

**Corporate social responsibility and environmental performance:
The mediating role of environmental strategy and green innovation**

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ABSTRACT: This study investigates the influence of corporate social responsibility (CSR) on environmental performance, using data from 297 large manufacturing firms in Malaysia. Our results show that CSR has no direct significant influence on environmental performance, but is positively correlated to environmental strategy and green innovation, which again improve environmental performance, i.e. they significantly mediate between CSR and environmental performance. Our study offers a valuable model for general managers of manufacturing organizations and policymakers to manage CSR, environmental strategy, and green innovation in examining environmental performance. It can help to assist general managers of large manufacturing organizations to strengthen their internal resources like CSR, environmental strategy, and green innovation to enhance environmental performance.

Keywords: Corporate social responsibility, environmental strategy, green innovation, environmental performance, natural resource-based view theory

Paper Type: Research Paper

1. Introduction

A few decades ago, industrial practitioners, environmental policymakers, academics and businessmen did not pay attention to the environment because they believed that goods manufactured in their organizations did not have much influence on the environment. The environmental decline/degradation has become a worldwide problem. However, these days, industrial practitioners, environmental policymakers, businessmen and scholars agree that the causes of environmental degradation/decline include climate change, air emissions, rising water and air pollution, resource depletion, and usage of dangerous materials. Ma, Jiang, and Jiang (2020) stated that the year 2018 is regarded as the hottest year ever because of the above-mentioned issues related to the environment. Stakeholders exert heavy pressure on organizations to minimize the environmental influence arising from their production activities (Yu, Ramanathan, & Nath, 2017). Due to various environmental issues that have been reported, firms must concentrate on environmental and nature conservation tasks. Paying attention to ‘green’ issues has been a key motive for industrial practitioners and scholars in the last few decades. From the academic viewpoint, researchers gradually switch their attention from general deliberation to constructs such as green HRM practices (Singh, Del Giudice, Chierici, & Graziano, 2020), green supply chain competition (Wu & Kung, 2020), green bonds (Tolliver, Keeley, & Managi, 2020), and green innovation (Singh et al., 2020; Zhang, Liang, Feng, Yuan, & Jiang, 2020). All over the world, business trends have changed rapidly because of the competitive environment. It is not sufficient to earn profit and gain a competitive advantage but also necessary to be answerable for the environmental impacts. Thus, the current study concentrates on what predictors examine environmental performance.

Manufacturing firms have great impact on the environment and manufacturing industry is a major contributor to environmental issues like climate change, wastage, natural resource depletion, water pollution, and air pollution. Zailani, Jeyaraman, Vengadasan, and Premkumar (2012) found that manufacturing firms produce pollution and wastage that threatens the survival of life on earth. Consequently, promoting environmental performance is an essential prerequisite to respond to global challenges. Specifically, in Malaysia, more than 6% increase in CO₂ emissions are recorded annually which is a concern for scholars and practitioners (Anwar et al., 2020). Centobelli, Cerchione, and Esposito (2020) asserted that greenhouse gas and CO₂ emissions are at the highest level in history.

The concerns regarding economic growth, environmental awareness, and social cohesion are not new issues but combining these three issues in one study becomes more essential each day (Hernández, Yañez-Araque, & Moreno-García, 2020). Moreover, the significance of corporate social responsibility (CSR) has increased the need to conduct business in a new way, purposely integrating environmental, social, and economic concerns in actions and strategies of business activity (Hernández et al., 2020). Researchers have paid much attention to CSR and it is considered an important phenomenon (Xu, Zeng, & Chen, 2018). According to Social Investment Forum (2014), more than 8,000 firms in more than 160 nations spend more than four trillion dollars in the context of CSR. While firms have the right to sell goods to consumers, on the other hand, they have some responsibilities to behave ethically (Hou, 2019). Literature has demonstrated that CSR practices are well-recognized across the world and the boundaries of CSR frequently expand (Hickle, 2017). Nowadays, CSR theory is very influential and important for firms because of increasing focus on the environment (Arrive, Feng, Yan, & Chege, 2019). Traditionally organizations have concentrated on profitability but now trends are changing and organizations should works on environment (Kraus, Burtscher, Vallaster, & Angerer, 2018).

For several decades, researchers have examined financial performance with the help of CSR (Ali, Danish, & Asrar-ul-Haq, 2020) but scant attention has been paid to examining CSR in the field of environmental performance. Moreover, a few studies have found that CSR significantly enhances organizational performance (Javed, Rashid, Hussain, & Ali, 2020; Long, Li, Wu, & Song, 2020). Despite this, CSR has not had a significant influence on organizational performance (Smith, Yahya, & Amiruddin, 2007). Even though various studies have determined a firm's performance through CSR, researchers still focus on this relationship because of inconclusive results. Literature reveals that the association between CSR and organizational performance is not conclusive (Galbreath & Shum, 2012). Moreover, some researchers recommended using moderators or mediators between CSR and firms' performance which ignore prior researchers (Galbreath & Shum, 2012; Surroca, Tribó, & Waddock, 2010). Thus, our research adds two mediators – environmental strategy and green innovation – between CSR and environmental performance. The natural resource-based view (RBV) theory signifies that environmental strategies and green innovation play a vital role in determining sustainable performance (Hart, 1995).

Green innovation is considered a significant predictor in determining firms' performance (Qiu, Jie, Wang, & Zhao, 2020). Moreover, literature has confirmed that green innovation plays a vital role in achieving sustainable performance (Chen, 2008). The researchers paid scant attention on green innovation to measure environmental performance. This study tries to determine environmental performance through green innovation. Industrial practitioners and scholars have concentrated on environmental strategy (Zhou, Shu, Jiang, & Gao, 2019). Fousteris, Didaskalou, Tsogas, and Georgakellos (2018) found that environmental strategy (e.g. innovative preventive practices and eco-efficient practices) is positively associated with financial performance. Walker, Ni, and Huo (2014) asserted that a proactive environmental strategy is considered a significant factor in examining firms' performance. Despite this, researchers have paid scant attention to environmental strategy to determine environmental performance. The motivation behind this study is that researchers have paid less attention to CSR to determine environmental performance in large manufacturing firms in Malaysia with the mediating role of environmental strategy and green innovation. Thus, this study tries to fill this gap. The main research objectives are as follows:

1. To examine the relationship between CSR and environmental performance.
2. To examine whether environmental strategy and green innovation significantly mediate between CSR and environmental performance.
3. To examine the relationship between environmental strategy, green innovation, and environmental performance.

The current study makes several contributions and implications. For example, this is pioneer research that builds a research framework to incorporate CSR, green innovation, environmental strategy, and environmental performance based on natural RBV theory that prior researchers have ignored. Meanwhile, managers can use CSR, environmental strategy, and green innovation in enhancing the environmental performance of large Malaysian manufacturing firms.

2. Theory and hypotheses development

2.1 Natural resource-based view theory

RBV theory indicates that organizational resources and capabilities help significantly to attain a competitive advantage (Barney, 1991). Moreover, natural RBV theory is the extended form of RBV theory which hypothesizes that firms can gain sustained competitive advantage in responding to answer issues about the natural environment (Hart, 1995). Hart (1995) indicated that RBV theory has some omissions. For instance, it does not include the interaction between the organizational natural environment and the organization itself. In the past, this omission was understandable, whereas, it is now obvious that the natural environment assists in attaining a competitive advantage. Hart and Dowell (2011) found that natural resources and capabilities boost profitability from the reduction of pollution. In addition, they recognized that environmental resources, strategies about pollution prevention, and organizational capabilities enhance sustainable performance (Hart & Dowell, 2011). Researchers can use natural RBV theory to measure firms' performance by focusing on using CSR environmental, social, and economic aspects (Menguc & Ozanne, 2005). Prior research used contingency theory for environmental strategy and environmental managerial performance (Rötzel, Stehle, Pedell, & Hummel, 2019), stakeholder theory for CSR and economic performance (Hernández et al., 2020), and ability motivation-opportunity theory for green innovation environmental performance (Singh et al., 2020). The researchers paid less attention to measuring environmental performance through CSR, green innovation, and environmental strategy by using natural RBV theory. This study used CSR (economic dimension, social dimension, and environmental dimension), green innovation, and environmental strategy (environmental business strategy and environmental corporate strategy) in enhancing environmental performance in light of natural RBV theory.

2.2 Corporate Social Responsibility, Environmental Strategy, Environmental Performance

These days, researchers concentrate on CSR in particular because customers want goods and services that are environmentally-friendly. The term eco-entrepreneur uses that focus to protect and prevent environmental issues among various industries and to introduce eco-friendly goods and processes into the marketplace (Melay & Kraus, 2012). Several organizations have faced pressure from organizations' stakeholders, e.g. competitors, customers, workers, and government to speak out about social and environmental issues (Pekovic & Vogt, 2020). In recent decades,

CSR has been considered a significant business practice globally (Xiang, Chen, Jones, & Xia, 2020). In addition, there are various studies available on CSR but there is no particular definition of CSR. Thus, researchers faced difficulty in conducting such an empirical study (Orlitzky, Siegel, & Waldman, 2011). To be successful, firms need to perform according to general public expectations. Inwardly-focused organizations have limited longevity, while organizations that think more about their customers are more likely to be successful in the current market. The term CSR refers to the obligation of a firm to pursue those strategies, make decisions, and follow those lines of action that build value for the general public (Bowen & Johnson, 1953). Our study used three dimensions of CSR: economic, social, and environmental (Alvarado, 2008). Few researchers have determined the influence of CSR on organizational performance and revealed that the latter is enhanced by CSR (Long et al., 2020; Orazalin, 2020). Málovics, Csigéné, and Kraus (2008) stated that CSR has gained more importance in business life. Recently, researchers have studied CSR and economic performance in micro, small and medium enterprises (Hernández et al., 2020) and found that CSR significantly improves economic performance, but researchers paid scant attention to CSR to actually measure that environmental performance (Orazalin, 2020). Our study attempts to fill this gap.

McWilliams and Siegel (2000) asserted that the association between CSR and firm performance does not include advertising expenditure and R&D spending, which are two elements of a differentiation strategy. The social, economic, and environmental constraints are not simply analytical concepts but represent drivers that an organization can employ to align the business model to business strategy (Martinez-Conesa, Soto-Acosta, & Palacios-Manzano, 2017). From a theoretical point of view, different researchers recognize the existence of an association between CSR and innovation (McWilliams & Siegel, 2000). There is limited empirical research available that sees the influence of environmental CSR on innovation (Zhou, Zhang, & Zhang, 2019). Researchers have ignored measuring environmental strategy and green innovation through CSR. Hence, this study attempts to fill this gap by hypothesizing as follows:

H1. CSR significantly determines environmental performance.

H2. CSR has a significant influence on environmental strategy.

H3. CSR has a significant influence on green innovation.

2.3 Environmental Strategy, Environmental Performance

RBV theory does not include environmental strategy in examining firms' performance (Barney & Arikan, 2001). Despite this, natural RBV theory paid more concentration attention to an environmental strategy to measure sustainable performance (Hart, 1995). Zhou et al. (2019) asserted that researchers and practitioners focus on environmental strategy. Solovida and Latan (2017) found that firms have environmental strategies to gain benefits in terms of environmental performance rather than those firms that lack this. Moreover, scholars argued that a debate exists regarding whether firms' performance should be measured through organizational resources or strategy (Newbert, Kirchhoff, & Walsh, 2007). Recently, researchers have demonstrated that business strategy is considered a crucial predictor in environmental protection and business operations (Kong, Yang, Liu, & Yang, 2020). Moreover, the literature has confirmed that proactive environmental strategies improve financial performance (Walker et al., 2014) and economic performance (Brullhart, Gherra, & Marais, 2017). Besides, a significant number of environmental strategies examined organizational performance (Quan, Wu, Li, & Ying, 2018). In contrast, environmental strategies do not determine managerial performance (Rötzel et al., 2019). However, the relationship between business strategies and firms' performance is not conclusive and needs to be studied further. Thus, we propose the following hypothesis:

H4. Environmental strategies significantly determine environmental performance.

2.4 Green Innovation, Environmental Performance

Green innovation refers to the innovation in technology applied to minimize wastage, global warming, use of water, air pollution, use of coal, oil, electricity, and conserving energy. Global warming is considered a severe issue faced by the world (Li, Deng, & Peng, 2020). Green innovation is linked with the organizational environmental management agenda and significantly encourages environmental performance (Adegbile, Sarpong, & Meissner, 2017). Moreover, green process and product innovation not only minimizes the negative environmental influence of business, but also improves organizational social and financial performance through the minimization of cost and waste (Weng, Chen, & Chen, 2015). Moreover, Edeh, Obodoechi, and Ramos-Hidalgo (2020) found that technological innovation significantly improves export performance. Ferreira, Fernandes, and Ferreira (2020) asserted that innovation and technology transfers can sometimes have a decreasing influence on the environment. Researchers also see the influence of green supply chain management on environmental performance with the

mediating role of green innovation (Seman et al., 2019). However, the above-mentioned studies are not able to judge how well green innovation determines environmental performance. In contrast, Chiou, Chan, Lettice, and Chung (2011) asserted that green innovation has a significant impact on environmental performance but green managerial innovation has no impact. Therefore, the association between green innovation and environmental performance is inconclusive and needs to be studied further. Thus, we propose the following hypothesis:

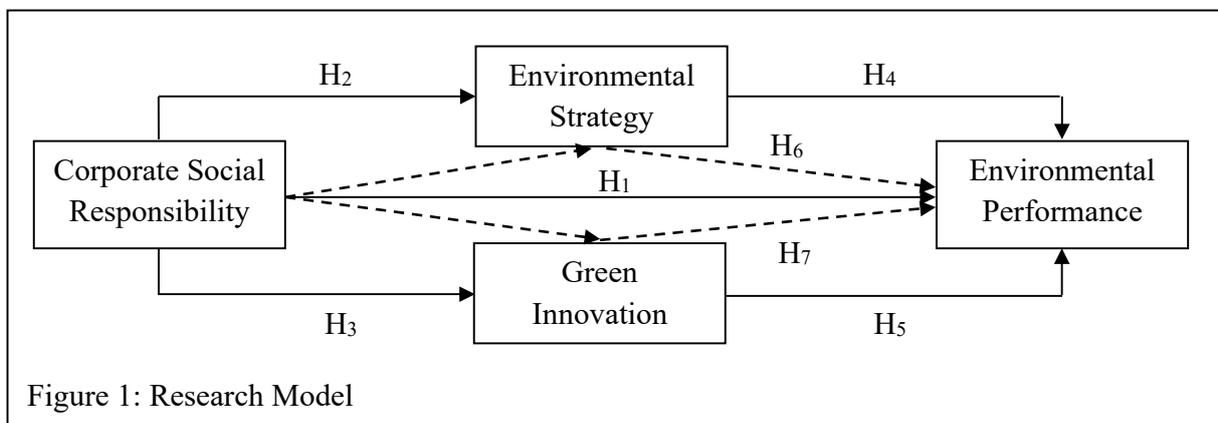
H5. Green innovation significantly influences environmental performance.

2.5 Mediating Role of Environmental Strategy and Green Innovation

The earlier discussion on the association between CSR, environmental strategy, green innovation, and environmental performance recommended that CSR influences environmental strategy and green innovation leads to improving environmental performance. Literature has confirmed that CSR significantly improves organizational performance (Long et al., 2020; Orazalin, 2020). Despite this, Hernández et al. (2020) found that a mixed relationship exists between CSR and economic performance. Hence, the relation between CSR and firms' performance is inconclusive and needs to be studied further by adding a mediating variable. Natural RBV theory, Hart (1995) recommends that environmental strategy and green innovation explain the relationship between environmental resources and competitive advantage. Thus, environmental strategy and green innovation are used as a mediating variable between CSR and environmental performance. Thus, we propose the following hypotheses:

H6. Environmental strategy significantly mediates between CSR and environmental performance.

H7. Green innovation significantly mediates between CSR and environmental performance.



3. Methodology

3.1 Questionnaire development

CSR was measured by using it 24 items and adapted from Alvarado (2008). CSR has three dimensions: social, environmental, and economic. The social dimension includes nine items, the environmental dimension includes seven, and the economic dimension consists of eight items. Environmental strategies (ES) were measured by using two dimensions: environmental corporate strategy and environmental business strategy. Environmental strategy includes eight items adapted from Banerjee (2002). The environmental corporate strategy consists of five items and environmental business strategy includes three items. Environmental performance includes five items and is adapted from a prior study (Laosirihongthong, Adebajo, and Tan, 2013). Green innovation includes eight items, out of which, green product innovation consists of four items and green process innovation consists of four items (Chen, Lai, & Wen, 2006). A five-item Likert scale is used to measure green innovation (1=strongly disagree to 5=strongly agree).

3.2 Sampling

The data for this study was collected from large manufacturing firms in Malaysia which are in the Federation of Malaysia Manufacturer (FMM) Directory. The aim of choosing large Malaysian manufacturing organizations is that less attention has been paid to CSR, environmental strategy, and green innovation to determine environmental performance. The total population for this is 661 companies, which were contacted via mail. A total of 312 questionnaires were returned, out of which 15 questionnaires had to be excluded because of misleading values, leaving a final sample of 297 companies, and an effective response rate of 44.9 per cent. Only established constructs from previous research have been used, measuring the variables in five-item Likert scales (Khan et al., 2019; Rehman, Bhatti, & Chaudhry, 2019a).

3.3 Common Method Bias (CMB)

This study collected data about both exogenous and endogenous constructs from a single source through questionnaires; thus, there is a possibility that common method bias (CMB) might have occurred and disturbed the data. During the data collection, the researchers must assure

respondents that their information is in safe hands and will not be divulged to any third-party. The researchers elucidated that CMB is considered a severe issue normally associated with the self-survey report (Podsakoff & Organ, 1986); it can increase an association that exists among measured variables (Conway & Lance, 2010). Harman's single-factor method is used to compute CMB and the outcomes of this study demonstrate that a single-factor enlightens 34.708% of the total variance. Thus, there is no issue with CMB in the data. A value of total variance higher than 50% reveals that a CMB issue exists, while a value of CMB less than 50% indicates that there is no CMB issue. Hence, in this study, there is no CMB issue in the data.

3.4 Results

The structural equation modeling (SEM) technique is used to test the proposed hypotheses developed in the earlier part of this paper, and for this purpose the researchers used SmartPLS 3.2.8. According to Hair, Hult, Ringle, and Sarstedt (2014), the partial least square structural equation modeling (PLS-SEM) method is more suitable for complex as well as simple models. Moreover, the researchers conclude that PLS-SEM is more suitable for estimation compared to CB-SEM (Hair et al., 2014). There are various reasons to use PLS-SEM. For example, PLS-SEM is considered better in executing estimations as compared to regression for assessing mediation (Preacher & Hayes, 2004). Also, the PLS-SEM technique allows accounting for measurement error and offers an accurate estimation for the mediation influence (Chin, 1998). Moreover, researchers confirm that PLS-SEM is more appropriate for complex and simple research models, and there is no need to check the normality assumption while applying SmartPLS (Hair et al., 2014). Our theoretical model includes four reflective constructs, where corporate social responsibility, green innovation, and environmental strategy have various dimensions. PLS-SEM includes an outer and inner model.

The measurement or outer model covers four types of tests to confirm reflective constructs such as individual item reliability, internal consistency reliability, convergent validity, and discriminant validity. Table 1 reveals that the lowest factor loading is 0.511 and the highest value is 0.949 which is more than the recommended threshold value, which is 0.50 (Hair et al., 2014). This confirms that the study has no issue regarding individual item reliability. If the value of factor loading is more than 0.40 and less than 0.50, the researchers can retain that item if that item does not disturb composite reliability (CR) and average variance extracted (AVE). Internal

consistency reliability should be measured to calculate the CR of every variable. Hair et al. (2014) stated that CR value should be higher than 0.60.

In the exploratory studies, a value of CR in the range of 0.60–0.70 is considered acceptable; a value in the range of 0.70–0.90 is considered satisfactory to good; but a CR value higher than 0.95 is deemed problematic. Table 1 demonstrates that the CR value of all constructs more than 0.60 suggests the homogeneity, internal consistency, and the reliability of all variables (Bagozzi, Yi, & Phillips, 1991). This study reveals that the internal consistency criterion is fulfilled. Convergent validity means the degree to which items of variables examine a similar construct, as suggested by Rehman et al. (2019a). Table 1 show that the lowest value of AVE is 0.523 and the highest value is 0.838. Thus, this study fulfills the convergent validity criterion as recommended by Hair et al. (2014) that the value of AVE must be equal to or greater than 0.50.

Table 1
Convergent Validity.

First-Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	R ²	α
Social Dimension		SD1	0.697	0.523	0.908		0.885
		SD2	0.694				
		SD3	0.763				
		SD4	0.746				
		SD5	0.613				
		SD6	0.724				
		SD7	0.742				
		SD8	0.777				
		SD9	0.738				
Economic Dimension		ECD1	0.819	0.548	0.904		0.878
		ECD2	0.710				
		ECD3	0.528				
		ECD4	0.511				
		ECD5	0.836				
		ECD6	0.755				
		ECD7	0.817				
		ECD8	0.858				
Environmental Dimension		END1	0.699	0.580	0.906		0.878
		END2	0.697				
		END3	0.657				
		END4	0.852				
		END5	0.771				
		END6	0.839				
		END7	0.793				

Table 1
Convergent Validity (Continued).

First-Order Constructs	Second-Order Construct	Items	Factor Loading	AVE	CR	R ²	α		
Green Product Innovation	Corporate Social Responsibility	Social Dimension	0.873	0.718	0.884		0.953		
		Economic Dimension	0.830						
		Environmental Dimension	0.838						
		GPDI1	0.729						
Green Process Innovation		GPDI2	0.884	0.653	0.882		0.820		
		GPDI3	0.802						
		GPDI4	0.809						
		GPRI1	0.742						
		GPRI2	0.723	0.546	0.828		0.723		
		GPRI3	0.747						
		GPRI4	0.742						
		Green Product Innovation	0.867					0.826	0.905
Green Process Innovation	0.949								
EBS1	0.904	0.838	0.939		0.903				
EBS2	0.927								
EBS3	0.914								
ECS1	0.712					0.608	0.885		0.836
ECS2	0.859								
ECS3	0.804								
ECS4	0.677								
Environmental Business Strategy		ECS5	0.831	0.720	0.836	0.289	0.861		
		Environmental Business Strategy	0.772						
		Environmental Corporate Strategy	0.919						
		ENPR1	0.712					0.613	0.887
ENPR2	0.865								
ENPR3	0.810								
ENPR4	0.685								
Environmental Performance		ENPR5	0.828						

Discriminant validity refers to a situation where researchers observe that two indicators must not be similar statistically, as suggested by Rehman, Mohamed, and Ayoup (2019b). Fornell and Larcker (1981) proposed a traditional metric to compute discriminant validity in two different ways. First, compare the value of AVE square root with correlational values. Second, compare the AVE value with square correlational values. Five years ago, researchers proposed a new method to compute discriminant validity and the researchers conclude that the traditional metric is not a suitable approach to compute discriminant validity. Henseler, Ringle, and Sarstedt

(2015) proposed a new method to compute discriminant validity, the Heterotrait-monotrait ratio (HTMT) of correlation. Our results reveals that the traditional metric does not perform well. Usually, when every indicator has factor loadings with minimum difference, such loadings are between 0.65–0.85. The threshold value of HTMT is 0.90 for constructs conceptually the same and 0.85 for variables conceptually different, as recommended by Henseler et al. (2015). Table 2 indicates that the value of HTMT of all constructs is less than 0.85. The variance inflation factor (VIF) is used to see the multicollinearity issue and the value of VIF should be below 5, as suggested by Hair et al. (2014). This study showed that the VIF value is below 5, hence the discriminant validity criterion is fulfilled.

Table 2

Discriminant validity (HTMT).

Variables	VIF	CSR	ENPR	ES	GINV
Corporate Social Responsibility	1.414				
Environmental Performance	---	0.554			
Environmental Strategy	3.246	0.582	0.647		
Green Innovation	2.982	0.512	0.848	0.814	

4. Empirical Results

After executing the measurement model in the previous section, we now cover the steps to validate the proposed hypotheses. To estimate the research model and analyze the structural path the hypotheses are tested to use SmartPLS 3.2.8. In the previous section, the measurement model is executed and this section includes a structural model or inner model. In the inner model to test the proposed hypotheses, the researchers calculate p-value and t-value. If the t-value is greater than 1.96 or the p-value below 0.05 then the proposed hypotheses is accepted and vice versa. The CSR does not influence environmental performance ($\beta= 0.010$, $t\text{-value}=0.369$) and H_1 is not supported, while CSR is significantly and positively associated with environmental strategy ($\beta= 0.537$, $t\text{-value}=12.104$) and green innovation ($\beta= 0.475$, $t\text{-value}=9.624$). Thus, this study supports is supported by H_2 and H_3 . Moreover, environmental strategy ($\beta= 0.673$, $t\text{-value}=15.034$) and green innovation ($\beta=0.276$, $t\text{-value}=5.208$) are positively associated with environmental performance. Hence, this study supports H_4 and H_5 .

The study variance accounted for (VAF) to look at the mediation effect of environmental strategy and green innovation between CSR and environmental performance. If the value of VAF is below 20% it signifies that there is no mediation; a value of VAF within 20% to 80% indicates that there is partial mediation; and a value of VAF higher than 80% indicates that there is full mediation, as suggested by Hair et al. (2014). Table 4 reveals that the mediating effect is 97.30% and 92.91% that is higher than 80%. Hence, H₆ and H₇ are fully mediated.

Table 3

Hypotheses results.

Hypotheses	Paths	β Value	T- values	P- values	BCI LL	BCI UL	Results
H ₁	CSR --> ENPR	0.010	0.369	0.713	-0.043	0.059	Not Accepted
H ₂	CSR -->ES	0.537	12.104	0.000	0.446	0.624	Accepted
H ₃	CSR --> GINV	0.475	9.624	0.000	0.377	0.566	Accepted
H ₄	ES --> ENPR	0.673	15.034	0.000	0.584	0.761	Accepted
H ₅	GINV --> ENPR	0.276	5.208	0.000	0.161	0.374	Accepted
H ₆	CSR->ES ->ENPR	0.362	9.136	0.000	0.289	0.445	Full Mediation
H ₆	CSR->GINV ->ENPR	0.131	6.329	0.000	0.172	0.341	Full Mediation

Table 4

Variance Accounted for (VAF) of the Mediator Variable for ENPR.

Independent Variable	Dependent Variable	Mediating Variable	Indirect Effect	Total Effect	VAF (%)
CSR	ENPR	ES	0.362	0.372	97.30%
CSR	ENPR	GINV	0.131	0.141	92.91%

4.1 Predictive Relevance and Effect Size

Few researchers provide another way to find the PLS path model's predictive accuracy to calculate the value of Q² (Geisser, 1974; Stone, 1974). In SmartPLS 3.2.8, the Q² is computed by using the blindfolding technique. The Q² should be higher than zero (0) as suggested by Chin (1998). A value of Q² greater than 0.35, 0.15, and 0.02 indicates large, medium, and small predictive relevance in that order, as suggested by Cohen, Manion, and Morrison (2013). The

environmental strategy (0.104) and green innovation (0.090) have a smaller predictive relevance effect, while environmental performance (0.376) has a large predictive relevance effect. Therefore, the theoretical framework of this study has predictive power to explain endogenous constructs. Few researchers suggest computing effect size (f^2) of every path co-efficient in the inner or structural model (Henseler, Ringle, & Sinkovics, 2009). The value of f^2 more than 0.02, 0.15, and 0.35 is considered a small, medium, and large effect size, as suggested by Cohen (1998). The value of f^2 demonstrates whether an exogenous construct has a significant effect on the endogenous construct (Götz, Liehr-Gobbers, & Krafft, 2010). Table 5 reveals that CSR has a smaller effect on environmental performance, a medium effect on green innovation, and a large effect on environmental strategy. Environmental strategy has a large effect on environmental performance, while green innovation has a medium effect on environmental performance.

Table 5

Effect size of a model.

	ENPR	ES	GINV
Corporate Social Responsibility	0.002	0.406	0.291
Environmental Strategy	0.880	---	---
Green Innovation	0.161	---	---

5. Discussion and Conclusion

This paper aims to observe see the association between CSR and environmental performance with the mediating role of environmental strategy and green innovation in large Malaysian manufacturing firms. The findings reveal that CSR does not influence environmental performance. The results are not similar to Bacinello et al. (2020), Orazalin (2020), who found that CSR significantly enhances organizational performance. Moreover, Hernández et al. (2020) confirmed that CSR (social dimension, economic dimension, and environmental dimension) significantly improves the economic performance of Spanish micro, small, and medium-sized enterprises. The findings are similar to Smith et al. (2007) who found that CSR does not play a role in examining organizational performance. The outcomes of this study are not like those with natural RBV theory which finds that environmental resources significantly enhance sustainable

performance (Hart, 1995). The findings highlight that CSR has no direct influence on environmental performance but managers and owners cannot ignore CSR as prior researchers demonstrate that it plays a crucial role in determining firms' performance. CSR significantly determines environmental strategy. The findings are similar to Martinez-Conesa et al. (2017) who found that that environmental, economic, and social constraint represent drivers that a firm can use in aligning business model and strategy. This study fills the gap by determining CSR influence on environmental performance. Meanwhile, CSR significantly determines that green innovation leads to environmental performance. Limited literature is available on environmental CSR and innovation (Zhou et al., 2019). While researchers ignore the relationship between CSR and green innovation, our research covers that.

The environmental strategy significantly improves environmental performance. The results are similar to Quan et al. (2018) who found that environmental strategies significantly enhance environmental performance. Despite this, Rötzel et al. (2019) found that environmental strategies do not play a role in examining managerial performance. The results match with natural RBV theory in that environmental strategies significantly improve sustainable performance (Hart, 1995; Hart & Dowell, 2011). RBV theory ignores business strategy in determining firms' performance and Hart (1995) was the first scholar to propose that corporate strategy (particularly environmental strategy) is considered a vital factor of organizations in increasing environmental performance. Moreover, green innovation significantly enhances environmental performance. The results confirm those of El-Kassar & Singh (2019) who found that green innovation helps organizations in attaining competitive advantage. The results confirm natural RBV theory in that innovation enhances sustainable performance (Hart, 1995).

Finally, environmental strategy and green innovation significantly mediate between CSR and environmental performance. Our results demonstrated that CSR has no direct influence but has an indirect effect on environmental performance with the existence of mediating variables such as environmental strategy and green innovation. The hypotheses are similar to natural RBV theory which shows that environmental strategy and green innovation explain the relationship between CSR and environmental performance. In conclusion, our study demonstrated that CSR has no direct influence on environmental performance. CSR has a significant influence on environmental strategy and green innovation. Moreover, environmental strategy and green innovation significantly improve environmental performance by reducing air emissions, energy

usage, material usage, and consumption of dangerous materials. Finally, environmental strategy and green innovation significantly mediate between CSR and environmental performance.

5.1 Theoretical Implications

Theoretical contribution requires specific kinds of research findings that can present novel insights into a phenomenon that is deemed important for improving organizational value. Our study offers an original insight based on the empirical data on CSR, environmental strategy, green innovation, and environmental performance, as well as various contributions to practitioners, researchers, and policymakers. It thereby contributes by determining the association between CSR and environmental performance with the mediating role of environmental strategy and green innovation. Hence, our study makes significant contributions to these areas as a pioneering study that incorporates CSR (economic, social, and environmental), environmental strategy (environmental business strategy and environmental corporate strategy), green innovation, and environmental performance in a single research model. Previous researchers used stakeholder theory, ability motivation–opportunity theory, and contingency theory for CSR, environmental strategy, green innovation, and environmental performance. For instance, the researchers observe the influence of CSR on economic performance by using the lens of stakeholder theory (Hernández et al., 2020). Moreover, researchers used ability motivation-opportunity theory to test the relationship between green innovation and environmental performance (Singh et al., 2020). Besides, the researchers used contingency theory to test the relationship between environmental strategy and environmental managerial performance (Rötzel et al., 2019). This study contributes to current literature to determine the association between CSR, environmental strategy, green innovation, and environmental performance in light of natural RBV theory. This study expanded research on environmental performance by examining how CSR, environmental strategy, and green innovation determine the environmental performance of the manufacturing sector. Moreover, this study identifies how large manufacturing organizations control their CSR, environmental strategy, and green innovation in achieving environmental performance.

5.2 Practical Implications

The outcomes of our study offer significant implications for general managers, business professionals, and policymakers. Our research framework aims to offer direction for large manufacturing firms regarding the influence of CSR, environmental strategy, and green innovation on the implementation of environmental performance. Nowadays, general managers and policymakers focus on environmental performance; meanwhile, they can use the research framework of environmental performance in emerging economies to reduce waste, pollution, air emissions, conserve water, conserve energy, and non-renewable resources that lead to enhancing environmental performance. The outcomes highlight that CSR has no direct influence on environmental performance but due to environmental strategy and green innovation, this relation has changed. Thus, general managers of large manufacturing organizations cannot ignore CSR to measure environmental performance because several researchers confirmed that CSR significantly improves organizational performance (Long et al., 2020; Orazalin, 2020). General Managers and policymakers must concentrate on CSR, environmental strategy, and green innovation to measure environmental performance.

5.3 Limitations and Future Research

Like previous studies, this study also has some limitations which upcoming researchers can work on in the future. First, the cross-sectional approach has been adopted, and scholars are not sure that CSR, environmental strategy, and green innovation in large manufacturing organizations provide identical outcomes in a longer time. Hence, future researchers can use the same research framework to observe whether outcomes over longer periods change or remain similar. Our study collected data from large manufacturing organizations in Malaysia and future scholars can collect data from small and medium enterprises to see the changes in results. Future researchers can also use green capability and green transformational leadership as a mediating construct between CSR and environmental performance to observe whether it is significant. Finally, the current study was conducted in Malaysia which has its own culture; future researchers can conduct a similar study in other countries to see the changes. Moreover, circular economy principles can be used to determine social, environmental, and economic performance (Ferasso, Beliaeva, Kraus, Clauss, & Ribeiro-Soriano, 2020).

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