RESEARCH PAPER

Green Intellectual Capital, Green Transformational Leadership, and Sustainable Performance: A Moderated Mediation Model

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ABSTRACT

PURPOSE: The motive behind this study is to determine the influence of green transformational leadership and green intellectual capital (IC) on sustainable performance with the mediating of green capability. In addition, top management commitment is used as a moderating variable between green IC, green transformational leadership, and green capability.

DESIGN/METHODOLOGY/APPROACH: This research is quantitative, cross-sectional, and correlational. Hypotheses were developed in light of theories and literature. The partial least square structural equation modelling (PLS-SEM) technique was used to test the proposed hypotheses. Data were collected through a simple random sampling technique, and a total of 463 questionnaires were used for final analysis. For analysis purposes, the researchers used SPSS 25.0 and SmartPLS 3.2.8 software.

FINDINGS: Green IC has no influence on sustainable performance, but significantly determines green capability. Green transformational leadership positively correlated with green capability and sustainable performance. Green capability is positively related to sustainable performance, i.e., green capability significantly mediates between green IC, green transformational leadership, and sustainable performance. Top management commitment significantly improves sustainable performance and strengthens the association between green capability and sustainable performance.

PRACTICAL IMPLICATIONS: Our study presents a significant model for policy-makers, and owners/managers of manufacturing enterprises to manage green IC, green transformational leadership, green capability, and top management commitment in determining sustainable performance.

ORIGINALITY/VALUE: Our study adds to the body of knowledge to concentrate factors that are valuable in examining sustainable performance. In addition, this paper incorporates green IC, green transformational leadership, green capability, top management commitment, and sustainable performance in light of intellectual capital based-view (ICV) theory and natural based-view theory.

KEYWORDS: *Green intellectual capital; green transformational leadership; green capability; top management commitment; sustainable performance*

INTRODUCTION

Organisations today are under pressure from stakeholders to follow green constructs/practices to attain sustainable performance. Environmental issues mostly occur in large organisations; however, small-medium enterprises (SMEs) also have an impact on the environment from their commercial activities. In terms of sustainable issues, researchers have paid more attention to large manufacturing organisations and SMEs remain under-researched (Boiral *et al.*, 2019). Kraus *et al.* (2020) asserted that environmental degradation has become a global problem. In the past, researchers, practitioners, policy-makers, and businessmen did not concentrate on the environment as they believed that organisations do not produce products that have an impact on the environment. Therefore, academicians, industrial practitioners, businessmen, and environmental policy-makers agree that environmental degradation has various causes, such as air and water pollution, air emission, resource reduction, and climate change.

Kraus *et al.* (2020) states that business trends rapidly changed globally due to the competitive environment. Moreover, the researchers asserted that organisations only concentrating on earning profits and gaining an advantage in the marketplace is not enough; they should also organisations

be answerable for environmental issues. With the increasing issues regarding the environment, organisations are required to adhere to their natural and environmental protection responsibilities. These phenomena highlight social, economic, and environmental performance. At present, the ecosystem is facing enormous pressure from an environmental, economic, and societal perspective. Therefore, our study concentrates on sustainable performance. Many issues are faced today, such as air and water pollution, wastage, climate change, and natural resource depletion regarding the environment, and manufacturing firms are considered the main contributors.

Green transformational leadership is deemed a vital factor in examining green performance. In addition, literature found green transformational leadership significantly enhanced green creativity/environmental performance (Mittal and Dhar, 2016). Less concentration has been paid to green transformational leadership to determine sustainable performance. Green transformational leadership is considered an organisational resource.

Environment-friendly organisations heavily depend on the commitment of top management. Spencer *et al.* (2013) asserted that top management commitment significantly determines competitive advantage and is considered an organisational resource that significantly determines corporate environmental performance. Despite this, researchers paid less attention to top management commitment in determining sustainable performance. The inspiration of our research is that earlier scholars paid scant attention to green intellectual capital, green transformational leadership in determining sustainable performance with the mediating (green capability), and moderating variable (top management commitment). Our study therefore attempts to fill this gap. Our study has the following objectives:

1. to determine the association between green IC and sustainable performance;
2. to determine the association between green transformational leadership and sustainable performance;
3. to determine whether green capability mediates between green IC, green transformational leadership, and sustainable performance;
4. to determine the relationship between green capability, top management commitment, and sustainable performance;
5. to determine whether top management commitment moderates between green capability and sustainable performance.

This study offers numerous implications and contributions. For instance, our study is a pioneer that creates a research model to incorporate green IC, green transformational leadership, green capability, top management commitment, and sustainable performance by using natural RBV theory and ICV theory ignored in the literature. General managers/owners can use green IC, green transformational leadership, green capability, and top management commitment to improve the sustainable performance of manufacturing SMEs.

THEORY AND HYPOTHESES DEVELOPMENT
Theoretical Consideration

Our study used natural RBV theory and ICV theory to develop a research framework. Natural RBV theory asserted that organisations can attain competitive advantage only if they have unique resources that are not easily copied by competitors. The theory includes three interrelated strategies; pollution prevention, product stewardship, and sustainable development. Each strategy has different environmental driving forces that build on various vital resources and have various sources of competitive advantage.

Resource-based-view (RBV) theory focuses on organisational capabilities and resources in determining superior performance and competitive advantage (Barney, 1991). RBV theory has some omissions, for example, it ignores the interactions between firms' natural environment and the firms themselves. Researchers ignore this exclusion; however, the natural environment has a high concentration as it helps attain sustained competitive advantage. Organisations can improve their profitability by reducing pollution. Moreover, the literature confirms that natural resources and capabilities lead to improved firm performance.

Green Intellectual Capital, Green Capability, and Sustainable Performance

Researchers today pay more attention to green intellectual capital throughout the world, and the significance of green IC is emphasised in management literature. The term green intellectual capital was introduced by Chen (2008), and this phenomenon is still a hot topic from a research perspective. Practitioners and academicians focus on environmentalism as they decrease environmental influence, and minimise air pollution and climate change that enables firms to enhance sustainable performance and competitive advantage.

Green IC minimises environmental impact and helps to attain sustained competitive advantage by decreasing costs. Literature confirmed that green IC significantly enhances environmental performance. Despite this, researchers confirmed that green IC does not influence environmental performance (Rehman *et al*., 2021b). Prior studies ignore green IC as it significantly influences competitive advantage. Our study used green relational capital, green human capital, green social capital, and green structural capital to measure green IC. Prior researchers ignored green IC to examine sustainable performance.

Green intellectual capital and organisational core competencies are positively associated with green innovation. However, intellectual capital has a mixed influence on technological innovation. Prior researchers ignored green IC to examine green capability. Our paper's hypotheses are:

H_1: Green intellectual capital determines sustainable performance.
H_2: Green intellectual capital determines green capability.

Green Transformational Leadership, Green Capability, and Sustainable Performance

The term leadership means the ability of an individual to assist, influence, and motivate other individuals to add value to a firm's success (Rehman *et al*., 2019a). Leadership includes transformational and transactional leadership. Our study used transformational leadership in a green perspective to measure sustainable performance. Green transformational leadership means the behaviour of a leader in motivating their subordinates to perform environmental goals and objectives, and persuading subordinates to increase their anticipation for attaining environmental performance.

Transformational leadership can significantly improve innovation performance. Our study argues that green transformational leadership is a significant factor that can determine the sustainable performance that prior researchers ignored. In terms of RBV, leadership is considered a vital resource for firms. The natural RBV theory postulates that green capabilities explain the relationship between environmental resources and sustainable performance. Prior researchers paid less attention to green transformational leadership in determining green capability. This study attempts to cover this gap and forms the following hypotheses:

H_3: Green transformational leadership determines sustainable performance.
H_4: Green transformational leadership determines green capability.

Green Capability, Sustainable Performance

The environment changes quickly and the best option for firms' existence is green or environmental capabilities in determining sustainable performance and competitive advantage. Prior researchers studied dynamic capabilities (Rehman *et al*., 2018; Rehman *et al*., 2019b) but they have less concentration on green capabilities. Green capability focuses on the integration, construction, and reconfiguration of external and internal resources regarding environmental protection. The relationship between green capability and sustainable performance has not been studied to any great extent and needs to study this relationship further. Top management commitment is used as a moderating variable between green capability and sustainable performance as top management commitment significantly determines competitive advantage (Spencer *et al*., 2013). This study tries to cover this gap, and gives the following hypotheses:

H_5: Green capability determines sustainable performance.
H_6: Top management commitment significantly moderates between green capability and sustainable performance.

Green Capability as a Mediator

Previous debates on the relationship between green IC, green transformational leadership, green capability, and sustainable performance suggested that green IC and green transformational leadership influence green capability, leading to improving sustainable performance. Yusliza *et al*. (2020) confirmed that green intellectual capital significantly improves sustainable performance. Despite this, the researchers asserted mixed findings between green IC and business sustainability. In contrast, researchers have recently found that green IC has no direct influence on environmental performance in Malaysian large manufacturing companies. Moreover, literature found that intellectual capital significantly reduces firm performance (Morariu, 2014). The relationship between green IC and firm performance is not conclusive; therefore, there are calls for further research by adding another variable.

The natural RBV theory recommended that firm capabilities improve sustainable performance. Therefore, our study used green capability as a mediating construct between green IC, green transformational leadership, and sustainable performance (Figure 1). The following hypotheses have been developed:

H_7: Green capability significantly mediates between green IC and sustainable performance.
H_8: Green capability significantly mediates between green transformational leadership and sustainable performance.
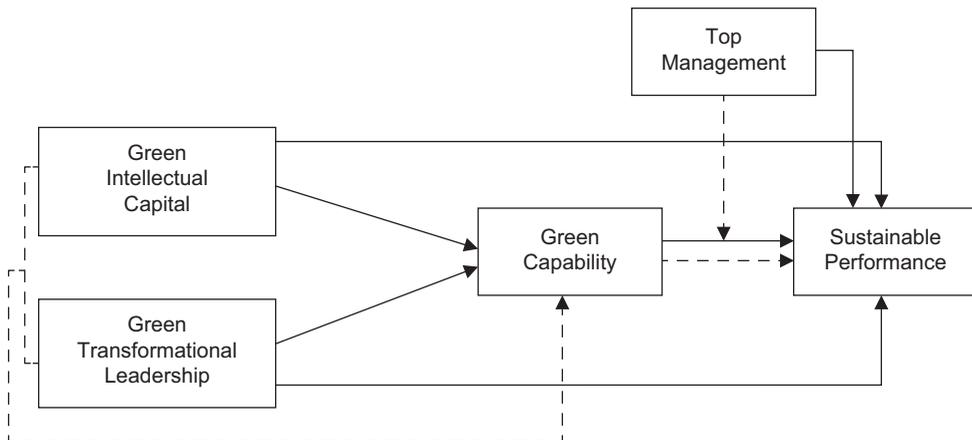
Figure 1: Research Model
Source: Constructed by authors

Top Management Commitment, Sustainable Performance

Top management commitment is considered a significant resource for organisations that work in a friendly environment, and it leads to sustained competitive advantage and superior performance. Top management decisions permit organisations to cope with discontinuous and rapid changes in demand, regulations, technology, and competitors. In addition, top management teams perform strategic decisions regarding technology adoption through resource provision, funding, and blueprints for action plans to departmental management. Top management commitment in Indonesian organisations improves environmental performance. Top management commitment also significantly determines competitive advantage (Spencer *et al*., 2013). The following hypotheses have been developed:

H_9: Top management commitment determines sustainable performance.

METHODOLOGY
Measures

Green IC includes four dimensions, green human intellectual capital consists of five items, green structural intellectual capital has nine items, and green relational intellectual capital five items adapted from Chen (2008). In addition, green social intellectual capital has four items adapted from (Delgado-Verde *et al*., 2014), while green capability consists of seven items adapted from Pavlou and El Sawy (2011). Top management commitment includes nine items from Spencer *et al*. (2013), and green transformational leadership consists of six items from Chen and Chang (2013). Sustainable performance includes three dimensions, environmental performance includes seven items adapted from prior studies (Ilinitch *et al*., 1998; Melnyk *et al*., 2003; Paillé *et al*., 2014). Economic performance includes five items and is adapted from two sources: "decrease in fines for environmental accidents" from Zhu *et al*. (2013), and the remaining four items adapted from Zhu *et al*. (2005). Social performance includes five items adapted from Paulraj (2011). Only established constructs from previous studies have been used, measuring variables in the five-Likert scale (Rehman *et al.*, 2019c; Rehman *et al*., 2020; Rehman *et al*., 2021a).

Population and Sampling

Our study is conducted on Malaysian manufacturing firms, the reason being that researchers paid less attention to green intellectual capital, green transformational leadership, green capability, and top management commitment to determine sustainable performance. There are 47,698 manufacturing firms registered on the public website of Malaysia. The data were collected from manufacturing firms using a 5-point Likert scale. A total of 1,150 questionnaires were distributed among respondents'

owners/managers. A total of 472 questionnaires were returned, with 7 questionnaires excluded due to misleading values. Therefore, a total of 463 questionnaires become a part of the final analysis.

Table 1 below highlights the least factor loadings (0.565) and upper factor loadings (0.933) that are much greater than the standardized value of 0.50 (Hair *et al*., 2014). Therefore, the convergent validity criterion is met.

Common Method Bias

A common method bias (CMB) test was used whereby a researcher collected data regarding exogenous and endogenous variables at one point to use a survey-based technique. This was because there could be CMB issues if data are collected by a single person. Researchers should remember that CMB issues normally occur in studies regarding behaviours. According to Herman's single factor theory, there are no CMB issues if the value of total variance is below 50%. In this study, a single factor explains 40.44% of the total variance. The second method for CMB is to compute full collinearity, as researchers found that if the variance inflation factor (VIF) or full collinearity value is less than 3.3, it recognises that empirical data are free from CMB issues. Table 2 below demonstrates that all latent variables have full collinearity below 3.3. Therefore, the study data are free from CMB issues.

Model Estimation

An SEM technique was followed to answer the hypotheses by using the SmartPLS 3.2.8. The PLS-SEM is more reliable for any kind of research model (Hair *et al*., 2014), and is considered more appropriate in estimation rather than CB-SEM. The research framework consists of five reflective variables, where sustainable performance and green IC have several dimensions and are measured at second-order. The PLS-SEM includes measurement and structural models.

Table 1 highlights the least factor loadings (0.565) and upper factor loadings (0.933) that are much greater than the standardised value of 0.50 (Hair *et al*., 2014). This shows that the individual item reliability criterion is fulfilled. Researchers can retain items having loadings between 0.40 to 0.50 only if this does not disturb the composite reliability (CR) and average variance extracted (AVE) (Kraus *et al*., 2020). Items with less than 0.40 loadings must not be included for final analysis. The second test is internal consistency reliability to calculate the CR value of all variables. The literature demonstrated that CR must be more than 0.60 (Hair *et al*., 2014). Table 1 highlights the least CR (0.790) and upper CR (0.928) that is exceeded from the standardised value (0.60) (Hair *et al*., 2014). Therefore, the internal consistency reliability criterion was fulfilled. The third test is convergent validity to calculate the AVE value of all the constructs. AVE must be more than 0.50 as recommended by Hair *et al*. (2014). Table 1 highlights the least AVE (0.515) and upper AVE (0.802) that is much higher than the standardised value. Therefore, the convergent validity criterion meets.

Table 1: Reliability of the Constructs and Factor Loadings of Indicators

First-Order	Second-Order	Items	Factor Loading	AVE	CR	R²	α
Green Human IC		GHIC1 GHIC2 GHIC3 GHIC4 GHIC5	0.780 0.861 0.819 0.728 0.586	0.579	0.871		0.811
Green Structural IC		GSIC1 GSIC2 GSIC3 GSIC4 GSIC5 GSIC6 GSIC7 GSIC8 GSIC9	0.805 0.786 0.738 0.780 0.766 0.769 0.725 0.762 0.778	0.590	0.928		0.913
Green Social IC		GSOIC1 GSOIC2 GSOIC3	0.901 0.890 0.724	0.709	0.879		0.789
Green Relational IC		GRIC1 GRIC2 GRIC3 GRIC4 GRIC5	0.716 0.682 0.744 0.787 0.827	0.567	0.867		0.809
	Green IC	Green Human IC Green Structural IC Green Social IC Green Relational IC	0.714 0.729 0.801 0.613	0.515	0.808		0.912
Top Management Commitment		TMC1 TMC2 TMC3	0.806 0.673 0.755	0.560	0.919		0.725
		TMC4 TMC5 TMC6 TMC7 TMC8 TMC9	0.868 0.712 0.717 0.701 0.681 0.796				
Green Capability		GC1 GC2 GC3 GC4 GC5 GC6 GC7	0.738 0.736 0.694 0.844 0.753 0.831 0.773	0.591	0.910	0.310	0.884

(continued)

Table 1: Reliability of the Constructs and Factor Loadings of Indicators *(continued)*

First-Order	Second-Order	Items	Factor Loading	AVE	CR	R²	α
Economic Performance		ECP1 ECP2 ECP3 ECP4 ECP5	0.731 0.825 0.812 0.744 0.565	0.549	0.857		0.789
Environmental Performance		ENP1 ENP2 ENP3 ENP4 ENP5 ENP6 ENP7	0.738 0.828 0.800 0.847 0.805 0.744 0.761	0.624	0.921		0.899
Social Performance		SOP1 SOP2 SOP3 SOP4 SOP5	0.691 0.844 0.799 0.629 0.811	0.576	0.871		0.812
	Sustainable Performance	Economic Performance Environmental Performance Social Performance	0.857 0.933 0.895	0.802	0.924	0.716	0.930
Green Transformational Leadership		GTL1 GTL2 GTL3 GTL4 GTL5 GTL6	0.737 0.758 0.702 0.817 0.742 0.733	0.561	0.884		0.852

Source: Constructed by authors

The results confirm that the Fornell-Larker criterion does not work well when loadings have a lesser difference. The Heterotrait-Monotrait ratio (HTMT) of correlation replaces the traditional metric of Fornell-Larker. HTMT standardised value for distinct variables is 0.85 and the threshold value for constructs similar in nature is 0.85. The HTMT value higher than 0.85 for distinct constructs considers that there is an issue that exists regarding discriminant validity. Table 2 highlights that the HTMT criterion is fulfilled.

Table 2: Heterotrait-Monotrait Ratio (HTMT)

| Variables	VIF	ES	GC	GIC	GTL	SP
Top Management Commitment	1.495					
Green Capability	1.487	0.505				
Green Intellectual Capital	1.427	0.511	0.574			
Green Transformational Leadership	1.504	0.553	0.477	0.463		
Sustainable Performance	---	0.880	0.534	0.449	0.713	

Source: Constructed by authors

EMPIRICAL RESULTS

In SmartPLS, the bootstrapping technique with 2,000 sub-samples was used. Table 3 shows that green IC does not determine sustainable performance ($\beta=0.027$, t=0.698) and hypothesis H_1 is therefore not accepted. However, green IC significantly determines green capability as ($\beta=0.365$, t-value=8.574) and H_2 is therefore supported. Green transformational leadership significantly improves sustainable performance as ($\beta=0.397$, t=13.518), and therefore H_3 is supported. Green transformational leadership significantly determines green capability as ($\beta=0.302$, t=7.440) and therefore H_4 is supported. In addition, green capability significantly improves sustainable performance as ($\beta=0.127$, t=3.527); therefore, H_5 is supported. Top management commitment strengthens the association between green capability and sustainable performance as ($\beta=0.045$, t=3.273); this supports H_6. Figure 2 highlights that top management commitment significantly strengthens the association between green capability and sustainable performance. The R-square (R^2) without the interaction term was 0.532; with the interaction term, R^2 increased to 0.716. Therefore, our study shows that top management commitment significantly moderates between green capability and sustainable performance.

For a mediation analysis, it is essential that the relationship between independent and dependent variables must be significant with the involvement of a mediating construct. Our study used Preacher and Hayes' approach and a bootstrapping sampling distribution of mediation. The bias-corrected bootstrapping approach is deemed a dominant method to identify mediation.

Table 3: Testing for Direct and Indirect Effects

Hypotheses	Paths	β Value	T-Values	P-Values	BCI LL	BCI UL	Results
H_1	GIC-->SP	0.027	0.698	0.493	-0.078	0.033	Not Significant
H_2	GIC-->GC	0.365	8.574	0.000	0.299	0.441	Significant
H_3	GTL-->SP	0.397	13.518	0.000	0.350	0.439	Significant
H_4	GTL-->GC	0.302	7.440	0.000	0.237	0.371	Significant
H_5	GC-->SP	0.127	3.527	0.002	0.066	0.185	Significant
H_6	GC*TMC-->SP	0.045	3.273	0.004	0.017	0.072	Moderated
H_7	GIC-->GC-->SP	0.046	3.832	0.001	0.026	0.070	Mediated
H_8	GTL-->GC-->SP	0.038	2.955	0.008	0.021	0.057	Mediated
H_9	TMC --> SP	0.515	15.439	0.000	0.423	0.556	Significant

Source: Constructed by authors
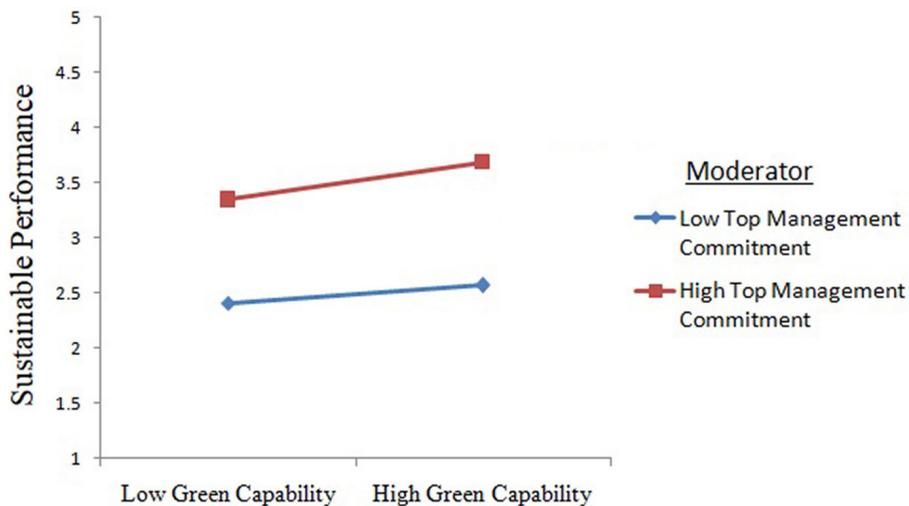
Figure 2: Top Management Commitment as Moderator
Source: Constructed by authors

Predictive Relevance of the Model and Effect Size

Some researchers suggested finding Q^2 to know the predictive relevance of the research framework (Geisser, 1974). As stated by Cohen et al. (2013), the Q^2 value has three stages:

- small, where Q^2 is in the range of 0.02 to 0.15;
- moderate or medium, where Q^2 is between 0.15 to 0.35; and
- high predictive relevance, when the Q^2 value is greater than 0.35

Table 4 highlights that green capability and sustainable performance have a medium predictive relevance effect. Therefore, this study elucidates that the exogenous constructs significantly explain endogenous variables.

Table 4: Predictive Relevance of the Endogenous Variables

Endogenous Variables	SSO	SSE	Q²
Green Capability	3,241.000	2,828.748	0.127
Sustainable Performance	7,871.000	5,982.957	0.240

Source: Constructed by authors

According to Cohen (1988), f^2 are smaller ($f^2>=0.02$), medium ($f^2>=0.15$), and high ($f^2>=0.35$). Table 5 demonstrates that green capability has little effect on sustainable performance, top management commitment and green transformational leadership has a greater effect, and green intellectual capital has no effect on sustainable performance. Green intellectual capital has medium and green transformational leadership has smaller effect on green capability.

Table 5: The Effect Size of a Model

	Green Capability	Sustainable Performance
Top Management Commitment	---	0.633
Green Capability	---	0.028
Green Intellectual Capital	0.164	0.002
Green Transformational Leadership	0.113	0.364

Source: Constructed by authors

DISCUSSION AND CONCLUSIONS

Our study examined the association between green IC, green transformational leadership, and sustainable performance with green capability as a mediator. Moreover, top management commitment was used as a moderating variable between green capability and sustainable performance. Our findings revealed that green IC does not determine sustainable performance. Morariu (2014) found similar outcomes as IC does not examine sustainable performance.

Green transformational leadership significantly enhances sustainable performance. The outcomes assert that green transformational leadership determines green performance. Rehman *et al*. (2019a) confirmed that transformational leadership improves firm performance from the perspective of RBV theory. In addition, natural RBV theory demonstrated that green resources (i.e., green transformational leadership) significantly improve sustainable performance. Green transformational leadership significantly determines green capability. The findings also show that transformational leadership significantly determines organisational learning. The natural RBV

theory stated that natural resources (i.e., green transformational leadership) significantly determine organisational capabilities. Green capability significantly enhances sustainable performance. The outcomes are similar to researchers who assert that green dynamic capabilities determine competitive advantage. The natural RBV theory supported this as green capabilities significantly determine sustainable performance. Top management commitment significantly moderates the association between green capability and sustainable performance.

Green capability significantly mediates between green IC, green transformational leadership, and sustainable performance. Our study shows that green IC does not determine sustainable performance; however, with the mediating role of green capability, this relationship changed. Green transformational leadership has direct and indirect effects on sustainable performance with and without the existence of mediating variables such as green capability. The results are supported by natural RBV theory that green capability enlightens the association between environmental resources (i.e., green intellectual capital, green transformational leadership) and sustainable performance. Finally, top management commitment enhances sustainable performance.

Theoretical Implications

The theoretical contribution entails a particular type of research outcome that is considered significant for enhancing a firm's value. This study covers green IC, green transformational leadership, green capability, top management commitment, and sustainable performance; the paper contributes to understanding for academicians, policy-makers, and practitioners. This study contributes by examining the relationship between green intellectual capital, green transformational leadership, and sustainable performance with the mediating role of green capability. In addition, top management commitment used a moderating variable between green capability and sustainable performance. Our study incorporates green IC (green human intellectual capital, green structural intellectual capital, green social intellectual capital, and green relational intellectual capital), green transformational leadership, green capability, top management commitment, and sustainable performance (economic performance, social performance, and environment performance) in a single framework.

The current research adds value to existing literature by examining the relationship between green IC, green transformational leadership, green capability, top management commitment, and sustainable performance by using ICV theory and natural RBV theory.

Practical Implications

The findings of this research present valuable implications for policy-makers and owners. The research framework intends to present directly for SMEs regarding the influence of green IC, green transformational leadership, green capability, and top management commitment on the implementation of sustainable performance. Owners/managers and policy-makers today concentrate on sustainable performance (economic performance, social performance, and environmental

performance); a research framework of sustainable performance can be used in developing countries to minimise waste and emissions, non-renewable material, chemicals, components, pollutants, and conserve water and energy. Policy-makers can use the research model to decrease waste and fines for environmental accidents. Finally, owners/managers and policy-makers can get benefits in terms of improved overall stakeholders' welfare, community/employees health and safety, and reduction in environmental influence and risks to society.

The findings highlight that green IC has no direct influence on sustainable performance; however, with the inclusion of green capability this relationship has changed. Therefore, owners/general managers of SMEs cannot ignore green IC in determining sustainable performance because various studies have found that green IC significantly enhances environmental performance and attains a competitive advantage (Chen, 2008). In addition, green transformational leadership has both a direct and indirect (mediating) influence on sustainable performance. This heightens the importance of green transformational leadership in the eyes of owners/general managers. Top management commitment has both direct and indirect (moderating) effects on sustainable performance. Finally, green capability significantly improves sustainable performance. Policy-makers, businessmen, and owners/general managers should focus on green intellectual capital, green transformational leadership, green capability, and top management commitment to measure sustainable performance.

Limitations and Future Research

Although the findings of this study have revealed a significant relationship for determining sustainable performance, current research has various limitations that future academicians can cover. Even though it was sufficient in terms of statistics, our study has a limited sample. Future researchers should increase the sample size to generate more generalisable results. This study used a cross-sectional approach and future researchers should use longitudinal settings. This research gathered data from SMEs in Malaysia. Upcoming academicians should test the same research model in other countries and industries to enhance generalisability. Future scholars should use innovativeness, entrepreneurial competency, green human resource management (HRM), and green innovation as a mediating variable between green intellectual capital, green transformational leadership, and sustainable performance. Also, future researchers should test cost leadership strategy and differentiation strategy as a moderator between innovativeness and sustainable performance or competitive advantage.

REFERENCES

Barney, J.B. (1991): Firm resources and sustained competitive advantage. *Journal of Management*, Vol. 17, No. 1, pp.99-120.

Boiral, O., Ebrahimi, M., Kuyken, K. and Talbot, D. (2019): Greening remote SMEs: The case of small regional airports. *Journal of Business Ethics*, Vol. 154, No. 3, pp.813-827.

Chen, Y.S. (2008): The positive effect of green intellectual capital on competitive advantages of firms. *Journal of Business Ethics*, Vol. 77, No. 3, pp.271-286.

Chen, Y.S. and Chang, C.H. (2013): The determinants of green product development performance: Green dynamic capabilities, green transformational leadership, and green creativity. *Journal of Business Ethics*, Vol. 116, No. 1, pp.107-119.

Cohen, J. (1988): *Statistical power analysis for the behavioral sciences*. 2nd edition. Hillsdale, NJ: Erlbaum.

Cohen, L., Manion, L. and Morrison, K. (2013): *Research Methods in Education*: Routledge.

Delgado-Verde, M., Amores-Salvadó, J., Martín-de Castro, G. and Navas-López, J.E. (2014): Green intellectual capital and environmental product innovation: The mediating role of green social capital. *Knowledge Management Research & Practice,* Vol. 12, No. 3, pp.261-275.

Geisser, S. (1974): A predictive approach to the random effect model. *Biometrika*, Vol. 61, No. 1, pp.101-107.

Hair, J.F., Hult, G.T.M., Ringle, C. and Sarstedt, M. (2014): *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks: Sage Publications.

Ilinitch, A.Y., Soderstrom, N.S. and Thomas, T.E. (1998): Measuring corporate environmental performance. *Journal of Accounting and Public Policy*, Vol. 17, Nos 4-5, pp.383-408.

Kraus, S., Rehman, S.U. and García, F.J.S. (2020): Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change*, Vol. 160, p.120262.

Melnyk, S.A., Sroufe, R.P. and Calantone, R. (2003): Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management*, Vol. 21, No. 3, pp.329-351.

Mittal, S. and Dhar, R.L. (2016): Effect of green transformational leadership on green creativity: A study of tourist hotels. *Tourism Management*, Vol. 57, pp.118-127.

Morariu, C.M. (2014): Intellectual capital performance in the case of Romanian public companies. *Journal of Intellectual Capital*, Vol. 15, No. 3, pp.392-410.

Paulraj, A. (2011): Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *Journal of Supply Chain Management*, Vol. 47, No. 1, pp.19-37.

Pavlou, P.A. and El Sawy, O.A. (2011): Understanding the elusive black box of dynamic capabilities. *Decision Sciences*, Vol. 42, No. 1, pp.239-273.

Paillé, P., Chen, Y., Boiral, O. and Jin, J. (2014): The impact of human resource management on environmental performance: An employee-level study. *Journal of Business Ethics,* Vol. 121, No. 3, pp.451-466.

Rehman, S.U., Mohamed, R. and Ayoup, H. (2018): Cybernetic Controls, and Rewards and Compensation Controls Influence on Organizational Performance. Mediating Role of Organizational Capabilities in Pakistan. *International Journal of Academic Management Science Research (IJAMSR)*, Vol. 2, No. 8, pp.1-10.

Rehman, S.U., Bhatti, A. and Chaudhry, N.I. (2019a): Mediating effect of innovative culture and organizational learning between leadership styles at third-order and organizational performance in Malaysian SMEs. *Journal of Global Entrepreneurship Research*, Vol. 9, No. 1, pp.1-24.

Rehman, S.U., Mohamed, R., and Ayoup, H. (2019b): The mediating role of organizational capabilities between organizational performance and its determinants. *Journal of Global Entrepreneurship Research*, Vol. 9, No. 1, pp.1-23.

Rehman, S.U., Bhatti, A., Mohamed, R. and Ayoup, H. (2019c): The moderating role of trust and commitment between consumer purchase intention and online shopping behavior in the context of Pakistan. *Journal of Global Entrepreneurship Research*, Vol. 9, No. 1, pp.1-25.

Rehman, S.U., Bhatti, A., Kraus, S. and Ferreira, J.J. (2020): The role of environmental management control systems for ecological sustainability and sustainable performance. *Management Decision*, Vol. 59, No. 9, pp.2217-2237. doi: https://doi.org/10.1108/MD-06-2020-0800.

Rehman, S.U., Elrehail, H., Alsaad, A. and Bhatti, A. (2021a): Intellectual capital and innovative performance: A mediation-moderation perspective. *Journal of Intellectual Capital*, Vol. 23, No. 5, pp.998-1024. doi: https://doi.org/10.1108/JIC-04-2020-0109.

Rehman, S.U., Kraus, S., Shah, S.A., Khanin, D. and Mahto, R.V. (2021b): Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change*, Vol. 163, p.120481.

Spencer, S.Y., Adams, C. and Yapa, P.W. (2013): The mediating effects of the adoption of an environmental information system on top management's commitment and environmental performance. *Sustainability Accounting*, *Management and Policy Journal*, Vol. 4, No. 1, pp.75-102.

Yusliza, M., Yong, J.Y., Tanveer, M.I., Ramayah, T., Faezah, J.N. and Muhammad, Z. (2020): A structural model of the impact of green intellectual capital on sustainable performance. *Journal of Cleaner Production*, Vol. 249, p.119334.

Zhu, Q., Sarkis, J. and Geng, Y. (2005): Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations & Production Management,* Vol. 25, pp.449-468.

Zhu, Q., Sarkis, J. and Lai, K.-h. (2013): Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *Journal of Purchasing and Supply Management,* Vol. 19, No. 2, pp.106-117.

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