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Risk Management Competency Strategy in Risk Allocation within PPP Infrastructure Projects in Kuwait City

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Abstract

Abstract—With the increase of the number of the Public-Private Partnership (PPP) projects in Kuwait, the associated risks with such projects are being studied from many angels. This study aims at evaluating the risk allocation competency in Kuwait city within infrastructure PPP projects. The used method included two parts; identifying the main risks in the PPP infrastructure projects in Kuwait city; besides their associated criteria and mechanisms. The second part of the method included ANP analysis for the main aspects of the risk management competency as one of the risk allocation critical factors. The results of this study indicated that most of the risks within PPPs projects in Kuwait city are micro and operational while the most allocation cases are loaded for the private sector. The results of the weighted super matrix showed that finding alternative solutions insure or hedge against the risk in financial markets, control the risk causes and controlling the risk impact in terms of customer inconvenience are the most influential factors in infrastructure PPP projects in Kuwait city.

Keywords: *Risk allocation, Kuwait city, competency, PPP projects*

I. INTRODUCTION

Public services including; transportation, power supply, education, telecommunications and health, are very important for most societies survival where the lack of them may result in significant social welfare risks [1]. Fast growth in several developing and developed countries has been resulting in a considerable demand for investing in these infrastructure projects. Conventional infrastructure provision funded through governments has result in inefficacies and exposed infrastructure development for the governmental funds availability [2]. While the balancing mechanism to this anomalies, providing concessions concept to financially unappealing projects has been enabled and used governments for maintaining a strategic interest within the infrastructure project. For several governments in the world, the arrangements range of Public-Private Partnership (PPP) are fast becoming the favored way for providing public services [3].

Public Private Partnerships (PPP) projects are widely discussed collaboration form amongst the private and public sectors within infrastructure projects in all over the world. Several task groups, handbooks and reports besides comprehensive studies [4, 5] were addressing PPP and suggesting the need for research.

The main advantage for governments including private participation within a project is that the proper risks are transferred into the private sector. Since the private sector can manage these risks cheaper, better and with higher quality provided services, the private sector can develop the project compared with the conventional methods of the public sector. On the other hand, PPP projects risk management are becoming complicated since social infrastructure projects, such as hospitals, courts, schools prisons as well as public housing, have started to appear within the PPP market. The arrangements complexity has result in increased exposure of risks for all the involved parties [6]. Factors like the loan duration,

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susceptibility to economic and political risk, low market value of the limitations and security package on enforcing security all help in the PPPs profile complex risk [7]. Effective PPP project risk allocation is thus not an easy job. While PPP markets have globally grown, there has been a resultant rise in PPPs studies especially with focusing on different risks inherent within PPP projects [8]. Risk management competency of the involved parties is usually the main concern while choosing the effective strategy of risk allocation. From the transaction cost economics perspective, though, considerable literature on organizational competencies suffers from the lack of attention for the business context and the resulting opportunism potential [9]. However, the related literature to organizational competencies stated that transaction cost economics pay no attention to the differences in the firm competencies [10].

The risk allocation criteria are divided into several categories including risk management competency, incentive mechanism and risk preference where each one of them includes sub-criteria. The rationale behind choosing such criteria is that they involve all the levels and stages of the infrastructure project and they include all the potential risks along the project.

In this study, risk management competency will be the main focus as it is the best way to assess the capability of the different parties to bear the risks as it will be demonstrated in the next section.

A. Risk management competency

The generally accepted 'competency' definition refers to the proper attitude, skills and knowledge to do a job in a better way. To sum up, competency denotes the right characters of the heart, hand and head [11]. The competency refers to the abstract knowledge. Knowledge with no skills (i.e. taking suitable action within an organizational context) is not used that much. Also, if someone has the right skills for performing a job then has a bad work attitude, this cannot benefit the firm [12].

The competency framework is a model that mostly describes the performance excellence in the organization. Usually, this framework contains many competencies, which are applied into many occupational roles in the organization [13]. Each competency describes, generally, excellence in the working behavior; such definition will establish the benchmark where the staff is assessed. In PPPs, risk management competency can vary from one sector to another; however, assessing the competency can create an insight on the appropriate criteria and mechanisms to be followed in PPPs in Kuwait city.

II. METHOD

After the related literature was reviewed, the Analytic Network Process (ANP) was used to evaluate the risk management competency of risk allocation within PPPs in Kuwait city. The topics were classified into clusters that are composed of related factors as links were created between them. The ANP is a descriptive method, which combines the measures in an enhanced way compared with the qualitative approach.

A. Population and sample

The population of this study included all the involved parties in PPP infrastructure projects in Kuwait city and the sample was a convenience sample of the sample is (120) working employees and workers besides (10) experts in the same field.

B. The questionnaire

The first part of the method included identifying the key risks in the PPP infrastructure projects in Kuwait city. For that reason, a questionnaire was distributed on the study sample consisted from a checklist for the most commonly identified PPPs risks in the related literature. The analysis of those risks involved the frequencies and percentages of each risk. Then, the allocation mechanisms for each identified risk were listed through a second checklist distributed on the (120) participants.

C. Applying the ANP model

Saaty's fundamental scale (1-9) was used where 1 denotes the equal importance of two elements and 9 denotes that element i empowers element j. Through

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this sale, the respondents were asked to rank the nine main criteria.

D. Translating decision problems to risk allocation criteria network structure

Through interviewing (10) experts in the PPPs infrastructure projects in Kuwait city, the inner and outer dependencies in the decision elements were formed.

E. Pairwise comparison matrix

The selected criteria importance and weight were derived as the experts were asked to determine the more influential element between two elements i and j where the 1-9 scale was used in this step.

F. Unweighted, weighted and limit super matrix

The super matrix began with the unweighted super matrix and then merged into the powered super matrix. The local priorities directly entered to the unweighted super matrix. When there is no effect form one element to the other, zero value was assigned. Afterward, the unweighted super matrix was transformed into weighted super matrix that involved columns with the sum of one for each. The final decision element priority was derived by increasing the weighted super matrix to power.

III. RESULTS

Table (1) below shows the categories and levels of top (10) risks as identified by the study sample. It can be noticed that the most common risks are either legal or operational. Moreover, the majority of those risks are on the project level (micro).

Table 1: Most ideftfied risks in PPPs in Kuwait city

Risk factors	Level	Category
Expropriation or nationalization of assets	Macro	Macroeconomic
Delay in project approvals and permits	Miso	Legal
Legislation change	Miso	Legal
Level of public opposition to project	Micro	Project selection
Change in tax regulation	Miso	Legal
Late design changes	Micro	Design
Inflation rate volatility	Macro	Macroeconomic
Excessive contract variation	Micro	Relationship
Lack of commitment from either partner	Micro	Operation
Inadequate experiences in PPP	Micro	Operation

Table (2) presents the second part of the questionnaire as the sample members rated the followed risk allocation mechanism for each risk (public allocation, private allocation, shared allocation as well as neglected allocation).

Table 2:Most frequent risk allocation mechaisms

Risk factors	Public	Private	Shared	Neglected
Expropriation or nationalization of assets	80%	13%	6%	1%
Delay in project approvals and permits	99%	-	1%	-
Lack of tradition of private provision of public services	3%	88%	9%	-
Land acquisition site availability	32%	38%	30%	-
Change in tax regulation	70%	-	30%	-
Late design changes	6%	56%	37%	1%
Inflation rate volatility	20%	-	80%	-
Excessive	5%	60%	35%	-

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contract variation				
Lack of commitment from either partner	12%	13%	74%	1%
Inadequate experiences in PPP	6%	92%	2%	-

It can be seen in table (2) that the private sector takes the higher share of risk allocation.

Based on the previous literature [7, 14-16], five risk management competency factors were chosen to be evaluated using Saaty's fundamental scale (1-9) where 1 denotes the equal importance of two elements and 9 denotes that element i empowers element j. The results of the primary judgments were aggregated. Figure (1) shows the network process.

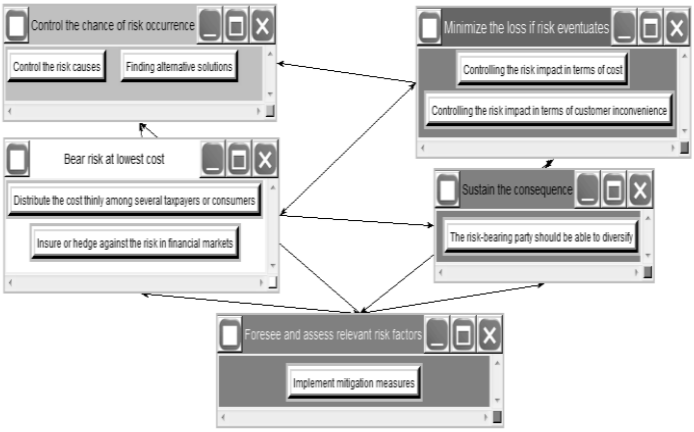

Figure 1: ANP model

The weighted super matrix was built indicating the most influential risk management competency factors. The results of the weighted super matrix showed that finding alternative solutions insure or hedge against the risk in financial markets, control the risk causes and controlling the risk impact in terms of customer inconvenience are the most influential factors in infrastructure PPP projects in Kuwait city. The weight matrix is presented in the Appendix.

IV. Discussion

The results showed that most of the risks associated with infrastructure PPP projects are micro risks on the level of the project itself. Starting from excessive contract variation, Inadequate distribution of authority in partnership, lack of commitment from either partner, late design changes and ends with land acquisition site availability and poor public decision-making process. Those risks are mainly internal risks where this result can be attributed to the complicated and multiple processes that the project involves. Moreover, this type of risks involves the internal relationships between the project members who are different in their strategies and the ways they manage the contracts [17]. This result is consistent with Bing et al., (2005) and Anwar et al., (2018) who confirmed that micro and macro risk factors are the leading levels of risk in PPP projects. The results of the current study revealed also that the operational risks are the dominant type of risks, which is consistent with the next result, which indicates that the allocation for the private sector is the common mechanism as the operational risks are usually allocated to the private sector. This result can be attributed to the long period that the operational processes have [18]. However, the illuminated risks in the current study included the unstable political status where Kuwait city government is considered as one of the leading governments in supporting the construction sector. The results related to the risk allocation mechanisms were widely different as there is no agreement or standards for such kind of partnership where the risk allocation related decisions are being judgmental in most times

The results of the current study showed also that finding alternative solutions insure or hedge against the risk in financial markets, control the risk causes and controlling the risk impact in terms of customer inconvenience are the most influential factors in infrastructure PPP projects in Kuwait city. According to [19, 20], those criteria are vital as it enables to build the appropriate measures to manage the predicted risk in the future and to control their occurrence.

The results of this study can be further elaborated through conducting further studies that examine the

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private sector competencies against the public sector to attain more comprehensive results. Moreover, this study suggests incorporating pre-plans to evaluate the effects of the possible risks before setting strategies to allocate them.

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Table 3: The weight matrix

Sustain the consequence	Minimize the loss if risk eventuates		Foresee and assess relevant risk factors	Control the chance of risk occurrence		Bear risk at lowest cost			
The risk-bearing party should be able to diversify	Controlling the risk impact in terms of customer inconvenience	Controlling the risk impact in terms of cost	Implement mitigation measures	Finding alternative solutions	Control the risk causes	Insure or hedge against the risk in financial markets	Distribute the cost thinly among several taxpayers or consumers		
3	3.846	1.5	0.28571	0.125	4	0.333	1	Distribute the cost thinly among several taxpayers or consumers	Bear risk at lowest cost
0.271057	0.2	0.212	0. 40	8	0.192166	1	3	Insure or hedge against the risk in financial markets	
3	0.2	0.25	0.133671	0.111	1	5.263	0.25	Control the risk causes	Control the chance of risk occurrence
4.1	7	0. 44527	0. 66836	1	9	0.125	8	Finding alternative solutions	
3.16	7.69	0.19	1	1.496	7.692	2.5	3.5	Implement mitigation measures	Foresee and assess relevant risk factors
3.57	0.25	1	5.26	2.2458	4	4.716	0. 6666	Controlling the risk impact in terms of cost	Minimize the loss if risk eventuates
0. 855	1	4	0.136313	0.1428	5	5	0.266667	Controlling the risk impact in terms of customer inconvenience	
1	1.169	0.28	0.316	0.243	0.333	3.69	0.333333	The risk-bearing party should be able to diversify	Sustain the consequence