



# Going green! Factors influencing green competitive advantage of Chinese SMEs: a moderated-mediated perspective

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## Abstract

This research observes the impact of environmental corporate social responsibility (CSR) and green supply chain management (GSCM) on green competitive advantage in Chinese manufacturing SMEs. Top management commitment is used as a mediator between environmental CSR, GSCM, and green competitive advantage. Moreover, a pro-environmental business strategy is used as a moderator between top management commitment and green competitive advantage. A simple random sampling technique was used, and 331 questionnaires were part of the final analysis. PLS-SEM is used for hypothesis testing. The results reveal that environmental CSR does not influence green competitive advantage. GSCM, top management commitment, and pro-environmental business strategy significantly measure green competitive advantage. Top management commitment significantly mediates between environmental CSR, GSCM, and green competitive advantage. Finally, a pro-environmental business strategy significantly moderates between top management commitment and green competitive advantage. This study strives to provide insightful information for strategic managers of Chinese manufacturing SMEs to optimize green competitive advantage, including environmental CSR, GSCM, top management commitment, and pro-environmental business strategy in decision-making. This study adds value to the body of knowledge by concentrating on factors that determine green competitive advantage. This initial research integrates environmental CSR, GSCM, top management commitment, pro-environmental business strategy, and green competitive advantage in a single framework using natural resource-based view (RBV). Furthermore, the study would present various implications for managers and lines for future directions.

**Keywords** Environmental corporate social responsibility · Green supply chain management · Top management commitment · Pro-environmental business strategy · Green competitive advantage

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## Introduction

The manufacturing sector is the most significant source of climate change, water pollution, air pollution, and waste (Rehman et al. 2021a). The stakeholders put substantial pressure on firms to decrease environmental impact because of production actions (Yu et al. 2017). The year 2018 was the hottest because of environmental issues (Ma et al. 2020). Few researchers recognized that customers need environmentally friendly products, and firms should focus on the environment (Bhatti et al. 2022a; Faishal 2022; Karamaşa et al. 2021; Loi 2022a, b; Phuoc et al. 2022). Firm objectives are to focus on sustainable factors due to rapid environmental changes (Mamani et al. 2022). Moreover, researchers found that ecological decline has become a worldwide issue (Kraus et al. 2020). The success or failure of firms depends on the environmental activities (Al-Tamimi 2022; Arsu & Ayçin 2021; Badi et al. 2022; Castillo-Acobo et al. 2022; Lubis & Pratama 2022). Any organization aims to attain a lasting competitive advantage (Astuty et al. 2022; Widajanti et al. 2022). The researchers increasingly change their focus from general deliberation to variables like environmental corporate social responsibility — CSR (Alam & Islam 2021), green intellectual capital (Asiaei et al. 2022), green innovation (Rehman et al. 2021a), green supply chain management or GSCM (Nureen et al. 2023), and environmental business strategy (Aftab et al. 2022). The trends are rapidly changing due to the competitive environment in the whole world. This research covers environmental CSR, GSCM, top management commitment (TMC), and pro-environmental business strategy to attain a green competitive advantage.

The organizations are gradually identifying strategic benefits that curtail the incorporation of environmental concerns in CSR undertakings (Alam & Islam 2021). Academicians tend to concentrate on the CSR phenomenon (Wu & Kung 2020). Xiang et al. (2021) state that CSR is a crucial business practice worldwide. Over 8000 organizations in 160-plus countries spend at least four trillion US dollars on CSR (Kraus et al. 2020). In the past, firms' primary objective was to earn money, but now organizations focus on producing environment-friendly products (Kraus et al. 2018). From an environmental CSR viewpoint, using economic resources for keeping activities and environmental awareness has become eminent among firms (Yadav et al. 2018). Environmental CSR is a matter of marvelous consideration in the eyes of academicians and industry (Kraus et al. 2020; Rehman et al. 2022). Environmental CSR assists firms in attaining sustainable competitiveness in their operations (Chuang & Huang 2018). Moreover, environmental CSR is likely to add value to a firm's sustainability distinctly (Chang et al. 2020).

Manufacturing organizations should provide environmentally friendly products to customers (Appolloni et al. 2022). The firms that are the base of environmental issues must change their supply chains and production processes to follow requirements and respect the government (Yildiz Çankaya & Sezen 2019). The firms comprehensively adopted the practices attached to the environmental problems in their supply chain (Rehman et al. 2023a). GSCM is an important initiative from the organizations' side to improve the ecological benefits and sustainability (Naseer et al. 2023). GSCM emerged due to environmental thinking in SCM (Rehman et al. 2023a). Few researchers have suggested that implementing GSCM organizations can get benefits in terms of operating performance (Cousins et al. 2019), and firm performance (Khanal et al. 2023). Hence, based on these studies, GSCM is essential for organizations, and researchers overlooked the influence of GSCM on green competitive advantage (Dzikriansyah et al. 2023).

Environment-friendly organizations highly rely on TMC, which is eventually responsible for attaining a competitive advantage (Yang Spencer et al. 2013). TMC is a crucial factor in an organization's strategies and objectives, and a manager's dedication is necessary to attain the firms progress (Solovida & Latan 2017). Few researchers reveal that TMC improves the green performance of Indonesian organizations (Latan et al. 2018). Environment-friendly firms tend to depend mainly on TMC, which ultimately assists in improving green performance (Bresciani et al. 2023). Finally, test a pro-environmental business strategy as a moderator between TMC and green competitive advantage. Academicians and practitioners pay much attention to environmental strategies (Adomako & Tran 2022; Kraus et al. 2020). Environmental strategy (e.g., eco-efficient practices and innovative preventive practices) positively affects firms' performance (Fosteris et al. 2018). The researchers suggested that environmental strategy can moderate TMC and green performance (Akram et al. 2023). Prior scholars overlooked the moderating role of pro-environmental business strategy between TMC and green competitive advantage (Kraus et al. 2020; Rehman et al. 2021a). Hence, this study covers this gap.

This study adds value to environmental CSR, GSCM, TMC, pro-environmental business strategy, and green competitive advantage literature. This research initially incorporated environmental CSR, GSCM, TMC, pro-environmental business strategy, and green competitive advantage that prior researchers overlooked (Kraus et al. 2020; Latan et al. 2018; Rehman et al. 2023a, 2021a; Waiyawuththanapoom et al. 2022). This study also determines the mediating role of TMC between environmental CSR, GSCM, and green competitive advantage. Moreover, a pro-environmental business strategy is also used as a moderator between TMC and

green competitive advantage. Natural RBV theory is used to explain the research framework. Proposed questions and objectives are listed below.

Research questions:

- Does environmental CSR affect green competitive advantage?
- Does GSCM affect green competitive advantage?
- Does TMC significantly mediate between environmental CSR, GSCM, and green competitive advantage?
- Does pro-environmental business strategy significantly moderate between TMC and green competitive advantage?

Research objectives:

- To identify the association between environmental CSR and green competitive advantage.
- To identify the association between GSCM and green competitive advantage.
- To identify whether TMC mediates between environmental CSR, GSCM, and green competitive advantage.
- To identify whether pro-environmental business strategy moderates between TMC and green competitive advantage.

This study has theoretical, managerial, and contextual contributions. From a theoretical perspective, this used natural RBV to determine green competitive advantage. Natural RBV postulated that natural resources and capabilities (i.e., environmental CSR, GSCM, TMC regarding the environment, and pro-environmental business strategy) assist in attaining a green competitive advantage (Hart 1995). This study avoids using RBV because RBV omits natural resources and capabilities to measure sustainable performance and green competitive advantage (Hart 1995). Management of Chinese manufacturing SMEs can get an edge over competitors if they concentrate on environmental CSR, GSCM, TMC, and pro-environmental business strategy. Contextually, this study conducted in China and prior researchers studied environmental CSR, GSCM, TMC, pro-environmental business strategy, and green competitive advantage in countries other than China (Kraus et al. 2020; Rehman et al. 2021b, 2022, 2023a, 2023b, 2021a).

The remaining article is outlined as follows. “[Literature review and hypotheses development](#)” are presented immediately to the next. “[Methodology](#)” covers measurements, pre-tests, population and sampling, and proposed analysis techniques. In “[Results](#),” this study covers the common method bias, model estimation, and regression model test. The final section includes the “[Discussion and conclusion](#),” “[Implications](#),” and “[Limitations and future recommendations](#).”

## Literature review and hypothesis development

### Natural RBV

Resource-based view (RBV) postulated that a firm’s resources and capabilities determine a firm’s performance (Barney 1991). Organizational capabilities are significant for effective business management (Charutawephonnukoon et al. 2022). Natural resources are one of any country most significant economic resources (Alghazali et al. 2022). RBV omits natural resources, and this issue covers natural RBV (Hart 1995). This emission was reasonable, but firms should think about natural factors in attaining sustainable performance (Kraus et al. 2020). Hart (1995) extended RBV and focused on environmental factors in measuring sustainable competitive advantage. The researchers suggested following natural RBV to determine organizational performance by focusing on environmental CSR (Menguc & Ozanne 2005). The researchers can focus on attaining a green competitive advantage through environmental CSR, GHRM, TMC, and pro-environmental business strategy through the lens of natural RBV. Hence, environmental CSR (i.e., environmental philanthropy, environmental customer wellbeing, and environmental community involvement), GHRM (i.e., cooperation with customers, internal environmental management, eco-design, and green purchasing), TMC, and pro-environmental business strategy in attaining green competitive advantage through natural RBV.

### CSR and green competitive advantage

The researchers focus shifted to CSR specifically because customer trends change rapidly, and they need more environmentally friendly products (Kraus et al. 2020). In recent decades, CSR has been deemed a vital practice worldwide (Xiang et al. 2021). Environmental CSR refers to the organizations’ responsibility to incorporate ecological concerns in the products, operations, recycling, waste management, and reducing practices that would distress the country future generation and world (Mazurkiewicz 2004). From an environmental CSR perspective, the use of economic resources for keeping activities and awareness regarding the environment has become prominent among organizations (Yadav et al. 2018). Moreover, environmental CSR has a stunning focus in industrialists’ and scholars’ eyes (Kraus et al. 2020; Rehman et al. 2022). Sustainable competitiveness in operations can be attained if environmental CSR is effectively implemented and measured (Chuang & Huang 2018). The literature stated that environmental CSR will likely contribute value to organizational sustainability (Chang et al. 2020). Hence, organizations are gradually focusing on green initiatives to achieve business

competitiveness (Chuang & Huang 2015). CSR which has no exact CSR definition is available (Kraus et al. 2020). Hence, scholars needed help conducting a CSR study (Orlitzky et al. 2011). CSR means the organizations' obligation to follow those strategies, make decisions, and pursue those lines of action that develop value for society (Bowen 2013). The researchers identified three dimensions: environmental philanthropy, environmental customer wellbeing, and environmental community involvement (Rashid et al. 2015). This study uses these dimensions to measure environmental CSR.

Organizational philanthropic contribution is a noticeable characteristic of environmental CSR (Brammer & Millington 2008). The researchers recognized that organizations are magnanimously encouraged by environmental philanthropy, where they are an essential element of the general public (Jhawar & Gupta 2017). The organizations enhance their societal image by focusing on philanthropic activities (Liu et al. 2017). Kim et al. (2020) stated that environmental philanthropy raises the image of organizations in the eyes of the public. Moreover, researchers suggested that organizations cannot ignore environmental philanthropy to attain a green competitive advantage (Alam & Islam 2021). Organization community developing actions through CSR contribute considerably toward making a sense of identity and customer loyalty (Statista 2023). Timely organizational efforts are significant predictors that build the base for stakeholders' trust (Baik & Park 2019). Organizational community involvement is essential, and management cannot be missed for an organization's success (Rahman 2011). When organizations provide environment-friendly products to customers and ensure that their primary purpose is to serve customers properly, this helps the organization gain a competitive advantage (Han et al. 2019). GCA refers to a situation in which an organization inhabits a specific position regarding environmental management that competitors find difficult to imitate, and the organization can thus attain the benefits of successful environmental strategies (Astuti & Datrini 2021). Natural RBV postulated that natural resources like environmental CSR determine green competitive advantage (Hart 1995). Organizations cannot overlook environmental customer wellbeing if they aim to attain a green competitive advantage in the marketplace (Alam & Islam 2021). The hypothesis is as below:

H<sub>1</sub>: Environmental CSR is positively related to green competitive advantage.

### GSCM and green competitive advantage

GSCM refers to a supply chain-wide management approach for environmental management, including strategic positioning and environmental practices to enhance organizational environmental goals (Zhu et al. 2008). The term GSCM covers environmental elements to handle the supply chain (Al-Ghwayeen & Abdallah 2018). The GSCM concept emerged

due to environmental thinking in supply chain management (Rehman et al. 2023a). Nowadays, practitioners and academicians highly concentrate on GSCM because this can be helpful for organizations in measuring performance and competitive advantage (Astawa et al. 2021). GSCM is an important initiative to enhance a firm's sustainability and ecological benefits (Dzikriansyah et al. 2023). GSCM incorporates ethical and inclusive parts of the supply chain plus environmental reflections (Laari et al. 2016). This study measures GSCM through green purchasing, eco-design, customer cooperation, and internal environmental management (Zhu et al. 2010).

Green purchasing and customer cooperation increase performance (Zhu et al. 2013). Eco-design and internal environmental management are essential for firms success (Shang et al. 2010). GSCM is a strategic organizational resource (Rehman et al. 2023a). Natural RBV favors the relationship between natural resources such as GSCM and green competitive advantage (Hart 1995; Hart & Dowell 2011). Prior researchers recommended implementing GSCM in organizations, and due to this, organizations can benefit from increasing operating performance (Cousins et al. 2019), and organizational performance (Khanal et al. 2023). Few studies show GSCM impact on competitive advantage (Das et al. 2023; Naseer et al. 2023). Following is the hypothesis:

H<sub>2</sub>: GSCM is positively related to green competitive advantage.

### TMC and green competitive advantage

From an ecological perspective, TMC refers to the employees' appraisal of an organization commitment to environmentally friendly initiatives and green activities in motivating its employees to exhibit pro-environmental behavior and assist the organization in achieving environmental sustainability objectives (Haldorai et al. 2022). Organizations that depend on the environment rely on TMC, which is eventually responsible for attaining a competitive advantage (Yang Spencer et al. 2013). TMC is essential in organizations' strategies and objectives, and a manager's dedication is necessary for the attainment of the firms progress (Solovida & Latan 2017). Literature elucidated that TMC improves the green performance of Indonesian organizations (Latan et al. 2018). Environment-friendly firms tend to depend mainly on TMC, which ultimately assists in improving green performance (Bresciani et al. 2023). TMC is vital to promote organizational effectiveness (Hoejmosse et al. 2012). TMC significantly increased green performance, and natural RBV supported this relationship (Latan et al. 2018). The



researchers overlooked the impact of TMC on green competitive advantage (Nureen et al. 2023). The hypothesis is below:

H<sub>3</sub>: TMC is positively related to green competitive advantage.

### TMC as a mediator

Prior researchers confirmed that if organizations effectively implemented environmental CSR practices, sustainable operations competitiveness could be attained (Chuang & Huang 2018). Moreover, environmental CSR adds value to firms' sustainability (Chang et al. 2020). Environmental CSR cannot be ignored because academicians and industry pay much attention to this (Kraus et al. 2020; Rehman et al. 2022). Few researchers reveal that environmental CSR is significantly related to the green competitive advantage of apparel factories in Bangladesh (Yadav et al. 2018). Conversely, CSR is not important for green performance (Kraus et al. 2020; Rehman et al. 2022). GSCM improves firms' performance (Khanal et al. 2023) and operating performance (Cousins et al. 2019). Conversely, GSCM is not essential for environmental performance (Rehman et al. 2023a) and firms' performance (Nureen et al. 2023). Environmental CSR, GSCM, and a firm's performance relationship are unclear. TMC is used as a mediator to explain the relationship.

TMC significantly plays a significant role in answering green issues (Ilyas et al. 2020). Moreover, TMC is an essential factor in firm strategies and objectives, and a manager's dedication is necessary for the attainment of a firm's progress (Solovida & Latan 2017). Hence, TMC is a mediator between environmental CSR, GSCM, and green competitive advantage. Hypotheses are below:

H<sub>4</sub>: TMC significantly mediates between environmental CSR and green competitive advantage.

H<sub>5</sub>: TMC significantly mediates between GSCM and green competitive advantage.

### Pro-environmental business strategy as a moderator

The environmental strategy of an organization's long-term orientation regarding managing environmental practices and building environmental resources and capabilities is to fit stakeholders' expectations well (Ortiz-de-Mandojana & Aragón-Correa 2016). Business practices and policies of organizations that fulfill stakeholders' requirements regarding environmental issues (van Someren 1995). Environmental strategies are reflected in organizations' expenditures to decrease waste pollution and safeguard the environment (Adomako & Tran 2022). The management focuses on natural

issues that trigger the organizations' aptitude to establish an environmental strategy (Hart & Dowell 2011). Natural RBV favored the relationship between environmental strategy and green performance (Kraus et al. 2020; Rehman et al. 2021a). Nowadays, practitioners and academicians focus on green strategies that improve environmental performance (Kraus et al. 2020). Moreover, environmental strategies improve financial performance (Fousteris et al. 2018). We used a pro-environmental business strategy between TMC and green competitive advantage. Environmental strategy can be a moderator between TMC and green performance (Akram et al. 2023). Moreover, prior researchers ignored to observe the moderating role of pro-environmental business strategy between TMC and green competitive advantage. Hypotheses are below; Fig. 1 depicts the research framework.

H<sub>6</sub>: Pro-environmental business strategy is positively related to green competitive advantage.

H<sub>7</sub>: Pro-environmental business strategy significantly moderates TMC and green competitive advantage.

## Methodology

### Measures

The items of all variables were adapted from previous studies. Environmental CSR includes EPH, ECI, and ECW. EPH has three items, ECI four items, and ECW has three items from Alam and Islam (2021). GSCM has four dimensions: eco-design, cooperation with customers, green purchasing, and internal environmental management. Eco-design includes four items and cooperation with customers and internal environmental management are five items each (Shang et al. 2010; Zhu et al. 2007). TMC's five items are from Yang Spencer et al. (2013). Pro-environmental business strategy includes three items from Banerjee (2002). Finally, green competitive advantage's four items are from Chen and Chang (2013) Table 1.

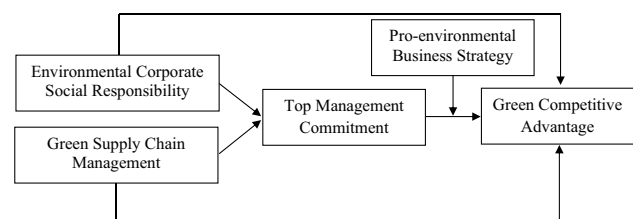


Fig. 1 Research framework

**Table 1** Respondents' profile

Demographics	Category	No	%
Industry type	Textile	99	29.91
	Food and beverage	92	27.79
	Pharmaceuticals	73	22.06
	Automotive and electronics	67	20.24
Supplier annual turnover (CYN) in million	Less than 10	85	25.68
	10 to 25	46	13.90
	26 to 50	53	16.01
	51 to 75	35	10.57
	76 to 100	47	14.20
	More than 100	65	19.64
Buyer annual turnover (CYN) in million	Less than 10	24	7.25
	10 to 25	19	5.74
	26 to 50	97	29.31
	51 to 75	66	19.94
	76 to 100	74	22.36
	More than 100	51	15.40
Type of buyer ownership	State-owned	37	11.18
	State-share-owned	53	16.01
	Wholly foreign-owned	64	19.34
	Privately owned	163	49.24
	State and privately owned	14	4.23

## Population and sampling

The researchers collected data from Guangdong, China. China is the biggest exporter worldwide (Liu et al. 2009). In China, SMEs are > 93 million, and their contribution to employment and GDP is greater than 80% and 60%, respectively (Yang et al. 2020). Moreover, 41,490 SMEs are listed in Guangdong, China (Statista 2023). Before distributing the questionnaire, a pre-test was conducted. A total of 10 questionnaires were distributed, five to industry and five to academicians. The feedback was used to improve the content of the questionnaire. In SmartPLS, cross-loadings are used for pre-testing. Table 2 shows the cross-loadings. Population is known, and researchers used probability sampling for data collection. In probability sampling, this study used a simple random sampling technique to collect data because a simple random sampling technique offers an identical chance of selection to every member of the population (Sekaran & Bougie 2016). The researchers collected data through questionnaires and visited organizations personally. According to Comrey and Lee (1992), a sample size below 50 is weaker; sample sizes 51 to 100 are weak; sample sizes 101 to 200 are adequate; sample sizes 201 to 300 are good; sample size of 500 is very good; and sample size of 1000 is considered excellent. Thus, this study distributed a total of 2000 questionnaires to respondents randomly and only 335 questionnaires were received. Out of 335 questionnaires, 4 questionnaires were excluded due to misleading information. Hence, only 331 questionnaires were part of the final

analysis. The Five-Likert scale was used. The Five-Likert scale approach is appropriate and followed by several prior researchers (Al Doghnan & Malik 2022; Wiroonratch & Mungsakul 2022).

Table 1 highlights the demographic characteristics. From an industry perspective, textile organizations were 99 or 29.91%, food and beverage 92 or 27.79%, automotive and electronics 67 or 20.24%, and pharmaceuticals were 73 or 22.06%. From a supplier annual turnover perspective, less than 10 million Yuan turnover organizations were 85 or 25.68%; turnovers 10 to 25 million organizations were 46 or 13.90%; turnovers 26 to 50 million organizations were 53 or 16.01%; turnovers 51 to 75 million organizations were 35 or 10.57%; turnovers 76 to 100 million organizations were 47 or 14.20%; and organizations more than 100 million Yuan organizations were 65 or 19.64%. From a buyer annual turnover perspective, less than 10 million Yuan turnover organizations were 24 or 7.25%; turnovers 10 to 25 million organizations were 19 or 5.74%; turnovers 26 to 50 million organizations were 97 or 29.31%; turnovers 51 to 75 million organizations were 66 or 19.94%; turnovers 76 to 100 million organizations were 74 or 22.36%; and organizations more than 100 million Yuan organizations were 51 or 15.40%. In the type of buyer ownership perspective, state-owned organizations were 37 or 11.18%; state-shared-owned organizations were 53 or 16.01%; wholly foreign-owned organizations were 64 or 19.24%; privately owned organizations were 163 or 49.24%; and state and privately owned organizations were 14 or 4.23%.

**Table 2** Cross-loadings

Variables	Items	CC	ECD	ECI	ECW	EPH	GCA	GP	IEM	PBS	TMC
Co-operation with customers	CC1	<b>0.803</b>	0.523	0.606	0.337	0.455	0.536	0.584	0.283	0.130	0.538
	CC2	<b>0.823</b>	0.558	0.543	0.312	0.414	0.562	0.504	0.274	0.117	0.588
	CC3	<b>0.784</b>	0.503	0.588	0.296	0.484	0.521	0.540	0.315	0.175	0.570
	CC4	<b>0.846</b>	0.417	0.617	0.285	0.510	0.594	0.549	0.343	0.204	0.476
	CC5	<b>0.632</b>	0.355	0.366	0.194	0.369	0.427	0.379	0.274	0.212	0.339
	CC6	<b>0.835</b>	0.328	0.692	0.279	0.526	0.398	0.564	0.295	0.236	0.491
Eco-design	ECD1	0.448	<b>0.820</b>	0.619	0.287	0.511	0.596	0.551	0.446	0.212	0.478
	ECD2	0.429	<b>0.652</b>	0.364	0.191	0.368	0.425	0.377	0.472	0.203	0.337
	ECD3	0.329	<b>0.815</b>	0.608	0.254	0.444	0.480	0.548	0.580	0.288	0.558
	ECD4	0.521	<b>0.735</b>	0.502	0.388	0.296	0.579	0.350	0.557	0.257	0.451
Environmental community involvement	ECI1	0.587	0.569	<b>0.848</b>	0.390	0.493	0.567	0.440	0.575	0.184	0.385
	ECI2	0.529	0.630	<b>0.869</b>	0.352	0.548	0.520	0.535	0.557	0.269	0.532
	ECI3	0.582	0.646	<b>0.887</b>	0.435	0.593	0.575	0.577	0.549	0.216	0.589
Environmental customer wellbeing	ECW1	0.189	0.238	0.230	<b>0.727</b>	0.421	0.226	0.414	0.249	0.015	0.208
	ECW2	0.169	0.183	0.178	<b>0.677</b>	0.390	0.159	0.370	0.237	0.049	0.138
	ECW3	0.342	0.318	0.414	<b>0.752</b>	0.460	0.312	0.469	0.338	0.036	0.374
	ECW4	0.283	0.282	0.390	<b>0.758</b>	0.355	0.336	0.393	0.297	0.013	0.334
Environmental philanthropy	EPH1	0.530	0.574	0.548	0.448	<b>0.913</b>	0.562	0.459	0.576	0.225	0.509
	EPH2	0.549	0.524	0.614	0.548	<b>0.929</b>	0.577	0.485	0.570	0.264	0.492
	EPH3	0.533	0.596	0.570	0.532	<b>0.920</b>	0.536	0.480	0.553	0.204	0.503
Green competitive advantage	GCA1	0.542	0.398	0.513	0.352	0.504	<b>0.826</b>	0.556	0.503	0.242	0.632
	GCA2	0.563	0.461	0.416	0.366	0.580	<b>0.890</b>	0.614	0.605	0.291	0.544
	GCA3	0.529	0.315	0.608	0.254	0.444	<b>0.880</b>	0.548	0.508	0.288	0.558
	GCA4	0.598	0.393	0.621	0.346	0.570	<b>0.851</b>	0.603	0.526	0.220	0.486
Green purchasing	GP1	0.530	0.574	0.548	0.448	0.313	0.562	<b>0.859</b>	0.576	0.225	0.509
	GP2	0.549	0.524	0.614	0.548	0.329	0.577	<b>0.885</b>	0.570	0.264	0.492
	GP3	0.533	0.596	0.570	0.532	0.320	0.536	<b>0.880</b>	0.553	0.204	0.503
	GP4	0.587	0.569	0.449	0.390	0.493	0.567	<b>0.740</b>	0.575	0.184	0.485
Internal environmental management	IEM1	0.384	0.581	0.592	0.279	0.512	0.515	0.567	<b>0.857</b>	0.175	0.526
	IEM2	0.391	0.593	0.535	0.216	0.517	0.524	0.540	<b>0.811</b>	0.221	0.460
	IEM3	0.435	0.592	0.516	0.326	0.469	0.478	0.550	<b>0.793</b>	0.077	0.490
	IEM4	0.486	0.515	0.543	0.423	0.495	0.503	0.569	<b>0.827</b>	0.086	0.548
	IEM5	0.481	0.545	0.595	0.405	0.557	0.549	0.606	<b>0.860</b>	0.161	0.564
Pro-environmental business strategy	PBS1	0.220	0.328	0.258	0.049	0.257	0.332	0.274	0.174	<b>0.910</b>	0.215
	PBS2	0.049	0.094	0.044	0.109	0.065	0.061	0.063	0.034	<b>0.603</b>	0.021
	PBS3	0.146	0.171	0.158	0.072	0.137	0.148	0.128	0.117	<b>0.656</b>	0.148
Top management commitment	TMC1	0.612	0.546	0.539	0.290	0.420	0.622	0.588	0.567	0.213	<b>0.879</b>
	TMC2	0.530	0.549	0.592	0.431	0.514	0.581	0.549	0.505	0.131	<b>0.897</b>
	TMC3	0.396	0.456	0.514	0.361	0.429	0.501	0.557	0.405	0.127	<b>0.851</b>
	TMC4	0.601	0.566	0.584	0.263	0.479	0.555	0.576	0.619	0.255	<b>0.743</b>

Source: Self

## Results

### CMB.

Data was gathered using questionnaires simultaneously, and there is a possibility that common method bias (CMB) issues can happen. It was promised to respondents that their information will not be shared with someone without their

consent. CMB is deemed a severe problem usually attached to self-survey (Podsakoff & Organ 1986). Statistically, variance inflation factor (VIF) or full-collinearity and Herman's single factor are used for CMB. VIF is followed to assess the existence of collinearity in empirical data. WarpPLS 8.0 was used for full-collinearity. VIF or full-collinearity should be less than 3.3 (Kock 2015). Tables 4 and 6 show that the

full-collinearity value is lesser than the standard value. Herman’s single factor is followed for CMB, and this study demonstrates that single-factor explains 41.23%, which is below 50%. Hence, both criteria are fulfilled, and empirical data is no CMB issue.

**Correlation analysis**

This study uses SPSS, WarpPLS, and SmartPLS for data analysis. The SPSS software was used for descriptive analysis. This study computes demographic results and correlation analysis in the descriptive analysis. Pearson’s correlation analysis technique was followed to compute interrelationships among variables/items. The researchers stated that the range of correlation is between – 1 and + 1 (Taylor 1990). The values near + 1 show high correlations and vice versa. Table 3 shows that green SCM is highly correlated with green competitive advantage ( $r=0.789, p < 0.05$ ). Table 3 reveals that the mean value of every variable is near to 4. Most respondents agree that green SCM, TMC, and pro-environmental business strategy measure green competitive advantage.

**Model estimation**

PLS is a soft modeling approach, so data distribution is unnecessary (Chidambaram et al. 2021). PLS-SEM technique is usually used to estimate hypotheses through SmartPLS software. The PLS-SEM is preferably adapted for exploratory research because this permits a complete evaluation of measurement and structural model (Yongliang & Sharon 2022). Several reasons are available for using PLS-SEM. For example, it is more reliable to execute mediation (Preacher & Hayes 2004). Moreover, it is appropriate for simple and complex models; data normality is not required, and smaller samples (Hair et al. 2014). PLS-SEM is widely accepted and followed by various researchers in diverse areas (Al-Muttar et al. 2022; Alfayad 2021; Almoussawi et al. 2022; Alyahya & Bhatti 2022; Ameer & Garg 2022; Anggusti 2022; Azizah 2021; Bhatti et al. 2022b; Chidambaram et al. 2021; Duong et al. 2022; Hos-sain et al. 2022; Khalil et al. 2022; Kuo et al. 2021; Olaleye

et al. 2021; Ruan & Liu 2021; Satria et al. 2022; Van Loi 2022b, a; Wang et al. 2021). The sample is not big, hence, this study followed PLS-SEM for hypothesis testing. The research framework covers five reflective constructs. Environmental CSR and green SCM have various dimensions.

Figure 2 portrays the measurement model in lower order. Loading should be > 0.50 (Hair et al. 2014). Table 4 confirms no issue regarding loadings. For the reliability test, Cronbach’s alpha and CR were used (Alnaim 2022; Susilawati et al. 2022; Tarrad et al. 2022). Cronbach’s alpha and CR value should be 0.70 or more (Hair et al. 2019). Table 4 shows no issue regarding this. Convergent validity was computed through average variance extracted (AVE), and researchers suggested that AVE should be > 0.50 (Hair et al. 2014). Table 4 shows no issue regarding this.

Researchers use heterotrait-monotrait (HTMT) because traditional metrics are outdated (Henseler et al. 2015). The HTMT value should be 0.85 for latent variables (LVs) conceptually different and 0.90 for the same. Table 5 shows that all the values are within the range at first order, and the discriminant validity criterion was achieved.

Tables 6 and 7 demonstrate that all the criteria like factor loadings, CR, AVE, full-collinearity, and HTMT are fulfilled in second order because these criteria are more than standardized values, as mentioned. Figure 3 portrays the measurement model in second order.

**Regression model test**

Table 8 highlights hypothesis results. Environmental CSR is not important for green competitive advantage ( $\beta=0.037$  and  $t\text{-value}=0.391$ ), and  $H_1$  is not accepted. Green SCM ( $\beta=0.591$  and  $t\text{-value}=5.476$ ) and TMC ( $\beta=0.193$  and  $t\text{-value}=2.929$ ) increase green competitive advantage and accept  $H_2$  and  $H_3$  (Fig. 4). TMC significantly mediates between environmental CSR ( $\beta=0.096$  and  $t\text{-value}=2.727$ ), green SCM ( $\beta=0.056$  and  $t\text{-value}=1.988$ ), and green competitive advantage and accepted  $H_4$  and  $H_5$ . Pro-environmental business strategy enhances green competitive advantage ( $\beta=0.097$  and  $t\text{-value}=2.644$ ), and  $H_6$  is accepted. Finally, a pro-environmental business strategy strengthens TMC and

**Table 3** Descriptive and correlation analysis

Variables	Mean	S.D	TMC	PBS	GCA	ECSR	GSCM
Top management commitment	3.802	0.956	1				
Pro-environmental business strategy	4.110	0.683	0.179**	1			
Green competitive advantage	3.853	0.992	0.673**	0.250**	1		
Environmental CSR	3.941	0.729	0.713**	0.172**	0.192**	1	
Green supply chain management	3.815	0.800	0.711**	0.221**	0.789**	0.635**	1

S.D. standard deviation

\*\*  $p < 0.01$



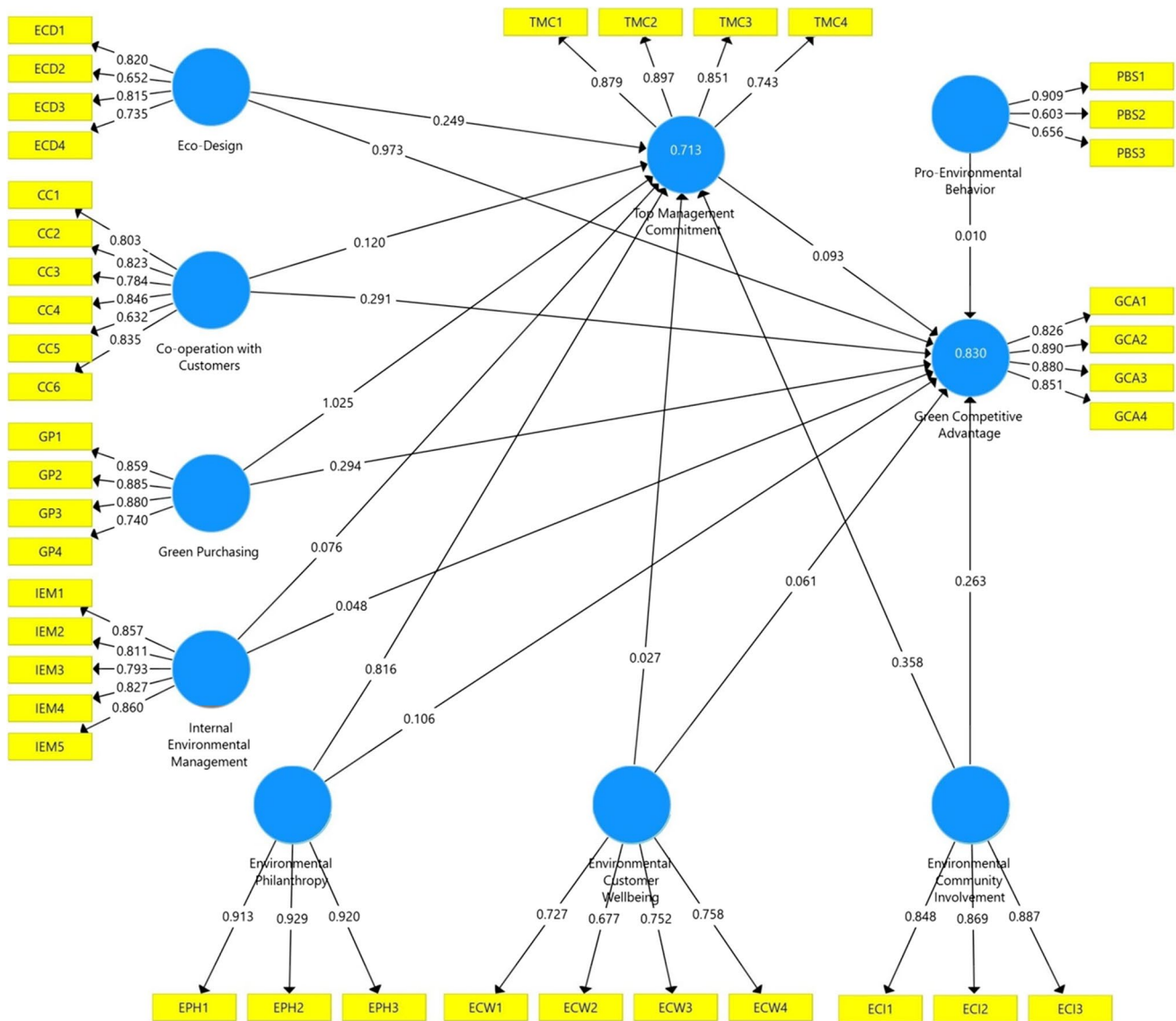


Fig. 2 Measurement model (first-order)

green competitive advantage ( $\beta = 0.055$  and  $t$ -value = 2.120) and supports H<sub>7</sub>. Figure 5 portrays this relationship.

The  $f^2$  displays if an external variable influences an endogenous variable (Ningning & Mengze 2022). According to Cohen (1988),  $f^2$  is categorized into smaller ( $f^2 = 0.02$ ), medium ( $f^2 = 0.15$ ), and high effect ( $f^2 = 0.35$ ). Table 8 demonstrates that environmental CSR has none, but TMC and pro-environmental business strategy are smaller, and green SCM has a medium effect on green competitive advantage. Environmental CSR has a medium, and GSCM has a smaller effect on TMC. For predictive relevance,  $Q^2$  and the explanatory power of research model  $R^2$  are used.  $R^2$  refers to the variance explained by collectively exogenous variables

(Abdulnabi et al. 2022; Prasetyo et al. 2022; Serrano-Díaz et al. 2022; Taddeo et al. 2022; Wachs et al. 2022; Waty et al. 2022). The  $R^2$  categories are weak ( $R^2 = 0.02 - 0.13$ ), moderate ( $R^2 = 0.13 - 0.26$ ), and substantial ( $R^2 =$  more than 0.26). Table 9 highlights that  $R^2$  of TMC is 57.6% and green competitive advantage is 66.7%. Hence, the  $R^2$  value of TMC and green competitive advantage fall under substantial. The literature stated that  $Q^2$  should be  $> 0$  (Chin 1998). The blindfolding technique is followed for  $Q^2$ . Table 9 reveals that the  $Q^2$  value of TMC and green competitive advantage is above zero. Hence, both criteria were achieved.

**Table 4** Convergent validity (first-order)

Constructs	Items	Factor loading	AVE	CR	$\alpha$	Full collinearity
Environmental philanthropy	EPH1	0.913	0.847	0.943	0.910	3.144
	EPH2	0.929				
	EPH3	0.920				
Environmental customer wellbeing	ECW1	0.727	0.532	0.819	0.730	1.578
	ECW2	0.677				
	ECW3	0.752				
	ECW4	0.758				
Environmental community involvement	ECI1	0.848	0.754	0.902	0.836	2.870
	ECI2	0.869				
	ECI3	0.887				
Eco-design	ECD1	0.820	0.575	0.843	0.759	2.182
	ECD2	0.652				
	ECD3	0.815				
	ECD4	0.735				
Cooperation with customers	CC1	0.803	0.625	0.908	0.878	1.553
	CC2	0.823				
	CC3	0.784				
	CC4	0.846				
	CC5	0.632				
	CC6	0.835				
Green purchasing	GP1	0.859	0.710	0.907	0.863	2.322
	GP2	0.885				
	GP3	0.880				
	GP4	0.740				
Internal environmental management	IEM1	0.857	0.689	0.917	0.887	1.731
	IEM2	0.811				
	IEM3	0.793				
	IEM4	0.827				
	IEM5	0.860				
Top management commitment	TMS1	0.879	0.714	0.908	0.864	2.416
	TMS2	0.897				
	TMS3	0.851				
	TMS4	0.743				
Pro-environmental business strategy	PBS1	0.910	0.540	0.773	0.771	1.186
	PBS2	0.603				
	PBS3	0.656				
Green competitive advantage	GCA1	0.826	0.744	0.921	0.885	2.981
	GCA2	0.890				
	GCA3	0.880				
	GCA4	0.851				

**Table 5** HTMT (first-order)

Variables	CC	ECD	ECI	ECW	EPH	GCA	GP	IEM	PEB	TMS
CC										
ECD	0.744									
ECI	0.787	0.774								
ECW	0.419	0.439	0.520							
EPH	0.643	0.795	0.719	0.671						
GCA	0.800	0.818	0.729	0.436	0.678					
GP	0.745	0.759	0.800	0.701	0.690	0.762				
IEM	0.713	0.656	0.812	0.470	0.684	0.755	0.722			
PEB	0.226	0.339	0.265	0.167	0.252	0.302	0.263	0.180		
TMC	0.738	0.741	0.749	0.448	0.616	0.767	0.787	0.710	0.223	

CC cooperation with customers; ECD eco-design; ECI environmental community involvement; ECW environmental customer wellbeing; EPH environmental philanthropy; GCA green competitive advantage; GP green purchasing; IEM internal environmental management; PEB pro-environmental business strategy; TMC top management commitment

**Table 6** Convergent validity at second-order

First-order	Second-order	Items	Factor loading	AVE	CR	Full collinearity			
	Environmental CSR	Environmental philanthropy	0.876	0.673	0.859	2.302			
		Environmental customer wellbeing	0.679						
		Environmental community involvement	0.889						
	GSCM	Cooperation with customers	0.938				0.834	0.952	2.082
		Internal environmental management	0.932						
		Eco-design	0.939						
Top management commitment	Green purchasing	0.839	0.714	0.908	2.367				
	TMC1	0.879							
	TMC2	0.897							
	TMC3	0.851							
Pro-environmental business strategy		TMC4	0.744	0.540	0.773	1.084			
		PBS1	0.910						
		PBS2	0.602						
Green competitive advantage		PBS3	0.656	0.744	0.92	2.876			
		GCA1	0.826						
		GCA2	0.894						
		GCA3	0.876						
		GCA4	0.851						

**Table 7** HTMT for second-order

Variables	HC	IOT	INP	IOL
Environmental corporate social responsibility				
Green competitive advantage	0.815			
Green supply chain management	0.761	0.773		
Pro-environmental business strategy	0.285	0.302	0.260	
Top management commitment	0.823	0.767	0.790	0.223

## Discussion and conclusion

This research objective is to contribute to natural RBV by determining the association between environmental CSR, green SCM, and green competitive advantage with the mediating role of TMC. A pro-environmental business strategy is followed as a moderator.

Environmental CSR is not important for green competitive advantage, and  $H_1$  is not accepted. Prior researchers found that CSR does not significantly determine environmental performance (Kraus et al. 2020). The results are not in favor of natural RBV (Hart 1995). GSCM attained a green competitive advantage, and  $H_2$  supported. Prior researchers reveal that GSCM influences green performance (Cousins et al. 2019). The natural RBV supported this relationship (Hart 1995).

TMC attains a green competitive advantage and supports  $H_3$ . TMC significantly improves the environmental performance of Indonesian organizations (Latan et al.

2018). Literature confirmed that environment-friendly firms tend to rely on TMC, which eventually assists in enhancing green performance (Bresciani et al. 2023). TMC explains the difference environmental CSR, GSCM, and green competitive advantage and supports  $H_4$  and  $H_5$ . TMC is helpful in boosting the relationship between natural resources and organizational performance (Nureen et al. 2023). Without a managerial role, the organizations cannot get maximum benefits in terms of green competitive advantage through natural resources like environmental CSR and green SCM (Hart 1995). TMC assists in attaining a green competitive advantage and supports  $H_5$ .

A pro-environmental business strategy significantly and positively determines green competitive advantage and supports  $H_6$ . Prior researchers elucidated that environmental strategy improves green performance (Kraus et al. 2020). Organizations that concentrate on environmental strategies get more benefits in terms of improved green performance,

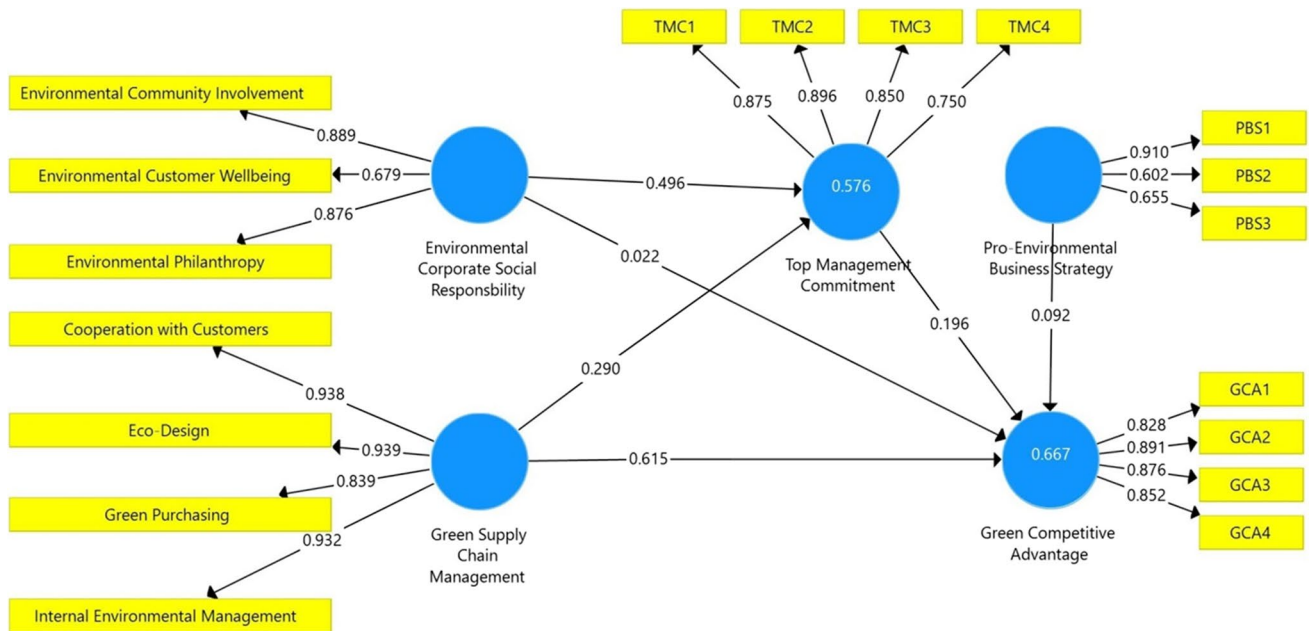


Fig. 3 Measurement model (second-order)

Table 8 Hypothesis results

Hypotheses	Paths	$\beta$ value	S.D	T-values	p-values	BCI LL	BCI UL	$f^2$	Remarks
H <sub>1</sub>	ECSR → GCA	0.037	0.094	0.391	0.699	-0.190	0.169	0.001	No
H <sub>2</sub>	GSCM → GCA	0.591	0.108	5.476	0.000	0.387	0.793	0.292	Yes
H <sub>3</sub>	TMC → GCA	0.193	0.066	2.929	0.007	0.085	0.310	0.049	Yes
H <sub>4</sub>	ECSR → TMC → GCA	0.096	0.035	2.727	0.012	0.045	0.150	—	Yes
H <sub>5</sub>	GSM → TMC → GCA	0.056	0.028	1.988	0.048	0.018	0.103	—	Yes
H <sub>6</sub>	PBS → GCA	0.097	0.037	2.644	0.014	0.020	0.157	0.024	Yes
H <sub>7</sub>	TMC × PBS → GCA	0.055	0.026	2.120	0.044	0.016	0.111	—	Yes

and organizations that lack environmental strategies cannot get this benefit (Solovida & Latan 2017). Natural RBV supports that environmental strategies are vital in measuring green competitive advantage (Hart 1995). Finally, the pro-environmental business strategy strengthens TMC and green competitive advantage and supports H<sub>7</sub>. This research suggests that even the TMC environmental CSR and GSCM organizations cannot ignore the pro-environmental business strategy to attain a green competitive advantage. Prior researchers supported this argument that environmental strategies cannot be overlooked in measuring green performance (Rehman et al. 2021a).

### Theoretical implications

This research has several theoretical implications. In literature, the influence of environmental CSR, GSCM, TMC, and pro-environmental business strategy on green competitive

advantage have rarely been discussed together (Kraus et al. 2020; Latan et al. 2018; Rehman et al. 2023a, 2021a). This study extends those of Nureen et al. (2023), who found GSCM on green culture and TMC leading firms’ performance. This study adds environmental CSR and pro-environmental business strategy to measure green competitive advantage. Prior studies overlooked the influence of environmental CSR, green GSCM, TMC, and pro-environmental business strategy on green competitive advantage (Bresciani et al. 2023; Kraus et al. 2020; Latan et al. 2018; Rehman et al. 2022). Hence, this research covers this gap.

Environmental CSR is used to attain a green competitive advantage through natural RBV and supports this relationship. Few researchers used stakeholder theory for CSR and economic performance (Hernández et al. 2020) and financial performance (Yang et al. 2020). The researchers suggested that natural RBV can be used to determine green competitive advantage through CSR (Menguc &

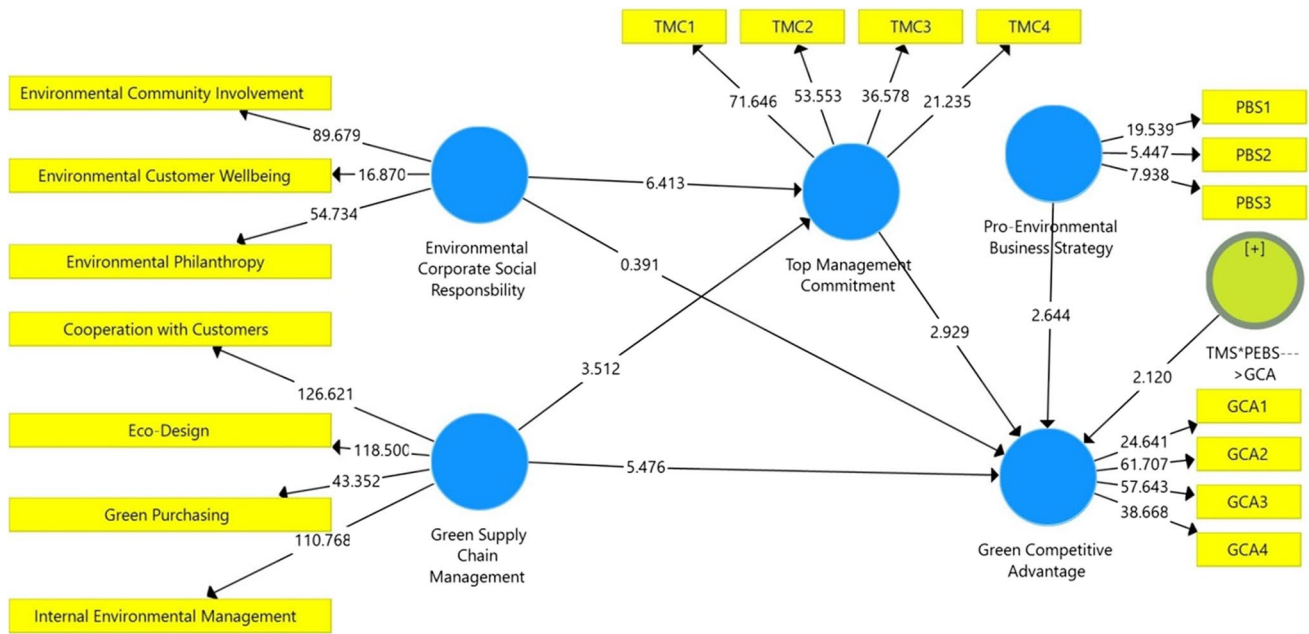


Fig. 4 Structural model

Fig. 5 Pro-environmental business strategy moderate between TMC and green competitive advantage

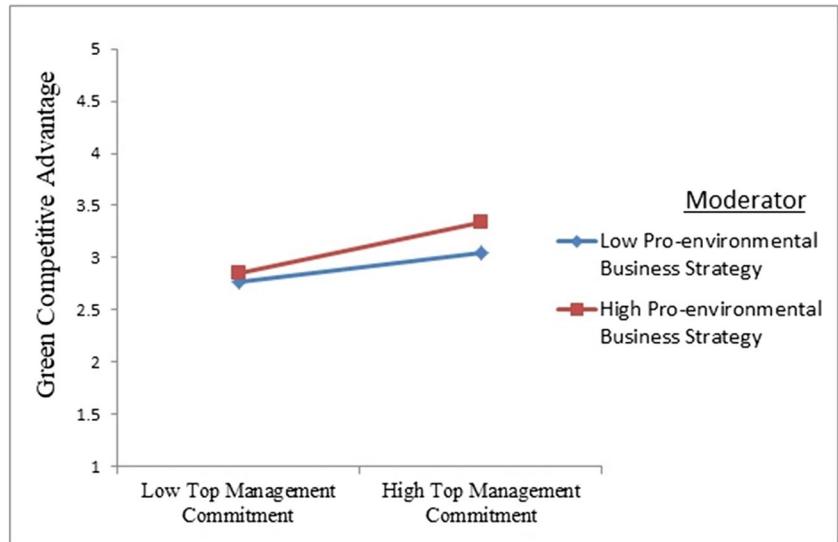


Table 9 Explanatory power and predictive relevance

	$R^2$	SSO	SSE	$Q^2$ (= 1 - SSE/SSO)
Top management commitment	0.576	1324.000	792.172	0.402
Green competitive advantage	0.667	1324.000	624.264	0.491

Ozanne 2005). Environmental CSR and green competitive advantage are not explored well particularly in SMEs (Kraus et al. 2020). Hence, we use natural RBV for environmental CSR and green competitive advantage. GSCM positively related to green competitive advantage through natural RBV. Few of the researchers used different theories on GSCM, for instance, stakeholder theory (Ahmed et al. 2020) and institutional theory (Saeed et al. 2018). GSCM measures environmental performance (Cousins



et al. 2019). Green competitive advantage through GSCM is explored little (Rehman et al. 2023a). Hence, this research uses natural RBV for GSCM and green competitive advantage.

TMC is a valuable factor in attaining a green competitive advantage. TMC measures firms' performance (Nureen et al. 2023) and environmental or green performance (Latan et al. 2018). Few researchers recommended that TMC in organizations can improve organizational green performance (Rehman et al. 2021a). The knowledge-based view is followed for TMC and environmental performance (Bresciani et al. 2023). The scholars recommended using natural RBV between TMC and firms' performance (Nureen et al. 2023). Hence, this study uses natural RBV for TMC and green competitive advantage. Finally, a pro-environmental business strategy measures green competitive advantage and gets superior results. Contingency theory is used for environmental strategy and performance (Rötzel et al. 2019). Natural RBV can be followed for pro-environmental business strategy and green performance (Kraus et al. 2020; Rehman et al. 2021a). Thus, we see the impact of a pro-environmental business strategy on green competitive advantage by using natural RBV.

### Managerial implications

This research concentrates on environmental CSR, GSCM, TMC, and pro-environmental business strategy to attain a green competitive advantage. If Chinese SMEs want an edge over competitors, then there is a need to focus on these predictors. Even environmental CSR does not directly measure green competitive advantage. SMEs cannot disregard the significance of environmental CSR for organizations' success. For instance, prior researchers found that CSR significantly enhances organizational performance (Naseem et al. 2020). This study suggests that even the findings of environmental CSR are not in favor, but management cannot ignore attaining green competitive advantage based on prior studies. The management should contribute to future generations and support non-government agencies operating in troublesome areas. The organizations take initiatives to promote and improve the natural environment and sustainable growth for future generations, inspire workers to take part in social activities, operationalize distinct schemes for reducing ecological effects, show respect for customers rights, and consider customer satisfaction on the priority list.

GSCM is an important indicator of green competitive advantage. For example, firms should liaise with suppliers for green objectives, supplier ISO 14000 certification, audit for supplier internal management, establish an environmental protection index of recycling gaseous reduction and energy conservation, and support for environmental

practices from upper and middle management. Moreover, cooperation is fostered with the customers for eco-design, green packaging, adoption, and third-party logistics. This study recommends that TMC is crucial for improving green performance (Latan et al. 2018). If organizations want a green competitive advantage, TMC regarding environmental activities is essential. For instance, top managers continue to emphasize green competitive advantage, put extra effort into meeting green competitive advantage, and provide accurate information on firms' green competitive advantage, and their work has contributed to green competitive advantage. Finally, this research suggests that a pro-environmental business strategy significantly impacts green competitive advantage. If organizations need to get an edge over competitors, they need to concentrate on a pro-environmental business strategy. For instance, organizations should emphasize the environmental aspects of products in ads, make marketing strategies for products/services, and product-market decisions that are always influenced by environmental concerns.

### Limitations and future recommendations

A cross-sectional approach is used, and upcoming scholars can use longitudinal research to see whether the results have changed. This research comprehensively sees the impact of environmental CSR, GSCM, TMC, and pro-environmental business strategy on green competitive advantage in Chinese manufacturing SMEs. The location and sample size might be a limitation. However, this study may enhance its scope in the future by considering the following directions. The sample size is small, and upcoming scholars can raise this to support the generalizability of outcomes. Researchers collected data from SMEs in Guangdong, China.

Nevertheless, considering the budget and time situation, some other industries might be targeted for data collection. Other countries might be focused on getting data and validating the results on a larger sample. This study might add other variables like environmental management control systems, environmental knowledge, and green innovation concerns to determine green competitive advantage.

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**Author contribution** Conceptualization and original write up: SR, MPC, and AHA; methodology: SR and MYA; Analysis and discussion and conclusion: SR and AIAA; project administration: SR; review and editing: SR and AHA.

**Data availability** Data are available from the corresponding author on request.

## Declarations

**Ethics approval** Not applicable.

**Consent to participate** No applicable.

**Consent for publication** Not applicable.

**Competing interests** The authors declare no competing interests.

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- Environmental corporate social responsibility (Alam and Islam 2021).
- Environmental philanthropy.*
1. The firm contributes to the projects promoting the well-being of the society.
  2. The firm invests into the projects for the future generations.
  3. The firm contributes to support other non-governmental agencies working in troublesome areas.
- Environmental community involvement.*
1. The firm takes part in the initiatives for promoting and improving the natural environment.
  2. The firm aims at sustainable growth of the society for future generations.
  3. The firm inspires employees for participating in societal activities voluntarily.
  4. The firm operationalizes distinct schemes for mitigating the negative effects upon ecology.
- Environmental customer wellbeing.*
1. The firm shows respects to the rights of customers and legal aspects.
  2. The firm discloses complete and precise information regarding products for the customers.
  3. The firm considers customer satisfaction as a very high priority.
- Green supply chain management.*
- Green purchasing* (Zhu et al. 2007).
1. Providing design specification to suppliers that include environmental requirements for purchased item.
  2. Cooperation with suppliers for environmental objective.
  3. Suppliers' ISO14000 certification.
  4. Environmental audit for suppliers' internal management.
  5. Choice of suppliers by environmental criteria. (Shang et al. 2010).
- Internal environmental management* (Shang et al. 2010).
1. Cross-functional cooperation for environmental improvements.
  2. Established an environmental protection index of recycling, gaseous reduction and energy conservation.
  3. Environmental management system exists.
  4. The company's efforts in relation to environmental matters have exceeded the requirements of the relevant regulations.



5. Support for environmental practices from senior managers and mid-level managers. (Zhu et al. 2007).

*Eco-design* (Zhu et al. 2013).

1. Design of products for reduced consumption of material/energy.  
2. Design of products for reuse, recycle, recovery of material, component parts.

3. Design of products to avoid or reduce use of hazardous of products.

4. Design of processes for minimization of waste.

*Cooperation with customers* (Zhu et al. 2013).

1. Cooperation with customer for eco-design.

2. Cooperation with customers for cleaner production.

3. Cooperation with customers for green packaging.

4. Cooperation with customers for using less energy during product transportation.

5. Adopting third-party-logistics.

6. Cooperation with customers for product take back.

7. Cooperation with customers for reverse logistics relationships.

*Top management commitment* (Yang Spencer et al. 2013).

1. My own work has made a contribution to the green competitive advantage.

2. Continues to put an emphasis on green competitive advantage.

3. Extra effort to meet green competitive advantage.

4. Green competitive advantage is one of the most important targets to achieve.

5. Providing accurate information on company green competitive advantage.

*Pro-environmental business strategy* (Banerjee 2002).

1. We emphasize the environmental aspect of our products and the services in our ads.

2. Environmental concerns have influenced our marketing strategies for our products and services.

3. In our firm, product-market decisions are always influenced by environmental concerns.

*Green competitive advantage* (Chen and Chang 2013).

1. The company has the competitive advantage of low cost about environmental management compared to its major competitors.

2. The quality of the green products or services that the company offers is better than that of its major competitors.

3. The company is more capable of environmental R&D and green innovation than its major competitors.

4. The company is more capable of environmental management than its major competitors.

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