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RISK MANAGEMENT FOR INTERNATIONAL
CONSTRUCTION JOINT VENTURES - CASE STUDIES OF
VIETNAMESE CONTRACTORS

Mr. Sy Tien Do

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Engineering Program in Civil Engineering

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ปัจจุบันประเทศเวียดนามเป็นหนึ่งในประเทศภูมิภาคเอเชียตะวันออกเฉียงใต้ที่มีการขยายตัวของอุตสาหกรรม
 การก่อสร้างในระดับสูง บริษัทที่ดำเนินธุรกิจก่อสร้างต่างชาติจึงให้ความสำคัญในการร่วมมือกับบริษัทก่อสร้างท้องถิ่น
 โดยเป็นความสัมพันธ์ในรูปแบบกิจการร่วมค้างานก่อสร้าง (International construction joint ventures หรือ ICJVs) ซึ่งเป็น
 รูปแบบที่ถูกใช้อย่างแพร่หลายในอุตสาหกรรมก่อสร้างทั่วโลก เนื่องจากผู้รับจ้างต่างชาติสามารถแบ่งปันประสบการณ์
 และทรัพยากรให้กับผู้รับจ้างท้องถิ่นซึ่งมีความเข้าใจในวัฒนธรรม การเมือง และกฎหมายภายในประเทศ แม้ว่าจะเป็น
 รูปแบบธุรกิจที่ถูกใช้อย่างแพร่หลาย แต่ผู้รับจ้างยังมีความเสี่ยงค่อนข้างมากในการดำเนินธุรกิจให้ประสบความสำเร็จ การ
 บริหารกิจการร่วมค้าในเวียดนามที่มีความเสี่ยงสูงทั้งสาเหตุจากปัจจัยภายในและปัจจัยภายนอก เช่น ความไม่แน่นอนทาง
 เศรษฐกิจ ซึ่ความสามารถในการบริหารของผู้รับจ้าง และความแตกต่างของวัฒนธรรม ดังนั้นงานวิจัยนี้เสนอ
 กระบวนการจัดการความเสี่ยงซึ่งมีผลกระทบต่อโครงการในสามช่วงระยะเวลาโครงการในประเทศเวียดนาม โดยการระบุ
 ประเมิน และตอบสนองความเสี่ยงสำหรับโครงการกิจการร่วมค้า เพื่อเพิ่มความเชื่อมั่นในการจัดการความเสี่ยงของผู้
 รับจ้างต่างชาติและมีการจัดการความเสี่ยงอย่างเป็นระบบ ตลอดจนสามารถพัฒนาแนวทางจัดการความเสี่ยงสำหรับกิจการ
 ร่วมค้าในเวียดนามได้ ผลการสำรวจจากแบบสอบถามและการสัมภาษณ์เชิงลึกจากผู้เชี่ยวชาญในกิจการร่วมค้า 15 ท่าน
 ผู้วิจัยสามารถระบุปัจจัยเสี่ยงได้ 47 ปัจจัยซึ่งจำแนกได้เป็น 3 กลุ่ม จากนั้นจึงประเมินระดับของโอกาสการเกิดและระดับ
 ความรุนแรงของปัจจัยเสี่ยงโดยวิธี PI พบปัจจัยเสี่ยงวิกฤตในแต่ละช่วงระยะเวลาโครงการ ตัวอย่างเช่น ช่วงเริ่มโครงการ
 ประกอบด้วย ปัจจัยเสี่ยงด้านบริษัทที่ร่วมธุรกิจ ทักษะด้านการเงิน ปัญหาด้านเศรษฐกิจ ปัญหาด้านการบริหาร และ
 ปัญหาด้านสังคม ขณะที่ปัจจัยเสี่ยงด้านการเงิน การบริหาร และเศรษฐกิจเป็นปัจจัยเสี่ยงวิกฤตตลอดช่วงระยะเวลา
 โครงการ โดยพิจารณาผลกระทบของปัจจัยเสี่ยงทางด้านต้นทุน ระยะเวลา ขอบเขต และคุณภาพ ส่วนปัจจัยเสี่ยงที่ส่งผล
 กระทบรุนแรงต่อเป้าหมายของโครงการได้แก่ ปัจจัยเสี่ยงด้านการเงิน ด้านสัญญาของผู้ร่วมกิจการ ด้านความต้องการของ
 เจ้าของโครงการ ด้านผู้รับจ้างช่วงและผู้จัดหาวัสดุ ด้านกลุ่มผู้บริหารโครงการ และด้านเหตุสุดวิสัย นอกจากนี้ผู้วิจัยได้
 สำรวจมาตรการตอบสนองความเสี่ยงของผู้รับจ้างเวียดนามด้วยการสัมภาษณ์เชิงลึก พบว่า มาตรการตอบสนองความเสี่ยง
 ที่นิยมใช้ได้แก่ การลดความเสี่ยง ขณะที่มาตรการถ่ายโอนความเสี่ยงและการยอมรับความเสี่ยงเป็นมาตรการที่ไม่นิยมใช้
 ส่วนมาตรการหลีกเลี่ยงความเสี่ยงเป็นมาตรการสุดท้ายที่จะถูกเลือกใช้ ผลการวิจัยจะเป็นแนวทางการวางแผนมาตรการ
 ตอบสนองความเสี่ยงในโครงการ โดยการพัฒนาผลดังกล่าวเป็นแนวทางจัดการความเสี่ยง งานวิจัยนี้สามารถใช้เป็น
 แนวทางสำหรับกิจการร่วมค้า ผู้รับจ้างท้องถิ่น และผู้รับจ้างต่างชาติในการวางแผนและการดำเนินโครงการในกิจการร่วม
 ค้าในเวียดนามให้ประสบผลสำเร็จได้

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Vietnam is a Southeast Asian country with a great expansion of the construction industry in recent years. To enter the local market, several international construction companies have been cooperating with local partners in the form of international construction joint ventures (ICJVs). This business form has been adopted in the construction industries worldwide because foreign contractors can share their work experiences and resources with local contractors that understand cultural, political, and legal factors in their countries well. In spite of its numerous merits, it is highly risky for all contractors to implement this business scheme. Managing ICJVs in Vietnam is extremely risky due to several internal and external factors such as unstable economy, limited managerial skills of Vietnamese contractors, and cultural difference of the partners. To manage such risks, most local contractors rely solely on their professional experience, rather than implementing systematic risk management. This research presents an application of risk management to identify, assess, and respond to risk factors affecting three performance stages of ICJV projects in Vietnam. The results were then used to establish the risk profile of the implementation of ICJVs in Vietnam. The questionnaire surveys and in-depth interviews were used to gather information from 15 respondents, who are experienced in ICJV projects. Forty-seven risk factors affecting the performance of ICJVs were identified and categorized into three risk groups. The probability and impact of such risks were assessed by using the PI method. The critical risk factors in different stages of ICJV projects were then identified. For example, the startup stage of ICJV projects encompasses such critical risk factors as the partners' parent companies, financial aspects of ICJV, economic problems, management issues, and social problems. The financial, management, and economic issues are the critical risk factors throughout the three stages of ICJV. The impacts of the risk factors on cost, schedule, scope, and quality were addressed. Financial problems, breach of contracts by ICJV partner, excessive demands by clients, subcontractors/suppliers, project management team, and force majeure issues contribute to significant impact on multiple objectives of ICJV projects. The risk-response measures implemented by Vietnamese contractors in ICJV projects were collected by in-depth interviews. The most common risk response measure was risk mitigation, whereas risk transfer and risk retention were not favorable alternatives. Risk avoidance was considered the last option to cope with these risk factors. These results were summarized to propose the risk response strategies of ICJVs in Vietnam. By integrating all the previous results, the risk profile for ICJV projects in Vietnam was developed. The findings in this research can be used to assist ICJVs, local contractors, and foreign contractors in planning and implementing ICJVs in Vietnam successfully.

Department : Civil Engineering Student's Signature

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CHAPTER 1

INTRODUCTION

1.1 Background

After Vietnam joined the World Trade Organization (WTO) on November 7, 2006, foreign investment capital in Vietnam has increased continuously. In spite of the adverse impact of world economic recession in 2008, Vietnam still attracts foreign direct investment (FDI). The amount of investment reached some 65 billion dollars in 2008. Due to the global economic downturn, the number of FDI in 2009 was only by one third of that in 2008, as shown in Figure 1-1. However, the FDI disbursement reached about 10 billion or 87% over the same period in 2008 (Vietnam General Statistics Office, 2009). Based on the sectors, the FDI invested in the construction sector was in the third rank, as shown in Table 1-1. As a result, construction has become an important section in the country development. The FDI in construction is growing to create the preconditions for economic and social development. However, most of the local contractors are inexperienced, have weak managerial skills, and lack funds. Therefore, most large projects, including foreign direct investment projects and official development assistance (ODA) projects, have strived for international joint venture contractors or the foreign contractors.

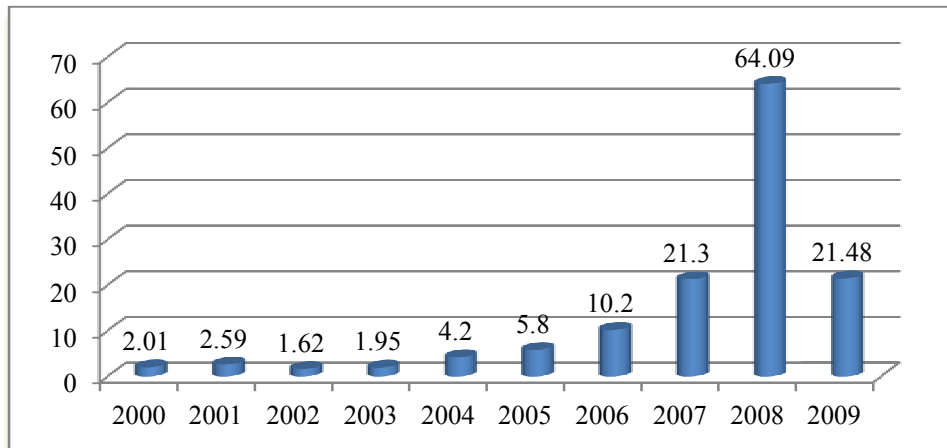


Figure 1-1 Total foreign investment capital in Vietnam
(Vietnam General Statistics Office, 2009)

Table 1-1 Direct investment by foreigners for different areas of investment
(The first five months in 2009) (Vietnam General Statistics Office 2009)

No.	Areas of investment	A number of new investing projects	New registered capital (million USD)	A number of projects increasing capital	Increasing registered capital (million USD)	Total registered capital (million USD)
1	Accommodation and Catering Services	16	665.99	2	3,804.05	4,470.04
2	Real Estate Business	19	1,447.29	1	0.00	1,447.29
3	Construction	29	231.05	6	48.51	279.56
4	Manufacturing and Processing Industries	50	152.92	19	82.55	235.48
5	Wholesale; Repair	37	104.76	3	9.93	114.69
6	Electricity, gas, water and air condition production	1	36.00			36.00
7	Agriculture, forestry, fishery production	5	28.88			28.88
8	Other services	10	10.19	1	2.00	12.19
9	Information and communication	38	8.47	3	3.46	11.94
10	Mining industry	1	10.00			10.00
11	Professional Contract, Science and Technology	36	9.23	2	0.34	9.57
12	Water supply, Waste treatment	2	7.80			7.80
13	Transportation, Storage	6	1.33	2	5.13	6.46
14	Arts and Entertainment	3	6.32			6.32
15	Education and Training	1	2.50	1	0.40	2.90
16	Health and social assistance	1	1.00			1.00
17	Finance, Banking, Insurance	1	0.02			0.02
	Total	256	2,723.77	40	3,956.38	6,680.15

Joint venture contractors can undertake not only foreign capital projects but also any construction projects in Vietnam if the contracts allow so. Foreign contractors have contributed to the success of several large and complex construction projects in which local contractors cannot undertake. Even though the JV is an attractive option for international construction joint ventures, it is extremely risky because of lack of overseas environmental information and construction experience of foreign contractors, as well as lack of the cooperation of the partners.

As can be seen, similar construction projects may have different risk characteristics in different regions. Due to different causes such as inflation, exchange rate (Bing et al., 1999; Shen et al., 2001; and Zhi, 1995), as well as the difference of design standard, social, culture, and religious, cash - flow problems of the client (Bing et al., 1999), these risks may affect largely the construction process.

Thus, it is very important to comprehend the risk profile of the international construction joint venture in Vietnam. This understanding will allow us to identify, analyze, assess, and suggest the risk management strategy for foreign contractors, and local contractors of international construction joint ventures (ICJVs) in Vietnam.

1.2 Problem statement

Construction risks are often encountered throughout the life cycle of construction projects, especially in developing countries (Sameh, 2007; Long et al., 2004). Project risks, if occur, can affect various objectives of the project such as scope, schedule, cost, and quality (PMBOK, 2000). Thus, construction projects need to develop appropriate risk management plans that can forecast potential project risks and provide appropriate response plans.

In Vietnam, international construction companies often enter local markets by forming joint ventures (JVs) with local partners. This form of cooperation is very popular in several developing countries because foreign contractors are more experienced and possess more resources, whereas local contractors understand cultural, political, and legal factors in their countries better. Even though the JV is an attractive option for international construction business management, it is also extremely risky due to the size, complexity, and multifaceted operations of JV projects (Bing et al., 1999; Shen et al., 2001; Andrew et al., 2000). Thus, it is necessary for JV contractors to comprehend the relevant risk factors throughout the project life cycle.

The term JV has a variety of meanings in different industries. JVs can be referred to a very general form of alliance, but sometimes to a more specific type of alliance, that involves the formation of a new entity (Ho et al., 2009). According to Covency et al. (2003), JVs are host or international enterprises involving two or more companies joining in short term to carry out a particular project. Thus, construction joint ventures

(CJVs) can be referred to the cooperation of business entities to implement projects related to construction, including designer, contractor, supplier, and consultant companies. If a CJV has at least one international firm as its partners and at least one local firm, it can be called international construction joint venture (ICJV).

Many JVs failed to achieve the objectives that they established (Geringer and Hebert, 1991). The number of unsuccessful JVs was quite high - more than 50% of JV companies in developing countries (Beamish, 1993). This is because the business environment of JV encompasses many participants, activities, and processes, as well as complex organization and environment. Risk management is therefore a necessary tool for JV administration. Risk management is a formal and orderly process for systematically identifying, analyzing, and responding to risks throughout the life cycle of a project to achieve the optimum degree of risk elimination, mitigation, and control (Wang et al., 2004). Understanding and managing risk factors appropriately can help JVs successful in construction.

The early studies concerning in JVs (e.g., Ding, 1996 and Swierczek, 1994) concentrated on a single risk factor. Many studies classified their sources, including internal, external, project-specific risk factors (Bing et al., 1999; Bing and Robert, 1999; Adnan, 2008), and risk in different phases of the projects, which helps project managers understand the negative influence of risk factors during JV development and manage JVs effectively (Bing et al., 1999 and Andrew et al., 2000). These research works focused on the CJV contractors. Bing et al. (1999) defined 25 risk factors through the survey questionnaire, there were five critical risk factors that affected the ICJV contractors significantly such as (1) client's cash flow problems; (2) partner's parent company in financial problems; (3) inconsistency in government policies, laws, and regulations; (4) economy fluctuation; and (5) poor relationship. A foreign construction company can minimize its risk impact by selecting its local partner carefully; choosing right staff and subcontractors; ensuring the drafted good JV agreement; as well as establishing good relationship and securing a fair construction contract with clients.

Shen et al. (2001) categorized 58 risk factors in CJVs into six main groups: financial risk, legal risk, management risk, market risk, policy and political risk, and technical risk. Based on their survey, the ten most critical consist of five management risks, two policy risks, two market risks, and one technical risk. They also provided some practical examples for managing risks in CJVs in China, such as cooperation with government offices, proper risk allocation in contract, and controlling technical risk. Previous research focused on analyzing the risk factors as well as the policy to managing these risk factors, but few mentions about the source and the effect of risk events in performance of CJVs.

The risk factors associated with the JV operations influenced the success of JVs (Andrew et al., 2000) and can be used to predict the performance of ICJVs (Ozorhon

et al., 2007). According to Andrew et al. (2000), 24 critical success factors for the operation of JVs are related to four phases of project: (1) Pre-planning (six risk factors), (2) Partner selection (seven risk factors), (3) Negotiation and policy agreement (six risk factors), and (4) Implementation (five risk factors). Based on their survey, the most critical factors in each implementation stage were identified. Gale and Luo (2004) investigated 160 JVs located in the four cities and provinces of China to find out the critical factors affected the success of JVs at the formation stage. By comparing the perceptions and attitudes of Chinese and foreign executives, five key factors to the success of JVs were identified, including selection of a suitable partner, unambiguous statement of JV agreement, sufficient information about potential partners before negotiation, clear identification of partner's objectives and control of the majority ownership of the capital. From this study, it can be concluded that the foreign contractors in CJVs in China were most concerned about suitable cultural, whereas the Chinese contractors expected a long-term cooperation through forming JVs, rather than the short-term profits. The issues of different cultural are one of significant problems that need attention by CJVs. The CJV partners should have an understanding of cultural norms to build a cultural cooperation and provide a suitable common management method for CJVs (Norwood, 1999; Gale and Luo, 2004).

In Vietnam, ICJVs operating in the construction sector is quite common, but a limited number of research works investigated the risks related to the ICJVs. Furthermore, the risk management in ICJVs is mostly spontaneous and non-systematic, except for foreign companies. The systematic identification, classification, and response evaluation of risk factors in the process of the CJV implementation is necessary to enhance the performance of both international and local partners.

1.3 Research objectives

The main objectives of this research are:

- (1) To identify the risk affecting the implementation of International Construction Joint Ventures (ICJVs) in Vietnam
- (2) To assess the risk significant indexes of major risks of the ICJVs in Vietnam
- (3) To establish the risk profile of the ICJVs in Vietnam

1.4 Scope of the research

This research investigates the ICJVs in Vietnam that consist of at least one Vietnamese partner by focusing on the local Vietnamese contractors. The survey and interview respondents are as follows.

- (1) The survey focused on the Vietnamese contractors that were or are JV partners with foreign contractors, including Japanese, Korean, Taiwanese, and so on.

(2) The in-depth interview with respondents from four companies:

- Vinata International JV Co., Ltd
- Construction Joint Venture Phu My Hung Co., Ltd
- Daewon – Thu Duc Joint Venture Co., Ltd
- Hung Duc Construction and Design Consultant Company

1.5 Research methodology

The investigation of the risk management process of ICJVs in Vietnam is based on the principles of risk management process by the Australian and New Zealand Standard AS/NZS 4360:2004. Figure 1-2 illustrates the proposed methodology in this research. The first row shows the organizations, the risk of which is investigated, which were adopted form that of ICJVs in Vietnam. The second row shows four typical phases of risk management: (1) risk identification, (2) risk assessment, (3) risk response, and (4) risk profile. The third row shows the methodology of the risk management process, which is to identify the risks by Hierarchical Risk Breakdown Structure (HRBS), to analyze the risks using the PI methods suggested by Dale et al. (2004) (this method will be explained more clearly in Chapter 3), to respond the risks using risk response strategy, and to establish the risk profile through Delphi technique.

The research methodology consists of seven steps as follows.

(1) Do literature review

The first step is to review relevant knowledge from academic journals, textbooks, reports, and websites by focusing on the following issues:

- Fundamental concepts of risk, risk management in construction, and risk management process research
- Definitions of JV and risks related to JVs
- Risk management models of ICJVs

(2) Collect data

The second step is to collect all data affecting ICJVs using data collection tools such as questionnaire and interview. Selecting Vietnam contractors, relevant projects, and respondents in ICJVs is very important. The data collection consists of three phases:

1) First phase: pilot interviews were used for collecting the risk factors affecting ICJVs in Vietnam and questionnaire surveys were used for preliminary assessing the probability and impact of risk factors.

2) Second phase: Large-scale questionnaire surveys were used for identifying and analyzing the probability and impact of risk factors and in-depth interviews were used for collecting risk response measures.

3) Third phase: Questionnaire surveys were used for verifying the risk response measures affecting ICJVs. Finally, risk profile was established.

Based on this information, we can understand the current status of ICJVs in Vietnam.

(3) Identify risks

This step is to identify the risks affecting ICJVs in Vietnam. Based on the data collected previously, we then identified the ICJV risks, including risk groups, risk categories, and risk factors through HRBS. After the risks were arranged based on the activities of ICJVs from startup to dismantle, the accuracy and suitability of the risks would be verified by questionnaires and interview.

(4) Analyze risks

The probability and impact method (PI method) is applied to qualitatively rank the affecting the risks (Dale et al., 2004). The critical risks are identified according to their ranking values.

(5) Respond to risks

While analyzing the data provided by the respondents, it is important to comprehend their point views about how to respond the risks. Furthermore, the patterns and the conceptions of risk response of ICJVs in Vietnam are established. The adverse consequence of the risks is controlled by selecting the appropriate risk mitigation strategy. The risk response measures in this research include: (1) mitigation, (2) transfer, (3) retention, and (4) avoidance.

(6) Develop the risk profile

Risk profile of ICJV projects is to develop a simple spreadsheet file that includes all of findings of this research. It was developed by Microsoft excels worksheet. Risk profile contain six worksheets, such as 1) risk code, 2) risk factor, 3) risk source-effect, 4) risk assessment, 5) risk response measures, 6) risk response methods. Finally, this risk profile can be used as a guideline to project organizations of ICJV projects in Vietnam as well as in other developing country.

(7) Verify and validate

Through validation questionnaire, the respondents verify the risk response measures of this research. The risk response measures are presented to the group to get feedbacks and ideas. Finally, the final risk profile is established.

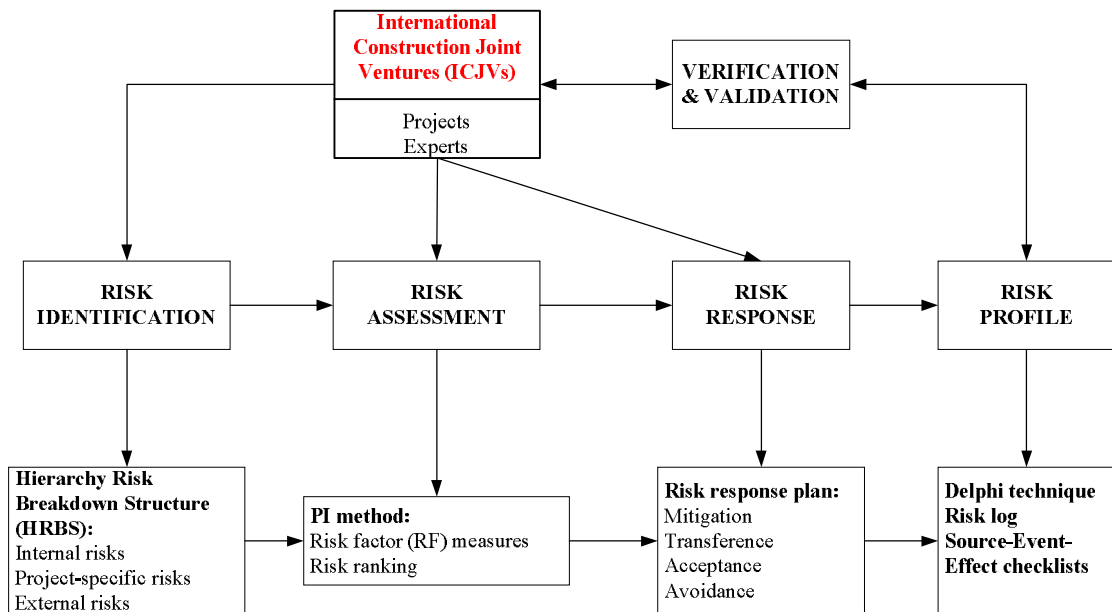


Figure 1-2 Proposed risk management process of international construction joint ventures (ICJVs)

1.6 Outcomes

The main results from this research are the critical risk factors of the ICJVs in Vietnam on the previous and current projects. In other words, this research tries to investigate risk management of ICJV from the information provided by Vietnamese contractors who worked in the past or have been working in ICJV projects. It also analyzes such risks to learn the risks major reason of ICJVs in Vietnam. Finally, the risk profile is established. The risk profile is the explosion of risk log or risk register that list all identified risks, risk assessment, risk response plan, and show the source-effect of risk factors by analyzing the causal relationships among risk variables and by constructing risk paths.

1.7 Contributions

The contributions of this research are as follows.

- (1) This research can help local contractors to identify the risks when forming JVs with foreign contractors. The local contractors can realize weakness and strength to compete with other contractors or the ICJV contractors. Finally, they can learn from the experience of risk management of foreign contractors.
- (2) Foreign contractors can manage the effectiveness of risks in the performance process of ICJVs in Vietnam, and have a suitable risk management when working with Vietnamese contractors.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews literature concerning risk management in construction. The first part discusses research works on risk management in construction and risk management techniques. The second part reviews definitions of joint venture (JV), and risk in JV. The third part focuses on risk management for the international construction joint ventures (ICJVs).

2.1 Overview of risk management

2.1.1 Risk

Risk can be divided into two major schools.

(1) Negative school

Risk is defined as the possibility of unlucky, loss, harm, or injury. In this school, the definitions of risks are as follows.

- Risk, an undesirable event, was normally used as a synonym for “hazard”, “danger” or “threat”.
- Risk is the loss injury or other outcome resulting from an event.

Thus, the traditional definition of risk is the possibility of damage, loss, or factor related to danger, uncertainty, or difficulty.

(2) Positive school

According to this school, the definitions of risk are as follows.

- Risks are the possibility of damage, loss, or other adverse or injury circumstance; a chance or situation involving such a possibility”. (The Oxford English Dictionary)
- Risks can have outcomes, which are more or less favorable than expected. Risks can be referred to as “upside” and “downside” risk, respectively (ICE, 2005).
- Risk is the “effect of uncertainty on objectives”. Furthermore, uncertainties include events (which may or not happen) and uncertainties caused by a lack of information or ambiguity. This definition also includes both negative and positive impacts on objectives (ISO, 2009).

Therefore, in the positive school, risk is uncertainty that can be measured; risk has a positive impact, as well as negative. Risks can bring the loss, damage, danger to the human, or project, but can also bring opportunities. If risk identification and

measurement are carefully studied, they can mitigate the impact of negative risks, and increase the consequence of positive risks.

2.1.2 Risk management

Risk management is a system that aims to identify and quantify all risks for the business or project. It is exposed so that a conscious decision can be taken on how to manage the risks. It can be divided into several steps, including risk identification, risk classification, risk analysis, risk attitude and risk response (Flanagan and Norman, 1993). The process framework of risk management system is as shown in Figure 2-1.

Moreover, risk management is a systematic process of identifying, analyzing, and responding to risk factors to gain the risk response measures during the life cycle of projects (Wang et al. 2004). In addition, Smith et al. (2006) proposed a risk management project standard model that was divided into four parts as illustrated in Figure 2-2: (1) risk identification, (2) risk analysis, (3) risk response, and (4) risk review. The process of risk review is essential to maintain and improve future appraisals and assessments of projects. It also influences the value management proceeds in this case-option appraisal, by allowing the users to consider specific options used in the past on similar projects, making them aware of their weakness, and strengths, and shortening the time taken to develop viable solutions on the risk facing a project. Additionally, it identifies specific risk allocation structures in association to contract strategies, providing more depth in the assessment process.

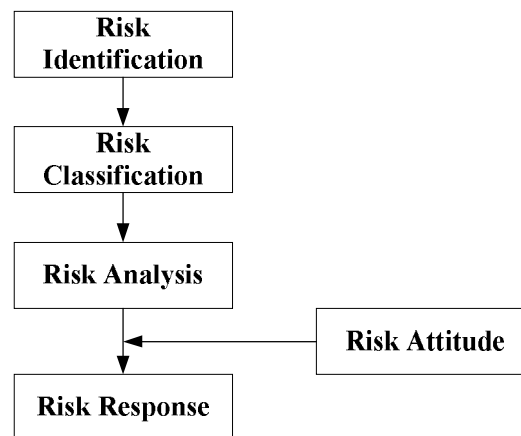


Figure 2-1 Framework of risk management (Flanagan and Norman, 1993)

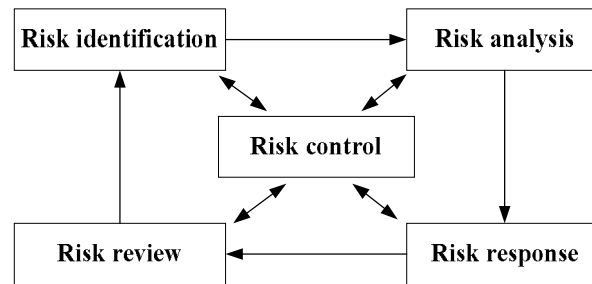


Figure 2-2 The risk control process (Smith et al., 2006)

Furthermore, risk management process should be integrated as a part of firm's management. It also should be embedded in the firm's culture and practices. Indeed, there have been some standards of risk management, such as The Australian and New Zealand Standard on risk management (AS/NZS 4360:2004) and risk management: principles and guidelines (ISO, 2009). ISO (2009) divided risk management process into five main phases, including (1) communication and consultation, (2) establishing the context, (3) risk assessment, (4) risk treatment, and (5) monitoring and review.

2.2 Overview of joint venture

2.2.1 Joint venture

There is no general legal definition of a JV, at least under common law legal systems (Chow, 1985). However, the JV definition is known as:

- JVs involve two or more legally distinct organizations (the parents), each of which actively participates, beyond a mere investment role, in the decision making activities of the jointly owned entity (Geringer, 1988).
- JVs are domestic or international enterprises involving two or more companies joining temporarily to undertake a particular project (Covency et al., 2003).
- A JV is the cooperation of two or more individuals or businesses each agreeing to share profit, loss and control in a specific enterprise (Investment Dictionary 2005).

Additionally, the Law on Foreign Investment in Vietnam (1996) described about the definition of JV Enterprise:

“A joint venture enterprise means an enterprise established in Vietnam by two or more parties on the basis of a joint venture contract or an agreement between the Government of the Socialist Republic of Vietnam and a foreign government, or an enterprise established on the basis of a joint venture contract between an enterprise with foreign owned capital and a Vietnamese enterprise or between a joint venture enterprise and a foreign investor.”

Through regulations in article 4 of Law on Foreign Investment in Vietnam established in 1996, there are three forms for foreign investors in Vietnam:

- (a) Business co-operation based on business co-operation contract
- (b) Joint venture enterprise
- (c) Enterprise with 100% foreign owned capital

Actually, in this research JV enterprise was focused on with participating at least Vietnamese company. Two or more parties may, based on a JV contract, co-operate to establish a JV enterprise in Vietnam. (*Article 6 - Law on Foreign Investment in Vietnam*).

Moreover, in the article 16 of the Law on Foreign Investment in Vietnam, the legal capital of an enterprise with foreign owned capital must be at least thirty percent (30%) of its invested capital as shown in Figure 2-3. Bing et al. (1999) cited that the JV with the local entity in East Asia: Malaysia sets a target of 30% share holding in the public sector. Thailand restricts foreign ownership of construction companies up to 49%; The Indonesia laws require a foreign participant to enter a JV with a local partner; The Philippines gives more freedom, but incentive is given to JVs with local partners.

Additionally, an International Joint Venture (IJV) is a special type of strategic alliance in which two or more companies from different countries join together to create a new business entity that is legally separate and distinct from its parents. JVs are normally established as corporations and are owned by the founding parents in whatever proportions they negotiate. Although unequal ownership is common, the founding firms (Berger, 1999) own many equally. Moreover, here is also another definition of Chow (1985): the expression “JVs” is commonly understood in its generic sense as referring essentially to any agreement or arrangement, which enables two or more parties to jointly execute some commercial enterprise. In terms of construction industry, JV form has become the tool for improving the performance construction projects in host country with local entity. However, the complexity of JV was caused by the presence of two or more partner organization usually of different cultures (Ozorhon et al., 2007).

Furthermore, in a typical IJV, the foreign party is usually responsible for providing the majority of financing, and the local partner provides the facilities, land, and labor (Shen et al., 2001).

The JVs may make the investment in construction projects with more convenient, but the investment activities of the IJV companies are often high risk. Thus in order to improving the performance of IJV, local and foreign companies have to suitable strategies.

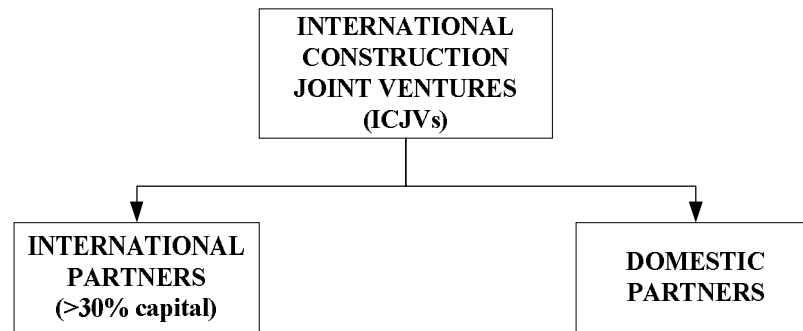


Figure 2-3 Joint Venture Enterprise in Vietnam

2.2.2 Types of joint venture

Through the literature review, joint venture (JV) can be classified into three groups including (1) classification by criteria related to legal status of partner, (2) classification by tactical arrangement, and (3) classification by criteria of business format (Yan and Gray, 1994; Geringer, 1988; Kobayashi et al., 2009; Prasitsom and Likhitruangsilp, 2011).

Joint venture organizations always consist of two levels: partners and the initial JV. The classifications of JV based on the legal status of partner contain two types of JV, such as local JV and international JV. Local JV is the JV that all partners are the same country within where that JV working in. If at least one partner comes from different countries, this JV is international JV (Yan and Gray, 1994).

Besides, in its simplest form, a JV may be defined as a tactical arrangement where two or more firms agree to co-operate and bring together their resources and expertise to carry out a construction projects. Each tactical arrangement can take other forms for JV. According to Kobayashi (2009) the administrative structures of CJV that classify by tactical arrangement can be categorized into four major structures, including integrated joint venture, non-integrated joint venture, combined joint venture and single-partner operation structure (adopted from Prasitsom and Likhitruangsilp (2011)).

1) Integrated joint venture

The firms agree cooperate and bring together their resources and expertise during the bidding and the construction processes and share the profits and losses of a CJV in proportion to resources each brought into the CJV.

2) Non-integrated joint venture

The firms agree cooperate but their responsibilities in term of the required resources and the profits and losses are not shared. Instead, each firm assumes a specified scope of tasks (i.e. planning and executing) and is responsible for the profits or losses associated with that scope of task.

3) Combined joint venture

The firms agree to cooperate by way of taking on a specified scope of tasks and are responsible for the profits or losses associated with that scope of task. At the same time, they also agree to cooperate in carrying out certain part or parts of the task and for that part or parts of the task, they share the profits and losses of a CJV in proportion to resources each brought into the CJV.

4) Single-partner operation

Prasitsom and Likhitrungsilp (2011) added a new form for CJV; this additional type is the CJV in term of singled-partner operation.

Additionally, the business format or a characteristic of JV operation for consideration was used to consider. The following are samples of another type of JV, which can be found in many articles. They are:

- 1) Construction joint ventures (CJV)
- 2) Real estate joint ventures
- 3) Research joint ventures (RJVs)
- 4) Manufacturing joint ventures
- 5) Financial joint ventures

2.3 Construction joint venture risk management

2.3.1 Construction risk management

Comparing with other industries, construction is often encountered with more risks. Construction projects always play against abundant challenges and critical risks that affect project objectives at different levels such as project performance, organization, and environment. Several previous research works investigated risk factors affecting the performance of construction projects. Risk management is a formal and orderly process for systematically identifying, analyzing, and responding to risks throughout the life cycle of a project to yield the optimum degree of risk elimination, mitigation, and control (Wang et al., 2004). Risk identification is an important step to set up the risk framework for controlling project risks. Various techniques can be used to identify construction risks, including checklists, brainstorming, sources of risk (Shen et al., 2001; Han et al., 2008), risk breakdown structure (Zhi, 1995; Ezeldin and Orabi, 2006; and Sameh, 2007) and so on. Risk assessment is also a significant step to analysis the important level of risk factors to project objectives. There are two methods to assess risks in construction projects, such as qualitative and quantitative methods (Smith et al., 2006). Besides, risk response is an important step for

mitigating project risks. The risk response strategies entail risk mitigation, risk transfer, risk acceptance, and risk avoidance (Flanagan and Norman, 1993; Smith et al., 2006); risk response strategies adopted by contract, insurance, and retention management (Zhi, 1995).

Han et al. (2008) were promoted a new source – effect (SE) checklist to help the project risk management in overseas construction projects. First, this study developed the risk paths or tree structures of risk sources. Risk paths consist of the sources (or causes) and their subsequent risk events, and categories of risks. Risk paths were shown the relationship among the main risks and related factors. Therefore, it is very useful for project organizations to understand the relationship of risk sources, risk events and effect of risks. However, this study was not mentioned about the important impact to organizations and projects objectives.

According to the results of Sameh (2007), 42 risks affecting UAE construction industry were identified, the Risk Breakdown Structure (RBS) showed about risk groups, risk categories, and risk events (Figure 2-4). Risks were divided into two groups: internal risks and external risks. The study exposed that economic risks such as inflation and sudden changes in process, shortage in material and labor supply were significant. Other significant risks included owner risks, political, social, and cultural risks. Additionally, this research addressed the proper allocation of risks to the appropriate contracting party, such as owners, contractors, and shared. Most of risks were allocated to contractors or shared between the parties, whereas only two risks allocated directly to owners.

Other study of Zou et al. (2007) investigated 85 risks associated with construction projects in China. The 85 risks were categorized into seven groups: risks related to clients, designers, contractors, subcontractors/suppliers, government bodies, superintendents, and external issues. The results of research were pointed out the 25 key risks based on an assessment of their likelihood and magnitude of impact on five project objectives, including cost, time, quality, safety, and environment. Especially, this study was also mentioned about the comparison between the findings of China and Australia. The same risks in two countries included project funding problem, contractors' poor management ability, difficulty in reimbursement, unwillingness to buy insurance and lack of awareness of construction safety and pollution. Moreover, this research was adopted relationship of key risks, stakeholders, and project life cycle (feasibility, design, construction, and operation). However, there are several limitations not to consider the alteration risk factors effect during the project life cycle.

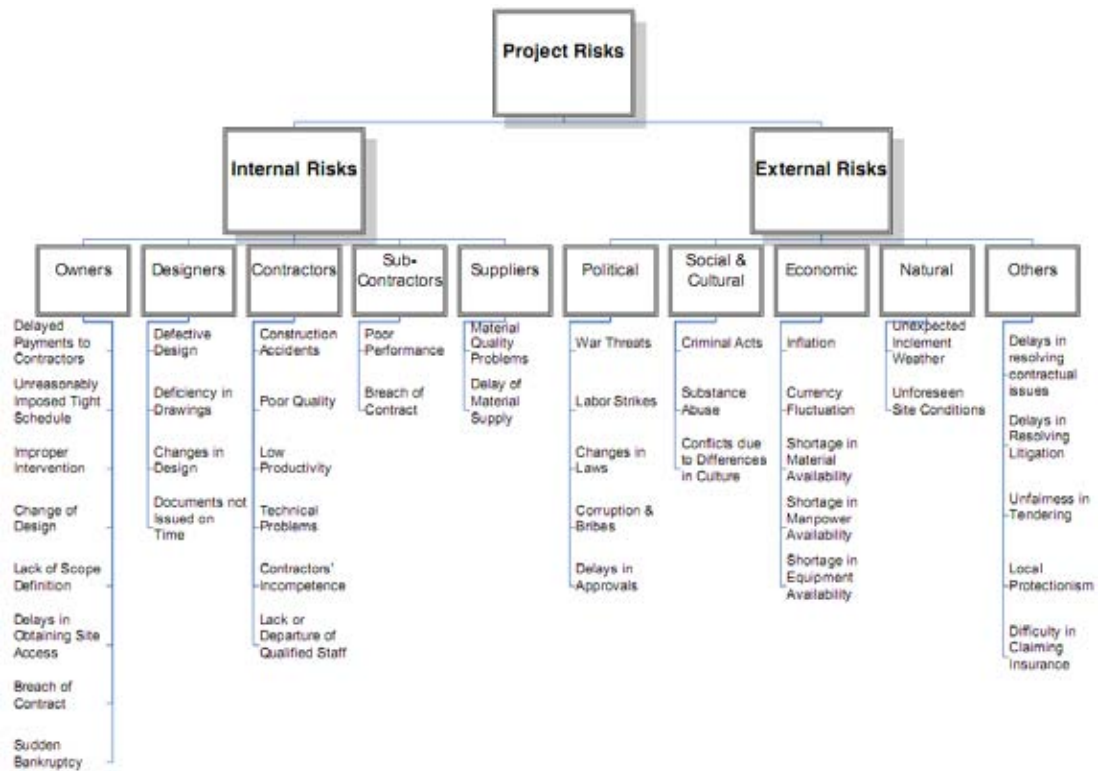


Figure 2-4 Risk breakdown structure of UAE construction industry (Sameh, 2007)

Probability		Risk Factors	Risk Level	Impact
0.90	→	High inflation	0.107 (1)	← 0.119
0.85	→	Bureaucracy	0.096 (2)	← 0.113
0.86	→	Low social security	0.083 (3)	← 0.097
0.70	→	Corruption	0.071 (4)	← 0.101
0.75	→	Lack education facility nearby	0.070 (5)	← 0.093
0.61	→	Lack transportation facility nearby	0.064 (6)	← 0.105
0.60	→	Tax rate changes	0.063 (7)	← 0.105
0.64	→	Exchange rate fluctuation	0.061 (8)	← 0.095
0.62	→	Lack legal system	0.054 (9)	← 0.087
0.60	→	Lack communication facility nearby	0.051 (10)	← 0.085

Figure 2-5 Risk assessment for overseas development project (Zhi, 1995)

Moreover, Zhi (1995) identified and assessed the risks related to the international construction projects. Overseas construction projects had more uncertainties, mainly because of the large size of projects and the international issues involved. Author divided the common factors affecting overseas projects into four risk groups: Nation/Region, Construction Industry, Company, and Project. Finally, the ten factors and the risk response strategies was determined such as: high inflation, bureaucracy, low social security, corruption, lack education, lack transportation, tax rate changes, exchange rate, lack of legal system, and lack of nearby communications facility as illustrated by Figure 2-5.

Additionally, Ezeldin and Orabi (2006) examined about number of response methods for 140 mitigation/elimination measures. Table 2-1 displays the number of response methods used for each category of risks from each response technique. Authors realized that the most commonly used risk response technique was the risk reduction. Risk transfer and retention response were not convenient for mitigating the impact of major risk such as financial and economic risks, client-generated and subcontractors-generated risks.

Table 2-1 Number of response methods per each risk category (Ezeldin and Orabi 2006)

	Elimination	Transfer	Reduction	Retention	Total / Category
[A] Financial	4	-	18	-	22
[B] Construction	6	7	22	5	40
[C] Political	5	3	18	2	28
[D] Client	5	-	6	6	17
[E] Subcontractors	1	3	10	-	14
[F] Miscellaneous	4	3	10	2	19
Total / Technique	25	16	84	15	140

2.2 Risk factors affecting joint venture performance

A large number of construction JV projects [more than 50% of JV projects in developing countries (Beamish, 1993) have failed to achieve their goal and objectives (Geringer and Hebert, 1991). This is because construction JV encompasses many participants leading to complex organization and environment. The ICJV projects are usually very large and complex. A large number of parties, including contractors, subcontractors, and nominated subcontractors/suppliers are associated with the

projects. The relationship and information stream among the participants are very complicated.

CJV risk factors were categorized according to their nature (e.g., management risks, financial risks, market risks) (Shen et al., 2001) or the relationship with organizations (internal risks, project-specific risks, and external risks) (Bing et al., 1999; Zhang and Zou, 2007). The internal risk group includes risks related to the organization of JV companies. The project-specific risk group entails risks associated with the project performance project. The external risk group involves risks resulting from external environment conditions. Most critical risk factors exist in the JV partners finance, government policies, economic conditions, and project relationship (Bing et al., 1999). In addition, the difference in management systems, technological practice, and cultural background among the partners within joint ventures also contribute to the function of JV (Gale and Luo, 2004). These factors thus need to be addressed throughout the implementation of JV to reduce the likelihood and impact level of the risks. Furthermore, the risk identification can be used to predict the performance, which contributes to the success of ICJVs (Andrew et al., 2000; Ozorhon et al., 2007).

Bing et al. (1999) considered the most critical risks in ICJVs related to financial, government policies, project relationship, economic conditions, and subcontractors of three above groups. Each group had several subgroups, and each subgroup included several risk factors which shown in Table 2-2.

The most effective risk mitigating measures were categorized eight groups: partner selection, agreement, employment, control, subcontracting, engineering contract, good relationship, and renegotiation.

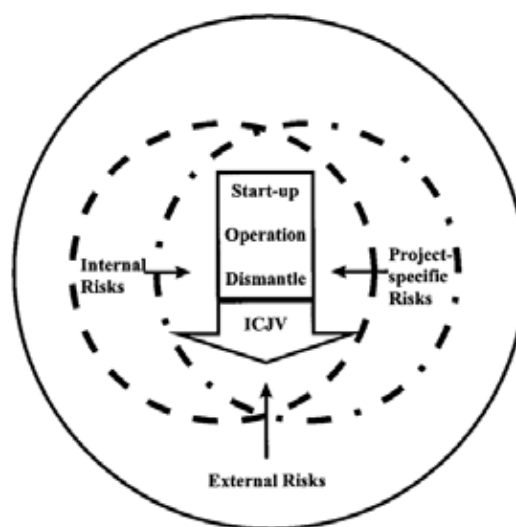


Figure 2-6 Risks of ICJV projects in China (Bing et al., 1999)

Table 2-2 Analysis the groups, subgroups of risk factors in ICJVs (Bing et al., 1999)

Internal Risk Factors	Partner's Financial Resources and Managerial Competence
	Disagreement on Profit/Loss, Accounts, and Work Allocation
	Policy of Parent Companies Toward JV
	Distrust
	Technology Transfer Dispute
Project-Specific Risk Factors	Client's Problems
	Project Relationship
	Subcontractors and Suppliers
	Contractual Risk
External Risk Factors	Political Risk
	Economic Risk
	Environment Risks
	Social Risks

Furthermore, based on the research of Andrew et al. (2000), the critical factors that contribute to successful JVs and the risk factors associated with JV operations was considered. There are 24 critical success factors for successful operation of JVs are related mainly to areas involving:

- (1) Pre-Planning (six risk factors)
- (2) Partner Selection (seven risk factors)
- (3) Negotiation & Policy Agreement (six risk factors)
- (4) Implementation (five risk factors)

Moreover, through the respondents' information, authors realized the most critical factors in each implementation stages. For instance, in the Initial Set-up Stage, the threat of the JV partner facing financial distress is the important to consider. Similarly, in the Operation and Implementation Stage, distrust among employees is perceived to be the most critical risk factor, and in the Dismantling and Defects Liability Period Stage, disagreement in accounting of profit and loss is especially critical.

In addition, Shen et al. (2001) categorized 58 risk factors in CJVs into six main groups: financial risk, legal risk, management risk, market risk, policy and political risk, technical risk. Through results of respondents' survey, among top ten risks, there were five management risks, two policy risks, two market risks, and one technical risk. Thus, issues of management-type risks should be attention. For instance, "inadequate choice of project partner" was a typical risk to JVs in China. Furthermore, Shen et al. (2001) indicated three types of typical risk management

strategies: risk transfer, risk retention, and risk reduction. They provided some practical examples for managing risks in CJVs in China, such as *cooperation with government offices*; *proper risk allocation in contract*; and *controlling technical risk*.

2.3.2 Risk management models

Risk management model is very important in construction project. There are many previous researches about risk management model for projects and companies. Dey (2010) has developed the model for managing project risk using combined analytic hierarchy process and risk map. The framework for project risk management included seven steps as shown in Figure 2-7

- (1) Identify alternative projects.
- (2) Identify project level risks and select the least risky project using the AHP.
- (3) Develop work breakdown structure.
- (4) Analyze work package level risk using risk map.
- (5) Develop responses to mitigate risk.
- (6) Analyze activity level risk using risk map.
- (7) Develop responses to mitigate risk.

The JVs may make the investment and building in construction projects in a more convenient, but activities of the ICJV related many participants and other cultural are often high risk. Thus in order to improving the performance of ICJV, many previous researchers has been conducted by various methods: qualitative methods, and quantitative methods. A qualitative risk management model incorporating to measure was proposed by Bing and Robert (1999) who help construction firm improving their decision-making process for their ICJVs. The most effective risk mitigating measures were categorized eight groups: partner selection, agreement, employment, control, subcontracting, engineering contract, good relationship, and renegotiation. The mitigating measures were proposed through the following process: risk identification, risk analysis and risk treatment with three main risk groups: internal, project-specific, and external throughout three stages of projects: startup, operation, and dismantle. As shown in Figure 2-8, the risk management process consists of three rows and five columns.

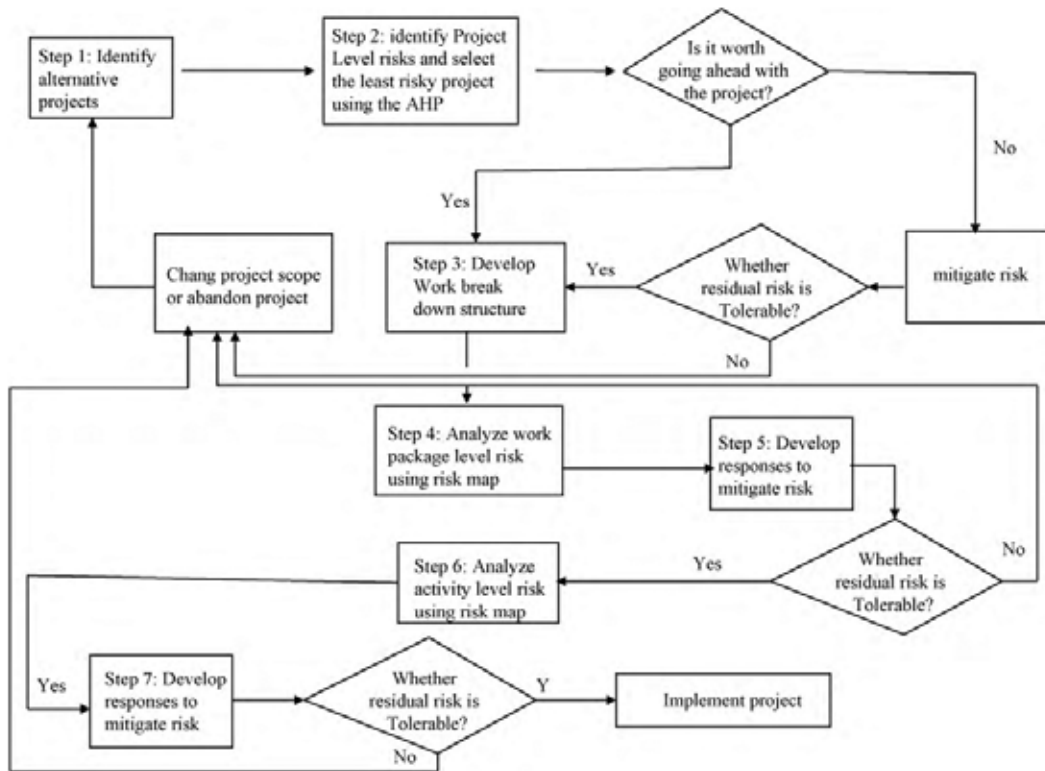


Figure 2-7 Framework for project risk management (Dey, 2010)

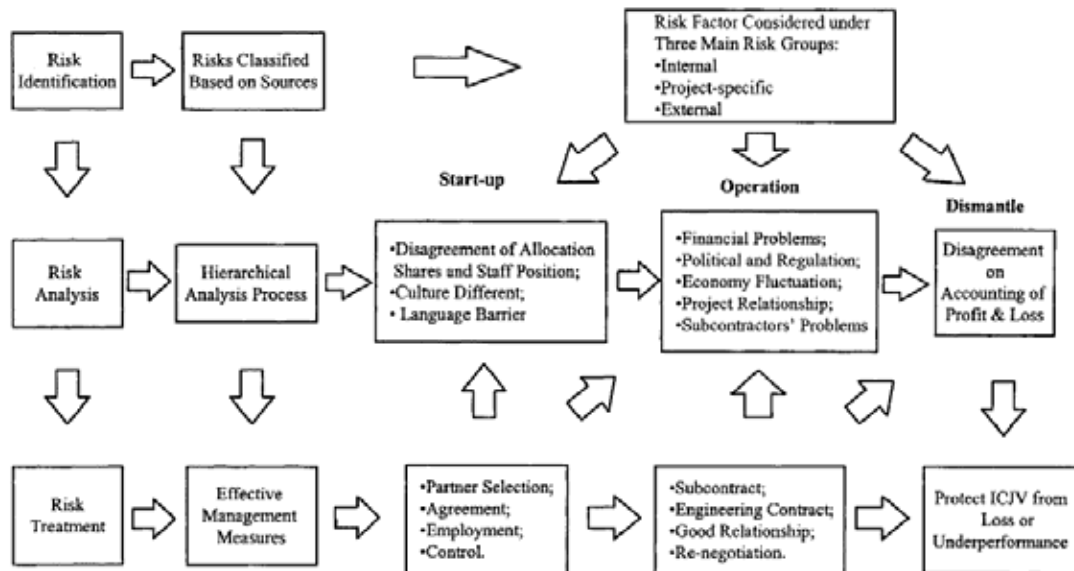


Figure 2-8 Risk management model for ICJVs (Bing and Robert, 1999)

Other study of Zhang and Zou (2007) suggested quantitative model for the appraisal of the risk environment (FAHP) to assess the level of risks and to evaluate the risky conditions of their CJV businesses in China. The fuzzy AHP have been applied for developing the model with following steps:

- Risk associated with Sino-Foreign JVs
- Hierarchy Structure of Risks
- Proposed Fuzzy AHP Risk Assessment Approach

2.3.3 Research gaps

Like others, the Vietnam construction industry has begun adopting “JV form” before 1992. Foreign construction companies often enter local markets by forming international construction joint ventures (ICJVs) with local partners. This is because overseas contractors have more capacities (e.g., financial capital, knowledge, and heavy equipment), whereas Vietnamese contractors more understand about domestic cultural, political, and legal factors. Throughout literature, it appears that little research has been studied to investigate the risks related to the ICJVs in Vietnam. Besides, Vietnamese companies had different risk management system, or even did not have. Moreover, the previous research has been mentioned about the difference of probability and impact of risk factors during the lifecycle of projects (Bing et al., 2009; Zou et al., 2007). However, it appears that little research has been researched about the develop trends of probability and impact of risk factors. Therefore, this research tried to gather the understanding of risk management and obtain risk profile of ICJV projects in Vietnam.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research methodology to identify, analyze, and respond to risks of international construction joint ventures (ICJVs) in Vietnam, as well as to create the risk profile to help the local contractors mitigate risks in ICJV projects in Vietnam.

3.1 Research methodology

Research methodology adopted for this research is illustrated below:

3.1.1 Risk identification

This step was to identify the risks affecting ICJVs in Vietnam. It was very significant to set up the risk framework for risks in ICJV projects, because they are many participants, and the linkages between them are quite complicated. There are many techniques to identify risks associated for construction projects, throughout checklists, sources of risks (Shen et al., 2011), Risk Breakdown Structure (Ezeldin and Orabi, 2006; Zhi, 1995; and Sameh, 2007). In this research, the Hierarchy Risk Breakdown Structure (HRBS) were used to identify the risks in ICJVs such as risk groups, risk categories, and risk factors because of the implicating of the organization of ICJV. Through the literature review and HRBS, risks of ICJVs in Vietnam divided into three groups:

(1) Internal risks: displays the risks in ICJV itself (two subcategories regard to multi-members include Partner-related risks and ICJVs-related risks).

(2) Project risks: displays the risks related to the performance itself project (five subcategories regard with multi-objectives include Organization, Management, Technical, Contract, Design risks).

(3) External risks: displays risk related to external environment (four subcategories regard with the multi-parts include Legal and Political, Social, Economic, and Force Majeure risks).

3.1.2 Risk assessment

In research presented this assessment by measuring levels of risk were divided into two-dimensional.

- Dimension of the probability to risk: measured by frequency of occurrence
- Dimension of the impact of risk: assessment the impact by the assumption that the risks considered to occur

This research has developed measures for risk assessment criterion modified from ICE (2005) which measure risk as follow in Table 3-1 and Table 3-2. Like we known, risk variables have traditionally been estimated by two criteria, probability, and impact. Then, traditional PI method was often used to rank the risks, and analysis the degree of risks (Zhi, 1995; Dale et al., 2004).

For the traditional PI method, the degree of risk calculates by multiplying P (Probability) and I (Impact). Here, P and I are not restricted to the ranges 0 to 1.

$$\mathbf{RF = P \times I} \quad (3.2)$$

Where

- RF = the degree of risk
- P = the probability of the risk occurring
- I = the degree of impact of the risk

Table 3-1 Probability of occurrence

<i>Rating</i>	<i>Scenario</i>	<i>Probability</i>
1	Not expected to happen	0.1
2	Small likelihood but could well happen	0.3
3	Quite often occurs	0.5
4	More than evens chance	0.7
5	Very frequent occurrence	0.9

Table 3-2 Impact of occurrence

<i>Rating</i>	<i>Scenario</i>	<i>Impact</i>
A	Not impact	0.1
B	Not significantly impact	0.3
C	Average impact	0.5
D	Significant impact	0.7
E	Very significant impact	0.9

Furthermore, Dale et al. (2004) has introduced about the new method for calculating the risk important factor or level of risk, the descriptive likelihood assessments were converted to numerical measures. A risk important factor RF or combined risk

measure was then calculated for each risk, and drew RF in the risk contour diagram as follows in Figure 3-1.

$$\mathbf{RF = P + I - P \times I} \quad (3.3)$$

Where P = risk likelihood measure, on a scale 0 to 1
 = average of likelihood factors;
 I = consequence (impact) measure, on a scale 0 to 1
 = average of consequence (impact) factors;

The traditional method has one significant disadvantage in comparison with the new PI method. For instance, risk factors with high impact but low probabilities can be indicated low risk factors, and thus the risk factors can be missed. However, for the new method, it will indicate exactly the risk important factor with high likelihood or high consequences or both, so the chance of high consequence but low likelihood items being ignored is reduced greatly.

A review of the risk profile for the procurement determines the cut-off point between High and Medium risks. In this research, it lies at about $RF = 0.8$, and the cut-off between Medium and Low lies at about $RF = 0.40$ as shown in Figure 3-2.

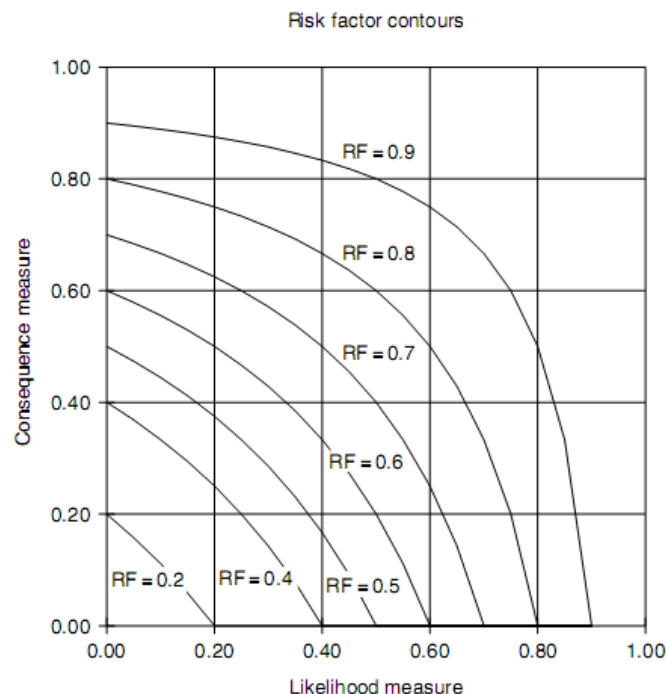


Figure 3-1 Risk contour diagram (Dale et al., 2004)

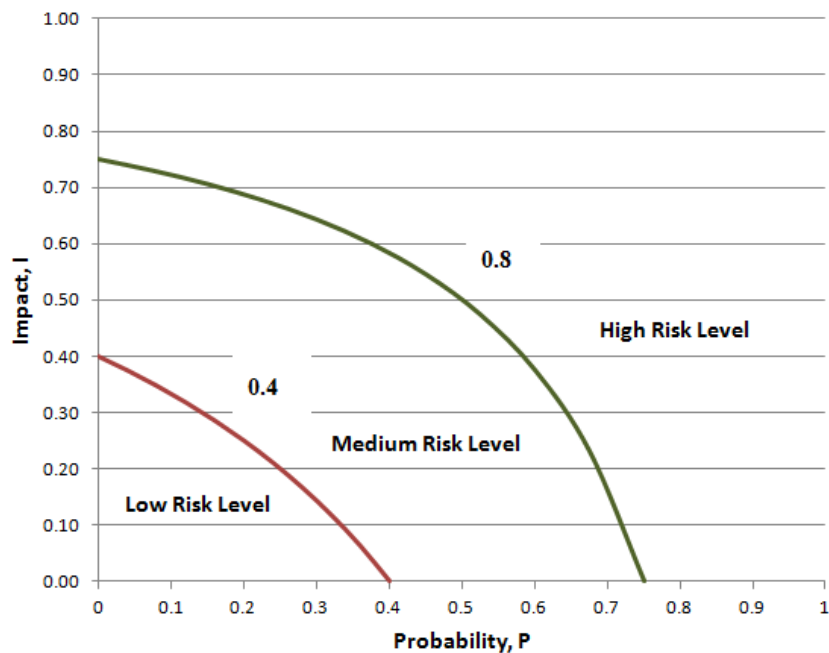


Figure 3-2 Risk contour diagram for ranking risk (Dale et al., 2004)

Reliability of testing scale

Cronbach's alpha is the most common measure of internal consistency or reliability. It is most commonly used when you have multiple Likert questions in a survey/questionnaire that form a scale and you wish to determine if the scale is reliable. Author has devised a 47 questionnaire to rank and assess the risk probability and impact of risk. Each question was a 5-point scale Likert item. In order to understand whether questions in this questionnaire all reliably measure the same latent variable, a Cronbach's alpha was run on SPSS to check the reliability. Cronbach's alpha is defined as:

$$\alpha = \frac{n}{n-1} \times \frac{(1 - \sum S_i^2)}{S_t^2} \quad (3.1)$$

Where:

- n: the number of components (items) in the sample
- S_i^2 : The variance of component i for the current sample of persons
- S_t^2 : The variance of the observed total test scores
- α : varies from $0 < \alpha < 1$; higher values of alpha are more desirable

By convention, a set of questions used to measure are evaluated to have a reliability of 0.80 or higher. However, the minimum acceptable can be more than 0.70

3.1.3 Risk response

The uncertainty of risk factors well as the probability of occurrence or potential impact should decrease by selecting the appropriate risk mitigation strategy as shown in Figure 3-3 (Dale et al., 2004). The risk response strategies include the following: (1) mitigation; (2) transference; (3) retention and (4) avoidance.

Mitigation - The most common form of managing a risk is through mitigation. Within this approach, a risk response plan is developed that presents the various ways the probability and/or impact of the risk may be lessened. For those risks being mitigated, the risk owner needs to formulate ideas as to how the risk's probability and/or impact may be reduced. General statements covering the various areas may be concentrated on to lessen the risk. Action items are then developed to outline specific actions that will be taken to support those ideas in reducing the probably and impact of the risk. These action items may also be included in the project plan. The risk mitigation template has been developed to assist in this process.

Transfer - When the placing the responsible for a risk and it consequence on someone outside the project the project team needs to documented who and how the risk responsibility if being transferred. This can be recorded in the consequence section of the Risk Management Plan template

Retention – Because no action is taken to manage this risk, the only thing that needs to be documented in the Risk Response Plan is the consequence of the risk if it occurs. No additional planning needs to be developed unless it is decided that a contingency plan will be developed. If this is the direction then the contingency plan needs to be development and the risk monitored.

Avoidance – Because a change is made to the project, such as revising the scope to eliminate the risk, no Risk Response Plan needs to be developed. It is very possible that the project management process needs to be followed as a result in changing the project.

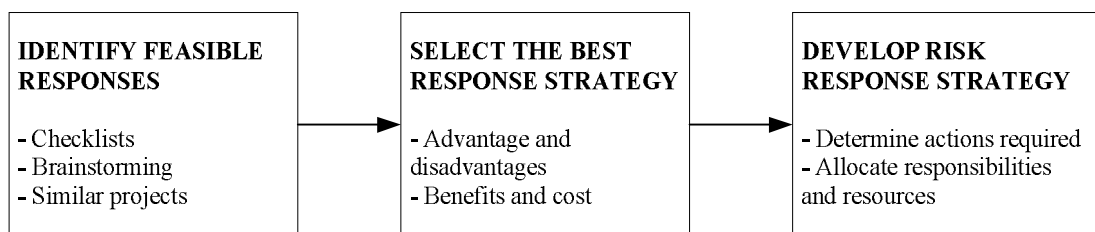


Figure 3-3 Risk response strategies (Dale et al., 2004)

3.1.4 Verification and validation

The details of risk response measures were developed by brainstorming from respondents group that may be established by a format of a small focus group. A small focus group was an established technique for obtaining consensus estimates from several respondents through using the strategically survey systems. This method can be applied to establish the response measures for mitigating risks.

3.1.5 Risk profile

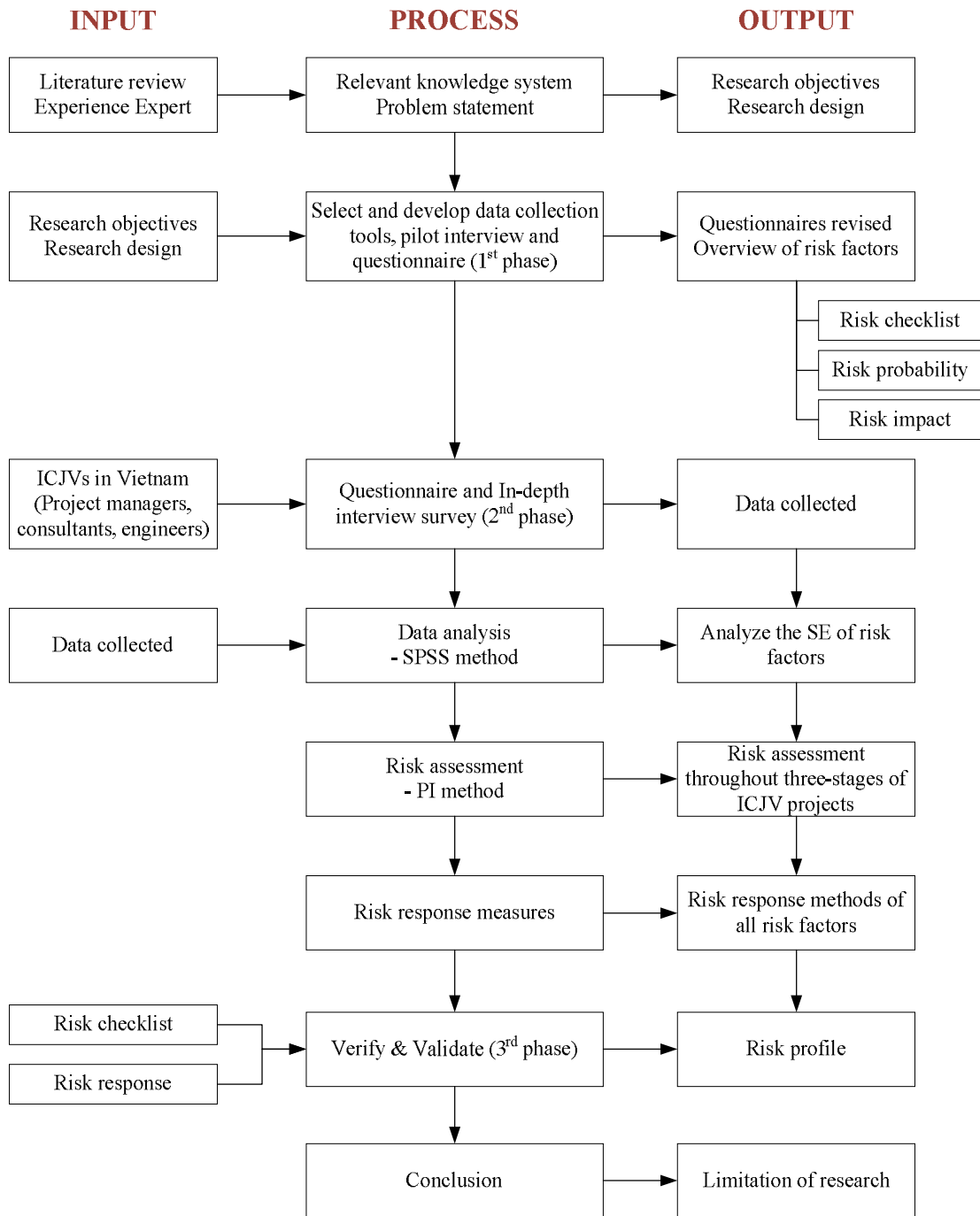
This step was to develop risk profile of the previous ICJV projects in Vietnam based on the respondents' experience. The risk profile were established to expand risk log or risk register that listed all identified risks, risk assessment, risk response measures, and show the source-effect (SE) of risk factors by analyzing the causal relationships among risk variables. The detail of risk profile included:

- Project stage: risk factors of ICJV projects were collected from three stages of projects from startup, operation, and dismantle.
- Risk identification: the Hierarchy Risk Breakdown Structure (HRBS) were used to identify the risks in ICJVs such as risk groups, risk categories, and risk factors.
- Risk assessment: the risk profile contained the assessments of risks probability of occurrence and impact of risks for ICJVs projects in Vietnam.
- Risk response measures: the risk profile contained the actions to avoid, mitigate, transfer, or accept risks for ICJVs in Vietnam.
- The SE of risk factors was developed to gather the awareness about the risk factors affecting ICJVs in Vietnam.

Finally, the research methodology for this research will be illustrated in Figure 3-4.

3.2 Data collection

In this research, data collection was primarily based on questionnaires surveys, in-depth interviews. Questionnaires surveys were designed to collect both qualitative and quantitative data. In-depth interviews were used to collect empirical evidence, and respondents' experience to support the findings of the questionnaire survey. Data collection process consists of three rounds, including pilot survey, large-scale survey, and validation survey. The content and purpose of each round of collecting data are as follows in Table 3-3.



Note:
ICJV: International construction joint venture
SE: Source – effect of risk factor
PI method: Probability and impact method to analyze risk factor

Figure 3-4 Research methodology

Table 3-3 Contents of data collection survey

PHASE	DATA COLLECTION	CONTENT	PURPOSE
Pilot survey (Appendix A1, A2)	1) Pilot interview	Section 1:	- Information about the respondents' profile Respondents' information
		Section 2:	- Structures and goals of ICJVs in Vietnam - Risk factors affecting ICJV projects in Vietnam For overview of ICJVs in Vietnam For research 1st objective
	2) Pilot questionnaire	Section 1:	- Information about the respondents' profile Respondents' information
		Section 2:	- The perception on the rating of each risk: likelihood and impact - Perception of risk response measures For research 1 st , 2 nd objectives
Large-scale survey (Appendix A3)	1) Questionnaires 2) In-depth interview	Section 1:	- Information about the respondents' profile Respondents' information
		Section 2:	The perception on the rating of each risk: - The likelihood, the impact of risk in three stages of ICJV projects - The significant impact on the objectives of ICJV projects For research 1 st , 2 nd objectives
		Section 3:	Risk response methods For research 3 rd objective
Validation survey (Appendix A4)	1) Questionnaires 2) In-depth interview		Verify risk response methods for such risk factors For research 3 rd objective

The main objective of this research is to explore the risks of ICJVs in Vietnam. The data collected from various people within a number of ICJVs were carried out using questionnaires for this research.

The questionnaire was designed to gather the views of project managers, consultants, main engineers in managing ICJVs, as well as to determine the likelihood, and impact of the risk in ICJVs. Eight respondents participated in the pilot test. The questionnaire was then amended so that it was easier to read and take exactly opinions of the respondents. The questionnaire was then distributed to 15 respondents in a large-scale test. The data collected from the questionnaire surveys were analyzed by using Statistical Package for Social Sciences (SPSS) version 16.

The in-depth interview was also designed to gather the awareness of the project managers, consultants, and engineers. The results were then incorporated with those

from the questionnaire to conclude briefly overview of ICJV organizations and risk response measures for ICJV projects in Vietnam. Three rounds of survey were carried out, including pilot survey, large-scale survey, and validation survey. The details of questionnaire survey are shown in Appendix A1, A2, A3, and A4.

3.3 Pilot survey

3.3.1 Data screening

The pilot survey consisted of two small rounds, such as pilot interview and then pilot questionnaire. First, the pilot interview aimed to understand briefly about background of ICJV organizations in Vietnam and to find risk factors affecting ICJV projects in Vietnam. Then, the pilot questionnaire survey aimed to check whether the questionnaires were ready to be distributed to the selected samples. The respondents in this research were the Vietnamese construction contractors, consultants, and owners. From the eight respondents, six respondents were the line managers, project managers, and site managers and another two respondents were the professionals about risk management (two senior lecturers). The duration for each respondent was approximately from 30 minutes to 45 minutes depending on the interviewed supervisor's speed for response.

The data screening process occupied many steps to check the accuracy of data entry and missing values. In addition, the frequencies and descriptive statistics command in SPSS Version 16 was used to detect any out-of-range values.

3.3.2 Pilot interview and questionnaire survey

Data collection was carried out in May and June 2011 in South of Vietnam. Respondents were contacted via email and direct phone. Then, the interview questionnaire would be sent via email if the respondents accepted. There are 20 questionnaire were sent to interview candidates. The participants in the survey were the Vietnamese construction contractors, consultants, owners that were or are currently ICJV partners with foreign contractors. Finally, there were eight respondents accepted and took the time to answer interview questionnaire that has a response rate of 40%.

(1) Pilot interview

The pilot interview questionnaire for pilot survey issued to the respondents is shown in Appendix A1. The questionnaire contained two sections. The first section observed the personal information of the respondents, such as years of experience, role, and position in construction company, and how many construction joint venture project projects you have ever participated. Moreover, this section tried to test the requirements of the respondents for the next study, including the knowledge about the risk management. The next section required the respondents to provide the perception

about structure of joint venture companies, and the risk factors affected the implementation of ICJVs in Vietnam. This questionnaire was translated to Vietnamese to ensure that all of information of questionnaire would be cleared. The respondents were free to have any opinions about the related-information. All of information from the respondents would be translated again to English and shown in the next chapter.

The pilot interviews helped refine the data collection procedure in preparation for the pilot questionnaires. The pilot interviews helped to collect all of awareness of overview of ICJVs, including the goals, the objectives, main structures, and risk factors affecting ICJVs in Vietnam. Then, the questionnaire survey for the assessment of risk factors was established. From the results of pilot study, some conclusions are discussed below.

For the first questionnaire section, the questions were commented clear and easy to understand. However, some responds should be added something about “type of joint venture projects that they participated in”. For example, type of ICJV projects that they participated in civil, construction industry or infrastructure and so on. Therefore, the next questionnaire survey should be revised. Detail of revised questionnaire is shown in Appendix A2.

(2) Questionnaire

The pilot questionnaire contained two sections. The first section observed the personal information of respondents. The next section required the respondents to assess the probability and the degree of impact of all risk factors subjectively.

For the second section, almost respondents agreed the risk factors in three groups of ICJV projects. From the respondents, all 47 questions in this section clear and easy to understand. Moreover, they also gave some mentioned about the difference probability and impact of risk factors during the lifecycle of projects. Therefore, they suggested that the questionnaire should be added the assessment for probability and impact in different stages of projects. In addition, important impacts of risk factors to project objectives were pointed out. In summarized, detail of revised questionnaire is shown in Appendix A3. The data analysis was shown in chapter 4.

3.4 Large-scale study

3.4.1 Data screening

Data collection methods for large-scale survey were a combination of two methods: questionnaire and interview. The questionnaire method was used for first and second sections; and the interview method was used for third sections. The large-scale survey was carried out of 15 respondents, including eight respondents in the pilot test and further seven respondents. Respondents were interviewed face to face by the author.

This survey tried to gather the views of the respondents about the probability and impact of risk factors; important impact of risks to project objectives; and risk response measures for ICJV projects in Vietnam. The respondents in this research were the Vietnamese construction contractors, consultants, and owners. From the 15 respondents, two respondents were directors, eight project managers, and five supervisors.

The time needed for each interviewer to complete the questionnaire varied from one hour to two hours, approximately double amount of time as that of the pilot test, depending on how much the interviewer wanted to say connected with the content. The period for the large-scale interviews was in 2 months.

The data screening process occupied many steps to check the accuracy of data entry and missing values. In addition, the frequencies and descriptive statistics command in SPSS Version 16 was used to detect any out-of-range values.

3.4.2 Questionnaire and in-depth interview

(1) Questionnaire

The large-scale questionnaire was primarily based on the literature review, pilot survey. In particular, the pilot survey provided the impetus to refine the questionnaire layout, refine data collection plans, modify the questionnaire, and gain an initial idea of the validity and reliability of the questionnaire survey.

The large-scale questionnaire contained three main sections. Section 1 included ten questions about the respondent's profile and the awareness of risk management. Section 2 consisted of 47 questions. The respondents provided their knowledge to assess probability and impact of risk factors. The respondents were asked to rank probability and impact in each stage of projects by five point Linkert scale method, as well as to assess the important impact on objectives of projects.

(2) In-depth interview

Finally, in-depth interview method was used to gather the views of the respondents about response methods for each risk factor in section 3. It was noted that the respondents could be described more than two measures to cope with each risk factors. The fully questionnaire which was used for large-scale study is shown in Appendix A3 in English version. The data analysis was presented in chapter 5.

3.5 Validation survey

Validation survey was used to verify the response measures for risk factors affecting ICJVs in Vietnam. The validation survey was carried out of seven respondents by selecting participants of large-scale survey. The respondents were chosen within more

experience and were working in popular foreign partners in Vietnam such as Taiwan (China), Japan, and Singapore.

According to the results of risk response measures in large-scale survey, all of risk response methods were collected and summarized. Validation questionnaire survey was drafted as follows in Appendix A4 to check the reliability of these methods. In questionnaire, the respondents were requested to specify and assess “agree”, “disagree” and “not sure” for each risk response method. The data analysis was presented in chapter 6.

3.6 Conclusion

This chapter described the guideline to build this research, such as how to build questionnaire survey to collect data, data test and analysis methods. Besides, the pilot study tested the validity and reliability of preliminary data and the basis for large-scale survey later. The large-scale study was set up to obtain the opinions of respondents for research. The data collection and data analysis are presented in the following chapters, including chapter 4, 5, 6, and conclusions in the chapter 7.

CHAPTER 4

OVERVIEW OF ICJVs IN VIETNAM

This chapter explores the current status of international construction joint ventures (ICJVs) in Vietnam. The first section presents the profile of all respondents that participated in this research. The second section shows the results from the pilot interview about goals of ICJVs in Vietnam. Then, this chapter presents the main structure of ICJVs based upon the administrative organizations.

4.1 Respondents' profile

The respondents were chosen from project-based ICJVs. Table 4-1 shows the characteristics of the ICJVs participated in the survey. Table 4-2 illustrates the profile of the participants, which include six respondents from ICJVs and two experts of ICJV risk management. Each ICJV company may involve in many projects. The partners of local companies are from many countries such as Japan, Taiwan, Korea, Singapore, Germany, and Netherlands.

Among eight respondents, there were seven respondents who had experience in construction more than five years (87.5%). They were project managers and line managers with many years experience in construction industry. Table 4-3 displays the distribution of the respondent's work experience.

Most of the respondents worked for main contractors, subcontractors, and consultants (75%). Two respondents worked as consultants for clients (25%). Table 4-3 shows the roles of the eight respondents. Thus, the pilot surveys can cover main stakeholders of the ICJV projects, namely, main contractors, subcontractors and consultants, all of which directly involved from initial stage to project completion.

Table 4-1 Characteristics of ICJVs in the survey

Name	Vietnam/ Japan (VJ)	Vietnam/ Taiwan (VT)	Vietnam/ Korea (VK)	Vietnam/ Germany & Netherlands (VGN)	Vietnam/ Singapore (VS)
Date of establishment	1993	05/1993	02/2004	2008	03/2008
Sector	Civil engineering	Building	Building	Civil engineering	Building
Share of equity	30:70	30:70	40:60	20:60:20	40:60

Table 4-2 Profile of the respondents

Joint Venture Company	Respondents	Designation	Experience in construction
Vietnam/Korea (VK)	Respondent 1	Engineer	3-5 years
Vietnam/Germany & Netherlands (VGN)	Respondent 2	Engineer	5-10 years
Vietnam/Singapore (VS)	Respondent 3	Project manager	5-10 years
Vietnam/Japan (VJ)	Respondent 4	Deputy project manager	5-10 years
Vietnam/Taiwan (VT)	Respondent 5	Engineer	> 10 years
	Respondent 6	Engineer	> 10 years
Experts of Joint Venture	Respondent 7	Director	> 10 years
	Respondent 8	Project manager	> 10 years

Table 4-3 Respondents' profile

Category	Respondents	
	Number	Percent (%)
<i>1. Respondents' work experience</i>		
3-5 years	1	6.7
5-10 years	4	53.3
>10 years	3	40.0
<i>2. Role of respondents</i>		
Main contractor	2	40.0
Subcontractor	1	6.7
Consultant	3	20.0
Owner	2	33.3
<i>3. Position of respondents</i>		
Directors	1	13.3
Deputy directors	0	0.0
Project managers	3	53.3
Supervisors	4	33.3
Engineers/Architects	0	0.0
<i>4. National of foreign partners</i>		
Singapore	1	6.7
Korea	1	6.7
Japan	1	6.7
China	2	13.3
Other	3	20.0

The results from the pilot interviews show that risk management is very important for the ICJV. As shown in Table 4-4, all respondents were aware of risk management. However, just only one respondent responded that he/she understand risk management system so well. The perceptions of the respondents about risk management were summarized below.

“The projects have rarely implemented a risk management system”

“We do not implement risk management in our company”

“Monitoring regularly to identify and decrease probability of occurrence and impact of risk factors based on the records on the management systems and risk profile in the previous research”

“The project manager creates the risk management process for each project based on the specific characteristics of each project. The process of risk management will identify and document known risk factors during creation of the risk register and it will be checked by the member of project manager throughout the life cycle of project”

As can be seen, in many cases risk management system was rarely carried out by the company in Vietnam. In Table 4-4, the proportions of the respondents who considered that risk management be necessary and very necessary are 37.5% and 62.5%, respectively.

Table 4-4 Perception of risk management

Category	Respondents (Total of 15)	
	Number	%
<i>1. Perception of risk management</i>		
Unknown	0	0.0
Heard of it	5	33.3
Known	9	60.0
Know very well	1	6.7
<i>2. Necessary of risk management</i>		
Unnecessary	0	0.0
Necessary	7	46.7
Very necessary	8	53.3

4.2 Goals of construction joint venture in Vietnam

This part specifies the main objectives of partners in Vietnam by interviewing ICJV respondents who worked in local partners. An ICJV is consists of at least one local company and a foreign company. The results of the pilot interviews about the objectives of ICJV are shown in Table 4-5. Clearly, their objectives and targets are often different. Vietnam, a developing country, now is focusing strongly on building and infrastructure, thus a lot of capital and new technology as well as international management ability are required. This is completely consistent with the preliminary results of pilot interviews. Therefore, the main objectives of local partners in Vietnam are to improve financial capability, application of new technologies, and improve management ability.

Additionally, in the current status, foreign companies have realized that Vietnam be a potential market with strong development. The main difficulties are however, they are not familiar with Vietnamese culture and law. The legal and institutional frameworks for the Vietnamese construction industry are problematic. Hence, a foreign partner can decrease its risks by selecting its local partner carefully to improve understanding about Vietnamese culture and law.

The goals of construction joint venture in Vietnam consist of two types: separate objectives and mutual objectives. Separate objectives mean that only one of the partners gets benefits, whereas mutual objectives mean that both partners earn benefits. According to these results, the main objectives of the local companies are to increase the finance, enhance management capacity, and learn new technology. In contrast, foreign companies would like to have easy approval procedures which all of the respondents mentioned in this interview. It implies that the foreign partner in ICJVs in Vietnam were most concerned about cultural, the legal and institutional framework, whereas the Vietnamese partner expected a good management capacity, increased financial. Particularly, foreign company (VJ) emphasized that “long-term cooperation for the future” is their most important goal.

Throughout Table 4-5, risks-sharing, expanding construction market, and increasing competition, and technology transfer were the similar mutual objectives of three ICJV companies. Clearly defined objectives of partners during the lifecycle of ICJV projects could avoid unnecessary conflicts (Gale and Luo, 2004). Moreover, significant differences in the goals of ICJVs may lead to the failure of the projects. Thus, the strategic objectives of ICJVs must to identify before the operation of projects.

Table 4-5 Goals of ICJV partners in Vietnam

Joint Venture Company		Local company	Foreign company
1. Vietnam – Japan Joint Venture Co., Ltd (VJ)	Separate objectives	- Learning technology - Profit - Increasing management capacity - Improving machinery	- Procedures - Creating more relationships - Getting more projects - Law, political - Cultural - Low-cost labor
	Mutual objectives	- Sharing risks - Expanding construction market - Increasing competition - Knowledge transfer	
2. Vietnam – Taiwan Joint Venture Co., Ltd (VT)	Separate objectives	- Increasing management capacity - Increasing finance - Learning technology	- Procedures - Political, cultural - Law
	Mutual objectives	- Sharing risks - Increasing investment efficiency - Expanding construction market - Knowledge transfer	
3. Vietnam – Korea Joint Venture Co., Ltd (VK)	Separate objectives	- Increasing finance - Management Capacity	- Procedures - Political, cultural - Law
	Mutual objectives	- Sharing risks - Expanding construction market - Increasing competition	

4.3 Structure of joint venture in Vietnam

Besides understanding the objectives of ICJVs partners, the structure, mode of operation and administration of the joint venture was also noted. As we know, the structures of joint venture are very complex. In fact, there is no clear definition of the types of JV.

According to Kobayashi et al. (2009) the administrative structures of ICJV that classify by tactical arrangement can be categorized into three major structures, including collaborated-operation structure (integrated joint venture), separated-operation structure (non-integrated joint venture), mixed-operation structure (combined joint venture). In addition, Prasitsom and Likhitrungsilp (2008) added single-partner operation structure in administrative structures of ICJV. It should be noted that the administrative structures in reality are the practices that were actually implemented by contractors, which were usually different from those officially stipulated in the JV agreements. Similarly, after analyzing the information from the respondents in Vietnam, we found that some different about the structures of ICJV organizations. Actually, the administrative structures are also complex based on the

original foundation of ICJV in Vietnam. As can be seen, the ICJV in Vietnam consists of two types: company-based ICJVs and project-based ICJVs.

Company-based ICJVs: The ICJV companies are established based on the company level. The partners will cooperate for a long time within constructing many construction projects. (VJ, and VT companies in Table 4-1)

Project-based ICJVs: the ICJV companies are established based on the specific project level. It means that when a project is completed, the ICJVs will end. (VK, VGN, and VS companies in Table 4-1)

The next following parts are some specific structure of three ICJV companies in Vietnam as shown in Figure 4-1, and Figure 4-2. Those are some basic administrative structures of ICJV organization in Vietnam.

(1) Vinata International Joint Venture Company

Vinata International JV Co., Ltd was established based on an ICJV contract between Vinaconex (Vietnam) and Taisei (Japan) where two firms agree to cooperate and bring together their resources and expertise to carry out construction projects. The share distribution between Vietnamese and Japanese companies was to be 30% (land and labour) and 70% (machinery and equipment), respectively. The Company has made great contributions to the country's development and modernization, playing an important role in such areas as construction, interior and fitting-out decoration, and construction equipment leasing. The structure of Vinata JV is shown in Figure 4-1, known as the coordination mechanism. In particular, it set up the executive board to manage the entire operations of the venture. Personnel of Japanese company specialized in terms of technology management and construction supervision. Meanwhile personnel of Vietnamese company hold less than as vice president, main project manager. Executive committee was responsible for employees, works and overall management. In addition, the company also has general affairs to serve the general management of construction projects. Members of general affairs were recruited for ICJV and did not have any relationship with any partners. Moreover, finance, profit and loss issues were determined by the overall performance of construction project and were allotted to each partner depended on its proportion of contribution. Therefore, according to classify by tactical arrangement of Kobayashi et al. (2009), the structure of Vinata International JV is integrated joint venture type (collaborated-operation structure). This administrative structure is a popular business structure of several construction contractors in Vietnam.

(2) Construction Joint Venture Phu My Hung Company

Phu My Hung JV was formed with function as an infrastructure development company for the new urban area in Hochiminh City. The Company was established as an ICJV between IPC (Vietnam) and CT&D Group (Taiwan) at the initial investment is 30% and 70%, respectively. The main objectives of ICJV were to build and develop a new modern city infrastructure. Through interviewing two respondents in this company, operational structure of the JV organization is very complex divided into many organizations and small parts as shown in Figure 4-2. Moreover, based on the previous research, the structure of the JV may be considered a mix-operation structure (combined joint venture) (Kobayashi et al., 2009; Prasitsom and Likhitrungsilp, 2011). As can be seen, this CJV structure is the combination between the collaborated-operation structure and the separated-operation structure. That is because multiple partners collaboratively perform some work packages, whereas the other work packages are assigned to individual partners. For example, the investment and development group done by the multiple partners, meanwhile the personnel of foreign contractors performed consulting and construction works. This administrative structure is a business structure of a few large construction contractors in Vietnam.

(3) Daewon – Thu Duc Joint Venture Company

Daewon – Thu Duc Joint Venture Company is a popular construction joint venture in Vietnam. This Company was established as an ICJV between Thu Duc House (Vietnam) and Korean Daewon Corporation (Korea) operating in the real estate service, business, and construction investment. As other construction investment joint venture, the initial structure of the company divided clearly the roles of each partners. For instance, the personnel of Daewon Company undertake the construction works and project management. Meanwhile, the personnel of Thu Duc House carry out the construction investment, all of the legal procedures related to construction and share profit and liability with the foreign company. Besides, the ICJV also recruited more employees for general affairs to serve the general management of construction projects.

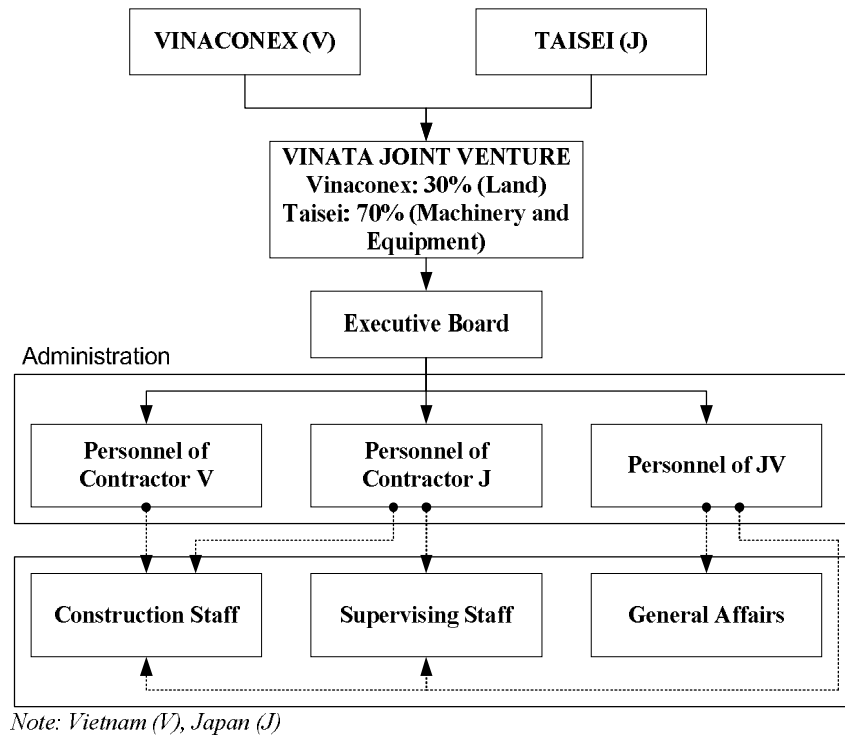


Figure 4-1 Structure of Vinata International JV Co., Ltd

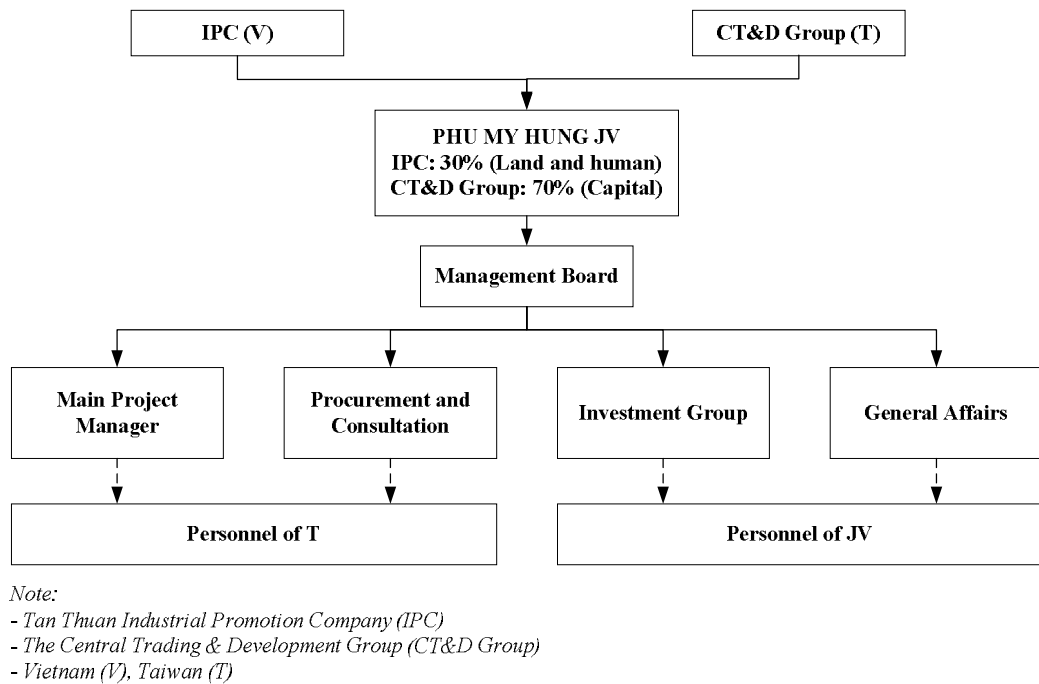


Figure 4-2 Structure of Construction Joint Venture Phu My Hung Co., Ltd

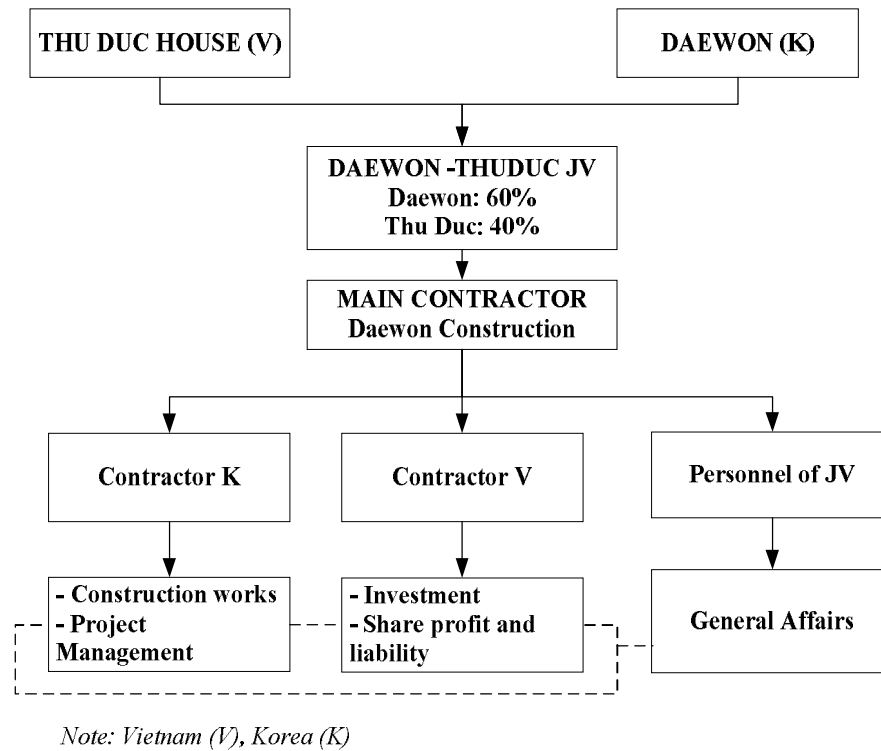


Figure 4-3 Structure of Daewon – Thu Duc Joint Venture Co., Ltd

4.4 Conclusion

According to the pilot interview, the overview of ICJVs in Vietnam was adopted based on information from the respondents. Firstly, it was found that the Vietnamese companies rarely carried out the risk management system. Moreover, the goals or objectives of ICJV partners were identified for three companies that associated in this research. As can be seen, risk sharing, expanding construction market, and increasing competition and technology transfer was the similar mutual objectives of these companies. The main objectives of the local companies are to increase the finance, to enhance management capacity, and learn technology. In contrast, foreign companies would like to have easy procedures and understanding the cultural of Vietnam. Finally, three examples of structure of ICJVs in Vietnam were analyzed in this research.

CHAPTER 5

RISK IDENTIFICATION FOR ICJVs IN VIETNAM

This chapter explores and assesses risk factors affecting ICJVs in Vietnam. The first part identifies risk factors associated with the operation of ICJVs in Vietnam. The second part presents the ranking of risk factors based upon the likelihood of occurrence and impact of the risks. The chapter then concludes with the critical risk factors that affect the performance of ICJVs in Vietnam.

5.1 Risk factors in ICJV projects in Vietnam

5.1.1 Data analysis

The pilot interview was used to gather information from the respondents about risk factors related to the ICJVs. The information from this interview and literature review was then used to set up a list of risk factors influencing ICJVs in Vietnam. Finally, questionnaire survey would be established to explore the probability, impact of risk factors and to rank prioritize risk of ICJV in Vietnam. In this research, the hierarchy risk breakdown structure (HRBS) technique was used as shown in Figure 5-2 to identify the risk factors of the ICJV in Vietnam. A risk coding system, as shown in Figure 5-1, was developed to help organize all of the risk factors. Table 5-1 lists 47 risk factors affecting ICJVs. Through the literature review and the interviews, these risk factors can be categorized into three main groups, including internal risks, project risks and external risks.

(1) Internal risks (I) include the risk factors in ICJV itself, which were subdivided into partners-related and ICJV-related risks.

Partners-related risks: there are five risk factors related to partners of ICJV organizations. Risk factors in this category are caused from partner companies (parent companies). Examples are partner's parent company in financial problems (I1.1), Policy changes in your partner's parent company toward ICJV (I1.2), over-interference by parent company of either partner (I1.3), change of organization within local partner (I1.4), and partner's lack of management competence and resourcefulness (I1.5).

ICJV-related risks: are the risk factors associated with initial of ICJV organizations. This category is very popular in ICJV projects and has more important impact implementation of ICJV projects in Vietnam. There are seven risk factors in this category, such as disagreement on allocation of staff positions and works (I2.1, I2.2); technology transfer dispute (I2.3), breach of contracts by ICJV partner (I2.4),

poor relation and disputes with partner (I2.5), inadequate ICJV organization structure (I2.6), and poor relation with government departments (I2.7).

(2) Project risks (P) include the risk factors related to the performance of project, which were subdivided into five subcategories: organization, management, technical, contract, and design risks.

Organization risks are the risks related to organization of ICJV projects. Poor project relationship (P1.1); excessive demands and variation by client (P1.2); and problems due to partners' different practice are adverse factors cited in the previous research.

Management risks concern factors or issues caused by project management. They consist of incompetence of subcontractors/suppliers, project management team (P2.1, P2.6); improper project feasibility, project planning and budgeting, selection of project location, type (P2.2, P2.3, P2.4), and inadequate project organization structure (P2.5).

Technical risks are the risk factors that related to technical of ICJV projects. Accidents on site (P3.1), equipment failure (P3.2), materials shortage (P3.3), shortage in skillful workers (P3.4) are the common technical problems in ICJV projects.

Design risks are the common risk factors in construction projects as well as ICJV projects. They may be caused by designers, drawings, or technical specification (P4.1, P4.2, and P4.3).

Contract risks are the risk factors associated with contract of ICJV projects. The contract problems consist of two factors, including disagree some conditions of contract (P5.1), and incomplete contract terms (P5.2).

(3) External risks (E) refer to the risk factors related to external environment, which were subdivided into four subcategories: legal and political, social, economic, and force majeure risks.

Legal and political risks are the external factors that related to legal and political of Vietnam. They may be caused by import restriction, lack of legal judgement, insufficient law, government policies changes, and political changes (E1.1 to E1.5)

Social risks concern risk factors or issues associated with social situation of Vietnam, such as security problems (E2.1), language barrier (E2.2), different culture (E2.3), corruption and bribery (E2.4), late approvals (E2.5), and worker strike (E2.6).

Economic risks are external risk factors that have more effect to implementation of ICJV projects. They may be caused by economy fluctuation, exchange rate, inflation, fluctuation of interest rate (E3.1 to E3.4)

Force majeure risks are the natural problems such as environmental pollution (E4.1), and force majeure (rain, flood, and earthquake) (E4.2).

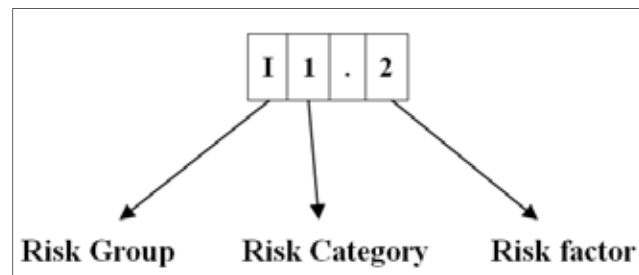


Figure 5-1 Definition of risk code system

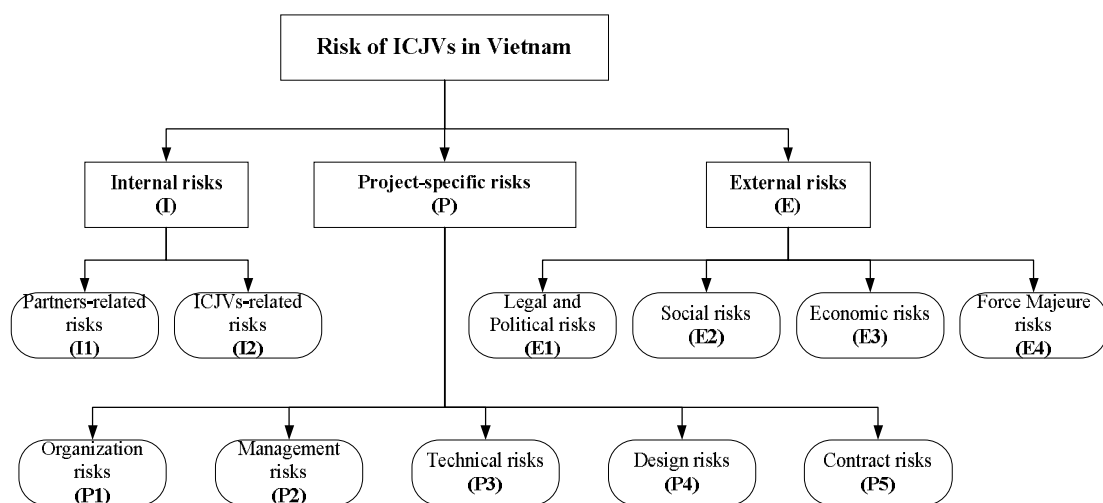


Figure 5-2 Hierarchical risk breakdown structure (HRBS) for ICJVs in Vietnam

The respondents subjectively assessed the probability and the degree of impact of all the risk factors previously identified. Table 5-2 shows top-20 risk factors having high probability and those having high impact. As can be seen, several risk factors had high degree of probability and impact. Examples are loss due to fluctuation of interest rate (E3.4), inflation (E3.3), design changes (P4.1), incompetence of subcontractors/suppliers (P2.1), and partner's parent company in financial problems (I1.1). The sources of these risk factors include economic conditions, design, management problems, and financial aspects of parent partners.

However, several risk factors had high probability but low impact and vice versa. For example, the breach of contracts by JV partners (I2.4) and improper project planning and budgeting (P2.3), which had low probability, had very high impact. On the contrary, language barrier (E2.2) and different social, culture, and religious attributes (E2.3) were recognized as having high probability, but their impacts were quite low.

Table 5-1 Risk groups, risk categories, and risk factors of ICJVs in Vietnam

Risk groups	Risk categories	ID	Risk factors
Internal risks	Partners	I1.1	Partner's parent company in financial problems
		I1.2	Policy changes in your partner's parent company toward ICJV
		I1.3	Over-interference by parent company of either partner
		I1.4	Change of organization within local partner
		I1.5	Partner's lack of management competence and resourcefulness
	ICJVs	I2.1	Disagreement on allocation of staff positions in ICJV
		I2.2	Disagreement on allocation of works
		I2.3	Technology transfer dispute
		I2.4	Breach of contracts by ICJV partner
		I2.5	Poor relation and disputes with partner
		I2.6	Inadequate ICJV organization structure
		I2.7	Poor relation with government departments
	Project risks	Organization	P1.1
P1.2			Excessive demands and variation by client
P1.3			Problems due to partners' different practice
Management		P2.1	Incompetence of subcontractors/suppliers
		P2.2	Improper project feasibility study
		P2.3	Improper project planning and budgeting
		P2.4	Improper selection of project location, type
		P2.5	Inadequate project organization structure
		P2.6	Incompetence of project management team
Technical		P3.1	Accidents on site
		P3.2	Equipment failure
		P3.3	Materials shortage
		P3.4	Shortage in skillful workers
Design		P4.1	Design changes
		P4.2	Errors in design drawings
		P4.3	Incomplete drawing and technical specification
Contract		P5.1	Disagree some conditions of contract
	P5.2	Incomplete contract terms with partner	
External risks	Legal and Political	E1.1	Import restriction
		E1.2	Lack of enforcement of legal judgment
		E1.3	Loss due to insufficient law for joint ventures
		E1.4	Cost increase due to changes of policies
		E1.5	Loss incurred due to political changes
	Social	E2.1	Security problems
		E2.2	Language barrier
		E2.3	Different social, culture, and religious attributes
		E2.4	Loss incurred due to corruption and bribery
		E2.5	Loss due to bureaucracy for late approvals
		E2.6	Worker strike
	Economic	E3.1	Economy fluctuation
		E3.2	Exchange rate
		E3.3	Inflation
		E3.4	Loss due to fluctuation of interest rate
	Force Majeure	E4.1	Pollution, weather
		E4.2	Force majeure (rain, flood, earthquake)

Once the probability and the impact of all risk factors had been assessed by the survey, they were used to calculate the risk level factor (RF) of each risk factor. Figure 5-3 displays the risk contour diagram of all 47 risk factors, which were divided into three zones, namely, the high-risk level, the medium-risk level, and the low-risk level. Table 5-3 shows the ranking of all risk factors, and Figure 5-4 shows risk distribution on rank order. Moreover, the ranking of risk factors is displayed in Appendix B2 to show the order in each risk group. Throughout the preliminary results, risk factors affecting the ICJVs in Vietnam were evaluated in enormous impact level to the performance of the success and failure of projects. Indeed, the results are shown by up to 12 major risk factors in high-risk level, 35 risk factors in the medium-risk level and without any low risk factors. It implies that the level of risk factors affecting ICJVs is very high. Therefore, a large-scale study is very necessary to cope with these statuses.

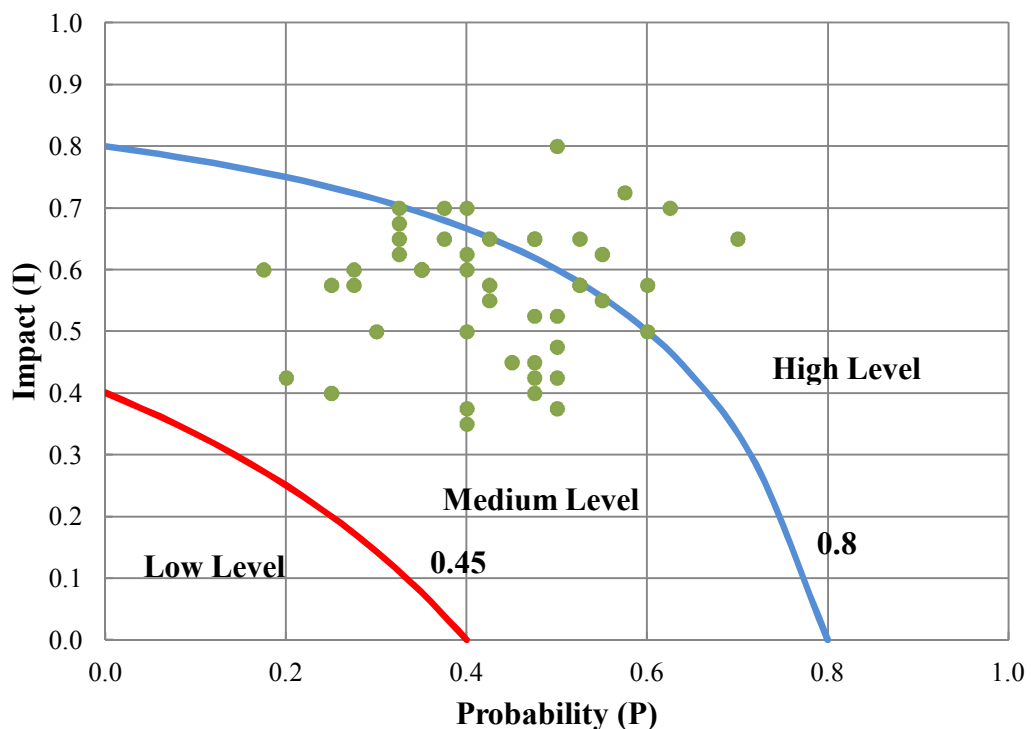


Figure 5-3 Risk contour diagram of the pilot results

Table 5-2 Risk factors with high probability or high impact

Rank	ID	Risks with high probability	Mean	Rank	ID	Risks with high impact	Mean
1	E3.4	Loss due to fluctuation of interest rate	0.70	1	I1.1	Partner's parent company in financial problems	0.80
2	E3.3	Inflation	0.63	2	P2.1	Incompetence of subcontractors/suppliers	0.73
3	P4.1	Design changes	0.60	3	E3.3	Inflation	0.70
4	P1.3	Problems due to partners' different practice	0.60	4	P2.5	Inadequate project organization structure	0.70
5	P2.1	Incompetence of subcontractors/suppliers	0.58	5	P2.6	Incompetence of project management team	0.70
6	P3.3	Materials shortage	0.55	6	I2.4	Breach of contracts by ICJV partner	0.70
7	E3.2	Exchange rate	0.55	7	P2.3	Improper project planning and budgeting	0.68
8	P1.2	Excessive demands and variation by client	0.53	8	P2.2	Improper project feasibility study	0.65
9	E3.1	Economy fluctuation	0.53	9	E3.4	Loss due to fluctuation of interest rate	0.65
10	E1.4	Cost increase due to changes of policies	0.53	10	E3.1	Economy fluctuation	0.65
11	I1.1	Partner's parent company in financial problems	0.50	11	I1.2	Policy changes in your partner's parent company toward ICJV	0.65
12	P4.2	Errors in design drawings	0.50	12	E1.3	Loss due to insufficient law for joint ventures	0.65
13	P4.3	Incomplete drawing and technical specification	0.50	13	I1.3	Over-interference by parent company of either partner	0.65
14	E2.2	Language barrier	0.50	14	P3.1	Accidents on site	0.65
15	E2.3	Different social, culture, and religious	0.50	15	P3.3	Materials shortage	0.63
16	I1.2	Policy changes in your partner's parent company toward ICJV	0.48	16	E1.1	Import restriction	0.63
17	P3.4	Shortage in skillful workers	0.48	17	I2.7	Poor relation with government departments	0.63
18	I1.4	Change of organization within local partner	0.48	18	P5.1	Disagree some conditions of contract	0.60
19	E1.3	Loss due to insufficient law for joint ventures	0.48	19	E1.2	Lack of enforcement of legal judgment	0.60
20	I2.1	Disagreement on allocation of staff positions in ICJV	0.48	20	I1.5	Partner's lack of management competence and resourcefulness	0.60

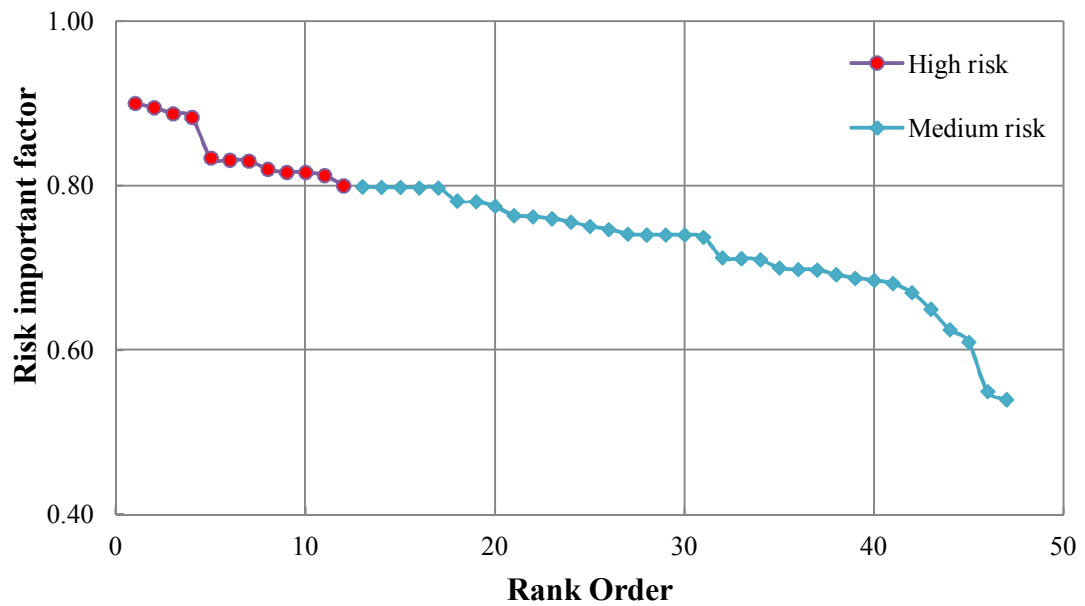


Figure 5-4 Risk distribution on rank order

Table 5-3 Ranking ICJV risk factors in Vietnam

Rank	ID	Risk factors	Probability of risks					Impact of risks					RF = P + I - P.I
			0	0.2	0.4	0.6	0.8	1	0	0.2	0.4	0.6	
High risk factors													
1	I1.1	Partner's parent company in financial problems	0.50					0.80					0.900
2	E3.4	Loss due to fluctuation of interest rate	0.70					0.65					0.895
3	E3.3	Inflation	0.63					0.70					0.888
4	P2.1	Incompetence of subcontractors/suppliers	0.58					0.73					0.883
5	E3.1	Economy fluctuation	0.53					0.65					0.834
6	P3.3	Materials shortage	0.55					0.63					0.831
7	P4.1	Design changes	0.60					0.58					0.830
8	P2.5	Inadequate project organization structure	0.40					0.70					0.820
9	I1.2	Policy changes in your partner's parent company toward ICJV	0.48					0.65					0.816
10	E1.3	Loss due to insufficient law for joint ventures	0.48					0.65					0.816
11	P2.6	Incompetence of project management team	0.38					0.70					0.813
12	P1.3	Problems due to partners' different practice	0.60					0.50					0.800

5.1.2 Reliability analysis of pilot test

To check the reliability of each items asked in each group of risk factors, the Cronbach Alpha scores for the group. The obtained Alpha scores of internal risk, project risk, and external risk groups were calculated by SPSS of 0.876, 0.954, and 0.891, respectively (Appendix B1). We found that the Cronbach Alpha coefficient of each group higher than 0.8 which indicates that the scale has high internal consistency. Considering the reliability table of the project risk factors group as shown in Table 5-4, under the “Cronbach’s Alpha if Item deleted” the reliability of 0.954 is the highest, so it is not necessary to delete any of the items to improve the reliability score of this scale.

Table 5-4 Reliability statistics for project risk factors group

Reliability statistics				
Cronbach's Alpha	N of items			
.954	18			
Item-total statistics				
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Poor project relationship	7.550	7.209	.637	.954
Excessive demands and variation by client	7.425	7.565	.040	.958
Problems due to partners' different practice	7.350	7.209	.637	.954
Incompetence of subcontractors/suppliers	7.375	6.308	.925	.948
Improper project feasibility study	7.625	6.525	.784	.951
Improper project planning and budgeting	7.625	6.754	.927	.949
Improper selection of project location, type	7.675	6.554	.978	.948
Inadequate project organization structure	7.550	6.763	.616	.954
Incompetence of project management team	7.575	6.148	.973	.947
Accidents on site	7.575	6.148	.973	.947
Equipment failure	7.550	6.740	.844	.950
Materials shortage	7.400	6.697	.789	.951
Shortage in skillful workers	7.475	7.296	.394	.956
Design changes	7.350	7.026	.670	.953
Errors in design drawings	7.450	7.734	-.269	.961
Incomplete drawing and technical specification	7.450	6.740	.721	.952
Disagree some conditions of contract	7.550	6.100	.934	.948
Incomplete contract terms with partner	7.600	6.606	.881	.949

5.2 Analysis results of pilot study

5.2.1 Risk group 1: Internal risk factors

(a) Partner-related risks

Among the 12 risk factors in the high level presented in Table 5-3, there were two risk factors from this category. The financial problem of the partner's parent company (I1.1) was the most critical risk with the probability of 0.50, the impact of 0.80 (highest), and the RF of 0.9. Another risk was the policy changes in partner's parent company toward ICJV (I1.2), which was in the ninth rank. The financial status of the ICJV partner's parent company is the most concerned issue in Vietnam. This is because it is currently affected by complex situation of inflation and high interest rates, which is a major challenge for managing any company and project. Thus, the strong financial status of ICJV partner's parent company is considered the top priority for both owner and contractor.

Additionally, the change of the parent company's policy has also plagued ICJV project management. The policies of an ICJV agreement usually involve the contribution of resources, technology, and management from parent companies to ICJVs. Actually, the policy changes often adjust to fit the new situation, such as limit of autonomy, contribute not high-qualified staff, and delay required funds (Bing et al., 1999). Once the parent company's policy changes, support for the ICJV could be diminished and it would cause difficulties for the ICJV's operation.

(b) ICJVs-related risks

Throughout the results of the pilot test, risks related to the operation of ICJVs were rated relatively important. In fact, the degree of risk factors (RF) of breach of contracts by ICJV partner (I2.4), inadequate ICJV organization structure (I2.6), poor relation with government departments (I2.7), and poor relation and disputes with partner (I2.5) were higher than 0.74. The underlying causes of these risk factors are ICJV partners without familiar in works and previous relationship. Complex organization structure of ICJVs is also a major source of the problems, these led to poor relation and disputes among the partners. Actually, in the previous analysis in Vietnam, the organization structures of ICJVs are very complex, and the ICJV contract is not clear among the partners. Thus, immaterial and material breach of contracts is the ending results indicate the unsuccessful of ICJV.

5.2.2 Risk group 2: Project risk factors

(a) Organization and Management risks

Among the 12 critical risk factors, four risk factors in this category, namely, incompetence of subcontractors and suppliers (P2.1), inadequate project organization structure (P2.5), incompetence of project management team (P2.6), and the problems due to partners' different practice (P1.3), were ranked 4th, 8th, 11th, and 12th, respectively. The basic cause of these risk factors is incompetent management of ICJVs in Vietnam. The ICJV projects are usually very large and complex. A large number of parties, including contractors, subcontractors, and nominated subcontractors/suppliers are associated with the projects. The relationship and information stream among the participants are very complicated. Thus, inadequate and incompetent coordination among parties is a major cause of the problems. Since inequity and fraud in the bidding process is a very common problem in Vietnam (Long et al., 2004), the contracts were often awarded to incompetent contractors. In addition, unfamiliar cooperation between contractors and nominated contractors may cause the difficulty in managing projects. Therefore, the participants executing ICJV projects need to be prepared to face this problem.

(b) Design and Technical risks

Materials shortage (P3.3) was so critical that it was the sixth rank in the list. There are many sources of this risk, including financial problems of the owners, change orders, and the incompetence of project management team. Hence, long-term planning, to avoid the effects of material shortage due to increased cost of material, especially materials imported from abroad, is essential for completing projects on time without cost overrun.

Design changes (P4.1), the seventh rank, were also a critical risk factor of ICJV. In Vietnam, the projects must often face with risks related to design changes, especially the projects implemented by ICJVs. It is logical that design changes were rated as high probability and high impact. To mitigate this risk factor, it is necessary to enhance the capability and qualification of designers and project management teams.

(c) Contract risks

Risk factors in contract category, including disagree some conditions of contract (P5.1) and incomplete contract terms (P5.2) should be paid attention to ICJV projects, although these factors were ranked 23rd and 30th, respectively. Normally, the contract would be drafted by the parties before and negotiation later. However, the foreign companies have more experience in implementing within international contracts, and local companies have many shortcomings because of the limit of experience and language skill. In the construction process, the local companies often take responsibility with risks caused by conflicts between the parties on the contract terms.

The main deficiency leads to relatively high risk factors for local partners. Thus, the local partners should have the staff with bilingual languages, and legal experts check carefully the specific requirements of contract agreement. In addition, foreign companies must also draft the consistent contract in accordance with working conditions, culture, law, and regulations in Vietnam.

5.2.3 Risk group 3: External risk factors

(a) Legal and political risks

Loss due to insufficient law for joint ventures (E1.3) was also the critical risk (the tenth rank). Indeed, the Vietnamese legal system and regulations are very complicated (Long et al., 2004), and some of them contradict with each other. It is therefore very difficult to deal and comply throughout the regulations, especially JV laws.

(b) Economic conditions risks

Among the 12 high-level risks of ICJVs in Vietnam, there are three risk factors in the economic category: loss due to fluctuation of interest rate (E3.4), inflation (E3.3), and economy fluctuation (E3.1), which were in the second, third, and fifth ranks, respectively. These factors could have a great impact on the profit or loss of the participants in ICJVs (Bing et al., 1999). The nation's inflation rate recently increased to 13.29% for the first six months in 2011, which enormously affected the prices of all construction resources. Additionally, high inflation also contributes to the fluctuation of interest rates. In Vietnam, the high inflation and the fluctuation of interest rates led to the crisis in the construction industry. Unfortunately, these risk factors were considered macroeconomic conditions and are impossible to avoid. The Vietnamese government is trying to resolve these problems to avoid an economic crisis as same as in 2008.

(c) Social risks

According to respondents' point of views in the current situation, social risk factors were mentioned less important than economic and management issues. However, these factors cannot be underestimated, these probability, impact and these degree in this results were evaluated not so small. Social risk factors consist of security problems (E2.1), language barrier (E2.2), different social, culture, and religious (E2.3), corruption and bribery (E2.4), late approvals (E2.5) and worker strike (E2.6). The first problem is different culture, social and religious. According to Hofstede and Hofstede (2005), different culture led to difference in the management models and the different opinions of organization cultures. Thus, this factor can affect some areas of ICJV such as the national culture and organizational culture. The different culture can cause major problems to the operation of ICJV. The following problem is the language barrier. In fact, English language skills of engineers and workers in Vietnam

are quite poor. Therefore, the communication among members of parties is quite difficult and its cause affect significantly on management performance.

(d) Force majeure risks

Force majeure category consists of two risk factors such as environmental pollution (E4.1) and force majeure (rain, flood, and earthquake) (E4.2). Force majeure is impossible to avoid but can predictable. The degree of its risk was 0.71 (medium-high degree). Indeed, Vietnam's climate is very complicated because of the effect of rain, storm, and flood. The construction work could be disrupted, and the projects progress could be delayed. Thus, it is very necessary to establish the pre-project planning or contingency plan to cope with this problem.

Environmental pollution factor evaluated with the low medium of risk degree was ranked 46 out of 47 risk factors. According to the respondents' opinions, the construction work in Vietnam has not been underestimated on the impact and consequence on the environment. This risk factor was not considered a major factor affecting the operation of ICJV projects. However, negative impacts on environment of construction have led to air, water, and noise pollution in urban and industrial centers.

5.3 Conclusion

Throughout pilot survey, 47 risk factors affecting ICJVs in Vietnam have been identified. These risk factors were divided into three main groups, namely, internal risks (12 factors), project risks (18 factors), and external risks (17 factors). The risk factors of the ICJVs in Vietnam were extremely critical. According to the assessment of critical risk factors, it was found that the critical risk factors having high-risk level were partner's parent company in financial problems, subcontractors/ suppliers, management issues, economic conditions, corruption and bribery, and lack of the law on ICJV. The financial and management issues were critical factors that have an enormous impact on the success or failure of ICJV. The JV law is also a critical issue that needs to be addressed thoroughly, especially the foreign company. Moreover, the respondents indicated that political, security problems and environment pollution had low affecting the ICJV projects in Vietnam.

CHAPTER 6

RISK ASSESSMENT FOR ICJVs IN VIETNAM

This chapter presents the analysis of the source-effect (SE) of risk factors and assessment of risk factors that affect international construction joint ventures (ICJVs) in Vietnam. The first part describes the respondents' profile of large-scale survey. The second part presents the sources of risk factors and assesses the risks that have an impact on the objectives of ICJV projects. The last part presents results of risk assessment and development trends of risk factors throughout three stages of ICJVs in Vietnam.

6.1 Respondents' profile

The 15 respondents that participated in this research were or are currently ICJV partners with foreign contractors. They were line managers, project managers, and site engineers in major cities in South of Vietnam, including Hochiminh, Dong Nai, Binh Duong, and Vung Tau. They were asked to assess the likelihood of occurrence and the impact of each risk factor. In addition, they were requested to specify and deliberate their risk response measures for each risk factor. Table 6-1 shows the respondents' profile of the ICJVs that participated in the survey.

According to the respondent's profile, 14 respondents (93.3%) had experience in construction more than five years. This is consistent with the purpose of this study, which focuses on the project manager and line manager with many years experience in the construction industry.

Most of the respondents (66.7%) worked for main contractors, subcontractors, and consultants and five respondents (33.3%) worked as consultants for clients. Thus, the large-scale survey covered main stakeholders of the ICJV projects, namely, main contractors, subcontractors, and consultants, all of which directly involved from the initial stage to project completion. Among the projects in this study, 73.3 % were civil projects and 26.7% were industrial projects.

Similar to the results from the pilot interviews, the respondents agreed that risk management is very important for the construction joint venture and the construction industry. As shown in Table 6-2, all respondents were aware of risk management, 66.7 percentages of the respondents considered that they have good awareness about risk management system. However, they have noted that the Vietnamese companies rarely implemented risk management system. Therefore, these are the huge matter of Vietnamese construction industry today; practical risk management system has not been widespread and regular used. In Table 6-2, the proportions of the respondents who considered that risk management be necessary and very necessary are 46.7% and

53.3%, respectively. It also showed that the construction companies in Vietnam just have a little experience about risk management. Risk management system is primarily based on experience learned from the previous projects, and general management skills.

Table 6-1 Respondents' profile

Category	Respondents	
	Number	%
<i>1. Years of experiences</i>		
3-5 years	1	6.7
5-10 years	8	53.3
>10 years	6	40.0
<i>2. Role</i>		
Main contractor	6	40.0
Subcontractor	1	6.7
Consultant	3	20.0
Owner	5	33.3
<i>3. Position</i>		
Directors	2	13.3
Deputy directors	0	0.0
Project managers	8	53.3
Supervisors	5	33.3
Engineers/Architects	0	0.0
<i>4. National</i>		
Singapore	3	20.0
Korea	1	6.7
Japan	4	26.7
China	3	20.0
Other	4	26.7
<i>5. Type of project</i>		
Civil	11	73.3
Construction industry	4	26.7

Table 6-2 Perception of risk management

Category	Respondents	
	Number	%
<i>1. Perception of risk management</i>		
Unknown	0	0.0
Heard of it	5	33.3
Known	9	60.0
Know very well	1	6.7
<i>2. Necessary of risk management</i>		
Unnecessary	0	0.0
Necessary	7	46.7
Very necessary	8	53.3

6.2 Analyzing source-effect of risk factors

6.2.1 Source-effect of risk factors

The determination of SE of risk factors is an essential task to understand known and unknown risk factors. If either of these risk factors occurs, there may have an adverse impact on project cost, time, or performance. Thus, throughout SE of risk factors, project managers could reduce the likelihood of occurrence of risk factors. Similarly, the effect of these factors can be reduced. In addition, SE of risk factors is a main part of risk profile for ICJV projects and is useful information for the ICJVs organizations to apply to the other similar projects in the future.

In this research, the Hierarchy Risk Breakdown Structure (HRBS) were used to identify the risks in ICJVs such as risk groups, risk categories, and risk factors. From the viewpoints of the respondents in the large-scale survey, the construction activities of ICJVs are associated with many risks, which depend upon organizations, country, contracts, and business measures applied. However, the key sources of such risk factors organized into categories are essentially the same, such as partners-related and ICJV-related risks, organization, management, technical, contractual, economic, and force majeure risks (Shen et al., 2001; Smith et al., 2006; Sameh, 2007). Through the process of reviewing the SE of risk as shown in Figure 6-1, detailed SE of risk factors is described in Appendix B3. Some SE of critical risk factors is shown in Table 6-3 (source of risk factors) and Table 6-4 (important impact of risk factors).

As can be seen, each risk factor may be caused by many sources. For example, in Table 6-3, there are many sources of *partner's parent company in financial problems* (I1.1), namely, *partner selection via broker and middleman, investment policy changed by shareholders, subsidiary loan company; and change of interest rate, economic fluctuation*. Indeed, some respondents emphasized that selecting the partners through broker and middleman without survey might lead to choose the incompatible partner (financial problems). In addition, fluctuation of economic and interest rate might affect directly to partner's parent company finance, and mostly in ICJV projects. The ICJV professionals then make a suitable plan to deal with these factors.

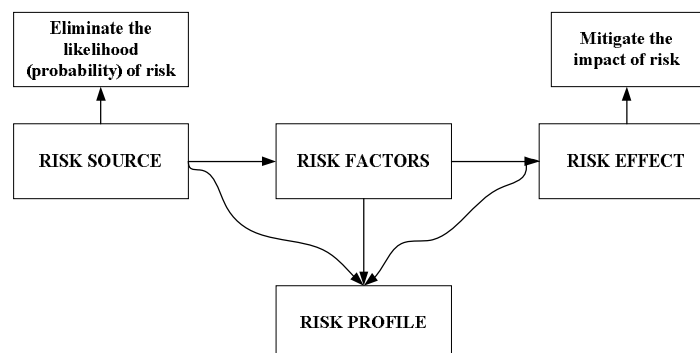


Figure 6-1 Source-effect of risk process

Table 6-3 Sources of some risk factors in ICJV projects

No.	ID	Risk factors	Source of risk
1	II.1	Partner's parent company in financial problems	- Inappropriate financial structure of ICJV - Investment policy changed by shareholders - Loaning from subsidiary company - Change of interest rate - Economic fluctuation - Partner selection via broker and middleman
2	II.2	Policy changes in your partner's parent company toward ICJV	- Policy changes in the partner's parent company - Unfamiliarity with the collaboration process, unclear terms and conditions in contract agreement - Alteration of construction market
3	P1.3	Problems due to partners' different practice	- Unfamiliarity in work and coordination with other contractors - Different experience of partners
4	P2.1	Incompetence of subcontractors/suppliers	- Lack of expertise and capability of subcontractors/suppliers - Coordination problems of prime contractor - Nominated subcontractors - Problems among subcontractors suggested by foreign and local contractor and vice versa
5	P2.5	Inadequate project organization structure	- Incompetent management - Very large and complex ICJV projects - A large number of parties
6	P2.6	Incompetence of project management team	- Lack of experience
7	P3.3	Materials shortage	- Low quality of materials - Import restriction - Lack of warehouse - Precious materials - Problems of transportation and warehouse
8	P4.1	Design changes	- Unclear requirements by client - Redesign - Incompatibility between design and site conditions - Incomplete drawing and specification - Unclear project objectives - Inappropriate feasibility study and lack of experience in feasibility study
9	E1.3	Loss due to insufficient law for joint ventures	- Policy change by government - Tax law and royalty change - Underdeveloped country - Political disturbance - Inconsistency of government policy - Economic situation - Corruption - Unfamiliarity with local law - Lack of experienced lawyer - Lack of working experience in country
10	E3.1	Economy fluctuation	- Payment eroded by inflation
11	E3.3	Inflation	- Instability of economy
12	E3.4	Loss due to fluctuation of interest rate	- Strong inflation - Misguided policies of the government - Unbalanced macroeconomics

6.2.2 Impacts of risk on the objectives of ICJV projects

The identification of risk is normally performed before the project begins, and a number of project risks will increase as the project proceeds. Once risk is identified, it should then be evaluated to assess the probability of its occurrence and its impact on cost, schedule, scope, and quality. Besides, risk factors can affect an objective, and others may affect the project in multiple objectives. As can be seen, Table 6-4 shows the significant impact of such risk factors on the objectives of ICJV projects. The third, fourth, fifth and sixth column presents the number of respondents had chosen the significant effect to time, cost, quality, and scope according to each risk factor. In this research, if the percentage of the respondents replied that risk factor had a major impact on the project objectives, are greater than 20% (more than three respondents in a total of respondents). In practice, its percentage depends on size of project, budget, and types of risk factors.

Consequently, the results of significant impact of risk factors on objectives of ICJV projects were established in Table 6-4. Finally, risk factors together with their recognized SE on ICJV project objectives are as shown in Appendix B3.

Table 6-4 Significant impact of risk on objectives of ICJV projects

<i>Time (T); Cost (C); Quality (Q); Scope (S)</i>									
Risk factors		Important impact (15 Respondents)				Important impact (Conclusion)			
		T	C	Q	S	T	C	Q	S
1. Internal risk factors									
I1.1	Partner's parent company in financial problems	15	15	10	12	x	x	x	x
I1.2	Policy changes in your partner's parent company toward ICJV	15	10	0	1	x	x		
I1.3	Over-interference by parent company of either partner	15	11	3	6	x	x		x
I1.4	Change of organization within local partner	13	10	1	0	x	x		
I1.5	Partner's lack of management competence and resourcefulness	15	13	10	2	x	x	x	
I2.1	Disagreement on allocation of staff positions in ICJV	15	4	1	0	x	x		
I2.2	Disagreement on allocation of works	15	5	2	0	x	x		
I2.3	Technology transfer dispute	13	12	11	0	x	x	x	
I2.4	Breach of contracts by ICJV partner	15	15	6	11	x	x	x	x
I2.5	Poor relation and disputes with partner	13	8	0	0	x	x		
I2.6	Inadequate ICJV organization structure	13	15	13	0	x	x	x	
I2.7	Poor relation with government departments	15	14	0	0	x	x		

Table 6-4 (cont.)

<i>Time (T); Cost (C); Quality (Q); Scope (S)</i>									
Risk factors		Important impact (15 Respondents)				Important impact (Conclusion)			
		T	C	Q	S	T	C	Q	S
2. Project risk factors									
P1.1	Poor project relationship	15	9	0	0	x	x		
P1.2	Excessive demands and variation by client	15	15	9	4	x	x	x	x
P1.3	Problems due to partners' different practice	15	7	13	0	x	x	x	
P2.1	Incompetence of subcontractors/suppliers	15	15	15	3	x	x	x	
P2.2	Improper project feasibility study	15	15	1	15	x	x		x
P2.3	Improper project planning and budgeting	15	14	6	0	x	x	x	
P2.4	Improper selection of project location, type	12	15	5	7	x	x	x	x
P2.5	Inadequate project organization structure	13	13	3	0	x	x		
P2.6	Incompetence of project management team	15	14	8	2	x	x	x	
P3.1	Accidents on site	15	15	6	0	x	x	x	
P3.2	Equipment failure	11	15	7	0	x	x	x	
P3.3	Materials shortage	14	14	4	0	x	x	x	
P3.4	Shortage in skillful workers	13	9	15	0	x	x	x	
P4.1	Design changes	14	15	3	11	x	x		x
P4.2	Errors in design drawings	15	13	5	0	x	x	x	
P4.3	Incomplete drawing and technical specification	15	13	10	0	x	x	x	
P5.1	Disagree some conditions of contract	15	15	0	0	x	x		
P5.2	Incomplete contract terms	15	13	7	0	x	x	x	
3. External risk factors									
E1.1	Import restriction	14	13	6	0	x	x	x	
E1.2	Lack of enforcement of legal judgment	15	9	0	4	x	x		x
E1.3	Loss due to insufficient law for joint ventures	13	14	0	0	x	x		
E1.4	Changes of government policies	2	15	0	0		x		
E1.5	Loss incurred due to political changes	9	15	0	0	x	x		
E2.1	Security problems	15	14	5	0	x	x	x	
E2.2	Language barrier	13	2	3	0	x			
E2.3	Different social, culture, and religious	15	3	4	0	x		x	
E2.4	Loss incurred due to corruption and bribery	15	15	9	0	x	x	x	
E2.5	Loss due to bureaucracy for late approvals	15	14	0	0	x	x		
E2.6	Worker strike	15	14	6	0	x	x	x	
E3.1	Economy fluctuation	13	15	0	0	x	x		
E3.2	Exchange rate	8	15	0	0	x	x		
E3.3	Inflation	12	15	0	0	x	x		
E3.4	Loss due to fluctuation of interest rate	10	15	0	0	x	x		
E4.1	Environmental pollution	15	12	2	3	x	x		
E4.2	Force majeure (rain, flood, earthquake, etc)	15	15	8	8	x	x	x	x

Discussion of risk impacts

Time and Cost Impact: As can be seen in Table 6-4, it was found that most of risk factors had a significant impact on cost and schedule of ICJV objectives, and just a several risk factors had an important impact on scope and quality of ICJV projects. This is because scope changes or poor quality also effect to cost or duration of the project. It implies that the time and cost are two objectives need to pay special attention to ICJV projects, because any risk factors that occur may also affect the operation of ICJV.

Scope Impact: As shown in Table 6-4, there are several major risk factors effecting to scope of ICJVs projects, such as partner's parent company financial problems (I1.1), over-interference by parent company (I1.3), breach of contracts by ICJV partner (I2.4), excessive demands and variation by client (P1.2), improper project feasibility study (P2.2), improper selection of project location, type (P2.4), design changes (P4.1), and force majeure (E4.2). Actually, there are many uncertainties and risks related to these issues during the lifecycle of projects, so scope changes are so obvious. In the startup stage, the improper of feasibility study and improper selection of project location and type result great impact to scope of projects. Negligence in the feasibility study causes project kick off, the enormous impact budget and duration. Moreover, the improper selection, monitoring, and coordination of consultants are also major sources of scope impact. Hence, the good ability consultants should conduct the feasibility study carefully during the startup stage of the project. Additionally, excessive demands by client, design changes, and force majeure are also mentioned high effect to scope of projects. It should be noted that social, legal, and external economic problems were considered that had indirect impact to the scope of the ICJV projects. As can be seen, the respondents confirmed a few risk factors that have an enormous affect the scope of ICJV projects. However, almost experts have emphasized that scope changes had an extremely large impact to all parties involved in ICJV projects. Finally, fishbone diagram that represents the risk factors having a major impact on the scope of ICJV projects in Vietnam is established in Figure 6-2.

Quality Impact: As can be seen, several risk factors were mentioned significant impact to quality of ICJV projects. Examples are partners' financial problems (I1.1), related ICJVs category (I2.*), management (P2.*), technical (P3.*), design (P4.*) issues, and some risk factors in social category (E2.*) (Table 6-4). First of all, management, technical and design issues are the most concerned issue in Vietnam now. This is true because in the ICJV, the function division of partners in the ICJV is very clear. Most of the foreign contractor is responsible for technology transfer or management, while the mostly main contractors and subcontractors/suppliers in Vietnam are responsible for construction. Therefore, technical and design management issues are most concerns of project organizations. Moreover, incompetence of subcontractors/suppliers (P2.1) was mentioned most significant

impact on quality objective. In fact, because inequity and fraud in the bidding process is a very common problem, the contracts are often awarded to incompetent contractors. Thus, the problem is that how to improve the management capabilities of the management team with the subcontractors, technical, design problems in ICJVs projects. Finally, the fishbone diagram is displayed in the Figure 6-3 to illustrate all of risk factors affecting quality impact of ICJV projects in Vietnam.

Multiple Important Impacts: As can be seen, it was found that several risk factors were mentioned significant impact to multiple objectives. Examples are partner's parent company in financial problems (I1.1), breach of contracts by ICJV partner (I2.4), excessive demands, and variation by client (P1.2), incompetent of subcontractors/suppliers (P2.1), improper selection of project management team (P2.6), and force majeure (E4.2). The sources of these risk factors include contract, design, management, force majeure problems, and financial aspects of parent partners. Therefore, they are the main issues that the project managers must focus more manpowers and resources to manage and reduce the impacts to the success of ICJV projects.

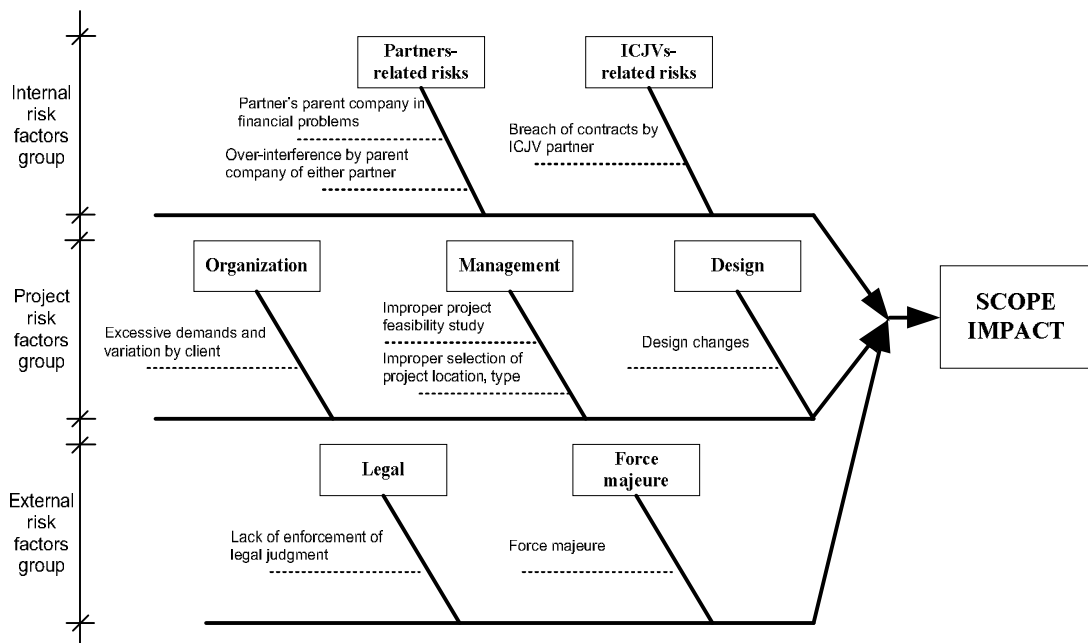


Figure 6-2 Fishbone diagram for scope impact of risk factors

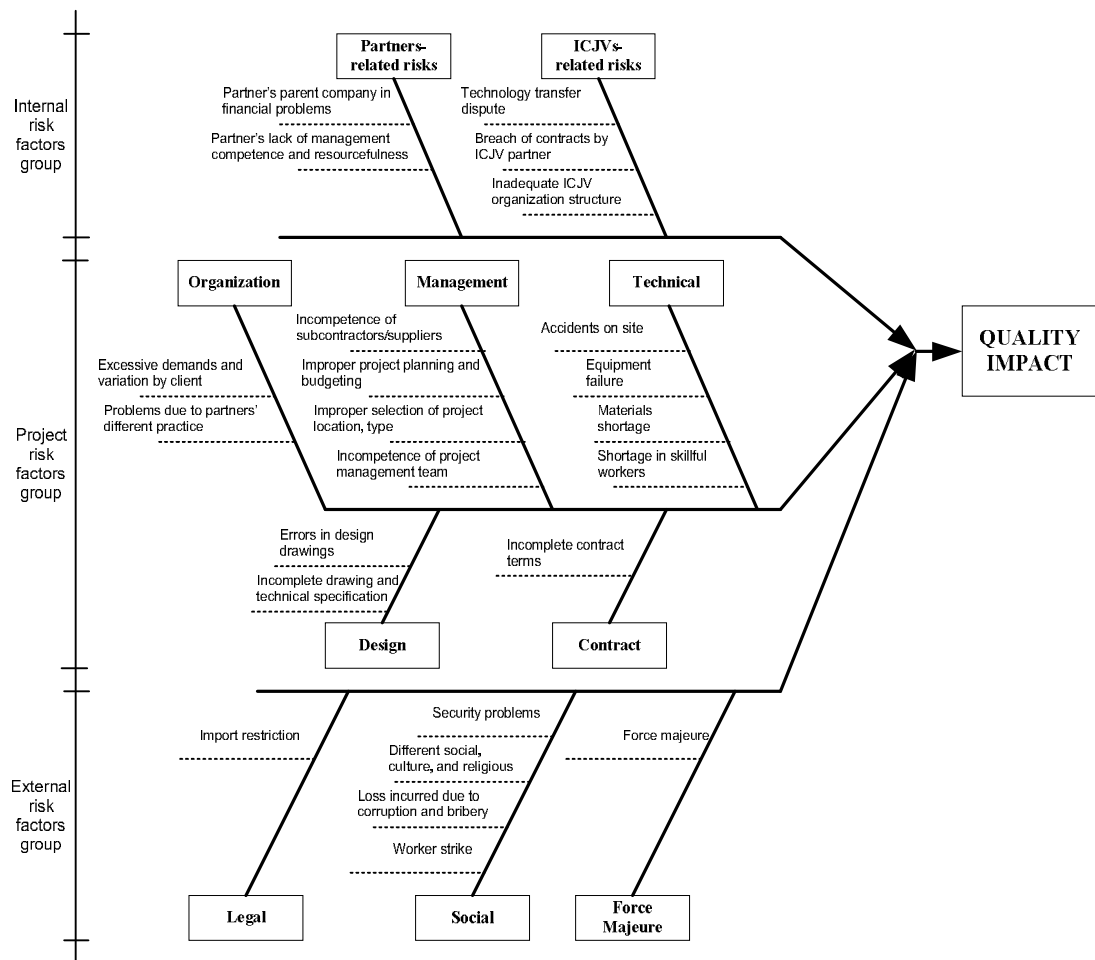


Figure 6-3 Fishbone diagram for quality impact of risk factors

6.3 Risk assessment in three stages of ICJV projects

Risk management is an ongoing process that continues through the life of a project. It includes processes for risk management planning, identification, analysis, monitoring, and control. Many of these processes are updated throughout project lifecycle as new risks can be identified at any time. In this study, ICJV project lifecycle was subdivided into three stages that were proposed by Bing et al. (1999): (1) Startup, (2) Operation, and (3) Dismantle. The startup stage of ICJV projects include two phases: beginning phase and formation phase (Prasitsom and Likhitrungsilp, 2011). Beginning phase is the period from initial contacts between parent companies to ICJV startup, including negotiation and a signing agreement. Formation phase is the period ICJV prepare bid proposal and submit bid to client. The operation stage refers to the stage of construction work being implemented. The dismantle stage is the period once most construction tasks have been completed, project is in the clean-up stage, and the participants start negotiating the ending matters. The purpose of this part is trying to

understand the differences in the respondents' opinions about rating the level of risk factors during many stages of project. The graph illustrates three-dimensional perspective of risk (probability, impact, and stage) are shown in Figure 6-4. The respondents assessed probability and impact of each risk factor in each stage of ICJV projects.

6.3.1 Analysis of risk factors throughout the lifecycle of ICJV projects

The probability (P) and the impact (I) of each risk factor that the respondents subjectively assessed in the questionnaire survey were then used to calculate the level of risk factors in the form of risk index factor (RF) (Appendix B4). Figure 6-5, Figure 6-6, and Figure 6-7 display the risk contour diagrams of all 47 risk factors that are analyzed in three stages of ICJV projects. Table 6-5, Table 6-6, and Table 6-7 show the 20 risk factors with the highest risk level in different stages of ICJV projects. Due to the limitation of time, this research focused on the assessment of these critical risk factors only. Finally, all of critical risk factors in different stages of ICJVs are as follows in Figure 6-8.

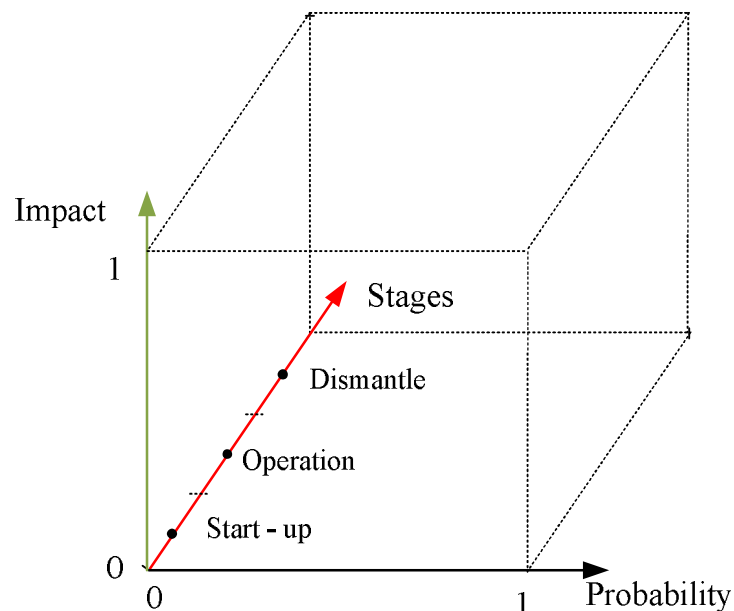


Figure 6-4 Relationship of probability, impact and stages of project

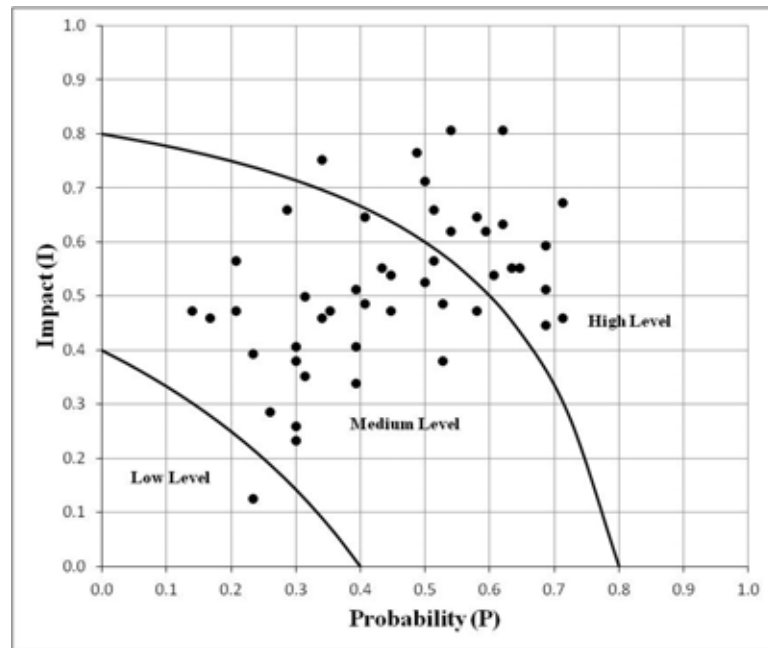


Figure 6-5 Risk contour diagram of the risk factors in the startup stage

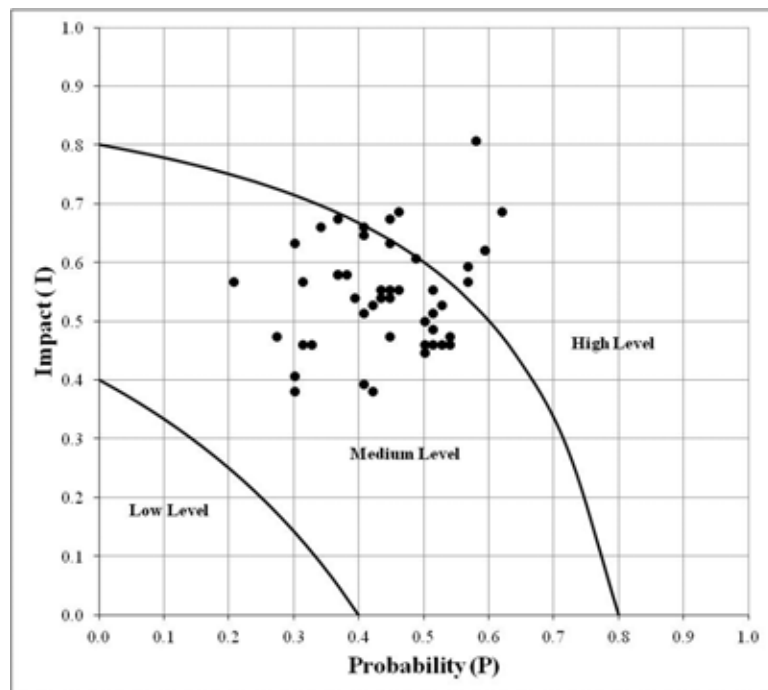


Figure 6-6 Risk contour diagram of the risk factors in the operation stage

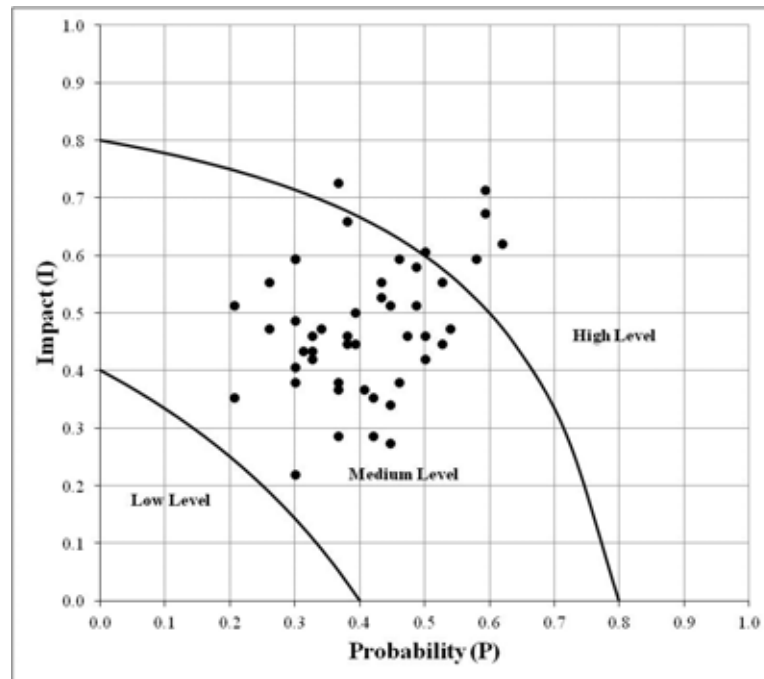


Figure 6-7 Risk contour diagram of the risk factors in the dismantle stage

Subsequently, the analysis of risk factors throughout three stages of ICJV projects, namely startup, operation, and dismantle stages is as follows.

(1) Startup stage

In the startup stage of ICJVs, among 20 risk factors presented in Table 6-5, there were 18 critical risk factors (RF index more than 0.8). In this stage, project managers encountered with numerous risk factors. According to Gale and Luo (2004), startup stage is a stage contains the important factors that lead to success or failure of a project. Hence, it is very important to manage these critical risk factors appropriately. The startup stage of project can be subdivided into two phases: beginning and formation phase.

(a) Beginning phase

The beginning phase expands from initial contacts between parent companies to ICJV startup, including set up its strategy, choose and then negotiate with the partners, and develop ICJV organization. It was found that risk factors affecting the beginning of ICJVs with high-risk level, including partner's parent company in financial problems (I1.1), loss due to bureaucracy for late approvals (E2.5), language barrier (E2.2), different social, culture, and religious (E2.3), interest rate (E3.4), inflation (E3.3), and economy fluctuation (E3.1). Partners' selection has less capacity, disagreement in the organization structure and failed negotiation to create ICJV agreement can be seen the most concerned issues ICJV organization. Moreover, an ICJV project involves at least

two companies collaborating to achieve the same goals. Based on the composition of the joint venture, the partners from different nations may face cultural difference issues. The foreign companies bring their cultures, new technologies, and management systems to the new environment that may affect the existing culture. As can be seen, it was found that the critical risk factors affecting the beginning phase of ICJVs such as initial parents' partners; language barrier; different social, culture; and economic problems.

(b) Formation phase

Once the partners were selected, it is almost certain that the ICJV is constituted and can be run. The ICJV then obtains bidding documents from the clients and prepare bid proposal. In this phase, it is also extremely complex due to the multifaceted organizations of ICJV, including initial ICJVs, clients, subcontractors, suppliers, and third parties. Among the 18 high-level risks of startup stage, there are five risk factors in internal risk group. These are partner's parent company in financial problems (I1.1), policy changes in your partner's parent company toward ICJV (I1.2), disagreement on allocation of staff positions in ICJV (I2.1), inadequate ICJV organization structure (I2.6), poor relation with government departments (I2.7), which were ranked 1st, 17th, 8th, 14th, and 15th, respectively. The financial status of the ICJV partner's parent company is the most concerned issue in Vietnam. This is because it is currently affected by complex situation of inflation (E3.3), high interest rates (E3.4), and economic fluctuation (E3.1), which is a major challenge for managing any construction projects. According to Gale and Luo (2004), more than 84% samples reported that the rights, responsibilities, and obligations of both parties were defined clearly in their ICJV agreement. Perhaps, these were not accurate with the current situation in Vietnam, leading to the disagreement in the allocation of staff position, inadequate organization structure, and even difficulty for implementation of ICJV upon the policy changes in partner's parent company (Sy and Likhitrungsilp, 2011).

In addition, many issues that related to omissions and negligence of architects/engineers (consultants) of clients, such as improper selection of project location (P2.4), improper project feasibility study (P2.2), were greatly ranked 2nd, and 7th, respectively. Actually, clients and consultants obviously have high influence in the early stage of Vietnamese ICJV projects. Moreover, feasibility study of Vietnam's investment projects used supporting information conjecturably and poorly, while international investors are willing to spend greater amount of funds for this step. These factors may cause design changes (P4.1), and excessive demands and variation by client (P1.2) in the bidding process, which could be affecting ICJVs in Vietnam.

Besides, language barrier (E2.2), difference social, culture, and religious (E2.3), and bureaucracy for late approvals (E2.5), corruption and bribery (E2.4) had significant influence on the ICJV startup stage. As can be seen, bureaucracy, corruption, and bribery issues in approving projects in Vietnam have become implicit cultural with

not many international companies can acknowledge. According to the recent survey of Ernst & Young, up to 96% of Vietnamese business confirmed that they are accustomed to bribery and corruption. They especially thought that spending more money for the relationship with the government departments not being major obstacles to their business activities.

(2) Operation stage

This stage is the period that the construction works are performed until most construction works are completed. As can be seen in Table 6-6, eight critical risk factors were identified, including the parent partners' financial aspects (I1.1), project management limitation (P2.6, P2.3), poor capacity of subcontractors/suppliers (P2.1), extreme variation and changes (P1.2, P4.1) and economic problems (E3.3, E3.4). Critical risk factors in operation stage divided into three main problems.

(a) Management problems

Management problems contain three main elements: (1) incompetence of project management team (P2.6), (2) improper project planning and budgeting (P2.3), and (3) excessive demands and variation by client (P1.2). The basic cause of these risk factors is incompetent management of ICJVs in Vietnam. The ICJV projects are usually very large and complex. A large number of parties, including contractors, nominated subcontractors, and subcontractors/suppliers are associated with projects. Moreover, excessive demands by client, along with the complexity of relationship and information stream among the participants, will effect to potential change of work allocation within partners, the disruption of work and associated claims.

(b) Subcontractors and suppliers

Currently there are many project activities related to the subcontractors and suppliers. Zou et al. (2007) were found that most risks in construction phase related directly to contractors and subcontractors. According to Sy and Likhitrungsilp (2011), inadequate and incompetent coordination among parties was a major cause of the problems. Incompetence of subcontractors/suppliers was mentioned a critical risk factors in operation stage, which was in the third rank. Since inequity and fraud in the bidding process was a very common problem in Vietnam (Long et al., 2004), the contractors were often awarded to incompetent contractors. In addition, unfamiliar cooperation between contractors and subcontractors/suppliers and among each other subcontractors may cause the difficulty in managing projects.

(c) Economic conditions

These risk factors are considered macroeconomic conditions and impossible to avoid. The high inflation and fluctuation of interest rates that enormously affected construction contract price were ranked second and fourth, respectively. Moreover, these factors were emphasized that have an important impact on cost, time, quality,

and scope of ICJV projects. In fact, these factors could have a great impact on the profit or loss of the participants in ICJVs (Bing et al., 1999). In 2008 and 2009, global economic crisis had the bad effects to the implementation of projects in Vietnam. The nation's inflation rate recently increased more than 18% in 2011, which enormously affected the prices of all construction resources. Moreover, high inflation has pushed total investment of ICJV projects increased beyond 10% backup funds. Thus, the participants executing ICJV projects need to be prepared to face this problem.

(3) Dismantle stage

The survey results in Table 6-7 shows that there just have six critical risk factors in dismantle stage. It is clear that when the project is near completion, the risk exposure would also be reduced correspondingly. It however still existed with some problems to be concerned. Firstly, these are the financial problems of main contractors and delayed payment to subcontractors. Moreover, in the final stage of ICJV projects, the conflict between profit and loss of clients, main contractors, subcontractors, and suppliers culminated. The clients would like to finish quickly their projects, and use of the project for its intended purpose. While the main contractors and subcontractors desire their work completion and receive all of owner's payments. The contractors may face delayed payments and sometimes nonpayment risk of clients. In addition, due to the inevitable effects of inflation and volatility of interest rates, not only the contractor but clients also affected significantly on the schedule of project as planned. Furthermore, the negligence and weakness of subcontractors may also cause the difficulty of finishing processes. Excessive demands and variation by client, design changes are also headaches for contractors in this stage.

Table 6-5 Risk factors with high-risk level in the startup stage

Rank	ID	Risk factors	P	I	RF
1	I1.1	Partner's parent company in financial problems	0.62	0.81	0.927
2	P2.2	Improper project feasibility study	0.54	0.81	0.911
3	E2.5	Loss due to bureaucracy for late approvals	0.71	0.67	0.906
4	E3.1	Economy fluctuation	0.49	0.77	0.880
5	P4.1	Design changes	0.69	0.59	0.873
6	E3.3	Inflation	0.62	0.63	0.861
7	P2.4	Improper selection of project location, type	0.50	0.71	0.857
8	I2.1	Disagreement on allocation of staff positions in ICJV	0.58	0.65	0.852
9	E2.2	Language barrier	0.69	0.51	0.848
10	E3.4	Loss due to fluctuation of interest rate	0.59	0.62	0.845
11	E2.3	Different social, culture, and religious	0.71	0.46	0.845
12	E1.3	Loss due to insufficient law for joint ventures	0.65	0.55	0.842
13	P1.2	Excessive demands and variation by client	0.34	0.75	0.837
14	I2.6	Inadequate ICJV organization structure	0.63	0.55	0.836
15	I2.7	Poor relation with government departments	0.51	0.66	0.835
16	E2.4	Loss incurred due to corruption and bribery	0.69	0.45	0.827
17	I1.2	Policy changes in your partner's parent company toward ICJV	0.54	0.62	0.825
18	P5.1	Disagree some conditions of contract	0.61	0.54	0.819
19	P2.5	Inadequate project organization structure	0.41	0.65	0.790
20	I2.2	Disagreement on allocation of works	0.51	0.57	0.789

Table 6-6 Risk factors with high-risk level in the operation stage

Rank	ID	Risk factors	P	I	RF
1	I1.1	Partner's parent company in financial problems	0.58	0.81	0.919
2	E3.3	Inflation	0.62	0.69	0.881
3	P2.1	Incompetence of subcontractors/suppliers	0.59	0.67	0.867
4	E3.4	Loss due to fluctuation of interest rate	0.59	0.62	0.845
5	P2.6	Incompetence of project management team	0.46	0.69	0.831
6	P4.1	Design changes	0.57	0.59	0.824
7	P2.3	Improper project planning and budgeting	0.45	0.67	0.819
8	P1.2	Excessive demands and variation by client	0.57	0.57	0.812
9	I2.7	Poor relation with government departments	0.41	0.66	0.798
10	E3.1	Economy fluctuation	0.49	0.61	0.798
11	I1.2	Policy changes in your partner's parent company toward ICJV	0.45	0.63	0.797
12	I2.4	Breach of contracts by ICJV partner	0.37	0.67	0.793
13	P2.5	Inadequate project organization structure	0.41	0.65	0.790
14	P3.4	Shortage in skillful workers	0.51	0.55	0.783
15	E3.2	Exchange rate	0.53	0.53	0.776
16	P2.2	Improper project feasibility study	0.34	0.66	0.776
17	P4.2	Errors in design drawings	0.51	0.51	0.763
18	I2.6	Inadequate ICJV organization structure	0.46	0.55	0.759
19	E2.5	Loss due to bureaucracy for late approvals	0.54	0.47	0.758
20	E1.3	Loss due to insufficient law for joint ventures	0.45	0.55	0.753

Table 6-7 Risk factors with high-risk level in the dismantle stage

Rank	ID	Risk factors	P	I	RF
1	I1.1	Partner's parent company in financial problems	0.59	0.71	0.883
2	E3.3	Inflation	0.62	0.66	0.871
3	E3.4	Loss due to fluctuation of interest rate	0.59	0.67	0.867
4	P2.1	Incompetence of subcontractors/suppliers	0.58	0.61	0.835
5	P4.1	Design changes	0.37	0.73	0.827
6	E2.4	Loss incurred due to corruption and bribery	0.50	0.61	0.803
7	P4.2	Errors in design drawings	0.38	0.66	0.789
8	E3.2	Exchange rate	0.53	0.55	0.789
9	E3.1	Economy fluctuation	0.49	0.58	0.784
10	P2.6	Incompetence of project management team	0.46	0.59	0.780
11	E2.5	Loss due to bureaucracy for late approvals	0.54	0.47	0.758
12	P3.4	Shortage in skillful workers	0.49	0.51	0.750
13	I2.5	Poor relation and disputes with partner	0.43	0.55	0.747
14	P1.3	Problems due to partners' different practice	0.53	0.45	0.738
15	P5.1	Disagree some conditions of contract	0.43	0.53	0.732
16	E1.3	Loss due to insufficient law for joint ventures	0.45	0.51	0.731
17	I2.1	Disagreement on allocation of staff positions in ICJV	0.50	0.46	0.730
18	P3.3	Materials shortage	0.47	0.46	0.716
19	P2.4	Improper selection of project location, type	0.30	0.59	0.715
20	E4.2	Force majeure (rain, flood, earthquake)	0.30	0.59	0.715

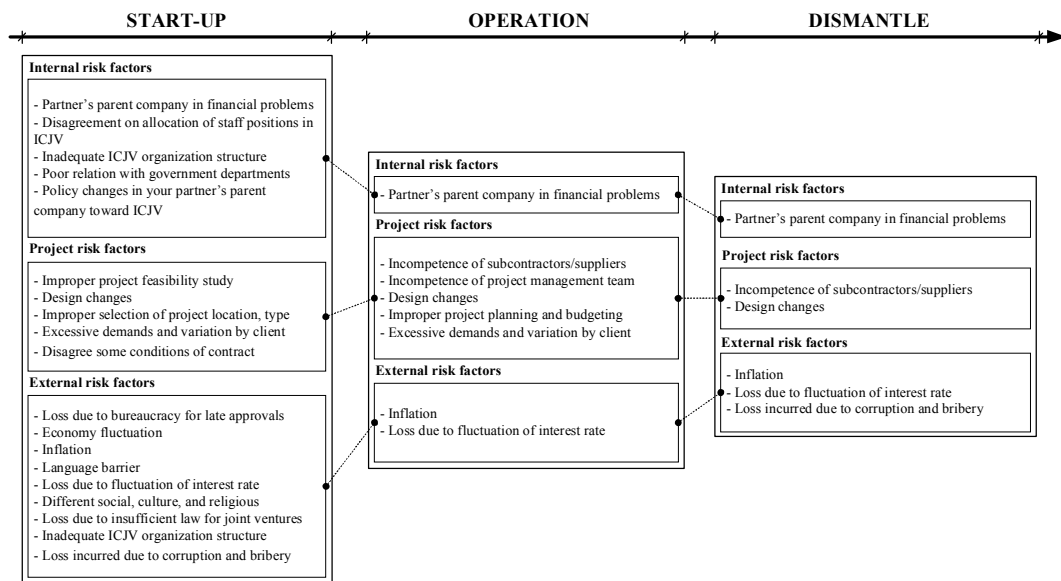


Figure 6-8 Critical risk factors in different stages of ICJVs in Vietnam

6.3.2 Trend analysis in different stages of ICJV projects

(1) Trend analysis of risk factors

In this research, trends of risk factors were analyzed based on the change value of probability (P), impact (I) and degree of risk factors (RF) in three stages of ICJV projects. ICJV projects were divided into three main stages such as startup (S), operation (O), and dismantle (D). The results of trend analysis of all risk factors are as shown in Appendix B5 (Figure 6-9 for internal risk factors group).

The probability and the impact of each factor that the respondents subjectively assessed in the previous section were then used to calculate the level of risk factors in the form of risk index factor (RF). All combined data were presented in propensity charts so that they can clearly presents the trends of (P), (I), and (RF) during three stages of the ICJV projects. The template of (RF) trends has been established to illustrate risk factors easier. As can be seen in Table 6-8, there are 10 RF trends of risk factors.

For example, trend analysis of *partner's parent company in financial problems* factor (I1.1) was analyzed as follows. In the three-stage development of ICJV projects, the probability of this risk index falls down a little bit from startup to operation and almost unchange until the end of the project period (dismantle stage) (Figure 6-9). Besides, the respondents mentioned that the financial problems had high impact to startup and operation stage. Moreover, its impact had lower than in the dismantle stage. As a result, the financial problems of the partner's parent company was the most critical risk in three stages of projects and RF indexes were 0.927, 0.919, and 0.883, respectively. The RF trend of this risk was categorized and classified in type

four as shown in Table 6-8. It is the mainly trend for the many risk factors, such as ICJV operation problems; design, contract issues; and language, culture and religious troubles.

As can be seen in Table 6-8, type one, type two, and type nine (●—●) are very popular in the ICJV projects. The risk factors had the average value in the startup stage of projects, and these factors were then becoming important in the operation stage. Finally, the level of risk factors was diminishing the impact until project near completion. This result is consistent with the ICJV projects where their duration is quite long. Due to the startup stage of project, risk factors may not appear or appear with low probability. Of course, since project operation, the risk factor will appear with higher probability and impact to the completion of project. At the end of project, the probability and impact of risk might be reduced.

In addition, the respondents was assessed 17 risk factors with type four (●—●) of development trends, including risk factors in ICJV organizations (I1.1, I1.2, I1.3, I2.2, I2.6, and I2.7), ICJV projects (P1.2, P2.2, P2.4, P4.1, P5.1, and P5.2), and external (E1.2, E1.3, E2.2, E2.3, and E3.1). As can be seen, these risk factors had high-level risk in the startup stage of projects. The RFs then fall down from startup to operation stage and RFs will get the lowest value at the dismantle stage of ICJV projects. This trend was considered characteristic of ICJV projects with the complexity in the startup stage. Therefore, the risk factors in this trend must to be focused coping and resolved during the startup period of the ICJV projects. Similar to the risk factors in type seven and eight.

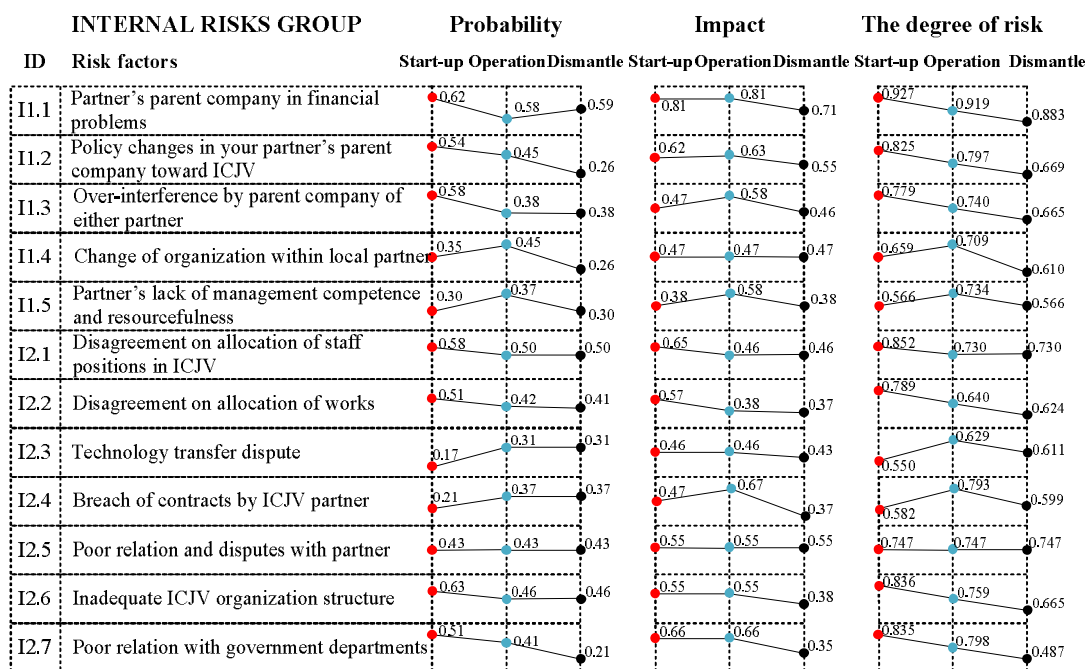



Figure 6-9 Trend assessment of internal risk factors in three stages of ICJV projects

Table 6-8 Trends of level of risk factors of ICJV projects in Vietnam

S= Startup stage; O= Operation stage; D= Dismantle stage

Type	Development trends	Risk factors
1	<p>S < D < O</p>	<ul style="list-style-type: none"> - Technology transfer dispute - Breach of contracts by ICJV partner - Accidents on site - Problems due to partners' different practice - Equipment failure - Shortage in skillful workers - Poor project relationship - Materials shortage - Incompetence of subcontractors/suppliers - Incompetence of project management team - Import restriction Force majeure (rain, flood, earthquake)
2	<p>D < S < O</p>	<ul style="list-style-type: none"> - Change of organization within local partner - Improper project planning and budgeting - Security problems
3	<p>S < O < D</p>	<ul style="list-style-type: none"> - Errors in design drawings - Exchange rate
4	<p>S > O > D</p>	<ul style="list-style-type: none"> - Over-interference by parent company of either partner - Disagreement on allocation of works - Policy changes in your partner's parent company toward ICJV - Poor relation with government departments - Inadequate ICJV organization structure - Partner's parent company in financial problems - Incomplete contract terms - Disagree some conditions of contract - Excessive demands and variation by client - Improper selection of project location, type - Design changes - Improper project feasibility study - Lack of enforcement of legal judgment - Loss due to insufficient law for joint ventures - Different social, culture, and religious - Language barrier - Economy fluctuation
5	<p>S > D > O</p>	<ul style="list-style-type: none"> - Loss incurred due to corruption and bribery
6	<p>S = O < D</p>	<ul style="list-style-type: none"> - Loss due to fluctuation of interest rate
7	<p>S = O > D</p>	<ul style="list-style-type: none"> - Incomplete drawing and technical specification - Inadequate project organization structure - Loss incurred due to political changes - Changes of government policies
8	<p>S > O = D</p>	<ul style="list-style-type: none"> - Disagreement on allocation of staff positions in ICJV - Loss due to bureaucracy for late approvals
9	<p>S = D < O</p>	<ul style="list-style-type: none"> - Partner's lack of management competence and resourcefulness - Worker strike - Inflation
10	<p>S = O = D</p>	<ul style="list-style-type: none"> - Poor relation and disputes with partner - Environmental pollution

Especially, type five () is a special tendency of risk factors in ICJV projects. The risk factors of this type have a strong influence in startup and dismantle stage; and minimal effect in the operation stage. It can be noted that respondents have recognized corruption and bribery problems in Vietnam about the huge impact at the beginning and end of ICJV projects. Thus, determining the tendency of risk factors during the period of ICJV projects is a very important job of project managers to take steps to deal with risk factors in the whole projects.

Therefore, it is very necessary to identify risk development trends. This is because it can help the project organizations to establish an appropriate risk management plan during the life cycle of projects. However, it was noted that it still exists more complicated due to the difficulties of collecting data as well as the subjective assessment from the respondents.

(2) Trend analysis of risk factors groups

The tendency of each risk factors group was then analyzed upon the overall average value of P, I, and RF. The overall RF of each group was defined by following formula

$$RF_i = \frac{\sum_{j=1}^n RF}{n} \quad (6.1)$$

Where $i = 1-3$: risk groups of ICJV

$j = 1-n$: risk factor of each risk group

The overall indexes of a risk group changes within the lifecycle of ICJV projects are shown in Table 6-9, Table 6-10, and Table 6-11. Moreover, the trend details of the degree of risk factors groups are shown in Figure 6-10.

(a) Internal risk group

In the three-stage development of an ICJV, the probability indexes of internal risk group fall down from startup to dismantle as shown in Table 6-9. It can be said that organization of an ICJV is accompanied by a large number of matters such as negotiate to make the agreement contract, language barrier, unsuitable organization structure. Conflicts could arise during negotiation, and if the parties cannot reach an agreement, ICJV cannot be continued. Moreover, according to Gale and Luo (2004), more than 70% of partners in JV had no previous relationship with each other before the negotiations to establish JV. Therefore, it is very difficult in cooperation among the partners of ICJV. As can be seen, risk factors would be inevitable and have the huge impact ($I = 0.556$) as follows in Table 6-10. Consequently, the degree of this group would be rated high in operation and startup stages where the financial problems of the ICJV organization and policy changes in your partner's parent company with having high-risk probability and impact are most concerned issues.

(b) Project risk group

In the project risk group, the probability of this group had its medium value of 0.410, in the startup stage. Risks would become significance when projects was be carried out, its probability increase of 0.461 which is most critical of probability of all stages. Until project was near completion, it falls over to low value of 0.416. The development of risk impact of project group had the same trend with its probability that is shown in Figure 6-10. As can be seen, the project risk group in the operation stage has high degree of probability and impact. As a result, its risk degree index reaches the highest value of 0.764. When a project is being executed, the more capital, material, and labor would be spent, the more risky might appear in the construction process during the life cycle of project. Therefore, it can be noted that the project organizations need to focus to solve risk factors of the specific project.

(c) External risk group

These risk factors are considered exterior conditions and impossible to avoid. The result of this research shows that the highest probability of external risk group is of 0.476 in the startup stage. It then falls to 0.429 in the operation stage and 0.418 in the dismantle stage. This is because in the startup stage, parties may encounter within new environment, the ICJV set up under government laws and regulations, language barrier and different culture, and even security problems. The probability of these issues might diminish until the project completion. However, level of impact of this group is reflected highest in the operation stage. Thus, we must to pay attention to huge impact of this risk group in operation stage of project. The instability economic problems at high interest rates and inflation are primarily alarmed. Finally, from startup to operation, the level of risk factors (RF) are mentioned very large influence to ICJV projects. Especially, since project was initiated and constructed, risk factors, if occur, will affect project completion.

Table 6-9 Risk probability in different stages of ICJVs

Risk factors groups	Startup	Operation	Dismantle
Internal	0.453	0.427	0.373
Project	0.410	0.461	0.416
External	0.476	0.429	0.418

Table 6-10 Risk impact in different stages of ICJVs

Risk factors groups	Startup	Operation	Dismantle
Internal	0.556	0.568	0.458
Project	0.515	0.560	0.492
External	0.490	0.520	0.472

Table 6-11 Risk index factors in different stages of ICJVs

Risk factors groups	Startup	Operation	Dismantle
Internal	0.746	0.750	0.655
Project	0.704	0.764	0.704
External	0.723	0.723	0.685

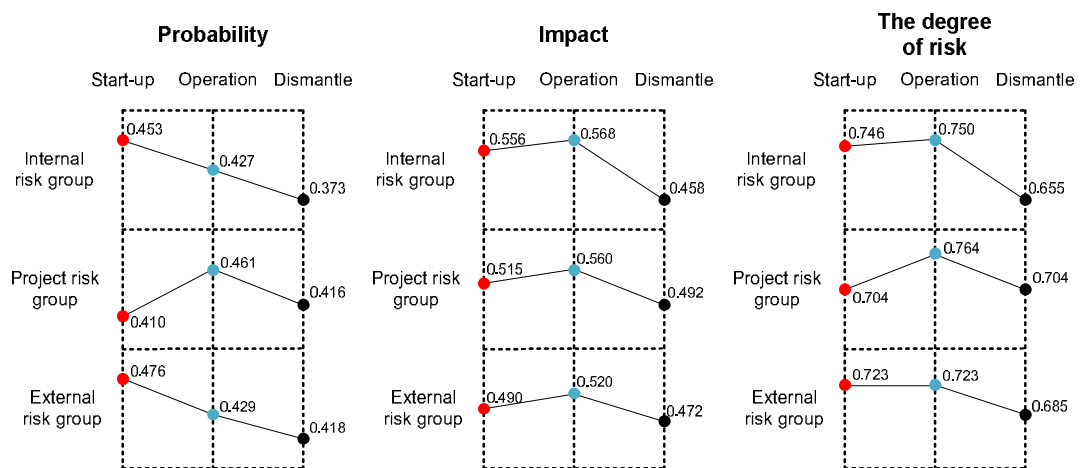


Figure 6-10 Trend analysis of probability, impact and the degree of risk groups in the life cycle of project

6.4 Conclusion

The risk factors are extremely critical and different throughout the lifecycle of ICJV projects in Vietnam. The primarily results from the large-scale survey was illustrated in this chapter as follows.

First, the source-effect of risk factors of the ICJV projects in Vietnam was identified, including the source of risk factors and assesses the risks that have an impact on the objectives of ICJV projects. The financial, contract aspects of ICJV; management, subcontractors/suppliers issues; and force majeure were critical factors that have an enormous impact on the multiple objectives of ICJV. These results can be used to support the project managers to enhance the operation of ICJVs in Vietnam.

Through the results of large-scale survey, the critical risk factors throughout the lifecycle of ICJV projects were identified.

- a. Startup stage: partners' parent financial and ICJV organization aspects; architects/engineers problems; language barrier; different social, culture; bureaucracy, corruption and bribery; and economic conditions
- b. Operation stage: partners' parent financial, management problems, incompetence subcontractors and suppliers, and economic conditions
- c. Dismantle stage: partners' parent financial aspects, incompetence subcontractors and suppliers, and economic conditions

The financial issues and economic conditions were critical factors that have high-risk level during three stages of ICJV projects.

Finally, trends of risk factors and groups have been adopted to help the project managers having an appropriate risk management plan throughout the lifecycle of ICJVs in Vietnam.

CHAPTER 7

RISK RESPONSE MEASURES AND RISK PROFILE FOR ICJVs IN VIETNAM

This chapter presents the investigation of the current respondents' views about the risk response measures during the implementation and the risk profile for international construction joint ventures (ICJVs) in Vietnam. The first part explores all of the risk response measures based on the proposed risk code system. The second part presents the risk profile to establish the reference information to help project organizations in ICJVs projects. Project organizations can use these results as a guideline for developing risk management plans for future ICJV projects in Vietnam as well as other developing country.

7.1 Risk response measures

Risk management is a systematic process for controlling project risks. It can be divided into several steps, including risk identification, risk classification, risk analysis, risk response, risk review and risk control. Risk response is an important step for mitigating project risks. It can be said that the above chapters only for identification and analysis of risk factors in stages of ICJV projects. Hence, the risk response measures were measured properly to deal with these risk factors. These response measures would eliminate the likelihood of occurrence or mitigate the consequence of each risk. As we know, the risk response measures entail risk mitigation, risk transfer, risk acceptance, and risk avoidance (Flanagan and Norman, 1993). In the questionnaire survey, the respondents were requested to specify and deliberate their risk response measures for each risk factor, which can be divided into four measures: risk mitigation (M), risk transfer (T), risk retention (R), and risk avoidance (A).

Based on a risk coding system developed to help organize all of the risk factors, a risk response measures code system (Figure 7-1) were established for managing all risk response methods of ICJV projects.

For each identified risk, response methods must be identified. In the third section of large-scale survey, the respondents felt free to describe the risk response methods for each risk factor based on their own experience. All of their opinions of the respondents about the risk response were collected and summarized. Then the best possible assessment of the risks and descriptions of the risk methods was obtained in order to select the right response methods for such risk factors.

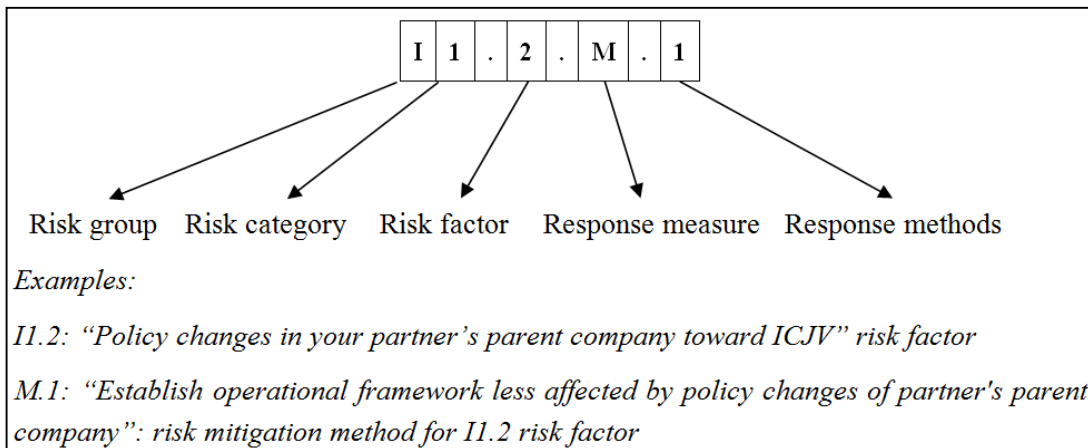


Figure 7-1 Definition code of risk response measures

Table 7-1 summarizes the risk response alternatives for each risk factor as specified by the respondents. Based on the assessment of risk response measures of the respondents, each risk factor can be considered and gave the appropriate response method. In this study, four symbols, including ○ (0-3 respondents), □ (4-7), ◆ (8-11), and ● (12-15) to reflect the number of respondents opinions. As can be seen in Table 7-1 about the risk factor “partner’s parent company in financial problems”, risk mitigation and risk transfer were mostly chosen to cope with this risk.

Moreover, in Table 7-2, the total of risk response methods replied by all respondents was then analyzed and synthesized. It was found that there are total 427 risk response methods of all risk factors in ICJVs established whereas typical risk management measures are risk mitigation, risk transfer and risk retention (Table 7-3).

As can be seen, the most common risk response measure used by the respondents was risk mitigation. It was also found that risk transfer and risk retention were not the favorable alternatives for the financial risks and some internal risk factors. In addition, risk avoidance was adopted for risk with high impacts, including breach of contract, improper project feasibility study, and improper selection of project location and type. The following discussions analyze some general practical response methods in managing risks as shown in Table 7-4. The general practical response methods were summarized from all risk response methods.

7.1.1 Risk avoidance

Risk avoidance is one of many options for risk treatment to deal with risk factors that have high probability of occurrence or great impact. Risk avoidance measures are directed to eliminate sources of risks and decrease the likelihood of their occurrence. Change a project scope and objectives or take another action to avoid risk is the main

methods to ensure risk factors. However, it was noted that this is not only the same as eliminating risk factors but also avoid sources of risk factors (Edwards and Bowen, 2005). In addition, it might be noted that this measure can increase the severity of other risks. Therefore, risk avoidance measure is not easy to carry out by project organizations.

In this research, risk avoidance measure was chosen by a handful of respondents for a few risk factors. Examples are partners' parent financial problems (I1.1), breach of contract (I2.4), inadequate ICJV organization structure (I2.6), improper project feasibility study (P2.2), improper selection of project location, type (P2.4). The main reason is that those factors were found to have significant impact level to the ICJV projects. In the Table 7-4, the general methods of risk avoidance are recognized, including *change business target, reduce investment, stop business and suspend temporary business*.

7.1.2 Risk transfer

Risk transfer is the response measure to shift the impact of risk factors to third parties. For example, a client will transfer risk factors to a main contractor, and then the main contractor will share them with subcontractors or suppliers. However, risk transfer does not reduce the criticality of sources of risk factors, it just shift it to another party. Commonly, the respondents mentioned mechanisms used to transfer these risk factors based on the circumstances of these factors. Contract agreement between clients and main contractors; subcontract with subcontractor/suppliers; insurance and contract with third parties are some methods to transfer risk to construction stakeholders. Actually, the regulations of risk transfer measures are done through negotiation and then contract. As shown in Table 7-4, general risk transfer measures for ICJV projects in Vietnam were illustrated.

- Insurance: a transfer mechanism for risk factors those are insurable: robbery, injury, damage to property or equipment of projects.
- Transfer to third parties: performance bonds, sureties, and payment guarantees are used in similar way to deal with the impacts of default risk by parties in the execution of project contracts and agreements. The risk transferees are banks, finance companies or other third parties.
- In addition, drafting the ICJV contract carefully is the way mentioned as important of risk transfer measure including specify addition payment, additional cost and extension time clauses in contract. Finally, it is noted that risk transfer methods are always costly and rarely 100% effective.

Table 7-1 Risk response measures for the ICJV projects

M: Mitigation; T: Transfer; R: Retention; A: Avoidance

No	ID	Risk factors	Risk measures (15 Respondents)				Risk measures (Sympol)			
			M	T	R	A	M	T	R	A
1	I1.1	Partner's parent company in financial problems	10	9	1	4	◆	◆	○	□
2	I1.2	Policy changes in your partner's parent company toward ICJV	8	3	5	3	◆	○	□	○
3	I1.3	Over-interference by parent company of either partner	9	2	5	2	◆	○	□	○
4	I1.4	Change of organization within local partner	11	2	9	0	◆	○	◆	○
5	I1.5	Partner's lack of management competence and resourcefulness	12	3	4	0	●	○	□	○
6	I2.1	Disagreement on allocation of staff positions in ICJV	8	5	7	1	◆	□	□	○
7	I2.2	Disagreement on allocation of works	10	6	4	1	◆	□	□	○
8	I2.3	Technology transfer dispute	9	3	5	3	◆	○	□	○
9	I2.4	Breach of contracts by ICJV partner	4	8	2	7	□	◆	○	□
10	I2.5	Poor relation and disputes with partner	10	2	4	2	◆	○	□	○
11	I2.6	Inadequate ICJV organization structure	11	3	1	6	◆	○	○	□
12	I2.7	Poor relation with government departments	11	5	2	3	◆	□	○	○
13	P1.1	Poor project relationship	11	3	4	1	◆	○	□	○
14	P1.2	Excessive demands and variation by client	13	3	1	1	●	○	○	○
15	P1.3	Problems due to partners' different practice	11	4	1	0	◆	□	○	○
16	P2.1	Incompetence of subcontractors/suppliers	8	5	3	3	◆	□	○	○
17	P2.2	Improper project feasibility study	9	2	5	5	◆	○	□	□
18	P2.3	Improper project planning and budgeting	13	3	3	3	●	○	○	○
19	P2.4	Improper selection of project location, type	3	2	8	5	○	○	◆	□
20	P2.5	Inadequate project organization structure	11	2	1	1	◆	○	○	○
21	P2.6	Incompetence of project management team	10	3	2	3	◆	○	○	○
22	P3.1	Accidents on site	9	11	4	0	◆	◆	□	○
23	P3.2	Equipment failure	12	5	3	0	●	□	○	○
24	P3.3	Materials shortage	13	5	2	0	●	□	○	○
25	P3.4	Shortage in skillful workers	10	3	6	1	◆	○	□	○
26	P4.1	Design changes	14	3	8	0	●	○	◆	○

Table 7.1 (cont.) Risk response measures for the ICJV projects

M: Mitigation; T: Transfer; R: Retention; A: Avoidance

No	ID	Risk factors	Risk measures (Respondents)				Risk measures (Sympol)			
			M	T	R	A	M	T	R	A
27	P4.2	Errors in design drawings	15	2	3	0	●	○	○	○
28	P4.3	Incomplete drawing and technical specification	9	3	7	0	◆	○	□	○
29	P5.1	Disagree some conditions of contract	9	5	5	3	◆	□	□	○
30	P5.2	Incomplete contract terms	8	6	4	0	◆	□	□	○
31	E1.1	Import restriction	9	6	7	0	◆	□	□	○
32	E1.2	Lack of enforcement of legal judgment	7	7	3	1	□	□	○	○
33	E1.3	Loss due to insufficient law for joint ventures	9	11	2	1	◆	◆	○	○
34	E1.4	Changes of government policies	6	3	8	2	□	○	◆	○
35	E1.5	Loss incurred due to political changes	4	4	5	5	□	□	□	□
36	E2.1	Security problems	7	7	5	0	□	□	□	○
37	E2.2	Language barrier	12	3	1	0	●	○	○	○
38	E2.3	Different social, culture, and religious	15	0	3	1	●	○	○	○
39	E2.4	Loss incurred due to corruption and bribery	14	3	0	3	●	○	○	○
40	E2.5	Loss due to bureaucracy for late approvals	12	3	4	2	●	○	□	○
41	E2.6	Worker strike	11	8	2	2	◆	◆	○	○
42	E3.1	Economy fluctuation	5	8	5	3	□	◆	□	○
43	E3.2	Exchange rate	3	8	9	1	○	◆	◆	○
44	E3.3	Inflation	4	11	7	3	□	◆	□	○
45	E3.4	Loss due to fluctuation of interest rate	6	8	7	2	□	◆	□	○
46	E4.1	Environmental pollution	7	1	6	2	□	○	□	○
47	E4.2	Force majeure (rain, flood, earthquake, etc)	8	3	10	0	◆	○	◆	○

Number of respondents:	○	0-3	◆	8-11
	□	4-7	●	12-15

Table 7-4 General risk response measures of ICJV projects in Vietnam

Risk Response Measures				
	Mitigation	Transfer	Retention	Avoidance
Risk Response Methods	<ul style="list-style-type: none"> - Choose the partners with strong financial resources, stability organization, long-term cooperation - Choose the previous relationship partners - Choose good management capacity team - Select carefully subcontractors/suppliers - Choose the previous relationship subcontractor/suppliers - Distribute works in accordance with the capabilities of each partners - Maintain good relationship with the stakeholders - Establish appropriate policies and strategies - Increase the level of control - Separate or relocate of activities and resources - Training staff - Improve the productivity and performance 	<ul style="list-style-type: none"> - Share risks to subcontractors/suppliers - Transfer risks to third parties - Insurance - Manage contract in JV - Clear authority and responsibility in contract - Clear terms and conditions in contract 	<ul style="list-style-type: none"> - Develop the contingency plan - Undertake pre-project planning - Prepare the suitable policies to cope with risk factor - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Change business target - Reduce investment - Stop business - Suspend temporary business

7.1.3 Risk mitigation

Practically, risk mitigation must be performed first in the response measures. This is because no risk factors should be avoided, transferred, or retained without checking to see if they are able to reduce it. Methods to reduce risk factors are that take steps to mitigate their likelihood of occurrence and/or impact consequences of such risk.

Reduce the probability of occurrence:

Project managers should be executed some mitigation methods to reduce before risk factors occur. In the previous chapter, the respondents have identified the sources of risk factors. Then now it can help the project managers understand the sources of these factors, thereby risk mitigation methods might be selected accordingly to cope with this issue. From in-depth interview, risk mitigation methods were chosen such as *choosing the partners with strong financial resources, selecting good capacity staff, or selecting the previous relationship subcontractors/suppliers* (Table 7-4).

For force majeure risks, it is rarely possible to reduce the likelihood of occurrence. The project organizations might prepare some suitable plan or schedule to reduce the

impact consequences. In fact, it was found that risk retention was mostly adopted to cope with force majeure risk factors.

Reduce the impact consequences:

Some risk factors cannot be avoided such as economic conditions and extreme weather conditions. Therefore, risk mitigation methods for these risk factors are to minimizing their consequences. Here show some risk mitigation methods the project management might perform to reduce the impact consequences of occurring risks. Examples are *increasing the level of control, establishing the new suitable work schedule, or improving the productivity and performance* by project managers.

Doing early steps may be less cost than repairing the damage after the risk has occurred. However, some risk mitigation options may simply be too costly, the project organizations should have to consider carefully. Then risk mitigation or risk retention options might be considered to respond with these risks.

In addition, whenever the new risk factors are encountered, it is possible that some response methods can be found among more related-risk factors in the risk profile.

7.1.4 Risk retention

Risk retention is simply accepted and retained such risk factors. As can be seen, when choosing risk retention as a response, the project organizations are not going to take any actions and will accept the cost, schedule, scope, and quality impact if the risk factors occurs. In all of these situations, the likelihood of occurrence, impact of such risk factors may be unchanged. Why need to retain risk factors, there are some causes of accepted these risks, such as: 1) any reduction treatment has a negative cost/benefit ratio, 2) simply because they have not been identified, 3) a stakeholder organization to reward itself for retaining a risk.

As can be seen in Table 7-4, there are four general risk retention methods, such as *prepare contingency plan, pre-project planning, the suitable policies, and do nothing*. This implies that the project organizations can carry out some contingency plan to cope with these risks instead of doing nothing.

7.1.5 Combined risk response

Finally, combined risk response measures are carried out simultaneously at least two risk response measures. Combination of retention, mitigation, and transfer response of risk factors are possible. Throughout the respondents, the most common example of combination risk response is the transfer of risk through insurance, while at the same time retaining a small amount of the impact by accepting liability for fixed excess

sum in the insurance policy agreement (Edwards and Bowen, 2005). Figure 7-2 is the combined risk response technique was revised from Edwards and Bowen (2005).

Finally, the ICJV projects risks can be reduced after some risk response measures to reduce likelihood of occurrence and risk impact on the implementation of the project. Then the remainder of projects risks, residual risks, still need to be considered further in later stages. As can be seen, residual risk factors are still forming other hazards affecting the performance of next stages of projects, even if the best response methods were applied. In addition, risk response methods carried out can cause adverse impact on other risk factors as well as the formation of new risk factors. Therefore, it is very necessary for project organizations to choose appropriate risk response methods, and to monitor changes and the impact of these risk factors during the period of ICJV projects.

7.1.6 Using likelihood and impact information to choose the risk response

According to Dale et al. (2004), the details rating of risk factors in the risk assessment provide the actions to response that may be useful for project organizations to manage. As follows in Figure 7-3, the groups of risk factors can be divided into four areas, including extreme risks (A), problems (B), catastrophes (C) and routines (D). Besides, this figure illustrated the methods to reduce the risk influence. For example, risk factors in extreme risks area required the risk response measures to bring them to B, C or even D areas. Consequently, risk response actions for risk factors in ICJV projects were established as shown in Figure 7-3. Therefore, these methods can be implemented separately or combined risk response measures.

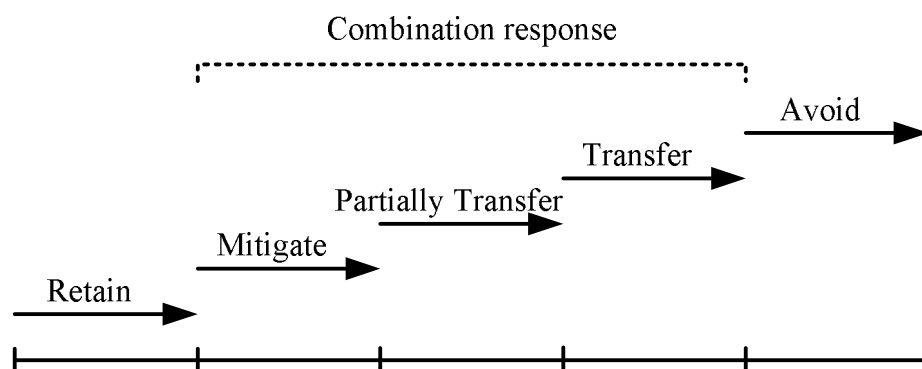


Figure 7-2 Combination risk response measures

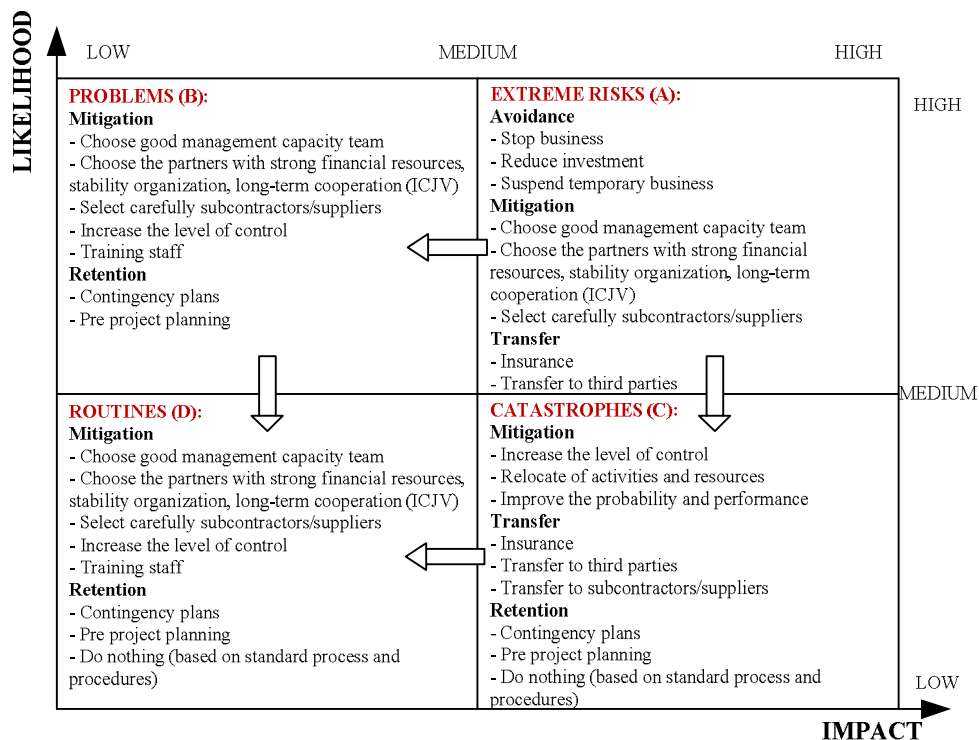


Figure 7-3 Risk response measures based on likelihood and impact of risk factors

7.2 Analysis of respondents' risk response methods

(1) Risk group 1: Internal risks of joint venture

Financial aspects of partner's parent company

The financial status of ICJV partners was the most concerned issue in three stages of ICJV projects. Risk mitigation and risk transfer were chosen to mitigate the likelihood of occurrence and the impact of such risk such as *choosing partner with strong financial resources, technical and management competence* (I1.1.M.1) and *sign contract with fixed rate loan to banks* (I1.1.T.2). Choosing the partner with strong finance was the most risk response methods used. This is because it is currently affected by complex situation of inflation and high interest rates, which is major challenge for managing any company and project. Strategic nature are often starting before the ICJV even established, the parties might spend more time to investigate the potential partners. Therefore, the strong finance, technical, and management status of ICJV partners was considered the top priority for both owner and contractor. Moreover, by trying to add more cash into ICJV entity was an option such as *obtain guarantees or other credit support from other agencies and reliable credit worthy* (I1.1.M.4). In addition, it was indicated that sign contract with fixed rate loan to banks is the method to mitigate the influence by transferring partially the amount of risks to third parties.

As can be seen, the financial aspects of partner's parent company can occur during lifecycle of ICJV projects and hence they need to be considered and updated in more than one time. Moreover, to deal with these issues in ICJV projects, the projects organizations can use *develop the contingency plan* (I1.1.R.1) or *undertake pre-project planning* (I1.1.R.2). Especially, *change business target* (I1.1.A.2) or *suspend temporary business* (I1.1.A.3) was mentioned to cope if this factor has high likelihood of occurrence and huge impact of risk.

Overinterference by parent company of either partner

This factor was of interest in initial stage that established ICJV. Defining clearly the responsibilities of members of ICJV can help to reduce disputes. Indeed, *clear authority and responsibility* (I1.3.A.1) was mentioned as primary measure to avoid this factor. In addition, *issue granting autonomy to the ICJV's chief executive officer (CEO)*(I1.3.M.1) was one of risk mitigation measure that a clear favorite by respondents. This is because CEO of ICJV was seen to be unbiased and strong capacity to resolve the problems in initial ICJV. Thus, the Overinterference by parent company of either partner would be mitigated. Moreover, the setting up of a contract agreement with *clear terms and conditions* (I1.3.T.1) was indicated quite common measure.

Disagreement on allocation in ICJV (staff position, works)

These factors were rated as very critical in the startup stage of ICJV projects, which were in the 8th, and 20th, respectively. This is because allocation the staff position and works with the suitable staff is very important. Actually, the companies which team up for ICJV projects has specialists' skill in own field. The ICJV projects are usually very quite complex and have many different works. Therefore, disagreement on allocation of works for member of ICJV partners is entirely possible. To reduce these risk factors, the project organizations must have the appropriate policies for implementation. *Divide staff according to specialized functions* (I2.2.M.1), and *recruit, train staff with appropriate qualifications* (I2.2.M.2) are the risk mitigation methods that were found favorite by the respondents. In addition, the setting up a contract with *specify careful clear terms and conditions* (I2.2.T.1) for allocation work to parties of ICJV is a risk transfer methods that was indicated quite common.

Continuity, in the operation of ICJVs in Vietnam, ICJVs often choose the key personnel in the ICJV parties to take the major positions in this ICJV organization. The major positions can then carry out the allocation of staff positions in ICJV. The disagreement often occurs among staffs from the other partner parent companies. It was found that risk mitigation was mostly adopted to cope with this risk, including *select the trustworthy people on important places in the ICJV* (I2.1.M.3) and *choose staff carefully* (I2.1.M.2).

Poor relation with government departments

Since ICJV projects are usually faced with a variety of risks due to the Vietnamese legal system and regulations. As we know, the legal and institutional framework for the Vietnamese construction industry is problematic, and these factors had huge impact to the legal procedures of ICJV projects. Poor relationship with government departments was pointed out a critical risk factor. Thus, good relationship with government departments was extremely critical of the convenience for ICJV operation. Difference measures were adopted to mitigate risk, transfer risk, and retain risk, such as *select the best person that have the relation closely with the government* (I2.7.M.1), *select sub-contractors that have good relationship with government departments* (I2.7.T.1), and *provide the contingency fund against late approvals, corruption and bribery* (I2.7.R.1) (Appendix B6). In particular, selection of the best personnel or company had a good relationship with government is a best option (risk mitigation method). The legal procedures for construction will pass quickly. In addition, selection of the suitable subcontractors that had closer relationship with government departments (risk transfer method) was also more convenient in construction site.

(2) Risk group 2: Project risks of joint venture

Subcontractors and suppliers

ICJV projects are usually very large and complex. A large number of parties, including clients, engineers, main contractors, subcontractors, and nominated subcontractors/ suppliers are associated with projects. Thus, lack of subcontractors/ suppliers capacity and inadequate coordination among parties are critical risk factors. It was found that risk mitigation was mostly adopted to cope with this issue, including *hire subcontractors/ suppliers with more experience and previous relationships* (P2.1.M.1), *be careful in accepting the nominated subcontractors/suppliers by client* (P2.1.M.2), and *require the performance bonds supplied by subcontractors* (P2.1.T.1).

The respondents mostly expressed the main characteristics of subcontractors and suppliers such as experience, ability, and previous relationship. It implies that ICJV companies might make more relationship with the stakeholders, and then they can have more cooperation in the future. This research was also found that the project managers must be careful with the nominated subcontractor/supplier. This is because conflicts among the main contractors, normal subcontractors/ suppliers, and nominated subcontracts/suppliers during the performance of projects. In addition, the main contractors must pay attention to the subcontractors/ suppliers with low bid price. The reason is that the subcontractors be willing to accept the low bid price to get the projects and jobs for their employees. As a result, construction quality and

project progress might not guarantee. Thus, requirement the performance bonds by subcontractors/ suppliers was the effective method to cope with this factor.

Managerial skills

Since ICJV projects are usually faced with a variety of risks due to their size, complexity, and multifaceted operations, the managerial skills of the contractor are extremely critical for the success of the project. Different measures were adopted to mitigate such risk, including *hire competent the project management team* (P2.6.M.1), *recruit staff in ICJV with bilingual languages* (P2.6.M.2), *define clearly scope of work of each party* (P2.6.M.3), and *undertake pre-project planning* (P2.6.R.1). As can be seen, the ICJV projects are usually very large and complex. A large number of parties, including contractors, subcontractors, and nominated subcontractors/ suppliers are associated with the projects. The relationship and information stream among the participants are very complicated. The flexibility in solving the ongoing issues by management team would be conducted the successful operation of ICJV. Thus, risk management is an integral part of construction projects. For partners of the ICJV projects such as clients, contractors, subcontractors, the selection of key management personnel with bilingual ability was likely an important step. In addition, in this research, risk factors had a huge impact to ICJV projects in Vietnam. Examples are inadequate and incompetent coordination among parties, unfamiliar cooperation between contractors and nominated contractors. Therefore, the project organizations executing ICJV projects need to be prepared the risk management plan to face this problem.

Design changes

Design changes (P4.1) were also a critical risk factor in three-stages of ICJV project. From results of the interviews, there are many risk response methods to cope this issue indicated by the respondents. Difference measures were adopted such as risk mitigation (8 methods), risk transfer (3 methods), and risk retention (3 methods). It implies that project organizations have more experience to cope with this factor. Indeed, design changes were rated as high probability and high impact. Sources of this risk are related to many project stakeholders, such as construction projects (unclear project objectives) clients (excessive demands and variation by client), consultants (imprecise feasibility study), and contractors/subcontractors (incompatibility between design and site conditions) (Table 6-3). Consequently, all of the risk response methods are as shown in Appendix B6, including *make every effort to fully understand the client's wants and needs* (P4.1.M.1), *carry out comprehensive investigation of site conditions* (P4.1.M.2), *specify an adjustment clauses in contract* (P4.1.T.2), *develop the contingency plan* (P4.1.R.1).

Contract management

Risk factors in contract category, including disagree some conditions of contract (P5.1) and incomplete contract terms (P5.2) should be attended in ICJV projects, although these factors were ranked 23rd and 30th, respectively. Normally, the contract would be drafted by the parties before and negotiation later. However, the foreign companies have more experience in implementing within international contracts, and local companies have many shortcomings because of the limit of experience and language skill. Therefore, “disagree some conditions of contracts and incomplete contract terms” often happened in the implementation of ICJV projects. *Establish arbitration in contract agreement (P5.1.T.1), specify clearly conflict resolution clause and extension clause in contract (P5.2.T.2), and revise contract more than one times (P5.2.M.1)* are some risk response methods which were suggested to cope with these risk factors. In addition, the local partners should have staffs with bilingual languages, and foreign companies should draft the contract in accordance with working conditions, regulations consistent in Vietnam.

(3) Risk group 3: External risks of joint venture

Economic problems

These problems are the most concerned issue of ICJV projects. This is because these factors could have a great impact on the profit or loss of the participant in ICJVs (Bing et al, 1999). In 2011, the national’s inflation rate increased to 18.13%, which huge affected to the fluctuation of interest rates. Additionally, high inflation also contributes to the fluctuation of interest rates. The high inflation and the fluctuation of interest rates led to the crisis in the construction industry. Unfortunately, these risk factors are considered macroeconomic conditions and are impossible to avoid. Thus, transferring the risk to other parties was the most common risk response measures, including *obtain payment bonds and performance bonds from banks (E3.3.T.3); incorporate escalation clauses for interest, inflation rates, and delays in the contract (E3.3.T.2); as well as specify the terms of extension or compensation clauses in contract (E3.3.T.7).*

Political

Vietnam is a Southeast Asian country with a great expansion of the construction industry in recent years. Moreover, Vietnam is a country with stability of politics in developing countries. A large number of international companies have been investing into Vietnam. Therefore, loss incurred due to political changes factor were mentioned less impact to ICJV projects. Indeed, according to the viewpoints of the respondents, risk retention was generally indicated to handle with this risk factor, including *do nothing (realized risk existence, but not take any action) (E1.5.R.2), develop the contingency plan (E1.5.R.1).*

Law

Loss due to insufficient law for joint ventures (E1.3) was also the critical risk; it was ranked 12th, 20th, and 16th, respectively in 3 stages. Indeed, the Vietnamese legal system and regulations are very complicated (Long *et al.*, 2004), and some of them contradict with each other. Moreover, Vietnamese companies do not understand clearly the law. It is therefore very difficult to deal and comply throughout the regulations, especially JV laws. *Hire a lawyer consultant for law and legal* (E1.3.T.1), *undertake the work plan in accordance with current joint venture law* (E1.3.M.2) and *develop the contingency plan to deal with risk event* (E1.3.R.1) was favorite response methods. Sharing risk to other parties or retaining risk was the most common measures to cope with this risk.

Social, culture, and religious

Social, culture, and religious problem was not mentioned to have a huge impact to ICJV projects. This is because the social, cultural differences were greatly reduced in the process of expanding international relationships. In fact, risk retention and risk mitigation was generally indicated to cope with this issue, such as *training employees about different social, culture* (E2.3.R.1), *apply long-term strategic partnership* (E2.3.M.1), and *do nothing* (realized risk existence, but not take any action) (E2.3.R.1).

Bureaucracy, corruption, and bribery

Bureaucracy, corruption, and bribery are the most concerned issue in Vietnamese ICJV projects. As can be seen, these risk factors was assessed a huge influence to the startup and dismantle stage. Indeed, the corruption and bribery in Vietnam is still an alarm rate. Risk mitigation and risk transfer were mentioned as primary measures to respond these factors. *Maintaining good relationships with government officers* (E2.4.M.3) is one of a risk mitigation measure that a clear favorite with the majority of respondents. The reason is that Vietnamese companies do not understand the complicated law and are afraid of administration officials. The legal procedures in Vietnam are quite difficult because of the popularity of bureaucracy, corruption, and bribery. It was noted that the foreign contractors might not acknowledge with bureaucracy in Vietnam. Therefore, *add contingency fund for delay of late approvals* was indicated the main retention method to resist the bureaucracy in Vietnam. Thus, the ICJV companies need prepare to face these issues.

Force majeure

Force majeure risk factors, such as rain, flood, and earthquake are impossible to avoid but can predictable. Their factors were pointed out high influence in the operation and dismantle stage of projects. The climate in Vietnam is very complicated due to the effect of rain, flood, and storm. Therefore, it is rarely possible to mitigate the

likelihood of occurrences. Planning a project to avoid seasonal weather extremes is one approach to cope with this issue. It was found that risk retention and risk transfer was mostly adopted to cope with this issue, including *collect statistical data for climates in the past (E4.2.R.3)*, *insurance (E4.2.R.3)*, *specify extension of time clause in the contract (E4.2.T.3)*.

7.3 Validation of risk response methods

According to the results in large-scale survey, all of risk response methods were collected and summarized. However, there are some errors of the respondents about risk response measures. Some risk response methods were arranged in accuracy measure, but some risk response methods were not in right measure. For example, one respondent mentioned that *select foreign contractors that have good management capacities and reputability* as risk retention, however, it actually is one of risk mitigation policy. Moreover, some risk response methods may not be appropriate to apply in the reality. Therefore, summary table of risk response measures must to be adjusted accordingly and then taken to verify. In the previous chapter, the respondents mentioned 427 risk response methods. After rechecking and rearranging this table, 423 risk response methods was taken through validation process. Validation questionnaire survey was drafted as follows in Appendix A4 to check the reliability of these methods. Seven respondents participated in the validation process. Table 7-5 shows the respondents' profile of the ICJVs participated in our validation. As can be seen, the respondents had experience in construction more than five years, whereas five respondents (71.4%) have experience more than ten years. In validation survey, the respondents were requested to specify and deliberate "agree", "disagree" and "not sure" for each risk response method (Table 7-6).

- "Agree": it means that the respondents agree with the risk response method for this risk factor (The respondents were, are, or will use this method to cope with this risk factor).
- "Disagree": it means that the respondents cannot agree with the risk response method for each risk factor (The respondents were not, are not, or will not use this method to cope with this risk factor).
- "Not sure": it means that the respondents are unsure on how to use the risk response method for this risk factor (The respondents were, are, or will use this method to cope with this risk factor).

According to validation survey, the respondents' consensus were illustrated such as "agree" (379 methods), "disagree" (30 methods), and "not sure" (14 methods). Therefore, only 379 response methods that got agreement from respondents were accepted to respond with risk factors affecting ICJV projects in Vietnam. Methods that got "disagreement" and "not sure" will be considered carefully for each specific ICJV project in the future. Consequently, the effective of risk response measures was adopted in Appendix B6.

Table 7-5 Profile of the respondents for validation

Joint Venture Company	Respondents	Designation	Experience in construction
Vietnam/Singapore (VS)	Respondent 1	Project manager	5-10 years
Vietnam/Germany & Netherlands (VGN)	Respondent 2	Engineer	5-10 years
Vietnam/Taiwan (VT)	Respondent 3	Engineer	> 10 years
	Respondent 4	Engineer	> 10 years
Vietnam/Japan (VJ)	Respondent 5	Deputy project manager	> 10 years
Experts of Joint Venture	Respondent 6	Director	> 10 years
	Respondent 7	Project manager	> 10 years

Table 7-6 Validation results of risk response measures

No	International risk factors	ID	Risk response methods	Agree	Disagree	Not sure	Results
				Percentage (%)			
1	Partner's parent company in financial problems	II.1.M.1	Examine the target company's financial resources, technical and management competence and connections with local government	100.0	0.0	0.0	agree
		II.1.M.2	Ensure that a reputable Client finances the project	100.0	0.0	0.0	agree
		II.1.M.3	Gain accurate financial and other information from international and independent security and risk evaluation agencies	71.4	0.0	28.6	agree
		II.1.M.4	Obtain guarantees or other credit support from reliable and credit worthy local and international entities	71.4	0.0	28.6	agree
		II.1.M.5	Joint venture with foreign partners that have strong financial resources	100.0	0.0	0.0	agree
		II.1.T.1	Specify extension or compensation clauses in contract for payment	100.0	0.0	0.0	agree
		II.1.T.2	Enter into fixed rate loan contract with lending banks	85.7	0.0	14.3	agree
		II.1.R.1	Undertake pre-project planning	100.0	0.0	0.0	agree
		II.1.R.2	Develop the contingency plan to support this risk event	100.0	0.0	0.0	agree
		II.1.R.3	Do nothing	0.0	100.0	0.0	<i>disagree</i>
		II.1.A.1	Reduce investment	100.0	0.0	0.0	agree
		II.1.A.2	Change business target	71.4	14.3	14.3	agree
		II.1.A.3	Suspend temporary business	71.4	14.3	14.3	agree
2	Policy changes in your partner's parent company toward ICJV	II.2.M.1	Establish operational framework less affected by policy changes of partner's parent company	85.7	0.0	14.3	agree
		II.2.M.2	Limit right to determine and intervention of parent company to a JV by clear policies and rules	100.0	0.0	0.0	agree
		II.2.T.1	Specify careful agreement about clear terms and conditions	100.0	0.0	0.0	agree
		II.2.T.2	Specify clear authority and responsibility	100.0	0.0	0.0	agree
		II.2.R.1	Set up appropriate policies for change activities of the parent company	57.1	28.6	14.3	agree
		II.2.R.2	Do nothing	71.4	28.6	0.0	agree
	II.2.A.1	Agreement: clear terms and conditions	100.0	0.0	0.0	agree	

Table 7-7 Validation results summary of risk response measures

Risk groups	Agree	Disagree	Not sure	Total
Internal risk factors	85 (85.9%)	11 (11.1%)	3 (3%)	99
Project risk factors	150 (89.3%)	12 (7.1%)	6 (3.6%)	168
External risk factors	144 (92.3%)	7 (4.5%)	5 (3.2%)	156
Total	379 (89.6%)	30 (7.1%)	14 (3.3%)	423 methods

7.4 Risk profile for ICJVs companies in Vietnam

In this research, the process for establishing the risk profile of ICJVs in Vietnam is based on the principles of risk management process by the Australian and New Zealand Standard AS/NZS 4360:2004. The proposed risk profile process consists of four detailed steps as follows.

(1) Step 1: risk identification for ICJV projects

This step identifies the risk factors affecting ICJV project based on the literature, project information. Projects stakeholders will identify risk factors throughout risk checklists, brainstorming, and risk profile. Then the risk groups, risk categories, and risk factors are defined through risk code system.

(2) Step 2: risk assessment for ICJV projects

The second step presents the assessment of the probability of occurrence and impact of risk factors during three stages of ICJV projects. Moreover, it presents the analysis of the important effect of risk factors to the projects objectives and the analysis of risk trends in the lifecycle of ICJVs.

(3) Step 3: risk response for ICJV projects

This step shows the identification of the risk response measures for each risk factor. The project organizations can choose the best possible response methods for risk factors during three-stages of ICJV projects.

(4) Step 4: risk profile for ICJV projects

Figure 7-4 illustrates the proposed research methodology. The first row shows the organizations, the risk of which is investigated, which is ICJVs in Vietnam. The second row shows four typical phases of risk management: (1) risk identification, (2) risk assessment, (3) risk response, and (4) risk profile. The third row shows the methodology of the risk profile process, which is to identify the risks by Hierarchical Risk Breakdown Structure (HRBS), to analyze the risks in three-stages of projects using the new probability-impact methods suggested by Dale et al. (2004), to respond

the risks using risk response measures, and to establish the risk profile through small respondents group. Finally, risk profile for ICJV projects in Vietnam was established. The objective of risk profiles was to develop a simple spreadsheet file that includes all of findings of this research. It was developed by Microsoft excels workbook. Risk profile (Figure 7-5) contains seven worksheets, such as 1) risk code, 2) risk factor, 3) risk source-effect (SE), 4) risk assessment, 5) risk response measures, 6) risk response methods, and 7) summarized-data of each risk factor (Figure 7-6 to Figure 7-11).

Risk profile of ICJV projects in Vietnam: consists of

a) Worksheet 1: Risk code (Figure 7-6)

This worksheet shows the definition of risk code system for risk factors and risk response methods.

b) Worksheet 2: Risk factor (Figure 7-7)

The second worksheet lists all of 47 risk factors affecting ICJV projects in Vietnam into three main groups: internal risks, external risks, and project risks. Risk factors are presented by two techniques, such as checklist and HRBS. This sheet also has the place to add more unknown risk factors.

c) Worksheet 3: Risk SE (Figure 7-8)

The third worksheet describes this research works about the sources of risk factors and illustrates the risk important impact to objectives of ICJV projects.

d) Worksheet 4: Risk assessment (Figure 7-9)

The fourth worksheet demonstrates the formula to ranking risk factors affecting ICJV projects in Vietnam. In addition, it also displays risk contour diagram of 47 risk factors, which were divided into three zones, namely, the high-risk level, the medium-risk level, and the low-risk level during three stages of ICJV projects.

e) Worksheet 5: Risk response measures (Figure 7-10)

The fifth worksheet displays opinions of 15 respondents about the risk response measures and it includes the general risk response methods of each measure.

f) Worksheet 6: Risk response methods (Figure 7-11)

The sixth worksheet includes all of risk response methods associated with each risk factor.

g) Worksheet 7: Summarized data of each risk factor (Figure 7-12)

Finally, the seventh worksheet presents all of findings of this research according to displaying information corresponding to each risk factor. This worksheet is very useful because it summarized all of information about each risk factor. Moreover, it can help project managers to understand the overview of this respective risk factor in ICJV projects. For example, it contains the risk factors

involved, risk indentity (ID), risk sources, risk important impact on objectives of projects. In addition, it also displays risk assessment throughout three stages of the ICJV projects by chart or diagram. Risk developing trend of such risk factor can be evaluated. Finally, through the evaluation of risk factors, the risk response measures that are suitable were suggested to project organizations to choose the appropriate risk response methods to cope with this risk factor.

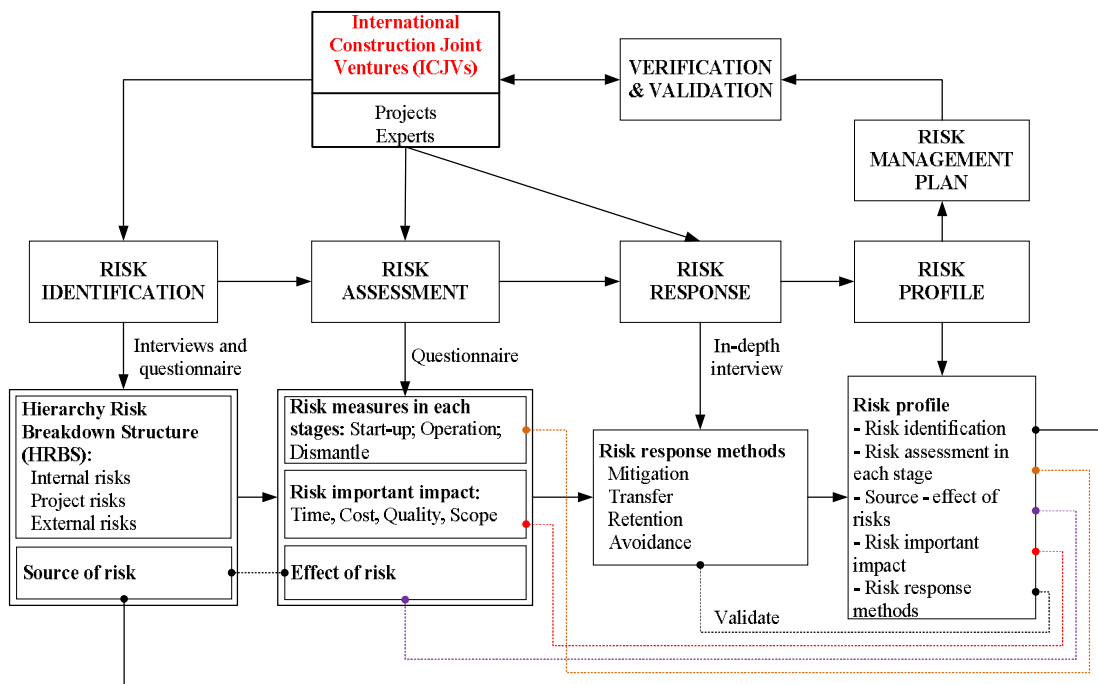


Figure 7-4 Risk profile process of ICJVs



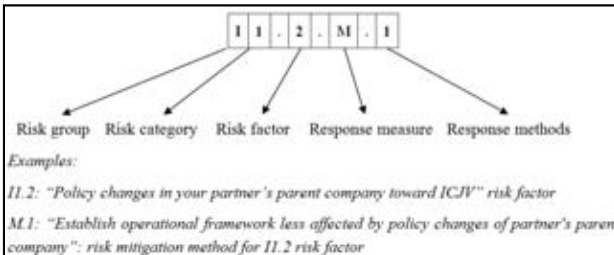
Figure 7-5 Risk profile interface

1) Risk code system for risk factors



Risk groups	Risk categories	ID	Risk factors
Internal risks (I)	Partners (11)	11.1	Partner's parent company in financial problems
		11.2	Policy changes in your partner's parent
		11.3	Over-interference by parent company of either
		11.4	Change of organization within local partner
		11.5	Partner's lack of management competence and
	ICJVs (12)	12.1	Disagreement on allocation of staff positions in ICJV
		12.2	Disagreement on allocation of works
		12.3	Technology transfer dispute
		12.4	Breach of contracts by ICJV partner
		12.5	Poor relation and disputes with partner
		12.6	Inadequate ICJV organization structure
		12.7	Poor relation with government departments
...

2) Risk code system for risk response measures

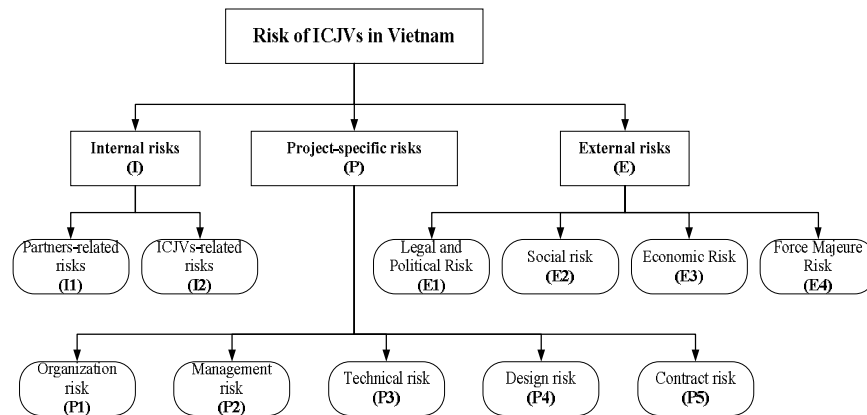


- M: Risk Mitigation measure
- T: Risk Transfer measure
- R: Risk Retention measure
- A: Risk Avoidance measure

Risk groups	Risk categories	ID	Risk factors	Response ID	Risk response methods		
Internal risks (I)	Partners (11)	11.1	Partner's parent company in financial problems	11.1.M.1	Examine the target company's financial resources, technical and management competence and connections with local government		
				11.1.M.2	Ensure that a reputable Client finances the project		
				11.1.M.3	Gain accurate financial and other information from international and independent security and risk evaluation agencies		
				11.1.M.4	Obtain guarantees or other credit support from reliable and credit worthy local and international entities		
				11.1.M.5	Joint venture with foreign partners that have strong financial resources		
				11.1.T.1	Specify extension or compensation clauses in contract for payment		
				11.1.T.2	Enter into fixed rate loan contract with lending banks		
				11.1.R.1	Undertake pre-project planning		
				11.1.R.2	Develop the contingency plan to support this risk event		
				11.1.R.3	Do nothing		
				11.1.A.1	Reduce investment		
				11.1.A.2	Change business target		
				11.1.A.3	Suspend temporary business		
				11.2	Policy changes in your partner's parent company toward ICJV	11.2.M.1	Establish operational framework less affected by policy changes of partner's parent company
						11.2.M.2	Limit right to determine and intervention of parent company to a JV by clear policies and rules
		11.2.T.1	Specify careful agreement about clear terms and conditions				
				11.2.T.2	Specify clear authority and responsibility		
				11.2.R.1	Set up appropriate policies for change activities of the parent company		
		11.2.R.2	Do nothing				
		11.2.A.1	Agreement: clear terms and conditions				
		11.3	Over-interference by parent company of either partner		
		11.4	Change of organization within local partner		
		11.5	Partner's lack of management competence and resourcefulness		

Figure 7-6 Risk code worksheet of risk profile

Risk factors affecting ICJV projects in Vietnam

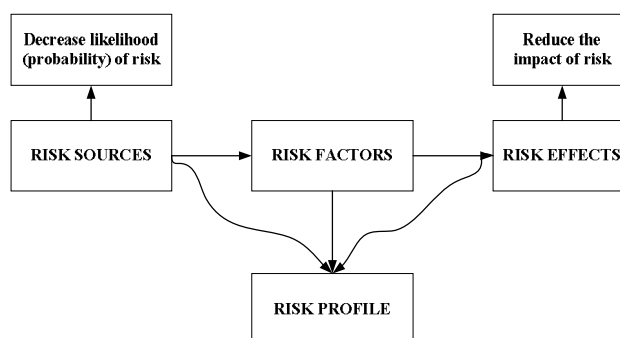


Risk groups	Risk categories	ID	Risk factors
Internal risks (I)	Partners (I1)	I1.1	Partner's parent company in financial problems
		I1.2	Policy changes in your partner's parent company toward ICJV
		I1.3	Over-interference by parent company of either partner
		I1.4	Change of organization within local partner
		I1.5	Partner's lack of management competence and resourcefulness
	ICJVs (I2)	I2.1	Disagreement on allocation of staff positions in ICJV
		I2.2	Disagreement on allocation of works
Project risks (P)	Organization (P1)	P1.1	Poor project relationship
		P1.2	Excessive demands and variation by client
		P1.3	Problems due to partners' different practice
	Management (P2)	P2.1	Incompetence of subcontractors/suppliers
		P2.2	Improper project feasibility study
		P2.3	Improper project planning and budgeting
		P2.4	Improper selection of project location, type
		P2.5	Inadequate project organization structure
		P2.6	Incompetence of project management team
	Technical (P3)	P3.1	Accidents on site
		P3.2	Equipment failure
		P3.3	Materials shortage
		P3.4	Shortage in skillful workers
Design (P4)	P4.1	Design changes	
	P4.2	Errors in design drawings	
	P4.3	Incomplete drawing and technical specification	
Contract (P5)	P5.1	Disagree some conditions of contract	
	P5.2	Incomplete contract terms	

New risk factors for ICJV projects			
Risk groups	Risk categories
	

Figure 7-7 Risk factor worksheet of risk profile

Source - effect of risk factors affecting ICJV projects in Vietnam

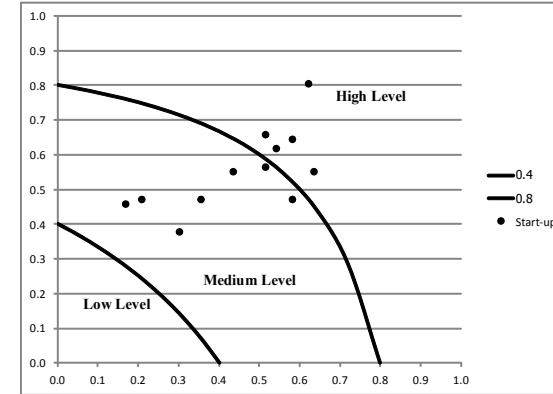


No	Category	ID	Internal Risk Factor	Source of Risk	Effect (Impact)			
					Time	Cost	Quality	Scope
1	Parent Partners	I1.1	Partner's parent company in financial problems	- Inappropriate financial structure of ICJV - Investment policy changed by shareholders - Loaning from subsidiary company - Change of interest rate - Economic fluctuation - Partner selection via broker and middleman	x	x	x	x
2		I1.2	Policy changes in your partner's parent company toward ICJV	- Policy changes in the partner's parent company - Unfamiliarity with the collaboration process, unclear terms and conditions in contract agreement (Construction joint venture is often first collaboration, and joint venture based on the other JVs experience) - Alteration of construction market	x	x		
3		I1.3	Overinterference by parent company of either partner	- Unsuccess of JV - Implementation of unreasonable policies of the director of JV - The over-reliance of JV on the parent company	x	x	x	x
4		I1.4	Change of organization within local partner	- Policies change in the partner's parent company - Fluctuation of construction	x	x		
5	ICJVs	I1.5	Partner's lack of management competence and resourcefulness	- A less capacity or inability of manager staff	x	x	x	x
6		I2.1	Disagreement on allocation of staff positions in ICJV	- A less capacity or inability of manager staff - Incapacity recruitment-staff - The complexity of the JV company	x	x		
7		I2.2	Disagreement on allocation of works	- Allocating works not suitable for ability of staff - Unexpected of the subordinates	x	x	x	
8		I2.3	Technology transfer dispute	- Unclear about the terms and conditions in technology transfer	x	x	x	
9		I2.4	Breach of contracts by Joint Venture partner	- Disagreement about the profit/loss in joint venture - Disagreement on allocation of works and staff positions in ICJV - Inconsistent clauses, inappropriate collaboration in ICJV contract - Conflicts in the division of the design changes	x	x	x	x
10		I2.5	Poor relation and disputes with partner	- Design changes - Disagreement about the profit/loss in joint venture	x	x		
11		I2.6	Inadequate ICJV organization structure	- Inexperienced partners - The complexity of JV projects - Unclear terms and conditions	x	x	x	
12		I2.7	Poor relation with government departments	- Poor relation of local partner with government departments	x	x		

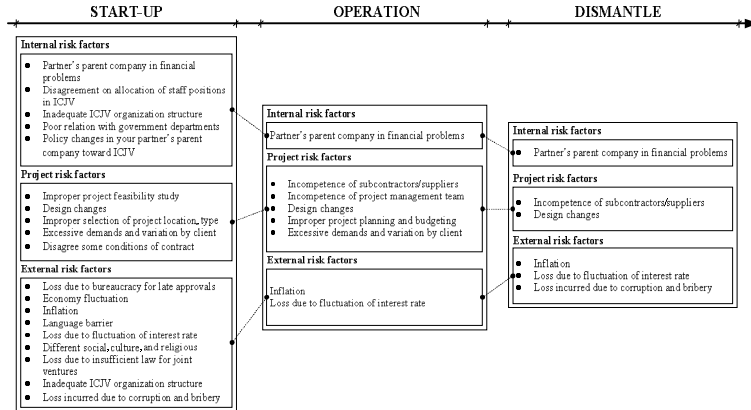
Figure 7-8 Risk source-effect worksheet of risk profile

1) Ranking risk factors affecting the performance of ICJV project in Vietnam

No.	ID	Risks	Probability of risks			Impact of risks			RF		
			Start-up	Operation	Dismantle	Start-up	Operation	Dismantle	Start-up	Operation	Dismantle
			Mean	Mean	Mean	Mean	Mean	Mean	P1	P2	P3
1	11.1	Partner's parent company in financial problems	0.62	0.58	0.59	0.81	0.81	0.71	0.927	0.919	0.883
2	11.2	Policy changes in your partner's parent company toward ICJV	0.54	0.45	0.26	0.62	0.63	0.55	0.825	0.797	0.669
3	11.3	Over-interference by parent company of either partner	0.58	0.38	0.38	0.47	0.58	0.46	0.779	0.740	0.665
4	11.4	Change of organization within local partner	0.35	0.45	0.26	0.47	0.47	0.47	0.659	0.709	0.610
5	11.5	Partner's lack of management competence and resourcefulness	0.30	0.37	0.30	0.38	0.58	0.38	0.566	0.734	0.566
6	12.1	Disagreement on allocation of staff positions in ICJV	0.58	0.50	0.50	0.65	0.46	0.46	0.852	0.730	0.730
7	12.2	Disagreement on allocation of works	0.51	0.42	0.41	0.57	0.38	0.37	0.789	0.640	0.624
8	12.3	Technology transfer dispute	0.17	0.31	0.31	0.46	0.46	0.43	0.550	0.629	0.611
9	12.4	Breach of contracts by ICJV partner	0.21	0.37	0.37	0.47	0.67	0.37	0.582	0.793	0.599
10	12.5	Poor relation and disputes with partner	0.43	0.43	0.43	0.55	0.55	0.55	0.747	0.747	0.747
11	12.6	Inadequate ICJV organization structure	0.63	0.46	0.46	0.55	0.55	0.38	0.836	0.759	0.665
12	12.7	Poor relation with government departments	0.51	0.41	0.21	0.66	0.66	0.35	0.835	0.798	0.487



2) Critical risk factors in difference stages of performance of ICJVs in Vietnam



3) Trend analysis of probability, impact and the degree of risk groups

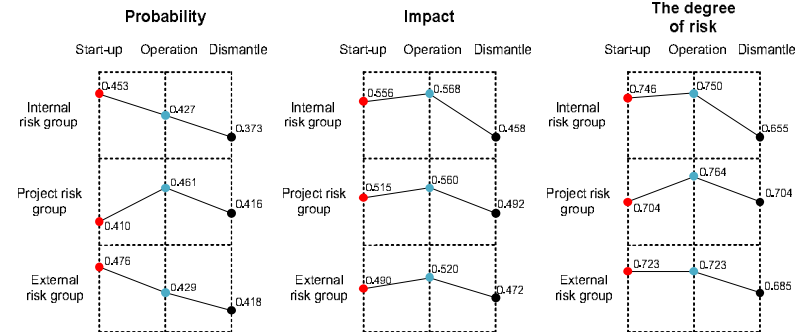


Figure 7-9 Risk assessment worksheet of risk profile

Risk response measures of ICJV projects in Vietnam

Profile

No	ID	Risk factors	Response plan			
			M	T	R	A
1	I1.1	Partner's parent company in financial problems	◆	◆	○	□
2	I1.2	Policy changes in your partner's parent company toward ICJV	◆	○	□	○
3	I1.3	Over-interference by parent company of either partner	◆	○	□	○
4	I1.4	Change of organization within local partner	◆	○	◆	○
5	I1.5	Partner's lack of management competence and resourcefulness	●	○	□	○
6	I2.1	Disagreement on allocation of staff positions in ICJV	◆	□	□	○
7	I2.2	Disagreement on allocation of works	◆	□	□	○
8	I2.3	Technology transfer dispute	◆	○	□	○
9	I2.4	Breach of contracts by ICJV partner	□	◆	○	□
10	I2.5	Poor relation and disputes with partner	◆	○	□	○
11	I2.6	Inadequate ICJV organization structure	◆	○	○	□
12	I2.7	Poor relation with government departments	◆	□	○	○
13	P1.1	Poor project relationship	◆	○	□	○
14	P1.2	Excessive demands and variation by client	●	○	○	○
15	P1.3	Problems due to partners' different practice	◆	□	○	○
16	P2.1	Incompetence of subcontractors/suppliers	◆	□	○	○
17	P2.2	Improper project feasibility study	◆	○	□	□
18	P2.3	Improper project planning and budgeting	●	○	○	○
19	P2.4	Improper selection of project location, type	○	○	◆	□
20	P2.5	Inadequate project organization structure	◆	○	○	○
21	P2.6	Incompetence of project management team	◆	○	○	○
22	P3.1	Accidents on site	◆	◆	□	○
23	P3.2	Equipment failure	●	□	○	○
24	P3.3	Materials shortage	●	□	○	○

No	ID	Risk factors	Response plan			
			M	T	R	A
25	P3.4	Shortage in skillful workers	◆	○	□	○
26	P4.1	Design changes	●	○	◆	○
27	P4.2	Errors in design drawings	●	○	○	○
28	P4.3	Incomplete drawing and technical specification	◆	○	□	○
29	P5.1	Disagree some conditions of contract	◆	□	□	○
30	P5.2	Incomplete contract terms	◆	□	□	○
31	E1.1	Import restriction	◆	□	□	○
32	E1.2	Lack of enforcement of legal judgment	□	□	○	○
33	E1.3	Loss due to insufficient law for joint ventures	◆	◆	○	○
34	E1.4	Changes of government policies	□	○	◆	○
35	E1.5	Loss incurred due to political changes	□	□	□	□
36	E2.1	Security problems	□	□	□	○
37	E2.2	Language barrier	●	○	○	○
38	E2.3	Different social, culture, and religious	●	○	○	○
39	E2.4	Loss incurred due to corruption and bribery	●	○	○	○
40	E2.5	Loss due to bureaucracy for late approvals	●	○	□	○
41	E2.6	Worker strike	◆	◆	○	○
42	E3.1	Economy fluctuation	□	◆	□	○
43	E3.2	Exchange rate	○	◆	◆	○
44	E3.3	Inflation	□	◆	□	○
45	E3.4	Loss due to fluctuation of interest rate	□	◆	□	○
46	E4.1	Environmental pollution	□	○	□	○
47	E4.2	Force majeure (rain, flood, earthquake, etc)	◆	○	◆	○

Number of respondents:	□	0-3	◆	8-11
	□	4-7	●	12-15

RISK RESPONSE MEASURES				
	MITIGATION	TRANSFER	RETENTION	AVOIDANCE
RISK RESPONSE METHODS	1 Choose the partners with strong financial resources, stability organization, long-term cooperation	1 Share risks to subcontractors/suppliers	1 Develop the contingency plan	1 Change business target
	2 Choose the previous relationship partners	2 Transfer to third parties	2 Undertake pre-project planning	2 Reduce investment
	3 Choose good management capacity team	3 Insurance	3 Prepare the suitable policies to cope with risk factor	3 Stop business
	4 Select carefully subcontractors/suppliers	4 Manage contract in JV	4 Do nothing (realized risk existence, but not take any action)	4 Suspend temporary business
	5 Choose the previous relationship subcontractor/suppliers	5 Clear authority and responsibility in contract		
	6 Distribute works in accordance with the capabilities of each partners	6 Clear terms and conditions in contract		
	7 Maintain good relationship with the stakeholders			
	8 Establish appropriate policies and strategies			
	9 Increase the level of control			
	10 Separate or relocate of activities and resources			
	11 Training staff			
	12 Improve the probability and performance			

Figure 7-10 Risk response measures worksheet of risk profile

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES	
		ID	Risk response methods
1	Partner's parent company in financial problems	II.1.M.1	Examine the target company's financial resources, technical and management competence and connections with local government
		II.1.M.2	Ensure that a reputable Client finances the project
		II.1.M.3	Gain accurate financial and other information from international and independent security and risk evaluation agencies
		II.1.M.4	Obtain guarantees or other credit support from reliable and credit worthy local and international entities
		II.1.M.5	Joint venture with foreign partners that have strong financial resources
		II.1.T.1	Specify extension or compensation clauses in contract for payment
		II.1.T.2	Enter into fixed rate loan contract with lending banks
		II.1.R.1	Undertake pre-project planning
		II.1.R.2	Develop the contingency plan to support this risk event
		II.1.R.3	Do nothing
		II.1.A.1	Reduce investment
		II.1.A.2	Change business target
		II.1.A.3	Suspend temporary business
2	Policy changes in your partner's parent company toward ICJV	II.2.M.1	Establish operational framework less affected by policy changes of partner's parent company
		II.2.M.2	Limit right to determine and intervention of parent company to a JV by clear policies and rules
		II.2.T.1	Specify careful agreement about clear terms and conditions
		II.2.T.2	Specify clear authority and responsibility
		II.2.R.1	Set up appropriate policies for change activities of the parent company
		II.2.R.2	Do nothing
		II.2.A.1	Agreement: clear terms and conditions

Figure 7-11 Risk response methods worksheet of risk profile

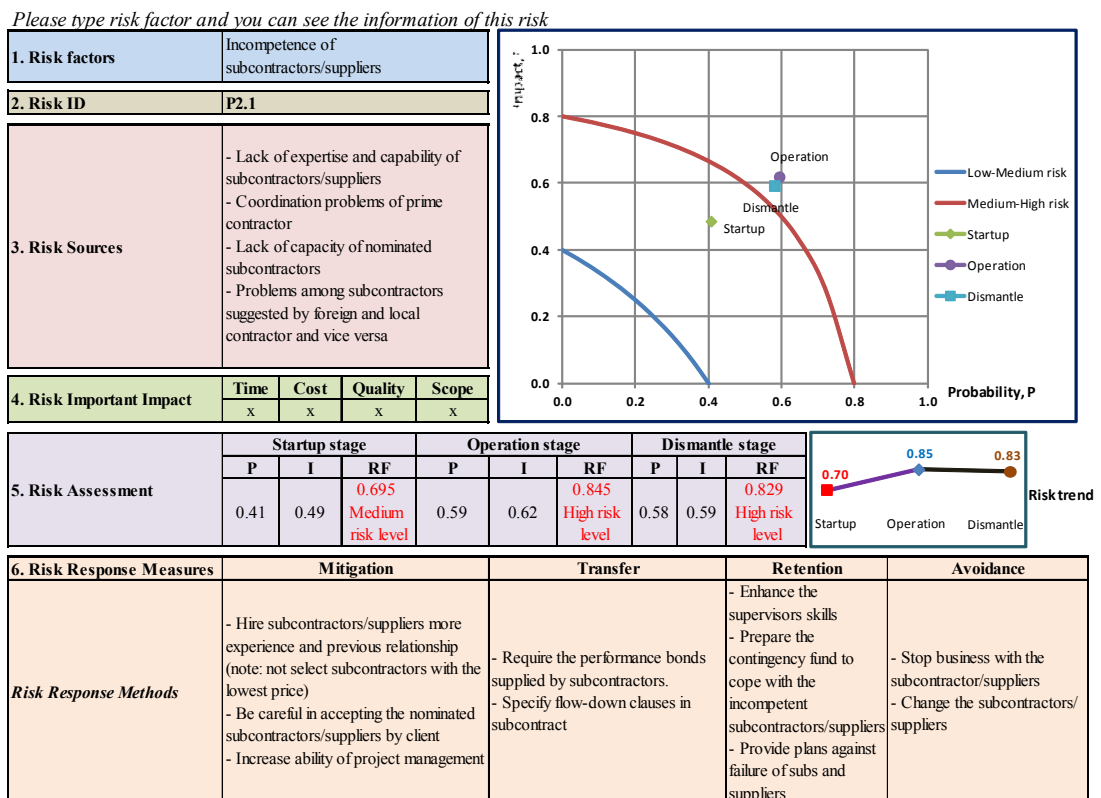


Figure 7-12 Summarized-data of each risk factor

7.5 Conclusion

Risk management in ICJV projects is an extremely challenging task for every party, especially the local partner in developing countries. Establishing a risk management system requires both knowledge and experience in ICJV project administration. This chapter investigates the current experts' views about risk response measures and then establishes the risk profile for ICJV companies in Vietnam. Fifteen respondents participated in this study through the in-depth interviews and questionnaire surveys. The 47 risk factors affecting ICJV projects in Vietnam were identified and assessed. The respondents then provided their risk response measures to manage such risk as well as risk response methods they adopted to cope with each risk factor. The most common risk response measure used by contractors was risk mitigation. It was also found that risk transfer and risk retention were not the favorable options for the financial risks and some internal risk factors. In addition, risk avoidance was adopted for risk with high-impact levels, such as breach of contract, improper project feasibility study, and improper selection of project location and type.

Finally, all findings of this research were included in risk profile that combined among risk identification and risk assessment in chapter 5 and risk response measures in chapter 6. The presented results can be used as guidelines for developing risk management plans for future ICJV projects in Vietnam.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

This final chapter presents all research conclusions and recommendations for the future research for international construction joint ventures (ICJVs) in Vietnam. The first part displays the conclusions about all aspects of risk factors affecting the implementation of ICJVs in Vietnam. The second part presents the research limitations and future research directions. Finally, the last part demonstrates the contributions of study for local and international contractors.

8.1 Conclusions

Vietnam is a Southeast Asian country with a great expansion of the construction industry in recent years. To enter the local market, several international construction companies have been cooperating with local partners in the form of ICJVs. This business form has been adopted in the construction industries worldwide because foreign contractors can share their work experiences and resources with local contractors that understand cultural, political, and legal factors in their countries well. In spite of its numerous merits, it is highly risky for all contractors to implement this business scheme successfully.

The objectives of this research are to identify, assess critical risk factors, and establish risk profile for ICJVs in Vietnam. Based on the findings through interviews and questionnaire surveys, risk factors affecting ICJVs in Vietnam were first listed. The risks were then subjectively assessed by considering the likelihood of occurrence and impact of such risk factors during the lifecycle of projects. The critical risk factors affecting ICJVs in Vietnam were adopted in three stages of projects. In addition, risk response measures were also established to cope with such risk factors. Finally, the findings of this research were collected and summarized in a risk profile. The present results can be used as guidelines for developing risk management plans for future ICJV projects in Vietnam.

Throughout pilot survey, a brief overview of ICJVs in Vietnam has conducted, including mutual and separate objectives, and some administrative structures of the ICJV in Vietnam. Next, 47 risk factors affecting the implementation of ICJVs projects in Vietnam have been identified. These risk factors were divided into three main groups, such as internal risks (12 factors), project risks (18 factors), and external risks (17 factors). According to the assessment of critical risk factors, it was found that the factors having high influence were as partner's parent company in financial problems, subcontractors/suppliers, management issues, economic conditions, bureaucracy,

corruption, and bribery. This research also indicated that political, security problems and environment pollution had low effective ICJV projects in Vietnam conditions.

It was found that in internal risk factors, the financial status of the ICJV partner's parent company is the most concerned issue in Vietnam. This is because it is currently affected by complex situation of economic fluctuation, inflation, and interest rates, which is major challenge for managing any company and project. Furthermore, disagreement on allocation of staff positions and works in ICJV must be paid attention to. Besides, the problems of organization and management are often difficult for the ICJV in Vietnam. The basic cause of these factors is the large and complex of ICJV projects. A large number of parties, such as contractors, subcontractors, and nominated subcontractors/suppliers are associated with the projects. The relationship and information stream among the participants are very complicated. Thus, participants executing ICJV projects need to be prepared to face this problem. In these external risk factors, the problems of the economy conditions (inflation, interest rate, and exchange rate) are the most concerned issue. This factor is quite obvious because of the impact on economic efficiency of ICJV projects with foreign capitals. In 2008 and 2009, global economic crisis had the bad effects to the implementation of projects in Vietnam. The nation's inflation rate recently increased more than 18% in 2011, which enormously affected the prices of all construction resources. Moreover, high inflation has pushed total investment of ICJV projects increased beyond 10% backup funds. Many of projects might suspend or delay business due to lack of funds, lack of quality and efficiency. Unfortunately, these risk factors are considered macroeconomic conditions and are impossible to avoid. Thus, specific measures must to be carried out to restrict the impact of these risk factors.

Additionally, in the current status, foreign companies have realized that Vietnam be a potential market with strong development and stability social security system. Moreover, political stability has created confidence for international companies to transfer technology, and cooperate with local companies. The main difficulties are however, they are not familiar with Vietnamese culture and law. The legal and institutional frameworks for the Vietnamese construction industry are problematic. The procedures still exist more cumbersome. It implies that the government agencies must review procedures to make rational policy for enabling foreign companies to facilitate with the business development.

Moreover, through the results of large-scale survey, the Source-Effect (SE) and the critical risk factors throughout three stages of ICJV projects were identified as follows. In this research, the key sources of such risk factors organized into categories, such as partners-related and ICJV-related risks, organization, management, technical, contractual, economic, and force majeure risks (Shen et al., 2001; Smith et al., 2006; Sameh, 2007). The important effects of risk factors on the objectives of

ICJV projects were also identified. As can be seen, it was found that several risk factors were mentioned significant impact to multiple objectives, including partner's parent company in financial problems (I1.1), breach of contracts by ICJV partner (I2.4), excessive demands, and variation by client (P1.2), incompetent of subcontractors/suppliers (P2.1), improper selection of project management team (P2.6), and force majeure (E4.2). Thus, the ICJV professionals then can make a suitable plan to decrease the level of impact on objectives of projects. During the three-stages of ICJV projects, startup stage is the period from initial contacts between parent companies to ICJV set-up, and then ICJV prepare bid proposal and submit bid to client. Startup stage was emphasized that had the most critical risk factors in all three stages, including partners' parent financial and ICJV organization aspects; architects/engineers problems; language barrier; different social, culture; bureaucracy, corruption and bribery; and economic problems. The operation stage is the period since construction work being implemented. Eight critical risk factors was found in the operation stage, namely, partners' parent financial, management problems, incompetence subcontractors and suppliers, and economic conditions. Finally, the dismantle stage is the period once most construction tasks have been completed, project is in the clean-up stage, and the participants start negotiating the ending matters. It was found that critical risk factors in this stage had six high level risks only, such as partners' parent financial aspects, incompetence subcontractors and suppliers, and economic conditions. The financial issues and economic conditions were critical factors that have high-risk level during three stages of ICJV projects. Finally, trends of risk factors and groups have been developed to create an overview of the risk factors in the periods of ICJV projects in Vietnam.

According to the results of risk response measures, the most common measure was risk mitigation. It was also found that risk transfer and risk retention were not favorable alternatives. Risk avoidance was used as the last choice for risk factors with high-level impact. In ICJV projects in Vietnam, the most effective risk response methods to cope with risk factors were mentioned such as:

(1) Risk mitigation methods

- a) Choose the partners with strong financial resources, stability organization, and long-term cooperation
- b) Select carefully the subcontractors/suppliers within good capacity, and previous relationship
- c) Establish appropriate policies and strategies
- d) Improve the productivity and performance
- e) Improve the level of control

(2) Risk transfer methods

- a) Insurance
- b) Share risks to subcontractors/suppliers
- c) Transfer risk to third parties
- d) Clear terms and conditions in contract
- e) Clear authority and responsibility in contract

(3) Risk retention methods

- a) Contingency plan
- b) Pre-project planning
- c) Prepare the suitable policies to cope with risk factor
- d) Do nothing

(4) Risk avoidance methods

- a) Change business target
- b) Reduce investment
- c) Stop business
- d) Suspend temporary business

Finally, risk profile that included all of findings of this research was established to support risk management system for ICJV companies in Vietnam. As we know, the effective risk management of ICJV projects depends on many factors, including initial ICJV, partners' aspects, organizations, and types of projects. In addition, it also depends on the knowledge of project management. Thus, risk profile that adopted in this research has not only its advantages but also disadvantages. It is necessary to have more future research about the risk factors affecting many countries, types of ICJV projects.

8.2 Limitations and future research directions

The result of this research currently established a risk profile for supporting risk management system of risk factors affecting the implementation of ICJV projects in Vietnam. Actually, it has a great significance in risk management system but it does not supply a perfection management system. The results of this research were based on the viewpoints of 15 respondents in ICJV companies, and the respondents subjectively assess most of collecting data. This research emphasized on the respondents' perception about the certain general ICJV projects. Normally, there are many different understanding about respondents' opinions. Therefore, this study has

some limitations and it should be improved in future research. Here are some suggestions for future research.

- The survey data collected in a narrow range, just focus on the respondents from local companies and some ICJV projects. Not only ICJV projects have unique characteristics but respondents also have different construction experiences on ICJV projects. Moreover, experts are not willing to share their own experience and the causes of failure of the ICJV projects in Vietnam. Therefore, more respondents in different types of ICJV projects must be increased in the future to build a comprehensive risk management system. This research might be expanded to obtain the opinions of the foreign respondents to take a multidimensional view of risk factors.
- This research was classified as qualitative and semi-quantitative research approach. The questionnaire survey and interview techniques were used to gather information from respondents. The survey data is not highly reliable. Therefore, a further quantitative research will be studied to strengthen and increase the reliability of risk management tools.
- This research carried out only for joint ventures among foreign and local companies, but still not considering the foreign joint venture and local joint venture (only local companies). Thus, future research will be conducted to clarify relationship or difference among types of JV in Vietnam.

8.3 Contributions

8.3.1 For local contractors

This research can help local contractors to identify the overall risk factors when forming ICJV with foreign contractors. Then they can have possible measures for risk factors during the implementation of ICJV projects as well as the operation with foreign contractors. The local contractors can increase competitiveness and the important in ICJV organizations. Moreover, the local contractors can realize weakness and strength to compete with other contractors or the ICJV contractors. Finally, they can learn from the experience of risk management of foreign contractors.

8.3.2 For international contractors

Foreign contractors can manage the effectiveness of risk factors in the implementation process of ICJVs in Vietnam, and have a suitable risk management when working with Vietnamese contractors. Especially, foreign contractors must be acknowledged about difference cultural, economic problems, bureaucracy, corruption, and bribery issues. Moreover, the international contractors can recognize the potential of construction price, cheap labor, and material market in Vietnam. Finally, they can make the suitable strategies to cooperation long-term in the future in Vietnam.

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APPENDICES

APPENDIX A
SURVEY QUESTIONNAIRE

APPENDIX A1 – PILOT INTERVIEW

RISK MANAGEMENT FOR INTERNATIONAL CONSTRUCTION JOINT VENTURES - CASE STUDIES OF VIETNAMESE CONTRACTORS

Dear Sir/Madam,

*I am Sy Tien Do, a Master student at the Chulalongkorn University in Thailand. I am doing a research about “**Risk Management for international construction joint ventures in Vietnam**”. This survey is only for writing a thesis, the information within the survey will not be opened to the public. Your information will be very important for the accuracy of the research.*

Please spend you a little time to mark the following statements carefully.

I appreciate your contribution and co- operation!

Wish you well.

The survey includes two parts and begins.

INTERVIEW QUESTIONS

SECTION 1: PERSONAL INFORMATION

1) How long have you worked in construction industry?

< 3 years

3→5 years

5→10 years

> 10 years

2) You are working at your company as a role:

Main contractor

Subcontractor

Consultant

Owner

3) You are working at your company as a position:

Directors

Deputy Directors

Project Managers

Supervisors

Engineers

Other:

4) How many construction joint venture projects have you ever participated in:

Nothing

2 projects

1 project

> 2 projects

5) Where do your joint venture come from:

Singapore

America

Korea

France

Hong Kong

Japan

China

Other:

6) Average project size:

<10 Billion VNĐ

100 - 500 Billion VNĐ

10 - 50 Billion VNĐ

500 - 1000 Billion VNĐ

50 - 100 Billion VNĐ

> 1000 Billion VNĐ

7) Do you know about the risk management?

Unknown

Known

Heard of it

Know very well

8) Risk management is necessary in construction or not?

Unnecessary

Necessary

Very necessary

9) How is the risk management system of your company?

SECTION 2: RISK AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

I. EXPLANATION:

1. Joint venture

A joint venture (JV) enterprise means an enterprise established in Vietnam by two or more parties on the basis of a joint venture contract; or an agreement between the Government of the Socialist Republic of Vietnam and a foreign government; or an enterprise established on the basis of a joint venture contract between an enterprise with foreign owned capital and a Vietnamese enterprise or between a joint venture enterprise and a foreign investor.

Construction joint ventures (CJVs) are referred to cooperation of business or entities to implement projects related to construction, including investment, design, contractor, supplier, and consultant companies.

2. Risk

Risk is commonly used as a synonym for “hazard”, “danger” or “threat” – an undesirable event. Therefore, we focus on studying risks of international construction joint ventures (ICJVs) in Vietnam: internal risks, projects-specific risks, external risks.

Risk factors affected the *success or failure of the project*, based on the probability and impact on cost, time, and quality of joint venture and joint venture projects. This survey aims to investigate risk management of ICJV from the information provided by Vietnamese contractors who worked in the past or have been working in ICJV projects.

Here are some examples of risks affecting the performance of ICJVs.

Risks	Probability of risks	Impact of risks
Delayed payments of client	Quite often occurs	Time, cost of projects
Exchange rate	More than even chance (3 times/years)	Cost of projects
Inadequate ICJV organization structure	Not expected to happen	Performance of JV
...		

II. INTERVIEW QUESTIONS

1. Structure of Joint Venture

2. Risks affect the implementation of ICJVs

A. Internal risks: *Displays the risks in ICJV itself. (There are two subcategories regard to multi-members include Partner-related risks and ICJVs-related risks).*

What are the risks existed in the internal ICJVs?

(Management, organization, works...)

What is the impact of parent company to ICJVs?

(Financial, policy, organization...)

B. Projects risks: *displays the risks related to the performance itself project (There are five subcategories regard with multi-objectives include organization, management, technical, contract, design risks).*

1. Design risk

Are design changes frequently made?

What are the policies to reduce the design risk in Vietnam?

2. Contractual risk

What contractual risks have you often faced during project implementation?

3. Management risk

What are these problems often encountered in the management of JV projects?

4. Organization risk

What are these problems often encountered in the organization of JV projects?

5. Technical risk

What are these problems often encountered in the technical of JV projects?
(For example: (Accidents, equipment failure, soil conditions, shortage in skillful workers)

C. External risks: *displays risk related to external environment (There are four subcategories regard with the multi-parts include Legal and Political, Social, Economic, and Force Majeure risks).*

1. Political risk

Please comment on the current political in Vietnam and impact to the ICJVs

What are some actions that Vietnam contractors can carry out to mitigate political risks?

2. Social and cultural risk

Is there the big problems with the difference of cultural and language barrier?

What is the social risks affecting the implementation of ICJVs?

3. Economic risk

How is the risk of currency fluctuation of construction projects managed?

Do economic flunctuation affect the performance of ICJVs?

4. Force majeure risk

What are these force majeure problems often encountered in the performance of ICJVs?

5) Where do your joint venture come from:

- Singapore America Korea France
 Australia Japan China
 Other:

Name of Joint Venture Company (Please specify):

6) Average project size:

- <10 Billion VND 100 - 500 Billion VND
 10 - 50 Billion VND 500 - 1000 Billion VND
 50 - 100 Billion VND > 1000 Billion VND

7) Type of joint venture projects that She/he participate in:

- Civil have projects
 Construction industry have projects
 Infrastructure have projects
 Port, irrigation have projects
 Other (Please specify) have projects

8) Do you know about the risk management?

- Unknown Known
 Heard of it Know very well

9) Risk management is necessary in construction or not?

- Unnecessary Necessary Very necessary

10) Please describe the risk management system of your company

SECTION 2: RISK AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

I. Explanation:

1. Joint Venture

A joint venture (JV) enterprise means an enterprise established in Vietnam by two or more parties on the basis of a joint venture contract; or an agreement between the Government of the Socialist Republic of Vietnam and a foreign government; or an enterprise established on the basis of a joint venture contract between an enterprise with foreign owned capital and a Vietnamese enterprise or between a joint venture enterprise and a foreign investor.

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Risk is commonly used as a synonym for “hazard”, “danger” or “threat” – an undesirable event. Therefore, we focus on studying risks of international construction joint ventures (ICJVs) in Vietnam: internal risks, projects-specific risks, external risks.

Risk factors affected the *success or failure of the project*, based on the probability and impact on *cost, time, scope, and quality* of joint venture and joint venture projects. This survey aims to investigate risk management of ICJV from the information provided by Vietnamese contractors who worked in the past or have been working in ICJV projects.

Here are some examples of risks affecting the performance of ICJVs.

Risks	Probability of risks	Impact of risks
Delayed payments of client	Quite often occurs	Time, cost of projects
Exchange rate	More than even chance	Cost of projects
Inadequate ICJV organization structure	Not expected to happen	Performance of JV
...		

If possible, please provide contact information when necessary:

Name:

Address:

Tel:

Email:

II. RISK AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

Explanation: Please check on the checklist box based on your own experience and opinion. The necessary score assumptions are provided below

She/he can click to select multiple boxes in the strategic (plan) to respond to risk:

Mitigation	Transfer	Retention	Avoidance
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1. Probability of occurrence

Description	Scenario	Rating
0.1	Not expected to happen	1
0.3	Small likelihood but could well happen	2
0.5	Quite often occurs	3
0.7	More than even chance	4
0.9	Very frequent occurrence	5

2. Impact of occurrence

Description	Scenario	Rating
0.1	Not impact	A
0.3	Not significantly impact	B
0.5	Average impact	C
0.7	Significant impact	D
0.9	Very significant impact	E

3. Strategic (plan) for responding risks:

Mitigation	Transfer	Retention	Avoidance
<ul style="list-style-type: none"> - Created the policy and strategy - Increase the level of control - New suitable work schedule - Member training - Improve productivity and performance 	<ul style="list-style-type: none"> - Insurance - Joint venture or consortium - Manage contract - Contract with subcontractors, suppliers 	<ul style="list-style-type: none"> - Contingency - Risk management - Policy for any failure 	<ul style="list-style-type: none"> - Stop business - Leave the market - Reduce investment - Change business target

No.	INTERNAL RISKS OF JOINT VENTURE	Probability of risk					Impact of risk					Response plan <i>(You can click multiple choices)</i>			
		1	2	3	4	5	A	B	C	D	E	Mitigation	Transfer	Retention	Avoid
1	Partner's parent company in financial problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Policy changes in your partner's parent company toward ICJV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Over-interference by parent company of either partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Change of organization within local partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Partner's lack of management competence and resourcefulness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Disagreement on allocation of staff positions in ICJV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Disagreement on allocation of works	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Technology transfer dispute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Breach of contracts by Joint Venture partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Poor relation and disputes with partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Inadequate ICJV organization structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Poor relation with government departments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about internal risks in ICJV

No.	JOINT VENTURE PROJECT RISKS	Probability of risk					Impact of risk					Response plan <i>(You can click multiple choices)</i>			
		1	2	3	4	5	A	B	C	D	E	Mitigation	Transfer	Retention	Avoid
1	Poor project relationship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Excessive demands and variation by client	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Problems due to partners' different practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Incompetence of subcontractors/suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Improper project feasibility study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Improper project planning and budgeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Improper selection of project location, type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Inadequate project organization structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Incompetence of project management team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Accidents on site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Equipment failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Materials shortage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Shortage in skillful workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Design changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Errors in design drawings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Incomplete drawing and technical specification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Disagree some conditions of contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Incomplete contract terms with partner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about joint venture project risks in ICJV

No.	EXTERNAL RISKS OF JOINT VENTURE	Probability of risk					Impact of risk					Response plan <i>(You can click multiple choices)</i>			
		1	2	3	4	5	A	B	C	D	E	Mitigation	Transfer	Retention	Avoid
1	Import restriction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Lack of enforcement of legal judgment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Loss due to insufficient law for joint ventures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Cost increase due to changes of policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Loss incurred due to political changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Security problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Language barrier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Different social, culture, and religious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Loss incurred due to corruption and bribery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Loss due to bureaucracy for late approvals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Worker strike	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Economy fluctuation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Exchange rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Inflation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Loss due to fluctuation of interest rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Pollution, weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Force majeure (rain, flood, earthquake, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about external risks in ICJV

APPENDIX A3 – LARGE-SCALE QUESTIONNAIRE SURVEY

RISK MANAGEMENT FOR INTERNATIONAL CONSTRUCTION JOINT VENTURES - CASE STUDIES OF VIETNAMESE CONTRACTORS

Dear Sir/Madam,

I am Sy Tien Do, a Master student at the Chulalongkorn University in Thailand. I am doing a research about “Risk Management for international construction joint ventures in Vietnam”. This survey is only for writing a thesis, the information within the survey will not be open to the public. Your information will be very important for the accuracy of the research.

Please spend you're a little time to mark the following statements carefully.

I appreciate your contribution and co- operation!

Wish you well.

The survey includes three parts

Please contact me by the following mail:

- **Do Tien Sy** - Master student at the Chulalongkorn University in Bangkok, Thailand
- **Email** : sy.dotien@yahoo.com
- **Tel** : 0932 011 085

INTERVIEW QUESTIONS

SECTION 1: PERSONAL INFORMATION

1) How long have you worked in construction industry?

< 3 years

3→5 years

5→10 years

> 10 years

2) You are working at your company as a role:

Main contractor

Subcontractor

Consultant

Owner

3) You are working at your company as a position:

Directors

Deputy Directors

Project Managers

Supervisors

Engineers

Other:

4) How many construction joint venture projects have you ever participated in:

Nothing

2 projects

1 project > 2 projects

5) Where do your joint venture come from:

Singapore America Korea France

Australia Japan China

Other:

Name of Joint Venture Company (Please specify):

6) Average project size:

<10 Billion VND 100 - 500 Billion VND
 10 - 50 Billion VND 500 - 1000 Billion VND
 50 - 100 Billion VND > 1000 Billion VND

7) Type of joint venture projects that She/he participate in:

Civil have projects
 Construction industry have projects
 Infrastructure have projects
 Port, irrigation have projects
 Other (Please specify) have projects

8) Do you know about the risk management?

Unknown Known
 Heard of it Know very well

9) Risk management is necessary in construction or not?

Unnecessary Necessary Very necessary

10) Please describe the risk management system of your company

SECTION 2: RISK AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

I. Explanation:

1. Joint Venture

A joint venture (JV) enterprise means an enterprise established in Vietnam by two or more parties on the basis of a joint venture contract; or an agreement between the Government of the Socialist Republic of Vietnam and a foreign government; or an enterprise established on the basis of a joint venture contract between an enterprise with foreign owned capital and a Vietnamese enterprise or between a joint venture enterprise and a foreign investor.

Construction joint ventures (CJVs) are referred to cooperation of business or entities to implement projects related to construction, including investment, design, contractor, supplier, and consultant companies.

2. Risk management

Risk is commonly used as a synonym for “hazard”, “danger” or “threat” – an undesirable event. Therefore, we focus on studying risks of international construction joint ventures (ICJVs) in Vietnam: internal risks, projects-specific risks, external risks.

Risk factors affected the *success or failure of the project*, based on the probability and impact on *cost, time, scope, and quality* of joint venture and joint venture projects. This survey aims to investigate risk management of ICJV from the information provided by Vietnamese contractors who worked in the past or have been working in ICJV projects.

Here are some examples of risks affecting the performance of ICJVs.

Risks	Probability of risks	Impact of risks
Delayed payments of client	Quite often occurs	Time, cost of projects
Exchange rate	More than even chance	Cost of projects
Inadequate ICJV organization structure	Not expected to happen	Performance of JV
...		

If possible, please provide contact information when necessary:

Name:

Address:

Tel:

Email:

II. RISK AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

Explanation: Please check on the checklist box based on your own experience and opinion. The necessary score assumptions are provided below

She/he can click to select multiple boxes in the strategic (plan) to respond to risk:

Mitigation	Transfer	Retention	Avoidance
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1. Probability of occurrence

Description	Scenario	Rating
0.1	Not expected to happen	1
0.3	Small likelihood but could well happen	2
0.5	Quite often occurs	3
0.7	More than even chance	4
0.9	Very frequent occurrence	5

2. Impact of occurrence

Description	Scenario	Rating
0.1	Not impact	A
0.3	Not significantly impact	B
0.5	Average impact	C
0.7	Significant impact	D
0.9	Very significant impact	E

No	INTERNAL RISK FACTOR	Probability of risk 1-----5			Impact of risk A-----E			With important impacts on			
		Stage			Stage			Time	Cost	Quality	Scope
		Startup	Operation	Dismantle	Startup	Operation	Dismantle				
1	Partner's parent company in financial problems							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Policy changes in your partner's parent company toward ICJV							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Overinterference by parent company of either partner							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Change of organization within local partner							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Partner's lack of management competence and resourcefulness							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Disagreement on allocation of staff positions in ICJV							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Disagreement on allocation of works							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Technology transfer dispute							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Breach of contracts by Joint Venture partner							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Poor relation and disputes with partner							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Inadequate ICJV organization structure							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Poor relation with government departments							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about internal risks in ICJV

No	PROJECT RISK FACTOR	Probability of risk 1-----5			Impact of risk A-----E			With important impacts on			
		Stage			Stage						
		Startup	Operation	Dismantle	Startup	Operation	Dismantle	Time	Cost	Quality	Scope
1	Poor project relationship							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Excessive demands and variation by client							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Problems due to partners' different practice							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Incompetence of subcontractors/suppliers							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Improper project feasibility study							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Improper project planning and budgeting							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Improper selection of project location, type							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Inadequate project organization structure							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Incompetence of project management team							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Accidents on site							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Equipment failure							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Materials shortage							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Shortage in skillful workers							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Design changes							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No	PROJECT RISK FACTOR	Probability of risk 1-----5			Impact of risk A-----E			With important impacts on			
		Stage			Stage						
		Startup	Operation	Dismantle	Startup	Operation	Dismantle	Time	Cost	Quality	Scope
15	Errors in design drawings							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Incomplete drawing and technical specification							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Disagree some conditions of contract							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Incomplete contract terms with partner							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about internal risks in ICJV

No	EXTERNAL RISK FACTOR	Probability of risk 1-----5			Impact of risk A-----E			With important impacts on			
		Stage			Stage						
		Startup	Operation	Dismantle	Startup	Operation	Dismantle	Time	Cost	Quality	Scope
1	Import restriction							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Lack of enforcement of legal judgment							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Loss due to insufficient law for joint ventures							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Cost increase due to changes of policies							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Loss incurred due to political changes							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Security problems							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Language barrier							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Different social, culture, and religious							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Loss incurred due to corruption and bribery							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Loss due to bureaucracy for late approvals							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Worker strike							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Economy fluctuation							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Exchange rate							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Inflation							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No	EXTERNAL RISK FACTOR	Probability of risk 1-----5			Impact of risk A-----E			With important impacts on			
		Stage			Stage						
		Startup	Operation	Dismantle	Startup	Operation	Dismantle	Time	Cost	Quality	Scope
15	Loss due to fluctuation of interest rate							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Pollution, weather							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Force majeure (rain, flood, earthquake, etc)							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

More suggestion about internal risks in ICJV

SECTION 3: RISK RESPONSE PLAN FOR RISK FACTOR AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

Explanation: Please describe the risk response strategy for each risk factors based on your own experience and opinion. The reference for risk response can show in the table below:

Strategic (plan) for responding risks:

Mitigation	Transfer	Retention	Avoidance
- Created the policy and strategy	- Insurance	- Contingency	- Stop business
- Increase the level of control	- Joint venture or consortium	- Risk management	- Leave the market
- New suitable work schedule	- Manage contract	- Policy for any failure	- Reduce investment
- Member training	- Contract with subcontractors, suppliers		- Change business target
- Improve productivity and performance			

No	INTERNAL RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
1	Partner's parent company in financial problems				
2	Policy changes in your partner's parent company toward ICJV				
3	Overinterference by parent company of either partner				
4	Change of organization within local partner				
5	Partner's lack of management competence and resourcefulness				
6	Disagreement on allocation of staff positions in ICJV				
7	Disagreement on allocation of works				
8	Technology transfer dispute				

No	INTERNAL RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
9	Breach of contracts by Joint Venture partner				
10	Poor relation and disputes with partner				
11	Inadequate ICJV organization structure				
12	Poor relation with government departments				

More suggestion about internal risks in ICJV

No	PROJECT RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
1	Poor project relationship				
2	Excessive demands and variation by client				
3	Problems due to partners' different practice				
4	Incompetence of subcontractors/suppliers				
5	Improper project feasibility study				
6	Improper project planning and budgeting				
7	Improper selection of project location, type				
8	Inadequate project organization structure				
9	Incompetence of project management team				
10	Accidents on site				

No	PROJECT RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
11	Equipment failure				
12	Materials shortage				
13	Shortage in skillful workers				
14	Design changes				
15	Errors in design drawings				
16	Incomplete drawing and technical specification				
17	Disagree some conditions of contract				
18	Incomplete contract terms with partner				

More suggestion about internal risks in ICJV

No	EXTERNAL RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
1	Import restriction				
2	Lack of enforcement of legal judgment				
3	Loss due to insufficient law for joint ventures				
4	Cost increase due to changes of policies				
5	Loss incurred due to political changes				
6	Security problems				
7	Language barrier				
8	Different social, culture, and religious				
9	Loss incurred due to corruption and bribery				
10	Loss due to bureaucracy for late approvals				
11	Worker strike				

No	EXTERNAL RISK FACTOR	Risk Response Strategy			
		Mitigation	Transfer	Retention	Avoidance
12	Economy fluctuation				
13	Exchange rate				
14	Inflation				
15	Loss due to fluctuation of interest rate				
16	Pollution, weather				
17	Force majeure (rain, flood, earthquake, etc)				

More suggestion about internal risks in ICJV

APPENDIX A4 – VALIDATION QUESTIONNAIRE SURVEY

RISK MANAGEMENT FOR INTERNATIONAL CONSTRUCTION JOINT VENTURES - CASE STUDIES OF VIETNAMESE CONTRACTORS

Dear Sir/Madam,

*I am Sy Tien Do, a Master student at the Chulalongkorn University in Thailand. I am doing a research about “**Risk Management for international construction joint ventures in Vietnam**”. This survey is only for writing a thesis, the information within the survey will not be open to the public. Your information will be very important for the accuracy of the research.*

Please spend you're a little time to mark the following statements carefully.

I appreciate your contribution and co- operation!

Wish you well.

The survey includes two parts and begins.

Please contact me by the following mail:

- **Do Tien Sy** - Master student at the Chulalongkorn University in Bangkok, Thailand
- **Email :** sy.dotien@yahoo.com
- **Tel :** 0932 011 085

INTERVIEW QUESTIONS

RISK RESPONSE MEASURES FOR RISK FACTORS AFFECTING THE IMPLEMENTATION OF ICJVs IN VIETNAM

Explanation: Based on your own experience and opinion, please check on the checklist box if you agree with this risk response method for response this risk factor

Example:

<input checked="" type="checkbox"/>	I1.1.M.1	Examine the target company's financial resources, technical and management competence and connections with local government	Agree
<input type="checkbox"/>	I1.1.M.2	Ensure that a reputable Client finances the project	Disagree
<input checked="" type="checkbox"/>	I1.1.M.3	Gain accurate financial and other information from international and independent security and risk evaluation agencies	Not sure

Respondent's profile

Name:

Address:

Email:

Phone:

1. RISK RESPONSE MEASURES FOR INTERNAL RISK FACTORS

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
1	Partner's parent company in financial problems		Examine the target company's financial resources, technical and management competence		Reduce investment
			Ensure that the project's clients have assurance of financial		Change business target
			Gain accurate information about financial status from international organizations and risk assessment agencies		Suspend temporary business
			Obtain guarantees or other credit support from other agencies and reliable credit worthy		Undertake pre-project planning
			Joint venture with foreign partners that have strong financial resources		Develop the contingency plan
			Specify the terms of extension or compensation clauses in contract		Do nothing (realized risk existence, but not take any action)
			Sign contract with fixed rate loan to banks		
		Other:			
2	Policy changes in your partner's parent company toward ICJV		Establish operational framework less affected by policy changes of partner's parent company		Specify careful clear terms and conditions
			Limit right to determine and intervention of parent company to a JV by clear policies and rules		Set up appropriate policies for change activities of the parent company
			Specify careful clear terms and conditions		Do nothing (realized risk existence, but not take any action)
			Specify clear authority and responsibility		
		Other:			
3	Overinterference by parent company of		Issue granting autonomy to the JV's CEO		Define clearly authority and responsibility
			Establish operational framework less affected by partners		Undertake pre-project planning

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
	either partner		parent company		
			Specify clearly engineering contract: clear term and conditions		Do nothing (realized risk existence, but not take any action)
		Other:			
4	Change of organization within local partner		Choose the partners had previously cooperated and have compatible strategies		Select local contractors that have organizational stability and long-term operation
			Maintain good relationships with top local government officers		Do nothing (realized risk existence, but not take any action)
			Specify careful agreement about clear terms and conditions		
		Other:			
5	Partner's lack of management competence and resourcefulness		Select partner carefully		Select strong sub-contractors to complement shortcomings
			Distribute works in accordance with the capabilities of each partners		Recruit staff in ICJV with bilingual languages
			Hire new local working groups that have good management capacity and understand clearly the situation of Vietnam		Do nothing (realized risk existence, but not take any action)
			Select foreign contractors that have good management capacities and reputability		
		Other:			
6	Disagreement on allocation of staff positions in ICJV		Select the site manager for ICJV having good capacity		Specify careful clear terms and conditions
			Choose staff carefully		Let the dominant party have first authority to decide
			Select the trustworthy people on important places in the ICJV		Rent (or hire) specialized groups to undertake the specific issues
			Be careful in the translation of contract documents		Specify clearly the policy to change flexible staff positions
			Insist that bilingual (English and local language) documents are prepared simultaneously and agreed in final form by all parties		Do nothing (realized risk existence, but not take any action)

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
		Risk response methods		Risk response methods	
		Allow re-negotiation in contract	Other:		
		Maintain clear contract documentation			
7	Disagreement on allocation of works	Divide staff according to the specialized functions		Specify careful clear terms and conditions	
		Recruit, train staff with appropriate qualifications		Rent (or hire) specialized groups to undertake the specific issues	
		Define clearly scope of work of each party		Specify clearly the policy to change flexible staff positions	
		Allocate work to partner corresponding with his ability		Do nothing (realized risk existence, but not take any action)	
		Be careful in the translation of contract documents	Other:		
		Recruit staff in JV with bilingual languages			
		Prepare bilingual (English and local language) documents at the same time and be agreed by all parties			
		Separate or relocate of activities and resources			
8	Technology transfer dispute	Check regularly to detect compliance with technology transfer policy		Develop the contingency plan	
		Choose right staff for technology transfer and training		Do nothing (realized risk existence, but not take any action)	
		Specify careful clear terms and conditions	Other:		
		Reduce investment			
		Stop business			
9	Breach of contracts by Joint Venture partner	Specify comprehensive terms of material and immaterial default in contract		Improve the level of site project management	
		Maintain good relationship with local government officials, such as senior executive		Reduce investment	

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Select the trustworthy people on important places in the ICJV		Stop business
			Specify clearly the regulations about material, immaterial breach of contracts in contract agreement		
			Supply notice for breach of contracts on time		
		Other:			
10	Poor relation and disputes with partner		Define clearly range of assets, employees, organizations, resources, and strategic among partners		Specify clearly contract about the profit/loss in joint venture
			Promote relationship among the parties		Reduce investment
			Give the appropriate regulations for settlement of risk factors		Change objectives of business
			Do nothing (realized risk existence, but not take any action)		
		Other:			
11	Inadequate ICJV organization structure		Select a suitable legal form of ICJV		Stop business
			Define clearly range of assets, employees, organizations, resources, and strategic among partners		Reduce investment
			Adopt a suitable operational structure for ICJV		Select JV parties that have previous relationship
			Sign contract with consultant for joint venture structure		Do nothing (realized risk existence, but not take any action)
		Other:			
12	Poor relation with government departments		Select the best person that have the relation closely with the government		Provide the contingency fund against late approvals, corruption and bribery
			Select the local companies that have good relationship with government departments		Give the relationship policies with government departments for newly established companies
			Train the staff about the law and regulations in Vietnam		Do nothing (realized risk existence, but not take any action)
			Select sub-contractors that have good relationship with		

No	INTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
		government departments			
		Other:			

More suggestions about external risk response:

2. RISK RESPONSE MEASURES FOR PROJECT RISK FACTORS

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
1	Poor project relationship		Select partner carefully		Select good ability consultant
			Select carefully subcontractors/suppliers		Select the previous relationship parties (have worked together for at least 1 or 2 projects)
			Increase the ability of project management		Give the reasonable business policies to attract more relationships to bring more projects
			Create a good relationship of the parties by organization regular meetings and reports		Do nothing (realized risk existence, but not take any action)
		Other:			
2	Excessive demands and variation by client		Inspect construction site regularly, notice to the client or client's representative to appropriate remedial measures		Undertake the appropriate adjustment policies corresponding to excessive demands of client
			Specify extension clause and addition payment in contract		Prepare the contingency fund to cope with excessive demands and variation by client
			Specify a reimbursement clause in contract during the construction period		Do nothing (realized risk existence, but not take any action)
			Stop business		
		Other:			
3	Problems due to partners' different practice		Hire subcontractors/suppliers more experience and previous relationship (note: not select subcontractors with the lowest price)		Enhance the supervisors skills
			Be careful in accepting the nominated subcontractors/suppliers by client		Prepare the contingency fund to cope with partners' different practice
			Train staff for enhancing project management skills		Provide a plan against failure of subs/suppliers

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Notice to failure of subcontractors/suppliers		Do nothing (realized risk existence, but not take any action)
			Require the performance bonds supplied by subcontractors.	Other:	
			Specify flow-down clauses in subcontract		
4	Incompetence of subcontractors/suppliers		Hire subcontractors/suppliers more experience and previous relationship (note: not select subcontractors with the lowest price)		Enhance the supervisors skills
			Be careful in accepting the nominated subcontractors/suppliers by client		Prepare the contingency fund to cope with the incompetent subcontractors/suppliers
			Increase ability of project management		Provide plans against failure of subcontractors and suppliers
			Require the performance bonds supplied by subcontractors.		
			Specify flow-down clauses in subcontract	Other:	
			Stop business with the subcontractor/suppliers		
			Change the subcontractors/ suppliers		
5	Improper project feasibility study		Develop a more detailed feasibility study for project		Stop business
			Notice to Client problems of planning and budgeting as soon as possible		Change business target
			Increase the level of control for feasibility study		Reduce investment
			Select experience architect/engineer		Do nothing (realized risk existence, but not take any action)
			Insurance for feasibility study		

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Specify additional cost and extension time clauses in contract		
	Other:				
6	Improper project planning and budgeting		Develop a more detailed feasibility study for project		Stop business
			Notice to Client problems of planning and budgeting as soon as possible		Change business target
			Increase the level of control for feasibility study		Reduce investment
			Select experience architect/engineer		Select experience architect/engineer
			Insurance for project planning and budgeting		Do nothing (realized risk existence, but not take any action)
			Specify clearly terms and conditions about the responsibility of A/E for project planning and budgeting in feasibility study		
	Other:				
7	Improper selection of project location, type		Develop a more detailed feasibility study for project		Stop business
			Notice to Client problems of project location/type as soon as possible		Change business target
			Increase the level of control for feasibility study		Reduce investment
			Select experience architect/engineer		Develop a more detailed feasibility study for project
			Specify clearly terms and conditions about the responsibility of A/E for feasibility study about project location/type		Do nothing (realized risk existence, but not take any action)
			Other:		

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
8	Inadequate project organization structure		Hire competent project management team		Specify notice provision and notice period in contract
			Employ local staff with bilingual ability		Specify construction extension clause and addition payment in contract if client causes the delay
			Clear definition of each staff's scope of work		Specify conflict resolution clause in contract
			Undertake pre-project planning		Select familiar group of project management
			Establish a fixed standard project management system		
			Other:		
9	Incompetence of project management team		Hire competent project management team		Specify notice provision and notice period clauses in contract
			Recruit staff in ICJV with bilingual languages		Specify schedule delay and additional payment clause in contract
			Define clearly scope of work of each party		Specify conflict resolution and construction extension clause in contract
			Undertake pre-project planning		Select familiar group of project management
			Establish a fixed standard project management system		
			Other:		
10	Accidents on site		Improve and control the safety plan regularly		Supply insurance for labour safety and construction
			Enhance management and supervision to minimize accidents on site		Labour must have clean bill of health.
			Design reasonable construction methods, construction layout, and team		Equipment: must have testing certificate and operators must have practice of profession certificate

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES					
			Risk response methods		Risk response methods		
			Maintenance periodically equipments, training for construction staff		Add provisions solving consequences of occupational safety and legal liability of main contractors, subcontractors, Clients when accidents occurs		
			Inspect construction site periodically		Develop the contingency plan		
			Restrict working overtime, especially construction at night		Prepare the budget for unexpected situation (or even the response plan for reducing the delay of work)		
			Suspend construction or design the appropriate construction measures to adverse weather such as heavy rain, strong wind, flood, storm, and earthquake.		Prepare a full range of safety standards related to work		
			Sanitate construction site to create favorable conditions for workers	Other:			
			Train workers about the safety knowledge regularly				
			Promote safety management in construction site, and establish safety management broad				
			Labor training about safety				
		11	Equipment failure		Enhance the equipment management system of contractors		Maintenance and inspect equipment periodically
					Inspect equipments of contractors periodically		Prepare the replaced construction equipment when the problems occurs
	Supply insurance for equipment and construction				Do nothing (realized risk existence, but not take any action)		
	Other:						
12	Materials shortage		Prepare plan for materials, machinery, and construction equipments before commencement date.		Supply insurance for construction materials		

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Find replacement materials, machinery, and construction equipments in the local country		Supply feedstock agreements
					Do nothing (realized risk existence, but not take any action)
		Other:			
13	Shortage in skillful workers		Select subcontractors carefully		Select skilled worker teams
			Monitor subcontractors and skillful of subcontractors workers regularly		Inspect the quality of subcontractors construction works frequently
			Consider the notice of the client's representative about the works quality		Undertake pre-project planning
			Subcontract with good ability subcontractors		Do nothing (realized risk existence, but not take any action)
		Other:			
14	Design changes		Make every effort to fully understand the client's wants and needs		Implement design liability insurance
			Carry out comprehensive investigation of site conditions		Specify an adjustment clauses in contract
			Articulate the clients' needs in a technically competent way and within the limitation of the clients' resource		Specify extension clause in contract
			Give advices for clients to minimize changes at the startup stage and operation stage of ICJV projects		Develop the contingency plan
			Notice the designer to visit the site during the design phase to reduce the changes		Undertake pre-project planning
			Adopt Design & Build contract to mitimize design/drawing disputes		Do nothing (realized risk existence, but not take any action)

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Arrange and undertake comprehensive site investigation before construction phase	Other:	
			Evaluate and review design and drawings by independent architects/engineers		
15	Errors in design drawings		Notice the designer to visit the site during the design phase to reduce the changes		Develop the contingency plan
			Evaluate and verify design drawings carefully to minimize the errors		Undertake pre-project planning
			Implement design liability insurance		Do nothing (realized risk existence, but not take any action)
			Specify an adjustment clauses in contract	Other:	
			Specify extension clause in contract		
16	Incomplete drawing and technical specification		Notice the designer to visit the site during the design phase to reduce the changes		Develop the contingency plan
			Evaluate and verify design drawings carefully to minimize the errors		Undertake pre-project planning
			Implement design liability insurance		Do nothing (realized risk existence, but not take any action)
			Specify an adjustment clauses in contract	Other:	
			Specify extension clause in contract		
17	Disagree some conditions of contract		Limit and avoid disputes with the parties involved in the project		Establish arbitration in contract agreement to solve disputes among the parties

No	PROJECT RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Make the contract that company takes less risk or get more benefit		Conflict resolution clause in contract and Specify extension clause in contract if client causes the delay
			Try to revise contract more than one times to make sure to have the best contract		Hire experience consultant for editing contract
			Notice immediately if there is any ambiguity (vague) about conditions of the contract		Consider carefully terms of contract before signing
			Stop business		Do nothing (realized risk existence, but not take any action)
		Other:			
18	Incomplete contract terms		Make the contract that company takes less risk or get more benefit		Establish arbitration in contract agreement to solve disputes among the parties
			Try to revise contract more than one times to make sure to have the best contract		Conflict resolution clause in contract and Specify extension clause in contract if client causes the delay
			Consider carefully terms of contract before signing		Hire experience consultant for editing contract
			Do nothing (realized risk existence, but not take any action)		
		Other:			

More suggestions about external risk response:

3. RISK RESPONSE MEASURES FOR EXTERNAL RISK FACTORS

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
1	Import restriction		Use the local raw materials		Add contingency fund for problems of material import
			Improve ability to manage raw materials imported for the construction project		Establish replacement local material
			Sign the contract with the supplier about the insurance agreement.		Do nothing (realized risk existence, but not take any action)
		Other:			
2	Lack of enforcement of legal judgment		Provide strategies and appropriate measures to enforcement of legal judgment		Reduce investment
			Undertake the work plan in accordance with current legal judgment		Develop the contingency plan to deal with risk event
			Hire a lawyer consultant for law and legal		Do nothing (realized risk existence, but not take any action)
		Other:			
3	Loss due to insufficient law for joint ventures		Provide strategies and appropriate measures to insufficient law for joint ventures		Reduce investment
			Undertake the work plan in accordance with current joint venture law		Develop the contingency plan to deal with risk event
			Hire a lawyer consultant for law and legal		Do nothing (realized risk existence, but not take any action)
		Other:			
4	Changes of government policies		Provide strategies and appropriate measures to decrease impact changes of government policies		Absorb the risk from the government policy because we cannot change it by ourselves
			Joint venture with reputable local contractors		Add contingency fund or special condition for changes in government policy

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
			Study about tax policies, foreign investment law for foreign contractors		Do nothing (realized risk existence, but not take any action)
			Keep good relationship with government officials, and local agencies	Other:	
			Stop business		
			Reduce investment		
		5	Loss incurred due to political changes		Consider clearly the policy changes of government's political
	Negotiate to share the loss between client and contractors				Use FIDIC international contract
	Appeal the support of foreign embassies and loan bank (ADB) to foreign contractors				Joint venture with public partner
	Stop business				Add contingency fund or special condition for changes in political changes
	Reduce investment				Do nothing (realized risk existence, but not take any action)
	Other:				
6	Security problems		Insurance for equipment, machinery, construction materials in construction site		Employ efficient security guards at the site
			Request the support of local authorities (police) increasing patrols to ensure security in site		Add contingency fund for security problems
			Require site security guard of subcontractors		Do nothing (realized risk existence, but not take any action)
			Install surveillance cameras for security control		
			Other:		

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
7	Language barrier		Hire more interpreters to direct communicate the labors with mother tongue, or recruitment, training existing staff to use the foreign language (at least English) more efficient		Contract should be translated to into two copies in English and Vietnamese (with equal validity)
			Recruit local staff with bilingual ability		Do nothing (realized risk existence, but not take any action)
			Hire local staff by foreign contractors to work together with local companies		
		Other:			
8	Different social, culture, and religious		Apply long-term strategic partnership		Employ unbiased and experienced staff
			Make a good relationship with partners		Train employees, especially managers about different cultural and religious practices
			All of the agreement should be evidenced in writing		Do nothing (realized risk existence, but not take any action)
			Study to understand clearly each other's cultural differences		
		Other:			
9	Loss incurred due to corruption and bribery		Select prestigious partners (state-owned companies)		Sign the contract with an organization good relationship with local official to undertake the approvals procedures
			Carry out all procedures, prepare complete dossier as required, to minimize corruption and bribery of local officials		Reduce investment
			Maintain good relationships with local officials, and agencies		
		Other:			
10	Loss due to		Maintain a close relationship with government officers		Add contingency fund for delay of late approvals

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
	bureaucracy for late approvals		Minimize the bureaucracy and the procedures for approvals by government		Prepare appropriate planning policies to be less affected by late approvals
			Joint venture with reputable local contractors		Do nothing (realized risk existence, but not take any action)
			Stop business	Other:	
			Reduce investment		
11	Worker strike		Raise the living standard and salary for workers		Stop cooperate with subcontractors
			Provide superior policies for workers		Reduce business
			Make a good relationship with more experience and large contractors		Provide reasonable salary, additional policies to support workers
			Sign the contract with subcontractors that have good management and high-quality workers		Do nothing (realized risk existence, but not take any action)
			Other:		
12	Economy fluctuation		Request payments in hard currency in countries with unstable economic conditions		Suspend temporary business
			Establish specialized monitor organization to monitor fluctuation of economic in the world		Stop business
			Ensure that the project's clients have assurance of financial		Put the cost provisions for economy fluctuation in construction costs
			Obtain payment bonds and performance bonds from banks		Do nothing (realized risk existence, but not take any action)
			Specify extension of time clause in contract	Other:	
			Specify the terms of extension or compensation clauses in contract		

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
13	Exchange rate		Specify compensation clauses for exchange rate		Ensure that the project's clients have assurance of financial
			Use dual-currency contracts with certain portion to be paid in local currency and others in foreign currency		Obtain payment bonds and performance bonds from banks
			Obtain local government guarantees of exchange rate and convertibility (i.e. fixed rate for long period or less fluctuation)		Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap)
			Use other money transfer tools (i.e. forward and swap that can hedge exchange rate)		Specify the terms of extension or compensation clauses in contract
			Request payments in hard currency in countries with unstable economic conditions		Revise portfolio of client, list of projects (contractors) and then transfer projects or restructure capital
			Suspend temporary business		Do nothing (realized risk existence, but not take any action)
			Put the cost provisions of inflation in construction costs	Other:	
			Control construction cost strictly, improve management process		
14	Inflation		Make a contract clearly for this problems (transfer or share)		Ensure that the project's clients have assurance of financial
			Establish specialized monitor organization to monitor fluctuation of economic in the world		Obtain payment bonds and performance bonds from banks
			Secure standby cash flow in advance		Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap)
			Specify escalation clauses for interest rate in contract		Specify the terms of extension or compensation clauses in contract
			Choose the potential cooperation partner		Specify a reimbursement clause in contract to mitigate loss from inflation

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES		
		Risk response methods	Risk response methods	
15	Loss due to fluctuation of interest rate	Secure standby cash flow in advance	Ensure that the project's clients have assurance of financial	
		Specify escalation clauses for interest rate in contract	Obtain payment bonds and performance bonds from banks	
		Ensure that the project's clients have assurance of financial	Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap)	
		Sign pre-defined prices with subcontractors/suppliers	Specify the terms of extension or compensation clauses in contract	
		Specify the terms of extension or compensation clauses in contract	Specify a reimbursement clause to mitigate the loss from fluctuation of interest rate or a client's demand variation during the construction period	
		Prepare the contingency funds for fluctuation of interest rate in construction costs	Sign the fixed price with the subcontractors/suppliers	
		Reserve the financial sources	Do nothing (realized risk existence, but not take any action)	
		Control careful costs, and improve quality of management process	Other:	
			Ensure that the project's clients have assurance of financial	Put the cost provisions of exchange rate in construction costs
			Sign pre-defined prices with subcontractors/suppliers	Revise portfolio of client, list of projects (contractors) and then transfer projects or restructure capital
			Obtain payment bonds and performance bonds from surety	Do nothing (realized risk existence, but not take any action)
			Use local product and labor to reduce the impact of inflation	Other:
			Suspend temporary business	
			Stop business	

No	EXTERNAL RISK FACTOR	RISK RESPONSE MEASURES			
			Risk response methods		Risk response methods
16	Environmental pollution		Suspend temporary business		
			Stop business		
			Sign a subcontract with specialist companies to control pollution		Develop the contingency plan
			Comply with laws, regulations of international and local environment		Specify some policy for disaster planning, claims management, litigation management
			Establish measures to strictly control pollution of construction site		Do nothing (realized risk existence, but not take any action)
			Include disclaimer clause for present pollution problems in contract		Other:
			Specify extension of time clause in contract		
	Reduce investment				
17	Force majeure (rain, flood, earthquake, etc)		Develop clearly policy in agreement to limit the impact of risks in the implementation of projects		Specify some policy for disaster planning, claims management, litigation management
			Sign a contract between clients and contractors with specified terms and particular conditions to share force majeure risks		Collect statistical data of climates in the past
			Insurance		Prepare appropriate construction measures to adverse weather such as heavy rain, strong wind, flood, storms and earthquakes
			Specify extension of time clause in contract		Do nothing (realized risk existence, but not take any action)
			Develop the contingency plan		Other:

More suggestions about external risk response:

APPENDIX B
DATA ANALYSIS

APPENDIX B1 – RELIABILITY ANALYSIS OF PILOT TEST**Reliability Statistics**

Cronbach's Alpha	N of Items
.876	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Partner's parent company in financial problems	4.475	1.822	.868	.843
Policy changes in your partner's parent company toward ICJV	4.500	2.377	.434	.874
Over-interference by parent company of either partner	4.550	2.180	.650	.862
Change of organization within local partner	4.500	2.571	-.056	.891
Partner's lack of management competence and resourcefulness	4.625	2.045	.620	.864
Disagreement on allocation of staff positions in ICJV	4.500	1.931	.677	.861
Disagreement on allocation of works	4.500	2.194	.480	.872
Technology transfer dispute	4.675	2.245	.656	.864
Breach of contracts by Joint Venture partner	4.650	2.249	.780	.861
Poor relation and disputes with partner	4.550	1.917	.804	.849
Inadequate ICJV organization structure	4.550	2.077	.724	.856
Poor relation with government departments	4.650	2.546	.063	.884

Reliability Statistics

Cronbach's Alpha	N of Items
.954	18

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Poor project relationship	7.550	7.209	.637	.954
Excessive demands and variation by client	7.425	7.565	.040	.958
Problems due to partners' different practice	7.350	7.209	.637	.954
Incompetence of subcontractors/suppliers	7.375	6.308	.925	.948
Improper project feasibility study	7.625	6.525	.784	.951
Improper project planning and budgeting	7.625	6.754	.927	.949
Improper selection of project location, type	7.675	6.554	.978	.948
Inadequate project organization structure	7.550	6.763	.616	.954
Incompetence of project management team	7.575	6.148	.973	.947
Accidents on site	7.575	6.148	.973	.947
Equipment failure	7.550	6.740	.844	.950
Materials shortage	7.400	6.697	.789	.951
Shortage in skillful workers	7.475	7.296	.394	.956
Design changes	7.350	7.026	.670	.953
Errors in design drawings	7.450	7.734	-.269	.961
Incomplete drawing and technical specification	7.450	6.740	.721	.952
Disagree some conditions of contract	7.550	6.100	.934	.948
Incomplete contract terms with partner	7.600	6.606	.881	.949

Reliability Statistics

Cronbach's Alpha	N of Items
.891	17

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Import restriction	6.750	2.694	.902	.870
Lack of enforcement of legal judgment	6.800	2.857	.648	.881
Loss due to insufficient law for joint ventures	6.675	2.868	.551	.884
Cost increase due to changes of policies	6.625	2.736	.580	.884
Loss incurred due to political changes	6.975	3.159	.291	.891
Security problems	6.950	3.037	.412	.889
Language barrier	6.650	2.786	.624	.881
Different social, culture, and religious	6.650	2.786	.624	.881
Loss incurred due to corruption and bribery	6.750	2.934	.349	.895
Loss due to bureaucracy for late approvals	6.700	3.097	.526	.887
Worker strike	6.900	3.040	.440	.888
Economy fluctuation	6.625	3.342	-.174	.903
Exchange rate	6.600	2.846	.669	.880
Inflation	6.525	2.788	.940	.872
Loss due to fluctuation of interest rate	6.450	2.786	.740	.877
Pollution, weather	6.900	3.120	.275	.892
Force majeure	6.875	2.811	.784	.876

APPENDIX B2 - RANKING OF RISK FACTORS GROUPS (PILOT TEST)

Table 1 Ranking of internal risk groups

Rank	Description	P	I	RF
1	Partner's parent company in financial problems	0.50	0.80	0.900
2	Policy changes in your partner's parent company toward ICJV	0.48	0.65	0.816
3	Over-interference by parent company of either partner	0.43	0.65	0.799
4	Breach of contracts by ICJV partner	0.33	0.70	0.798
5	Inadequate ICJV organization structure	0.43	0.58	0.756
6	Poor relation with government departments	0.33	0.63	0.747
7	Poor relation and disputes with partner	0.43	0.55	0.741
8	Partner's lack of management competence and resourcefulness	0.35	0.60	0.740
9	Change of organization within local partner	0.48	0.45	0.711
10	Disagreement on allocation of staff positions in ICJV	0.48	0.43	0.698
11	Disagreement on allocation of works	0.48	0.40	0.685
12	Technology transfer dispute	0.30	0.50	0.650

Cronbach's Alpha = 0.876.

Table 2 Ranking of project risk groups

Rank	Description	P	I	RF
1	Incompetence of subcontractors/suppliers	0.58	0.73	0.883
2	Materials shortage	0.55	0.63	0.831
3	Design changes	0.60	0.58	0.830
4	Inadequate project organization structure	0.40	0.70	0.820
5	Incompetence of project management team	0.38	0.70	0.813
6	Problems due to partners' different practice	0.60	0.50	0.800
7	Excessive demands and variation by client	0.53	0.58	0.798
8	Accidents on site	0.38	0.65	0.781
9	Improper project planning and budgeting	0.33	0.68	0.781
10	Improper project feasibility study	0.33	0.65	0.764
11	Errors in design drawings	0.50	0.53	0.763
12	Disagree some conditions of contract	0.40	0.60	0.760
13	Shortage in skillful workers	0.48	0.53	0.751
14	Incomplete contract terms	0.35	0.60	0.740
15	Incomplete drawing and technical specification	0.50	0.48	0.738
16	Poor project relationship	0.40	0.50	0.700
17	Improper selection of project location, type	0.28	0.58	0.692
18	Equipment failure	0.40	0.35	0.610

Cronbach's Alpha = 0.954.

Table 3 Ranking of external risk groups

Rank	Description	P	I	RF
1	Import restriction	0.40	0.63	0.775
2	Loss due to fluctuation of interest rate	0.70	0.65	0.895
3	Inflation	0.63	0.70	0.888
4	Economy fluctuation	0.53	0.65	0.834
5	Loss due to insufficient law for joint ventures	0.48	0.65	0.816
6	Changes of government policies	0.53	0.58	0.798
7	Exchange rate	0.55	0.55	0.798
8	Lack of enforcement of legal judgment	0.35	0.60	0.740
9	Language barrier	0.50	0.43	0.713
10	Force majeure (rain, flood, earthquake, etc)	0.28	0.60	0.710
11	Loss due to bureaucracy for late approvals	0.45	0.45	0.698
12	Different social, culture, and religious	0.50	0.38	0.688
13	Worker strike	0.25	0.58	0.681
14	Loss incurred due to political changes	0.18	0.60	0.670
15	Loss incurred due to corruption and bribery	0.40	0.38	0.625
16	Environmental pollution	0.25	0.40	0.550
17	Security problems	0.20	0.43	0.540

Cronbach's Alpha = 0.891.

APPENDIX B3 – SOURCE-EFFECT OF RISK FACTORS

1. INTERNAL RISK FACTORS

No	Internal Risk Factor	Source of Risk	Effect(Impact)			
			Time	Cost	Quality	Scope
1	Partner's parent company in financial problems	<ul style="list-style-type: none"> - Inappropriate financial structure of ICJV - Investment policy changed by shareholders - Loaning from subsidiary company - Change of interest rate - Economic fluctuation - Partner selection via broker and middleman 	x	x	x	x
2	Policy changes in your partner's parent company toward ICJV	<ul style="list-style-type: none"> - Policy changes in the partner's parent company - Unfamiliarity with the collaboration process, unclear terms and conditions in contract agreement - Alteration of construction market 	x	x		
3	Overinterference by parent company of either partner	<ul style="list-style-type: none"> - Unsuccess of JV - Implementation of unreasonable policies of the director of JV - The over-reliance of JV on the parent company 	x	x	x	x
4	Change of organization within local partner	<ul style="list-style-type: none"> - Policies change in the partner's parent company - Fluctuation of construction 	x	x		
5	Partner's lack of management competence and resourcefulness	<ul style="list-style-type: none"> - A less capacity or inability of manager staff 	x	x	x	x
6	Disagreement on allocation of staff positions in ICJV	<ul style="list-style-type: none"> - A less capacity or inability of manager staff - Incapacity recruitment-staff - The complexity of the JV company 	x	x		
7	Disagreement on allocation of works	<ul style="list-style-type: none"> - Allocating works not suitable for ability of staff - Unexpected of the subordinates 	x	x	x	
8	Technology transfer dispute	<ul style="list-style-type: none"> - Unclear about the terms and conditions in technology transfer 	x	x	x	
9	Breach of contracts by Joint Venture partner	<ul style="list-style-type: none"> - Disagreement about the profit/loss in joint venture - Disagreement on allocation of works and staff positions in ICJV - Inconsistent clauses, inappropriate collaboration in ICJV contract - Conflicts in the division of the design changes 	x	x	x	x
10	Poor relation and disputes with partner	<ul style="list-style-type: none"> - Design changes - Disagreement about the profit/loss in joint venture 	x	x		
11	Inadequate ICJV organization structure	<ul style="list-style-type: none"> - Inexperienced partners - The complexity of JV projects - Unclear terms and conditions 	x	x	x	
12	Poor relation with government departments	<ul style="list-style-type: none"> - Poor relation of local partner with government departments 	x	x		

2. PROJECT RISK FACTORS

No	Project Risk Factor	Source of Risk	Effect (Impact)			
			Time	Cost	Quality	Scope
1	Poor project relationship	<ul style="list-style-type: none"> - Local partners lack of experience, unwidely relationship - Poor relationship with other organizations in the project 	X	X		
2	Excessive demands and variation by client	<ul style="list-style-type: none"> - The financial problems of client - The inconsistency of the client - Inexperienced consultants 	X	X	X	X
3	Problems due to partners' different practice	<ul style="list-style-type: none"> - Unfamiliar in work and coordination with other contractors - Different experience of partners 	X	X	X	
4	Incompetence of subcontractors/suppliers	<ul style="list-style-type: none"> - Lack of expertise and capability of subcontractors/suppliers - Coordination problems of prime contractor - Lack of capacity of nominated subcontractors - Problems among subcontractors suggested by foreign and local contractor and vice versa 	X	X	X	X
5	Improper project feasibility study	<ul style="list-style-type: none"> - Lack of expertise and capabilities of A/E - Coordination problems of prime contractor - Lack of capacity of nominated subcontractors - Problems among subcontractors suggested by foreign and local contractor and vice versa 	X	X		X
6	Improper project planning and budgeting	<ul style="list-style-type: none"> - The negligence of A/E in project feasibility study process - Lack of supervision of the clients - The financial problems of clients 	X	X	X	
7	Improper selection of project location, type	<ul style="list-style-type: none"> - Improper project feasibility study - Lack of experience, capacity of consultants (Engineer/Architecture) 	X	X	X	X
8	Inadequate project organization structure	<ul style="list-style-type: none"> - Incompetence management - Very large and complex ICJV projects - A large number of parties 	X	X	X	
9	Incompetence of project management team	<ul style="list-style-type: none"> - Lack of experience 	X	X	X	X
10	Accidents on site	<ul style="list-style-type: none"> - Examine sparely the safety plan in construction site - Lack of awareness of workers about the safety knowledge - Lack of safety engineering in construction site - Lack of training for workers about the safety knowledge regularly - Focus on progress of construction of client, lack of facilities investment to ensure safety during the construction 	X	X	X	
11	Equipment failure	<ul style="list-style-type: none"> - Incapacity of the site management and project management - Lack of equipment quality control in construction site 	X	X	X	

No	Project Risk Factor	Source of Risk	Effect (Impact)			
			Time	Cost	Quality	Scope
12	Materials shortage	<ul style="list-style-type: none"> - Low quality of materials - Import restriction - Lack of warehouse 	x	x	x	
13	Shortage in skillful workers	<ul style="list-style-type: none"> - Lack of skills of workers - Low probability - Most workers in small teams, the skill is not high and very difficult to control 	x	x	x	
14	Design changes	<ul style="list-style-type: none"> - Unclear requirements by client - Redesign - Incompatibility between design and site conditions - Incomplete drawing and specification - Unclear project objectives - Inappropriate feasibility study and lack of experience in feasibility study 	x	x	x	x
15	Errors in design drawings	<ul style="list-style-type: none"> - Lack of the contract examination and notice to the Client - Careless of feasibility study - Lack of design experience 	x	x	x	
16	Incomplete drawing and technical specification	<ul style="list-style-type: none"> - Lack of design experience - Careless of feasibility study 	x	x	x	
17	Disagree some conditions of contract	<ul style="list-style-type: none"> - None standard contract form - Lack of contract examination 	x	x		
18	Incomplete contract terms	<ul style="list-style-type: none"> - Unfamiliar with the contract documents (inexperience) - Language barrier - Local staff doesn't have biligual ability 	x	x	x	

3. EXTERNAL RISK FACTORS

No	External Risk Factor	Source Of Risk	Effect(Impact)			
			Time	Cost	Quality	Scope
1	Import restriction		x	x	x	
2	Lack of enforcement of legal judgment	- Policy changes of government - Tax law and royalties change - Underdeveloped country	x	x		x
3	Loss due to insufficient law for joint ventures	- Political disturbance - Inconsistency government policy - Economic situation	x	x		
4	Changes of government policies	- Corruption - Unfamiliar with local law - Lack of experienced lawyer	x	x		
5	Loss incurred due to political changes	- Lack of working experience in country	x	x		
6	Security problems	- Labor conflicts and land disputes	x	x	x	
7	Language barrier	- Lack of experienced staff - Foreign company whose first language is not English	x	x	x	
8	Different social, culture, and religious	- Foreign company whose first language is not English - None working experience in local country	x	x	x	
9	Loss incurred due to corruption and bribery	- The imperfect of the policies and laws - Embarrassing legal procedures - Low salaries of employees and officials - Lack of expertise and capacity of officials	x	x	x	
10	Loss due to bureaucracy for late approvals	- Embarrassing legal procedures - Corruption and bribery	x	x		
11	Worker strike	- Low salaries and instable life of workers - Inflation	x	x	x	
12	Economy fluctuation	- Payment eroded by inflation - Initial instability of economy	x	x	x	
13	Exchange rate	- Strong inflation	x	x		
14	Inflation	- Misguided policies of the government	x	x		
15	Loss due to fluctuation of interest rate	- Imbalance in the macroeconomics	x	x		
16	Environmental pollution	- Environmental pollution caused by construction work - Not evaluate the impact of construction projects on the environment	x	x	x	x
17	Force majeure (rain, flood, earthquake, etc)	- Rain, floods, storms often occurs - Earthquake	x	x	x	x

APPENDIX B4 – RISK ASSESSMENT OF RISK FACTORS AFFECTING ICJVs PROJECTS IN VIETNAM

S: Startup; O: Operation; D: Dismantle stage

ID	Risk factors	Probability of risks			Impact of risks			RF					
		S	O	D	S	O	D	Startup		Operation		Dismantle	
		Mean	Mean	Mean	Mean	Mean	Mean	P1	Rank	P2	Rank	P3	Rank
11.1	Partner's parent company in financial problems	0.62	0.58	0.59	0.81	0.81	0.71	0.927	1	0.919	1	0.883	1
11.2	Policy changes in your partner's parent company toward ICJV	0.54	0.45	0.26	0.62	0.63	0.55	0.825	17	0.797	11	0.669	23
11.3	Over-interference by parent company of either partner	0.58	0.38	0.38	0.47	0.58	0.46	0.779	21	0.740	28	0.665	24
11.4	Change of organization within local partner	0.35	0.45	0.26	0.47	0.47	0.47	0.659	31	0.709	38	0.610	37
11.5	Partner's lack of management competence and resourcefulness	0.30	0.37	0.30	0.38	0.58	0.38	0.566	39	0.734	31	0.566	44
12.1	Disagreement on allocation of staff positions in ICJV	0.58	0.50	0.50	0.65	0.46	0.46	0.852	8	0.730	33	0.730	17
12.2	Disagreement on allocation of works	0.51	0.42	0.41	0.57	0.38	0.37	0.789	20	0.640	41	0.624	33
12.3	Technology transfer dispute	0.17	0.31	0.31	0.46	0.46	0.43	0.550	41	0.629	44	0.611	36
12.4	Breach of contracts by ICJV partner	0.21	0.37	0.37	0.47	0.67	0.37	0.582	38	0.793	12	0.599	40
12.5	Poor relation and disputes with partner	0.43	0.43	0.43	0.55	0.55	0.55	0.747	25	0.747	24	0.747	13
12.6	Inadequate ICJV organization structure	0.63	0.46	0.46	0.55	0.55	0.38	0.836	14	0.759	18	0.665	25
12.7	Poor relation with government departments	0.51	0.41	0.21	0.66	0.66	0.35	0.835	15	0.798	9	0.487	46
P1.1	Poor project relationship	0.39	0.41	0.50	0.41	0.51	0.42	0.640	35	0.711	37	0.710	21
P1.2	Excessive demands and variation by client	0.34	0.57	0.38	0.75	0.57	0.45	0.837	13	0.812	8	0.657	27
P1.3	Problems due to partners' different practice	0.26	0.54	0.53	0.29	0.46	0.45	0.472	45	0.752	21	0.738	14
P2.1	Incompetence of subcontractors/suppliers	0.41	0.59	0.58	0.49	0.62	0.59	0.695	30	0.845	3	0.829	4
P2.2	Improper project feasibility study	0.54	0.34	0.33	0.81	0.66	0.46	0.911	2	0.776	16	0.636	30
P2.3	Improper project planning and budgeting	0.45	0.45	0.45	0.47	0.67	0.27	0.709	27	0.819	7	0.598	41
P2.4	Improper selection of project location, type	0.50	0.31	0.30	0.71	0.57	0.59	0.857	7	0.702	39	0.715	19
P2.5	Inadequate project organization structure	0.41	0.41	0.39	0.65	0.65	0.45	0.790	19	0.790	13	0.664	26
P2.6	Incompetence of project management team	0.29	0.46	0.46	0.66	0.69	0.59	0.757	23	0.831	5	0.780	10

S: Startup; O: Operation; D: Dismantle stage

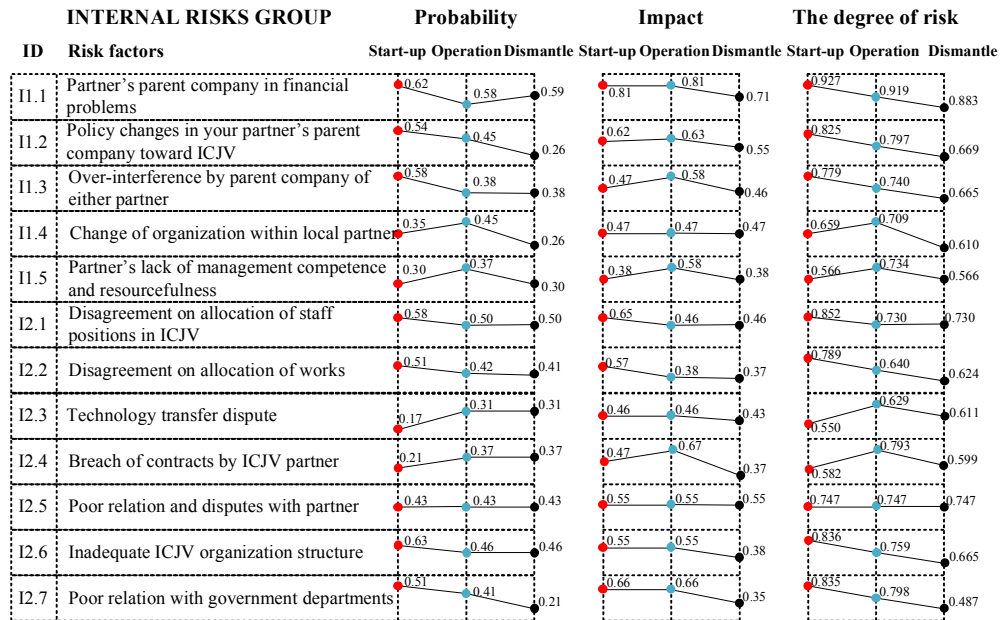
ID	Risk factors	Probability of risks			Impact of risks			RF					
		S	O	D	S	O	D	Startup		Operation		Dismantle	
		Mean	Mean	Mean	Mean	Mean	Mean	P1	Rank	P2	Rank	P3	Rank
P3.1	Accidents on site	0.23	0.37	0.30	0.13	0.58	0.49	0.330	47	0.734	32	0.641	29
P3.2	Equipment failure	0.23	0.41	0.37	0.39	0.39	0.38	0.535	43	0.640	42	0.607	39
P3.3	Materials shortage	0.31	0.50	0.47	0.50	0.50	0.46	0.657	32	0.750	23	0.716	18
P3.4	Shortage in skillful workers	0.31	0.51	0.49	0.35	0.55	0.51	0.556	40	0.783	14	0.750	12
P4.1	Design changes	0.69	0.57	0.37	0.59	0.59	0.73	0.873	5	0.824	6	0.827	5
P4.2	Errors in design drawings	0.39	0.51	0.38	0.51	0.51	0.66	0.705	29	0.763	17	0.789	7
P4.3	Incomplete drawing and technical specification	0.53	0.51	0.34	0.49	0.49	0.47	0.757	24	0.750	22	0.652	28
P5.1	Disagree some conditions of contract	0.61	0.43	0.43	0.54	0.54	0.53	0.819	18	0.739	29	0.732	15
P5.2	Incomplete contract terms	0.50	0.42	0.42	0.53	0.53	0.35	0.763	22	0.725	34	0.625	32
E1.1	Import restriction	0.39	0.39	0.39	0.34	0.54	0.50	0.600	36	0.721	36	0.697	22
E1.2	Lack of enforcement of legal judgment	0.34	0.33	0.33	0.46	0.46	0.43	0.644	34	0.636	43	0.618	34
E1.3	Loss due to insufficient law for joint ventures	0.65	0.45	0.45	0.55	0.55	0.51	0.842	12	0.753	20	0.731	16
E1.4	Changes of government policies	0.45	0.45	0.45	0.54	0.54	0.34	0.745	26	0.745	25	0.635	31
E1.5	Loss incurred due to political changes	0.21	0.21	0.21	0.57	0.57	0.51	0.656	33	0.656	40	0.614	35
E2.1	Security problems	0.30	0.30	0.30	0.23	0.38	0.22	0.463	46	0.566	47	0.454	47
E2.2	Language barrier	0.69	0.51	0.42	0.51	0.46	0.29	0.848	9	0.737	30	0.586	42
E2.3	Different social, culture, and religious	0.71	0.53	0.33	0.46	0.46	0.42	0.845	11	0.744	26	0.609	38
E2.4	Loss incurred due to corruption and bribery	0.69	0.50	0.50	0.45	0.45	0.61	0.827	16	0.723	35	0.803	6
E2.5	Loss due to bureaucracy for late approvals	0.71	0.54	0.54	0.67	0.47	0.47	0.906	3	0.758	19	0.758	11
E2.6	Worker strike	0.14	0.27	0.37	0.47	0.47	0.29	0.547	42	0.617	45	0.548	45
E3.1	Economy fluctuation	0.49	0.49	0.49	0.77	0.61	0.58	0.880	4	0.798	10	0.784	9
E3.2	Exchange rate	0.53	0.53	0.53	0.38	0.53	0.55	0.707	28	0.776	15	0.789	8
E3.3	Inflation	0.62	0.62	0.62	0.63	0.69	0.62	0.861	6	0.881	2	0.856	3

S: Startup; O: Operation; D: Dismantle stage

ID	Risk factors	Probability of risks			Impact of risks			RF					
		S	O	D	S	O	D	Startup		Operation		Dismantle	
		Mean	Mean	Mean	Mean	Mean	Mean	P1	Rank	P2	Rank	P3	Rank
E3.4	Loss due to fluctuation of interest rate	0.59	0.59	0.59	0.62	0.62	0.67	0.845	10	0.845	4	0.867	2
E4.1	Environmental pollution	0.30	0.30	0.30	0.41	0.41	0.41	0.585	37	0.585	46	0.585	43
E4.2	Force majeure (rain, flood, earthquake)	0.30	0.30	0.30	0.26	0.63	0.59	0.482	44	0.743	27	0.715	20

APPENDIX B5 – TREND ANALYSIS OF RISK FACTORS

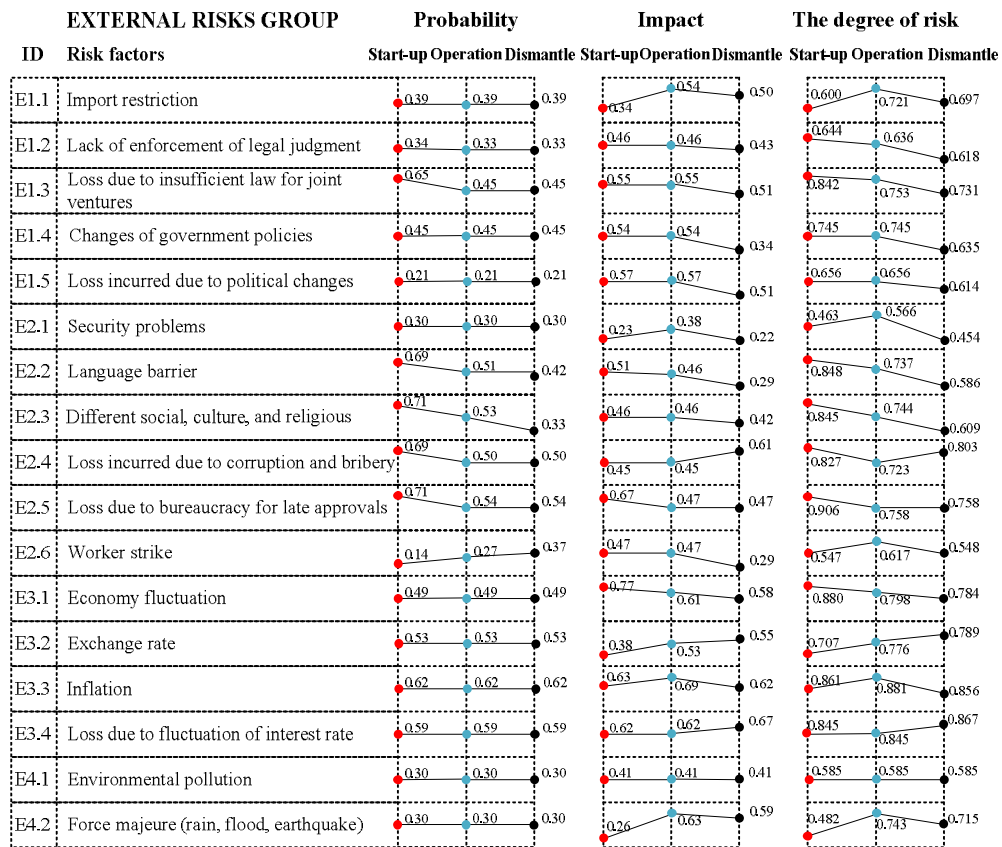
1. Trend analysis for internal risk factors group



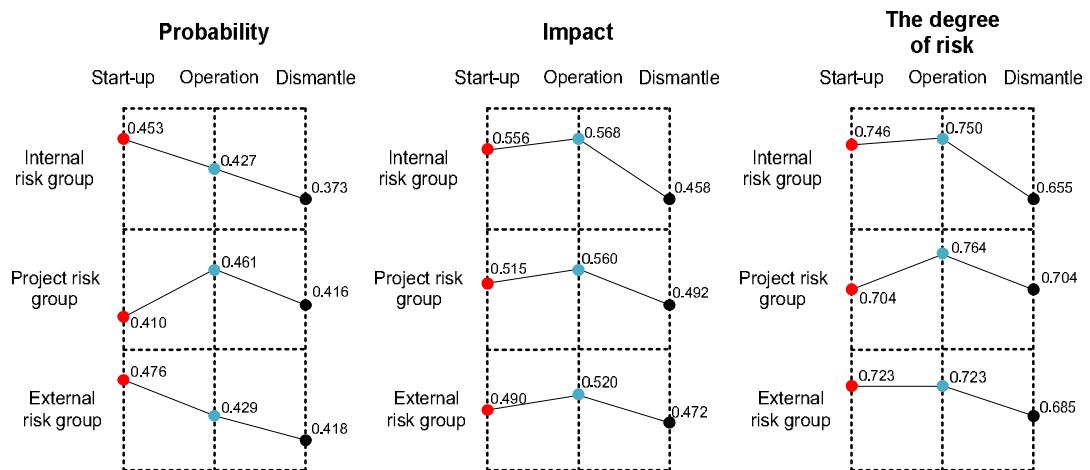
2. Trend analysis for project risk factors group



3. Trend analysis for external risk factors group



4. Trend analysis of risk group



APPENDIX B6 – RISK RESPONSE MEASURES

No	INTERNAL RISK FACTOR	RISK RESPONSE PLAN			
		REDUCTION	TRANSFER	RETENTION	AVOIDANCE
1	Partner’s parent company in financial problems	<ul style="list-style-type: none"> - Examine the target company's financial resources, technical and management competence and connections with local government - Ensure that the project's clients have assurance of financial - Gain accurate financial and other information from international and independent security and risk evaluation agencies - Obtain guarantees or other credit support from reliable and credit worthy local and international entities - Joint venture with foreign partners that have strong financial resources 	<ul style="list-style-type: none"> - Specify extension or compensation clauses in contract for payment - Enter into fixed rate loan contract with lending banks 	<ul style="list-style-type: none"> - Undertake pre-project planning - Develop the contingency plan to support this risk event 	<ul style="list-style-type: none"> - Reduce investment - Change business target - Suspend temporary business
2	Policy changes in your partner’s parent company toward ICJV	<ul style="list-style-type: none"> - Establish operational framework less affected by policy changes of partner's parent company - Limit right to determine and intervention of parent company to a JV by clear policies and rules 	<ul style="list-style-type: none"> - Specify careful agreement about clear terms and conditions - Specify clear authority and responsibility 	<ul style="list-style-type: none"> - Set up appropriate policies for change activities of the parent company - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Agreement: clear terms and conditions
3	Overinterference by parent company of either partner	<ul style="list-style-type: none"> - Issue granting autonomy to the ICJV's chief executive officer (CEO) 	<ul style="list-style-type: none"> - Specify clearly engineering contract: clear term and conditions 	<ul style="list-style-type: none"> - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Define clearly clear terms and conditions in contract agreement , clear authority and responsibility

No	INTERNAL RISK FACTOR	RISK RESPONSE PLAN			
		REDUCTION	TRANSFER	RETENTION	AVOIDANCE
4	Change of organization within local partner	- Choose the partners had previously cooperated and have compatible strategies		- Select local contractors that have organizational stability and long-term operation - Do nothing (realized risk existence, but not take any action)	
5	Partner's lack of management competence and resourcefulness	- Select partner carefully - Distribute works in accordance with the capabilities of each partners - Hire new local working groups that have good management capacity and understand clearly the situation of Vietnam - Select foreign contractors that have good management capacities and reputability	- Select strong sub-contractors to complement shortcomings	- Recruit staff in ICJV with bilingual languages	
6	Disagreement on allocation of staff positions in ICJV	- Select the site manager for ICJV having good capacity - Choose staff carefully - Select the trustworthy people on important places in the ICJV - Be careful in the translation of contract documents - Insist that bilingual (English and local language) documents are prepared simultaneously and agreed in final form by all parties - Allow re-negotiation in contract - Maintain clear contract documentation	- Specify careful clear terms and conditions	- Specify clearly the policy to change flexible staff positions	- Rent (of hire) specialized groups to undertake the specific issues
7	Disagreement on allocation of works	- Divide staff according to the specialized functions - Recruit, train staff with appropriate	- Specify careful clear terms and conditions	- Specify clearly the policy to change flexible staff positions	- Rent (of hire) specialized groups to undertake the specific

No	INTERNAL RISK FACTOR	RISK RESPONSE PLAN			
		REDUCTION	TRANSFER	RETENTION	AVOIDANCE
		<ul style="list-style-type: none"> qualifications - Define clearly scope of work of each party - Allocate work to partner corresponding with his ability - Be careful in the translation of contract documents - Prepare bilingual (English and local language) documents at the same time and be agreed by all parties - Separate or relocate of activities and resources 			<ul style="list-style-type: none"> issues
8	Technology transfer dispute	<ul style="list-style-type: none"> - Check regularly to detect compliance with technology transfer policy - Choose right staff for technology transfer and training 	<ul style="list-style-type: none"> - Specify careful clear terms and conditions 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event 	<ul style="list-style-type: none"> - Reduce investment - Stop business
9	Breach of contracts by Joint Venture partner	<ul style="list-style-type: none"> - Specify comprehensive terms of material and immaterial default in contract - Maintain good relationship with local government officials, such as senior executive - Select the trustworthy people on important places in the ICJV 	<ul style="list-style-type: none"> - Specify clearly the regulations about material, immaterial breach of contracts in contract agreement - Supply notice for breach of contracts on time 	<ul style="list-style-type: none"> - Improve the level of site project management 	<ul style="list-style-type: none"> - Reduce investment - Stop business
10	Poor relation and disputes with partner	<ul style="list-style-type: none"> - Define clearly range of assets, employees, organizations, resources, and strategic among partners 	<ul style="list-style-type: none"> - Specify clearly contract about the profit/loss in joint venture 	<ul style="list-style-type: none"> - Promote relationship among the parties 	<ul style="list-style-type: none"> - Reduce investment - Change objectives of business

No	INTERNAL RISK FACTOR	RISK RESPONSE PLAN			
		REDUCTION	TRANSFER	RETENTION	AVOIDANCE
11	Inadequate ICJV organization structure	<ul style="list-style-type: none"> - Select a suitable legal form of ICJV - Define clearly range of assets, employees, organizations, resources, and strategic among partners - Adopt a suitable operational structure for ICJV 		<ul style="list-style-type: none"> - Select JV parties that have previous relationship 	<ul style="list-style-type: none"> - Stop business - Reduce investment
12	Poor relation with government departments	<ul style="list-style-type: none"> - Select the best person that have the relation closely with the government - Select the local companies that have good relationship with government departments - Train the staff about the law and regulations in Vietnam 	<ul style="list-style-type: none"> - Select sub-contractors that have good relationship with government departments 	<ul style="list-style-type: none"> - Provide the contingency fund against late approvals, corruption and bribery - Give the relationship policies with government departments for newly established companies 	

No	PROJECTS RISK FACTOR	RISK RESPONSE PLAN			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
1	Poor project relationship	<ul style="list-style-type: none"> - Select partner carefully - Select carefully subcontractors/suppliers - Increase the ability of project management - Create a good relationship of the parties by organization regular meetings and reports 	<ul style="list-style-type: none"> - Select good ability consultant 	<ul style="list-style-type: none"> - Give the reasonable business policies to attract more relationships to bring more projects 	<ul style="list-style-type: none"> - Select the previous relationship parties (have worked together for at least 1 or 2 projects)
2	Excessive demands and variation by client	<ul style="list-style-type: none"> - Inspect construction site regularly, notice to the Client or Client's representative to appropriate remedial measures 	<ul style="list-style-type: none"> - Specify extension clause and addition payment in contract - A reimbursement clause to mitigate the loss from a client's demand variation during the construction period 		
3	Problems due to partners' different practice	<ul style="list-style-type: none"> - Hire subcontractors/suppliers more experience and previous relationship (note: not select subcontractors with the lowest price) - Be careful in accepting the nominated subcontractors/suppliers by client - Train staff for enhancing project management skills - Notice to failure of subcontractors/suppliers 	<ul style="list-style-type: none"> - Require the performance bonds supplied by subcontractors. - Specify flow-down clauses in subcontract 	<ul style="list-style-type: none"> - Enhance the supervisors skills - Provide a plan against failure of subs/suppliers 	
4	Incompetence of subcontractors/suppliers	<ul style="list-style-type: none"> - Hire subcontractors/suppliers more experience and previous relationship (note: not select subcontractors with the lowest price) - Be careful in accepting the nominated subcontractors/suppliers by client - Increase ability of project management 	<ul style="list-style-type: none"> - Require the performance bonds supplied by subcontractors. - Specify flow-down clauses in subcontract 	<ul style="list-style-type: none"> - Enhance the supervisors skills - Prepare the contingency fund to cope with the incompetent subcontractors/suppliers - Provide plans against failure of subs and suppliers 	<ul style="list-style-type: none"> - Stop business with the subcontractor/suppliers - Change the subcontractors/ suppliers

No	PROJECTS RISK FACTOR	RISK RESPONSE PLAN			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
5	Improper project feasibility study	<ul style="list-style-type: none"> - Conduct a more detailed feasibility study for the project - Notice to Client problems of planning and budgeting as soon as possible - Increase the level of control for feasibility study - Select experience architect/engineer 	<ul style="list-style-type: none"> - Specify additional cost and extension time clauses in contract 	<ul style="list-style-type: none"> - Select experience architect/engineer - Do nothing 	<ul style="list-style-type: none"> - Stop business - Change business target - Reduce investment
6	Improper project planning and budgeting	<ul style="list-style-type: none"> - Conduct a more detailed project planning and budgeting for the project - Notice to Client problems of planning and budgeting as soon as possible - Increase the level of control for project planning - Select experience architect/engineer 	<ul style="list-style-type: none"> - Insurance for project planning and budgeting - Specify clearly terms and conditions about the responsibility of A/E for project planning and budgeting in feasibility study 	<ul style="list-style-type: none"> - Select experience architect/engineer 	<ul style="list-style-type: none"> - Stop business - Change business target - Reduce investment
7	Improper selection of project location, type	<ul style="list-style-type: none"> - Conduct a more detailed feasibility study for the project - Notice to Client problems of project location/type as soon as possible - Increase the level of control for feasibility study - Select experience architect/engineer 	<ul style="list-style-type: none"> - Specify clearly terms and conditions about the responsibility of A/E for feasibility study about project location/type 	<ul style="list-style-type: none"> - Do nothing - Conduct a more detailed feasibility study for the project 	<ul style="list-style-type: none"> - Stop business - Change business target - Reduce investment
8	Inadequate project organization structure	<ul style="list-style-type: none"> - Hire competent project management team - Employ local staff with bilingual ability - Clear definition of each staff's scope of work 	<ul style="list-style-type: none"> - Specify construction extension clause and addition payment in contract if client causes the delay - Specify conflict resolution clause in contract 	<ul style="list-style-type: none"> - Undertake pre-project planning 	<ul style="list-style-type: none"> - Select familiar group of project management
9	Incompetence of project management team	<ul style="list-style-type: none"> - Hire competent project management team - Employ local staff with bilingual ability - Clear definition of each staff's scope of work 	<ul style="list-style-type: none"> - Specify conflict resolution clause in contract and construction extension clause in contract if client causes the delay 	<ul style="list-style-type: none"> - Undertake pre-project planning - Establish a fixed standard project management system 	<ul style="list-style-type: none"> - Select familiar group of project management

No	PROJECTS RISK FACTOR	RISK RESPONSE PLAN			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
			- Provide clauses on schedule delay and additional payment if caused by client		
10	Accidents on site	<ul style="list-style-type: none"> - Improve and control the safety plan regularly - Enhance management and supervision to minimize accidents on site - Design reasonable construction methods, construction layout, and team - Maintenance periodically equipments, training for construction staff - Inspect construction site periodically - Restrict working overtime, especially construction at night - Suspend construction or design the appropriate construction measures to adverse weather such as heavy rain, strong wind, flood, storm, and earthquake. - Sanitate construction site to create favorable conditions for workers - Train workers about the safety knowledge regularly - Promote safety management in construction site, and establish safety management broad - Labor training about safety 	<ul style="list-style-type: none"> - Supply insurance for labour safety and construction - Labour must have clean bill of health. - Equipment: must have testing certificate and operators must have practice of profession certificate - Add provisions solving consequences of occupational safety and legal liability of main contractors, subcontractors, Clients when accidents occurs 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event - Prepare the budget for unexpected situation (or even the response plan for reducing the delay of work) - Prepare a full range of safety standards related to work 	
11	Equipment failure	<ul style="list-style-type: none"> - Enhance the equipment management system of contractors - Inspect equipments of contractors periodically 	<ul style="list-style-type: none"> - Supply insurance for equipment and construction 	<ul style="list-style-type: none"> - Maintenance and inspect equipment periodically - Prepare the replaced construction equipment when the problems occurs 	

No	PROJECTS RISK FACTOR	RISK RESPONSE PLAN			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
12	Materials shortage	<ul style="list-style-type: none"> - Prepare plan for materials, machinery, and construction equipments before commencement date. - Find replacement materials, machinery, and construction equipments in the local country 		<ul style="list-style-type: none"> - Supply feedstock agreements - Do nothing 	
13	Shortage in skillful workers	<ul style="list-style-type: none"> - Select subcontractors carefully - Monitor subcontractors and skillful of subcontractors workers regularly - Consider the notice of the client's representative about the works quality 	<ul style="list-style-type: none"> - Subcontract with good ability subcontractors 	<ul style="list-style-type: none"> - Inspect the quality of subcontractors construction works frequently - Undertake pre-project planning - Do nothing 	<ul style="list-style-type: none"> - Select skilled worker teams
14	Design changes	<ul style="list-style-type: none"> - Make every effort to fully understand the client's wants and needs - Carry out comprehensive investigation of site conditions - Articulate the clients' needs in a technically competent way and within the limitation of the clients' resource - Give advices for clients to minimize changes at the instigation and if variations are unavoidable, they should inform designers of any changes in time - Notice the designer to visit the site during the design phase to reduce the changes - Adopt Design & Build option which enables contractor to design in harmony with site conditions thus minimizing design/drawing disputes - Arrange and undertake comprehensive site investigation before construction phase - Organize for appraisal/vetting of drawings and design criteria by at least one 	<ul style="list-style-type: none"> - Introduce adjustment clauses in contract to review plan and constructability - Specify construction extension clause in contract 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event - Undertake pre-project planning to minimize design errors - Do nothing 	

No	PROJECTS RISK FACTOR	RISK RESPONSE PLAN			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
		independent engineering/architect consultant			
15	Errors in design drawings	<ul style="list-style-type: none"> - Notice the designer to visit the site during the design phase to reduce the changes - Evaluate and verify design drawings carefully to minimize the errors 	<ul style="list-style-type: none"> - Get design liability insurance - Introduce adjustment clauses in contract to review plan and constructability - Specify construction extension clause in contract 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event - Undertake pre-project planning to minimize design errors - Do nothing 	
16	Incomplete drawing and technical specification	<ul style="list-style-type: none"> - Notice the designer to visit the site during the design phase to reduce the changes - Evaluate and verify design drawings carefully to minimize the errors 	<ul style="list-style-type: none"> - Introduce adjustment clauses in contract to review plan and constructability - Specify construction extension clause in contract 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event - Undertake pre-project planning to minimize design errors 	
17	Disagree some conditions of contract	<ul style="list-style-type: none"> - Limit and avoid disputes with the parties involved in the project - Make the contract that company takes less risk or get more benefit - Try to revise contract more than one times to make sure to have the best contract - Notice immediately if there is any ambiguity (vague) about conditions of the contract 	<ul style="list-style-type: none"> - Establish arbitration in contract agreement to solve disputes among the parties - Conflict resolution clause in contract and specify construction extension clause in contract if client causes the delay 	<ul style="list-style-type: none"> - Consider carefully terms of contract before signing - Do nothing 	Stop business
18	Incomplete contract terms	<ul style="list-style-type: none"> - Make the contract that company takes less risk or get more benefit - Try to revise contract more than one times to make sure to have the best contract 	<ul style="list-style-type: none"> - Establish arbitration in contract agreement to solve disputes among the parties - Conflict resolution clause in contract and specify construction extension clause in contract if client causes the delay - Hire experience consultant for editing contract 	<ul style="list-style-type: none"> - Consider carefully terms of contract before signing - Do nothing 	

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
1	Import restriction	<ul style="list-style-type: none"> - Use the local raw materials - Improve ability to manage raw materials imported for the construction project 	<ul style="list-style-type: none"> - Sign the contract with the supplier about the insurance agreement. 	<ul style="list-style-type: none"> - Add contingency fund for problems of material import - Establish replacement local material - Do nothing (realized risk existence, but not take any action) 	
2	Lack of enforcement of legal judgment	<ul style="list-style-type: none"> - Provide strategies and appropriate measures to enforcement of legal judgment - Undertake the work plan in accordance with current legal judgment 	<ul style="list-style-type: none"> - Hire a lawyer consultant for law and legal 	<ul style="list-style-type: none"> - Develop the contingency plan to deal with risk event - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Reduce investment
3	Loss due to insufficient law for joint ventures	<ul style="list-style-type: none"> - Undertake the work plan in accordance with current joint venture law 	<ul style="list-style-type: none"> - Hire a lawyer consultant for law and legal 	<ul style="list-style-type: none"> - Develop the contingency plan to deal with risk event - Do nothing (realized risk existence, but not take any action) 	
4	Changes of government policies	<ul style="list-style-type: none"> - Provide strategies and appropriate measures to decrease impact changes of government policies 	<ul style="list-style-type: none"> - Joint venture with reputable local contractors - Keep good relationship with government officials, and local agencies 	<ul style="list-style-type: none"> - Absorb the risk from the government policy because we cannot change it by ourselves - Add contingency fund or special condition for changes in government policy - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Stop business - Reduce investment
5	Loss incurred due to political	<ul style="list-style-type: none"> - Consider clearly the policy changes of government's political 	<ul style="list-style-type: none"> - Insurance for losses caused by policy changes 	<ul style="list-style-type: none"> - Add contingency fund or special condition for changes in 	

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
	changes	<ul style="list-style-type: none"> - Negotiate to share the loss between client and contractors - Appeal the support of foreign embassies and loan bank (ADB) to foreign contractors 	<ul style="list-style-type: none"> - Use FIDIC international contract - Joint venture with public partner 	<ul style="list-style-type: none"> political changes - Do nothing (realized risk existence, but not take any action) 	
6	Security problems	<ul style="list-style-type: none"> - Request the support of local authorities (police) increasing patrols to ensure security in site - Require site security guard of subcontractors - Install surveillance cameras for security control 	<ul style="list-style-type: none"> - Employ efficient security guards at the construction site - Insurance for equipment, machinery, construction materials in construction site 	<ul style="list-style-type: none"> - Do nothing (realized risk existence, but not take any action) - Add contingency fund for security problems 	
7	Language barrier	<ul style="list-style-type: none"> - Hire more interpreters to direct communicate the labors with mother tongue, or recruitment, training existing staff to use the foreign language (at least English) more efficient - Recruit local staff with bilingual ability - Hire local staff by foreign contractors to work together with local companies 	<ul style="list-style-type: none"> - Contract should be translated to into two copies in English and Vietnamese (with equal validity) 		
8	Different social, culture, and religious	<ul style="list-style-type: none"> - Apply long-term strategic partnership - Make a good relationship with partners - All of the agreement should be evidenced in writing - Study to understand clearly each other's cultural differences 		<ul style="list-style-type: none"> - Train employees, especially managers about different cultural and religious practices (Foreign contractors and local contractors) (investing in staff education) - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Employ unbiased and experienced staff

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
9	Loss incurred due to corruption and bribery	<ul style="list-style-type: none"> - Select prestigious partners (state-owned companies) - Carry out all procedures, prepare complete dossier as required, to minimize corruption and bribery of local officials - Maintain good relationships with local officials, and agencies 	<ul style="list-style-type: none"> - Sign the contract with an organization good relationship with local official to undertake the approvals procedures (Thuê một tổ chức có mối quan hệ tốt với địa phương phụ trách các công việc liên quan đến approvals) 		<ul style="list-style-type: none"> - Reduce investment
10	Loss due to bureaucracy for late approvals	<ul style="list-style-type: none"> - Maintain a close relationship with government officers - Minimize the bureaucracy and the procedures for approvals by government 	<ul style="list-style-type: none"> - Joint venture with reputable local contractors 	<ul style="list-style-type: none"> - Add contingency fund for delay of late approvals - Prepare appropriate planning policies to be less affected by late approvals - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Stop business - Reduce investment
11	Worker strike	<ul style="list-style-type: none"> - Raise the living standard and salary for workers - Provide superior policies for workers 	<ul style="list-style-type: none"> - Sign the contract with subcontractors that have good support and high-quality workers 	<ul style="list-style-type: none"> - Provide reasonable salary, additional policies to support workers - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Stop cooperate with subcontractors - Reduce business
12	Economy fluctuation	<ul style="list-style-type: none"> - Request payments in hard currency in countries with unstable economic conditions 	<ul style="list-style-type: none"> - Insurance - Ensure that the project's clients have assurance of financial - Obtain payment bonds and performance bonds from banks - Specify extension of time clause in contract - Specify extension or compensation clauses in contract for payment 	<ul style="list-style-type: none"> - Put the cost provisions for economy fluctuation in construction costs 	<ul style="list-style-type: none"> - Suspend temporary business - Stop business

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
13	Exchange rate	<ul style="list-style-type: none"> - Use dual-currency contracts with certain portion to be paid in local currency and others in foreign currency - Obtain local government guarantees of exchange rate and convertibility (i.e. fixed rate for long period or less fluctuation) - Request payments in hard currency in countries with unstable economic conditions 	<ul style="list-style-type: none"> - Specify compensation clauses for exchange rate - Ensure that the project's clients have assurance of financial - Obtain payment bonds and performance bonds from banks - Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap) - Specify extension or compensation clauses in contract for payment 	<ul style="list-style-type: none"> - Put the cost provisions of inflation in construction costs - Control construction cost strictly, improve management process - Revise portfolio of client, list of projects (contractors) and then transfer projects or restructure capital - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Suspend temporary business
14	Inflation	<ul style="list-style-type: none"> - Secure standby cash flow in advance - Choose the potential cooperation partner - Ensure that the project's clients have assurance of financial - Sign pre-defined prices with subcontractors/suppliers - Use local product and labor to reduce the impact of inflation 	<ul style="list-style-type: none"> - Make a contract clearly for this problems (transfer or share) - Specify escalation clauses for interest rate in contract - Obtain payment bonds (contractor) and performance bonds (Client) from surety (bank) - Ensure that the project's clients have assurance of financial - Obtain payment bonds and performance bonds from banks - Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap) - Specify extension or compensation clauses in contract for payment - Specify a reimbursement clause in contract to mitigate loss from inflation 	<ul style="list-style-type: none"> - Put the cost provisions of exchange rate in construction costs - Revise portfolio of client, list of projects (contractors) and then transfer projects or restructure capital - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Suspend temporary business - Stop business

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
15	Loss due to fluctuation of interest rate	<ul style="list-style-type: none"> - Secure standby cash flow in advance - Specify escalation clauses for interest rate in contract - Ensure that the project's clients have assurance of financial - Sign pre-defined prices with subcontractors/suppliers 	<ul style="list-style-type: none"> - Specify extension or compensation clauses in contract for payment - Ensure that the project's clients have assurance of financial - Obtain payment bonds and performance bonds from banks - Establish payment alternatives for payment in ICJV contract (i.e. land development rights, resource swap) - Specify extension or compensation clauses in contract for payment - Specify a reimbursement clause in contract to mitigate loss from interest rate changes - Sign the fixed price with the subcontractors/suppliers 	<ul style="list-style-type: none"> - Prepare the contingency funds for fluctuation of interest rate in construction costs - Reserve the financial sources - Control careful costs, and improve quality of management process - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Suspend temporary business - Stop business
16	Environmental pollution	<ul style="list-style-type: none"> - Sign a subcontract with specialist companies to control pollution - Comply with laws, regulations of international and local environment - Establish measures to strictly control pollution of construction site - Include disclaimer clause for present pollution problems in contract 	<ul style="list-style-type: none"> - Specify extension of time clause in contract 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event (the schedule for raining, flood, ...) - Do nothing (realized risk existence, but not take any action) 	<ul style="list-style-type: none"> - Reduce investment - Stop business

No	EXTERNAL RISK FACTOR	Risk response plan			
		MITIGATION	TRANSFER	RETENTION	AVOIDANCE
17	Force majeure (rain, flood, earthquake, etc)	<ul style="list-style-type: none"> - Develop clearly policy in agreement to limit the impact of risks in the implementation of projects (clients and contractors) 	<ul style="list-style-type: none"> - Sign a contract between clients and contractors with specified terms and particular conditions to share force majeure risks - Insurance - Extension of time clause 	<ul style="list-style-type: none"> - Develop the contingency plan to support this risk event (the schedule for raining, flood, ...) - Specify some policy for disaster planning, claims management, litigation management - Collect statistical data of climates in the past - Prepare appropriate construction measures to adverse weather such as heavy rain, strong wind, flood, storms and earthquakes - Do nothing (realized risk existence, but not take any action) 	

BIOGRAPHY

Do Tien Sy was born on Oct 01, 1985 in Ha Tay, a large province in Vietnam. He finished his elementary education in Le Hong Phong High school in Hochiminh. Then he continued to study Civil Engineering in Hochiminh City University of Technology (HCMUT), Hochiminh, Vietnam. His undergraduate research focused on Structural Engineering, in the area of high-rise building design. In April 2008, he finished his bachelor's degree and was accepted to become an assistant lecturer in HCMUT. Then, he got a scholarship from AUN/Seed-net/JICA to continue his study in the Master of Engineering program in Department of Civil Engineering, Faculty of Engineering, Chulalongkorn, Bangkok, Thailand.