

Understanding the Risks of Public-Private Partnerships in Construction and Infrastructure Development before the 2008 Global financial Crisis.

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Abstract

This paper is concerned with issues relating to understanding the risks of Private Finance Initiatives (PFIs) / Public-Private Partnerships (PPPs) and in particular with critically enumerating the associated risks seen in construction and infrastructure development projects. The discussion is illustrated by references to empirical and case studies in PFIs/PPPs written in top academic journals. The paper begins by discussing the scope, background and concept of PPP before moving on to consider the development of PPP across the globe. It then analyzes and examines the criticisms of PFIs and PPPs in the United Kingdom. The theoretical framework developed in the cost of public capital investment and risk is then applied in relation to the arguments for and against the theory that restructuring cannot reduce the cost of risk in construction and infrastructure development projects. This is the challenge for the future and one which will most likely need to be undertaken in an enhanced partnership with the respective national audit offices around the world.

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1. Introduction

Since government can always borrow more cheaply than the private sector, why should they still engage themselves with Private Finance Initiatives (PFIs) / Public-Private Partnerships (PPP) to provide the basic amenities for its citizenry?

The term Public-Private Partnerships (PPPs) has been practiced in construction and infrastructure development in highly advanced and less advanced countries with different results. A broad range of sectors have used different types and models of PPPs, which have recorded assorted failure and success in various aspects of the economy.

Thus, PPPs have created lots of hype in the academic world in regards to the claims that it has achieved success in a wide range of sectors of the economy. The claims have lead to the development of PPP in other sectors such as in road construction, recycling and waste disposal systems, Wi-Fi broadband internet connections and fiber optic telecommunication networks, water treatment and supply, high speed railways, modern airport terminals, hi-tech sea and dry ports, bridges. Other sectors like the services of information technology, construction of schools, hospitals, prisons, and also military facilities are not left out in this claim that PPPs have lead to significant increased value to the outputs. For instance, the PPP program in the UK widely

known as the Private Finance initiative (PFI) when compared with traditional public procurement schemes, the average cost saving for the first eight design-build- finance-operate DBFO roads construction is 15%. For the Bridgend and Fazakerley prison construction projects it is 10%. Then it is 60% for the national insurance recording system. Also, the figure is 40% for the Home Office's immigration casework IT project scheme (Partnership for Prosperity 1997).

The purpose of the paper is to set out and critically understand the cost of risks in PPPs /PFIs construction and infrastructure development. The paper then analyzes the risks associated with PPP models in relation to the arguments for and against the idea that restructuring cannot reduce the cost of risk. The structure of the paper is as follows. It begins with an explanation, concept and background of PPP, including the various forms and development of PPPs across the globe. Then, further sections of the paper discuss the origin, criticisms of PFI and PPP in the United Kingdom. Empirical studies on risks in construction and infrastructure development were also carefully examined accordingly. The final sections discuss the demerits and merits of PPP and conclude with suggested directions for further studies on the subject.

2. Definition, Scope and Background of PPP

The term (PPPs) is one of the structures seen in the liberalization policy. This is an aspect by which public services are produced and delivered to the general public. This structure opens up the potentials for the provision of public services, not only to come completely from organizations owned and managed in the public sector, but also to stream down between public and private sectors in the form of partnerships. To acknowledge that public services could be supplied by PPPs inevitably requires liberalization in thought, since, as IPPR are at pains to point out, the —public good, private bad|| (IPPR, 2001, p.23). A PPP is an approach to delivery of

public services that involves the private sector, but one that also provides for a more direct control relationship between the public and private sector than would be achieved by a simple (legally-protected) market-driven and arms-length purchase.

Sagalyn (2007) argues that existing Public-Private (PP) construction and development projects have three generations.

During the first generation, mistakes are easily made due to the lack of experience by public and private partners and their consultants. In the second generation, large companies with strong experience emerge and then develop specialized PP urban construction and development projects and employ staffs with requisite expertise who managed PP projects for public entities or for PP corporations. Then, as a result of social development, the third generation emerges. These are PP development projects created by developers who are looking for private-sector involvement.

Over the past decade, the number of PP construction and development projects is expanding in the third generation, and it is expected that they will become more rampantly used in public service, urban and town regeneration, and city renewal projects, etc. In other words, the initiative of permitting private firms to finance construction and development projects of public sector infrastructure results in the emergence of PPPs (Li and Akintoye, 2003; The World Bank, 1992).

According to Grimsey and Lewis (2002) PPP can also be defined as, agreement where public sector bodies enter into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity, or the provision of services (using infrastructure facilities) by the private sector entity to the community on behalf of a public sector entity. Peirson and McBride (1996; 1-4) noted that numerous forms of PPP include some or all of the following features:

- ◆ The public sector entity transfers facilities controlled by it to the private sector entity

(with or without payment in return) usually for the term of the arrangement;

- ◆ The private sector entity builds, extends or renovates a facility;
- ◆ The public sector entity specifies the operating features of the facility;
- ◆ Services are provided by the private sector entity using the facility for a defined period of time (usually with restrictions on operations and pricing); and
- ◆ The private sector entity agrees to transfer the facility to the public sector (with or without payment) at the end of the arrangement.

3. The Concept and Development of Public Private Partnership across the globe

The concept of PPP is universal, unique and dynamic in nature. Such concepts and development have made it interesting in the sense that there exists no universally accepted definition of PPP.

Rather PPP has numerous definitions which apply to different countries.

3.1. United Kingdom (UK): the United Nations Development Programme (2007), when planning PPPs for the Urban Environment, pointed out that the concept and definition of PPP should be broad based so that even the informal dialogues between government officials and local community-based organizations, which are perceived to be essential to successful PPP, should not be left out but need to be included.

3.2. Canada: The Council for Public-Private Partnerships (2004) defines the concept of PPP as a cooperative venture between the public and private sectors, built on the expertise of each partner, which best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards.

3.3. New Zealand: Baker (2003) the development of PPP in New Zealand is associated with the belligerent privatization of large parts of its public sector in the 1970s and 1980s.

Beyond the privately owned public service suppliers, (such as utilities) are PPPs that have been developed in a more proactive or collaborative mode and which, from the start, have been recognized and known as such. The development of these latter PPPs in the traditional public sectors throughout the world has been the subject of considerable research interest. These PPPs are the most recent development of —New Public Management (NPM) (Hood, 1991; 1995). Thus, the overall nature of this has become well-established in many countries.

3.4. Australia: Just like its neighbor New Zealand. Large parts of its public sector were subject to belligerent privatization in the 1970's and 1980's. English and Guthrie (2003) based the discussions on use of Macro and Micro Value for Money (VFM) argument.

They argue that the evidence in favor of a macro or micro emphasis is even less in Australia, which has in its states a more complex government structure than the UK.

Judgments were drawn from a range of —steering mechanisms|| in the Australian context.

It then means that PPPs, which are known as privately, financed projects (PFPs) in Australia, fall someplace in between New Zealand (more macro) and the UK (more micro) positions. This is to say that Australia and New Zealand are probably nearer than they are to the UK as regards to their more macro justification for the development of PPP, although in the case of New Zealand the operational outworking of actual PPPs has started but is not as widespread as in Australia.

3.5. United States (US): The National Council for Public-Private Partnership defines the concept of PPP as a contractual arrangement between a public sector agency and a for profit private sector developer, and where resources and risks are shared for the purpose of delivery of a public service or development of Public infrastructure (Li and Akintoye,2003). However, in the US,

because of the public and private sector existing tradition of cooperation, the US never had to engage in such a belligerent privatization schemes (Broadbent and Laughlin 2003).

Baker (2003) argues that instead of being ingenious with their peculiar public service delivery issues, the rest of the world simply caught up with the United States model of provision of some key public services by turning to privatization. Baker's thought of the utilities companies in the UK argues that these newly or never privatized organizations were the original Public-Private Partnerships. Put simply, the governments around the world plans on how to exercise some ownership rights and control over nature, and, particularly, the pricing of the public services offered by these privatized companies gave birth to PPP. However, arguments abound that could suggest otherwise.

3.6. Hong Kong (HK): The Efficiency Unit (EU) was established as a unit of the Office of the Chief Secretary for Administration in HK in 1992. The Efficiency Unit defines a PPP as —arrangements where the public and private sectors both bring their complementary skills to a project, with varying levels of involvement and responsibility, for the purpose of providing public services or projects.|| The vision and mission of the Unit is to provide bureaus and departments with high quality management consultancy services and to advance the delivery of world-class public services and to advance the delivery of world-class public services to the people of HK (EU, 2005b). The EU (2005a) created a new focus on private-sector involvement (PSI), to —assist the government in meeting its priorities, building on the clear recognition that public funds are limited.|| This PSI has two forms: Outsourcing and Public-Private partnerships (PPPs). It also initiated the concept of PPP for the maintenance of infrastructure facilities in HK. Six forms of PPPs as described by the Efficiency Unit are as follows:

◆ *Franchises:* this stipulates that the private sector pays a fee during the concession

period awarded by the government for the revenue (or a share of the revenue) that the service generates.

◆ *Partnership investments (PIs)*: this stipulates that the public sector and private sector shares the proceeds from the investment made by private sector establishments

◆ *Partnership companies (PCs)*: it is a model where by private sector owns the stateowned businesses through legislation, regulation, partnership agreements, or retention of a special government share.

◆ *Joint ventures (JVs)*: it stipulates that the public and private sectors combined their expertise, finance and assets under joint management. In most cases, the participation of the private sector is seen more in management.

◆ *Creating wider markets*: this stipulates that the public and private sector needs to develop and maximize the assets, skills and finance that comes from both parties.

◆ *Private Finance Initiatives (PFIs)*: This is a model that engages the public sector purchasing quality services while the private sector maintains or constructs the necessary infrastructure. Thus, the private sector supplies designs, builds, finances and covers the costs through charges on the users of the project.

Apart from the above forms of PPP models, other types of PPP models exist which allocate responsibilities and risks between the public and private partners in different ways. Some of them are used frequently to denote typical partnership agreements:

◆ *Buy-Build-Operate (BBO)*: This is the transfer of a public asset to a private or quasi-public entity usually under contract that the assets are to be upgraded and operated for a specified period of time. Public control is exercised through the contract at the time of transfer.

- ◆ *Build-Own-Operate (BOO)*: The private sector finances, builds, owns and operates a facility or service in perpetuity. The public constraints are stated in the original agreement and through on-going regulatory authority.
- ◆ *Build-Own-Operate-Transfer (BOOT)*: This is where a private entity receives a franchise to finance, design, build and operate a facility (and to charge user fees) for a specified period, after which ownership is transferred back to the public sector.
- ◆ *Build-Operate-Transfer (BOT)*: The private sector designs, finances and constructs a new facility under a long-term Concession contract, and operates the facility during the term of the Concession after which ownership is transferred back to the public sector, if not already transferred upon completion of the facility. In fact, such a form covers *BOOT* and *BLOT* with the sole difference being the ownership of the facility.
- ◆ *Build-Lease-Operate-Transfer (BLOT)*: This is where a private entity receives a franchise to finance, design, build and operate a leased facility (and to charge user fees) for the lease period against payment of a rent.
- ◆ *Design-Build-Finance-Operate (DBFO)*: It stipulates that the private sector designs, finances and constructs a new facility under a long-term lease, and operates the facility during the term of the lease. The private partner transfers the new facility to the public sector at the end of the lease period.
- ◆ *Finance Only*: This is where a private entity, usually a financial services company, funds a project directly or uses various mechanisms such as a long-term lease or bond issue.
- ◆ *Operation and Maintenance Contract (O&M)*: This is where a private operator, under contract, operates a publicly owned asset for a specified term. Ownership of the asset remains

with the public entity. (Note: Many do not consider O&M's to be within the spectrum of PPPs and consider such contracts as service contracts.)

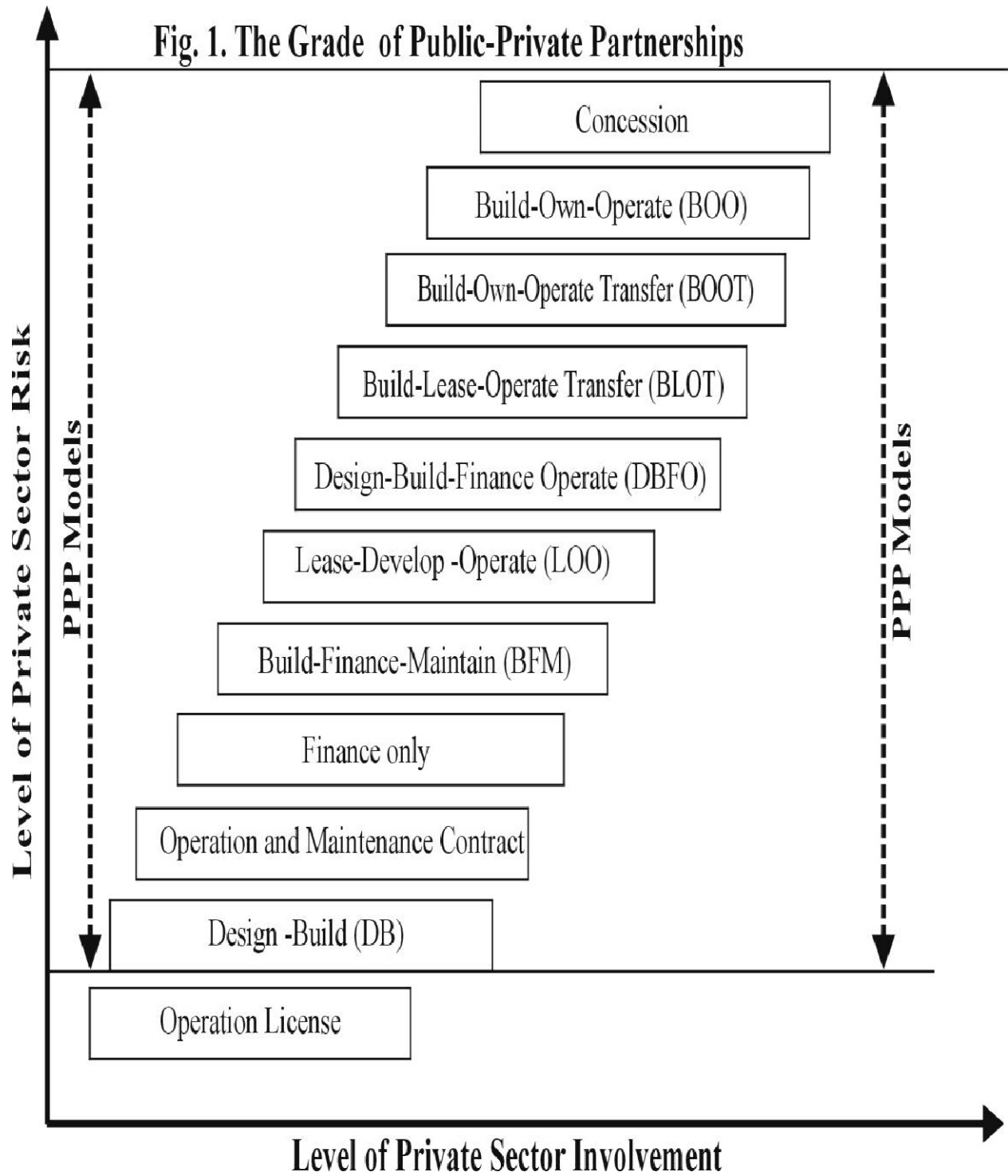
◆ *Design-Build (DB)*: The private sector designs and builds infrastructure to meet public sector performance specifications, often for a fixed price, turnkey basis, so the risk of cost overruns is transferred to the private sector. (Note: Many do not consider DB's to be within the spectrum of PPPs and consider such contracts as public works contracts.)

◆ *Operation license*: This is where a private operator receives a license or rights to operate a public service, usually for a specified term. This is often used in information technology projects. (United Nations Economic Commission for Europe 2008).

Available options for the provision of public services by a ministry or government department exist, and it defers from absolute privatization. The term privatization is indicative of when the government transfers all risks, responsibilities and rewards for service delivery to the private sector. Within this range, PPP can be classified, based on the extent of public and private sector participation, contribution and the echelon of risk allocation.

Fig.1 summarizes the forms and models of PPP using a level of private sector risk on the vertical axis and level of private sector involvement on the horizontal axis. The figure uses the grade of PPPs to highlight which PPP models are most associated with high level private sector risk and low level private sector involvement. For instance,

Concession and Build-Own-Operate (BOO) are both high-risk PPP models, which involve higher level of private sector involvement. Operation and Maintenance contracts and Design – Build are both low-risk PPP models, that also involves lower private sector involvement. In some cases, both Operation and Maintenance contracts and Design-Build are not regarded as a PPP Models, but are consider as a service or public works contracts.



4. Origin of Private Finance Initiative

The Conservative Government in UK started from 1992 to tap the private sector to maintain and manage the building and sometimes the operation of investments previously undertaken within

the public sector (Terry, 1996, Parker et al, 2003). This involvement was still in the infancy stage until the Labour Government came into power in May 1997, although they were previously critical of the Private Finance Initiative, it did not stop them from rebranding the program under the flagship of PPP and also demonstrated willingness to speed up the process by which public-private contracts are awarded (HM Treasury, 1998a). In 2000, the Partnerships UK was established and saddled with the objective which is to accelerate the process by which PPP contracts are agreed and in part by taking equity stakes in projects and in part by providing loans to public bodies. Included are initiatives such as creation of the Office of Government Commerce, and a government-proposed initiative to publish model contracts, which will help to reduce the costs of private firms when tendering for public sector work.

Furthermore, the UK's Private Finance Initiative (PFI) which was designed and built up in the UK in 1992 has now been adopted by different parts of Canada, France, the Netherlands, Portugal, Ireland, Norway, Finland, Australia, Japan, Malaysia, the US and Singapore etc as part of a wider reform program for the delivery of public services. This is in contrast to the concession form, financing schemes are structured differently (United Nations Economic Commission for Europe 2008). Even in the present situation, when it comes to the PPP development in Europe. The UK has continue to dominate in terms of both the value and number of PPPs, for instance from 1992 to 1999 approximately 40% percent of all PPPs in Europe by value are carried out in the UK, compared with 8% percent in Germany, 4% percent in Spain and 9% in Italy, France and the Netherlands join together (Privatization International, 2000, pp.4-5). The growing demand of PFIs in the UK, has lead it to be adopted in different areas such as in education, new government IT programs, hospital buildings, waterways, road schemes, prison management, redevelopment of the London Underground, estate transfers by

government departments and Ministry of Defence projects. The total value of capital projects as of 2002 is estimated at around 22.5bn pound (The business 6/7 October 2002, p.16)

During the 2002, more than 500 PFI contracts were signed and most of them if not all of them are presently operational. Privately-financed capital expenditure is now more than 15% percent of all publicly-sponsored gross capital spending each year, and PFI projects are very diverse. More typical are projects of 10 – 100 million pounds, for facilities such as educational or civic buildings, police stations, hospitals, energy management, urban regeneration or street lighting. Thus, more expensive and massive projects, of more than 100 million pounds, include roads, prisons and hospital buildings.

5. Criticism of PFI and PPP in the UK

The global demand of PFIs and PPP in construction, infrastructure and development projects have also resulted to various concerns and serious criticism from the academia and general citizenry. Some concerns have been raised in the UK regarding the resulting costs and benefits. For instance, the UK's National Audit Office (NAO) a body that supervises probity and efficiency in public spending criticized the first big hospital development project. The NAO found out that savings from the contract were greatly overestimated by the National Health Service (NHS) Trust that awarded it. The contract was awarded in the sense that, it would record average cost savings of about 17 million pounds, but the NAO estimated that it ended up just saving just about 5 million pounds (Financial Times, 1999, Parker et al, 2003). It has also criticized the profits made by private companies on certain deals (NAO, 1997a, b). The ideological discrepancies in the role of government and the presumed competence of public

service agencies apply to contracting out in general (and sometimes privatization) rather than to private financing.

However, this disagreement is more often than not pointed towards financing, as PFI projects are now the main instrument for new contracting out. Another contentious criticism leveled at PFI and PPP is in the area of employment. The government through the NHS piloted a scheme, under which ancillary staffs, in areas such as catering and pottering services are managed by the private sector, but remain public employees (HM Treasury, 2001). This scheme did not go down well with the Union; it was criticized in the sense that public services should be driven by motives of social concerns rather than commercial profit (Prentice, 2001). This creates disparities with the government view that contracting out is the preferred approach where it is practicable because it remedies a lack of vitality and energy in traditional public service delivery. A collection of ideological positions is summarized from a British perspective by the (IPPR, 2001).

Similar positions are described in the American literature (e.g. Linder, 2000).

We mention here some of the UK popular opinion that imposes constraints. The IPPR (2001, pp. 135-136) quotes opinion-poll evidence of public antipathy to profits being made from public services, combined inconsistently with enthusiasm for private sector involvement in these services. The NHS considered it a taboo, on the private sector provision of clinical services within the trust, and the consequent, mixed, story of private finance in the NHS is well set out by (Sussex 2001). However, tenders are now being invited from foreign clinical teams for work in NHS hospitals. The criticism is seen in the unpopular concerns made on privately-provided education services in the public education system. But there is a smaller amount of concern about prisons, where the PFI program continues, even though with human rights decisions, such as prisoner isolation, etc. is still taken by public sector staff.

Moreover, we draw attention and use case studies to argue and buttress the criticisms leveled on PFI and PPP in UK. Gaffney and Pollock (1999), on the study of PFI, in the NHS found out that, as regards to the calculations of the overall cost saving for PPP projects in healthcare sector. It concluded that PFI has had the effect of raising the costs of construction and infrastructure development projects in the health service. The hypothesis that higher capital costs would be offset by savings resulting from the participation of the private sector has proved incorrect. A report, conducted by The London Institute for Public Policy Research critically argue that actual saving from the PFI/PPP are likely to amount only to between 360 million pounds to 720 million pounds a year by the middle of the next decade (Financial Times, 2000a, p.2).

Another comprehensive study of an education PFI/PPP in the UK has raise substantial questions, arguing whether the anticipated innovation in project development design, construction, and execution on the part of private companies will actually occur (Ball et al., 2000).

Hence, PPP tends to conceal the true value of the government's future liabilities when not included in public sector debt and therefore government has been vehemently criticized for using techniques of which WorldCom and Enron would be proud' (Financial Times, 2002, p.21).

6. Risks of PPP

What are the risks involved in a construction and infrastructural development projects?

According to Kerzner (1989), Smith (1990), Chapman and Ward (1997), and Thobani (1998), nine types of risks faces any construction and infrastructure development projects.

They are follows,

Types of risks seen in any construction and infrastructural development projects.

Type of Risks Outcomes

I. Technical risk: This is the type of risk that occurs due to engineering and design failures.

II. Construction risk: This is the type of risk that occurs due to faulty construction techniques, cost escalation and delays in construction.

III. Operation risks: This is the type of risk that occurs due to higher operating costs and maintenance costs.

IV. Revenue risks: The revenue risks occur due to traffic shortfall or failure to extract more resources, the volatility of prices and demand for products and services sold (e.g. materials, office space, exchange rate fluctuations etc.) leading to revenue deficiency.

V. Financial risks: The financial risks occur due to inadequate hedging of revenue streams and financing costs.

VI. Force Majeure risks: This is the type of risk that happens due circumstances such as national conflicts, wars or calamities and the acts of God.

VII. Regulatory/Political risks: The regulatory/political risks as the name implies happens due to legal and frequent regulatory changes, and other unsupportive government policies.

VIII. Environmental risks: The environmental risks are associated because of adverse environmental impacts, degradation and other environmental hazards.

XI. Project default risks: This is the type of risk that happens due to the complete failure of the project resulting from a combination of any of the above risks.

Consequently, we argue here, that for any construction and infrastructural development projects to be successful, it requires the expert analysis of all the above risks and the blueprint of contractual arrangement, prior to competitive tendering that will appropriately allocate risks burden. Hence, Merna (1996) argues that appropriate allocating of risks burdens can be broadly categorized as global or elemental. The term —global risks can be said to be those

risks that are normally allocated through the project agreement and specifically include political, legal, commercial and environmental risks. The term elemental risks are said to be those risks related to the construction, operation, finance and revenue generation components of the project.

All of these risks mention above are common to any construction and infrastructural development, financing activity, and can be applied with more or less force depending on the project concerned. With some PPP agreement, revenue risk and market risk might be low, indeed negligible. For example, the revenue from a toll bridge might be more assured than that of an oilfield, while a private prison is likely to operate with a higher occupancy rate (e.g. 100%) than a luxury hotel.

In principle, the risks that are associated with other project financing activities can be assessed using much of the same essential method. The significant question, as always, is whether the revenue status of the project can effectively cover operating costs, service the debt finance and provide returns to risk capital. We discuss the case of infrastructure and product development, as regards to building a power plant. First, the sponsors of the power project borrow money from bank or capital venture to build a generation plant. The sponsors contract to supply power to utilities, anticipating that the contract revenues will be sufficient to pay debt service and generate profits. Here, a great deal of risks is present. Risks related issues that must be address includes such as will the plant work to full capacity in generating power? Will the market value of the contracts enable stakeholders to avoid an income shortfall? Can rates be raised to levels that it will be competitive to surpass the utility's cost for generation electricity? Since electricity generation & distribution has been held and regulated by government for a long time. These sensitive and compelling questions cannot be avoided or ignored in construction and

infrastructure development evaluation. Eventually, the crux of the matter, for instance, the project default risk is borne by the investors and strategic partners. In line with the scenario, the uncertainties in relation to future cash flows can be viewed and structured into two kinds:

- ◆ The moderate deviations from estimated cash flow projections, due to unpredictable prices, costs, timing delays, minor technical problems, etc.
- ◆ The unforeseen disasters to a project, as a result of a huge cost overrun, meltdown in the economy, change in legal rulings and regulations, frequent modification to the political climate, environmental disaster due to natural causes etc could seriously jeopardize the project and lead to bankruptcy and failure of the entire project.

7. Empirical and case studies on risks in construction and infrastructural development projects

In this section, we use the empirical and case studies carried out and published in top academic journals on risks of PPP, to buttress our arguments on the associated risks in construction and infrastructural development projects. We appraise this collection of risks of PPP written in academic journals. They are follows; Li et al., 2005a, 1999; Shen et al., 2006; Akintoye et al., 1998; Li and Tiong, 1999; Schaufelberger and Wipadapisut, 2003; Yeo and Tiong, 2000; Zayed and Chang, 2002; Lam and Chow, 1999; Abednego and Ogunlana, 2006 ; Tang, L et al. 2009; and Liu et al., 2010.

According to Tang, L et al. (2009) research on risks can help to explore the suitable ways for managing the significant risks associated with PPP construction projects. Risks in PPP can be strategized according to the conventional risk management process: namely identification of risk areas, risk analysis and risk strategies. In order to enhance the use of strategies, risk areas need to

be properly identified and analyzed accordingly. Different researches have been carried out to discover the main risk areas and attributes, and to study how clients' contractors and financial institutions perceive risks. For instance, previous studies have used questionnaires to collect data for identifying the main risk areas in BOT projects, such as political risks, financial risks, procurement risks, development risks, construction completion risks and operating risks (Akintoye et al., 1998; Zayed and Chang, 2002).

A research investigation of 13 case studies, discover that project risks, project conditions, and availability of financing were the most important considerations in selecting a financing strategy. It is widely believed that the political, financial and market risks are arguably the most significant risks that faces any construction project.

However, Shen et al. (2006), argued differently by using the case study of Hong Kong Disneyland theme park to analyze the risks influencing project performance. They clustered the important risks into the following 13 categories namely: site acquisition, unexpected underground conditions, pollution to the land and surroundings, land reclamation, development, design and construction, changes in market conditions, inexperienced private partner, financial, operational, industrial action, legal and policy and force majeure.

Consequently, these risk categories were further divided into three main factor groups namely: internal, project-specific, and external. Thus, Li and Tiong (1999); Li et al., (1999); Yeo and Tiong (2000) conducted case studies about the effective risk management measures of international construction joint ventures. They found out in their respective studies, the initiative that the most critical risk factors are the financial aspects of joint ventures, government policies, economic conditions, and project relationship.

We also argue and look into other researcher's studies on risks that affect individual project stages. For instance, Lam and Chow (1999) did a survey study that seeks to find out the effect of financial risks in BOT projects on different phases of procurement. The survey suggests that —interest rate fluctuation|| was the most important financial risk in the pre-investment stage, while currency exchange restrictions' was moderately significant in the operational stage. The above-mentioned important risk areas must be cautiously studied, and subsequent unforeseen circumstances strategies rigorously developed, whenever a person intends to embark on a PPP in construction and infrastructural development projects.

Furthermore, analysis into the risk strategies adopted by the public and private sectors has been conducted by different researchers.

According to Li et al., (2005a) carried out a questionnaire survey about risk allocation preferences in PPP construction projects in the UK.

They establish that risks could be differentiated by, if the public sector borne or private sector should share the associated risks. This research led to the suggestion that in PPP, construction projects, site availability and political risks is better in the hands of the public sector, while relationship risks, force majeure risks and the risks of legislation changes shared by both strategic partners.

8. The cost of public capital investment and Risk

Brealey and Myers, (2000) states that following the perfect capital markets'(PCM) structure seen in many financial textbooks, that the apparently lower cost of public finance is an illusion; the cost of capital in a privately-financed contract reveals the cost of risk inherent in producing that output. If this were true, it would make straightforward PFI policy and implementation, but it

appears to be based on unduly restricted views of how institutions and markets work in practice (Spackman, 2002).

We use this section of the paper to straighten out the arguments. The first thing is to distinguish between risk in the logic of optimistic bias and risk in the logic of variability. In some literatures on risks, such as in finance, economic and accounting, risks are almost completely concerned with variability around expended value. Practical risk analysis of PPP construction and infrastructural projects are almost completely concerned with optimism about the expected value itself. The modifications made to offset potential *optimism* are conceptually straightforward. Thus, for a privately financed PPP, some of the risk of deficits will be reflected in the cost of bank or bond finance. Other deficit risks foreseen by the contractor will also raise the contract price. With conventional public expenditure, corresponding increase does not exist in the cost of debt or equity to reflect foreseeable optimistic bias. However, a principal feature in the comparison of publicly-financed and a privately-financed option in the UK is the unambiguous assessment of such risks. This raises the projected costs with public finance.

Variability risk raises more intricate issues. The perfect capital markets (PCM) position maintains that, given adequate competition, institutional structure can have no effect on the nature or costs of the variability risks of manufacturing a given physical output.

[Footnote... 1 it is sometimes suggested that PPP/PFI contracts have a further optimistic bias because they lock the public sector into long-term payment for services which may later not be needed (e.g.Heald, 2003). This is not a well-researched issue. However the public sector is not less locked into a publicly financed asset and it seems unlikely that, given a well designed contract, the extra costs of compensation a PPP/PFI contractor need to be substantial.]

Practitioners, in contrast, find that private financing can affect the equitable distribution of risks and their costs, and can initiate new risks.

Arrow and Lind (1970), in one of the classic paper written on variability risk in the public sector concluded that the cost is by and large negligible, because it is broaden so widely and

hence thinly across the population. Currie (2000), using the arguments discussed below, criticizes the application of the Arrow and Lind conclusion (A&L) to the public sector. Grout (1997) believes that A&L views on variability risk can be equally applicable to *private sector costs*, but also suggests that public sector *benefits* should be discounted as the same risky rate as in the private sector. There are three most common criticisms of A&L namely: correlation with income, risk spreading, and implications for public ownership. (see Spackman, 2002, pp 292-294).

◆ *Correlation with income:* The financial values of many public-sector costs and benefits, such as the salary bill for MPs or the value of environmental improvements, are correlated with national income. In this case, the cost of variability does not approach zero as it is more widely spread. This was noted by Arrow and Lind. The question is how much it matters in practice. In most practical situations, people's valuation of risk is influenced by many complex factors, such as fairness and blame. However, small uncertainties in future aggregate analysis appears to be justified. A richer population gains or loses less utility than a poorer population from a marginal \$1, the rate at which the marginal utility of money declines as income increases usually being expressed as the elasticity of marginal utility of consumption (or the index of relative risk aversion).

[Footnote 2.*]. The equations below apply it to aggregate income and utility.

◆ *Some risks cannot be widely spread:* Foldes and Rees (1977) discuss three circumstances where public sector risks are not widely spread. Thus, the first one is public goods such

* Footnote 2 *: A value of 2 for this index implies that a given percentage increase gives twice as much utility to someone with half the initial income. The consensus value in academic debate appears now to be around 1.0-15 (Arrow et al., 1996). A good review of this quantity has been published by the UK Office of Fair Trading (Cowell and Gardiner, 2000)]

as national defense or many environmental benefits. However, it is rare for such goods to be valued in monetary terms. Even where they are valued, this is usually as a utility impact, as described above, in which case risk aversion is immaterial. The second circumstance is when the scale of a project would increase in proportion to the size of the economy. This could apply to a new technology in the whole of some national infrastructure. However, A&L depends only upon spreading to the point at which variability are very small relative to household income. No clear example of such a scaled investment in the UK which has faced users or taxpayers with large overspending or performance deficit can be substantial). The third circumstance is when the costs or benefits of a project are heavily concentrated, e.g. where some individuals face the possibility of substantial losses, for instance from proposed new infrastructure.

Then, more complex risk perception issues come into play, and A&L does not apply. Yet this rarely, if ever, affects comparisons between public and private financing, because impacts of this kind are unrelated to the method of financing. Concentration of risks on financiers does however have an impact on private financing, as discussed below.

◆ *Arrow and Lind seem to imply nationalization:* A closer look on the common argument against A&L is that, if it were correct, —we would expect the government to invest in high risk projects that are currently the preserve of the private sector. In a market economy, this would appear to be a ridiculous proposition|| (Currie, 2000). It would be strange, but because public investment requires a different incentive structure, which would be less satisfactory for most current private sector activities. The cost of capital is one factor in decisions about structure, but not the only one. The conclusion of Arrow and Lind seems dynamic, but that is just a working hypothesis. (see Spackman, 2002, pp 292-294).

9. Argument for and against that restructuring cannot reduce the cost of risk

We start this session by pointing out the reasons that lead government to use PPP in construction, project financing and in providing other infrastructural development to its citizenry. Three convincing arguments for private financing that we use to buttress these points are as follows;

a.) *Enhance effective monitoring by private financiers.* The scrutinizing pressures that contractors face from private financiers may be stronger than those from the public sector clients under conventional contracts. (IPPR, 2001,). For instance, the high unsuccessful rate of PFI/PPP projects may be because of the absence of such scrutinizing- although this may simply be verification of the belief of banks (who will not finance these projects) that IT investment comes with high risk. Hence, little evidence is seen on the importance of scrutinizing by financiers. In a classic report, Arthur Andersen (2000) discussed of 18 suggested drivers of value of money in PFI/PPP projects, —involvement of third party finance was given by far the *lowest* weight by the public sector respondents, though a survey of contractors might have given a more positive view. However, this scrutinizing role, if it is important, might be replicated with public financing, whether by reformed public monitoring procedures, or contracting out some project management functions. This appears not to have been explored.

b.) *The contractual profits of long-term capital at risk.* Maybe, the most convincing case for private financing in construction and infrastructural development projects is that, it binds the contractor into a long-term commitment. Without capital investment at risk, a contractor can easily walk away, if the cash flow is inadequate, with little redress.

Gerrard (2001) argues that even if, in principle, contracts might prevent this from happening, in practice it is difficult or impossible to design and enforce comprehensive penalty clauses

extending over a long period of time. This is an aspect of PPP practice that worth more research since little work has been done in this area.

c.) Enforcement of whole life costing. In recent years, UK has seen private financing in construction and infrastructural development projects grow from one level to another level, and this forces both clients and contractors to consider the interaction of design changes at the construction stage with long-term performance. Government departments are regularly urged to do this in any case, but the direct commercial and financial incentives provided by the PFI structure, maybe more effective than exhortation within government. Even so, it appears that no recent empirical analysis of this effect on PFI/PPP contracting. Thus, arguments might abound that could suggest otherwise. We ask the question.

Do these many arguments provide a sound case for private financing in construction and infrastructural development projects for public services?

According to Palmer (2001), its arguments rests on the premise that, for most services which are now subject to PFI/PPP contracts, all the savings could be realized by using Design, Build and Operate (DBO) which, seems cheaper and quicker, and would lead to more larger savings than Design, Build, Finance and Operate (DBFO). We argue here that there is no appropriate data currently available to assess this argument. *What is off-budget financing?*

Off-budget financing is a way by which government finance construction and infrastructural development projects and allow it to be done off their main budget. We pointed out here that for most PFI/PPP tenders the public-procuring body sees it as vital to keep the capital spending off-budget. In 1997 the Accounting Standards Board (ASB) issued a classic draft proposal on the application to PFI transactions of a 1994 Financial Reporting Standard (FRS5) on Reporting the substance of transaction. ‘ This singular proposal threatened the off-budget

status of many projects and led to ‘differences between the ASB and the Treasury’ (House of Commons Treasury Committee, 2000).

In continuation, to the argument for and against that restructuring cannot reduce the cost of risk. Since we have already considered the better argument that lead government to use PPP in construction, project financing and in providing other infrastructural development restructuring. We then move on to examine five seemingly unsatisfactory arguments and evidence that are showing that it would reduce the cost of risk.

a.) Government limitation and future borrowing taxation demand. The fact that privately financed capital spending is off-budget is one of the most important reasons for private financing. [Footnote 3.*].It is a politically attractive discussion. However, there is no substance to this argument unless, constraints on public financing exists which currently do not apply to private financing. The government constrains its borrowing because of concerns about future taxation, demand in the economy, effects on the cost of borrowing, and the need for flexibility to respond to shocks. A macroeconomic case scenario for off budget financing, if it avoided any of these constraints. In a rare classic discussion of this issue, the IPPR (2001). Following an earlier summary by Robinson (2000), dismisses any claim of lasting macroeconomic gain as ‘bogus’, because liabilities to service PFI contracts are as binding as the servicing of conventional government debt. The IPPR concedes that, while the PFI market matures and the capital market adjusts to understanding the new liabilities, the markets and the capital market adjusts to understanding through PFI than other means; but this is a best a short-term deception of the markets (Spackman, 2002).

An argument which is related to this deception that emerged in the context of PFI proposals for the infrastructure of London Underground Limited (LUL). Deloitte & Touche (2001) in one of

their review of the proposals reported that the interest cost advantage of public financing had been largely cancelled out by adoption of the concept of *'reputation*

* [Footnote 3. the presents Government's first policy statement. (HM Treasury,1997b) recorded that _the PFI is not about borrowing money from the private sector (but) all about... improved value for money.' However, the responsible Treasury Minister said later that, in contrast, the PFI is really about... enabling investment in key areas to take place that otherwise would not' (HM Treasury,1998). The ministerial foreword to the current policy statement (HM Treasury, 2000) opens with references to private capital _leverage' in by the PFI and a comment that PPPS are providing a major boost for the construction industry.' The main text says that private finance _can relieve the pressure on public finances.']

externality.' Note, the cost of this externality, calculated according to Treasury advice at the time, appeared to be within 700 million pound. The externality was presented by the UK government as _an adjustment... to capture the impact additional public sector borrowing would have on the government's reputation for prudence and therefore on the risk premium demanded on sterling-denominated securities' (Hansard, 2001). Thus, this adjustment could be applied to conventional debt but not to PFI liabilities. It then implied that, by putting liabilities off-budget, the UK was enhancing its reputation for financial WorldCom appears have been subsequently reconsidered and withdrawn.

The external finance can be crucial for public investments with high social returns in a developing or transition economy. This is because in developed economy no such argument applies which now creates the situation whereby private financing depends o its contribution to micro-efficiency.

b.) Over / under investment and public service investment. Public sector managers sometimes claim that the government has underfunded investment in their field, and media references to decades of neglect' are common. If it were so, then undermining normal expenditure controls with off-budget finance might be in the public interest. The existence or otherwise of bias appears never to have been systematically examined. Over – investment in some cases of the UK's construction and infrastructural development projects (for instance, the case of Millennium

Dome) and under-investment (for instance, various aspects of railways that needs urgent upgrading and repairs). In service sectors such as hospitals and schools, little systematic evidence is seen either way. However, if there were a bias against investment, off-budget finance would be an inefficient remedy.

Accrual accounting and budgeting provide ready means to rectify it without distorting the budgeting system.

c.) Evading formal limitations on borrowing or spending. During Prime Minister Tony Blair's administration, the UK government imposes on itself two formal borrowing limits. The rule stipulates that, over the economic cycle, the government will only borrow for investment. A 'sustainable investment rule' requires that the ratio of net public sector debt to GDP should not exceed a 'stable and prudent' level, defined as 40%. Nevertheless, even if the government wishes to use private finance to understate its true liabilities, no need for that. The sum of private finance and conventional debt still lies within the 40% limit (IPPR, 2001, Table 4.1). The government imposed upon itself a more serious constraint before the 1997 general election, to maintain the previous government's published expenditure plans for the 3 years to April 2000. Privately-financed capital did offer some relief, perhaps to the national advantage, from this temporary electoral commitment. The only significant external limitations in recent years have been the Maastricht convergence criteria, followed by the current Stability and Growth pact for Euro countries, requiring that government deficits should generally not exceed 3% of GDP. For economic consistency, this deficit should also include public sector commitments to repay project-specific finances. It does not, but these criteria have not been a limitation on the UK.

d.) Quasi-Privatization of self-financing projects. Quasi-financing and private financing enjoy some synergies. The increment of charges for a contract is easily met with a private operator than by voting in local or national government. Private financiers may regard income from users as a less risky source of revenue. However, these are not adequate reasons for such schemes being necessarily privately financed. The diversion of road toll revenue to a private financier, instead of the government, is no less a burden on the taxpayer than government payments to the operator of a privately-financed, the diversion of un-tolled, road. Furthermore, distortions can arise if charging creates system externalities. For instance, charging on some roads will generate congestion on un-tolled roads in the network. Nonetheless, in the UK at the moment, no requirement even to consider public finance for a self-financing construction and infrastructural development projects.

e.) Capital rationing as an instrument for change. Although, private financing provides no extra resources at the national level, it is extra capital for individual spending units. The Minister for Finance in the Northern Ireland Assembly Executive has commented that the PPP approach... offers the potential ... to improve our infrastructure more rapidly than if we relied solely on public capital finance' (Durken, 2001). The Minister's capital budget might be less than the socially optimal level, because the UK budgeting system is inefficient. Furthermore, the finance ministry's budget might set on the presumption of additional, off-budget financing, because of a belief that contracting out with private finance provides more cost-effective delivery. This may be satisfactory as a device to kick-start a new approach, as in the early days of the PFI. However, 18 years later, a blunt instrument is what it is at best. Thus, distorting the choices in favor of off-budget options, relative to others that may provide better value.

10. Advantages and Disadvantages of PPP

We start out by pointing out arguments and discussions on the various disadvantages or demerits of PPP in construction and infrastructure development projects.

a.) Lack of ownership: firstly, with PFI/PPP, the building is technically not owned by the public sector. Although, who has the asset of the building is a major disagreement in construction and infrastructure development projects.

b.) Design and Services: the design of the PPP projects together with the accompanying services is the responsibility of the private sector. The public sector should not be actively involved in this specification, but will only be required to specify the outputs in terms of services.

Kumaraswamy and Zhang (2001) presented several cases of BOT ventures that had run into problems due to cost overruns in the design and services, unrealistic price and income projections, and legal disputes between private operators and the government.

c.) Long-term relationship and Different values and interests: this is another demerit of PPP in construction and infrastructure development projects, whereby the public sector is locked into a relationship that is too long and difficult to break loose from it. The contract should specify as possible through a legal contract with a private sector, which might have different values and interests. Then, a distinctive concern too many is that, this private sector supplier, with its profit emphasis and necessity to give importance to its shareholders, may or may not share the same public values that might be the case if provision was completely made by those in the employment of the public sector. (Broadbent and Laughlin, 2003)

d.) Profit orientation and maximizations: While other arguments have gone further to suggest that the profit motive, which inexorably must drive the private provider, is fundamentally different to, and likely to conflict with, the principles of ethos of the public sector.

However, arguments abound that could suggest otherwise.

e.) Political Obstacles and Resistance to change: Although, PPP is perceived as a way of creating public infrastructure at little or no cost to the public purse, but the perception that there is no free lunch is true (Kumaraswamy and Zhang, 2001). Algarni et al., (2007) argue that practitioners and private stakeholders have pointed out political obstacles which stand in the way of effective and efficient usage of PPPs in providing infrastructure development projects. This view is not astonishing, since PPP projects always need special legislation. In most circumstances, the municipal or state legislature has to discuss this issue at length before legislation is enacted to regulate the use of PPP. For instance, the case of building the 2008 Olympic Games stadium in Beijing. (Liu et al. 2010). In addition, some government agencies may show signs of resistance to change in the context of implementing a new delivery/ financing approach.

One of the main advantages of the PPP in construction and infrastructure development projects is that, it can save resources in various ways. When that is done, government can concentrate on its core competencies, and does not need to rely on its own resources for unfamiliar projects (Cumming, 2007). Because of the involvement of the private sector, government assets, data and intellectual property can also be utilized more efficiently and effectively. This will lead to significant enhancement in the quality of public amenities and services (Edkins and Smyth, 2006).

Furthermore, the correct use of the private sector's skills, experience, technology and innovation, public services can be delivered more satisfactorily and equitably. According to Shen et al., (2006) and Liu et al., (2010) another advantage of PPP in construction and infrastructure development projects is that the public and private sectors can share risks at different stages. As

the private sector brings profitable disciplines into public projects, the risk of cost overruns and project postponements can be significantly reduced (Li and Akintoye, 2003; Ho, 2006, L. Tang et al 2009, Liu et al., 2010).

Other advantages of PPPs which includes risk allocation, for instance, cost over-runs could be managed more effectively through incentive-based contracts; innovation, openness, greater transparency. But when political meddling in project specification occurs; encouraging of high risk research and development, innovation in intensive project design, construction, operation and maintenance must be sort after and the recommendations and suggestion strictly adhere to. . To finish the design, build, and operation stages with PPP in construction and infrastructure development projects, the private sector can assist to make a weak and leaner civil service structure with an extra efficient and effective hierarchy of responsibility for services delivery (EU, 2005a). The effective and efficient use of PPP enables government to transfer expenditures from the public budget (and hence the public sector borrowing requirement) to the private sector. The opportunity costs of resources used in projects, and the impact on economic welfare, is only lower by using PPPs rather than other methods of public procurement, including direct state provision, if the real cost savings are applicable. (Parker and Hartley 2003).

11. Conclusion discussion.

The analysis undertaken in this paper covers and deals with issues relating to understanding the risks of Private finance Initiatives (PFIs) / Public-Private Partnerships (PPPs) and in particular, to critically enumerate the associated risks seen in construction and infrastructure development projects. We used the empirical studies and some cases to analyze the risks associated with PPP

models, as regards to the arguments for and against that restructuring cannot reduce the cost of risk.

Since the move to use PFIs/PPPs in construction and infrastructure development projects is now a worldwide movement and an unstoppable phenomenon, where there are marked differences in terms of levels of development and overall emphasis, all of which are in need of analysis and comparison. More capacity-building and sharing good practices clearly need to be done, in view of the fact that PFIs/PPPs are likely to be the major vehicle for developments in the provision of public services for many years to come.

Moreover, understanding how different countries structure, organize, adopt and adapt PFIs/PPPs in construction and infrastructure development projects to their individual specific needs, will be important to understand.

Lastly, strategic insights must be looking into areas that are offerings further innovative and efficient research directions in understanding the cost of risks in construction and infrastructure development projects could not be over emphasized. We believe that by conducting more research, more efficient and reliable ways can be developed to manage the liaison between the public sector and the private sector. This is the challenge for the future and one which will probably need to be undertaken in —effective partnership with the National Audit Offices around the world.

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