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RESEARCH ARTICLE

Development of OLI+S Entry Decision Model for Construction Firms in International Markets

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Abstract

The paper aims to provide a holistic approach to address how construction firms make decisions covering all three domains (location, timing and mode) across country, market, firm and project factors within the Ownership, Locational and Internalisation plus Specialty (OLI+S) paradigm. Questionnaires were administered to 62 project managers based on a sampling frame provided by the Construction Industry Development Board Malaysia. The findings provide empirical and theoretical insights on how the OLI+S model addresses firms' entry decisions to penetrate international markets. It suggests that the ownership-entry decision factors focus on firms' internal transferable advantages. The locational-entry decision factors emphasise attractiveness of certain locations where firms decided to invest and operate. The internalisation– entry decision factors emphasise the extent to which firms were able to manipulate their internal competitive assets (firm's resources and capabilities). Finally, the specialty-entry decision factors emphasise on firms' competency in project management and specialist expertise to handle complex projects based on their previous project experience. An example of construction firms' unique characteristics, namely, specialty advantages based on the original Dunning's OLI eclectic paradigm has been adopted. The established OLI+S entry decision model could be investigated to further refine other related internationalisation theory.

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Keywords

Construction firms, international markets, entry decision model.

Introduction

The Dunning's Eclectic Paradigm, or known as the Ownership, Locational and Internalization (OLI) theory (Dunning, 1988; Dunning, 1995; Dunning, 2001) has been the subject of extensive interest in the strategy literature in the past decades. The OLI theory's first evolution was in the mid-1950s and suggested that the entry decisions into international markets are influenced by the OLI advantages (Dunning, 2001). Subsequently, Low and Jiang (2004) have incorporated a "Specialty" or S-advantages into their research framework known as Ownership, Locational and Internalization plus Specialty or OLI+S framework which became the basis of this study.

Within the context of this paper, the OLI theory states that a firm's decision to internationalize and to choose the entry mode are motivated by the ownership, locational and internalization advantages, which reflect the entry timing, location and mode decisions by firms in international markets, respectively. When construction firms decided to enter a specific location in international markets, they must then decide a suitable timing and an appropriate mode of entry to be adopted in their operations. Thus, assessing these three decisions is a continuous process and has important implications on the long-term and short-term financial positions of the firms. Even though many international construction researchers have incorporated the OLI eclectic paradigm which include Seymour (1987), Cuervo and Pheng (2003), Low, Jiang and Leong (2004), Rahman (2014), Wong and Abdul-Aziz (2009), Abdul-Aziz and Awil (2010), Abdul Aziz et al. (2011) and Gabriel (2014), they did not consider the specialty advantages in their studies as introduced by Low and Jiang (2004).

There are different combinations of entry decision models developed and proposed by previous researchers. Koch (2001a; 2001b) proposed a market entry and mode selection (MEMS) model which combined the entry location and mode decisions to accommodate various business contexts, meanwhile Zhu, et al. (2012) demonstrated the patterns of the entry location and timing decisions for service sectors, such as hotel and banking. In addition, Somlev and Hoshino (2005) found that entry locational factors have strong predictive power for mode of establishment and ownership choice of a sample of manufacturing subsidiaries of Japanese multi-national enterprises (MNEs). Sivakumar (2002) developed a mathematical modelling for companies going abroad that integrates simultaneous entry timing and mode decisions through numerical simulations instead of an empirical research. Using four Portugal construction contractors, Neves and Bugalho (2008) studied to entry mode decision or autonomy of local subsidiaries and the entry location decision based on the effectiveness of localization which have positively influenced the contractors' performance. Ling, Ibbs and Cuervo (2005) focused only on entry mode as one of the business strategies of firms in China, while Jung, et al. (2012) analysed the effects of entry mode (strategic alliance) on Korean contractors' international performance.

Other studies have incorporated all three entry decisions in their models but not as simultaneous decisions (Alcácer, Dezső, and Zhao, 2015; Che Senik, et al., 2010; Ellis, 2007; Gabriel, 2014; Gallego, et al., 2009; Huang and Sternquist, 2007; Tjosevik and Refsland, 2012). Even though the studies by Gallego et al. (2009) and Tjosevik and

Refsland (2012) incorporated all three decisions for general firms and high-technology firms, respectively, they only proposed the conceptual models with no empirical evidence provided. Alcácer, Dezső, and Zhao (2015) local learning, and global learning. Three equilibrium strategies arise: accommodate, marginalize, and collocate. We identify how these strategies emerge depending on the tradeoff between the opportunity costs of absence (giving competitors a lead in a market developed a similar model to the Gallego et al.'s model, but only explained the impacts of the entry location decision on the entry timing and mode decisions and did not consider any common or shared factors influencing all three entry decisions. Using a comprehensive two-stage qualitative approach, Che Senik (2010) studied 70 Malaysian small and medium enterprises (SMEs) steps toward internationalization focusing more on the entry location and mode with less attention in entry timing decision.

In most of the past research, the entry location, timing and mode decisions were often studied in silo or combinations of the three entry decisions. Explicit views that suggest these three decisions as parts of one simultaneous decision process are not empirically visible. Currently there is no theoretical model that allows for the independent variables within the OLI+S advantages that significantly explains the entry location, timing and mode simultaneous decisions as the dependent variables.This clearly requires an integrated framework incorporating all three simultaneous entry decision factors to be established for construction firms.

Literature Review

The following sub-section explains further on international construction entry decisions adopting the OLI theory.

INTERNATIONAL CONSTRUCTION ENTRY DECISIONS (LOCATION, TIMING AND MODE) IN RELATION TO OLI THEORY

Many previous researchers explain situations associated with international market entry decisions using variables namely; entry location, timing and mode decisions (Abdul Aziz and Wong, 2010; Asgari, Ismail and Ahmad, 2009; Rahman (2014); Fosfuri, Lanzolla, and Suarez, 2013; Kaur and Sandhu, 2014; Liu, Low, and Niu, 2011; Manley, McFallan, and Kajewski, 2009; Musso and Francioni, 2009). There were also studies that include both construction and non-construction research have adopted the OLI theory to explain the entry location, timing and mode decisions by firms in international markets. (Abdul-Aziz, 1995; Abdul Aziz and Wong, 2010; Cantwell, 2014; Jin and Deng, 2012; Li, 2010; Low and Jiang, 2004, 2006; Tallman, 1993; Wong and Abdul Aziz, 2009; Wymbs, 2001; Yang and Lu, 2013). For example, Cantwell (2014) applied the OLI eclectic paradigm in relation to building new capabilities which were derived from an interaction between the ownership and locational capabilities due to firm and its home country institutions and also due to other actors in host country at other locations

There were also other significant empirical studies relating to the application of the OLI eclectic paradigm in international construction (Seymour, 1987; Abdul Aziz and Awil, 2010; Abdul Aziz et al., 2011; Rahman, 2014; Cuervo and Low, 2003; Low and Jiang, 2006; Low and Jiang, 2004). These studies examined firms in construction industry in a country or region by identifying their respective OLI advantages.An important study was carried out by Low and Jiang (2006), in which a comparison between Chinese international and local contractors was made. They found that an international firm is likely to perform well in terms of its ownership advantages when it has a significant advantage on its reputation and its accessibility to resources when compared to local contractors. Rahman (2014) deployed the eclectic paradigm of internationalization in their study on the determinants of multinational contractors' willingness to bid for Australian public sector major infrastructure projects. The ownership-advantages are related to the firm specific advantages in its domestic market before contemplating foreign direct investment (FDI), while the locational-advantages includes the size of the market; host governments' attitudes, polices and regulatory framework; industrial structure; resource and manpower quality and availability; costs of doing business; research and development (R&D) factors and project factors. Finally, the internalization-advantages include a more permanent entry mode that naturally occurs in their operations. Wong and Abdul Aziz (2009) established the E3R (relationship, resource and regional factors) model for Malaysian construction firms as a holistic approach by consolidating various theories and models including the OLI eclectic paradigm focusing on entrepreneurship dimensions.Using the eclectic theory, Abdul Aziz and Awil (2010) proposed the locational disadvantages construct to study the challenges related to the demand-related factors faced by Malaysian housing developers as the market-seeking firms in international markets. Various O-, L- and I- advantages and disadvantages were found related to different dimensions and constructs (country, market, firm, and project factors) such as regional, home and host country, market demand, market size, policies and regulations, firm's capabilities, business strategies, networking, resources, research and development, reputation, project performance, etc.

The following sub-section focuses on the OLI+S advantages with respect to the construction firm's entry decisions into international markets.

ENHANCEMENT OF OLI THEORY - OLI+S ADVANTAGES

A study that enhanced the OLI theory for construction industry was proposed by Low, Jiang and Leong (2004) who incorporated a "Specialty" or S-advantages into the (O-IRTR), international business distribution (L-IBD), overseas management structure (I-OMS) and involvement with specialized fields (S-ISF). By estimating the international revenue to total revenue (O-IRTR), they found that firms from countries with a relatively small domestic market, (e.g., the framework. The S-advantages relate to the market involvement of a firm among different specialized fields. The proposed OLI+S model was only applied to measure the degree of internationalization of multi-national corporations (MNCs) using secondary data from the Engineering News Records (2003)to estimate the firm's revenue, international business distribution, overseas management structure and specialized fields.The proposed model estimated four different aspects of firm's internationalization process in terms of the ratio of international revenue to total revenue Netherlands and Sweden) are more likely to venture into overseas markets to generate revenues to overcome the constraints of their small domestic market and to optimize the use of their ownership advantages.In general, this OLI+S model demonstrates that firms under different nationalities exhibit very different patterns in the internationalization process depending on their business strategies, indigenous market situations and historical factors.

Zhengxing, Shengyue and Lianwei (2005) have also considered specialty by their engineering technicians and professionals of domestic construction enterprises which improved their capabilities in international markets. In addition, Ling, Ibbs and Hoo (2006) considered specialty/niche service/product as one of the Singaporean construction firms' business strategies in international markets. However, these studies did not contribute OLI+S advantages. Recently, Liu et al. (2011)adopted the OLI+S theory to determine empirically, the challenges and opportunities for cross-border acquisitions that involved 34 Chinese construction firms. The findings were based on the objectives, intentions, preparations and impediments of Chinese construction enterprises for cross-border acquisitions as the independent variables but did not specifically consider any entry location, timing and mode decision dimension as compared to the current study.

In an earlier study, Low and Jiang (2004) recommended that the proposed OLI+S model be adopted for strategic planning and resources at both the country and firm level. Thus, to address the gap from the previous study, the current study is carried out on how construction firms make strategic planning and entry market decisions covering all three domains (location, timing and mode) across country, market, firm and project factors within the OLI+S paradigm.

Figure 1 shows a conceptual framework for an integrated decision model for the current study. It is proposed based on the combinations of entry decisions models that were compared and discussed. There are three dependent variables namely: (1) entry location (EL) decision to determine the firm's international business locations (ASEAN and non-ASEAN regions); (2) entry timing (ET) decision (either as an early or a late mover to penetrate the chosen market or country) and; (3) entry mode (EM) decisions that involve the selection of entry mode adopted (equity and non-equity modes).

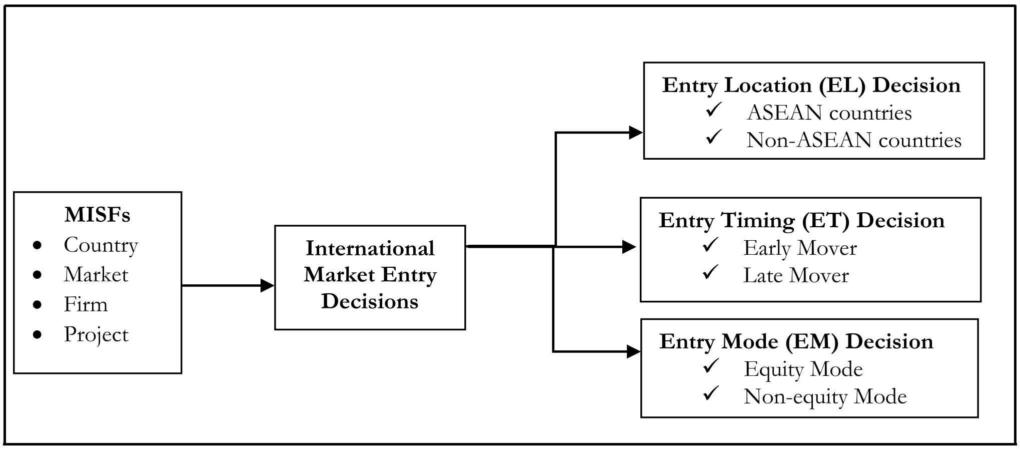

Figure 1 A Proposed Conceptual Framework for ELETEM Decision Model

A review of the available literature was undertaken to identify the significant factors (independent variables)that influence international market entry decisions of Malaysian construction firms. Most of the forty-four (44) identified factors are drawn largely from the studies conducted at the developed countries with some from developing countries.These factors were then grouped under four themes: country, market, firm and projects factors that were used in the questionnaire survey are shown in Table 1.

Table 1 Forty-four (44) identified factors based on previous studies

Theme	Factors (Authors)
Country Factors (11)	Attitude and intervention of host governments (Owhoso, Gleason, Mathur, and Malgwi, 2002), similarity to host country/market in terms of social, cultural and religious (Javernick-Will and Scott, 2010), proximity to host country (Ahmad and Kitchen, 2008a), anticipated non-economic risk such as political, technological etc. (He and Wei, 2011), anticipated economic risks such as currency fluctuation, interest rate, etc.(Zaradiah, 2008), other foreign competitors in the host country (Ramayah, Mohamad, Jaafar, Abdul Aziz, and Wong, 2010), promotion of export efforts of home government (Abdul Aziz et al., 2011), financial support from home country banks (Mat Isa, Mohd Saman, and Preece, 2014), trade relationship between two countries (Braunerhjelm, Oxelheim, and Thulin, 2005), diplomatic relationship between two countries (Chen, 2005), host government control on licensing, restrictions and other FDI requirements (Ozorhon et al., 2010).
Market Factors (6)	Market profit potential/attractiveness (Quer, Claver, and Rosario, 2007), market intensity of competition (Gallego et al., 2009), product/ service market growth (Korkmaz and Messner, 2008), market entry barriers (Asgari, Ahmad, and Gurrib, 2010), availability of innovative and entrepreneurial opportunities in market (Schwens and Kabst, 2011), construction market demand for finance, labour, material, transport and other utilities (Ahmad and Kitchen, 2008b) .
Firm Factors (14)	Firm's size (Cuervo-Cazurra, 2011), firm's ability to assess market signals and opportunities (Preece, et al., 2016), international experience (Majocchi, Bacchiocchi, and Mayrhofer, 2005), long-term and strategic management orientation/objectives (Ozorhon, et al., 2008), superior management and organizational dynamic capabilities (García-Villaverde, Ruiz-Ortega, and Parra-Requena, 2012), financing capacity (Chen, 2005), competencies (project management, specialist expertise and technology) (Isik, et al., 2010), resources (level of knowledge, and Research and Development) (Abu Bakar, Razak, and Yusof, 2011) , management of risk attitude (Chelliah, Sulaiman, and Pandian, 2010), management of quality (product, service, human resource) (Ling and Lim, 2010), firm's performance (profit targets - return on investment/sales/assets) (Chen, 2005), firm's performance (knowledge and international experience) (Quer, Claver, and Rosario, 2007), uncertainty avoidance (Ozorhon et al., 2008) and international business network (strong relationship with foreign partners in host countries) (Forsgren, 2002).
Project Factors (13)	Product differentiation (strong brand name) (Fahy, 2002), reputation, track record/competitive advantage (Cuervo and Low, 2003), project size, project types (building, manufacturing) (Han, et al., 2010), technical complexity of projects (Tan and Ghazali, 2011), type of clients (public vs. private) (Scherer and Kruglianskas, 2009), availability of funds for projects (Ozorhon, Dikmen, and Birgonul, 2007), contract types or procurement methods (lump sum, cost-plus, design and build) (Zhengxing et al., 2005), experience of firm in similar works (Chen, 2005), existence of strict time limitations, existence of strict quality requirements (Ozorhon et al., 2007) and availability of partner/alliance (Benjamin Levi, 2006).

Thus, there is a need to understand the influential factors for a construction firm's entry decisions from a highly developing country, such as Malaysia. As compared to most research on other topics, only few empirical research exist on a comprehensive model or framework on the relationships between country, market, firm and project factors and the three simultaneous entry decisions for construction firms that wish to internationalize, are in the process or already in international markets. In the proposed conceptual framework, the influence of factors on the three entry decisions are determined empirically through a three-step approach or stages as described in the following section. In the current study, the OLI+S advantage model provides a comprehensive platform as a unifying theoretical framework to identify and analyse various factors influencing the construction firms' entry decisions into international markets.

Research Method

This study adopts a mixed methods research. The main reasons for a mixed method was first, to conduct quantitative research to identify and quantify the significant factors, before using qualitative research to explore particular issues and further define major themes through interviews (Johnson and Onwuegbuzie, 2009). The strategy used in this study is sequential where the process started a quantitative method to test the theory, followed by a qualitative method to add depth of understanding (Creswell, 2003).Thus, the managers from construction firms were targeted to enquire their opinions and perceptions of their firms' entry location, timing and mode decisions in international markets. Then, a few of the highly experienced managers were interviewed to obtain their specific language and voices about the strategies and to validate the proposed OLI+S entry decision model. Hence, validity and reliability issues counterbalanced each other to triangulate on the "true" results. This approach has being widely accepted by many researchers in studies related to internationalization and market entry strategies (Abdul Aziz and Awil, 2010; Abdul Aziz et al., 2011; Abdul Aziz, Azmi, Law, and Ngau, 2013; Maqsoom, Charoenngam, Masood, and Awais, 2014). In this study, the quantitative method outweighed the qualitative method. The survey generated quantitative data for identifying important factors, measuring relationships among variables, while interviews collected richer, qualitative details and at the same time validated the quantitative findings and the proposed OLI+S entry decision model. However, due to the page and word limitations this paper presents only on the quantitative findings and does not include the findings from the interview sessions

RESEARCH POPULATION, SAMPLING DESIGN AND INSTRUMENT DESIGN

This research used a sampling frame provided by the Construction Industry Development Board (CIDB) Malaysia. Based on a formal registry of Malaysian construction firms, the CIDB Malaysia (2013) record indicated that only 115 firms were registered under Class A and Grade 7, as global players operating in more than 50 countries. These construction firms have the capability in tendering for projects within the area of expertise without any capacity limitation. In a globalized world, this aspect can be regards as an advantage to other international construction firms seeking to enter the Malaysian construction markets. Currently, many foreign firms have penetrated Malaysian markets, especially from China.

A probability sampling method is used as a sampling technique in this study. In survey research, a probability sampling method is generally more appropriate than a nonprobability one because the resulting sample is likely to provide a representative cross-section of the whole. Thus, the units of analysis are the construction firms that engage in international business activities and have foreign market experience. Their involvement in international projects includes various sectors, such as buildings, infrastructure, branches of engineering in mechanical and electrical, power transmission and plant facilities, and oil and gas. Out of 115 firms, sixty-two (62)firms have responded to the self-administered questionnaire survey. The survey was followed by semi-structured interviews with 13 experts selected based on their international experience and expertise involving international projects. For the Rasch Model analysis, the minimum sample size for most purposes is 50 samples as recommended by Linacre (1994). In addition, with 99% confidence, 61 samples are adequate for + 1.0 *logit*. Thus, a sample of 62 participating managers is within the acceptable limit recommended.

The questionnaires consist of 4 sections: Section A enquires the respondent's background information. Section B consists of three parts where the respondents were required to choose the international business location, to indicate their firm's entry timing choices being as a late or early mover, and to determine the entry modes that they adopted in their international projects. Definitions for the entry location, timing and mode decisions are provided in the questionnaires to ensure that the respondents understand their choices Section C contains three parts that require the respondents to evaluate the factors influencing their entry location, timing and mode decisions, respectively. The data from Section C was analysed using Rasch Model Analysis and presented in this paper to develop the OLI+S ELETEM decision model. Finally, in Section D, respondents were encouraged to state any comments relevant to the scope of study. The survey ended with a thank you note expressing appreciation for the respondents' time and consideration.

Figure 2 shows the following percentages: Vice President (3.2%), General Manager (4.8%), Managing/Project/Technical Director (12.9%), Senior Project Manager (4.8%), Senior Project Engineer (3.2%), Project Coordinator (3.2%), Project Manager/Planner (9.7%), Project Engineer (24.2%), Contract/Quantity Surveyor/ Financial Manager (14.5%), Other Managers (19.4%).

These managers were directly involved in their firm's operations and acquired international experience in planning, managing and controlling construction projects in international

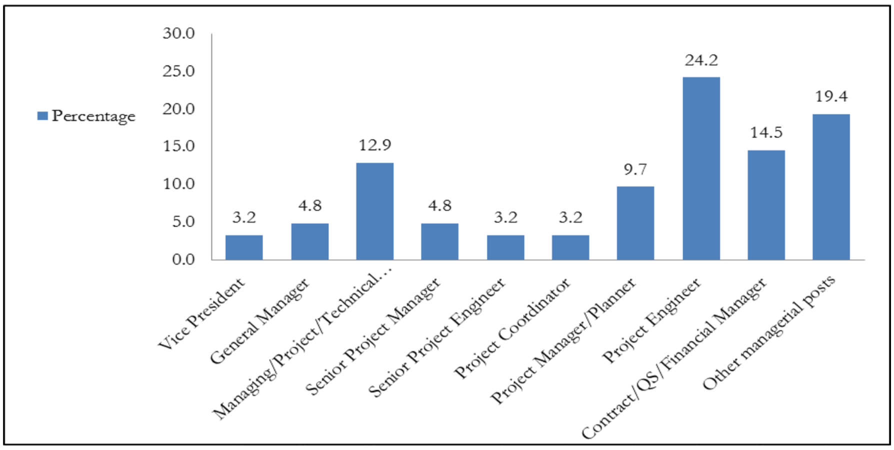

Figure 2 Percentage distribution of respondents based on their designations

markets. Thus, this profile indicates a diverse background of top managers and professionals involved in international operations in this study.

Figure 3 depicts the percentage distribution of respondents based on number of years of international experience.It shows that 26% of the respondents have acquired more than 10 years of international experience, 29% of the respondents have experience between 5 to 10 years and 45% of the respondents have experience between 1 to 5 years.

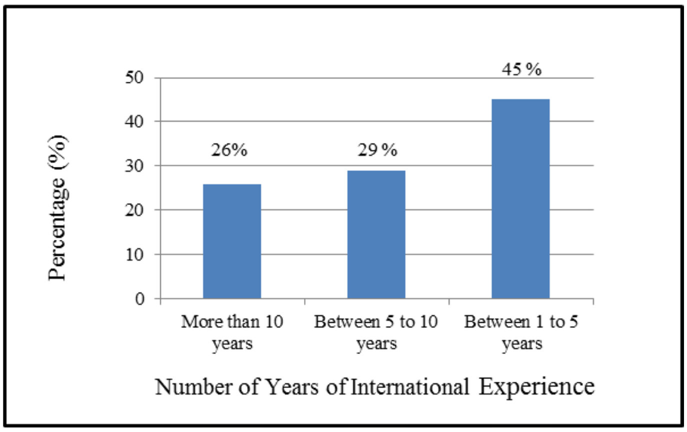

Figure 3 Percentage distribution of respondents based on number of years of international experience

Based on their number of years of experience and from performing different leading positions within their firms, respondents were all knowledgeable about international operations. Thus, the respondents have gained the necessary international construction background to participate and give reliable opinions in the questionnaire survey for this study.

The following section explains the development of the OLI+S entry decision model using Rasch Model analysis.

OLI+S Entry Decision Model Development using Rasch Model Analysis

The OLI+S entry decision model was developed based on 62 responses from Malaysian construction companies. The current study applies the underlying theory adopted known as the OLI eclectic paradigm in context of the current academic knowledge together with the enhancement of the OLI theory was proposed by Low and Jiang (2004) with an additional advantage (Specialty).

Rasch Model analysis was adopted to integrate all three entry decision constructs to determine the OLI+S entry decisions factors using a three-stage approach as shown in Figure 4. There are three constructs (domains) namely entry location (EL) decision, entry timing (EL) decision and entry mode (EM) decision. Under each construct or domain, there are four themes namely: country, market, firm and project. Under each theme, there are 11 county factors, 6 market factors, 14 firm factors and 13 project factors giving the total number of 44 items in each construct (domain).

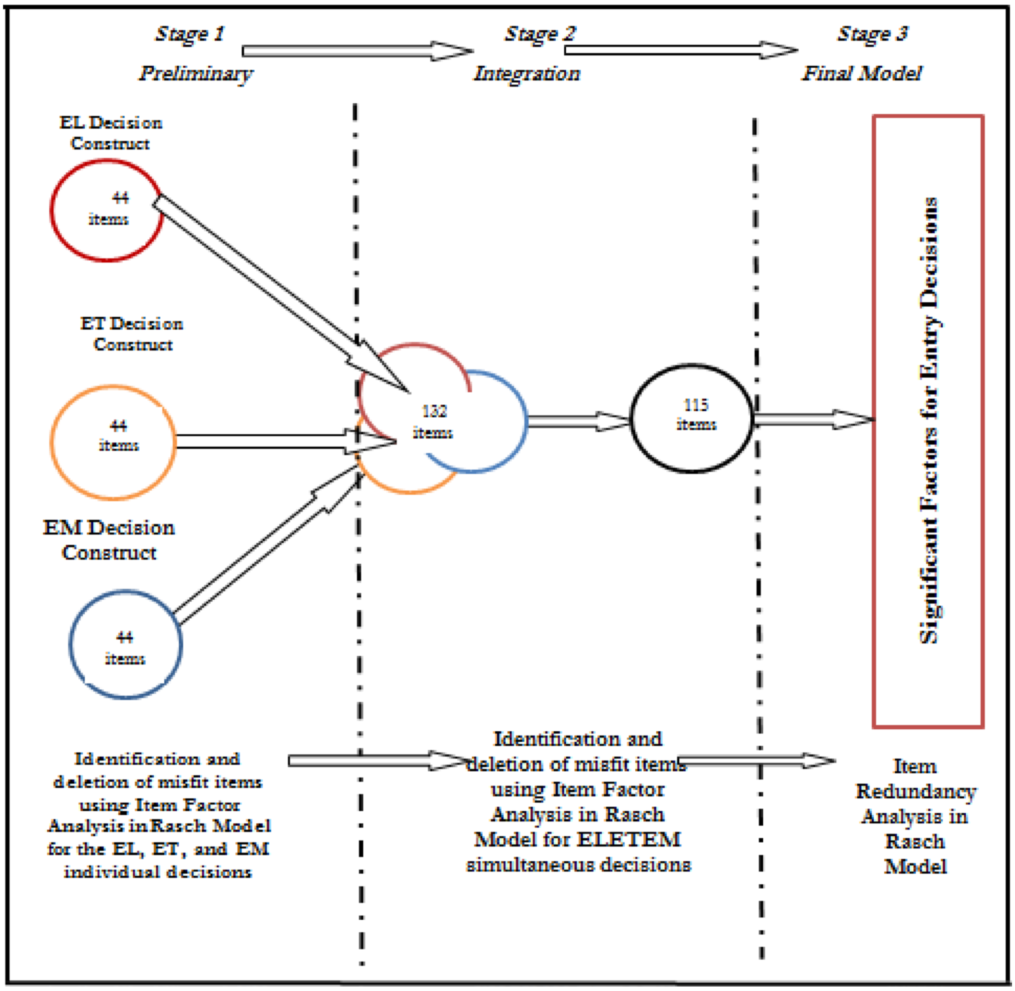

Figure 4 Proposed Integrated ELETEM Decision Model

Stage 1 is based on the preliminary framework that involves the Rasch Model "analysis-by-construct" on each of the three constructs: (1) EL decision (44 items), (ii) ET decision (44 items) and (iii) EM decision (44 items) constructs. In Stage 2, an "overall-analysis" using the Rasch Model analysis was carried out by integrating all three constructs (EL, ET and EM decisions) to determine the common shared factors known as the mutually inclusive and significant factors influencing location, timing and mode decisions. In this stage, the OLI+S decision model was generated based on 132 items. Next, the item fit analysis was carried out to identify any misfit items. By deleting the misfit items, a better fit and valid instrument for the final ELETEM decision model was constructed, where all required parameters are met. Finally, in Stage 3, an item fit analysis was carried out prior to item redundancy analysis. The following section presents the results and discussion on the entry location, timing and mode decisions based on the Rasch Model analysis.

Results and Discussions

An appraisal of the ELETEM decision data was carried out as a means of observing the extent that the managers' responses to each entry decision factor is consistent with the response to other factors on the assessment. Table 1 summarizes the statistics of the survey instrument for 132 measured items, which were generated from 62 persons using a total of 8184 (132 x 62) data points.

Table 1 Summary Statistics for 132 Measured Items

	TOTAL		MODEL		INFIT		OUTFIT	
	SCORE	COUNT	MEASURE	ERROR	MNSQ	ZSTD	MNSQ	ZSTD
MEAN	225.9	62.0	.05	.16	.91	-.6	.90	-.6
S.D.	10.8	.0	.27	.00	.20	1.2	.21	1.2
MAX.	252.0	62.0	.81	.17	1.48	2.5	1.55	2.7
MIN.	194.0	62.0	-.65	.15	.51	-3.4	.50	-3.4
	REAL RMSE	.16	TRUE SD	.22	SEPARATION	1.65	Item RELIABILITY	.73
	MODEL RMSE	.16	TRUE SD	.22	SEPARATION	1.77	Item RELIABILITY	.76
	S.E. OF Item MEAN = .02							

It shows an item reliability of 0.73 (model = 0.76) (>0.7) indicating sufficiency of the items spread along the continuum (Fisher, 2005). This allows further investigation to be conducted (Bond and Fox, 2012). It also indicates that the probability of the difficulty levels of every item remain the same if the instrument was given to a different group of managers of the same size (Bond and Fox, 2012). The results indicate that the instrument has a good measurement model error of + 0.16 logit (Fisher, 2005).

Table 2 shows the summary statistics for 62 measured managers.

Table 2 Summary Statistics for 62 Measured Persons

	TOTAL		MODEL		INFIT		OUTFIT	
	SCORE	COUNT	MEASURE	ERROR	MNSQ	ZSTD	MNSQ	ZSTD
MEAN	742.0	202.0	.94	.09	1.01	-.5	1.00	-.6
S.D.	113.4	.0	.92	.02	.44	4.6	.43	4.6
MAX.	984.0	202.0	3.99	.20	2.00	8.1	2.00	8.2
MIN.	422.0	202.0	-1.25	.08	.08	-9.9	.09	-9.9
	REAL RMSE	.10	TRUE SD	.91	SEPARATION	9.07	Person RELIABILITY	.99
	MODEL RMSE	.09	TRUE SD	.91	SEPARATION	9.82	Person RELIABILITY	.99
	S.E. OF Person MEAN = .12							

An excellent person reliability of 0.99 indicates that the instrument is capable to categorize and distinguish the level of ED factors endorsed by the managers. A comparison between the person maximum measure and the item maximum measure determined that the instrument contains sufficient items to measure the managers' latent trait (endorsing the entry decision factors). A mean-square fit (*MnSq*) statistic shows the size of the randomness, i.e. the amount of distortion of the measurement system. In the Rasch Model context, 1 is the expected value where "Observed" is divided by "Expected" (Linacre, 1994). The results show that for item: *MnSq* = 0.91; *ZStd* = -0.6, and for person: *MnSq* = 1.01; *ZStd* = -0.5. The *MnSq* for both item and person are close to 1, which are the expected values as stipulated by the quality item criteria. Furthermore, the mean Z standardized (*ZStd*) infit and outfit values are expected to be 0.0. This indicates a good sign of a fit and valid instrument, which can measure what is intended. Thus, the data for this study does fit the Rasch Model reasonably well and the analysis conducted reflected the outcome of this research. Therefore, the overall findings show that the survey instrument is validated and reliable to be used in the ELETEM decision model development. Stage1 is not explained in this paper since it involved preliminary analysis for individual entry decisions.

STAGE 2: ITEM FACTOR ANALYSIS

The ELETEM decision model is developed based on 132 items representing the factors influencing ELETEM decisions. Table 3 shows an excerpt from the analysis on the measure order of the firm's ELETEM simultaneous decision factors before the misfit items are identified and deleted.

Table 3 Measure Order of 132 Items for ELETEM Decision

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT		OUTFIT		PT-MEASURE		EXACT MATCH		Item
					MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%	
49	194	62	.81	.15	.96	-.2	.98	.0	.46	.60	40.3	43.2	LC3_PROXIMITY
48	195	62	.78	.15	1.02	.2	1.04	.3	.35	.60	45.2	43.3	LC2_SIMILARITY
92	210	62	.44	.15	.90	-.6	.90	-.5	.68	.58	51.6	45.1	MC2_SIMILARITY
52	211	62	.42	.15	1.12	.7	1.21	1.2	.33	.58	51.6	45.1	LC6_COMPETITORS
85	248	62	-.53	.17	1.25	1.3	1.20	1.1	.63	.53	46.8	49.3	LP39_PROJ_FUND
69	252	62	-.65	.17	1.11	.7	1.09	.5	.55	.52	59.7	49.6	LF23_FINANCE_CAP
MEAN	225.9	62.0	.05	.16	.91	-.6	.90	-.6			53.4	46.3	
S.D.	10.8	.0	.27	.00	.20	1.2	.21	1.2			7.1	1.3	

As highlighted, the most significant ELETEM decision factor is Item 69: LF23_FINANCE_CAP (-0.65 logit), while the least significant ELETEM decision factor is Item 49: LC_PROXIMITY (+0.81 logit). In the item factor analysis, the misfits' pattern is observed based on a three-step comparison procedure namely; (1) Point measure correlation (PMC); 0.4<PMC value<0.85; (2) Outfit mean square (MnSq); 0.5 < MnSq value <1.5; and (3) Outfit Z-standard (ZStd); -2 < ZStd value <+2. These three criteria must be fulfilled when considering outliers and misfit items. From Table 3, an observation on the PMC values yields a two misfit items which are: Items 48 and 52 having PMC values of 0.35 and 0.33 (< than 0.4).

ITEM MISFITS

In order to identify the misfit items, the Rasch Model analysis produces another measure order table based on item misfit order for ELETEM decision factors as shown in Table 4. Earlier observation on the PMC values yielded two misfit items, which are Items 48 and 52 with PMC values that are less than 0.4 (see Table 3).

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Table 4 Item Misfit Measure Order for ELETEM Decisions

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT		OUTFIT		PT-MEASURE		EXACT MATCH		Item
					MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%	
57	232	62	-.10	.16	1.48	2.5	1.55	2.7	A .41	.56	58.1	46.6	LC11_HOST_CONTROL
71	239	62	-.28	.16	1.43	2.2	1.36	1.8	B .53	.55	35.5	48.3	LF25_R&andD
139	227	62	.03	.16	1.06	.4	1.43	2.2	C .58	.57	45.2	46.0	TC5_ECONOMIC
56	231	62	-.07	.16	1.40	2.1	1.35	1.8	D .59	.56	33.9	46.5	LC10_DIPLOMATIC
156	230	62	-.05	.16	.68	-2.0	.69	-1.9	s .72	.56	61.3	46.5	TF22_SUPERIOR_MGT
155	227	62	.03	.16	.69	-2.0	.66	-2.1	r .69	.57	59.7	46.0	TF21_LONG_TERM_STR
161	232	62	-.10	.16	.69	-1.9	.67	-2.0	q .70	.56	62.9	46.6	TF27_QUALITY_MGT
136	207	62	.51	.15	.69	-2.0	.67	-2.1	p .67	.59	56.5	44.6	TC2_SIMILARITY
101	238	62	-.26	.16	.67	-2.1	.69	-1.9	o .68	.55	61.3	48.2	MC11_HOST_CONTROL
120	214	62	.35	.15	.59	-2.7	.68	-2.0	l .60	.58	61.3	45.3	MF30_UNCERT_AVOID
109	218	62	.25	.16	.68	-2.1	.65	-2.2	k .65	.58	58.1	45.4	MF19_ASSESS_MARKET
164	214	62	.35	.15	.65	-2.2	.67	-2.1	j .57	.58	56.5	45.3	TF30_UNCERT_AVOID
119	225	62	.08	.16	.65	-2.2	.64	-2.3	i .71	.57	62.9	45.9	MF29_PERFORM_ KNOWLEDGE
75	233	62	-.12	.16	.65	-2.2	.64	-2.2	h .69	.56	59.7	46.7	LF29_PERFORM_ KNOWLEDG
97	208	62	.49	.15	.64	-2.4	.63	-2.4	g .70	.59	58.1	44.8	MC7_HOME_PROMOTION
145	236	62	-.20	.16	.60	-2.6	.62	-2.4	f .69	.55	61.3	48.0	TC11_HOST_CONTROL
74	235	62	-.18	.16	.60	-2.6	.61	-2.5	e .77	.55	56.5	48.0	LF28_PERFORM_ROI
117	233	62	-.12	.16	.59	-2.7	.60	-2.6	d .66	.56	66.1	46.7	MF27_QUALITY_MGT
73	231	62	-.07	.16	.58	-2.8	.57	-2.8	c .68	.56	61.3	46.5	LF27_QUALITY_MGT
148	217	62	.27	.15	.52	-3.4	.51	-3.4	b .67	.58	59.7	45.4	TM14_MARK_GROWTH
68	232	62	-.10	.16	.51	-3.4	.50	-3.4	a .75	.56	66.1	46.6	LF22_SUPERIOR_MGT
MEAN	225.9	62.0	.05	.16	.91	-.6	.90	-.6			53.4	46.3	
S.D.	10.8	.0	.27	.00	.20	1.2	.21	1.2			7.1	1.3	

As highlighted, there exist other misfit items that were identified based on the other two criteria: (1) Outfit mean square (MNSQ): 0.5 <MnSq value <1.5; and; (2) Outfit Z-standard (ZStd): -2 <ZStd value <+2. Fifteen (15) misfit items (highlighted) were found: Item 57, Item 139, Item 155, Item 136, Item 109, Item 164, Item 119, Item 75, Item 97, Item 145, Item 74, Item 117, Item 73, Item 148 and Item 68. After these 17 misfit items were deleted, there are 115 fit items are obtained. However, these items consist of many redundant items derived from the EL, ET and EM decision constructs.

STAGE 3: ITEM REDUNDANCY ANALYSIS

Finally, in Stage 3, an item redundancy analysis was carried out to identify and delete the redundant items based on the two principles in the Rasch Model; if two or more items with the same measure (logit) exist, they are assumed to be testing or measuring the same dimension or similar concept. They are not allowed to co-exist since they are performing the same or similar task at the same difficulty level. Thus, to avoid redundancy, the item at the upper position in the measure order table is deleted; meanwhile the item at the lower position is maintained. To select the most significant factors with their respective measures, the following two observations were made to delete the redundant items (1) Items with same measure and same dimension (SMSD) and (2) Items with different measure and same dimension (DMSD).

SAME MEASURE SAME DIMENSION (SMSD)

Table 5, the items having the same logit measure and same dimension (SMSD) coming from different constructs are identified to eliminate redundancy. For example, Item 84: LP38_CLIENT (0.00 logit; MnSq = 0.97; ZStd = -0.1; PMC = 0.64) and Item 172: TP38_CLIENT (0.00 logit; MnSq = 0.77; ZStd = -1.4 ; PMC = 0.79). Both items have the same measure of 0.00, which means they are measuring the same dimension ("types of clients").

Table 5 Items with Same Measure and Same Dimension (SMSD)

Item	Dimension	Construct	Logit	MnSq	ZSTD	PMC
Item 84	LP38_CLIENT (type of clients)	EL	0.00	0.97	-0.1	0.64
Item 172	TP38_CLIENT (type of client)	ET	0.00	0.77	-1.4	0.79

Therefore, the less significant item, which is Item 84 (at the upper position in the measure order table) was deleted and the more significant item, which is Item 172 (at the lower position) is maintained.

DIFFERENT MEASURE SAME DIMENSION (DMSD)

In the second type of item redundancy analysis, any two or more items with different logit measure, having the same dimensions coming from the different constructs, a lower measure (more significant) is maintained. Table 6 shows items with a different measure, but the same dimensions and under the different constructs that were identified. For example, Item 69: LF23_FINANCE_CAP (-0.65 logit), Item 157: TF23_FINANCE_CAP (-0.39 logit) and Item 113:MF23_FINANCE_CAP (-0.34 logit).

Table 6 Items with Different Measure and Same Dimension (DMSD)

Item	Dimension	Construct	Logit
Item 69	LF_FINANCE_CAP (Financial capacity)	EL	-0.65
Item 157	TF_FINANCE_CAP (Financial capacity)	TF	-0.39
Item 113	MF_FINANCE_CAP (Financial capacity)	MF	-0.34

As shown in Table 6, items 69, 157 and 113 have different logit measures but measuring the same dimension which is the "firm's financial capacity" and under the different constructs of ET, EL and EM, respectively. Therefore, an item with a lower measure, which is LF23 with -0.65 logit (which means more significant) is maintained, while the other two items, TF3 and MF23 having a higher measure of -0.39 logit and – 0.34 logit, respectively were deleted. After deleting all redundant items, 44 items that represent significant factors influencing the ELETEM decisions are generated. Out of these 44 items, there are 27 items with negative logits that represent the mutually inclusive and significant factors (MISFs) which are further incorporated in the ELETEM decision model development.

UNIDIMENSIONALITY BASED ON STANDARDIZED RESIDUAL VARIANCE

The Principal Component Analysis (PCA) which is part of the Rasch Model was utilised to identify the amount of variance in the survey instrument in measuring the ELETEM decision strategy adopted by the firms through the managers' experience and knowledge. It is important that the instrument measures one common latent trait, which is the MISFs influencing the ELETEM decision. Table 7 indicates that the raw variance explained by measures is 35.9%, which very closely matches the modelled value of 36.1%. This 35.9% consists of 20.5% of raw variance explained by items and 15.4% of raw variance explained by the managers. The instrument meets the unidimensionality requirement minimum of 20% (Reckase, 1979), but does not fulfill the Rasch cut-low point of 40% (Conrad et al., 2011). However, the unexplained variance by the first contrast is good at 7.1% which is below the cut-off point of 15% (Fisher, 2005) and further supports the unidimensionality requirement.

Table 7 Standardised Residual Variance (Eigenvalue Units)

		-- Empirical --			Modeled
Total raw variance in observations	=	68.6	100%		100.0%
Raw variance explained by measures	=	24.6	35.9		36.1%
Raw variance explained by persons	=	10.5	15.4%		15.5%
Raw Variance explained by items	=	14.0	20.5%		20.6%
Raw unexplained variance (total)	=	44.0	64.1%	100.0%	63.9%
Unexplained variance in 1st contrast	=	4.8	7.1%	11.1%	

Development of OLI+S entry decision model based on mutually inclusive and significant factors (MISFs) influencing ELETEM decisions

Comparative analysis was carried out between previous studies with the current ELETEM decision model to empirically contribute to the body of knowledge of international market entry strategy research for construction firms. The review revealed that most of the studies that incorporate all three-entry location, timing and mode decisions were carried out on firms from various industries, for examples, Huang and Sternquist (2007) on retailers, Ellis (2007) on Hong Kong manufacturing firms, Gallego et al. (2009) on manufacturing firms, Che Senik (2010) on Malaysian small and medium enterprises (SMEs), Tjosevik and Refsland (2012) on high technology firms and only Gabriel (2014) on Hong Kong construction firms. Other researchers such as Jung et. al (2011), Ling, Ibbs and Cuervo (2005) and Neves and Bugalho (2008) studied international business strategies by construction companies but not related to all three-entry location, timing and mode decisions.

The ELETEM decision model consists of 27 mutually inclusive and significant factors (MISFs) with logit measures generated from the Rasch Model as shown in Table 8. These are the MISFs that the firms paid attention to in their market expansion based on the managers' opinions and international experience. In the Rasch Model analysis, an easy item or a factor endorsed without difficulty by any manager with any given level of competency produces negative logits which represents the significant entry decision factors considered by the firms. On the other hand, any positive logit measures represent less significant entry decision factors while 0.0 logit measure means that a manager has a 50:50 chance of choosing the significant factor and vice versa is used as a cut-off point.

Table 8 Mutually Inclusive and Significant Factors (MISFs) Influencing ELETEM Decisions

No	Factors	Measure (Logit)
1	Firm's financial capacity	-0.65
2	Availability of project funds	-0.53
3	Firm's competency	-0.53
4	Attitude and intervention of host country government	-0.45
5	Market profit potentials/attractiveness	-0.45
6	Experience of firm in similar projects	-0.45
7	Anticipated economic risks	-0.31
8	Firm's international experience	-0.31
9	Diplomatic relationships countries	-0.28
10	Contract types/procurement methods	-0.28
11	Firm's track record/competitive advantages	-0.28
12	Firm's level of knowledge and R&D	-0.28
13	Host government control	-0.26
14	Firm's performance (ROI/Sales/Assets)	-0.15
15	Firm's superior management	-0.15
16	Anticipated non-economic risks	-0.12
17	Firm's management of quality	-0.10
18	Firm's management of risk attitude	-0.10
19	Construction demand	-0.07
20	Market intensity of competition	-0.07
21	Client types	-0.07
22	Firm's reputation	-0.07
23	Project technical complexity	-0.05
24	Financial support from home country banks	-0.05
25	Existence of strict project quality requirements	-0.05
26	International business network	-0.05
27	Firm's long term strategic orientation/objectives	-0.02

The following discussion on the integrated ELETEM decision model is carried out with the application of OLI+S theory for construction firms by comparing with other studies that applied the Dunning's OLI eclectic paradigm and the OLI+S theory. The 27 MISFs are further grouped under four OLI+S entry decisions, namely the ownership-entry decision (OED), locational entry decision (LED), internalization-entry decision (IED) and specialty-entry decision (SED) factors.

OWNERSHIP ENTRY DECISION (OED) FACTORS

There are 11 OED factors that significantly influenced the firm's ELETEM decisions, which are the firm's financial capacity, international experience, track record/competitive advantages, level of knowledge and R&D, performance (ROI/Sales/Assets), superior management, quality management, risk attitude, reputation, international business network and long-term strategic orientation/objectives. These OED factors are mainly related to firm factors. The findings suggest that the Malaysian construction firms possessed competitive advantages and have gone through the process of adapting the firm's resources under the managerial resource, personnel, financial and knowledge components.

Within the context of this study, these OED factors can also explain the "when" question of the firms' international market expansion. The factors emphasize the extent to which the firms possess internal transferable advantages, such as track record, reputation, international experience, international network and resources over its foreign competitors which determined their entry timing as the early or late movers.The findings are consistent with the earlier studies on the O-advantages related to the firm's reputation, technical knowledge, international experience, management of quality and management expertise (Seymour, 1987; Low and Jiang, 2004). Similarly, Cuervo and Low (2003) found that the O-advantage factors leveraged by the construction firms were related to the information, knowledge, technology and R&D capability, firm's name and reputation, and management and organisational capability. In addition, certain project types were found as the main disadvantage factors. The previous findings are in line with the current study, except that the disadvantage factor in terms of project types, is found to be insignificant in influencing the ELETEM decision of the firms.

LOCATIONAL ENTRY DECISION (LED) FACTORS

The 9 LED factors that significantly influenced the firm's ELETEM decisions are attitude and intervention of host country government, market profit potentials/attractiveness, anticipated economic risks, diplomatic relationships between home and host countries, host government control, anticipated non-economic risks, construction demand, market intensity of competition and financial support from home country banks. These factors are related to both country and market factors. The findings indicate that the LED factors are related to economic risks related to fluctuation of the currency and interest rates together with the non-economic risks, such as political, economic, and social factors. Other country factors are related to the home-host country diplomatic relationship and financial supports from home banks while market factors include market potentials and attractiveness. Within the context of the current study, the LED factors explain the 'where' question of the firms' ELETEM decisions that are very much influenced by the home-host country advantages or known as the "degree of attractiveness" and also "locational disadvantages" of certain locations where the firms wish to venture. Countries with high market potential and construction demand attracted and influenced the construction firms' decision to choose these locations.

Similar findings by Low and Jiang (2006) show that the influential factors were related to the competition with the host and other international contractors, resources (workers, equipment, material, financing), political and social stability, and laws and regulations related to foreign investment. Seymour (1987) determined that non-economic risks such as host country political risk and degree of competition from local or other foreign contractors were the major locational disadvantages. On the other hand, market factor was regarded as the locational advantages relates to location-bound construction demand due to the market size supported by the project factor related to the clients' attitude. Some locational disadvantages reported by Abdul Aziz and Wong (2008) were related to the host country such as political stability, taxation and incentive, law and order, business cost, financial freedom, market openness, foreign competition, government bureaucracy and government integrity. Similarly, Rahman (2014) included the L-factors in their study such as market size, host governments' attitudes, polices and regulatory framework, industrial structure, resource and manpower quality and availability, costs of doing business, R&D and project factors.

Internalisation Entry Decision (IED) Factors

The 4 IED factors that influenced the Malaysian construction firm's ELETEM decisions are availability of project funds,contract types/procurement methods, client types and existence of strict project quality requirements. These factors were obtained from the firm's direct internal control instead of other market entry modes explain the 'how' question of the firm's ELETEM decisions. They emphasized the extent to which the firms were able to manipulate their internal competitive assets (IED factors) using the firm's resources and capabilities (OED factors) to take advantage of market potentials and face the risks and competition in the host country (LED factors). A study by Low and Jiang (2006) exhibits the I-advantage factors that were adopted by construction firms and support the findings of the current study. In relation to the project funds, the IED factors are considered to facilitate the need for alternative investments for profits earned, whereas the different contract types/procurement methods were adopted to avoid the costs of breach of contracts and ensuing litigation and to better facilitate strategic alliances, partnering and networking with others for the business. Finally, the client types are the IED factors used to meet the host government's policy requirements relating to construction business operations.

Specialty Entry Decision (SED) Factors

The three SED factors that influenced the Malaysian construction firm's ELETEM decisions are firm's competency in project management, specialist expertise, technological capabilities, experience of firm in similar project and project technical complexity.

The S-advantages emphasises market involvement of a firm among different specialised fields and explains the "what" firm's specialisation focused on multi-specialty projects with competent technical expertise (Low and Jiang, 2004). The specialty/niche service/product was also considered as one of the Singaporean construction firms' business strategies in international markets (Ling, Ibbs and Hoo, 2006). It is recommended that international construction firms focus on niche services such as project management and position themselves to offer services in complex and specialised projects by having the specialty or S-advantages in their internationalisation operations. Thus, the need to have specialized fields in internationalization efforts confirms the findings of Low and Jiang (2004) and Ling, Pham and Hoang (2009). Effective strategies and lessons learned from leading contractors in sustaining operations and growth indicate that they proactively responded to the changing markets by increasing their overseas revenues and enhancing their competency through more diversified products and services in order to stabilize their revenue structure (Han et al., 2010). The leading firms' level of specialisation were measured using the diversification and specialisation concepts in which the firms' strategies vary, being subject to a firm's specialty and attitude toward expanding into overseas markets. Within the context of this study, the SED factors should be considered to be an important aspect of a construction firm's ELETEM decisions into international markets due to the firms' competency in project management and specialist expertise together with high technical capabilities to handle complex projects based on their previous similar project experience. In relation to project technical complexity, the SED factors were leveraged to protect technological know-how of the firm and to better utilize and control resources such as construction materials, equipment, technology and human.

Conclusion

The main objective of the study is to determine the mutually inclusive and significant factors (MISFs) influencing construction firms' decisions covering all three domains (location, timing and mode) across country, market, firm and project factors within the Ownership, Locational and Internalization plus Specialty (OLI+S) paradigm. This paper focuses only on the quantitative method using questionnaire survey sent to construction firms, thus presents only the quantitative findings based on the independent variables (ELETEM decisions) measured. Using a three-stage approach described earlier in the methodology section, the developed OLI+S entry decision model of construction firms in international markets is shown in Figure 5.

The current study breaks out the silo-based thinking by integrating all three domains of EL, ET and EM or known as ELETEM decisions. The findings contribute to the theoretical aspects of international market and management research in four main factors under OLI+S paradigm based on the 11 ownerships, 9 locational, 4 internalisations and 3 specialty entry decision factors. Generally, if the ELETEM decisions must be carried out simultaneously, the firms must take into consideration of all the 27 MISFs.

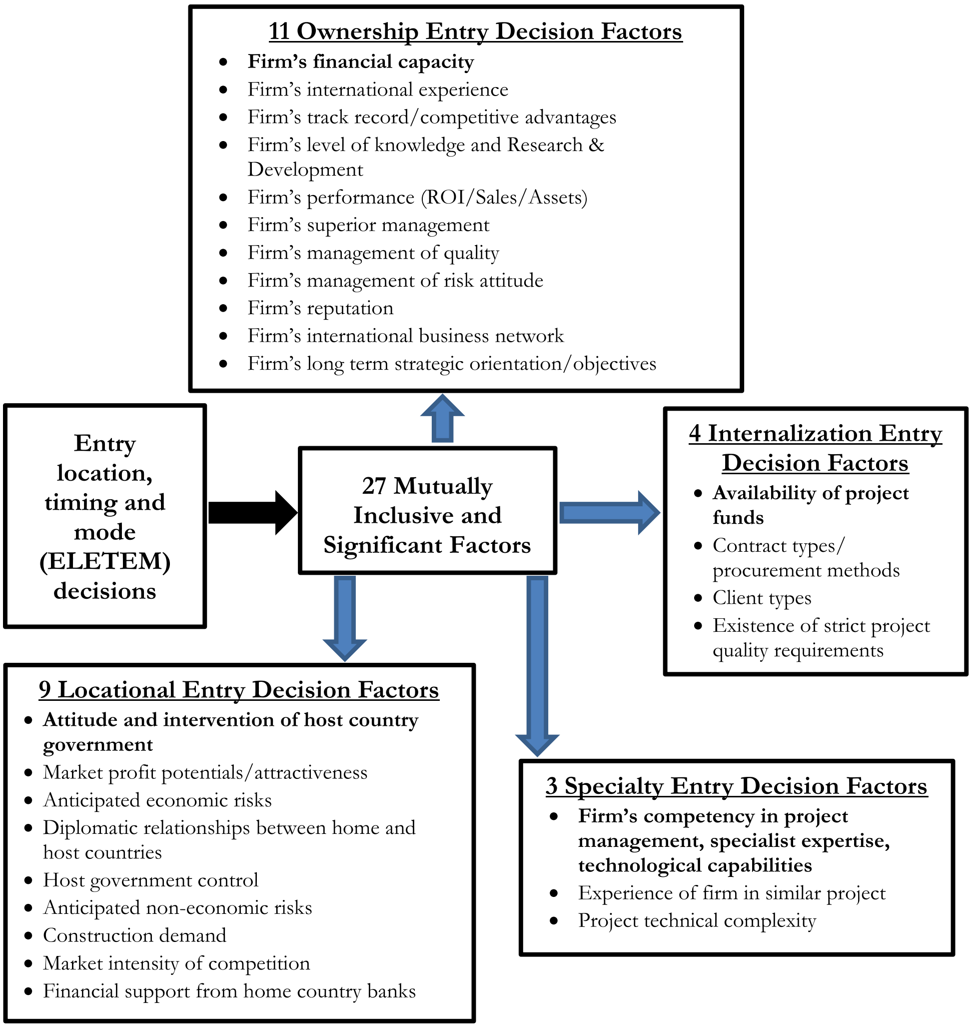

Figure 5 OLI+S entry decision model of construction firms in international markets

As shown in Figure 5, within the context of the OLI+S paradigm, the most significant factor under ownership paradigm is firm's financial capacity as the firms' internal transferable advantages. Next, important factor under locational paradigm is the attitude and intervention of host country government that emphasizes the attractiveness of certain locations where firms decided to invest and operate. Under internalization paradigm, the availability of project funds is very crucial where it emphasizes the extent to which firms were able to manipulate their internal competitive resources. Finally, under specialty paradigm the entry decision factors emphasize on firms' competency in project management and specialist expertise to handle complex projects based on previous project experience. Thus, to determine the right location, suitable timing and appropriate mode of entry, the firms must have a strong financial capacity, competency in project management, ensure a stable project funding to sustain their operation and strongly consider the host country government' attitude and intervention programs/plans/regulations towards foreign firms. Within Malaysia context, many construction firms were observed not able to sustain their international operations, where the firms' international presence was found to be reducing in numbers. The main observations from this study indicate that Malaysian construction firms must continue to sustain themselves in international markets. The firms could not afford to make poor or wrong decisions in assigning their limited resources to diminishing markets while avoiding the attractive or growing markets. Presently, with strong support by the government, Malaysian construction firms are seen to continually establish and strengthen their capabilities and assets in line with the Malaysian economic plan and vision to be a developed country by 2020. The current study is in line with the three-step approach in the development of internationalization strategy by the Malaysian government (CITP: 2015-2020), namely to target and prioritize potential markets, and to define entry strategy such as entry mode. Thus, OLI+S ELETEM decision model provides important and significant factors on entry decisions of construction firms into international markets.

Since this study is based on construction firms from a developing country, the established OLI+S ELETEM decision model offers some of the important and significant factors to be considered by small or medium firms having no international experience but interested to start their foreign operations. It may also apply to large firms with international experience to help them to identify new markets to sustain their presence in international markets. However, there might be some other factors that were not considered, where these firms will still face the challenge of determining exactly which country to enter, when to enter and which mode of market entry to select.

In general, the decision makers' perceptions on the identified factors will be based on their vision and missions, their resources and capabilities' commitments and their attitudes towards risks are critical to lead the firms' readiness to initiate entry location, timing and mode decisions. They have to adopt and implement long-term strategies, reposition their knowledge from their research and design activities to improve and innovate their products and services. They must increase efficiency in allocating their tangible and intagible resources, such as financial, experience, business network, and adopt suitable entry mode strategies in their global operations using the right entry strategy within any geographical proximity of the targeted markets. By continuously developing their international market entry strategies and enhancing their managerial and resources capabilities, the firms can face the changing globalized business environment.

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