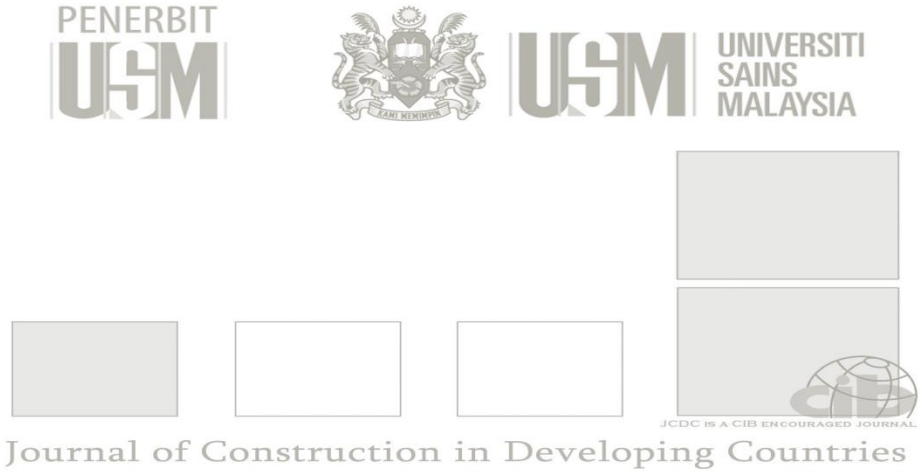

Manuscript Title	The Impact of External Risks on International Construction Project Success: Evidence from Commonwealth Caribbean Islands
Authors	Hernan Albeiro Parra, Alexander Zuñiga-Collazos and Luis Fernando Cruz-Caicedo
Submitted Date	17-Jul-2021 (1st Submission)
Accepted Date	15-Dec-2021
DOI	https://doi.org/10.21315/jcdc-07-21-0106

Impact of External Risks on International Construction Projects Success: Evidence from Commonwealth Caribbean Islands

Hernan Albeiro Parra[1], Alexander Zuñiga-Collazos[2] and Luis Fernando Cruz-Caicedo[3]

[1]Economics Sciences Faculty, Universidad de San Buenaventura, Cali, Valle 760008, Colombia (corresponding author). ORCID: 1. Email: hernanalbeiro@gmail.com.

[2]Economics Sciences Faculty, Universidad de San Buenaventura, Cali, Valle 760008, Colombia. ORCID: https://orcid.org/0000-0002-0337-6113. Email: azuniga01@usbcali.edu.co.

[3]Economics Sciences Faculty, Universidad de San Buenaventura, Cali, Valle 760008, Colombia. ORCID: https://orcid.org/0000-0001-6506-0651. Email: lfcruz@usbcali.edu.co.

Impact of External Risks on International Construction Projects Success: Evidence from Commonwealth Caribbean Islands

ABSTRACT

Because risks on international construction show region to region variation, the present study investigates the impact of external risks on international construction project (ICP) success and the relationships between them, from the perspective of construction professionals working in the Commonwealth Caribbean Island (CCI) states. After a literature review, a survey questionnaire was designed with the input of a small group of experts. An instrument was tested and then sent to construction professionals working in the CCI. Seventy valid surveys collected were processed using the structural equation model (SEM). The results suggest CCI be an attractive region for construction enterprises looking into developing countries because they do not support a direct impact of external risks on project success, contrary to findings in other studies on developing regions. The SEM confirmed that global risks influence economic risks, economic risks influence legal risks, and economic risks influence social risks in this region. Results obtained help address a knowledge gap for ICP risks for the Caribbean region. The study will help firms and professionals looking to venture into the CCI, or other regions with similar characteristics, to create their risk management plan.

KEYWORDS

Construction project success, Commonwealth Caribbean, international construction, risk management, SEM.

INTRODUCTION

International markets provide newer opportunities for organisations with expansion plans, even when doing business in foreign countries is considered riskier than doing business in domestic projects (Han and Diekmann, 2001; Liu, Zhao and Yan, 2016; Deng et al., 2018; Chang et al., 2019; Viswanathan and Jha, 2020). International contractors deal with more complex, diverse, and uncontrollable political, economic, and cultural risks (Liu, Low and Zhang, 2018) but project managers frequently rely on their intuition or experience to tackle these risks (Dandage, Mantha and Rane, 2018). Yet, intuition may not work so well when moving into a different region because of the new unknown risks; international construction projects (ICPs) have more complications and uncertainties than domestic projects (Al-Sabah, Menassa and Hanna, 2014), mainly on external risks (Zhi, 1995), which were found relevant to most of the previous studies (Chua, Wang and Tan, 2003; Eybpoosh, Dikmen and Birgonul, 2011; Al-Sabah, Menassa and Hanna, 2014; Chang et al., 2018). Consequently, a source of information about ICP risks and how external risks behave in a new market is important due to the lack of experience therein.

Risk identification, the first step in risk management, is essential for developing a suitable risk response strategy (Lee et al., 2017; Siraj and Fayek, 2019; Viswanathan and Jha, 2020). After risk identification, the risk management process continues with effects' assessment, and the development of risk management strategies (Wang, Dulaimi and Aguria, 2004; Eybpoosh, Dikmen and Birgonul, 2011; Wang et al., 2016; Dandage, Mantha and Rane, 2019). Zhi (1995) reported that the risk management process should also include risks classification into groups with certain criteria to clarify their relationships. Therefore, a classification of external risks has been proposed here to determine the relationship between them.

Existing non-regional studies have different findings. For example, Wang et al. (2004) and Chang et al. (2018) reported that external factors like host-country risks are more critical than internal risks; Eybpoosh, Dikmen and Birgonul (2011) concluded that contractor-specific vulnerabilities have more effect on the project over costs than adverse economic, political, legal, social, and market conditions. Regional studies are even more diverse in their finding as described further in the background section and even on studies conducted in the same country, such as in China. Zhi (1995) also found that the four biggest impact factors were high inflation, bureaucracy, low social security, and corruption; however, Chua, Wang and Tan (2003) and Zhang (2011) considered these factors irrelevant.

The Commonwealth Caribbean Islands (CCI) are a group of developing countries on the Caribbean Sea in North and Latin America, characterised by positive economic growth (BCQS International, 2019) and political stability (Sutton, 1999). So

far, only McIntosh and McCabe (2003) have specifically studied the risks of ICP in the CCI for international construction joint ventures (ICJVs), using a qualitative approach. Given the immense importance of the tourism industry for this region, local governments offer investors incentives for the construction of new hospitality projects and luxury residencies.

Using a quantitative approach, the present study investigates the impact of external risks on ICP success and the relationships between them in the CCI. The study might help international enterprises and construction professionals to benefit from the CCI market opportunities. Thus, a survey designed from the literature review and the inputs from construction professionals with >10 years of experience in the region was sent to construction professionals working in the region. Then, data collected from 70 out of the total 71 surveys were processed using a structural equation model (SEM). Even when 70 samples could be considered inadequate, small homogeneous samples may produce accurate predictions (Guo and Hussey, 2004). To process the collected data, IBM statistical package for the social sciences (IBM SPSS Statistics version 24), and EQS version 6.3, an SEM program were used. The SEM was chosen because it seeks to explain the relationships among multiple variables (Hair et al., 2014: 546), it has superior results compared with other multivariate analysis methods (Chang et al., 2018), and is the most frequently used method in quantitative studies on ICP risks (Chang et al., 2019; Chang et al., 2018; Eybpoosh, Dikmen and Birgonul, 2011; Liu, Zhao and Yan, 2016; Ozorhon et al., 2007; Viswanathan, Tripathi and Jha, 2019). The

findings are then explained in the discussion section and finally, the conclusions and limitations sections summarise the findings and recommend further research guidelines.

BACKGROUND

Risk definitions vary based on the context and industry in which they are used (Siraj and Fayek, 2019). For example, the Project Management Institute (PMI) defines risk as an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives (PMI, 2017: 720). In the construction sector, the risk is commonly defined as the probability of the occurrence of a negative event (Viswanathan and Jha, 2020) or the likelihood of the occurrence of an event/factor or a combination of events/factors to detriment of the project's success (Wang, Dulaimi and Aguria, 2004; Husin et al., 2018).

Project performance or project success is determined using indicators such as if the projects were within budget, schedule, and quality, which result in client satisfaction (Ozorhon et al., 2007). Risks are inherent in construction projects and adversely influence project performance criteria such as cost and schedule (Wang et al., 2016; Viswanathan and Jha, 2020; El-Sayegh et al., 2021), and scope creep (Dandage, Mantha and Rane, 2018).

Risk Management in ICPs

An ICP is a project performed by a construction firm outside its country of residence (Dandage, Mantha and Rane, 2019; Viswanathan and Jha, 2020), frequently to take

advantage of economic growth in another country (Al-Sabah, Menassa and Hanna, 2014). ICPs have a high level of risk because of the differences in construction practices, working conditions, cultures, and political, legal, social, and economic conditions between the home and host countries (Jha and Devaya, 2008; Lee et al., 2017; Utama et al., 2018). Risks also arise from regional conditions like cultural divergences, currency devaluation, exchange restrictions, and unstable laws or regulations (Han and Diekmann, 2001). To evade the higher-level risk exposure of ICPs, an appropriate risk management process is needed to meet the project success criteria (Viswanathan, Tripathi and Jha, 2019). A structured and detailed risk identification provides the basis for risk management effectiveness (Siraj and Fayek, 2019).

Risk Classification

Prior studies have adopted different approaches in classifying risks, both in the classification titles and in the assignment of risks to a specific group. Nevertheless, there is a tendency to classify them as either external or internal risks (Zhi, 1995; El-Sayegh, 2008; Al-Sabah, Menassa and Hanna, 2014; Chang et al., 2019). Some authors group them by country, market, and project level (Isa, Saman and Nasir, 2014; Liu, Zhao and Yan, 2016; Wang et al., 2016; Viswanathan, Tripathi and Jha, 2019). Few others have not done any risk classification at all (Jha and Devaya, 2008; Abdul-Rahman, Loo and Wang, 2011; Zhang, 2011). A few studies have termed all external risks "political risks" (Xiaopeng and Pheng, 2012; Chang et al., 2018; Deng et al., 2018).

Several studies have classified the ICP risks as political, economic, and legal, using those three alone or combined with other groups (Han and Diekmann, 2001; McIntosh and McCabe, 2003; Ling and Hoang, 2010; Lee et al., 2017; Dandage, Mantha and Rane, 2018; Dandage, Mantha and Rane, 2019).

Regional Studies

Region-wise, Asia has remained the focus of existing ICP risk studies. The nature and complexity of the international business environment are unique from one country to another (Isa, Saman and Nasir, 2014) and such risk differences between different countries are evidenced by Chua, Wang and Tan (2003) who documented significant differences between China and Singapore risk impacts. Chua, Wang and Tan (2003) investigated cost growth factors and concluded that while factors being studied were critical-to-extremely critical in China, those same factors were non- or low-critical in Singapore. Applying an SEM to data collected from 104 Chinese contractors with experience in ICPs, Liu, Zhao and Yan (2016) found that government-related risks have a significant influence on the project's costs and can also trigger economic and legal risks. Chang et al. (2018) , in a case study of Chinese construction enterprises, applied an SEM to 264 valid responses received from practitioners working around the world, and found that seven out of eight political risk factors or external risks have a directly negative effect on risk consequences and three have an indirect negative effect. Later, using confirmatory factor analysis (CFA), Chang et al. (2019) found political risks, contractual and legal risks, cultural risks, and financial and economic risks as the highest priority risk categories.

In India, Jha and Devaya (2008) determined that the most influential risk factors are political instability, poor government responsiveness, a weak legal system, *force majeure,* and an ambiguously defined project scope. Focusing on political, economic, and legal risks, Ling and Hoang (2010) investigated the risks faced by foreign firms when undertaking construction projects in Vietnam. The high impact of political risks is a common characteristic in both India and Vietnam (Jha and Devaya, 2008; Ling and Hoang, 2010). Using information from multinational Indian companies working around the world, Viswanathan and Jha (2020) reported that political-specific risk factors were comparatively less critical for Indian firms in ICPs. Viswanathan and Jha (2020) suggested that their results were contrary to other findings, predominantly because Indian firms prefer the least risky markets when venturing into ICPs. Similar results were obtained by Isa, Saman and Preece (2015) who tested the relationship between the country, market, project, and firm factors with project performance. Findings of these authors supported the relationship between firm factors and performance, but the other factors were not supported. Using Malaysian firms with experience in ICPs, Isa, Saman and Nasir (2014) observed that the five highest loaded factors were intensity of competition, the existence of strict quality requirements, proximity to competitors, and host country and company's international competitiveness.

El-Sayegh (2008) revealed that economic risks such as inflation and sudden changes in prices, shortages in materials and labour supply are significant for the Arabian Gulf Region (AGR), specifically the United Arab Emirates (UAE), but political,

social, and cultural risks have little significance in the UAE construction industry. Later, Abdul-Rahman et al. (2011) collected data from Malaysian firms working in the AGR, and their top five risk factors were delayed on non-receipt of payment, design changes, project delays, material or labour availability, and rushed design. Supporting results of El-Sayegh (2008), Abdul-Rahman et al. (2011) found a low significance of political risks for the AGR. More recently, using a quantitative method with 81 surveys in the AGR, Al-Sabah, Menassa and Hann (2014) concluded that war threat, political instability, price inflation, resource availability and quality, authorities and regulation requirements, and inclement climate are the external risks with the most significant impact on the performance metrics used. The differences may be explained because while El-Sayegh (2008) research focused on the UAE, and Abdul-Rahman, Loo and Wang (2011) responders were from the Kingdom of Saudi Arabia, the UAE, and Qatar; Al-Sabah, Menassa and Hann (2014) additionally covered the Republic of Iraq, the State of Kuwait, the Kingdom of Bahrain, the Sultanate of Oman, and the Republic of Yemen.

In the Caribbean region, more specifically the English-speaking Caribbean, McIntosh and McCabe (2003) investigated the risks of ICJVs established between local companies from English-speaking Caribbean countries and foreign firms in the US and Canada. McIntosh and McCabe (2003) sent questionnaires to 182 professionals working for either the local or the foreign parties of the ICJV. From the 182 professionals who were sent questionnaires, 147 expressed their intent to participate, but only 48 returned the questionnaires, negatively impacted by the questionnaire's length. The

three highest-ranked risks suggested by McIntosh and McCabe (2003) were loss because of bureaucracy for late approvals, project delays, and client's cash flow problems.

Commonwealth Caribbean Islands

The CCI are English-speaking islands with British influence and enjoy some advantages that make them attractive for international contractors. These benefits include steady economic growth, government incentives for investors, low-qualified local competition, and political stability. Before the 2009 financial crisis, between 2000 and 2006, the Caribbean economies' average gross domestic product (GDP) growth was 3.5%, in 2009 was -3.0%, and recovered to 1.4% in 2015 (International Monetary Fund 2016; Drinkwater et al. 2018). Recently, as described by BCQS International (2019), the World Bank reported real GDP growth of 3.5% for 2018 and projected growth rate for 2019 and 2020 were 3.5% and 3.8%, respectively in the region. Like any other region, worldwide crises affect the Caribbean, but it can quickly recover and get back to historical growth levels. Worried about the local construction industry, the Council of Caribbean Engineering Organizations (CCEO) commissioned a report on the Caribbean Community (CARICOM) construction industry (CCEO, 2002). In this report, the CCEO identified regional competitiveness problems like poor qualifications of local contractors when bidding on large projects, low availability of local skilled and experienced staff, and limited access to financial and insurance by local companies. Also, Drinkwater et al. (2018) concluded that an inadequately educated workforce

and lack of access to finance are the two most severe obstacles to Caribbean enterprise development. International contractors usually bring experienced staff on board to compensate for the low availability of a local skilled workforce.

There has been a significant increase in the number of construction companies entering the CCI construction market, with a great influence from US and Canadian firms because of their geographic proximity (McIntosh and McCabe, 2003), from the UK because of their colony bounds, and from China and a few middle east firms because of their financial capabilities. Focusing on English-speaking Caribbean Islands with British influence, 15 countries included in this study are listed below:

First, the six countries in the Caribbean that are still part of the UK are Anguilla, Bermuda, British Virgin Islands (BVI), Cayman Islands, Monserrat, and Turks and Caicos; then, the nine independent territories are Antigua and Barbuda, Barbados, Dominica, Grenada, St. Kitts and Nevis, St. Vincent and the Grenadines, St. Lucia, Trinidad and Tobago, and the Bahamas (Worldatlas, 2018). Jamaica, with about 3 million people, is excluded from the study because of the different context associated with its violent crime, drug trafficking, and poverty statistics (Worldatlas, 2018), making Jamaica a potential separate study subject. The Caribbean countries with different European influences, such as the Netherlands and France, are also not included in this study because of their different cultures, languages, and legislative systems. Sutton (1999) called the Commonwealth Caribbean the English-speaking Caribbean countries and affirmed that within developing countries, the Caribbean's reputation has been as the

most democratic region, especially the Commonwealth Caribbean countries, which have decisively moved toward democracy since the 1930s.

HYPOTHESES

From the literature review, and the collaboration of four construction experts with >15 years of rich experience in ICPs in the CCI, risks that are representative of the region were selected (**Error! Reference source not found.**). The following are the hypotheses proposed, as graphically shown in **Error! Reference source not found.**.

Risk Category	Risks in the Caribbean Countries with British Influence	References
Economic	Low availability of construction equipment (E1)	Al-Sabah, Menassa and Hanna (2014), El-Sayegh (2008), Eybpoosh, Dikmen and Birgonul (2011), Liu, Zhao and Yan (2016), Siraj and Fayek (2019), Zhi (1995).
	Low availability of construction materials (E2)	Al-Sabah et al. (2014), El-Sayegh (2008), Eybpoosh, Dikmen and Birgonul (2011), Liu, Zhao and Yan (2016), Siraj and Fayek (2019), Viswanathan, Tripathi and Jha (2019), Zhi (1995).
	Lack of infrastructure (E3)	Eybpoosh, Dikmen and Birgonul (2011), Liu, Zhao and Yan (2016), Siraj and Fayek (2019).
Legal	Inadequate legal framework (L1)	Al-Sabah, Menassa and Hanna (2014), Chang et al. (2018), Chua, Wang and Tan (2003), Eybpoosh, Dikmen and Birgonul (2011), Jha and Devaya (2008), Ling and Hoang (2010), Liu, Zhao and Yan (2016), McIntosh and McCabe (2003), Ozorhon et al. (2007), Siraj and Fayek (2019), Viswanathan, Tripathi and Jha (2019), Wang et al. (2004), Xiaopeng and Pheng (2012), Zhang (2011), Zhi (1995).
	Restriction on repatriation of funds (L2)	Chua, Wang and Tan (2003), Ling and Hoang (2010), Liu, Zhao and Yan (2016).
	Restrictions for foreign companies (L3)	Chang et al. (2018), Chua, Wang and Tan (2003), Eybpoosh, Dikmen and Birgonul (2011), Siraj and Fayek (2019), Wang et al. (2004), Zhang (2011).
Social	Low availability of qualified local labour or subcontractors (S1)	Abdul-Rahman et al. (2011), Al-Sabah, Menassa and Hanna (2014), Eybpoosh, Dikmen and Birgonul (2011), Liu, Zhao and Yan (2016), Siraj and Fayek (2019).
	Hostility to foreigners (S2)	Chang et al. (2018), Liu, Zhao and Yan (2016), Xiaopeng and Pheng (2012).
	Public opposition to projects (S3)	Chang et al. (2019), Liu, Zhao and Yan (2016), Siraj and Fayek (2019), Xiaopeng and Pheng (2012).
Global	External conflicts (G1)	Chang et al. (2018), Eybpoosh, Dikmen and Birgonul (2011)
	External interferences (G2)	Chang et al. (2018), Chang et al. (2019),
	Imported materials price fluctuation (G3)	Abdul-Rahman et al. (2011), Chua, Wang and Tan (2003), Ling and Hoang (2010), Liu, Zhao and Yan (2016), Siraj and Fayek (2019).

Table 1. ICP risks and their references

Host Country's Economic-related Risks Impact ICP Success (H1).

Economic risks frequently translate into financial impacts on the projects (Ling and Hoang, 2010). The financial and economic risk category is one of the most significant risk categories in ICPs (Dandage, Mantha and Rane, 2019). Using two analyses, Al-Sabah, Menassa and Hann (2014) ranked the economic risk category first among all external risk categories. Of the factors listed in those studies, the only one with a potential impact on the Caribbean region is resources availability. For the relationship of economic risks, three factors from Liu, Zhao and Yan (2016) were selected. Two of them related to host-country availability of resources and one to host-country infrastructure.

Legal Risks Impact ICP Success (H2)

A few authors have analysed legal ICP risks. For instance, Chang et al. (2018) listed weak enforcement mechanisms, policy uncertainty, the unfairness of the judicial process, price controls, and speediness of judicial process in their legal group. Similarly, Ling and Hoang (2010) and Liu, Zhao and Yan (2016) listed inadequate legal framework and ineffective legal system, and Liu added changes in law regulations and fairness of construction laws and regulations. Inadequate legal framework and restriction on repatriation of funds Liu, Zhao and Yan (2016) factors are used to analyse legal risks, as well as one factor from Eybpoosh, Dikmen and Birgonul (2011), restriction to foreign companies. Changes in regulations ranked seventh in the CCI (McIntosh and McCabe, 2003).

Social Risks Impact ICP Project Success (H3)

Within the cultural part of social risks, Wang et al. (2004) discussed the differences in work culture, values, education level, racial prejudice, among others, between foreign and local partners. Social risks and their consequences in ICPs were also evaluated by Chang et al. (2018) who demonstrated social risks have a direct negative impact on the project results. The language barrier, differences in religious or cultural tradition, security and crime issues are the risks listed by Liu, Zhao and Yan (2016) within social risk groups. Social risk factors are striking in the actual Chinese construction market, showing that local protectionism for local projects is considered the most critical factor (Zhang, 2011). The hypothesis is then presented based on Liu, Zhao and Yan (2016) and Chang et al. (2018) factors.

Global Risks Impact ICP Success (H4).

International contractors should pay close attention to the changes in the international situation and adjust their operations, strategies, and project plans (Chang et al., 2018). Liu, Zhao and Yan (2016) determined that host government-related risks affect project cost performance indirectly through resource price fluctuation. The relationships between global risks, also described as "international risks" in other articles, are analysed through two constructors from Chang et al. (2018), external conflicts and external interferences, and one constructor from Liu, Zhao and Yan (2016) added risk of "imported" to "material price fluctuation" given the Caribbean local material limitation.

Host Country's Economic-related Risks Impact Legal Risks (H5).

Because of the British influence, most of the countries included have parliaments that create and modify laws and governments that make regulations, and in UK dependent ones, the local parliament creates the laws, and ultimately the governor appointed by the crown, approves them (Dina, 2018). Economics performance was identified as a critical political risk factor that had a positive effect on sociopolitical stability, legal and regulatory, and public safety, and adverse effect on risk consequences (Chang et al., 2018).

Global Risks Impact Economic Risks (H6).

Globalisation is creating dependencies between whatever happens internationally and what happens locally in countries, and the Caribbean region is no stranger to this situation. Local Caribbean governments should adjust their economic politics according to international markets, international regulations, and even foreign government influences. Chang et al. (2018) demonstrated a direct impact of the international environment on the local economic performance.

Economic Risks Impact Social Risks (H7).

Continuing with economic risks, Chang et al. (2018) demonstrated a direct impact of economic performance on public safety and Liu, Zhao and Yan (2016) demonstrated that host government-related risks impact social risks. The hypothesis is proposed in alignment with Liu, Zhao and Yan (2016) findings.

About the relationship between legal and social risks, neither Chang et al. (2019) nor Liu, Zhao and Yan (2016) correlate them. Furthermore, Dandage, Mantha and Rane al. (2019) defined contractual and legal-related risks compared with cultural risks as not affecting each other since they are unrelated. Based on those findings, no statement has been formulated about these relationships.

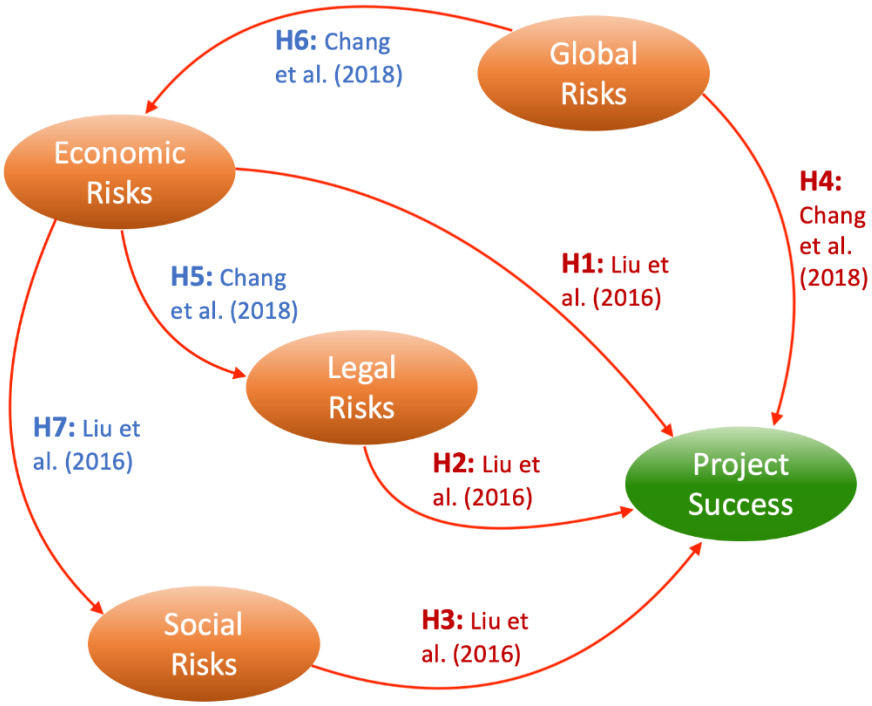

Figure 1. Hypotheses

Project Success Criteria

Regularly used project success criteria are time, cost, and scope. The current study used Joslin and Müller (2016) criteria as followed: Activities carried out as scheduled (A1), finished within budget (A2), and the project achieved its purpose (A3).

RESEARCH METHOD

The steps to identifying the risks and their impacts on what seems to be an unexplored region are as follows. First, a search for related studies conducted over the last two decades was conducted using keywords used in international construction industry risk. The literature review showed a list of prior studies that identified risks along

with their influence and other details were presented as shown in the background section. Second, with the help of four construction industry experts with experience in the CCI, risks with an impact on the region were selected. Third, a questionnaire design was tested with a pilot survey of academics and project management professionals. Fourth, 70 valid responses were collected from construction professionals with experience in the CCI region. Fifth, the collected data were processed using the EQS-SEM to validate the proposed model and the hypotheses presented. Sixth, the final draft elaborated with the analysis of the results and conclusions of the study. Steps are also shown in **Error! Reference source not found.**.

Data Collection

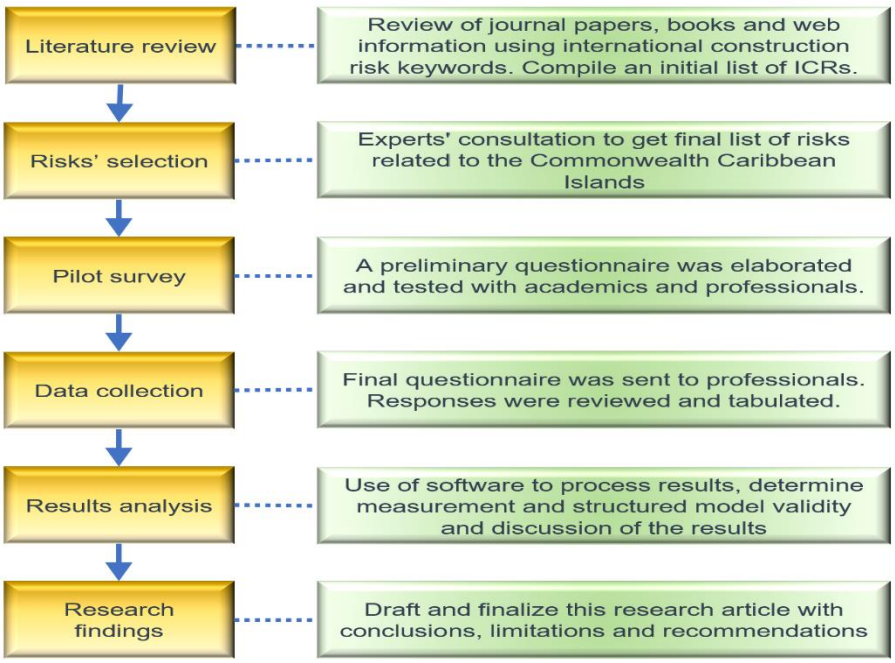

Figure 2. Research Method

A non-probability sample procedure was used, which has been recognised as appropriate when respondents are selected based on their disposition to participate in the study and not randomly selected from the population (Wilkins 2011 cited Liu, Zhao and Yan 2016). Because the objective of this study was to determine how ICP risks behave in a specific environment rather than inferring results to the global population, it is better to use a non-probability sample procedure (Guo and Hussey, 2004). From an online search using search engines and online phone books, 337 construction companies were found in the CCI, and only nine of them conducted business in more than one island. Four of the nine were designers/consultants. From overseas, eight contractors were identified doing projects in the CCI and four designers/consultants for 13 international enterprises identified in the region. The data collected for this empirical study came from surveys sent to one author's network, completed by overseas project directors, senior managers, project managers, engineers, and designers who have done at least one construction project in the last five years in one of the CCI. A PDF file or a link to the survey was sent to 67 professionals with the described profile, via e-mail, or social media. Using a snowball sampling approach to increase the sample size (Zhang, 2011), 44 of the 67 professionals responded to the survey and a few of these 44 referred the surveys to their own professionals' network, getting extra 28 responses, for a total of 71 surveys collected with 70 valid ones. The rejected answer came from a professional working out of the list of Caribbean countries studied. Even when the collected surveys may be considered too small for quantitative research, according to Guo and Hussey (2004),

small homogeneous samples generated by non-probability sampling may produce more accurate predictions. Also, some other prior ICP risk quantitative studies have been completed with a similar number of responses, like 68 completed questionnaires in Ozorhon et al. (2007) , 65 in El-Sayegh (2008), 81 completed questionnaires in (Al-Sabah, Menassa and Hanna, 2014). Even with 100 minimum sample size as recommended in Hair et al. (2014: 574), "No matter the modelling approach, the sample size must be sufficient to allow the model to run, but more importantly, it must adequately represent the population of interest" (Hair et al., 2014: 576). Given the small number of international enterprises in the CCI, the population of interest is adequately represented by 70 valid questionnaires.

The questionnaire had two main groups of questions. The first group of questions was used to collect the respondent characteristics with a mix of open and selection questions. The second group presented five blocks of statements assessing the economic risks, legal risks, social risks, global risks, and project success achieved. A 5-point Likert scale was used, where one (1) is considered to have no negative impact and five (5) is considered to have a high negative impact on the four first blocks (the risk-related ones) and, one (1) is not successful at all and five (5) is very successful, for the last block about project success.

Of the 70 valid respondents, 33 (47%) were originally from the US, 16 (23%) from the UK, and the remaining 30% from Argentina, Barbados, Belize, BVI, Canada, Cayman Islands, China, Colombia, India, Pakistan, Palestine, Saint Lucia, Spain, the Bahamas,

and Turkey. This demonstrated the large cultural variability of the people working in the Caribbean region. Even when having origins from different countries around the world, all the responders had experience with ICPs in the CCI and were asked to respond based on their Caribbean experience. **Error! Reference source not found.** shows some other characteristics of the respondents.

Years of Experience	No	%
<5 years	27	38%
5-10 years	21	30%
11-15 years	11	16%
>15 years	11	16%
Total	70	100%

Number of Projects	Total	%
1-3 projects	29	41%
4-6 projects	20	29%
7-9 projects	5	7%
> 10 projects	16	23%
Total	70	100%

Type of project	Total	%
Commercial	15	21%
Hospitality	42	61%
Public/Government Project	5	7%
Residential	8	11%
Total	70	100%

Role on the project worked on	Total	%
Design and Build contractor	1	1%
Designer or Engineer/Consultant	6	9%
General Contractor	28	40%
Owner representative/Developer	25	36%
Sub-Contractor	10	14%
Total	70	100%

Current Positions	Total	%
Architect/Engineer	12	18%
Commercial Manager	4	6%
Construction Manager	1	1%
Estimator	1	1%
Landscape Architect / M. Planner	1	1%
Owner	1	1%
Owners Rep	1	1%
Program Director	1	1%
Project Director	12	18%
Project Manager	27	39%
Section manager	4	6%
Senior Services Chief Engineer	1	1%
Superintendent	4	6%
Total	70	100%

Last country worked on	Total	%
Anguilla	10	14%
Bermuda	2	3%
British Virgin Islands	7	10%
Cayman Islands	13	19%
Dominica	4	6%
Grenada	1	1%
Saint Lucia	2	3%
St. Kitts and Nevis	13	18%
St. Vincent and the Grenadines	2	3%
The Bahamas	11	16%
Trinidad and Tobago	1	1%
Turks and Caicos	4	6%
Total	70	100%

Table 2. Respondent Characteristics

Measurement Model

Convergent validity is verified from the result of three statistics, the average variance-extracted (AVE), the construct reliability (CR), and the Cronbach's alpha score, as per the data shown in **Error! Reference source not found.** and detailed next.

An AVE of ≥ 0.5 suggests adequate scale convergence (Fornell and Larcker, 1981); results obtained are ≥ 0.60. CR results are > 0.8; CR values of ≥ 0.7 suggest good reliability (Fornell and Larcker, 1981) and between 0.6 and 0.7 may be acceptable (Hair et al., 2014: 619). For Cronbach's alpha, the scale is reliable with values > 0.70 (Nunnally and Bernstein, 1994); the results showed that some constructs obtained an alpha above the 0.70 mark and the others were close to it. However, Hair et al. (2014) suggest that Cronbach's alpha score may understate reliability. The AVE test can determine the divergent validity of the scale in the measurement of the constructs. Gefen and Straub (2005) argued a discriminant validity of the scale using the Confidence Interval Test (**Error! Reference source not found.**) and the AVE test (**Error! Reference source not found.**). Under Ullman (2001) proposal, a good measurement model fit is present with, a root-mean-square error of approximation (RMSEA) of 0.095, a comparative fit index (CFI) of 0.842, an incremental fit index (IFI) of 0.854, and a goodness-of-fit index (GFI) of 0.821. With a chi-square value of 129.5 with 80 degrees of freedom (DF), the normed chi-square is 1.62; a normed chi-square number < 2.0 is considered very good, and that between 2.0 and 5.0 is acceptable (Hair et al., 2014: 630).

Factor	Item	Stand. Loading	AVE	CR	Alpha
Economic risk (F1)	E1	0.898	0.753	0.898	0.749
	E2	0.738			
	E3	0.529			
Legal risk (F2)	L1	0.629	0.623	0.828	0.619
	L2	0.715			
	L3	0.475			
Social risk (F3)	S1	0.384	0.663	0.846	0.654

	S2	0.722			
	S3	0.749			
	G1	0.803			
Global risk (F4)	G2	0.772	0.747	0.898	0.772
	G3	0.646			
	A1	0.498			
Project success Achieved (F5)	A2	1,000	0.741	0.878	0.627
	A3	0.358			

Table 3. Measurement model

Factor	Coefficient of Correlation	Y	Inferior Limit	Superior Limit
F1, F2	0.288	0.107	0.074	0.502
F1, F3	0.126	0.063	0.000	0.252
F1, F4	0.267	0.103	0.061	0.473
F1, F5	-0.106	0.079	-0.264	0.052
F2, F3	0.126	0.059	0.008	0.244
F2, F4	0.400	0.108	0.184	0.616
F2, F5	-0.046	0.052	-0.150	0.058
F3, F4	0.164	0.068	0.028	0.300
F3, F5	-0.031	0.029	-0.089	0.027
F4, F5	-0.021	0.049	-0.119	0.077

Table 4. Confidence interval test

Correlation	Correlation estimate	Squared correlation estimate	Factor	AVE value
F1, F2	0.652	0.425	F1	0.753
F1, F3	0.346	0.120	F2	0.623
F1, F4	0.550	0.303	F3	0.663
F1, F5	-0.217	0.047	F4	0.747
F2, F3	0.205	0.042	F5	0.741
F2, F4	0.405	0.164		
F2, F5	-0.147	0.022		
F3, F4	0.260	0.068		
F3, F5	-0.100	0.010		
F4, F5	-0.083	0.007		

Table 5. Average variance extracted test

Structural Model

The structural model presented the following results: RMSEA =0.065, non-normed fit index (NNFI) =0.904, CFI =0.928, and IFI =0.934. The NNFI, CFI, and IFI presented values > 0.9 that represent an adequate model fit, according to Ullman (2001),. Also, Browne and Cudeck (1993) proposed that RMSEA values between 0.05 and 0.08 show an adequate model. A chi-square value of 100.8 with 78 DF is presented, resulting in an excellent normed chi-square of 1.29. Table 6 shows that three of the seven hypotheses

were supported. The supported hypotheses show a causal relationship beta (β) between 0.730 and 0.921, and a coefficient of determination (R2) between 0.533 and 0.848. The results are further discussed in the next section.

Hypotheses	Results	B	Significance	R2
H1	Non-Supported	-1.142	Non-significant	
H2	Non-Supported	0.196	Non-significant	0.226
H3	Non-Supported	0.089	Non-significant	
H4	Non-Supported	0.865	Non-significant	
H5	Supported	0.730	.000	0.533
H6	Supported	0.893	.000	0.797
H7	Supported	0.921	.000	0.848

Table 6. Structural model results

DISCUSSION OF THE RESULTS

Our results have some important contributions to the body of knowledge. First, the validation of a measurement model with only 70 samples confirms Hair et al. (2014) theory that not only the sample size should be sufficient for the model to run but the sample should also represent the population of interest.

The SEM confirmed the hypotheses related to the influences of each risk category, but contrary to many prior studies like Chang et al. (2018) and Liu, Zhao and Yan (2016) findings in China; Ling and Hoang (2010) in Vietnam; Al-Sabah, Menassa and Hanna (2014) in AGR; Dandage, Mantha and Rane (2019); and even some of McIntosh and McCabe (2003) findings in CCI. In these studies, a direct influence of external risks on project success was proven, though the results obtained in this study did not support a direct impact of external risks on the success of the project. So, that suggests that external risk in the CCI has an indirect influence on project success, a

finding supporting Mohamed (2003) and Ozorhon et al. (2007). El-Sayegh (2008) documented that political, social, and cultural risks have an insignificant impact on the UAE construction industry mainly because of the political and economic stability of the El-Sayegh (2008) studied countries. A direct impact of external risks on the CCI may not be supported because of the political and economic stability of the CCI region and because external risks in developing countries with economic and political stability may not have that much influence on project success.

With a beta value of 0.730, the hypothesis about the economic risks impact legal risks is confirmed in the CCI, same as in Chang et al. (2018), host-country economic risks affect the regulations of the country. With a 0.893 beta, the hypothesis about economic risks impact social risks is also confirmed in agreement with Liu, Zhao and Yan (2016) and Chang et al. (2018) findings such as poor economic performance can cause social unrest. Finally, with 0.921 as the higher beta value, the supported hypothesis about global risks having a direct influence on economic risks confirms that an unstable international environment can impact the economy in most countries (Chang et al., 2018). Global risks have high relevance on the CCI because they impact economic risks which impact both, legal and social risks categories. The main issue is that global risks are generally not mitigable but are still needed to be identified and included for budget or contracting phases and monitored during execution.

As the results previously shown in Table 3, within the economic risks, low availability of construction equipment (0.898) indicated not only the variable with the greatest influence for the group but also for all the risk variables, closely followed by low

availability of construction materials (0.738). For Liu, Zhao and Yan (2016) project cost is influenced by economic, social, and legal risks.

For legal risks, the most influential variable is the restriction on repatriation of funds (0.715) and the least influential is the restriction for foreign companies (0.475). For social risks, public opposition to projects (0.749) is the variable with the greatest weight, followed by hostility to foreigners (0.722). In addition to legal risks reported by Liu, Zhao and Yan (2016), an adverse country condition such as restrictions for foreign companies also have an impact (Eybpoosh, Dikmen and Birgonul, 2011)

Low availability of qualified local labour or subcontractors (0.384) was not only the lower of the social risks but also the lower of all risk factors, while hostility to foreigners (0.722) and public opposition to projects (0.749) were seen important risks. Similar factor loading on hostility to foreigners was obtained by Chang et al. (2018)

For global risk, the most influential component is the external conflicts (0.803) and the least the imported materials price fluctuation (0.646). For Liu, Zhao, and Yan (2016), resource price fluctuation increases the cost and for Chang et al. (2018), international environment factors like external conflicts and external interferences can destabilise the social safety of host countries and even economic depression.

CONCLUSIONS

There are significant differences in the results obtained in earlier studies, and those differences seem to be influenced by the regions or countries where the investigations

were made, macro-conditions when conducted, and including the responders or the methodology of the study.

In general, the existing literature suggests that external risks are more relevant in developing countries, yet a few studies including the present one suggest that when there is political and economic stability, the impact of external risks is less perceptible.

This contribution helps address a knowledge gap for ICP risks for the Caribbean region, and the findings may help international entrepreneurs to venture into the Caribbean region, or another region or country with similar characteristics. This study provides a better perspective of the impacts of external risks for them to create their specific risk management plan. The Caribbeans is a region attractive not only to foreign investors but also to professional talent globally, as shown in the responders' origin diversity.

A validity achieved for a structural model in this region opens opportunities for researchers to use either the model or the results on the CCI or in regions with similar characteristics. Further, empirical results obtained confirm that it is possible to use an SEM with a small amount of collected data when homogeneous non-probability samples are used. With the results obtained, further comparisons of the Caribbean region with other regions around the world might be useful.

LIMITATIONS AND FUTURE RESEARCH OPPORTUNITIES

Considering the Caribbean region, English-speaking Caribbean Islands are a limitation. A future study may either select Caribbean islands with different languages

or other territories around the globe with British influence to provide additional comparisons to determine how such differences affect the results. Because the hypotheses about the studied risks impacting the success of the projects could not be validated in this study, further investigations could include internal risk in addition to the external risk tested, or even evaluate different success constructs. It is also suggested to further explore risk mitigation measures and their influence on risk factors for the region.

Overall, the Caribbeans is a prosperous region with potential benefits to international construction enterprises and further studies in the region may attract more investors and professionals.

REFERENCES

Abdul-Rahman, H., Loo, S.C. and Wang, C. (2011). Risk identification and mitigation for architectural, engineering, and construction firms operating in the Gulf region. *Canadian Journal of Civil Engineering*, 39(1): 55-71. https://doi.org/10.1139/l11-111.

Al-Sabah, R., Menassa, C.C. and Hanna, A. (2014). Evaluating impact of construction risks in the Arabian Gulf Region from perspective of multinational architecture, engineering and construction firms. *Construction Management and Economics*, 32(4), 382-402. https://doi.org/10.1080/01446193.2014.884281.

BCQS International (2019). *Caribbean & Latin America Construction Market Trend Report*, [Online], Available: https://bcqs.com/wp-content/uploads/2019/09/bcqs-construction-market-report-2019.pdf, [22 January 2021].

Browne, M.W. and Cudeck, R. (1993). Alternate ways of assessing model fit. In Bollen, K.A. and Long, J.S. (eds.). *Testing structural equation models*, Newbury Park: Sage Focus Edition. https://doi.org/10.1177/0049124192021002005.

CCEO (2002). *CARICOM Construction & Installation Services Sector*, [Online], https://caricom.org/documents/10182-report_on_the_caricom_construction__installation_services_sector.pdf, [22 January 2021].

Chang, T., Deng, X., Hwang, B.-G. and Zhao, X. (2018). Political Risk Paths in International Construction Projects: Case Study from Chinese Construction

Enterprises. *Advances in Civil Engineering*, 2018. https://doi.org/10.1155/2018/6939828.

Chang, T., Deng, X., Hwang, B.-G. and Zhao, X. (2019). Improving Quantitative Assessment of Political Risk in International Construction Projects: The Case of Chinese Construction Companies. *Journal of Construction Engineering and Management*, 145(12), 04019083. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001738.

Chua, D.K.H., Wang, Y. and Tan, W.T. (2003). Impacts of obstacles in East Asian cross-border construction. *Journal of Construction Engineering and Management*, 129(2), 131-141. https://doi.org/10.1061/(ASCE)0733-9364(2003)129:2(131).

Dandage, R., Mantha, S.S. and Rane, S.B. (2018). Ranking the risk categories in international projects using the TOPSIS method. *International journal of managing projects in business*. https://doi.org/10.1108/IJMPB-06-2017-0070.

Dandage, R.V., Mantha, S.S. and Rane, S.B. (2019). Strategy development using TOWS matrix for international project risk management based on prioritization of risk categories. *International Journal of Managing Projects in Business*, 12(4), 1003-1029. https://doi.org/10.1108/IJMPB-07-2018-0128.

Deng, X., Low, S.P., Zhao, X. and Chang, T. (2018). Identifying micro variables contributing to political risks in international construction projects. *Engineering, construction and architectural management*. https://doi.org/10.1108/ECAM-02-2017-0042.

Dina, Y. (2018). *Update: Guide to Caribbean Law Research*, [Online], http://www.nyulawglobal.org/globalex/Caribbean1.html, [24 January 2021].

Drinkwater, S., Lashley, J. and Robinson, C. (2018). Barriers to enterprise development in the Caribbean. *Entrepreneurship & Regional Development*, 30(9-10), 942-963. https://doi.org/10.1080/08985626.2018.1515821.

El-Sayegh, S.M. (2008). Risk assessment and allocation in the UAE construction industry. *International journal of project management*, 26(4), 431-438. https://doi.org/10.1016/j.ijproman.2007.07.004.

El-Sayegh, S.M., Manjikian, S., Ibrahim, A., Abouelyousr, A. and Jabbour, R. (2021). Risk identification and assessment in sustainable construction projects in the UAE. *International Journal of Construction Management*, 21(4), 327-336. https://doi.org/10.1080/15623599.2018.1536963.

Eybpoosh, M., Dikmen, I. and Birgonul, M.T. (2011). Identification of risk paths in international construction projects using structural equation modeling. *Journal of Construction Engineering and Management*, 137(12), 1164-1175. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000382.

Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. https://doi.org/10.1177/002224378101800104.

Gefen, D. and Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information systems*, 16(1), 5.

Guo, S. and Hussey, D.L. (2004). Nonprobability Sampling in Social Work Research. *Journal of Social Service Research*, 30(3), 1-18. https://doi.org/10.1300/J079v30n03_01.

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2014). Structural Equations Modeling Overview. In *Multivariate Data Analysis*, 7th edition, Harlow: Pearson.

Han, S.H. and Diekmann, J.E. (2001). Approaches for making risk-based go/no-go decision for international projects. *Journal of construction engineering and management*, 127(4), 300-308. https://doi.org/10.1061/(ASCE)0733-9364(2001)127:4(300).

Husin, S., Abdullah, A., Riza, M. and Afifuddin, M. (2018). Risk assessment of resources factor in affecting project time. *Advances in Civil Engineering*. https://doi.org/10.1155/2018/6896141.

Isa, C.M.M., Saman, H.M. and Nasir, S.R.M. (2014). Specific-factors influencing market selection decision by Malaysian construction firms into international market. *Procedia-Social and Behavioral Sciences*, 129, 4-10. https://doi.org/10.1016/j.sbspro.2014.03.641.

Isa, C.M.M., Saman, H.M. and Preece, C.N. (2015). Determining significant factors influencing Malaysian construction business performance in international markets. *Journal of Construction in Developing Countries*, 20(2), 1.

Jha, K.N. and Devaya, M.N. (2008). Modelling the risks faced by Indian construction companies assessing international projects. *Construction Management and Economics*, 26(4), 337-348. https://doi.org/10.1080/01446190801953281.

Joslin, R. and Müller, R. (2016). The relationship between project governance and project success. *International Journal of Project Management*, 34(4), 613-626. https://doi.org/10.1016/j.ijproman.2016.01.008.

Lee, K.P., Lee, H.S., Park, M., Kim, D.Y. and Jung, M. (2017). Management-reserve estimation for international construction projects based on risk-informed k-NN. *Journal of Management in Engineering*, 33(4), 04017002. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000510.

Ling, F.Y.Y. and Hoang, V.T.P. (2010). Political, economic, and legal risks faced in international projects: Case study of Vietnam. *Journal of professional issues in engineering education and practice*, 136(3), 156-164. https://doi.org/10.1061/(ASCE)EI.1943-5541.0000015.

Liu, J., Low, S.P. and Zhang, Q. (2018). Enterprise risk management practices of top ENR international contractors. *International Journal of Construction Management*, 18(5), 364-374. https://doi.org/10.1080/15623599.2017.1326299.

Liu, J., Zhao, X. and Yan, P. (2016). Risk paths in international construction projects: Case study from Chinese contractors. *J. Constr. Eng. Manage.*, 142(6), 05016002. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001116.

McIntosh, K. and McCabe, B. (2003). Risk and benefits associated with international construction–consulting joint ventures in the English-speaking Caribbean. *Canadian Journal of Civil Engineering*, 30(6), 1143-1152. https://doi.org/10.1139/l03-063.

Mohamed, S. (2003). Performance in international construction joint ventures: Modeling perspective. *J. Constr. Eng. Manage.*, 129(6), 619-626. https://doi.org/10.1061/(ASCE)0733-9364(2003)129:6(619).

Nunnally, J.C. and Bernstein, I.H. (1994) *Psychometric Theory*, 3rd edition, New York: McGraw-Hill Inc.

Ozorhon, B., Arditi, D., Dikmen, I. and Birgonul, M.T. (2007). Effect of host country and project conditions in international construction joint ventures. *International Journal of Project Management*, 25(8), 799-806. https://doi.org/10.1016/j.ijproman.2007.05.003.

PMI (2017) *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*, 6th edition, Newtown Square: Project Management Institute, Inc.

Siraj, N.B. and Fayek, A.R. (2019). Risk identification and common risks in construction: Literature review and content analysis. *Journal of Construction Engineering and Management*, 145(9), 03119004. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001685.

Sutton, P. (1999). Democracy in the commonwealth Caribbean. *Democratization*, 6(1), 67-86. https://doi.org/10.1080/13510349908403597.

Ullman, J.B. (2001). Structural equation modeling. In Tabachnick, B.G. and Fidel, L.S. *Using multivariate statistics*, 4th edition, Needham Heights: Allyn & Bacon. https://doi.org/10.1002/9781118133880.hop202023.

Utama, W.P., Chan, A.P.C., Gao, R. and Zahoor, H. (2018). Making international expansion decision for. *International Journal of Construction Management*, (18)3, 221-231. https://doi.org/10.1080/15623599.2017.1315527.

Viswanathan, S.K. and Jha, K.N. (2020). Critical risk factors in international construction projects. *Engineering, Construction and Architectural Management*, 27(5), 1169-1190. https://doi.org/10.1108/ECAM-04-2019-0220.

Viswanathan, S.K., Tripathi, K.K. and Jha, K.N. (2019). Influence of risk mitigation measures on international construction project success criteria–a survey of Indian experiences. *Construction Management and Economics*, 1-16. https://doi.org/10.1080/01446193.2019.1577987.

Wang, S.Q., Dulaimi, M.F. and Aguria, M.Y. (2004). Risk management framework for construction projects in developing countries. *Construction Management and Economics*, 22(3), 237-252. https://doi.org/10.1080/0144619032000124689.

Wang, T., Tang, W., Du, L., Duffield, C.F. and Wei, Y. (2016). Relationships among risk management, partnering, and contractor capability in international EPC project delivery. *Journal of management in engineering*, 32(6), 04016017. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000459.

Worldatlas (2018) *Caribbean Countries: A list of countries that are considered to be part of the world's Caribbean region*, [Online], https://www.worldatlas.com/articles/caribbean-countries.html, [24 January 2021].

Xiaopeng, D. and Pheng, L.S. (2012). Understanding the critical variables affecting the level of political risks in international construction projects. *KSCE Journal of Civil Engineering*, 17(5), 895-907. https://doi.org/10.1007/s12205-013-0354-5.

Zhang, X. (2011). Social risks for international players in the construction market: A China study. *Habitat International*, 35(3), 514-519. https://doi.org/10.1016/j.habitatint.2011.02.005.

Zhi, H. (1995). Risk management for overseas construction projects. *International journal of project management*, 13(4), 231-237. https://doi.org/10.1016/0263-7863(95)00015-I.