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THE DIRECT AND MODERATING ROLE OF GEOGRAPHICAL FACTORS ON THE DETERMINANTS OF ENVIRONMENTAL PERFORMANCE

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Abstract

This study investigates the direct and moderating impacts of geographical factors on the environmental performance of construction firms. Environmental performance is measured by compliance to environmental standards and minimisation of pollution, waste, toxic materials and energy. Four geographical operations of construction firms were considered – local, regional, national and international. A questionnaire survey was distributed face-to-face to project team members, and the data were tested using the Partial Least Squares Structural Equation Modelling (WarpPLS version 6.0). The results reveal that geographical factors have a direct and significant impact on environmental performance. Also, compatibility factor, quality of project team and client pressure have a higher effect on construction firms' environmental performance if they broaden their geographical operation to the international market. The study underscores the importance of geographical factors in achieving a higher level of environmental performance among construction firms. Several practical implications were presented at the end of the paper.

Keywords: *geographical factors, determinants, environmental performance, construction firms*

1. INTRODUCTION

Deterioration of the environment is becoming a worldwide phenomenon, and governments have been increasingly pressured to develop effective measures to solve the problem (Glass, Greenfield, and Longhurst 2017). Considering the negative impact of the construction industry's activities on the environment, governments have made concerted efforts through incentives and legislation to improve the construction players' environmental performance (Serpell, Kort, and Vera 2013, Shi et al., 2016; Yusof, Awang, and Iranmanesh, 2017). Several construction firms have started to enhance their environmental performance as a reaction or response to client and government pressures or their own environmental conscience (Zainul Abidin, Yusof, and Othman 2013). Until now, the construction firm's environmental performance is mixed. While many construction firms are still not environmentally certified and most construction processes, materials and technologies are not environmentally-friendly, with only a few green buildings being built (Liu and Lin 2016; Gangolells et al., 2014), there are firms that have improved their environmental performance (Yu et al., 2018, Kibwami and Tutesigensi, 2016; Gangolells et al., 2014; Abuzeinab et al., 2016). Why do some firms demonstrate better environmental performance than others?

Several factors have been identified by previous studies to influence construction firms' environmental performance. However, scholars are not united on which factors have determined environmental performance and how. Knowledge and sensitivity towards the environment are regarded as the key qualities of a project manager (Hwang and Ng 2013), but these two factors do not inevitably result in better environmental performance (Lee 2014). The high cost of investment of environmental technologies and materials discourage firms from improving their environmental performance (Low, Gao, and See, 2014, Zainul Abidin, Yusof, and Othman, 2013). In addition, regulatory pressures can either improve or deteriorate environmental performance (Chan et al., 2018). Adoption of an environmental management system to satisfy clients' demands does not ensure an improvement in a firm's environmental performance (Grandic, 2017). Government support was found to negatively affect environmental performance but has a moderating effect on the link between adhocracy culture and sustainable construction (Bamgbade et al., 2017). Lately, some firms are expanding their operations overseas as a result of increased competition and saturated conditions in the local markets (Daniele and Volker, 2015). This brings us to the debate about the role of geographical factors in influencing firms' environmental performance.

Geographical factors refer to the coverage of a firm's operations, which can be local, regional, national, or international. The Kyoto Protocol witnessed environmental agreements signed by participating countries. However, the implementation of environmental regulations varies, and firms with competitive advantage have the freedom to shift operations to a location with lenient environmental regulations or policies (Scaringelli, 2014; Koop and Tole, 2008). The European region performed much better environmentally compared to other regions across the globe (Liu, Chiu, and Liou, 2017). However, even within the same country, some studies pointed out that environmental policies and regulations are not being implemented in the same way (Guan, Grunow, and Yu, 2014; Glass, Kenjegalieva, and Sickles, 2013). For example in Malaysia where the present study was conducted, several public buildings have achieved platinum rating in the Malaysia's Green Building Index. However, at the local and state levels environmental degradation is still a major issue. Large development projects have been approved and built near conservation areas; Tasik Kenyir Free Trade Zone in Trengganu and Forest City in Johor are among the examples. As envisaged by Chatterjea (2014), the development of multistory buildings and infrastructure will have a negative impact on the conserved area and drastically change the area's characteristics. The latest tragedy was a landslide in a construction site adjacent to a hillslope, in Tanjung Bungah, Penang that caused 11 lives (Sitheravellu, 2017). The project was previously objected by the Department of Environment (DoE) but the development proceeded after receiving approval from the local authority - the Penang Island City Council's (MBPP) One Stop Centre (OSC) committee (Mok, 2017). On the other hand, firms operated in a broader geographical location, such as international firms that venture into foreign countries, have to follow stricter energy policies and, therefore, are perceived to gain more through energy cost saving and, subsequently, become motivated to improve their environmental performance as compared to local firms (Ramstetter and Kohpaiboon, 2013; Ramstetter 2013). Firms aiming for international markets will make constant efforts to improve their environmental performance to stay competitive (Grandic, 2017). Macchion et al., (2017) revealed the presence of the moderating effect of geographical factors on firms' environmental performance. They established that 'venturing overseas' has a positive moderating impact on environmental performance for an environmentally-friendly product distribution.

The above discussion points out the importance of geographical factors on firm's environmental performance. This study attempts to uncover the direct and moderating roles of geographical factors on the determinants of environmental performance. The findings will provide a clearer understanding about whether operating in a larger geographical location, i.e., the international market, leads to a higher environmental performance. A suitable strategy needs to be developed to encourage construction managers to focus on the determinants that can effectively boost their firms' environmental performance.

2. HYPOTHESES DEVELOPMENT AND CONCEPTUAL FRAMEWORK

Environmental performance refers to the outcome of any effort taken to respect the environment or to ensure a less polluted environment (Bhattacharyya and Cummings, 2015). Environmental performance is centred around the degree to which firms obey environmental standards or adopt environmental management (Zeng et al., 2011), minimizing or preventing waste, pollution and toxic materials (Zeng et al., 2011; Li, Ngniatedema, and Chen, 2017). Firms with higher environmental performance are said to gain more financially, to enjoy a good reputation among clients and the public, and to maintain a competitive advantage (Yadav, Han, and Kim, 2017).

Previous studies have listed several factors as determinants of environmental performance, namely, Relative Advantage, Compatibility, Project Team Quality, Regulatory Pressure, Client Pressure, Government Support, and Geographical Factor. Relative advantage is the perception that environmental initiatives provide greater benefit to the firms as compared to their competitors, such as resource optimisation, faster construction process, better profits, reputation and a cleaner environment (Heras-Saizarbitoria, Landín, and Molina-Azorín, 2011; Kehbila, Ertel, and Brent, 2009). Cost savings and low carbon emissions gained from energy efficiency buildings are argued to improve a firm's environmental performance (Lundgren and Zhou, 2017). The application of energy performance procurement is argued to be able to offset the high cost of adopting green technologies and thus increase a firm's environmental performance (Zhang et al., 2014). The use of Information Constraint Net (ICN) during a project cycle results in faster project completion and increases environmental performance through resource optimisation (Cheng et al., 2013). Awareness about the benefit of environmental management systems and environmentally-friendly buildings is proposed to increase a construction firm's environmental performance (Heffernan et al., 2015; Sakr, Sherif, and El-Haggar, 2010). Therefore, the relative advantage of environmental initiatives has a positive and significant impact on a firm's environmental performance. Our first hypothesis is as follows:

H1: Relative advantage has a positive effect on construction firms' environmental performance.

Compatibility refers to the degree of coherence of a construction firm's values, culture and structure with environmental agenda (Ho et al., 2014). Compatibility includes achieving a match between environmental requirements and a firm's resources or technical capability to avoid difficulty in fulfilling the environmental requirement (Yu et al., 2018). Complexity in adopting environmental standards may deter firms from improving their environmental performance (Chan et al., 2018). When a firm's business model is aligned with its environmental agenda, it will be easier for firms to overcome the challenges in adopting environmental practices, and this will result in improved environmental performance (Häkkinen and Bellon, 2011). Therefore, the second hypothesis of this study is:

H2: Compatibility has a positive effect on construction firms' environmental performance.

Quality Project Team refers to a pool of people with knowledge about and skill in handling the environmental standards and prerequisites, and who work together to drive the execution of environmental initiatives within the firm (Ho, Lin, and Tsai, 2014). In construction firms, the quality project team refers to the environmental knowledge and skill of members of the project team which is made up of different firms, including architecture and engineering consulting firms, contractor and subcontractor firms, and client organisations (Häkkinen and Bellon, 2011). Project members who understand the cost of environment abatement will ensure construction activities are carried out in a responsible manner and thus work towards improving a firm's environmental performance. Therefore, our third hypothesis is:

H3: Quality Project Team has a positive effect on construction firms' environmental performance.

Regulatory Pressure: Understanding the serious consequences of unsustainable development and the urgent need to encourage construction firms to improve their environmental performance, governments have established various environmental regulations, standards and policies (Dirckinck-Holmfeld, 2015). Other than imposing fines and penalties for violations, regulatory pressures include the granting of authority to identify materials, design, method, technologies and tools that are encouraged or to be avoided (Li and Shui, 2015, Fraj-Andrés, -Salinas, and Vallejo, 2009). Therefore, our fourth hypothesis is:

H4: Regulatory pressure has a positive effect on construction firms' environmental performance.

Client Pressure: Nowadays, construction clients are well-informed and conscious about the environment and are demanding energy efficient buildings and pro-environment construction processes, technologies and services (Lai et al., 2017; Qi et al., 2014). The extent of such demands from clients will shape the products and services that construction firms adopt (Qi et al., 2010). Apart from achieving project time, cost and quality, environmentally-conscious clients will request specific designs, technologies and materials that improve a building's life-cycle (Eskerod, Huemann, and Ringhofer, 2015; Mokhlesian, 2014). The higher the pressure from clients demanding environmentally-friendly products and services, the better will be a firm's environmental performance. Therefore, our fifth hypothesis is:

H5: Client Pressure has a positive effect on construction firms' environmental performance.

Government Support refers to the support that the government provides to boost firms' environmental performance. Many studies have acknowledged the importance of government support to increase environmental performance (Deng and Tang, 2015; Zainul Abidin, Yusof, and Othman, 2013). Examples of such support are subsidies to reduce the cost of environmental technology, tax reduction for firms that achieve a certain environmental standard, providing training and technical support (Hwang and Tan, 2012; Zainul Abidin, Yusof, and Othman, 2013; Bamgbade et al., 2017). However, the impact of government support to firm environmental performance varies; for example, subsidy on prefabrication technology has a stronger impact on a firm's environmental performance compared to tax reduction measures (Li, Shen, and Alshawi, 2014). Therefore, our sixth hypothesis is:

H6: Government Support has a positive effect on construction firm's environmental performance.

Geographical factor refers to the extent of construction firms' geographical operations, whether they are local, regional, national or international. The importance of geographical factors on firms' environmental performance has not been sufficiently investigated by environmental researchers. In an urban study, inhabitants of traditional, national, regional and global cities are argued to have different qualities of urban life (Rosu, Corodescu, and Blăgeanu, 2015). In an information and communications technology (ICT) study, although internet seemed to be everywhere, geographical factors still played a role in explaining the reason for inequality of access to ICT. An imbalance in infrastructure development saw poor and peripheral regions suffer from insufficient cable networks, lack of network connections, slow communication connections, as well as infrequent and limited usage of ICT (Jakobi, 2014). These studies suggest that geographical factors do have an important impact. In the construction sector, firms operating in a larger geographical area, especially in an international market, are said to face various political, culture, and economic challenges that warrant them to comply with international environmental standards in order to compete and survive (Ramstetter and Kohpaiboon, 2013). Arguably these international firms will have a high environmental performance (Grandic, 2017), a point challenged, however, by Koop and Tole (2008), who claimed that the geographical spread of firm operations does not mean higher or lower environmental performance. (Aragón-Correa, Marcus, and Hurtado-Torres, 2016) revealed that the environmental performance of international firms is not better than local or national firms, but their performance is accepted by the public due to voluntary reporting. Dut (2015) revealed that lower environmental performance would be observed in countries where local or national governments gave favourable treatment to private or state-owned firms that helped to achieve the state's or nation's development agenda. To clear these conflicting views, de Jong, Phan, and van Ees (2011) propose that a firm's meta-environment characteristics which are unique to the firm, determine its performance regardless of the firm's geographical spread of operations. This point brings us to an additional role of geographical factor– as a moderator—for explaining the relationship between the previously discussed determinants and environmental performance.

Macchion et al. (2017) revealed that operating in an international market not only forced firms to comply with foreign environmental regulations, which are more strict towards international firms, but also, have to satisfy customers who are environmentally-conscious. These factors drive international firms to improve their environmental performance. In extractive industries, venturing overseas helps firms to improve their environmental performance, and this performance is higher if the firms' home country is a developed country, signifying the moderating role of geographical factors (Symeou, Zyglidopoulos, and Williamson, 2018). A strong connection between international firms and home countries that observed stricter environmental regulations resulted in international firms performing well environmentally (Buchanan and Marques, 2018). Our seventh and eighth hypotheses are:

H7: Geographical factor has a positive effect on construction firms' environmental performance.

H8: Geographical factor positively moderates the effect of a) relative advantage b) compatibility, c) quality of project team, d) regulatory pressure, e) client pressure, f) government support on construction firms' environmental performance.

The conceptual framework of the study indicating the direct and moderating roles of geographical factors on the relationship between the determinants and environmental performance is demonstrated in Figure 1- Conceptual Framework.

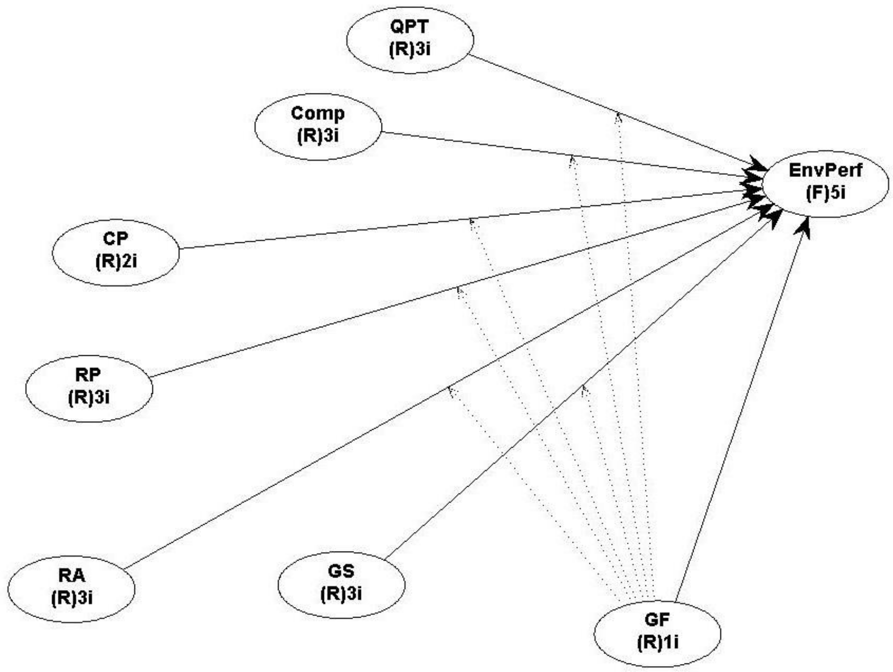

Figure 1. Conceptual framework

3. RESEARCH METHODOLOGY

A structured survey was used to collect the data. The survey form consists of 20 items based on previous studies to ensure content validity. Relative Advantage (RA) consisted of 3 items adapted from (Kehbila, Ertel, and Brent, 2009; Heras-Saizarbitoria, Landín, and Molina-Azorín 2011); Compatibility (Comp) with 3 items, derived from (Ho, Lin, and Tsai, 2014); Quality of Project Team (QPT) with 3 items, adapted from (Häkkinen and Bellon 2011); Regulatory Pressure (RP) with 3 items, adapted from (Dirckinck-Holmfeld, 2015; Li and Shui, 2015); Client Pressure (CP) with 2 items from (Qi et al., 2010); Government Support (GS) with 3 items, derived from (Deng and Tang, 2015); and Environmental Performance (EnvPerf) with 5 items, from (Bhattacharyya and Cummings, 2015; Du et al., 2014). The targeted respondents were the members of the project team in Malaysian construction projects.

The survey form was distributed face-to-face, and 210 usable responses were received. Descriptive analysis showed that most respondent firms are contractor firms (44 percent), followed by real estate developers (30 percent), and consulting firms (26 percent). Fifty-nine percent of the firms have been in the industry for more than ten years, while 31 percent between 6 to 10 years, and the remaining were new firms with 5 or fewer years of experience in the construction business. Regarding firm size, 28 percent of the firms were medium-sized (between 20 and 50 employees), and large firms (more than 50 employees), respectively. The remaining percentage consisted of small firms (less than 20 employees). Regarding their geographical operations, 49 percent of the respondent firms were local firms - operating within a single state; 29 percent were regional firms; 18 percent were national firms; and 4 percent were international firms.

The gamma-exponential method was used to calculate the required sample size and the minimum sample size was 146. Based on the power of 0.8, a significance level of 0.05 and the default minimum absolute significant path coefficient of 0.197 (Kock and Hadaya 2016) were found. The study's sample size was 210, with the power of 0.90, which is well above 146, demonstrating a precise and replicable result (Kock and Hadaya, 2016). In the next section, the testing and analysis of all processes and their results will be elaborated.

4. RESULTS

The data were analysed using the Partial Least Squares Structural Equation Modelling (PLS-SEM) of WarpPLS Version 6.0 to evaluate the measurement model and structural model.

4.1 Measurement model evaluation

The first step was to examine the reliability and validity of all of the determinants. Convergent validity and discriminant validity were used for evaluating the measurement model for the seven determinants which are reflective. Convergent validity, collinearity amongst the indicators, and the significance and relevance of the outer weights were used for evaluation of the measurement model for Environmental Performance which is a formative construct (Hair et al., 2013).

The convergent validity was evaluated using composite reliability (CR) and the Average Variance Extracted (Kock, 2014b; Hair, Ringle, and Sarstedt, 2011; Chin, 2010) where the factor loading should be higher than 0.7 (Hair, Ringle, and Sarstedt 2011; Kock, 2011). Factor loadings for all items in the reflective constructs were greater than 0.7 and the CR of all reflective constructs was above 0.7, complying with Hair et al.'s (2013) minimum threshold. The Average Variance Extracted value was beyond 0.5 in all constructs, fulfilling Fornell and Larcker's (1981) criteria. Also, full collinearity variance inflation factors assessment was performed to ensure that there is no redundancy issue amongst the constructs. Kock and Lynn (2012) suggest a threshold of less than 3.3 for the full collinearity variance inflation factors. The reflective constructs showed that the full collinearity variance inflation factors were between 1.177 – 1.818, well below 3.3. Table 1 shows the results of the measurement model evaluation for reflective constructs.

Table 1: Measurement model evaluation for the reflective constructs

Construct	Factor Loadings	CR	AVE	Full collinearity VIF
Relative Advantage - RA	0.787 - 0.803	0.838	0.633	1.629
Compatibility - Comp	0.731 – 0.861	0.851	0.657	1.818
Quality of Project Team - QPT	0.793 – 0.904	0.896	0.742	1.790
Regulatory Pressure - RP	0.838 – 0.898	0.894	0.737	1.586
Client Pressure - CP	0.889	0.883	0.791	1.634
Government Support - GS	0.853 – 0.900	0.908	0.766	1.540
Geographical factor - GF	1.000	1.000	1.000	1.177

CR= Composite Reliability; AVE= Average Variance Extracted; VIF = variation inflation factors

Next, cross-loadings and inter-correlation indicators were used to examine the discriminant validity of the constructs. The results showed that each opposing construct was less than any indicator load, satisfying Hair et al.'s (2012) rules. Also, the value of the inter-correlations between the construct and other model constructs was greater than the square root of the AVE of a single construct (see Table 2). These tests confirmed the discriminant validity of all of the constructs.

Table 2: Discriminant validity coefficients

	RA	Comp	QPT	RP	CP	GS	GF	EnvPerf
RA	0.796*							
Comp	0.468	0.810*						
QPT	0.619	0.623	0.861*					
RP	0.6348	0.331	0.309	0.859*				
CP	0.474	0.411	0.304	0.474	0.889*			
GS	0.454	0.363	0.457	0.454	0.331	0.875*		
GF	0.168	0.117	0.081	0.018	0.035	-0.026	1.00*	
EnvPerf	0.309	0.459	0.478	0.119	0.226	0.230	0.149	0.827*

***Square root of the AVEs are on the diagonal and the other entries are the correlations

Next, the evaluation of the measurement model for the formative items was performed using convergent validity, collinearity amongst the indicators, and significance and relevance of the outer weights. Kock (2014a) proposed that weights with P values that are less than or equal to 0.05 be counted as valid items in a formative latent variable measurement item subset. The present study showed that the P values for all formative items were significant at <0.001. Also, the VIFs between the associated formative construct indicators were less than 3.3, the P value of the outer weights was lower than 0.05 and significant, fulfilling Kock's (Kock 2014b) formative latent variable measurement's threshold. The full collinearity of the formative construct was 1.523, complying with Kock's 3.3 rules, indicating a satisfactory level for the measurement model of the formative construct. Table 3 presents the evaluation of the measurement model for the formative construct.

Table 3: Measurement model evaluation for the formative construct

	Weights	P-Value	VIF	Full collinearity
Environmental Performance	0.230 – 0.251	<0.001	1.824– 2.776	1.523

4.2 Structural Model Evaluation

Next, the structural model was analysed and the hypotheses were tested using the PLS-SEM analysis. Two criteria, namely, the R^2 measure for the endogenous constructs and the path coefficients, were considered and interpreted (Chin, 2010; Hair et al., 2011). The study's model showed $R^2 = 0.343$ with a significant path coefficient, indicating a moderate relationship according to Chin (2010). Stone's (1974) and Geisser's (1975) predictive relevance evaluation measure were performed to determine model fit. The model recorded Stone–Geisser $Q^2 = 0.350$ for the average cross-validated redundancy, which was greater than zero, complying with Chin's (2010) rules for predictive relevance. Thus, the model displayed satisfactory fit and high predictive relevance.

Eight quality indices were calculated for the whole model as suggested by Kock (2017). The model showed an average path coefficient (APC)=0.107, where P=0.028; Average R-squared (ARS)=0.343, significant at P<0.001; Average adjusted R-squared (AARS)=0.300, significant at P<0.001; Average block VIF (AVIF)=1.775, which fulfilled Kock (2017) threshold of AVIF<=

5; Average full collinearity VIF (AFVIF)=1.786, satisfying Kock (2017) rules of AFVIF <= 5; Tenenhaus GoF (GoF)=0.505, which was considered as large; Sympson's paradox ratio= 0.769, meeting Kock (2017) rules of SPR >= 0.7; and R-squared contribution ratio (RSCR)=0.953, which is at an acceptable level if RSCR >= 0.9 (Kock 2017). It should be noted that without geographical factor as a moderator, the Average adjusted R-squared (AARS) =0.292, P<0.001, indicating an improved adjusted R-squared after a moderator role of geographical factor is introduced.

Focusing on the objectives of this paper to investigate the direct and moderating effect of the geographical factor on the determinants of environmental performance, the results showed that i) GF → EnvPerf path was significant (P-value<0.05), supporting **H7**. The strength of the effect of the geographical factor on environmental performance was examined by the effect size (f^2) (Hair et al. 2013), where f^2 = 0.018, which Cohen (1988) regarded as small; ii) concerning the moderating effect of Geographical Factor, three paths were significant; Comp→GF→EnvPerf, QPT→GF→EnvPerf and CP→GF→EnvPerf, supporting **H8b, H8c** and **H8e**. However, the effect size of geographical factor as a moderator to these relationships was small; the highest was f^2 = 0.013 for CP→GF→EnvPerf. In contrast, the RA→GF→EnvPerf, RP→GF→EnvPerf and GS→GF→EnvPerf paths were not significant, providing insufficient evidence to support **H8a, H8d**, and **H8f**. Table 4 shows the study's path coefficient and hypothesis testing.

Table 4: Path coefficient and hypothesis testing

Hypothesis	Relationship	Path Coefficient	P-value	Effect Size	Decision
H1	RA → EnvPerf	0.065	0.184	0.019	Not Supported
H2	Comp →EnvPerf	0.294	<0.001	0.135	Supported
H3	QPT → EnvPerf	0.320	<0.001	0.153	Supported
H4	RP → EnvPerf	-0.090	0.092	0.011	Not Supported
H5	CP → EnvPerf	0.001	0.492	0.000	Not Supported
H6	GS → EnvPerf	0.013	0.423	0.003	Not Supported
H7	GF →EnvPerf	0.121	0.037	0.018	Supported
H8a	RA→GF→EnvPerf	-0.081	0.117	0.002	Not Supported
H8b	Comp→GF→EnvPerf	-0.010	<0.001	0.001	Supported
H8c	QPT→GF→EnvPerf	-0.142	0.018	0.006	Supported
H8d	RP→GF→EnvPerf	0.086	0.105	0.011	Not Supported
H8e	CP→GF→EnvPerf	0.118	0.041	0.013	Supported
H8f	GS→GF→EnvPerf	0.057	0.204	0.007	Not Supported

5. DISCUSSION AND CONCLUSION

The results showed that the geographical factor has a direct effect on the firm's environmental performance, signified by a positive and significant effect of geographical factor on firms' environmental performance. The result suggests that firms with broader geographical spread of operation and which operate in the international market have better environmental performance as compared to firms in a narrower or restricted location of operation such as within a municipality or state. The result provides empirical evidence of the advantage of internationalisation on firms' environmental performance, supporting Grandic (2017) and Ramstetter and Kohpaiboon (2013) findings.

Secondly, the results showed that the geographical factor has a moderating effect on firms' environmental performance in three situations: where the environmental agenda is compatible and integrated into a firm's business value and culture (compatibility factor); where project members are pro-environment (quality of project team); and where clients demand environmentally-friendly products or services (client pressure). The results suggest that Compatibility Factor, Quality of Project Team and Client Pressure have a higher effect on construction firms' environmental performance if such firms broaden their geographical operations into international markets. The result is similar to Macchion et al. (2017) work in the fashion industry, which demonstrated the moderating role of the internationalisation of the market on firms' environmental performance.

One explanation for the direct and moderating effects of geographical factor is that requirements for better environmental performance among construction firms are in place in most countries, probably as a consequence of the Kyoto Protocol. This is in contrast to the favouritism that construction firms may receive when they operate in the local market if the development project is regarded as superior to the environmental objective; a typical situation in many developing countries. Such laxity would worsen firms' environmental performance. Firms aiming to venture overseas do not enjoy any protection, and have to face stringent environment requirements as well as higher expectations from clients. These firms will strive to provide quality products and services (via quality-based strategies) to ensure success in the international market. It is no doubt, venturing overseas is different from the local market based on price competition strategy. Among the key success factors for firms going international are hiring a quality workforce, aligning international norms and standards into the firms, and ensuring sufficient demand from clients for the products and services that these firms offer (see (Pickernell et al., 2016; Haddoud et al., 2017; Cassetta, Meleo, and Pini, 2016). The presence of these determinants increased firms' environmental performance when firms operate in the international market.

Theoretically, the present study provides greater understanding about the role of geographical factors in several ways: i) the study provides empirical evidence to support the previous supposition by Grandic (2017) and Ramstetter and Kohpaiboon (2013) about the positive impact of geographical factors on a firm's environmental performance; ii) the study applied Macchion et al.'s (2017) work in the context of the construction sector by identifying the moderating effect of geographical factors on firms' environmental performance; iii) a robust research analysis by utilizing WarpPLS version 6.0 was conducted to investigate the complex interaction between the determinants, geographical factors and environmental performance simultaneously, making a meaningful contribution to the existing knowledge.

Practically, the findings imply that expanding the firms' geographical operations to the international market is a good strategy for improving environmental performance, especially in the developing world where environmental regulations are more relax and clients demand for environmental friendly products and services is not as vocal as in the developed world. To obtain the highest effect, construction managers should focus on ways to embed an environmental agenda into the firm and engage project members who are capable of executing the environmental agenda throughout the project cycle. The government should also encourage firms to choose international markets where demand for environmentally-friendly products and services exist.

One of the study's drawbacks is its limitation in scope, since the study was confined only to Malaysian construction firms. Although the results can be generalized to other countries that experience similar environmental issue, studies that involve several countries will allow comparison between countries and provide valuable information on the role of geographical factors in achieving broader environmental goals. Secondly, the sample consists of only eight firms that operate in the international market. We admit that there is a small number of international firms in developing countries like Malaysia. Engaging these international firms may be through in-depth interviews will enrich our understanding on this subject.

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