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## An evaluation of environmental sustainability performance via attitudes, social responsibility, and culture: A mediated analysis

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## ABSTRACT

Demands for environmentally sustainable construction are driving firms towards the adoption of environmental sustainability practices, and the rising regulatory burden to reduce impacts on the intending users and other stakeholders may demand firms re-strategising their internal factors and level of compliance towards environmental sustainability in project delivery. Using a cross-sectional data collection method, 185 respondents from Malaysian G7 construction firms participated in this research. We utilised partial least squares path modelling for data analysis. Our findings established strong empirical evidence for the hypothesised positive effects of company culture, managerial attitudes and coercive pressure on environmental sustainability performance. However, social responsibility is revealed to have no effect on environmental sustainability performance. This is not unconnected with the fact that most Malaysian firms incur more social responsibility expenditure in the social sector than the environment. Our findings also established that coercive pressure is a positive mediator and a catalyst that plays a complementary role between managerial attitudes, company culture and social responsibility, and environmental sustainability performance. Policy implications and future study's directions are equally discussed.

## 1. Introduction

Although the natural environment has an astonishing capacity to maintain itself, human activities unsettle it and endanger its sustainability (Amel, Manning, Scott, & Koger, 2017). In order to preserve the natural environment for coming generations, there is a dire need to protect it through environmental-friendly initiatives that permit long-term ecological quality (Balsalobre-Lorente et al., 2018; Rajalakshmi, 2016). In other words, if humans leave a route of destruction and pollution as they struggle for more prosperity, without permitting the environment a break to restock itself, later generations will be unable to meet up with their needs. The current trends in the built environment are disturbing. The world has lost 80 per cent of its forests and constantly loses them at 375 square kilometres in a day to the built environment. Equally, 55 billion tons of fossil energy, metals, minerals and biomass are estimated to be extricated from the earth every year; 90 per cent of water bodies have insistent toxic biochemical pollutants (The World Count, 2020). Also, greenhouse gases are anticipated to double in the next five decades, resulting in an increase in superficial world temperature by 3°C to 6°C; 50% more natural resources are exhausted, which is higher than the level at which earth can provide (The World Count, 2020; UNSTATs, 2019).

These and many more are the environmental challenges needed to be addressed globally to save the earth and its inhabitant. Environmental sustainability is an integral part of sustainable development as a multi-faceted "cause and effect" mechanism that connects the environment and development (Brundtland, 1985). Therefore, the causes of environmental degradation are significant in this regard and the concerned firms are recognized as one of the leading players (others are clients and the government) influencing environmental sustainability with their actions (Petrescu et al., 2020; Warren-Myers and Heywood, 2016). Their relevance stems from their compelling roles in employment creation (WBCSD, 2014) and national economic development through their access to institutional, technological, and financial resources (Petrescu et al., 2020).

In the construction industry, environmental sustainability highlights a model of creating a favourably built environment by cautiously utilizing construction practices and services so that whole efficiency is enhanced and the risks for people and the environment are lowered (Kibert, 2016). As part of its sustainability commitments, the construction industry is obliged to balance human desires with the natural and cultural environment (Bamgbade, Kamaruddeen, & Nawi, 2017; Goudie, 2018). This responsibility begins from the design stage, where the architectural design should integrate occupants' safety and

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health, physical comfort and satisfaction, and efficiency (Goudie, 2018; Khare and Varade, 2018). Within the Malaysian construction industry, countless efforts have been made towards environmental sustainability, an idea which involves growing efficacy in resource consumption such as energy, materials, water, and land, while limiting building construction influences on human health and the natural environment throughout the building's lifespan (Zhang et al., 2019). Experts in the construction industry believed the industry's effort is not enough to develop green construction. Yet, the government has a vital role in promoting the culture of environmental sustainability within and not limited to the Malaysian construction industry through formulation and enforcement of legislation and policies (Chang et al., 2016). These anticipations demanded further study on factors that could impact Malaysian construction firms further to embrace environmentally sustainable construction practices in their project implementations.

While earlier studies have recognized client's demands for environmentally sustainable construction are driving firms towards the adoption of environmental sustainability practices, the rising regulatory burden to minimise influences on the intending users and other stakeholders may demand firms strategising their internal factors and level of compliance towards environmental sustainability in project delivery (Esfahbodi et al., 2017; Fogel, 2016; Löfman and Jonsson, 2016; Mountfield et al., 2019; Wiengarten et al., 2017). Several organisational internal factors have been proposed as an antecedent of environmental sustainability performance. One of the major predictors of environmental sustainability is the organisation (Fogel, 2016; Wiengarten et al., 2017). Organisational internal factors are important considerations in understanding how well a firm meets its objectives. They might be seen as strengths if they have favourable impacts on the firm's output and weaknesses if they negatively affect the business (Baumgartner and Rauter, 2017). To date, some of the organisational internal factors that have been studied in relation to environmental sustainability include leadership styles (Esfahbodi et al., 2017; Fogel, 2016; Mountfield et al., 2019; Wiengarten et al., 2017), top management's attitude (Chan & Hsu, 2016; Jang et al., 2017; Löfman & Jonsson, 2016; Todaro et al., 2020), company culture (Bamgbade et al., 2017; Evangelista et al., 2017; Matinaro and Liu, 2017; Raineri and Paillé, 2016), and attitude and perception of the construction workforce, among others (Baumgartner and Rauter, 2017; Hall et al., 2016; Liu et al., 2019; Nikmehr et al., 2017; Swaim et al., 2016; Yucedag et al., 2018).

Despite these empirical evidences, very few studies have looked at the effects of managerial attitudes, company culture, and social responsibilities on the construction industry's environmental sustainability performance. Additionally, organisational internal factors such as managerial attitudes, company culture and social responsibilities are considered in the present study because they play essential roles in shaping the development of strategies and the formulation of policies that promote the culture of environmental sustainability within an organisation (Nikmehr et al., 2017; Rao and Tilt, 2016; Setó-Pamies and Pappoikonomou, 2016). The extant literature has also identified firms' social responsibilities (a dimension of organisational factors considered in this study) that focuses on improving the quality of the environment as a viable concept that can improve the environmental sustainability of an organisation (Bhattacharyya, 2016; Crane et al., 2019; Gallego-Álvarez and Ortas, 2017; Rajalakshmi, 2016). However, only limited empirical evidence has investigated the effects of organisational internal factors (such as managerial attitudes, company culture, and social responsibility) on the construction industry's environmental sustainability performance. This study intends to fill such a gap empirically by examining how managerial attitudes, company culture, and social responsibility could affect Malaysian large construction firms' environmental sustainability performance through coercive pressure. In this study, we build on concepts of firm capability and resources allocation to understand how construction firms develop their dynamic capability of a proactive environmental policy to safeguard the natural environment and guarantee profits for the firms. To shape our claim, we draw on

the contingency Resource-Based View (RBV) theory (Aragón-Correa and Sharma, 2003) to understand how resources can be allocated to generate more meaningful outputs or profits for a firm. This study focused on Grade 7 (G7) construction firms holding a G7 licence approved by the Construction Industry Development Board (CIDB) Malaysia. The G7 license allows them to bid and deliver projects for an unlimited amount. Specifically, we focussed on the construction firms undertaking civil engineering and building construction. The findings of this study have consequences for policymakers and stakeholders in the construction industry, and they may aid in successful policymaking and oversight of firms' compliance with environmental regulations. In the subsequent sections, the underpinning theory is explained, followed by the development of hypotheses to be examined, methods are discussed, findings are communicated and linked to the theory and literature, and conclusions are drawn with relevant implications and recommendations for future studies.

## 2. Theoretical considerations and hypotheses development

### 2.1. Theoretical considerations

Drawing from theoretical perceptions of contingency RBV, which blends the RBV and contingency theories, this study focuses on resource allocation concerning organisational internal factors by contemplating internal and external related factors. Precisely, it contends that the allotment should be contingent on the degree of a firm's internal and external pressures. Based on the principle of the resource-based view (RBV) (Barney et al., 2001; Wernerfelt, 1984), by coordination between resources and capacities, an organization can gain a competitive advantage. A resource may not be useful per se, but several resources materialize as capabilities when packaged together for a real, worthwhile mission (Hoopes et al., 2003). In a given context, these capacities and tools perform and are determined by many contingent variables (Jeble et al., 2018). RBV speaks of the "valuable", "rare", "impeccably imitable" and "not substitutable" (VRIN) system (Barney, 1991).

Nevertheless, because of its imitation, every company could eventually collapse due to competition, leading to a reduction in its market share (Jeble et al., 2018). Ling-Yee (2007) has elucidated that RBV suffers from "context insensitivity", where resources or abilities that fall into the "VRIN" framework are challenging to identify. This implies that the conditions in which capabilities or resources can be most important may not be identified (Ling-Yee, 2007). The theory of contingency discusses this concept of contingent scenarios and insists that internal and external influences can affect how an entity is handled (Grötsch et al., 2013) and therefore impact the capacities or resources required in varying conditions to drive efficiency. The contingency theory indicates that volatile variables that are both inherent and external to companies further influence these capacities' final realisable performance (Grötsch et al., 2013).

Increasingly, advocates of RBV are acknowledging the above inadequacy and have appealed for the inclusion of a contingency viewpoint in evaluating the competitive significance of organisational capabilities and resources. Contingency theory is opposed to the notion of universalism, that is, a single, efficient methodology to take part in a market (Freeman, 2015). Alternatively, an approach's efficacy is bolstered by its compatibility with or advantageousness of a firm's internal value chain activities, structure and strategies, and the external environment. Blending the viewpoints of "contingency theory" and "resource-based view theory", contingency RBV theory advocates that the efficacy of a capability or resource is measured by its fit with the exogenous characteristics of a firm, such as its internal formation (or structure) or external environment (Aragón-Correa and Sharma, 2003). The Contingency RBV theory guides decisions on resource allocation, as more organisational resources can be expended in expanding resources that generate more meaningful outputs or profits for a firm.

Applying the theory to this context, this study maintains that a construction firm's choice to develop its organisational internal factors

should be contingent on its internal factors (such as managerial attitudes, company culture and social responsibility) and external factors (coercive pressure). Accordingly, organisational internal factors (like managerial attitudes, company culture and social responsibility) and coercive pressure represent a construction firm's internal structure and external environment, respectively. Contingency theory proposes that firms must adjust subject to the environmental circumstances in which they operate (Donaldson, 2001). Scholars have suggested a "contingent RBV" as it aids in addressing the reasonably static nature of the RBV. This development helps evaluate the degree to which different organisational capabilities or resources may provide value (Aragón-Correa and Sharma, 2003) to augment further the theory's expediency (Brush and Artz, 1999) and to recognize circumstances that affect the usefulness of different capabilities or resources. Contingencies have been identified as crucial in achieving competitive advantage generated by capabilities and resources, particularly in connection with deployment and selection (Sirmon et al., 2008).

## 2.2. Hypotheses development

### 2.2.1. Organisational Internal Factors (OIF), Coercive Pressure (CI) and Environmental Sustainability Performance (ESP)

Firms with managers holding strong attitudes toward the natural environment will be more fixated on problems connected with the natural environment (Testa et al., 2018; Todaro et al., 2020). The greater the attention top management is putting on environmental issues, the more their determination to respond to these problems (Jang et al., 2017). The firm's natural environment's positive attitudes are vital for developing and wherewithal of firms' proactive environmental approaches for two key reasons. Firstly, the managers have total power over resource production and utilization, including allocating resources for environmental practices (Testa et al., 2018). Secondly, the manager turns out to be a resolute "champion of the cause" and the connecting badge to harmonize all the firm's environmental management practices (Testa et al., 2018). Chan & Hsu (2016) revealed the strong impact that managers' attitude has on the organisations' adoption and execution of environmental practices in their study comprising forty company executives in the Chinese hospitality industry. Similarly, Löfman & Jonsson (2016) have observed that behavioural factors that include beliefs, values, and norms influence one's overall inclination to act with pro-environmental intention, impacting all actions an individual deems to be environmentally essential.

Additionally, Testa et al. (2018) argue that optimising firms' accountable environmental behaviour depends mainly on managerial attitudes. Managers' attitudes regarding the natural environment signify one's overall position to overlook or react with a pro-environmental commitment to vital questions and problems relating to one's immediate natural environment (Löfman and Jonsson, 2016). It was maintained that proactive manager attitudes regarding the natural environment profoundly affect adopting and implementing environmental management practices in their firms (Löfman and Jonsson, 2016; Testa et al., 2018).

While prior studies (Chan & Hsu, 2016; Epstein & Buhovac, 2014; Han & Yoon, 2015; Jang et al., 2017; Löfman & Jonsson, 2016; Testa et al., 2018) have investigated the direct impact of manager's attitudes on "firm-level" acceptance and application of environmental management practices and strategies, some critics maintain that the connection is not uncomplicated. For example, Han & Yoon (2015) claims that an explicit correlation between attitudes of managers and environmental behaviour of small firms is somewhat inappropriate. Previous findings have revealed that small businesses, irrespective of their managers' attitudes, have difficulty turning managerial pro-environmental attitudes into real behaviour. However, in recent time, Testa et al. (2018) stressed the significance of leadership in establishing and executing sustainability strategy and also in discussing corporate sustainability with internal and external stakeholders; Chan & Hsu (2016) portrayed management as an essential power in corporate

environmentalism. Other confusing variables could clarify how managers' attitudes transform into real environmental management practices at the "firm-level". This study delves into this issue by assessing the effect of managers' attitudes toward the natural environment on firms' strategic position toward embracing and implementing environmental sustainability practices.

Moreover, company culture is another internal factor conceptualised to affect the construction firm's environmental sustainability performance. Bamgbade (2016) argued that exceptional environmental performance hinges on integrating environmental concerns into the company culture. Raineri & Paillé (2016) also believed that a sustainability-related culture allows organisations' decision-makers to maintain equilibrium among economic, ecological and social objectives. Previously, Shrivastava & Hart (1995 p. 162) were confident that "organisational values should emphasise harmonious co-existence with the natural world, view humans as part of the natural world, and acknowledge the rights of nature to exist". Galpin, Whittington, & Bell (2015) emphasised that environmentally sustainable organisations must cultivate cultures founded on shared environmental values, pro-sustainability social norms, and artefacts that emphasise the importance of environmental sustainability. Later, Jizi (2017) and Thakathi, le Roux, & Davis (2019) also revealed that genuinely entrenched sustainability-related values are crucial to the firm's environmental sustainability performance. Hence, to become sustainable, organisations must go through a paradigm change in their values and culture, and this culture shift must influence every part of the organisation's life (Bamgbade, 2016; Matinaro & Liu, 2017).

Furthermore, Evangelista et al. (2017) identified the foundational practices that drive environmental sustainability in an organisation, one of which is its culture. Their studies of forty-seven (47) sustainable organisations established that environmentally sustainable organisations promote a consistent, visibly articulated, and shared culture and have inflexible core values. Organisations seeking to be sustainable must build a supportive culture of sustainability. However, Evangelista et al. (2017) also did not indicate whether these shared organisational cultures' particular traits are unique to sustainable organisations. Despite the growing confidence that the company's culture is fundamental to accomplishing sustainability, relatively little study has been carried out to pinpoint this culture's specific characteristics (Doppelt, 2017). While some researchers, including Raineri & Paillé (2016); Matinaro & Liu (2017); Evangelista et al. (2017), have scrutinized the types of organisational cultures that reinforce social responsibility, others have constrained their contributions to proposed or even inferred, cultural dimensions and values they contemplate necessary to corporate sustainability. The often-cited study of Linnenluecke, Russell, & Griffiths (2009) and Linnenluecke & Griffiths (2010) focused on culture categorizations rather than individual cultural dimensions. Future orientation and proactiveness are additional parts of culture deemed critical for organisations longing to adopt sustainable practices (Lefkowitz, 2017). For social sustainability, Bamgbade (2016) believes that organisations must have social skills such as negotiation, engagement, openness, and community values, including trust, respect, justice, coordination, and care.

Moreso, fundamentally, the firms' activities impact the environment in considerable ways. With the increasing significance of ecological hazards, firms have reacted at a collective level through associations to cooperate with institutions; and at an individual level – by introducing and incorporating sustainability-related matters in their operation and policy (Pogutz, 2008). Three motivations have been acknowledged by Rai & Bansal (2014) for organisations reacting to environmental concerns: competitiveness, legitimacy, and environmental responsibility.

Organisations driven by competitiveness concentrate on cost-effectiveness through low cost and variation (Rai and Bansal, 2014). Their judgment is based on the analysis of "cost-benefit" with a concentrated effort on the clients/customers and shareholders' desires. Firms driven by legitimacy concentrate on conforming with rules and guide-

lines to guarantee their businesses' easy running. They concentrate on their stakeholders, local community and the government. Also, firms inspired by environmental responsibility aim at increasing corporate confidence. Indicators on environmental sustainability offer statistics on firms' progress, subject to the definition of environmental sustainability's construct. For example, environmental sustainability is defined by Zoogah (2014) from the point of view of the practices and processes deployed by firms which increases the quality of the ecosystem in the long run.

In comparison, in terms of the sustainable policies of green companies, corporate environmental sustainability is defined by Prasad, Mishra, & Bapat (2019), whereas Yusliza et al. (2019) suggest eco-friendly practices in their description. Others define environmental sustainability from the perspective of energy conservation, resource management, and product sustainability, such as Cowan et al. (2010). Companies like Walmart have integrated energy, waste and product creation to demonstrate their contribution to environmental sustainability (Walmart, 2015). However, a number of procedures a company should follow to guarantee environmental protection, including the environment itself as an aspect of the CSR strategy, which is undisputed to contribute favourably to being sustainable (Pogutz, 2008). As both factors, the success of environmental sustainability and social responsibility strives to reduce the influence of companies' actions on the environment. There is an upgradable opposition in the descriptions arising from realistic and theoretical viewpoints (Pogutz, 2008). Dahlsrud (2008) indicated that social responsibility requires safeguarding environmental sustainability, as CSR aims to integrate environmental and social problems into businesses' corporate practices.

The theoretical oppositeness between environmental sustainability and social responsibility has been named "environmental CSR", which encompasses firms going beyond conformity to participate in eco-friendly activities (Demmerling, 2014). The quest towards "environmental CSR" is motivated by the level of competitiveness in the marketplace, ethically inspired employees, socially responsible shareholders, and pressure from global markets (Duanmu et al., 2018; Jamali and Karam, 2016). The "supply-side" factors swaying "environmental CSR" comprise regulation from the government and enhancement in environmental effectiveness in reducing costs (You et al., 2019). Additional, firms are found to divulge environmental information in their yearly reports to guarantee legitimacy (Kansal et al., 2014). As a developing economy, Malaysia is facing double challenges of dealing with environmental trepidations and economic growth. Hence, now mandatory, especially for government-linked companies, to incur CSR spending to enhance investors' accountability, including responsibility to the environment.

As per the procedures in the Companies Act, 2016 with the tagline "driving business beyond profitability", firms are expected to constitute a CSR Board of the committee and incur a minimum of 2% of the average proceeds netted on CSR activities (Malaysian Company Act, 2016). This regulation from the government is expected to swing the supply of "environmental CSR" upwardly, constraining firms to participate in "environmental CSR" at the same par with production, which is expected to aid firms in improving their environmental sustainability performance owing to their expenditure in environmental activities as a fragment of the CSR policy (Lys et al., 2015). Likewise, social responsibility and environmental sustainability, in this situation, will have a positive correlation. Though, one of the social responsibility elements is its charitable nature (de Jong and van der Meer, 2017; Williamson et al., 2006). So, even within the obligation to be socially responsible, firms have the choice to choose precise areas for investment. In Malaysia, as part of their social responsibility, companies can invest in a variety of areas such as education, the environment, community development and sanitation. Because of the charitable nature of social responsibility practices, organizations may expand to areas other than the environment unless they expect a rise in the need for social responsibility activities in the area of the environment. In such a case, as they have surplus resources,

businesses will change the environment, making their contribution a humanitarian gesture, implying little connection between corporate responsibility and the success of environmental sustainability (Lys et al., 2015). Verma & Kumar (2014) noted that a longitudinal social responsibility investment study of thirty BSE Sensex companies showed that the climate is not a focus field for India's CSR. However, these surveys were carried out as part of the Companies Act, 2013, prior to the CSR legislation, and companies may have expanded their allocation to the environment in the post-regulation period. The top 20 Indian companies' CSR spending for 2014-2015 indicates that ensuring environmental sustainability is the third most involved sector, accounting for approximately 20 per cent of the overall CSR spending, after education and healthcare (Press Information Bureau (PIB) 2015). (Press Information Bureau (PIB), 2015). In the Malaysian sense, Lu & Castka (2009) also noted that, relative to the environment, companies spent more on social responsibility related initiatives in the social sector. Their assertion is focused on qualitative studies of businesses from diverse sectors' annual results.

The hypothetical model for the interaction between social responsibility, coercive pressure, and environmental sustainability performance is shown in Fig. 1. Therefore, from the empirical shreds of the evidence above, it suffices to hypothesise as follows:

- H<sub>1a</sub>: There is a significant positive effect between managerial attitudes and environmental sustainability performance.
- H<sub>1b</sub>: There is a significant positive effect between social responsibility and environmental sustainability performance.
- H<sub>1c</sub>: There is a significant positive effect between company culture and environmental sustainability performance.
- H<sub>2a</sub>: There is a significant positive effect between managerial attitudes and coercive pressure.
- H<sub>2b</sub>: There is a significant positive effect between social responsibility and coercive pressure.
- H<sub>2c</sub>: There is a significant positive effect between company culture and coercive pressure.

#### 2.2.2. Coercive pressure and environmental sustainability performance

Firms take part in environmental programmes to obtain benefits or forestall being outlawed/fined due to nonconformity with certain government regulations (Saeed et al., 2018). Regulatory institutions can compel them to abide by institutional requirements concerning environmental sustainability through command and control (mandatory regulations) and economic inducement instruments (charitable programmes that allow firms to obtain subsidies or other concessions) (Daddi et al., 2016; Li et al., 2017; López-Gamero et al., 2010; Saeed et al., 2018). DiMaggio & Powell (1983) emphasised that coercive pressures stem from political pressure and a legality problem. Coercive pressures allude to government demands for businesses to conform with environmental regulations and policies or partake in environmental management programmes. They are the organisation's most apparent external influences (Daddi et al., 2016; Roxas et al., 2017). Previous research observed that coercive pressures have a considerable effect on the organisation's environmental behaviours (Daddi et al., 2016; Li et al., 2017; Saeed et al., 2018).

In the construction context, a firm will try to comply with rules and regulations to legitimise. In a bid to lessen the harmful effects of construction activities on the environment, regulatory institutions engage in different strategies, including regulation, information, encouragement, and incentives (Daddi et al., 2016). Given that sustainability standards are specified in the certification programmes, which indicate the adoption of green practices, to qualify, the regulatory institutions compel participants to implement the requisite practices (Daddi et al., 2016). It should be noted that, in developing countries where government institutions are not strong enough, there is inadequate political resolve in stringent regulatory compliance. The Malaysian government's actions to highlight environmental concerns through visions, investments, reg-

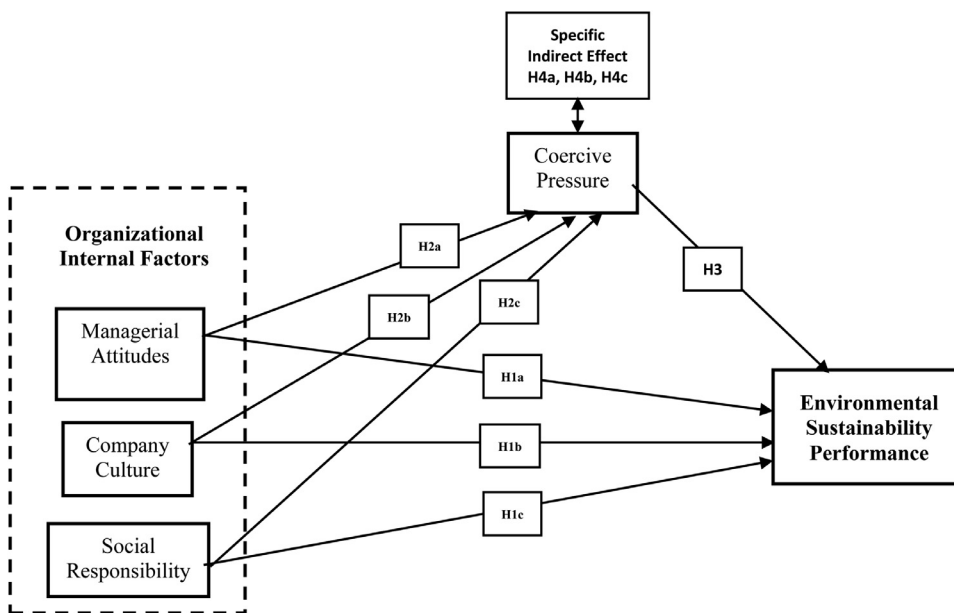


Fig. 1. Effects of OIF and CI on ESP.

ulations, directives, punishments, and awards indicate its readiness in tackling environmental issues. They also represent the government's anticipation of sincere and responsible environmental commitments by organisations. Within the context of sustainability, [Adebanjo, Teh, & Ahmed \(2016\)](#) asserted that firms are subject to all three forces (coercive, normative and mimetic pressures). Besides, they noted that the construction industry is significant polluters and accountable for greater exhaustion of resources than others and are consequently subject to tremendous pressure. Equally, [Zhang et al. \(2019\)](#) discovered that in Malaysia, the construction firms are obliged by institutional forces to become more responsible environmentally in their operations. In their study, they found that competitor and regulatory pressures were exceptionally strong in this respect. The study by [Chu, Xu, Lai, & Collins \(2018\)](#) also confirmed that China's construction industry is faced with growing institutional pressure to become sustainable in their operations.

Clients are also an influential force in improving environmental sustainability adoption and practice considering their influence on contractors [Ainin, Naqshbandi, & Dezdar \(2016\)](#) and indirectly exert coercive pressures on firms. Adoption and practices of Environmental sustainability standards may also be the "responsible response" from firms under scrutiny by social and environmental "watchdogs" ([Lee et al., 2018](#)). [Kauppi & Hannibal \(2017\)](#) remarked on the significance of external pressure regarding implementing environmental sustainability practices and advocated that such pressure is gradually becoming paramount. This view was also recognised by [Lee et al. \(2018\)](#). They observed that businesses worldwide are progressively subject to regulation that inspires them to minimise the polluting effects of product and process activities. The growing consciousness of clients and other external pressures to be sustainable were recognized by [Darko, Zhang, & Chan \(2017\)](#) when they found clients, investors and non-governmental organisations as drivers of sustainability in the construction industry.

External pressure has already been found to incorporate societal pressure and ethical action as fundamental facets of sustainability ([Chan, Darko, & Ameyaw, 2017](#); [Darko et al., 2017](#)). This ensures companies face tremendous external pressure to remain profitable. [Daddi et al. \(2016\)](#), however, concluded that companies need to turn the pressure they encounter into an advantage. Environmental outcomes faced by the organization are one such potential benefit. However, economic performance is also essential for contractors in the sector. Construction performance relating to environmental sustainability con-

tributes to firms' willingness to eliminate waste, reduce resource/energy usage and improve productivity ([Daddi et al., 2016](#)).

However, the purpose of external pressure might not essentially be related to the company's financial output. In reality, many external stakeholders are not solely motivated by the company's performance obligations. Government regulators, for example, will advocate for emissions reduction and promote recycling, regardless of whether this contributes to the organization's improved economic efficiency. Besides, clients will be inspired by the desire to align with their sustainability agenda ([Daddi et al., 2016](#)). Similarly, social pressures will ultimately facilitate good corporate citizenship ([Chan et al., 2017](#)). Therefore, the immediate impact of coercive pressure will drive evident and understandable environmental sustainability management policies to be implemented. Thus, this study embraces the viewpoint that the construction industry operates in an environment where they are subject to external pressure from various stakeholders to be environmentally sustainable in their operations. The main concern is developing insight into what is the effect of such intense pressure. Therefore, it is thus hypothesised:

H<sub>3</sub>: There is a significant positive effect between coercive pressure and environmental sustainability performance.

### 2.2.3. Mediating effects of coercive pressure

A mediating variable clarifies the relationship between an independent (predictor) variable and a Dependent variable (criterion) ([Baron and Kenny, 1986](#)). Mediators explain how something works or why it works. An interfering variable that describes the correlation between a predictive variable and a criteria variable is considered by the mediator ([Kenny and Judd, 2014](#)). One justification for testing mediation is to consider the process by which the independent variable influences the result (dependent) variable. Mediation and moderation evaluations are an integral aspect of what has been referred to as process analysis, but mediation tests appear to be more accurate than moderation analyses ([Kenny and Judd, 2014](#)). In comparison, as most causal or structural models are examined, the model's mediational component is always the most interesting portion.

Firms across the globe are faced with growing pressure to reorganise their strategic preferences and capabilities in reaction to demands for sustainable development in which Malaysia is not an exception. This led to several legislative and regulatory reforms to bolster the Malaysian government's capacity to establish an institutional framework that ef-

ficiently supports businesses' embracing environmental sustainability practices. However, issues emerge about the scope and nature of the impacts of different institutional environmental factors, like government regulations, policies, and industrial practices, on firms' inclination to embrace environmental sustainability practices.

Firms' external environment is regulated by institutions exhibited by various social constructs, including norms, schemas, and practices (Scott, 2002). These social constructs are deep-rooted in society and have reached a high dependence on reliable regulations for social conduct (Scott, 2002). Firms attain legality from their institutional framework if their conduct and practices align with specific regulatory, normative, and cognitive requirements. Previous researches (Ajibike et al., 2020; Bamgbade et al., 2019; Bamgbade et al., 2017; Jaaffar et al., 2018; Lu et al., 2018; Saeed et al., 2018; Yusliza et al., 2019) have identified the roles of regulatory, social, economic, competitive and industrial structures and their execution processes in the implementation of different kinds of environmental management. These studies gravitate to investigate the immediate impacts of institutions on environmental sustainability practices at the organisation level.

Environmental policies are approved to curb the environmental harms caused by firms' operations ((Dechezleprêtre and Sato, 2017). Hence, construction firms are obliged to work under regulation constraints (Lai and Wong, 2012; Wagner, 2015). Environmental regulation reinforces the performance of environmental sustainability in construction firms through environmental requirements and standards on compliance. Hence, there is a necessity for environmental regulation's compliance to bolster the construction firms' commitment to implementing environmental sustainability strategies and approaches. This statement is in line with Lai & Wong (2012) result on green logistics management among the Chinese manufacturing exporter, which observed that environmental regulation mediates the correlation between environmental practices and firm performance. The conventional viewpoint of environmental regulation on the firms' performance is that environmental regulations go with an added cost that eats away the firms' profits. However, if environmental regulations are well-conceived and properly channelled, it tends to make up for the conformity's cost and strives innovation, resulting in business and environmental performance (Chen et al., 2016; Geng et al., 2017). Following Zhao, Lynch Jr, & Chen (2010) and Ramayah, Cheah, Chuah, Ting, & Memon (2018), this study, therefore, introduces coercive isomorphism as a mediating variable to understand how managerial attitudes affect environmental sustainability performance. We then hypothesised that coercive isomorphism is a significant mediating construct in managerial attitudes and ESP relationships. Therefore, it suffices to hypothesise as follows:

*H4a: Coercive pressure significantly mediates the relationship between managerial attitudes and environmental sustainability performance.*

*H4b: Coercive pressure significantly mediates the relationship between social responsibility and environmental sustainability performance.*

*H4c: Coercive pressure significantly mediates the relationship between company culture and environmental sustainability performance.*

### 3. Research method

#### 3.1. Measures

This study used questionnaires with items adopted and adapted from several previous studies and prepared in the English language. A "7-point" and "5-point" Likert scale ranging from strongly disagree to strongly agree was used for endogenous and exogenous variables, respectively (Robinson, 2018). To examine managerial attitudes, social responsibility and company culture, seven separate statements were adapted and adopted from Chatterjee, Grewal, & Sambamurthy (2002), Bamgbade (2016) and Sanders & Neuijen (1987), respectively. A total of eight items were adopted and adapted from Bamgbade et al. (2019) and Abidin (2005) to measure environmental sustainability performance

with reliability varies from 0.81 to 0.90 (Bamgbade et al., 2019). Sample of these items comprises, "solid waste minimisation is an important environmental sustainability practice considered in our projects."

Also, 8 items were adopted and adapted from Zhu, Sarkis, & Lai (2013), to measure coercive pressure. Omer (2019) recorded a Cronbach alpha of 0.82 for the construct. Examples of the statements are, "the increasing environmental consciousnesses of our clients have spurred our company to adopt and implement environmental sustainability strategies" and "penalties will be imposed if our company does not comply with the environmental regulations."

#### 3.2. Sample size and data collection procedure

Bearing in mind that this research focuses on environmental sustainability among Malaysian G7 construction firms, a sample of the Malaysian G7 construction firms were randomly selected using a proportionate cluster sampling technique. This study was designed to target the top and middle management levels of Malaysian G7 construction firms as respondents. From the data gathered from the Construction Industry Development Board (CIDB) website, a total of 7,358 G7 construction firms were available as of January 2020. Regarding the sample size, Iacobucci (2010) strongly advocated as "bigger is always better". It is generally agreed that a larger sample size enhances the power and lowers the estimation error (VanVoorhis and Morgan, 2007). In this context, GPower 3.1 was utilized to obtain a better sample size (Faul et al., 2007). From the outcome of GPower statistics, an appropriate sample size of 146 was measured having power (1- $\beta$  err prob. = 0.9).

Following the recommendation of Waris, Liew, Khamidi, & Idrus (2014) and Bamgbade et al. (2019), that the Malaysian construction industry has been linked with low response's rate and to take good care of this idiosyncratic trend and also reduce sampling error, the recommendations of (Hair et al., 2010), that the sample size is doubled or tripled, is adhered to. Hence, a sample size of 438 is adhered to, which is also in line with Sekaran & Bougie (2016), that the perfect sample should be between thirty (30) and five hundred (500). In light of the argument mentioned above, this study managed to get a response from 185 respondents. In this study, the survey research method was used to collect data online. Survey research was considered the most appropriate because it is a widely used method adopted by organisational researchers interested in collecting information about a huge population that cannot be observed directly (Druckman, 2005; Tanur, 1982). Meanwhile, the survey was carried out online because of the current pandemic ravaging the whole world. One hundred and eighty-five (185) of 438 questionnaires mailed were returned and completed, and all found appropriate for analysis, reflecting a response rate of 42%. This response rate is in line with existing studies (Bamgbade et al., 2019; Taofeeq, Adeleke, & Ajibike, 2020; Waris et al., 2014).

The sample of 185 respondents has a moderately imbalanced population distributed between female (31.9%) and male (68.1%) respondents. The main group of respondents were Chief Executive Officer (14.6%), Executive Officers (18.9%), Managing Directors (21.1%), Construction Managers (13.5%), Project Managers (21.1%), and others (10.8%) respectively. Generally, 47.0% of the respondents have a minimum of one (1) and five (5) years of experience within construction firms under review.

Before the main study, the questionnaire items were assessed by ten experts from both academics and the construction industry, and their recommendations were infused into the questionnaire before the main data collection was carried out. After that, a pilot study was carried out with sixty respondents. This is consistent with the current literature that has emphasised the suitability of 60 respondents in a pilot test (Sekaran and Bougie, 2016). The data from the pilot study were analysed using SPSS software version 26. The findings showed that 5 out of 37 items loaded lower than the recommended value of 0.70. Therefore, they were removed (Sarstedt et al., 2014), which reduced the items' total number to 32.

**Table 1**  
Descriptive Statistics, Normality Assessments, Reliability and Validity of Measurement Model.

Construct	Descriptive Statistics					Normality Statistics					
	N	Min	Max	Mean	Std Dev.	CA	CR	AVE	VIF	Skewness	Excess Kurtosis
CC	185	1	5	3.964	0.805	0.865	0.897	0.557	2.449	-0.512	0.050
CP	185	1	5	3.826	0.806	0.929	0.942	0.669	2.764	-0.446	0.177
ESP	185	3	7	5.820	0.769	0.921	0.937	0.681	2.643	-0.424	-0.065
MGA	185	1	5	4.079	0.763	0.909	0.933	0.735	2.661	-0.615	0.529
SR	185	1	5	3.697	0.869	0.891	0.920	0.698	2.738	-0.606	0.405

Note: (N) Observation; CR (composite reliability); CA (Cronbach alpha); AVE (average variance extracted); CP (Coercive Pressure); ESP (Environmental Sustainability Performance); MGR (Managerial Attitudes); SR (Social Responsibility); CC (Company Culture); VIF (variance inflation factor).

### 3.3. Analysis

To drive the analysis of its main data, this study utilized a Structural Equation Modelling technique. Thus, Smart PLS 3 software was employed in this study's analysis. The SPSS software version 26 was also used to analyse the descriptive and demographics statistics of this research. Respondents were guaranteed their anonymity throughout and after the survey to avert common method bias (CMB), which is consistent with the recommendations of (Podsakoff et al., 2003). Besides, Kock (2015) also recommends a unique method for observing CMB for PLS-SEM research. The incidence of a VIF of 3.3 and above indicate possible collinearity, and it is also a sign that CMB may influence a model. Hence, the model can be assumed to be free of common method bias if all the VIFs' values are equal or lesser than 3.3 (Becker et al., 2015). From the outcomes, as displayed in Table 1, all the VIFs' values are below 3.3, demonstrating CMB is not an issue. Respondents were also enlightened with substantial expertise to respond to the questionnaire items. In testing for non-response bias, early and late respondents' responses were compared. Early responses of 113 (61.1%) were compared with those of late responses 72 (38.9%) using the independent sample t-test. The outcome showed no significant variation in all variables examined, which shows that responses are typical of the target respondents (Armstrong and Overton, 1977). Additionally, following Lindner & Wingenbach (2002) recommendation, since this study attained a 42% response rate, it is also an added proof that the issue of non-response bias does not seem to be a major fear.

### 3. Empirical findings

The descriptive statistics, as revealed in Table 1, signifies the values of the SD and mean. The mean values of 4.0 out of 5 and 5.8 out of 7 indicate that most respondents agree to the questionnaire items. For SD, all the values are reasonably close to each other, which shows that the constructs have been equally spread, signifying data distribution's normality.

As revealed in Fig. 2, all the measurement items exceeded the recommended value of 0.7 (Sarstedt et al., 2014) except CC6 and CC7. Still, they were retained since the AVE and CR meet their necessary thresholds level and keeping them does not meaningfully hinder the model integrity (Hair et al., 2010; Md Noor et al., 2019). This indicates that all the items favourably contribute to their respective constructs. Composite Reliability (CR) and Cronbach's alpha (CA) varied from 0.897 to 0.942 and 0.865 to 0.929, as highlighted in Table 1, respectively, for all five constructs. This study's CA and CR results exceeded the minimum thresholds values of 0.7, hence signifying all constructs' internal consistency and reliability. The AVE for all constructs also surpassed the threshold of 0.50, indicating convergent validity for all the constructs (Hair et al., 2016).

The VIF was also examined to test for likely multicollinearity issues. As shown in Table 1, VIF values ranged from 2.449 to 2.764 for all the constructs, thereby confirming no multicollinearity issue (Becker et al., 2015). To test for discriminant validity (DV), the HTMT developed by

**Table 2**  
Heterotrait-Monotrait Ratio (HTMT).

Constructs	CC	CP	ESP	MGA	SR
CC					
CP	0.757				
ESP	0.811	0.791			
MGA	0.684	0.674	0.782		
SR	0.643	0.732	0.694	0.670	

HTMT < 0.85 (Henseler et al. 2015)

Note CP (Coercive Pressure); ESP (Environmental Sustainability Performance); MGR (Managerial Attitudes); SR (Social Responsibility); CC (Company Culture).

Henseler et al., 2015 was applied. The HTMT is advocated to be a superior boundary criterion for accessing DV. The HTMT, an approximation for factor correlation, should be considerably lesser than 1 (preferably < 0.850) to differentiate between two factors (Henseler et al., 2015). Results, as shown in Table 2, indicate a range between 0.643 and 0.811. These values are below the recommended value of 0.850, signifying that all constructs are clearly autonomous and that the DV benchmark was met.

To examine the structural model, statistical significance,  $R^2$  and effect sizes values were taken into consideration. Hair, Ringle, & Sarstedt (2011) advocated path coefficients to test the statistical significance with a minimum value of 1.65 t-values and p values of  $\leq 0.01$  confidence interval. Similarly, Cohen (1988) also advocate effect sizes of 0.02, 0.15, and 0.35 as a small, medium, and large effect, respectively. Henseler, Ringle, & Sinkovics (2009) considered  $R^2$  values of 0.25, 0.50, and 0.75 as weak, moderate, and substantial, respectively. The PLS bootstrapping was initiated using 5000 subsamples (Adeleke et al., 2018; Hair, Gabriel, & Patel, 2014).

In this study, an evaluation of the coefficient of determination ( $R^2$ ) was also measured, which is the level of variance, as explained by all four exogenous constructs, as revealed in Fig. 3. In this research, the results of  $R^2$  are 0.701 and 0.597, which shows a moderate degree of variance explained in environmental sustainability performance and coercive pressure, respectively, which indicates that all three exogenous constructs (i.e., managerial attitudes, social responsibility, and company culture) altogether significantly explained the variance in environmental sustainability performance and coercive pressure respectively (Henseler et al., 2009). Hence, they are considered significant for further understanding (Hair et al., 2014). As shown in the Fig. 3, company culture ( $\beta = 0.310$ ; t-value = 4.597;  $p \leq 0.01$ ) has the strongest positive effect and predictive capability on environmental sustainability performance followed by managerial attitudes ( $\beta = 0.370$ ; t-value = 4.763;  $p \leq 0.01$ ), and coercive pressure ( $\beta = 0.279$ ; t-value = 4.011;  $p \leq 0.01$ ). However, social responsibility is revealed to have no effect on environmental sustainability performance. These results confirm the initial hypotheses H1a, H1b and H3 which shows that MGA, CC and CP have significant positive effects on environmental sustainability performance

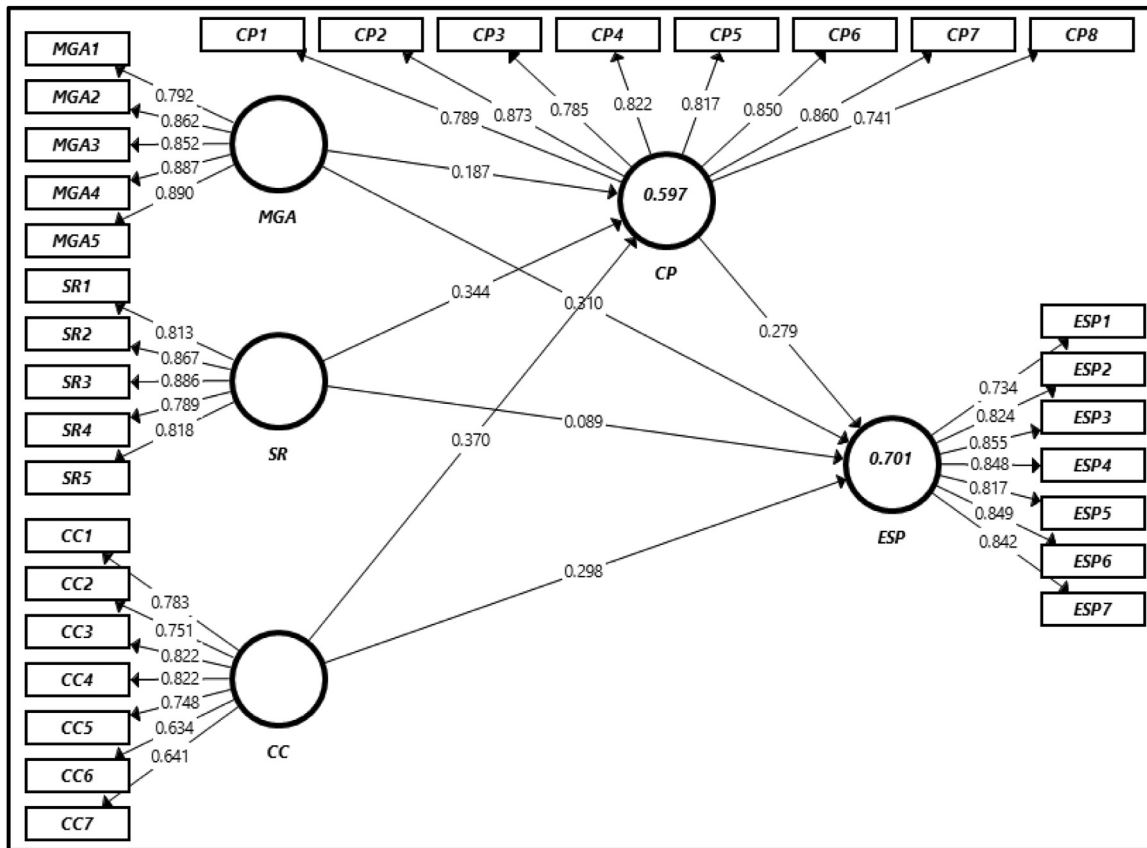


Fig. 2. Measurement Model.

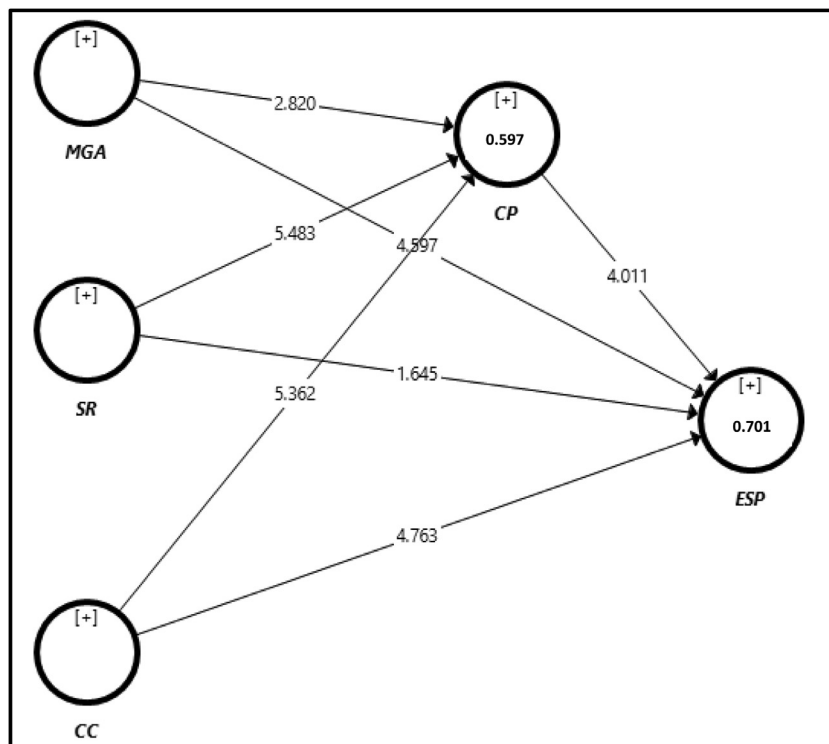


Fig. 3. Structural Model.



**Table 3**  
Structural Model Results.

Hypotheses	Path	$\beta$	Std Error	t-value	P-Values	Confidence Interval		Decision
						2.50%	97.50%	
<b>H1a</b>	MGA -> ESP	0.310	0.067	4.597	0.000	0.166	0.436	<b>Supported</b>
<b>H1b</b>	CC -> ESP	0.298	0.063	4.763	0.000	0.190	0.422	<b>Supported</b>
<b>H1c</b>	SR -> ESP	0.089	0.054	1.645	0.101	-0.006	0.200	<b>Not Supported</b>
<b>H2a</b>	MGA -> CP	0.187	0.066	2.820	0.005	0.060	0.311	<b>Supported</b>
<b>H2b</b>	CC -> CP	0.370	0.069	5.362	0.000	0.220	0.492	<b>Supported</b>
<b>H2c</b>	SR -> CP	0.344	0.063	5.483	0.000	0.204	0.453	<b>Supported</b>
<b>H3</b>	CP -> ESP	0.279	0.070	4.011	0.000	0.145	0.418	<b>Supported</b>
<b>H4a</b>	MGA -> CP -> ESP	0.052	0.025	2.129	0.034	0.016	0.117	<b>Supported</b>
<b>H4b</b>	CC -> CP -> ESP	0.103	0.030	3.424	0.001	0.055	0.180	<b>Supported</b>
<b>H4c</b>	SR -> CP -> ESP	0.096	0.030	3.158	0.002	0.047	0.169	<b>Supported</b>

at  $t \geq 1.65$  and  $p \leq 0.01$ , but H1c is not statistically significant and hence not supported.

Also, the significance of path coefficients' results as shown in Fig. 3 and Table 3 indicate that MGA, CC and SR have significant positive impacts on coercive pressure, reinforcing initial projections of H2a, H2b and H2c respectively at  $t \geq 1.65$  and  $p \leq 0.01$ . To evaluate mediation effects, the guidelines of Nawansir et al. (2020) and Zhao et al. (2010) was followed to investigate specific indirect effects. The outcomes show that CI complementarily mediates the correlation between MGA and ESP as well as CC and ESP wherein both the direct and indirect effects do exist and point to the same directions (i.e., both are positive) as shown in Table 3 (Zhao et al., 2010). This result is significant and confirms the initial hypotheses H4a and H4b. Although the H4c is significant and supported as earlier predicted, there is "indirect-only mediation" of CP on the effects of SR on ESP because the indirect effects of SR on ESP are significant but insignificant for the direct effects of SR on ESP as shown in Table 3 and Fig. 3.

## 4. Discussions and conclusion

### 4.1. Discussions

The study established strong empirical support for the hypothesised positive effects of managerial attitude on the G7 construction firms' environmental sustainability performance (H1a). This study's outcomes have proven that although government agencies and environmentalists' pressures remain a formidable driver of environmental sustainability performance among large construction firms, top managers' involvement and attitudes are needed for effective project delivery (Walls and Berrone, 2017). Firstly, this study presents empirical data that, notwithstanding their capability to take part in environmental sustainability practices and strategies, large construction firms in many emerging nations are forced to pay attention to environmental sustainability issues (Bamgbade et al., 2019; Esfahbodi et al., 2017; Fogel, 2016; Walls & Berrone, 2017). The positive impacts of managerial attitudes on the environmental sustainability performance of the assessed firms present innovative empirical clue that large construction firms are better placed to get positive products in their implementation of environmental sustainability practices and measures like reduction of pollution and control by refining their managerial attitudes towards the natural environment (Han and Yoon, 2015; Jang et al., 2017; Walls and Berrone, 2017). Top managers are most likely to engage in a given policy if they have a personal comprehension and interest in the issue at hand and possess the required expertise to tackle it. For example, leaders in the environmental sector are masters at motivating others to follow their example and ensure that their vision is accomplished because of their grasp of environmental issues and their value orientations (Walls and Berrone, 2017). Hence, while firms are likely to face comparable pressure to participate in corporate greening, leaders' personalities and judgment define how

firms respond. This competence primarily evolves from social sources of power that top management possess.

Hypothesis H1b, which predicted that there is a significant positive effect between company culture and environmental sustainability performance, was also supported with a medium effect size of ( $f^2 = 0.192$ ), suggesting that when construction firms integrate environmental culture, the higher their chances of adopting and practising environmentally sustainable strategies like pollution control, minimisation of solid and toxic waste, reduction in the protection of biodiversity, energy conservation and so on in construction project delivery. These results conform with the Contingency RBV theory, which submits that culture within a firm is a viable source of continual competitive advantage (Barney & Clark, 2007; Barney & Wright, 1998); and that firms with robust cultures are viewed as replicas of excellent management (Waterman and Peters, 1982). It could be recalled that company culture has been interpreted by Raineri & Paillé (2016) and Waterman & Peters (1982) as a multi-faceted set of values, beliefs, norms, and symbols that defines the way and manner by which firms do business, At the same time, based on the description of economic value suggested by Waterman & Peters (1982), certain characteristics of the extraordinary and successful company reflect, to a large extent, a strong values and beliefs in company cultures. And firms without such strong beliefs and values are constantly slackers in efficiency maximisation (Kantabutra and Suriyankietkaew, 2012; Raineri and Paillé, 2016). Therefore, the effects of company culture on environmental sustainability performance was positive, bearing in mind the fact that environmental sustainability in construction projects is always a sensation wherever it is applied because implementing its principles and strategies in project delivery guarantees not only the project success but also it improves the image of the project and arouses competitive advantage within the industry (Bamgbade, 2016; Powmya & Abidin, 2014).

Hypothesis H1c, which predicted a significant positive effect of social responsibility on environmental sustainability performance, was not significant and hence not supported. This is not unconnected with Lu & Castka (2009) study and Ibrahim, Hua, & Omoola (2019), who has reported that most Malaysian firms expend more on social responsibility related activities in the social sector than the environment. The findings are also connected to social responsibility's charitable nature (de Jong & van der Meer, 2017; Williamson et al., 2006). Construction firms are not obliged to be socially responsible through investment environmental, social responsibility activities. This could be due to unconformity with regulations that require them to expend on activities related to social responsibility and secure legitimacy from various stakeholders (Ahmad & Tower, 2011).

Furthermore, the outcome of this study presents a more refined thoughtful on how pressure from government regulatory agencies and environmentalist may offer superior clarifications on how and why some large construction firms are motivated to do better in their internal factors (like managerial attitudes, company culture and social responsibility) towards the natural environment (Walls and Berrone, 2017). Pre-

vious research (e.g., Kauppi & Hannibal, 2017; Walls & Berrone, 2017) have shown how spirited firms endlessly improve these internal factors toward the natural environment by investing and participating in activities beyond normal regulatory acquiescence due to uncertainties in the business environment occasioned by pressure from environmentalist, stakeholders, and heightened regulatory burden that could spark more stringent regulations and high expectations for additional environmental sustainability performance. Though environmental sustainability performance of several large construction firms may at first be induced by pressure from government agencies occasioned by rules and regulations (Walls and Berrone, 2017), those that have effectively established strong managerial capabilities and culture concerning environmental sustainability performance are usually symbolised by innovation and continuous learning for improvement towards the natural environment amid extreme rivalry and uncertainty (Kuckertz and Wagner, 2010; Walls and Berrone, 2017).

This study considers coercive pressure as a mediating variable to see how and why the managerial attitudes affect environmental sustainability performance based on the outcomes of numerous earlier studies that emphasised its potentialities in substantially improving environmental sustainability in construction projects in the construction industry. Government agencies are seen as a major player in enforcing environmental sustainability practices and strategies by developing environmental sustainability policies that define sustainability goals and visions for several years (Bibri, 2018; Samari et al., 2013). The result of H4a is in line with Bamgbade et al. (2019) and Seng, Kumar, & Mohtar (2012), who reported the role of the Construction Industry Development Board (CIDB), an agency of the government of Malaysia, in ensuring the stakeholders in the construction industry are responsive to the environment in their project delivery through periodic conferences, workshops and seminars so as to ensure they are in tune with environmental laws and regulations and not lagging within the international market. Consistent with this study, they discovered that without pressure from government agencies and other stakeholders within the industry in ensuring environmental laws and regulations are strictly adhere to, construction firms might not be able to achieve improvement in environmental sustainability in their construction project delivery.

Likewise, the results of hypotheses H4b and H4c are not unexpected because they are in line with earlier studies. Mousa (2015) indicated that environmental sustainability strategies could be more practised within the industry in most emerging nations with the pressure from government agencies through legislation and enforcement of environmental laws and when the construction industry's informal culture is transformed through the "unfreeze-change-lock model". Again, Häkkinen & Belloni (2011) contended that the industry's fragmented culture and numerous players' participation in the construction project's execution necessitate performance-based government regulations to ensure compliance with construction firms' environmental regulations. More importantly, this study also highlighted the significance of government pressure in the form of policies and regulations to environmental sustainability performance (Jiang et al., 2018; Lai and Wong, 2012). Environmental policies and regulations provide the necessity for firms to enforce environmental sustainability strategies while the regulation requirements monitor construction firms' practices to safeguard the environment. For a business to gain more competence in an environment with strict environmental regulation, environmentally sustainable construction practices are essential to counterbalance the ineffective cost of non-compliance. More importantly, one of the efficient measures to embark on is to promote environmental incentives in the taxation system. This, according to (Bamgbade et al., 2017), will considerably ease the problems linked with environmental sustainability in construction project delivery.

Although environmental regulation's usual viewpoint on firms' performance is that environmental regulation goes with the extra cost that eats into the firm's profits. Yet, this study can establish that, if environmental regulations are well designed and adequately channelled (in

terms of regulation incentives provided to construction stakeholders), it tends to balance the cost of compliance and attempts innovation which results in business and environmental performance (Chen et al., 2016; Geng et al., 2017). Reinforced by several previous studies, the study has emphasised the importance of coercive pressure as an enabler of environmental sustainability performance in construction project delivery.

## 4.2. Conclusion

Generally, the outcomes of this study emphasize some key points. First, this study presents a more refined understanding of how pressure from the regulatory agencies and environmentalist may motivate some large construction firms to utilise their managerial attitudes, social responsibility and culture to minimize construction impacts on the natural environment (Ajibike et al., 2020). This study presents empirical data that, notwithstanding their capability to participate in environmental sustainability practices and strategies, large construction firms in many emerging nations are forced to pay attention to environmental sustainability issues (Bamgbade et al., 2019). The adoption of environmental sustainability practices and strategies in large construction firms has always been described with bureaucratic processes compared to small firms that are less methodical. This study's results indicate that environmental sustainability policies are considered necessary to be bolstered to assist large construction firms in conquering the inherent constraints associated with internal factors.

Further, this study also highlighted that by strengthening the regulatory capacities of government agencies, environmental sustainability might be considerably strengthened through numerous alternative sustainability initiatives at multiple firm levels. Clearly, sustainability-oriented incentives can help curtail undesired environmental degradation and suggest opportunities for structural changes in construction project delivery (Bamgbade et al., 2017).

Finally, a supportive environmental regulation aimed explicitly at the exceptional composition of large construction firms in the Malaysian context is expected to contribute to their environmental sustainability performance. This study established that large construction firms in an emerging nation like Malaysia are well-positioned to do well in environmental sustainability if they focus more on internal factors that will bolster the natural environment. However, it is acknowledged that the impact of managerial attitudes, social responsibility, company culture, and coercive pressure on environmental sustainability may vary for construction small and medium enterprises (SMEs). Interestingly, other construction small and medium enterprises in several developed countries have been observed to become more aggressively involved in environmental sustainability practices (Bamgbade et al., 2017), probably due to their failure to withstand pressure from government agencies and other stakeholders within the industry.

## 5. Study's implications, limitations, and recommendations for future study

### 5.1. Study's implications

This study's finding makes some theoretical and practical contributions to the field of managerial attitudes, social responsibility, company culture, and environmental sustainability. Theoretically, this study fills the study gap of the inadequacy of quantitative analysis of the association between these organisational internal factors (managerial attitudes, social responsibility, and company culture) and its impact on the Malaysian construction industry's environmental sustainability performance. In practice, the findings suggest that Malaysian large construction firms' management drive are critical factors in the execution and delivery of environmentally sustainable construction projects. Hence, the outcomes of this study will be able to provide many practical managerial recommendations for top managers in the industry as well policymakers to not only incur more social responsibility spending in the environment

than social sectors but also through improvement of their managerial attitudes towards the natural environment and instituting appropriate sustainability cultures within the firms. For instance, Malaysia's construction industry and the government could significantly compensate or reward construction firms for carefully implementing environmental sustainability practices and strategies to execute and deliver their construction project. This should be a simple itinerary for managers in the industry to follow, which can also add to their financial performance.

## 5.2. Study's limitations and recommendations for future study

This research is not without limitations that pose questions for future studies. First, this research focused on large (G7) construction companies within Peninsular Malaysia, suggesting that the findings may undoubtedly not be generalized to other large construction firms in Sabah and Sarawak or abroad due to cultural and contextual differences. This is not unconnected to the variations in regulatory environments, leading to differences in firms' environmental sustainability performance. Therefore, future research may consider the influence of regulatory environments across different settings, both at the local and international levels.

Secondly, this study used a cross-sectional research design as data was collected only once. Hence, future study design can also contemplate a longitudinal procedure toward better understanding variations in construction firms' environmental sustainability performance connected with these organisational internal factors and coercive pressure over time. This is because a comprehensive knowledge of how construction firms implement and perform in environmental sustainability issues over time would be cherished by policymaking.

Lastly, the measurement items for environmental sustainability performance did not consider whether the studied firms embark on sustainability practices and strategies due to conformity with regulations or to prove their point toward adopting environmental sustainability practices. Hence, future research is pertinent to look at other facilitators, drivers and stimulates environmental sustainability.

## Declaration of Competing Interest

None.

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