs) are key in attracting private sector investors, complemented by adequate regulation.

13. Public Private Partnership Infrastructural Project IDA Countries:

Public Private Partnership Infrastructural Project is becoming the very popular strategy for fulfilling the gap of supply and demand of the Infrastructure investment. Private investment in infrastructure in IDA[3] countries from 2009 to 2014 totaled US$73 billion. Over the same six-year period, 189 projects attained financial closure in four sectors: telecom, energy, transport, and water and sewerage. Of these projects, the vast majority of deals — 128 of 189 -- were in energy; telecom followed with 35; transport had 22; and water had four. Figure 4 Table 3 and Table 4 shows the status of infrastructural investment projects (number and amount) in IDA countries.

When comparing private investment in IDA countries to global PPI from 2009 to 2014, the difference is notable: investment in IDA countries was roughly 7% of total PPI, or just US$73 billion of the US$1 trillion in global commitments. The number of projects in IDA countries versus those in non-IDA countries is also comparably disproportionate: 189 in IDA versus 1,833 in non-IDA countries

Figure4: Numrer of Projects in IDA Countries, by Sector, 2009-2014



■ *Energy (Bottom part of the Bar)* ■ *Telecom (just above the Bottom part of the Bar)* ■ *Transport (just below the Top part of the Bar)* ■ *Water and sewerage (Top part of the Bar)*

Table 3: Total PPI in IDA Countries from 2009 to 2014, by sector (Million MSD)

	Energy	Telecom	Transport	ater & Sewerage	Grand Total
2009	$1,362	$10,500	$914	$1	$12,777
2010	$7,642	$10,707	$728	$0	$19,077
2011	$2,275	$8,419	$1,254	$0	$11,948
2012	$3,383	$7,108	$0	$126	$10,617
2013	$1,924	$4,598	$5,796	$0	$12,319
2014	$5,557	$387	$80	$0	$6,024
Grand	**$22,143**	**$41,720**	**$8,772**	**$127**	**$72,761**

Source: World Bank and PPIAF, PPI Project Database

Table4: Total Projects in IDA Countries from 2009 to 2014, by sector by Sector*

	Energy	Telecom	Transport	ater & Sewerage	and Total
2009	24	11	5	1	41

2010	31	10	4	1	46
2011	28	7	3	0	38
2012	22	5	1	1	29
2013	7	2	7	1	17
2014	16	0	2	0	18
Grand Total	**128**	**35**	**22**	**4**	**189**

Source: World Bank and PPIAF, PPI Project Database

* Table includes new projects only and does not include expansions to existing facilities. There were several such expansions recorded by the PPI Database in IDA countries between 2009 and 2014, including Henri Konan Bedie Bridge (Cote d'Ivoire), Vientiane Airport Terminal (Lao PDR), Port of Monrovia (Liberia), Maputo Port (Mozambique), and and Apapa Container Terminal Concession (Nigeria).

Among 77 IDA countries, Bangladesh is the most active country (Lao PDR is highest in with US$7 billion in nine projects). Bangladesh had 42 projects (See Appendix-E)–the highest number and –the third highest of investment commitment. The Munshiganj Mawa Orion-Long King coal-fired plant was the largest deal at US$579 million. Among them half of the all energy projects were rental power projects. Background is useful here. In 2007, Bangladesh sought to fix the country's power shortage problem, characterized by daily brownouts and blackouts. To narrow the gap between power supply and demand, the government tendered a package of six contracts for "quick rental power plants" (QRPPs), each offering temporary power at peak load times. By 2010 it became official: the government's Power System Master Plan noted that QRPPs would be the main tool to reduce power shortages in the country. Under the plan, QRPPs were commissioned to add 1,000MW of power. But since rented plants are relatively inefficient and costly, they were meant to be a short-term solution until the country added greater capacity to the existing grid.

14. A Snapshot of Private Participation in Infrastructure in Bangladesh, South Asia and East Asia and Pacific

A. Private Participation in Infrastructure in Bangladesh from 1990 - 2014

Table 5: Highlights (1990 - 2014)

Infrastructure Sectors Reported	Airports, Electricity, Natural Gas, Roads, Seaports, Telecom
Projects reaching financial closure	65
Total investment	10,941
Sector with largest investment share	Telecom
Type of PPI with largest share in investment	Greenfield project
Projects cancelled or under distress	4 representing 1% of total investment

Source: http://ppi.worldbank.org/data, Retrieved at: 12.08.15

Table 6: Top Projects in Bangladesh

Project	Investment (USD million)
GrameenPhone	2,688
Banglalink	1,774
TM International (Bangladesh) Ltd.	1,063
Warid Telecom Bangladesh	805
Munshiganj Mawa Orion-Long King coal-fired plant	579
Haripur Marubeni combined cycle plan	370
Pacific Bangladesh Telecom Limited	329
Summit Meghnaghat Power Company Limited	320
Meghnaghat Gas-Fired Power Plant	314
Peoples Telecommunication and Information Services Ltd	301

Source: http://ppi.worldbank.org/data, Retrieved at: 12.08.15

Table 7: Top Sponsors in Bangladesh

Sponsor	Country of Origin	Investment(USD million)	No.of projects
Telenor	Norway	2,688	16
Orascom	Egypt, Arab Rep.	1,774	13
NTT DOCOMO	Japan	1,063	12
Axiata Group Berhad	Malaysia	1,063	12
Summit Industrial and Mercantile Corp.	Bangladesh	893	8
Abu Dhabi Group	United Arab Emirates	805	8
Bharti Enterprises	India	805	8
Orion Group	Bangladesh	705	3
General Electric	United States	620	2
Al Jomaih Holding Co.	Saudi Arabia	598	3

Source: http://ppi.worldbank.org/data, Retrieved at: 12.08.15

Table 8: Sectoral Project in Bangladesh

Sub-sector	Project Count	Total Investment(USD million)
Airports	1	0
Electricity	47	3,905
Natural Gas	1	31
Roads	2	0
Seaports	2	0
Telecom	12	7,005

Source: http://ppi.worldbank.org/data, Retrieved at: 12.08.15

Table 9: Cancelled or Distressed in Bangladesh

Sub-sector	Project Count	Total Investment(USD million)	% of Total Invement
Airports	1	0	0%
Telecom	3	163	1%

Source: http://ppi.worldbank.org/data, Retrived at: 12.08.15

B. Private Participation in Infrastructure in South Asia from 1990 - 2014

Table 10: Highlights (1990 - 2014)

Infrastructure Sectors Reported	Airports, Electricity, Natural Gas, Roads, Seaports, Telecom
Projects reaching financial closure	8
Projects reaching financial closure	1,103 with total investment of $ 387,081
Sector with largest investment share	Electricity(42%)
Type of PPI with the largest share ofinvestment	Greenfield project(76%)
Type of PPI with largest share in projects	Greenfield project(63%)
Projects cancelled or under distress	40 representing 5% of total investment

Source: http://ppi.worldbank.org/data, Retrived at: 12.08.15

Table 11: Sectoral Project and Investment of Private Participation in Infrastructure in South Asia from 1990 – 2014

Sub-sector	Project Count	Total Investment (USD million)
Airports	10	5,629
Electricity	551	161,879
Natural Gas	8	1,076
Railroads	8	7,826
Roads	384	72,878
Seaports	50	11,891
Telecom	77	126,090
Water and sewerage	15	605

Source: http://ppi.worldbank.org/data, Retrived at: 12.08.15

C. Private Participation in Infrastructure in East Asia and Pacific from 1990 - 2014

Table 12: Highlights (1990 - 2014)

Infrastructure Sectors Reported	Airports, Electricity, Natural Gas, Roads, Seaports, Telecom
Projects reaching financial closure	8
Projects reaching financial closure	1,103 with total investment of $ 387,081
Sector with largest investment share	Electricity(42%)
Type of PPI with thelargest share in investment	Greenfield project(76%)
Type of PPI with largest share in projects	Greenfield project(63%)
Projects cancelled or under distress	40 representing 5% of total investment

Source: http://ppi.worldbank.org/data, Retrived at: 12.08.15

Table 13: Sectoral Project and Investment of Private Participation in Infrastructure in East Asia and Pacific from 1990 – 2014

Subsector	Project Count	Total Investment(USD million)
Airports	28	4,536
Electricity	683	153,317
Natural Gas	208	9,734
Railroads	28	22,882
Roads	209	43,707
Seaports	120	21,468
Telecom	81	112,524
Water and sewerage	488	31,232

Source: http://ppi.worldbank.org/data, Retrived at: 12.08.15

15. Conclusion

As infrastructure is public goods in nature, as well as large volume of financing is involved and return of capital is comparatively low and slow (though reliable), market mechanism does not function efficiently. For this reason, national and international organizations should take special types of policies and regulations for supplying the efficient level of infrastructural investment. There is a growth, maximizing level of infrastructure above which the diversion of resources from other productive uses is greater than the gain from having more infrastructure. Below this level, increases in infrastructure provision increase long run income, while above this level an increase in infrastructure reduces long run income. Investment in infrastructure follows the economic rule of diminishing returns to scale. There is a clear division in the context of required amount of infrastructural investment between developed and undeveloped or developing or less developing countries. So, Global growth is certainly sub-optimal. For achieving the optimal global growth (bliss point), incremental rate of the infrastructural investment in less developed countries should be larger than that of the developed countries.

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Notes:

[1]***Standard and Poor's Rating Service, McGROHILL FINANCESERVICE,***
With 26 offices around the world and a history that dates back more than 150 years, Standard & Poor's Ratings Services provides high-quality market intelligence in the form of credit ratings, research, and thought leadership.

[2]***Preqin*** *is the alternative assets industry's leading source of data and intelligence. Our products and services are utilized by more than 24,000 professionals located in over 94 countries for a range of activities including investor relations, fundraising and marketing, and market research.*
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[3]***IDA****-The International Development Association (IDA) is the part of the World Bank that helps the world's poorest countries. Established in 1960, IDA aims to reduce poverty by providing loans (called "credits") and grants for programs that boost economic growth, reduce inequalities, and improve people's living conditions.*

Appendix A: Table of National Infrastructure Investment Needs in Asia: 2010-2020

Country / Sub region	% of Total Asian Investment Need	Estimated Investment Needs (US$ millions)	Investments as Percentage of Total		Total Investment per Year	Total Investment per Capita (US$)	2008 GDP Per Capita (Constant 2000 US$)
			New Capacity	Maintenance			
Central Asia	**4.544%**	**373,657**	**54%**	**46%**	33,969	1,403	**753**
Afghanistan	0.318%	26,142	57%	43%	2,377	901	-
Armenia	0.051%	4,179	41%	59%	380	1,358	1,520
Azerbaijan	0.344%	28,317	64%	36%	2,574	3,262	2,131
Georgia	0.060%	4,901	24%	76%	446	1,138	1,268
Kazakhstan	0.846%	69,538	61%	39%	6,322	4,436	2,378
Kyrgyz Rep.	0.107%	8,789	38%	62%	799	1,665	376
Pakistan	2.172%	178,558	53%	47%	16,233	1,075	650
Tajikistan	0.139%	11,468	47%	53%	1,043	1,678	245
Uzbekistan	0.508%	41,764	48%	52%	3,797	1,529	840
East and Southeast Asia	**66.553%**	**5,472,327**	**71%**	**29%**	**497,484**	**2,886**	**1,765**
Cambodia	0.163%	13,364	51%	49%	1,215	918	511
PRC	53.118%	4,367,642	72%	28%	397,058	3,297	1,965
Indonesia	5.476%	450,304	70%	30%	40,937	1,981	1,087
Lao PDR	0.138%	11,375	56%	44%	1,034	1,833	475
Malaysia	2.287%	188,084	79%	21%	17,099	6,962	5,151
Mongolia	0.122%	10,069	37%	63%	915	3,812	735
Myanmar	0.264%	21,698	56%	44%	1,973	438	-
Philippines	1.546%	127,122	53%	47%	11,557	1,407	1,225
Thailand	2.103%	172,907	72%	28%	15,719	2,566	2,640
Viet Nam	1.335%	109,761	53%	47%	9,978	1,273	647
South Asia	**28.829%**	**2,370,497**	**63%**	**37%**	**215,500**	**1,756**	**685**
Bangladesh	**1.762%**	**144,903**	**54%**	**46%**	**13,173**	**906**	**462**
Bhutan	0.011%	886	30%	70%	81	1,291	1,247
India	26.421%	2,172,469	64%	36%	197,497	1,906	718
Nepal	0.174%	14,330	50%	50%	1,303	497	254
Sri Lanka	0.461%	37,908	52%	48%	3,446	1,881	1,199
The Pacific	**0.073%**	**6,023**	**30%**	**70%**	**548**	**625**	**840**
Fiji	0.008%	667	15%	85%	61	790	2,181
Kiribati	0.001%	82	10%	90%	7	846	826
PNG	0.051%	4,214	34%	66%	383	641	676
Samoa	0.003%	242	13%	87%	22	1,351	1,739
Solomon Is.	0.004%	336	33%	67%	31	657	1,136
Timor-Leste	0.001%	71	35%	65%	6	65	329
Tonga	0.001%	106	13%	87%	10	1,022	1,666
Vanuatu	0.004%	306	40%	60%	28	1,309	1,339
Total Asia	**100%**	**8,222,503**	**68%**	**32%**	**747,500**	**2,335**	**1,272**

Source: Bhattacharya (2010), pp 12

Appendix B: Infrastructure Investment Needs as a % of Estimated GDP 2010-2020

Country	**Investment as % of Estimated GDP**				
	Transport	**Electricity**	**ITC**	**Water and Sanitation**	**Total**
Central Asia	**1.86%**	**2.97%**	**1.40%**	**0.42%**	**6.64%**
Afghanistan	6.21%	0.00%	4.82%	0.89%	11.92%
Armenia	1.20%	1.01%	0.98%	0.27%	3.46%
Azerbaijan	0.60%	3.82%	0.44%	0.11%	4.97%
Georgia	1.20%	1.06%	0.69%	0.19%	3.14%
Kazakhstan	0.58%	2.92%	0.20%	0.07%	3.77%
Kyrgyz Rep.	3.94%	6.24%	2.44%	0.67%	13.29%
Pakistan	2.65%	2.68%	2.22%	0.73%	8.27%
Tajikistan	3.30%	9.83%	2.57%	0.51%	16.21%
Uzbekistan	2.65%	4.65%	1.94%	0.58%	9.82%
East and Southeast Asia	**1.61%**	**3.22%**	**0.53%**	**0.17%**	**5.54%**
Cambodia	4.43%	0.95%	2.97%	0.36%	8.71%
PRC	1.39%	3.42%	0.44%	0.13%	5.39%
Indonesia	3.88%	0.98%	0.97%	0.35%	6.18%
Lao PDR	10.62%	0.00%	2.40%	0.60%	13.61%
Malaysia	1.94%	4.42%	0.27%	0.04%	6.68%
Mongolia	12.04%	0.00%	1.21%	0.21%	13.45%
Myanmar	2.70%	0.00%	1.46%	1.88%	6.04%
Philippines	2.30%	1.87%	1.22%	0.65%	6.04%
Thailand	0.58%	3.69%	0.45%	0.19%	4.91%
Viet Nam	2.07%	3.12%	2.38%	0.54%	8.12%
South Asia	**5.55%**	**3.03%**	**2.02%**	**0.39%**	**11.00%**
Bangladesh	4.92%	1.24%	4.22%	1.19%	11.56%
Bhutan	2.84%	0.00%	0.87%	0.36%	4.07%
India	5.67%	3.23%	1.87%	0.34%	11.12%
Nepal	1.65%	0.58%	5.14%	1.10%	8.48%
Sri Lanka	4.23%	1.00%	1.39%	0.22%	6.85%
The Pacific	**2.60%**	**0.00%**	**0.65%**	**0.30%**	**3.55%**
Fiji	1.01%	0.00%	0.53%	0.14%	1.68%
Kiribati	5.17%	0.00%	0.16%	0.32%	5.65%
PNG	3.30%	0.00%	0.73%	0.32%	4.35%
Samoa	3.33%	0.00%	1.12%	0.26%	4.70%
Solomon Is.	3.50%	0.00%	0.28%	0.35%	4.13%
Timor-Leste	0.00%	0.00%	0.07%	0.79%	0.86%
Tonga	2.29%	0.00%	1.13%	0.29%	3.71%
Vanuatu	2.92%	0.00%	0.92%	0.28%	4.13%
Total Asia	**2.30%**	**3.17%**	**0.82%**	**0.22%**	**6.52%**

Source: Bhattacharya (2010), pp14

Appendix C: Table of The Second Global Infrastructure Investment Index ranks Results, 2014

Country	Overall Rank 14	Country	Overall Rank 14
Singapore	1	South Africa	22
Qatar	2	Indonesia	23
UAE 4	3	Spain	24
Canada	4	India	25
Sweden	5	Mexico	26
Norway	6	Colombia	27
Malaysia	7	Turkey	28
USA	8	Philippines	29
Australia	9	Poland	30
UK	10	Portugal	31
Netherlands	11	Brazil	32
Saudi Arabia	12	Egypt	33
Chile	13	Russia	34
Germany	14	Italy	35
Japan	15	Romania	36
Austria	16	Pakistan	37
China	17	Nigeria	38
Belgium	18	Argentina	39
France	19	Greece	40
Thailand	20	Venezuela	41
Korea (Rep of)	21		

Source: The Second Global Infrastructure Investment Index ranks, 2014

Appendix D: Table ofA New Global Index of Infrastructure Country Ranking; Overall infrastructure and sub-categories

Country	Income Level	Total (Rank)	Index Value	Transport	Energy	ICT	Finance	2010	2000	1990
Hong Kong	High	1	(-3.216)	1	2	42	1	1	11	18
Singapore	High	2	(-2.673)	2	9	16	2	2	3	4
Germany	High	3	(-2.519)	4	1	21	18	3	6	14
United States	High	4	(-2.399)	3	19	7	10	4	2	1
Switzerland	High	5	(-2.015)	8	4	18	13	5	4	7
Canada	High	6	(-2.012)	18	14	3	15	6	12	6
Norway	High	7	(-1.924)	23	18	1	36	7	1	2
Luxembourg	High	8	-(1.872)	5	3	8	55	8	7	17
Japan	High	9	(-1.861)	10	15	14	11	9	5	3
United	High	10	(-1.85)	9	8	32	8	10	10	8
Austria	High	11	(-1.715)	7	11	17	31	11	14	16
France	High	12	(-1.695)	12	6	19	22	12	15	12
Korea, Rep.	High	13	-1.685)	25	5	11	12	13	18	21

Sweden	High	14	(-1.573)	31	10	6	27	14	8	5
Finland	High	15	(-1.461)	32	26	4	28	15	16	10
Australia	High	16	(-1.457)	44	17	10	9	16	21	9
Belgium	High	17	(-1.441)	15	12	15	35	17	17	27
Netherlands	High	18	(-1.39)	24	13	23	17	18	9	11
Israel	High	19	(-1.302)	40	22	20	6	19	24	19
Spain	High	20	(-1.271)	30	25	33	4	20	22	25
New Zealand	High	21	(-1.249)	41	16	13	19	21	20	15
Kuwait	High	22	(-1.248)	50	42	2	20	22	28	29
Denmark	High	23	(-1.187)	22	7	27	38	23	13	13
Italy	High	24	(-1.168)	14	31	36	24	24	19	23
Ireland	High	25	(-1.102)	13	23	30	51	25	26	26
Qatar	High	26	(-1.094)	37	24	5	56	26	27	24
United Arab Emirates	High	27	(-1.06)	28	29	9	44	27	31	20
China	Upper	28	(-0.943)	17	71	47	5	28	35	58
Czech Rep.	High	29	(-0.852)	16	30	25	68			
Slovenia	High	30	(-0.794)	19	20	26	88	29	30	33
Portugal	High	31	(-0.767)	36	37	38	23	30	25	48
Cyprus	High	32	(-0.707)	35	35	34	37	31	23	28
Bahrain	High	33	(-0.686)	27	50	12	54	32	34	31
Croatia	High	34	(-0.652)	42	28	58	25	33	41	44
India	Lower	35	(-0.579)	6	117	109	16	34	37	52
Greece	High	36	(-0.547)	43	21	35	58	35	29	37
Ukraine	Lower	37	(-0.485)	11	65	51	64	36	53	22
Malaysia	Upper	38	(-0.485)	72	76	41	7	37	33	42
Belarus	Upper	39	(-0.467)	21	34	52	71	38	40	30
Saudi Arabia	High	40	(-0.447)	102	41	22	34	39	51	47
Lebanon	Upper	41	(-0.447)	54	63	55	14			
Estonia	High	42	(-0.443)	104	27	24	53	40	36	34
Jordan	Upper	43	(-0.415)	45	83	71	3	41	48	39
Poland	High	44	(-0.351)	29	43	45	66	42	38	41
Russian Federation	High	45	(-0.325)	38	32	29	96	43	55	32
Panama	Upper	46	(-0.321)	26	55	79	42	44	42	56
Slovak Rep.	High	47	(-0.244)	34	39	31	102	45	32	38
Bulgaria	Upper	48	(-0.223)	46	33	40	82	46	45	36
Oman	High	49	(-0.108)	71	44	44	60	47	57	61
Latvia	High	50	(-0.078)	20	38	57	120	48	47	40
Trinidad and Tobago	High	51	(-0.071)	47	49	28	95	49	54	53
Bosnia and Herzegovina	Upper	52	(-0.029)	92	54	48	46			
South Africa	Upper	53	(-0.029)	76	89	43	30	50	43	55
Serbia	Upper	54	(-0.023)	86	51	53	49			

Egypt, Arab Rep.	Lower	55	(-0.020	48	78	68	33	51	50	73
Chile	High	56	(-0.002)	126	56	49	29	52	58	76
Mauritius	Upper	57	(-0.015)	87	60		45	53	39	46
Thailand	Upper	58	(-0.033)	112	86	54	21	54	44	51
Guyana	Lower	59	(-0.056)	89	46		62			
Vietnam	Lower	60	(-0.062)	94	72	77	32			
Libya	Upper	61	(-0.065)	53	74	46				
Turkey	Upper	62	(-0.068)	90	68	69	39	55	62	90
Morocco	Lower	63	(-0.152)	121	67	88	26	56	56	93
Suriname	Upper	64	(-0.161)	66	66		72			
Brazil	Upper	65	(-0.203)	128	48	78	41	57	63	91
Iran, Islamic	Upper	66	(-0.243)	73	69	65	63	58	78	64
Hungary	Upper	67	(-0.254)	93	40	50	110	59	46	49
Tunisia	Upper	68	(-0.278)	85	87	76	40	60	60	89
Moldova	Lower	69	(-0.281)	70	57	107	59			
Bhutan	Lower	70	(-0.317)	88	96		47			
Uruguay	High	71	(-0.366)	78	45	56	116	61	68	62
Lithuania	High	72	(-0.375)	84	36	91	113	62	52	35
Fiji	Upper	73	(-0.385)	39	85		107			
Mongolia	Lower	74	(-0.414)	80	112	74	43	63	83	57
Honduras	Lower	75	(-0.417)		91	116	48	64	65	63
Uzbekistan	Lower	76	(-0.419)	79	95	63				
Kazakhstan	Upper	77	(-0.440)	33	93	39	124			
Armenia	Lower	78	(-0.449)	96		70	89	65	71	45
Cuba	Upper	79	(-0.454)	58	98	93		66	72	59
Guatemala	Lower	80	(-0.466)	63	90	83	69	67	74	66
Venezuela, RB	Upper	81	(-0.470)	52	47	72	127	68	76	74
Albania	Upper	82	(-0.470)	122	58	73	70	69	91	88
Turkmenistan	Upper	83	(-0.490)	81	108	61				
Costa Rica	Upper	84	(-0.505)	119	62	64	87	70	59	60
Mexico	Upper	85	(-0.515)	116	61	82	81	71	70	75
Romania	Upper	86	(-0.518)	108	59	59	106	72	49	54
Swaziland	Lower	87	(-0.521)	75	88		94	73	95	81
Macedonia, FYR	Lower	88	(-0.555)	120	52	67	103	74	61	50
Syrian Arab	Lower	89	(-0.559)	111	70	81	85	75	82	70
Philippines	Lower	90	(-0.567)	105	92	86	57	76	64	94
Tajikistan	Low	91	(-0.606)	99	105	84				
Ethiopia	Low	92	(-0.617)	61	130	92		77	85	79
Sri Lanka	Lower	93	(-0.622)	113	82	97	67	78	86	97
Dominican Rep.	Upper	94	(-0.626)		80	122	78	79	66	68

Ecuador	Upper	95	(-0.637)	55	64	98	123	80	98	77
Colombia	Upper	96	(-0.681)	107	73	96	101	81	89	95
Jamaica	Upper	97	(-0.693)	69	79	105	108	82	67	72
Lao PDR	Lower	98	(-0.709)	65	120		109			
Tanzania	Low	99	(-0.721)	67	124	112	61	83	101	83
Burkina Faso	Low	100	(-0.723)	68	132		100			
Paraguay	Lower	101	(-0.731)	131	94	37	90			
Indonesia	Lower	102	(-0.738)	106	106	80	74	84	77	85
Algeria	Upper	103		91	97	104	75	85	75	67
Argentina	Upper	105	(-0.765)	100	53	60	132	86	80	100
Gambia, The	Low	106	(-0.768)	109	111		99			
Mauritania	Lower	107	(-0.772)	125	119		65			
Congo, Dem. Rep.	Low	108	(-0.798)	95	136	94				
Guinea	Low	109	(-0.811)	49	134		112			
Zimbabwe	Low	110	(-0.816)		138	62	97	87	93	102
Bangladesh	**Low (Now lower middle)**	**111**	**(-0.823)**	**127**	**113**	**90**	**52**			
Georgia	Lower	112	(-0.839)	74	84	66	130	88	73	43
Azerbaijan	Upper	113	(-0.840)	118	77	100	105			
Senegal	Lower	114	(-0.847)	123	107	114	50	89	84	82
Kenya	Low	115	(-0.848)	117	100	103	73	90	103	99
Pakistan	Lower	116	(-0.851)	83	116	102	84	91	69	96
El Salvador	Lower	117	(-0.893)	82	81	89	128	92	90	71
Sudan	Lower	118	(-0.895)	64	123	117	93	93	92	80
Yemen, Rep.	Lower	119	(-0.940)	62	114	118	104	94	79	65
Cambodia	Low	120	(-0.941)	57	129	121	80			
Nigeria	Lower	121	(-0.955)	60	104	108	118	95	100	103
Nicaragua	Lower	122	(-0.976)	110	110	119	76			

Papua New Guinea	Lower	123	(-0.980)	56	133		129			
Peru	Upper	124	(-1.009)	129	75	75	122	96	81	98
Mozambique	Low	125	(-1.011)	103	131	99	92	97	88	78
Madagascar	Low	126	(-1.045)	115	135		111			
Myanmar	Low	127	(-1.049)	124	137	106		98	97	92
Zambia	Lower	128	(-1.051)		125	115	119	99	94	69
Cote D'Ivoire	Lower	129	(-1.068)	51	122	113	121	100	99	101
Ghana	Lower	130	(-1.069)		99	110	131	101	102	86
Cameroon	Lower	131	(-1.077)	130	128	87	77			
Gabon	Upper	132	(-1.078)	101	109	101	115			
Iraq	Upper	133	(-1.086)	97	115	123	79			
Nepal	Low	134	(-1.160)		126	124	114	102	87	84
Botswana	Upper	135	(-1.206)	77	101	125	91			
Haiti	Low	136	(-1.243)		127	126	83			
Kyrgyz Rep.	Low	137	(-1.265)	98	139	111	98			
Namibia	Upper	138	(-1.282)	114	102	120	125			
Bolivia	Lower	139	(-1.347)	132	103	85	126			
Congo, Rep.	Lower	140	(-1.435)		118	127	117	103	96	87

Sourc: Donaubauer, J, Mayer B., Nunnenkamp, P., (2014),

Appendix E: PPP Projects List of Bangladesh in Infrastructure Sector

The list of CCEA/LM approved projects under the Public Private Partnership Programme:

SL	*Sector*	*Project Name*	*Status*
1.	Transport	Dhaka-Elevated Expressway.	Award Stage - Preparatory Activities
2.	Health	Hemodialysis Centre at Chittagong Medical College Hospital.	Award Stage - Preparatory Activities
3.	Health	Hemodialysis Centre at National Institute of Kidney Diseases and Urology (NIKDU).	Award Stage - Preparatory Activities
4.	Zone	Hi-tech Park at Kaliakoir.	Award Stage - Letter of Award

5.	Transport	2 Jetties at Mongla Port through PPP.	Procurement Stage - Negotiation
6.	Zone	Economic Zone 4: Mongla.	Procurement Stage - Proposal Evaluation
7.	Zone	IT Village at Mohakhali.	Procurement Stage - RFP
8.	Tourism	Development of Integrated Tourism & Entertainment Village at Cox's Bazar.	Procurement Stage - RFQ
9.	Transport	Supply, Installation and Commissioning of a Multi Mode Surveillance System (Radar,etc. at Hazrat Shahjalal International Airport, Dhaka).	Procurement Stage - ROI
10.	Health	Oboshor: Senior Citizen Health Care and Hospitality Complex at Sreemangal, Sylhet Division.	Procurement Stage - IFT
11.	Transport	Upgrading of Dhaka Bypass to 4 Lane (Madanpur-Debogram-Bhulta-Joydebpur).	Procurement Stage - ROI
12.	Civil Accomodation	Construction of Satellite Township with Multi-storied Flat Building at Section 9, Mirpur, Dhaka.	Procurement Stage - RFQ
13.	Transport	Flyover from Santinagar to Mawa Road via 4th (New) Bridge over Buriganga River.	Project Development Stage - Feasibility Study
14.	Tourism	5 Star Hotel at Zakir Hossen Road, Chittagong.	Project Development Stage - Feasibility Study
15.	Civil Accomodation	Construction of BSS Bhaban under PPP.	Project Development Stage - Feasibility Study
16.	Transport	Hemayetpur-Singair-Manikganj PPP Road.	Project Development Stage - Feasibility Study
17.	Zone	Economic Zone 2: Mirersharai.	Project Development Stage - Feasibility Study
18.	Transport	Dhaka-Chittagong Access Controlled Highway.	Project Development Stage - Feasibility Study
19.	Zone	Economic Zone 3: Sherpur.	Project Development Stage - Feasibility Study
20.	Zone	Economic Zone 5: Anowara, Chittagong.	Project Development Stage - Feasibility Study
21.	Transport	Construction of a Railway Bridge parallel to the existing Bangabandhu Bridge with provision of Dual Gauge Double Track-over the river Jamuna.	Project Development Stage - Feasibility Study
22.	Transport	Construction of Railway bridge over river Jamuna near Fulchhari Bahadurabad Ghat including approach Rail links.	Project Development Stage - Feasibility Study
23.	Transport	Dhaka-Ashulia Elevated Expressway.	Project Development Stage - Feasibility Study

24.	Zone	Hi-Tech Park in Sylhet.	Project Development Stage - Advisor Appointment
25.	Transport	Jatrabari-Sultana Kamal Bridge-Tarabo PPP Road.	Project Development Stage - Advisor Appointment
26.	Transport	Construction of Laldia Bulk Terminal.	Project Development Stage - Feasibility Study
27.	Transport	Construction & Operation of Inland Container Terminal (ICT) at Khanpur.	Project Development Stage - Feasibility Study
28.	Education	Medical College and Modernization of Railway Hospital at CRB in Chittagong.	Project Development Stage - Feasibility Study
29.	Education	Medical College & Nursing Institute and Modernization Railway Hospital of Kamlapur.	Project Development Stage - Advisor Appointment
30.	Civil Accomodation	Shopping Mall with Hotel-cum-Guest House on the unused Railway land in Comilla.	Project Development Stage - Feasibility Study
31.	Civil Accomodation	Shopping Mall with Hotel-cum-Guest House on the unused land in Chittagong.	Project Development Stage - Feasibility Study
32.	Civil Accomodation	Shoping Mall with Hotel-cum-Guest House on the unused Railway land in Khulna.	Project Development Stage - Feasibility Study
33.	Tourism	Establishment of Intl. Standard Tourism Complex at Existing Motel Upal Compound of BPC at Cox's Bazar.	Project Development Stage - Advisor Appointment
34.	Transport	Construction of a New Inland Container Depot (ICD) near Dhirasram Railway Station.	Project Development Stage - Advisor Appointment
35.	Energy	Construction of LPG Import, Storage and Bottling Plant at Kumira or any Suitable Place at Chittagong Including Import Facilities of LPG, Jetty, Pipeline and Storage Tanks under PPP.	Project Development Stage - Advisor Appointment
36.	Zone	Economic Zone 1: Shirajgonj.	CCEA Approved
37.	Tourism	Establishment of Sabrang Exclusive Tourism Zone.	CCEA Approved
38.	Health	Medical College and Modernization of Railway Hospital at Saidpur in Nilphamary.	CCEA Approved
39.	Health	Medical College and Modernization of Railway Hospital at Paksey in Pabna.	CCEA Approved
40.	Health	New Modern Medical College & Hospital of 250 beds on the unused land in Khulna.	CCEA Approved
41.	Transport	2nd Padma Multipurpose Bridge at Paturia-Goalundo.	CCEA Approved
42.	Transport	3rd Sea Port.	CCEA Approved

Source: http://www.pppo.gov.bd/projects.php; Retrieved at 31.08.15