

## **The Supervision and Categorization of Expenditure Risks in Infrastructure Development Projects**

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### **Abstract**

*This article is concerned with issues relating to the supervision and categorization of expenditure risks in infrastructure development projects. It is quite reasonable to mention that expenditure is the vital part and life stream of infrastructure development projects and without it the entire project comes to an abrupt halt. The paper carefully recognizes the expenditure risks that are associated with the stakeholder, chief structural engineer, Architecture Company etc Thus, the article also discusses and demonstrated ways to ease and supervise expenditure risks together with government apparatus. It pointed out and recommended expenditure protected mechanism such as international bond, upfront expenditure agreement, and intermediary initiatives for infrastructural development projects. Finally, as adjudication is considered in some quarters, as the last alternative in reconciling expenditure disagreement, disputes and issues in infrastructural development projects, some adjudication laws, rules and regulation are highlighted and proposed to efficiently protect expenditure for infrastructural development project partners.*

**Keywords:** Supervision; Categorization; Expenditure risks, Infrastructure developmental project partners; Stakeholder; Chief Structural Engineer.

### **1. INTRODUCTION**

The United Nations (United Nations Economic Commission for Europe 2007) estimated that the people that would be living in the urban areas of The People's Republic of China (PRC) would increase from approximately 563 million in 2005 to about 827 million in 2025. The urban inhabitants are projected to grow at an astronomic rate than the entire population. The payment of the urban inhabitants in PRC would in so doing, swell from 41% in 2005 to about 57% in 2025. In other to assuage this negative effect of unstructured urbanization growth, the government is promoting the development of public transportation to relieve traffic congestion, reduce pollution, and improve mobility for urban commuters (Asia Development Bank 2005, Chan et al., 2010). In the government 11th Five-Year Plan, it recognized mass rapid transit as a main transport scheme for the second tier cities and megacities. Other public infrastructural facilities such as; adequate water supply schemes, gas pipelines construction, hygienic waste and sanitation disposal units and renewable energy as also in high demand to cope with the rapidly growing urbanization development. (Ministry of Construction 2004).

However, ineffective and inefficient supervision and categorization of expenditure system may limit the development of large-scale infrastructure development projects. The term "expenditure or expenditure fee" could be seen as the price which the structural engineers have fulfilled and the stakeholders payment to the engineers as regards to infrastructural development contracts. Expenditure is regarded as a critical subject in infrastructure development projects. In this research study, the expenditure is the stakeholders cost and the expenditure is structural engineers' remuneration. According to Hu et al., (2008) the expenditure procedure in any infrastructure development project is complex and exciting, which in so doing, present numerous challenges and concerns for the stakeholders and structural development engineers while dealing with expenditure risks.

From the perspectives of Kerzner (1989), Smith (1990), Chapman and Ward (1997), and Thobani (1998); Chinyere and Xu (2011) there are nine categories of risks that confront any construction and infrastructure development projects. They are follows, technical risks, construction risks, operation risks, revenue risks, financial/expenditure risks, force majeure risks, regulatory/political risks, environmental risks, and project default risks. Expenditure and financial risks are very crucial from the beginning to end of the entire stages of infrastructure development projects.

And when it involves international companies' issues such as cultural legacies, differences and customs tends to, in some cases create a gratuitous atmosphere for effective expenses administration. Thus, development partners must also strive to be flexible and understanding in expenditure risks. This is because expenditure risks are not stagnant, and if it is not recognized early enough and tackled throughout the entire stages of project development, infrastructure development companies could go broke and lose their financial investment within a very short time frame.

In infrastructure development projects, the stakeholders, and chief structural engineer /structural engineers have been known to at odds each other in issues like arranging for secure expenses platform, decreasing associated risks and when it comes to dealing with expenditure risks (Hu et al., 2008). At any given time, what the stakeholders requires is to have precise result oriented delivery from structural development engineers, after that the stakeholders remits the money to the development structural engineers for the project. On the other hand, what the development engineer requests is the expenditure fee from the stakeholders after the execution of the contractual agreement. This type of correlation between the stakeholders and structural development engineers creates friction and hostility, which brews suspicion and distrust from both parties, thereby making it complex to encourage healthy and trustworthy partnerships within infrastructure development projects.

## **2. Literature Review**

The section use empirical and case studies carried out and published in top academic journals on risks of Public - Private Partnerships projects (PPPs) and international development projects to buttress the review of literature and arguments on the associated risks in construction and infrastructural development projects. The researcher also evaluated the anthology of risks in infrastructure development projects, construction development projects and PPP written in top academic journals. They are as 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; Liu et al., 2010; Chan et al. 2010 and Chinyere and Xu., 2011

Lam and Chow (1999) did a study that seek to understand the consequence of financial and expenditure risks in BOT infrastructure development projects on different stages of procurement. The analysis propose that “interest rate fluctuation” was the main financial and expenditure risk in the pre-investment stage, while “currency exchange limitations” was fairly momentous in the operational stage. The above –mentioned risk must be rigorously studied, and successive conditions strategies meticulously developed, whenever any stakeholder, Project Company or other investor wants to embark on an infrastructural development projects.

Different scholars and non –academic scholars have research on ways to manage risks in infrastructure development projects. Smith et al., (2006) discussed basic expenditure management apparatus and initiates the form or how to effectively manage risks in development projects. Schexnayder et al., (2003) explain the construction management fundamentals. Wibowo and Kochendorfer (2005) investigated financial risks of project finance in Indonesian toll roads. Adams (2008) explains risk perception and Bayesian analysis of international construction contracts risks, and talk about a case of expenditure delays in a developing country. Hu et al., (2008) briefly explain some payment risks in construction projects. Hence, based on the supervision and categorization of expenditure risks in infrastructure development projects, a methodical expenditure risk administration formula is proposed in this research article.

## **3. RESEARCH METHODOLOGY**

It is not an overstatement to pinpoint that in recent years non academic and academic researches that centered on international development projects and dispute administration have continued to grow in volume, but to date there seems to be lack of interest or is it phobia in researching large infrastructure development projects, expenditure risks in international construction development projects. For instance gigantic intra and inter city transportation system, high-speed railways development, international shipping ports and airport terminals have not been systematically or painstakingly covered when it comes to the supervision and categorization of expenditure risks in resolving any associated disputes in infrastructure development projects especially in emerging and developing economics. Firstly, in this study, the researcher used empirical, documentary analysis and non empirical data information. This is done by collecting information, researching on documentary analysis from the development planning commission.

It also involves reviewing previous expenditure dispute resolution and administration case studies, scholarly and non academic literatures of Chinese and global viewpoints, examining related literatures, visiting the certified and trustworthy website addresses, four Municipal level Development Planning Commission, State Administration of Taxation, international infrastructure development project companies, Xin Hua News Agency, China's CCTV News Network, listening and watching to documentary reports, News reports, programmes and video archives that relates to analysis of expenditure cost, arguments, theory and practice of expenditure risks, conflicts, disputes, resolution, work progress achievement, management in national and international infrastructure development projects.

Secondly, the researcher also had formal and informal discussion with relevant bodies on issues that relates to the local and international infrastructural development projects, supervision and categorization structure for development projects and expenditure risks in China. From various previous case studies research experiences, the researcher circumvented using questionnaires, due to the low response rate, unreliable variables, inconsistency and the respondent's apathetic approach towards academic research case studies, especially if it has to do with conflicts, financial and expenditure risks, dispute resolution and with issues relating to international infrastructure development companies and the local government authorities.

Consequently, in order to eliminate and purge out bias situation, preconceived idea or concept and be more objective, in so doing have a comprehensive, dynamic and coherent understanding of the supervision and categorization of associated expenditure risks in infrastructure development projects. Some brief meetings were held with individuals and top level players from public and the organized private sector (OPS) that have got industrial, academic, research knowledge and construction management experiences.

More importantly, roughly more than 75 percent of them had 23 to 27 years or more experience in their specific field or have witnessed first hand concerns and issues relating to financial or expenditure risks within the last 5 to 7 years. In addition, those individuals that the researcher had discussion with were from the public sector and private sector, experienced construction and infrastructure development practitioners, and other institutional organizations (notably academic scholars and civil, mechanical, structural, construction development project researchers). This is how the research information was collected and compiles the evidence used for this work.

The underlying principle of this paper is mainly to bring out concerns and issues relating to supervision and categorization of expenditure risks in infrastructure development projects based on the context of Chinese administration arrangement, expenditure risks management, and other emerging/developing nation's measures would be properly discussed. In particular, it will also convey the notion that supervision and categorization of expenditure risks management is not the final solution or mandatory method in adequately resolving stakeholders and structural engineers disputes in infrastructure development projects. Finally, the article will illustrate and proffer a valuable and efficient supervision outline for protected expenditure and work progress achievement concomitantly with other subject matter relating to adjudication laws and intermediary initiatives, thus showing the unique formula and favourable alternative to efficiently and effectively protect expenditure for infrastructural development project partners.

#### ***4. The Supervision and categorization of expenditure risks in Infrastructure development projects.***

##### **4.1 Attentiveness to Expenditure risk**

Disagreement and clashes are frequent occurrence in any local or international infrastructural development projects. These clashes are more often than not directly or indirectly linked to financial and expenditure difficulties. Since the stakeholder and chief structural engineer cannot work out a cordial and trustworthy correlation in development projects, expenditure risks may not be eradicated in projects sites, but it could be categorized and managed to a minimum standard accordingly (Hu et al., 2008). With the complex nature of infrastructural development projects, apportioning responsibilities to all the projects partners such as the stakeholder, chief structural engineer, sub-structural engineers, purveyor, architecture firm/company, and independent professional experts (IPEs) could be a daunting task. That notwithstanding, it is even more complicated since all the expenses directly can from the stakeholder who happens to be the major financier of the project. Thus, the expenditure pattern should conform with the development project supervision technique.

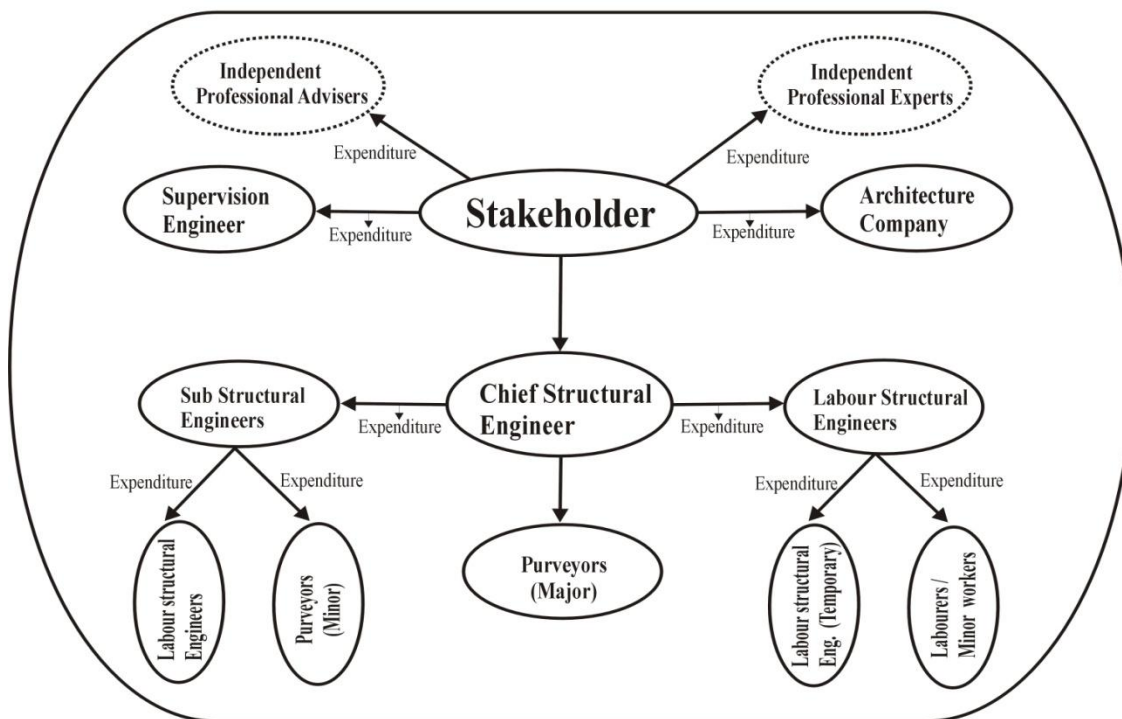
According to Tang, L et al. (2009) research studies on risks can assist to discover the appropriate ways for managing the significant risks associated with infrastructure development projects.

Thus, further research investigation of 13 case studies, discover that project risks, project conditions, and availability of financing were the most significant considerations in selecting a financing plan. It is widely believed that the political, financial, expenditure and market risks are arguably the most significant risks that faces any construction project. (Chinyere and Xu 2011).

With Public-private partnerships gradually becoming popular and prominent as the alternative way of delivering public works in the society, the previously fashionable infrastructure development project technique of Design-Bid Build, Build-Finance and Build is facing a huge threat. In the Build, Build-Finance and Design-Bid Build technique, it is the obligation of the chief structural engineer to oversee the entire development project and this jurisdiction also include managing the sub-structural engineers, special purpose engineers, contractual structural engineers, purveyors, labourers and other site workers etc. All the subordinate units in the development projects receive their money through the chief structural engineer and they are also answerable and accountable to the chief structural engineer, while the chief structural engineer is answerable to the stakeholders.

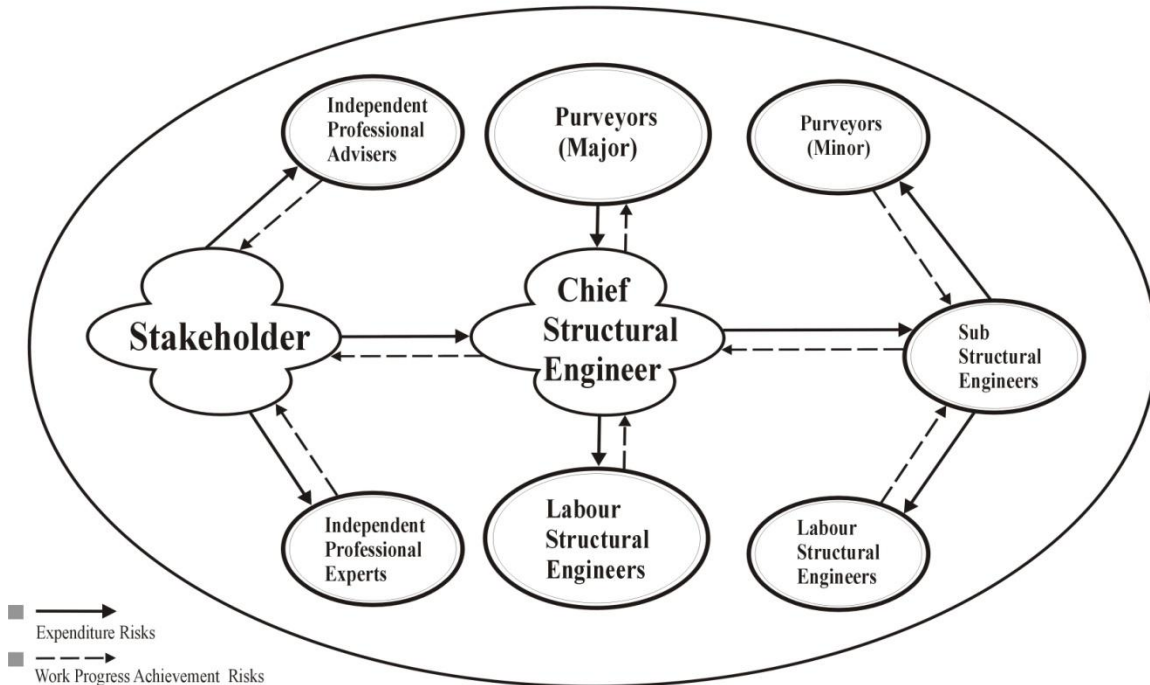
There is always a possibility or frightful sentiment that expenditure risks can occur involving any of the group. A classic expenditure pattern arrangement is illustrated in Figure 1.

**Figure 1. The expenditure pattern arrangement in an infrastructure development project**



#### 4.2 Foundation and Source of infrastructure development expenditure risks

In infrastructural development project, expenditure and financial activities are habitually aligned in a chain of command division and most of the expenses are provided by the stakeholder who initiated the project. Hence, the chief structural engineer receives the finances from the stakeholders and then make payment for the services, expenses due to the sub-engineers, purveyors etc. However, in some situation it is the responsibility of the sub-engineers to pay the purveyors, the daily labourers and other site workers. But there is no law that says that the chief structural engineer can not pay the daily labours or other site workers directly. However, it is easier and faster when payment is done from the lower stratum than from the higher stratum. The chain of command is disorganized if the stakeholder suspends, rejects or postpones expenses fees in this type of expenditure pattern. This will render the entire divisions of the project inactive causing huge monetary difficulties for the project. It could even lead to lowering the development outputs, efficiency, demoralized the workers and greatly incapacitating the deadline for the completion of the infrastructure projects (Hu et al. 2008). Thus, the foundation and sources of infrastructure development expenditure risks is illustrated in figure 2

**Figure 2. The Foundation and Source of infrastructure development expenditure risks**

Some academic and non-academic research believes that infrastructure development financial or expenditure risks are occasionally entwined with work progress achievement risks also known as performance risks when the stakeholder regards expenses as the only alternative in the chief structural engineer's poor performance. The foundation and sources of infrastructure development expenditure risks is the stakeholders liquidation and ruin or the chief structural engineers' deplorable manner or appalling quality of work progress achievement.

### 5. The Stakeholder and Liquidation

As the infrastructural development projects continue to whether storm of European debtcrisis, under-performing return on investment, low global financial growth. The stakeholder's liquidation and financial ruin poses serious concerns for structural engineers. As soon as the chief structural engineer have executed the development project contractual agreement, it is the responsibility of the stakeholder to immediately make payment to the chief structural engineer as it stipulates in the agreement. Under the international law, when the stakeholders does not pay the chief structural engineer and sub structural engineers the money due to them. These engineers have the right to place a lien on the properties on which the infrastructural project was developed. A lien is a the legal claim of one person (chief structural engineer) upon the property of another person (stakeholders) to protect the compensation of a debt or the satisfaction of a contract. The property include building materials, machines, equipments, installation materials and other development products (Hu et al. 2008).

The lien rights gives the chief structural engineer a little protection, when executing a project abroad and these rights also serve as a veritable tool for the structural engineer to effectively manage the adverse effect of stakeholder liquidation, late payment or unjustifiable collapse of the contractual agreement. Furtherance, local laws and local administration regulators in some countries prohibits the chief structural engineer to place a lieu rights on an infrastructural development projects.

On the other hand, in addition to the lien rights, chief structural engineers can also decide to defer or discontinue with the development project. The chief structural engineers have the avenue to file a lawsuit or a aver for projects they have finished. The International Federation of Consulting Engineers (FIDIC) have documented that a typical contractual agreement should provide appropriate rights for the chief structural engineers, sub structural engineers etc in case of the stakeholder's liquidation and bankruptcy.

Moreover, the issue of filing a lawsuit is logical and acceptable if the stakeholder is wealthy, the structural engineers may file a lawsuit in order to get paid. But it still varies, because the chances of winning a lawsuits is slimmer in countries that that do not have proper and adequate judicial system.



When it comes to how to manage against the risk of stakeholder liquidation and bankruptcy, most structural engineers believe that to avoid this ugly situation, the best option is to only choose projects that are own by very affluent stakeholders, governments, companies, reputable international firms and work for them. Then, the serious question arises how do you know or determine an affluent stakeholder? Consequently, an affluent stakeholder varies from one country to another. But a typical affluent stakeholder is someone that can pay his chief structural engineer, sub structural engineers, architecture company, supervision engineer, independent professional advisers or experts and purveyors etc promptly, regularly as stipulated during the signing of the initial contractual agreement.

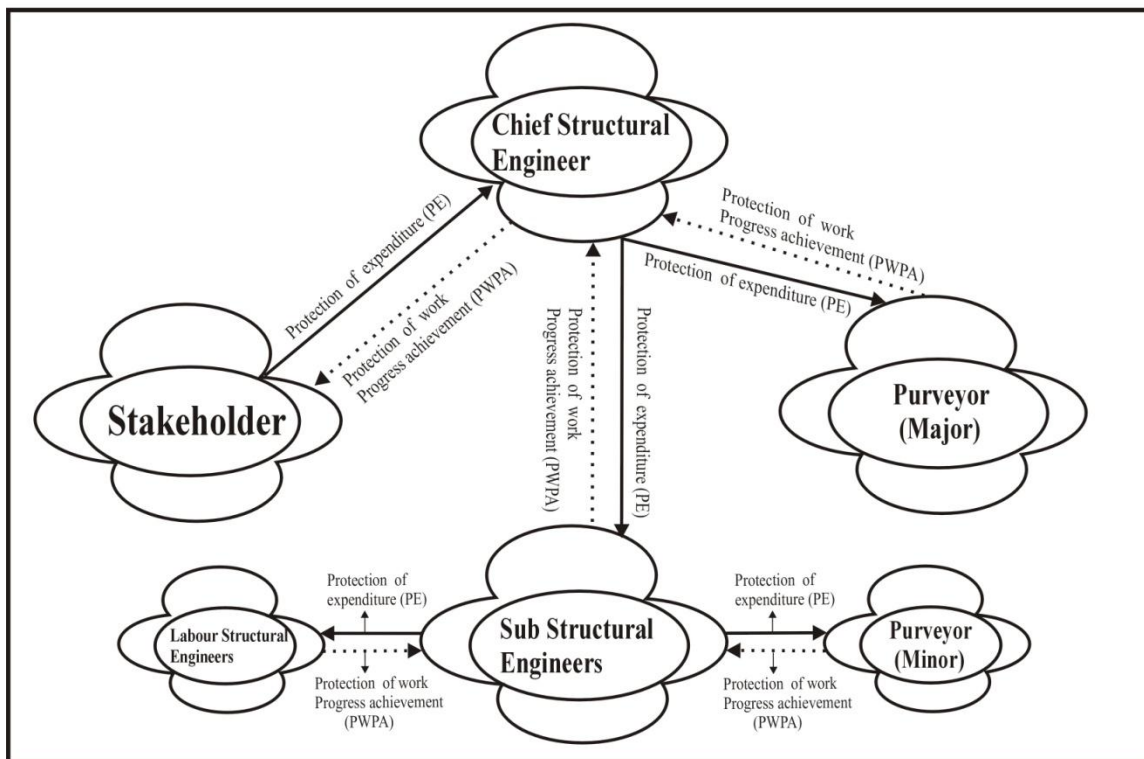
An affluent stakeholder should be someone that is financially stable, and with a soundtrack record of financial prudence in his involvement with the infrastructure development industry. Although, executing development projects with an affluent stakeholder is not an assurance that the chief structural engineer would receive his payment at as when due. This is because there are multi cases, whereby the stakeholder hides its true financial difficulties during the initial contractual agreement with the structural engineer in so doing, shows a false picture of his accurate financial capabilities to execute the development project.

**6. Supervision of protected expenditure**

In this article, according to (Hu et., 2008) there are three values that could be apply to supervise and protect infrastructural development projects expenditure. They are follows court of law and legitimate mechanism, upfront expenditure agreement, and intermediary. The safety or protection of expenditure (S/PE) may include upfront expenditure fee mechanism, payment bond, expenses bond, intermediary agreement and other safety nets securities. However, the safety or protection of work progress achievement (PWPA) involves contractual agreement of the actual work achievement, infrastructural development agreement etc. This is because the term safety measures of expenditure, protection of expenditure and work progress achievement differ in context, concept, and meaning from one economy to the other. Even in some developing economies safety measures of expenditure might not be available or still in its formative stage (Hu et., 2008).

The supervision outline of protected expenditure and work progress achievement is shown in Figure 3.

**Figure 3. The Supervision outline of protected expenditure and work progress achievement**



## **6.1 Court of law and legitimate mechanism**

In infrastructural development projects, due to the uncertainty in local court administration and arrangement, it is important to stipulate that an international development structural engineer must under no circumstance accept to have conflicts and disagreement settled under the confines of local laws. Most emerging and developing economies still have courts of law that are not fully developed to the internationally accepted standard of litigation and arbitration. In some developing nations, some judges or magistrates are harsh and could quickly take sides with the local defendant or plaintiff and have prejudice against international development projects partners. In recent years, an adjudication award is habitually much more implementable than a court ruling in infrastructure development projects.

The legitimate mechanism of expenditure risks in infrastructure projects are mostly achieved with the aid of adjudication rather than the court of law. Thus, there is a complexity here for instance, the individual or company that won the dispute by local court's verdict will take the verdict in one nation, and then the other individual or company that won will attempt to implement it locally in another nation. But it is not always applicable to impose a court verdict in a different nation and for the verdict to work, it entails that there must be a strong friendly treaty between the two nations, if not the verdict remains inefficient or useless just like a toothless bulldog. Legitimate mechanisms can also be seen mainly as a subject of contractual agreement concern. Certain paragraphs in dispute resolution are the vital component and significant foundation that most structural engineer must always evaluate and reassess before moving forward to strike an accord in the principle of globally accepted infrastructural development project agreement. The main concern includes selecting adjudication regulations, the venue of the negotiation and the appropriate law before embarking on any infrastructural development project.

Hence, whereby such adjudication paragraphs, sub sections and safety nets are not available or inserted in the agreement, then the project partners have, by default, agreed to settle on their conflicts and disagreement by means of the court of law in the specification where the supposed project development is situated. The location of the adjudication does not have to be the country where the development project is situated or even the home country of the chief structural engineer or stakeholder. Consequently, in most cases a non influenced and non aligned location is always an ideal option, this act helps to avoid biased ruling in favour or against any of the partners involved in the contract. Hence, it is been suggested that non aligned environments have always helped in encouraging more amicable dispute resolution between both parties.

Furthermore, the European laws are very strong and more often than not it, these laws are often enacted as the appropriate and valid laws use for the contractual agreement. The regulation of the nation where the adjudication is taking place habitually relates to technical substances. This means that the law or regulation enacted by the partners in the contract, by and large governs the substantive substances. The stakeholders are probable more pressurize as regards to issues with the law and regulation than the structural engineer.

Further still, it is now the responsibility of the infrastructure development structural engineer to be supple and accommodating in the law to utilize and also to know when to back down. In the adjudication or arbitration segment, the vital important rules for infrastructural development projects includes those enacted by the United Nations Commission on International Trade Law (UNCITAL), International Chamber of Commerce (ICC), International Court of Justice (ICJ) just to mention but a few and other specialized individual nation's adjudication rules.

## **6.2 Government apparatus**

With the sovereign debt crisis still hitting hard on the euro zone in particular and the world economy in general. The economic crisis, government apparatus and politics are interwoven together. In most developing nations governance and political will might play a significant role, rise up to the occasion and apply resourceful method in tackling experience risks. Hence, some emerging and developing economies are working out modalities to favour infrastructure development projects, because it will enable them to portray economics as the best investment friendly market, in so doing strive for perfection, with more innovation techniques in luring global financiers, transnational investment companies / institution for better trade and cooperation. The government of emerging nations more often than not, uses it apparatus in securing political guarantee for large- scale government development projects for example in rural electrification projects, dam construction, railways, power generation and transmission, dual carriage roads etc.

This is done in a situation whereby the international structural engineers are battling with the threat of expenditure risks due to the stakeholders liquidation and payment default. On the other hand, if government does not balance its expenses accordingly, it tends to create an atmosphere of uncertainties, problems which leaves a bad taste on the society, in turn hampers the nation's economic growth and development. The Chinese government has been seriously investigating and promoting infrastructural development project companies in the provision of public services to cater for the needs of public facilities and improve quality, service delivery and efficiency. (Adams et al., 2006). With Chinese economic development still averaging 8 percent year on year, global financiers and infrastructural development partners who have benefited in low taxes, levies and other apparatus of government packages have also in turn encourage and advance the viability, competitiveness and potentials of the local market finances.

In the last 15 years or so, infrastructure development foreign partners that are engage in critical infrastructure development projects in china have witnessed minimum disruption when it comes to expenditure risks than other projects. Consequently, the local government administration with its increasing economic and political status work assiduously to ratify any expenditure risks associated with infrastructural development projects especially when it involves foreign partners. They also encourage both partners to settle and negotiate any associated expenditure risks, issues and concerns amicably. However, the local government authorities have been known to weld in and resolve serious expenditure risks and complex development projects issues with the aid of government apparatus. These mounted political pressures from the government enable the infrastructural development structural engineers to get their payment as at when due, even though it is likely that the adjudication or court of law verdicts would not have been useful inprotecting expense fees (Hu et al., 2008) . On the other hand, it is expedient that government apparatus should retain some powers in case of wanton default and be ready to step in and reassure the development projects if necessary. (Abdul-Rashid et al. 2006; Birnie 1999; Chan et al. 2010; Corbett and Smith 2006; El-Gohary et al. 2006; Jamali 2004; Kanter 1999; Tam et al. 1994; Tiong 1996; Zhang 2005).

### **6.3 Upfront Expenditure Agreement**

This could be defined as part of a contractual agreement due sum which is paid upfront/in advance for work, projects, goods or services performed by receiving party, while the balance sum included in the invoice will be paid in the final delivery of the projects, goods and services. In accrual accounting field, it is known as prepaid expense. If the stakeholder will not provide any expenditure guarantees or security, the Infrastructure development structural engineer or sub structural engineer have the right to insist on upfront expenditure agreement, whereby his dues will be given to him on an advance or prepaid basis from the stakeholder or project company. This medium of payment have be known to minimize the excessive risks of the stakeholder's liquidation and protected expenditure concerns.

Furthermore, the upfront expenditure also serves as a hedge against the stakeholder liquidation and bankruptcy. The upfront payment will be minimized proportionally as the development project progress expenses are processed. The sum of the upfront expenditure will be deducted from infrastructural progress payment before the during of the project. Moreover, during the actual development project stages, the structural engineers still posses some money but have not earned it yet, since all the work have not been execution. The unearned sum could serve as a buffer for the infrastructure structural engineer in a situation whereby the stakeholder go bankrupt or into liquidation (Hu. et al. 2008).

Last, the structural engineer could also insist during the initial contractual agreement stage that the stakeholders should make an upfront expenditure agreement of 15 to 35 percent of the entire sum, while the structural engineer on the other hand will provide a special counterpart bond of the upfront expenditure payment to the stakeholder. This avenue will guide both parties to strictly adhere to their contractual agreement and make the project a success fulfilling each one's responsibility. Good contractual relationship among all the development partners, stakeholder and structural engineers is also very vital because they all bear relevant risks and benefits from the cooperation (Abdul-Rashid et al. 2006; Birnie 1999; Chan et al. 2010; Corbett and Smith 2006; Jefferies et al. 2002; Kanter 1999; Tam et al. 1994; Tiong 1996; Zhang 2005).

### **6.4 Intermediary Initiatives**

The term intermediary initiatives used in this research study refers to an aspect of strong promise, third party assurance or guarantee.



These intermediary initiatives usually comes from investment bond companies, local bank establishments, investment bond companies, local, international financial institutions and international securities companies. It could also be another type such as; letter of credit, bonds, shares, or a financial institution written guarantee.

Subsequently, in the last 4 to 6 years more and more stakeholders are habitually unwilling to bring in an intermediary partners or third party in infrastructure development projects. The FIDIC has done its part and fair share of responsibility in proposing that a sort of intermediary initiative must be included by the owner, stakeholder or project company as an annex in any standard construction and infrastructure development project contracts. Some academic scholars believes that it is due to the high cost of guarantee, unstable economic outlook, default loans and high credit repayment, that made stakeholders not be in agreement with the FIDIC while another school of thought blame it on the stakeholders perception that intermediary initiatives does not bring concrete value to the project as stake.

The notion of infrastructure development project going bankrupt or being liquidated is always a big issue and concern for foreign chief structural engineer, sub structural engineers, but not too much of a problem for local structural engineers. In most cases, local chief structural engineer and sub structural engineers rely heavily on the safety nets provided the local government authorities to protect and nurture home grown infrastructural development companies. However, the upfront expenditure agreement, intermediary initiatives which is habitually insisted upon by international structural engineer is now gradually becoming the norm in most, if not all infrastructural development projects.

## **7. Summary and Conclusion**

This article will contribute to the literature of infrastructure development projects as it presents the issues and concerns relating to the supervision and categorization of expenditure risks in any infrastructure development projects. In infrastructural development projects, expenditure is considered as the vital part and life stream of an infrastructure development projects and without it the entire project comes to an abrupt halt. The nature and mode of expenditure outline in developmental projects is complex and not stable which means that, it is constantly evolving all the time, with it bring numerous expenditure risks for the stakeholder, chief structural engineer, sub structural engineers, purveyors and architect company just to mention a few. These expenditures are not one sided, but could be interpreted to indicate the stakeholder's expenses and on the other hand, the chief structural engineer's wages and earnings. Since this is the case, both parties have the propensity to disagree on critical aspects of expenditure risks. In this article, the expenditure pattern arrangement is initiated and prospective expenditure risks from the stakeholder, chief structural engineer, sub structural engineers and other partners are methodically categorized accordingly.

Thus, other issues such as the foundation and sources of infrastructural development expenditure risks, supervision outline protection expenditure, and work progress achievement were illustrated and discussed, concomitantly with ways to ease and supervise expenditure risks with the inputs of government apparatus. Expenditure protection methods were also carefully looked into and expenditure protected mechanism such as international bond, upfront expenditure agreement, and intermediary initiatives advocated for infrastructural development projects.

Lastly, as adjudication is considered in some quarters, as the last alternative in reconciling expenditure disagreement, disputes and issues in infrastructural development projects, some adjudication laws, rules and regulation are highlighted and proposed to effectively and efficiently protect expenditure for infrastructural development project partners.

In future, this research study can be extended to integrate the consciousness and attitude of other emerging and developing nations as regards to infrastructural development projects, development partners and cultural diversity issues of the development project host nations. This is very significant because supervision, categorization, expenditure risks issues and concerns differs and varies from one nation to another nation in particular and from one continent to another continent in general.

**References**

- Abednego, M.P., Ogunlana, S.O. (2006). Good project governance for proper risk allocation in public–private partnerships in Indonesia. *International Journal of Project Management*, 24 (7), 622 – 634.
- Abdul-Rashid, A. A., Puteri, S.J.K., Ahmend, U.A., and Mastura, J. (2006). “Public private partnerships (PPP) in housing development: The experience of IJM Malaysia in Hyderabad, India.” Proc., Accelerating Excellence in the Built Environment, University of Wolverhampton, Birmingham,
- Akintoye, A., Taylor., C., Fitzgerald, E. (1998). Risk analysis and management of private finance initiative projects. *Engineering, Construction and Architectural Management*, 5 (1), 9–21.
- Andreas W., Bernd K. (2005). Financial risk analysis of project finance in Indonesian toll roads. *Journal of Construction Engineering and Management*, v 131, n 9, pp 963-972.
- Asian Development Bank. (2005) “Technical assistance People’s Republic of China: Application of public-private partnerships in urban rail-based transportation project.” Project Number: 39527, <http://www.adb.org/Documents/TARs/PRC/39527-PRC-TAR.pdf> (February 9,2010).
- Birnie, J. (1999). “Private finance initiative (PFI) – UK construction industry response.” *Journal of Construction Procurement.*, 5(1), 5 -14.
- Corbett, P., and Smith, R. (2006). “An analysis of the success of the private finance initiative as the government’s preferred procurement route.” Procurement Accelerating Excellence in the Built Environment Conference Birmingham, U.K.
- Clifford J. S., Richard E. M., Thomas W P. (2003). *Construction Management Fundamentals*. New York, USA: McGraw-Hill Science Engineering.
- Chapman CB, Ward SC., *Project risk management – Processes, techniques and insights*. Chichester: John Wiley and Sons, 1997.
- Chan, A. P. C., Lam, P. T. I., Chan, D. W. M; Cheung, E. Ke, Y.J. (2010). Critical success factors for PPPs in Infrastructure developments: Chinese Perspective. *Journal of Construction Engineering and Management.*, Vol. 136, No.5. 484 – 494.
- Chinyere, I. I., Xu. X.L., Understanding the risks of Public Private Partnerships in construction and infrastructure development. In proceedings of AABRI Conference Las Vegas October 6 – 8, 2011.
- El-Gohary, N. M., Osman, H., and DI-Diraby, T. E. (2006).“ Stakeholder management for Public private partnerships.” *International Journal of Project Management*, 24, 595 – 604.
- George J. Ritz. (1993). *Total Construction Project Management*. New York, USA: McGraw-Hill Professional.
- Francis K. Adams. (2008). Risk perception and Bayesian analysis of international construction contract risks: The case of payment delays in a developing economy. *International Journal of Project Management*, 26, (2), 138 – 148.
- Jamali, D. (2004). “Success and failure mechanisms of public private partnerships (PPPs) in developing countries: Insights from the Lebanese context.” *International Journal of Public Sector management*, 17 (5), 414 - 430.
- Jefferies, M. (2006). “ Critical success factors of public private sector partnerships a case study of the Sydney SuperDone.” *Engineering Construction Architecture Management*, 13 (5). 451- 462.
- John A., Alistair Y., Wu Zhihong. (2005). Public private partnerships in China system, constraints and future prospects. *International Journal of Public Sector Management*, 19, (4), 384-396.
- John Murdoch, Will Hughes. (2000). *Construction Contracts: Law and Management*. London, UK: Taylor & Francis.
- Hu, W. F, Jian G. C., George W., Zhao M. R (2008). Identification and control of payment risks in international construction projects in International construction projects, International Conference on Multi-National Construction Projects “securing high performance through cultural awareness and Dispute Avoidance” Shanghai, November 21 -23, China 2008
- Kanter, R. M. (1999). “From spare change to real change.” *Harvard Bus. Rev.*, 77 (2), 122 - 132.
- Lam, E. W. M., Chan A. P. C and Chan, D. W. M. (2008). “Determinants of successful design-build projects.” *Journal of Construction Engineering and Management*, 134 (5), 333 - 341.
- Kerzner H. *Project management, a systems approach to planning, scheduling and controlling*. 3rd ed. New York: Wan Nostrand Reinhold, 1989.
- Lam, K.C., Chow, W.S., (1999). The significance of financial risks in BOT procurement. *Building Research and Information* 27 (2), 84–95.
- Li, B., Tiong, R.L.K., Fan, W.W., Chew, D.A.S., (1999). Risk management in international construction joint ventures. *Journal of Construction Engineering and Management* 125 (4), 277–284.
- Li, B., Akintoye, A., Edwards, P.J., Hardcastle, C., (2005a). The allocation of risk in PPP/PFI construction projects in the UK. *International Journal of Project Management*, 23 (1), 25–35.

- Li, B., Akintoye, A., Edwards, P.J., Hardcastle, C., 2005b. Critical success factors for PPP/PFI projects in the UK construction industry. *Construction Management and Economics* 23 (5), 459–471.
- Li, B., Tiong, R.L.K., (1999). Risk management model for international construction joint ventures. *Journal of Construction Engineering and Management*, 125 (5), 377–384.
- Liu, W.Y., Zhao F.G., Wang, Q.S., (2010). Many hands, much politics, multiple Risks. *The Australian Journal of Public Administration*, 69, (S1), S85- S98
- Schaufelberger, J.E., Wipadapisut, I., (2003). Alternate financing strategies for build–operate–transfer projects. *Journal of Construction Engineering and Management* 129 (2), 205–213.
- Martin Loosemore, John Raftery, David Higgon, Charles Reilly. (2006). *Risk Management in Projects*. London, UK: Taylor & Francis.
- Nigel J. Smith, Tony Merna, Paul Jobling. (2006). *Managing Risk: In Construction Projects*. London, UK: Blackwell Publishing.
- Shen, L.Y., Platten, A., Deng, X.P., (2006). Role of public private partnerships to manage risks in public sector projects in Hong Kong. *International Journal of Project Management* 24 (7), 587–594.
- Smith. RC, Walter I, *Global financial services*. New York: Harper Business, 1990.
- Tang, L. Y., Qiping S. A., Eddie A review of studies on Public-Private Partnership Projects. *International Journal of Project Management*. Doi:10.1016/j.ijproman.2009.11.009
- Thobani M., (1998). Private infrastructure, public risk. *Finance and Development*; 36 (1):50-3.
- Tiong, R. L. K. (1996). “CSFs in competitive tendering and negotiation model for BOT projects.” *Journal of Construction Engineering and Management*, 122 (3), 205 - 211.
- Yeo, K.T., Tiong, R.L.K., (2000). Positive management of differences for risk reduction in BOT projects. *International Journal of Project Management* 18 (4), 257–265.
- Yu-Lin Hu., (2008). The pricing of conditional performance guarantees with risky collateral. *Construction Management and Economics*, 26, (9), 967 - 978.
- Zayed, T.M., Chang, L.M., (2002). Prototype model for build–operate–transfer risk assessment. *Journal of Management in Engineering* 18 (1), 7–16.
- Zhang, X.Q. (2005). Critical success factors for public-private partnerships in infrastructure development. *Journal of Construction Engineering and Management* 131 (1), 3 - 14.

#### **FURTHER READING MATERIALS**

- Arumba, Chimay J., Carillo, Patricia and Egbu, Charles (2005), *Knowledge Management in Construction*, OR Oxford, OX4 2DQ, UK: Blackwell Publishers.
- Awakul, P., and Ogunlana, S. (2002). “The effect of attitudinal differences on interface conflicts in large scale construction projects: A case study.” *Construction Management Economics*, 20 (4), 365 - 377.
- Campbell, P. (1997) *Construction Disputes: Avoidance and Resolution*, Scotland, UK: Whittles Publishing.
- Chan, E.H.W., and Tse, R.Y.C. (2003). Cultural considerations in international construction contracts. *Journal of Construction Engineering and Management*, 129, (4), 375 - 381.
- Diekmann, J. E., Girard, M. J. (1995). Are Contract Disputes Predictable?, *Journal of Construction Engineering and Management* ASCE 121(4), 355-363. doi:10.1061/(ASCE)0733-9364(1995)121:4(355)
- Gunhan, S., and Arditi, D. (2005). Factors affecting international construction. *Journal of Engineering and Management*, 131 (3), 273 - 282.
- Kangari, R. (1995). Risk management perceptions and trends of U.S construction. *Journal of Construction Engineering and Management*, 121, (4), 422 - 429.
- Ministry of Construction (2004). “Sample document for the franchised cooperation of urban water supply, gas supply and waste disposal.” Beijing.
- Shen, L.Y., Wu, G.W.C., and Ng, C.S.K. (2001). Risk assessment for construction joint ventures in China, *Journal of Construction Engineering and Management*, (127), (1), 76 - 81.
- Wang, S.Q., Dulaimi, M.F., and Aguria, M.Y. (2004). Risk management framework for construction projects in developing countries. *Construction Management and Economics*, Vol. 22, pp 237 - 252.
- Zhang, X.Q. (2005). Critical success factors for public-private partnerships in infrastructure development. *Journal of Construction Engineering and Management* 131 (1), 3 - 14.