Exploring the risk factors of the international companies in Iraqi construction projects

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Abstract:

Despite continuous improvement in risk management, many construction projects suffer from poor project management, especially international projects. The development of buildings in Iraq and the failure to apply modern methods of risk management, this has led to delays and weaknesses in the performance of international construction projects, which increases the failure rates of these projects. To develop a basic method of risk management for construction projects, an extensive study must be conducted on the risk factors that caused the failure or delay of international projects. This study aims to identify and assess risk factors in international construction projects in Iraq.

The research methodology was sequential in a mixed manner. The study began with collecting data on risk factors through an in-depth review of previous studies, then surveying the opinions of experts in the field of international construction projects by conducting an interview with eight experts to evaluate and validate the questionnaire. This was followed by questionnaires distributed to 40 a sample represented by 17 a consultant, 8 a contractor and 15 a site engineer to assess the risk factors.

The results showed that the highest risks affecting international companies in Iraq are project risks and economic risks, and the least affecting risks are environmental risks. According, conclusions were drawn along with a set of recommendations that show the main role of the Iraqi government in avoiding risks that negatively affect these projects.

Keywords: (project management, international company, risk factors).

استكشاف عوامل الخطر للشركات العالمية في مشاريع البناء العراقية

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الملخص:

على الرغم من التحسن المستمر في إدارة المخاطر ، إلا أن العديد من مشاريع البناء تعاني من سوء إدارة المشاريع ، وخاصة المشاريع الدولية. إن تطور المباني في العراق وعدم تطبيق الأساليب الحديثة في إدارة المخاطر أدى إلى تأخيرات وضعف في أداء مشاريع البناء الدولية مما يزيد من معدلات فشل هذه المشاريع. لتطوير طريقة أساسية لإدارة المخاطر لمشاريع البناء ، يجب إجراء

دراسة مكثفة حول عوامل الخطر التي تسببت في فشل أو تأخير المشاريع الدولية. تهدف هذه الدراسة إلى تحديد وتقييم عوامل الخطر في مشاريع البناء الدولية في العراق.

كانت منهجية البحث متسلسلة ومختلطة. بدأت الدراسة بجمع البيانات حول عوامل الخطر من خلال مراجعة متعمقة للدراسات السابقة ، ثم مسح آراء الخبراء في مجال مشاريع البناء الدولية من خلال إجراء مقابلة مع ثمانية خبراء لتقييم الاستبيان والتحقق من صحته. تبع ذلك استبيانات وزعت على ٤٠ عينة يمثلها ١٧ استشاري و ٨ مقاول و ١٥ مهندس موقع لتقييم عوامل الخطر.

وأظهرت النتائج أن المخاطر الأكبر التي تؤثر على الشركات العالمية في العراق هي مخاطر المشاريع والمخاطر الاقتصادية ، وأقلها تأثيراً هي المخاطر البيئية. واستناداً إلى ذلك ، تم استخلاص الاستنتاجات إلى جانب مجموعة من التوصيات التي توضح الدور الأساسي للحكومة العراقية في تجنب المخاطر التي تؤثر سلباً على هذه المشاريع.

الكلمات المفتاحية:(إدارة المشروع ، شركة دولية ، عوامل الخطر).

1. Introduction

Construction companies are able to achieve a high level of market competition by participating in international projects (Jang et al., 2019). Where the strength of competition for international construction companies increases the more they enjoy the advantages of a good relationship with the host country, employment, low costs and flexibility in work (Lee et al., 2011). Although there are attractive opportunities for international construction companies however, it faces many risks at the level of the company and the project (Utama et al., 2018). This study classified risk factors into nine categories are political risk, economic risk, social risk, contract risk, employer risk, location risk, technical risk, management risk, and partner risk (Jung & Han, 2017). Therefore, the presence of these risks negatively affects the performance of the international construction company in terms of project costs, schedule and quality of work, which leads to the failure of the executing company (Al-Sabah et al., 2014). A previous review of the literature shows that most studies dealt with projects implemented by companies from East Asia and Europe and the United States in the field of project risk management international construction. Only limited studies have been conducted from the West Asian side, specifically from Iraq (Howell, 2007). Thus, it is necessary to identify critical risk factors that affect the performance of international companies in Iraq.

2. Literature Review

The construction industry has become more complex due to the multiplicity of project partners and the diversity of their competencies and opinions, as well as the climatic and environmental conditions of the job site. Due to the current complexity of the competitive construction market, construction companies achieve a higher level of profitability and competition by expanding their business in international construction projects (Jang et al., 2019). Construction companies that carry out a project outside their home countries are known as international construction companies (Rahman et al., 2018). The success of these international projects may face many obstacles, challenges and risks, including financial, safety, contractual risks, and others (S. Q. Wang et al., 2004). In Nigeria delays in payment, poor project scope and inadequate design information is one of the most dangerous factors affecting the performance of international construction companies (Ibrahim et al., 2019). In fact, the presence of such risks leads to the failure of international companies at high rates compared to local companies (Ozorhon et al., 2007). So that studies have proven that there is a failure in developing countries by more than 50% in international construction projects and by 30% in developed countries (Beamish & Berdrow, 2003). So that the risk factors for international construction companies differ from one country to another, according to the political, economic, social and cultural situation of the country (Ammar et al., 2009). Among other risks identified to be high the impact on international construction projects are contractual relationships, resource availability and environmental conditions (Mahamid et al., 2015). Also, factors related to the client, consultant and contractor have been identified as risk factors by (Jarkas & Haupt, 2015). On the other hand, the construction industry in many countries suffers from a decline in identifying, evaluating and analyzing risks, as these risks are important because they have a significant impact on the time and cost of the project it is necessary to focus more on risk factors that pose a major threat to construction projects (Ugwoeri, 2012).

3. Objective of Research

This study set the following objectives:

1- Identification of the main risks and associated secondary risks as risk factors that affect the performance of international companies in Iraq.

2- Identifying the relatively critical risk factors for international companies in Iraq.

4. Methodology

The methodology of this research was implemented by applying the following steps:

4.1 Theoretical Study

Studying and analyzing previous literature to collect information about the risks of international projects, their causes and their impact on the project, and classifying them according to their sources. Therefore, this data has been collected from multiple sources such as books, articles, international conferences and all available resources on the internet. A matrix containing risk factors for international construction projects was designed and categorized into groups from previous studies.

4.2 A Field Study

At this stage, the need for experts appears to evaluate and review the matrix prepared by the researcher in the first stage related to the risk factors of international construction projects in Iraq derived from the theoretical side. This stage consists of two parts:

Part 1: Open questionnaire

The Iraqi Ministry of Planning was visited and semi-structured interviews were prepared with eight experts of officials of engineering departments and departments in the Government Sectors Department and the Government Contracts Department within the scope of project management in Iraq.

These interviews have an effective role in discussing the risks in international construction projects in Iraq, and in evaluating and making some modifications to the matrix prepared by the researcher in the previous stage.

Part 2: Close questionnaire

This phase includes a quantitative approach to determine the weight of the determinants using respondents survey through questionnaire.

5. Research Findings and Results

5.1 Literature analysis

A matrix containing risk factors for international construction projects was designed and classified into groups from previous studies, as 25 factors were collected and classified into 6 main groups as shown in Table 1.

Table.1 Matrix of risk factors affecting international construction projects for each group

No.	Groups	Factors	Sources
1	Environmental Risk	-Weather conditions. -Natural disasters. -Environmental protection.	(Al-Sabah et al., 2014), (Ibrahim et al., 2019), (Altoryman, 2014), (Bajwa & Syed, 2020), (Kerur & Marshall, 2012), (Abd El Khalek et al., 2017), (Cao, 2020), (Martin et al., 2018), (McIntosh & McCabe, 2003), (Bu-Qammaz et al., 2009), (Bahamid et al., 2019)
2	Sociocultural Risk	-Religious, ethnic, and tribal conflicts. -Influence of language differences.	(Al-Sabah et al., 2014), (Liu et al., 2016), (Bajwa & Syed, 2020), (Kerur & Marshall, 2012), (Jin et al., 2021), (Tao et al., 2012), (Ullah et al., 2019), (Du Toit, 2013), (Chang et al., 2019), (Abd El Khalek et al., 2017), (Chang et al., 2018), (Deng & Low, 2014), (Annett, 2001), (Ashley & Bonner, 1987), (Cao, 2020), (Birgonul & Dikmen, 2001), (Zhi, 1995), (McIntosh & McCabe, 2003), (Bu-Qammaz et al., 2009), (Bahamid et al., 2019)
3	Economical Risk	- Inflation. - Frequent currency fluctuation. - Oil price fluctuations. - Client's ability to meet financial requirements.	(Viswanathan & Jha, 2020), (Jung & Han, 2017), (Al-Sabah et al., 2014), (Ahiaga-Dagbui et al., 2011), (Ibrahim et al., 2019), (Bajwa & Syed, 2020), (Kerur & Marshall, 2012), (Jin et al., 2021), (D. Wang, 2013), (Chang et al., 2019), (Abd El Khalek et al., 2017), (Hastak & Shaked, 2000), (Chang et al., 2018), (Ashley & Bonner, 1987), (Cao, 2020), (Birgonul & Dikmen, 2001), (Zhi, 1995), (Lozano-Torró et al., 2019), (McIntosh & McCabe, 2003), (Bu-Qammaz et al., 2009), (Bahamid et al., 2019)
4	Political Risk	- War threat. - Increased influence of	(Jung & Han, 2017), (Dandage et al., 2018), (Viswanathan & Jha, 2020), (Al-Sabah et al.,

		terrorism and antisocial elements. - Changes in Government. - Civil disorders. - Poor foreign relations of the state. - Government permits. - Changes in regulations.	2014), (Ahiaga-Dagbui et al., 2011), (Ibrahim et al., 2019), (Bajwa & Syed, 2020), (Kerur & Marshall, 2012), (Jin et al., 2021), (Asare et al., 2015), (Ullah et al., 2019), (D. Wang, 2013), (Chang et al., 2019), (Abd El Khalek et al., 2017), (Hastak & Shaked, 2000), (Ling & Hoang, 2010), (Chang et al., 2018), (Cao, 2020), (Birgonul & Dikmen, 2001), (Zhi, 1995), (McIntosh & McCabe, 2003), (Bu-Qammaz et al., 2009), (Bahamid et al., 2019)
5	Project Risk	- Improper cost estimation. - Change orders. - Weakness in the decision-making process. - Difficulty to access the site. - Inexperienced design team. - Inaccuracy in the project schedule. - Non-availability of quality labor, materials, equipment.	(Viswanathan & Jha, 2020), (Jung & Han, 2017), (Ibrahim et al., 2019), (Chang et al., 2019), (Cao, 2020), (Bahamid et al., 2019), (Liu et al., 2016), (Al-Sabah et al., 2014), (Liu et al., 2016), (Ahiaga-Dagbui et al., 2011), (Altoryman, 2014), (Bajwa & Syed, 2020) , (Abd El Khalek et al., 2017), (Hastak & Shaked, 2000), (Martin et al., 2018), (Birgonul & Dikmen, 2001), (Zhi, 1995), (Lozano-Torró et al., 2019), (McIntosh & McCabe, 2003), (Bu-Qammaz et al., 2009), (Bahamid et al., 2019).
6	Level of Competition Risk	- Policies of the contractor. - Number of bidders/increasing competition.	(Ibrahim et al., 2019), (Liu et al., 2016), (Hastak & Shaked, 2000), (Chang et al., 2018), (Lozano-Torró et al., 2019), (McIntosh & McCabe, 2003), (Bahamid et al., 2019)

5.2 Questionnaire Survey

The questionnaire was designed in an understandable way to be answered by the respondents very easily, and it consists of two main axes, the first is related to the personal information of the respondents, and the second contains the risks of international construction projects in Iraq. 50 questionnaires were distributed to the targeted research sample, and 40 questionnaires divided into five categories were returned as shown in Table (2).

Table.2 Respondent's category list.

Class of respondents	Number of respondents	Per cent
Director general	3	7.5
Director of the Department	7	17.5
Division Officer	6	15
project manager	9	22.5
Site engineer	15	37.5
Total	40	100

The response rate was 96.4%, which is a valid indicator for statistical analysis purposes. This large percentage reflects the respondents' active interest in the risks of international projects in Iraq. Thus, the results of the sample can be generalized to the research community because it is an integral part of the construction industry workers and influencers. Figures (1) to (4) show the details of the target sample: the number of years of experience in the construction industry, type of work sector, academic degree, and competencies.

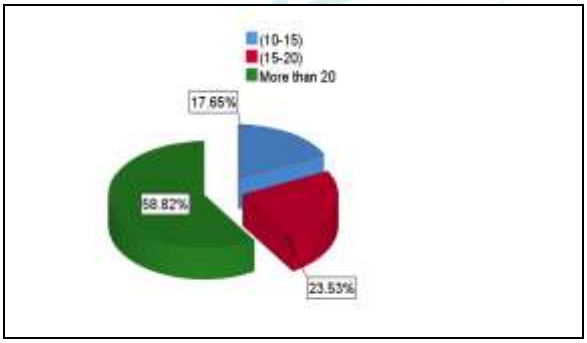

Figure (1): Percentage for years of work experience for respondents.

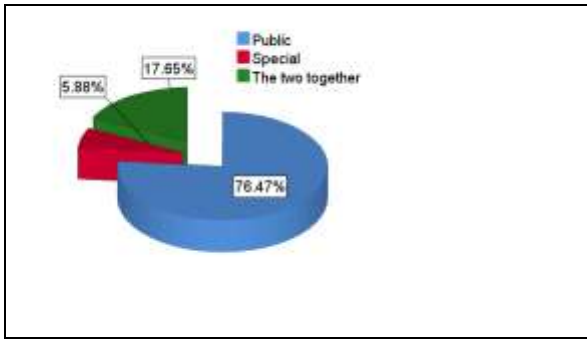

Figure (2): Percentage for working sector respondents.

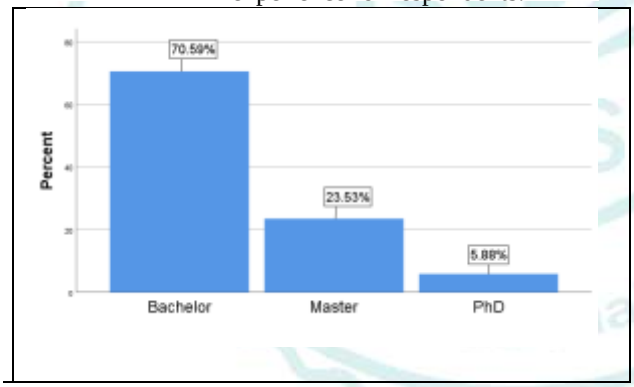

Figure (3): Percentage for the academic degree of respondents.

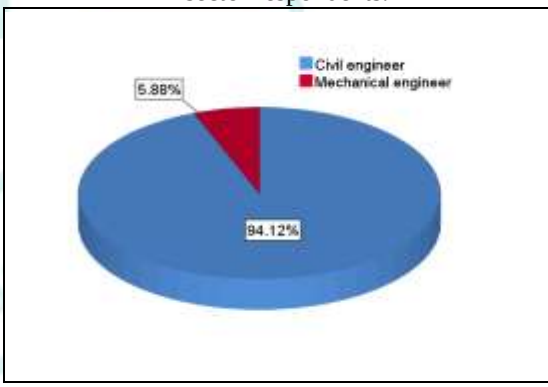

Figure (4): Percentage for respondents competencies.

5.3 The Risk Factors of the International Iraqi Companies

This section shows 6 major groups of risks for international projects in Iraq and each group contains a number of secondary risk factors. After examining the opinions of the respondents, their results were analyzed and drawn. These results include the relative importance index (RII), the mean, and the standard deviation. One of the methods used in data analysis is RII and the aim of its use is to provide a rank for each item in a specific part of the

questionnaire. The (RII) was determined for each factor and ranked from highest to lowest.

$$RII = \Sigma W / (A * N) \quad \text{.....Eq. (1), (Rajgor et al., 2016)}$$

where:

W: The weight given by respondents for each factor (ranging from 1 to 5).
A: Represents the highest weight (which equals 5).
N: Represents the total number of respondents.
RII rated to levels as shown in table (3):

Table.3 Importance level (Akadiri, 2011).

RII	**Importance level**	
0.8 < RII ≤ 1	High	H
0.6 < RII ≤ 0.8	High-Medium	H-M
0.4 < RII ≤ 0.6	Medium	M
0..2 < RII ≤ 0.4	Medium-Low	M-L
0 < RII ≤ 0.2	Low	L

5.3.1 Main Factors Analysis

Table 4 shows the main risk factors in international construction projects in Iraq based on the responses of the respondents. A test was conducted to ensure the validity of the questionnaire responses and the consistency of the answers, and it showed a very good value of (0.0179).

Analysis of the results revealed that the project risks were the most important and ranked first with (RII = 0.833), followed by economic risks with (RII = 0.826), while in the third place were political risks with (RII = 0.749), followed by the level of competition risk with (RII =0.741) then sociocultural risks with (RII =0.738), and got on the last place environmental risks with (RII =0.690).

Table.4 Rank of The Main Factors Depending on RII, Mean, and SD.

Rank	**The main factors**	**Mean**	**SD**	**RII**
1	Project Risk	4.02	0.897	0.833
2	Economical Risk	4.01	0.750	0.826
3	Political Risk	3.90	0.819	0.749
4	Level of Competition Risk	3.88	0.976	0.741
5	Sociocultural Risk	3.69	0.931	0.738
6	Environmental Risk	2.99	0.906	0.690

5.3.2 Sub- Factors Analysis

Project Risk

Table 5 shows the priorities of project risk sub-factors based on respondents' responses, the project risk category has been divided into seven sub-factors**.** It was noted that change orders were the most important factor with (RII = 0.856), The inexperienced design team was second place with (RII = 0.849), then came the improper cost estimation in third place with (RII = 0.845), followed by inaccuracy in the project schedule with (RII = 0.841) in the fourth place, and in the fifth place was the non-availability of quality labor, materials, equipment with (RII = 0.830), while in the sixth place was the difficulty in access the site with (RII = 0.811), and weakness in decision-making took the last place with (RII = 0.800).

Table.5 Rank of The Project Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Change orders	4.25	0.853	0.856
2	Inexperienced design team	4.23	0.776	0.849
3	Improper cost estimation	4.11	1.038	0.845
4	Inaccuracy in the project schedule	4.00	0.962	0.841
5	Non-availability of quality labor, materials, equipment	3.90	0.720	0.830
6	Difficulty to access the site	3.90	0.800	0.811
7	Weakness in the decision-making	3.77	1.133	0.800

Economical Risk

The current study divided economic risks into four sub-factors. The study showed that the most dangerous of them for international companies in Iraq is the client’s ability to meet the financial requirements with (RII= 0.841), and that the frequent currency fluctuation occurred in the second place with (RII= 0.830), followed by the third rank is the fluctuation in oil prices with (RII= 0.822) which indicates the instability of the financial market in the country and also leads to inflation, which occurred in the fourth place with (RII= 0.811) through the results shown in Table 6.

Table.6 Rank of The Economical Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Client's ability to meet financial requirements	4.21	0.717	0.841
2	Frequent currency fluctuation	4.15	0.818	0.830
3	Oil price fluctuations	3.90	0.800	0.822
4	Inflation	3.77	0.663	0.811

Political Risk

Table 7 shows that political risks were divided into seven sequential sub-factors, according to the importance of the risk, from highest to lowest, based on the opinions of the respondents. In this study, the most dangerous political factor influencing is the changes in government with (RII= 0.856), And increased influence of terrorism and antisocial elements in Iraq was in the second place with (RII= 0.818), As for the changes in the regulations ranked in the third with(RII= 0.762) and the poor foreign relations of the state led to it being one of the risk factors for international companies in Iraq, as it ranked fourth with (RII= 0.739) as well as the demonstrations that led to civil disorders were a threat to international companies as it ranked fifth with (RII= 0.732), followed by war threats in the penultimate position with (RII= 0.683), while government permits were ranked seventh, according to the classification of this study with (RII= 0.656).

Table.7 Rank of The Political Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Changes in Government	4.28	0.690	0.856
2	Increased influence of terrorism and antisocial elements	4.09	0.815	0.818
3	Changes in regulations	4.02	0.982	0.762
4	Poor foreign relations of the state	3.81	0.992	0.739
5	Civil disorders	3.72	1.091	0.732
6	War threat	3.70	1.133	0.683
7	Government permits	3.66	0.720	0.656

Level of Competition Risk

The study showed that the risks of the level of competition between international companies in Iraq are affected by two important factors in the first place. The contractor's policy was the most dangerous, followed by the number of bidders/increasing competition by the importance of (RII= 0.754) (RII= 0.728) respectively, as shown in Table 8.

Table.8 Rank of The Level of Competition Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Policies of the contractor	4.09	0.818	0.754
2	Number of bidders/increasing competition	3.66	1.133	0.728

Sociocultural Risk

Table 9 shows that there are two factors that affect cultural risks at the level of international construction projects, where it was normal for the influence of language differences factor to get first place with (RII= 0.747), so most of the previous studies in this field confirmed this, but in the second place was religious, ethnic, and tribal conflicts factor with (RII= 0.728)

Table.9 Rank of The Sociocultural Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Influence of language differences	3.74	0.880	0.747
2	Religious, ethnic, and tribal conflicts	3.64	0.982	0.728

Environmental Risk

The impact of environmental risks is important on construction projects, so this study divided it into three sub-factors. The environmental protection factor had the greatest importance with (RII= 0.732), and in the second place the fluctuating weather conditions in Iraq with (RII= 0.683), while the factor with the least impact was natural disasters with (RII= 0.656) as shown in Table 10

Table.10 Rank of The Environmental Risk Sub-Factors Depending on RII, Mean, and SD.

Rank	The Sub- Factors	Mean	SD	RII
1	Environmental protection	3.60	1.025	0.732
2	Weather conditions	3.28	0.972	0.683
3	Natural disasters	2.09	0.720	0.656

6. Conclusions and Recommendations

The delay of international companies in Iraq is the lack of a real risk management system. The results of the current study showed that among the group of six risk factors for international construction projects in Iraq, project risks were the most critical risk factors, followed by economic risks in second place, and this is consistent with the study (Viswanathan & Jha, 2020) and that 12 sub-factors obtained a high relative risk rate out of a total of 25 sub-factors, in addition to the fact that the most serious reason in most of these projects is the factor of change orders that are consistent with the study (Ibraheem & Mahjoob, 2022), as well as the factor of changes in the government also consistent with the study (Howell, 2007).

Based on the results of the study, the following recommendations were drawn:

- The Iraqi government must impose a risk management approach on international companies.
- Raising the skills of senior management to prepare the necessary plans for managing the risks of international contracting companies, through the provision of training courses and the necessary programs.
- Develop strategic plans to determine the requirements for the level of competition between international companies.

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