

Customer Based Approach in Understanding the Interaction Between Green Business Activities and Green Brand Equity

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Abstract

Numerous automotive corporations have recently embraced environmentally conscious business practices, and this study aims to explore the specific impacts of these green business practices on green brand equity. A meticulously designed questionnaire was administered to individuals knowledgeable about green business functions. The investigation employed a conceptual framework, validated through partial least square structural equation modelling. The results revealed a noteworthy influence of Green Marketing (GM), Green Human Resource Management (GHRM), and Green Supply Chain Management (GSCM) on the formation of green brand image (GBI). However, the impact of green finance (GF) on GBI was found to be inconclusive. Within the inner model, GBI demonstrated a strong association with green trust (GT) and green customer satisfaction (GCS). The study's findings highlight a significant and positive impact of GBI on green brand equity (GBE). Intriguingly, GCS exhibited no discernible effect on GBE. Conversely, statistical analyses underscore a significant relationship between GBE and GT. These findings encourage managers to rethink their strategies for cultivating green brand equity by leveraging the potential of various green business functions.

Keywords: green brand equity; green trust; green brand image; green business functions; SEM.

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1 Introduction

In today's world, the drive to protect our environment is fueled by numerous concerns such as pollution, climate change, and the depletion of natural resources. This heightened environmental awareness has sparked a significant shift in consumer attitudes toward eco-friendly products. More and more people are motivated to align their purchasing decisions with a commitment to environmental preservation. In response to this evolving landscape, shaped by environmental, regulatory, and consumer pressures, businesses are integrating green practices into the core of their strategies (Choudhary et al., 2020). Sustainability has become a key differentiator for companies, providing them with unique market positioning (Zhang et al., 2019). In this modern era, numerous businesses have stepped up to create and promote environmentally friendly goods and services.

However, despite these efforts, a cloud of consumer skepticism continues to loom over many of these businesses. This skepticism can give rise to a phenomenon known as greenwashing (de Freitas Netto et al., 2020; Szabo & Webster, 2021), where businesses' environmental claims are met with doubt. This not only erodes consumer confidence but also poses a challenge to the effective implementation of sustainable practices (de Freitas Netto et al., 2020; Naciti et al., 2021; Szabo & Webster, 2021). Balancing the genuine commitment to sustainability with consumer expectations becomes crucial, as businesses navigate the intricate landscape of eco-friendly marketing in the pursuit of a greener future.

In the ever-evolving landscape of product and service performance, the functional aspects are often a subject of scrutiny and debate, as pointed out by Kalafatis et al. (1999). Scholars have grappled with this challenge, providing insights into green practices, green branding, and green brand equity (Bai & Sarkis, 2013; Bulsara et al., 2014; Chang & Fong, 2010; Chen, 2008, 2010; Testa & Iraldo, 2010; Zhu et al., 2012). However, the realm of business activities related to green business functions, encompassing Green Marketing (GM), Green Finance (GF), Green Human Resource Management (GHRM), and Green Supply Chain Management (GSCM), has received limited attention in the literature. Unlike the well-explored domains of green marketing, green supply chain management, and green human resource management, green finance remains either absent or receives lesser emphasis in scholarly discourse. While previous research has suggested few green brand equity models addressing aspects like perceived quality, trust, awareness, and brand image (Bekk et al., 2016; Gorska-Warsewicz et al., 2021), the interplay between green business functions and brand equity has remained largely unexplored (Khan et al., 2022). Notably, the bulk of research on green branding has centered on industrialized nations, leaving a conspicuous dearth of studies on brand equity and green business practices in regions like India (Bashir et al., 2020; Chen, 2008, 2010; Gong et al., 2021; Huang et al., 2014; Khandelwal et al., 2024; Mourad & Ahmed, 2012; Ottman, 2017; Priya et al., 2014; Sarkar, 2012). The present study seeks to fill this void, testing some of the relationships suggested in the literature along with the proposed relationships among green business functions and green brand equity with green trust, green customer satisfactions and green brand image playing as mediators. Thus, this study introduces the concept of "green business functions," amalgamating "green marketing," "green finance," "green HRM," and "green supply chain management" to evaluate their effects on brand equity. Building on the interconnected nature of all components in the green value chain, the study also probes into the roles of brand equity mediators, including Green Brand Image (GBI), Green Customer Satisfaction (GCS), and Green Trust (GT). The Findings may help policy makers and practitioners to adopt green business functions into their operations to build customer-based brand equity.

In the contemporary world, heightened environmental consciousness spurred by climate change, global warming, and pollution has led consumers, governments, and environmentalists to scrutinize the ecological repercussions of their actions. Since the adoption of the Kyoto Protocol in 1997, organisations have increasingly embraced green practices (Boiral, 2006; Cirman et al., 2009; Freedman & Jaggi, 2005). For businesses in both the industrial and service sectors, green branding has become a pivotal strategic element. The automotive industry stands out as a sector where green business practices can seamlessly be integrated from inception to completion. Notably, several automakers have secured prominent positions in Interbrand's ranking of the world's leading green brands. This study's focus on the automotive sector provides a unique opportunity to explore how green business functions influence green brand equity, given the industry's capacity to implement comprehensive green practices. The anticipated findings aim to enhance the understanding of

corporate and academic experts regarding the impact of green business practices on green brand equity, addressing a critical knowledge gap.

In summary, this research contributes by examining various green business functions, delineating the components of green brand equity, and proposing a conceptual model to empirically investigate the relationship between diverse green business functions and green brand equity in the context of the Indian automobile industry. The ensuing sections of the paper delve into the theoretical underpinnings and a comprehensive review of existing literature, followed by the proposed methodology. Subsequently, the paper discusses managerial implications, acknowledges limitations, outlines avenues for future research, and culminates in the presentation of finding and accompanying insights.

This study contributes valuable insights to academia by advancing theoretical understanding and methodological rigor in the field of green brand equity research. Additionally, it offers actionable guidance to practitioners by informing strategic decision-making processes and facilitating the development of effective sustainability strategies within the automotive industry and beyond.

2 Conceptual framework and Hypotheses Development

The integration and implementation of environmentally conscious business practices are commonly known as the green business function. According to Gilbert (2007), a "green business activity" encompasses any practice that directly benefits the environment or minimizes its negative ecological impact. Over the past two decades, businesses have shown a growing interest in green business due to demonstrated advantages in previous research (Linan et al., 2014; Molenaar & Kessler, 2017; Pattinson, 2015). Stakeholders, including consumers, are increasingly influenced by green business practices as environmental awareness rises.

The concept of green brand equity (GBE) encompasses consumer perceptions of a company's environmental commitments and concerns (Chen, 2010). The term "green" has evolved to represent various brand positioning strategies, including organic, energy-efficient, and environmentally friendly approaches (Mourad & Ahmed, 2012). Businesses globally are increasingly adopting green marketing for reasons such as preparing for future regulations, meeting consumer expectations, and competing with other environmentally conscious offerings (Grant, 2008). Green efforts not only can enhance a company's reputation but also contribute to its image as "The Good Brand" through corporate responsibility (Chen, 2010; Cretu & Brodie, 2007; Padgett & Allen, 1997). In the literature several authors focussed on the study of traditional 4Ps (Product, Price, Place, and Promotion) of marketing in Green Marketing context (Dangelico & Vocalelli, 2017; Polonsky & Rosenberger, 2001). Dinh et al. (2023) concluded that the green promotion tools have a significant positive influence on green brand equity. On the other hand, green washing was found to have a negative influence on brand equity (Khattari & Tomar, 2024; Qayyum et al., 2023; Zaid et al., 2024). Deng and Yang (2024) noted that green packaging design has a significant positive influence on green purchase intentions. Ecolabels represent a significant promotional tool for Green Marketing (Grundey, 2009; Rex & Baumann, 2007).

Consumer pressure and government regulations have driven many businesses to adopt green practices (Bateman & Zeithaml, 1993). In addition, the desire to differentiate from competitors, gain a competitive edge, and enhance sustainability are significant drivers behind the adoption of green business practices (Smith & Perks, 2010). According to Porritt and Winner (1989), adopting a green or sustainable business model allows companies to protect the environment. Rather than focusing on short-term objectives, businesses are encouraged to develop long-term strategic plans based on their green vision (Gunningham et al., 2003). Green marketing approaches and

strategies have been found to have significant impact on corporate reputation, image, and business performance (Kewakuma et al., 2021; Ko et al., 2013; Liu & Tang, 2023; Majeed et al., 2022; Mukonza & Swarts, 2020; Tan et al., 2022). However, businesses in the domain of green marketing often face challenges such as poor trustworthiness, green skepticism, and unpredictability (Liu & Tang, 2023; Mendleson & Polonsky, 1995). Consequently, companies heavily rely on their brand reputation to establish and maintain an environmentally friendly image (Ng et al., 2013). Thus, the literature provides a wide support to green marketing functions having a positive impact on green brand image. In line with this, our first hypothesis is as follows:

\mathcal{H}_1 : Green Brand Image (GBI) is positively and directly influenced by green marketing efforts.

In the vast realm of business strategies, Green Supply Chain Management (GSCM) emerges as a holistic approach encompassing all aspects of supply chain operations – from procurement and production to materials management, distribution, and reverse logistics (Green et al., 2012). It's more than just a set of practices; it's a way for supply chain managers to navigate environmental legislation changes, reduce waste, mitigate reputational risks, and fortify their company's commitment to corporate social responsibility (Green et al., 1998). Hall (2000) emphasizes the compelling reasons for companies to enhance their environmental performance, whether driven by legal obligations, public pressure, potential cost savings, or the pursuit of a positive public image. Zhu et al. (2012) further highlight that GSCM goes beyond operational efficiency; it can elevate brand perception, social interactions, and individual motivation. The positive impact extends to a company's overall brand image and market performance (Ashraf et al., 2020; Balasubramanian, 2014; Herrmann et al., 2021). The link between GSCM and a company's brand image is quite evident in the literature (Rehman et al., 2024; Testa & Iraldo, 2010), leading us to propose the following:

\mathcal{H}_2 : Green Brand Image (GBI) is positively and directly influenced by Green Supply Chain Management (GSCM).

Green finance refers to strategic planning, sourcing, allocation, and utilization of resources to support initiatives that have a positive environmental impact resulting in alignment of investment and environmental goals (Sean, 2020). Green management of finance helps businesses build a good green reputation and brand image (Chen, 2010). The longevity of a business is intricately tied to environmental accounting, commonly known as green accounting (Gallhofer & Haslam, 1997). Unlike traditional accounting, green accounting measures unit value in terms of market carbon pricing (Bowen & Wittneben, 2011). Bulsara et al. (2014) mention the concept of green financing as a company's strategic plan to invest in environmentally friendly projects. Green finance not only fosters environmental responsibility but also contributes to a favorable brand reputation. The rise of green funds and investments influences business practices, and green accounting and finance are anticipated to enhance a company's green brand image (Maulani & Ekuitas, 2015). Thus, the impact of green finance on green brand image has not been widely studied in the literature. This leads us to propose:

\mathcal{H}_3 : Green Brand Image (GBI) is directly and positively impacted by green finance.

Shaikh (2014) asserts that green HRM enhances the reputation of manufacturers and employers. Green HRM is the promotion of environmentally friendly human resource management practices like green recruitment, green development, and green reward (Samola, 2022). Increasing employee

understanding and commitment to environmental issues is also referred to as "green HRM," which is the promotion of environmentally friendly human resource management practices (Gill, 2012). It incorporates HR practices that are environmentally friendly and increase productivity, employee engagement, cost savings, and retention, all of which aid in reducing the carbon footprints of enterprises. Other strategies that can help with this include e-filing, flexible schedules, transport sharing, online interviewing, recycling, e-learning, telecommute, and energy-efficient office architecture. As a result, Green HRM helps companies build a good reputation among stakeholders. According to Cohen et al. (2010), the HR division is essential in developing and implementing sustainable business strategies throughout the organisation. Promoting environmental sustainability in enterprises depends on how the greening function is positioned and how it relates to company strategy and performance. Renwick et al. (2013), claim that by implementing Green HRM systems into their company processes, companies can improve their outcomes by gratifying their workforce and increasing consumer loyalty. Green HRM enhances a company's reputation (Mustapha et al., 2017). As a result, developing, implementing, and upholding a green HRM strategy within the company aids in creating a green image that draws both quality employees and clients (Muisyo et al., 2022; Samola, 2022; Song et al., 2021). As previous research has demonstrated a connection between green HRM and a green image, the authors continue to hold the following beliefs:

\mathcal{H}_4 : Green Brand Image (GBI) is directly and positively impacted by Green HRM.

The interplay between Green Brand Image (GBI), Green Trust (GT), and Green Customer Satisfaction (GCS) is emphasized in the literature (Nazari et al., 2015; Sarmiento-Guede et al., 2021). Green qualities are integral to service offerings (Robinot & Giannelloni, 2010), and customer satisfaction with green innovations is influenced by perceived emotional, functional, and social elements (Hur et al., 2013). Sarmiento-Guede et al. (2021) studied hierarchical effect of green image, trust, satisfaction and loyalty following the framework of hierarchy of effects model and found Green Satisfaction and Green Trust to be affected by Green Image. In understanding the dynamics between brand trust, customer satisfaction, and their interplay within the context of green business, it's essential to consider various perspectives. Numerous studies have delved into these concepts, defining brand trust as an immediate outcome linked to an enthusiastic customer response. On the other hand, customer satisfaction is often portrayed as an emotional response tied to a purchasing opportunity (Dehdashti Shahrokh et al., 2012). Chen (2010) articulates the essence of Green Trust (GT) as "the readiness to rely on a certain thing based on a belief or anticipation about its environmental performance as a result of its reliability, goodness, and capacity." He further emphasizes the mediating role of Green Brand Image (GBI) in fostering the development of Green Brand Equity (GBE) through the mediation of GT and Green Customer Satisfaction (GCS). Similar findings were observed by Dangaiso (2024) in his study related to organic food brands. Recognizing this interdependence, we propose:

\mathcal{H}_5 : Green Customer Satisfaction (GCS) is directly and positively impacted by Green Brand Image (GBI).

In the realm of customer satisfaction, it has been extensively studied as an emotional response triggered by the opportunity to make a purchase (Anderson & Narus, 1990; Hur et al., 2013). However, trust as distinguished from satisfaction, is often seen as a result of prior business dealings (Chauhan & Goyal, 2024). It is influenced by various factors, including advertising, word-of-mouth, and the overall pleasure derived from the customer experience (Krishnan, 1996). Notably, brand trust tends to evolve naturally when a purchase leads to a favorable response. Jannah et al. (2024)

also observed that green brand image and customer satisfaction has a positive influence on green trust. Considering the nuances presented in the literature, the following hypothesis is put forward:

\mathcal{H}_6 : Green Trust (GT) is directly and positively impacted by Green Brand Image (GBI).

Understanding the intricate relationship between environmental preservation, consumer awareness, and the facets of Green Brand Equity (GBE) is crucial for navigating the landscape of sustainable business practices (Delafruez & Goli, 2015). Chen (2010) succinctly defines Green Brand Equity as "a collection of customer views of a brand that are connected to environmental commitment and concerns." While the influence of Green Brand Equity is evident, Cretu and Brodie (2007) argue that customer value and loyalty are more profoundly impacted by a company's overall reputation. The brand's reputation, in turn, directly shapes consumer perceptions of the quality of goods and services. Chen (2010) further establishes the positive impact of Green Brand Image (GBI) on Green Brand Equity. Building on these insights, the next hypothesis can be articulated:

\mathcal{H}_7 : Green Brand Equity (GBE) is directly and positively impacted by Green Brand Image (GBI).

Trust is the cornerstone on which brand equity is built (Ambler, 1997). Aaker and Joachimsthaler (2009) and Keller (1993) define green brand equity as "*a combination of brand assets and liabilities addressing green commitments and environmental concerns linked with a brand that improve or detract from the value delivered by a product or service*". As per Chen and Chang (2013) when consumers are dubious about a brand's commitment to sustainability due to greenwashing, trust has greater importance. Greater consumer trust is correlated with a more favourable brand image. Additionally, the brand's GBE increases with a brand's greener customer base Bekk et al. (2016). Other studies have also shown that a higher level of GT has a beneficial impact on a GBE (Akturan, 2018; Butt et al., 2017; Ha, 2022; Ha, 2020). As a result, we keep our following hypothesis.

\mathcal{H}_8 : Green Brand Equity (GBE) is directly and positively impacted by Green Trust (GT).

The consumer's green demands, sustainable expectations, and environmental aspirations are satisfied at the level of green satisfaction, which is delightful (Chen, 2010). Chen (2010) also confirmed in the same study that green satisfaction drives green brand equity. Customers tend to stick with brands of products that appeal to them more than those of rival companies. Those received in return are an indication of the client's favourable mindset and purchasing habits (Yasin et al., 2007). The GBE is influenced by attitudinal ideas like consumer satisfaction with the product (Bekk et al., 2016). Numerous studies indicated that contentment significantly influenced (Bekk et al., 2016; Chen, 2010; Ha, 2022; Kang & Hur, 2012; Kazmi et al., 2021). So, the authors move on to the next hypothesis.

\mathcal{H}_9 : Green Brand Equity (GBE) is directly and favorably impacted by Green Customer Satisfaction (GCS).

Thus, the study builds on the existing literature as discussed above. Some of the relationships have been well-established and widely supported in the existing literature but some of the proposed

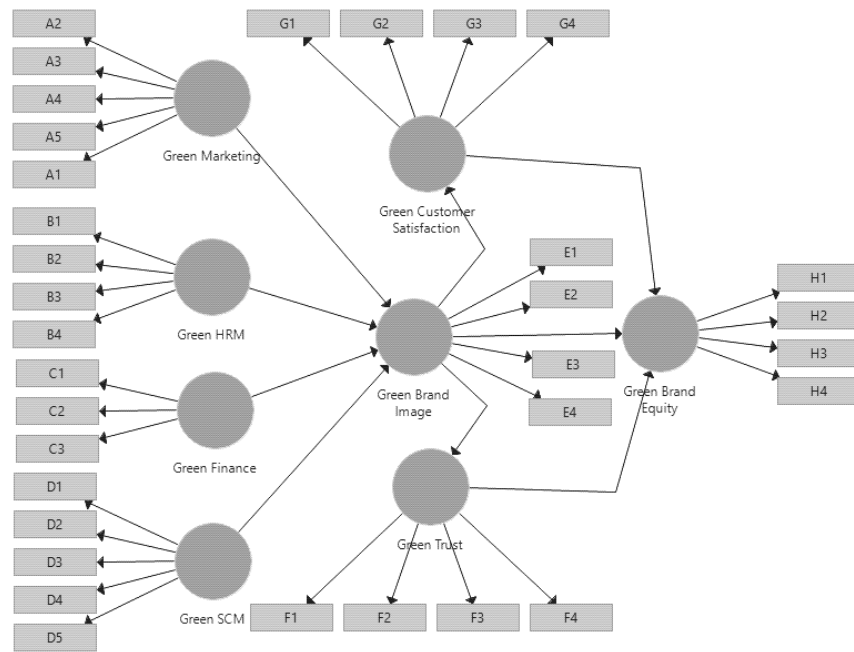


Figure 1. Conceptual Framework

relationships are not well-established and supported. The present study provides a comprehensive model detailing the effect of green business functions on green brand equity with green trust, green customer satisfactions and green brand image playing as mediators. Specific context of the study is the Indian automobile sector.

3 Conceptual model

The link between green business functions and higher-order variables (including GBI, GCS, GT and GBE) is at the core of the present study. The proposed model for the effect of green business functions on GBE is depicted in the diagram below. Our model's general sequence of effects is that various green business functions lead to GBI, which leads to GCS and GT. Furthermore, the GBI has an impact on GBE both directly and indirectly through GCS and GT. As a case study, the model is applied to the Indian automobile sector.

4 Research Methodology

In the research journey, the authors embarked on a comprehensive exploration employing various research methodologies, including exploratory, descriptive, and causal research methods. To address the research questions, the authors adopted a quantitative approach using a survey method. The targeted population consisted of individuals from the ten most populous cities in India who had a reasonable understanding of green business functions in the automotive industry. For the survey, questionnaire was developed and used as primary data collection tool. To ensure the reliability and validity of the questionnaire, the authors leveraged the Delphi method to assess its face validity, engaging experts in the field for a thorough evaluation. Delphi method is a widely used approach to develop consensus among the experts through collecting anonymous

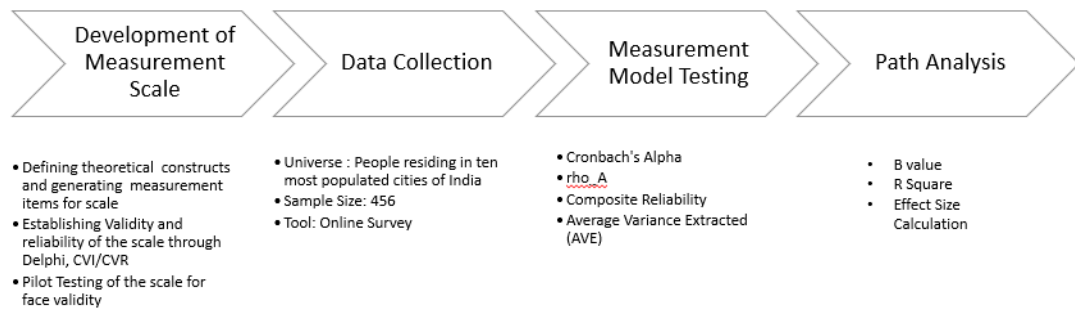


Figure 2. Methodology used for the research

feedback in several rounds (Dalkey & Helmer, 1963). To ensure quality in the outcome of Delphi method key considerations are panel members having knowledge about the topic under discussion, appropriate panel size and diversity from the perspective of research topic (De Villiers et al., 2005; Nasa et al., 2021). A Delphi panel was created with thirty experts who have a reasonable knowledge of the green business functions in automobile industry. Seven of the panel members were senior professionals from the automobile industry, five members were from academia, and eighteen members were customers. Panel members age ranged from 24 years to 55 years. Eleven of the panel members were females and nineteen were male. Geographically panel members were from six large Indian cities from top ten most populated cities of India. A consensus among the experts was reached in the sixth iteration. Transitioning to the data collection phase, the authors opted for the efficiency and accessibility offered by e-mail-based surveys. These surveys, facilitated through electronic mail applications over the Internet or business intranets, provided the authors with a swift, cost-effective, and streamlined approach to gather valuable insights (Kiesler & Sproull, 1986). The data collection unfolded in two stages. The initial phase involved gathering responses to assess face validity, refining the questionnaire, conducting a pilot study, and ensuring the scale's content validity and reliability. Building upon this groundwork, the second phase centered around an extensive e-mail survey, reaching out to individual customers residing in India's ten most populous cities with an understanding of green business functions.

Sample and Scale

For the survey, purposive sampling, a method akin to choosing reliable companions for our research journey, was employed. The targeted population consisted of Indian individuals with a reasonable understanding of green business functions in the automotive industry. Targeting individual customers well-versed in green business functions within the automobile industry, the authors emailed 500 potential responders. The robustness of our study was further confirmed with 456 valid responses received. A summary description of the respondent sample is presented in the Table 1.

In our analytical pursuits, we employed partial least square structural equation modelling (PLS-SEM) to rigorously test our conceptual model. This sophisticated approach ensures a nuanced examination of the relationships and constructs under scrutiny, providing a comprehensive

understanding of our research landscape.

Table 1. Sample Description

Characteristics		Number	Percentage
Awareness of Green Cars	Yes	334	73.25
	A Little	122	26.75
Sex	Male	239	52.41
	Female	217	47.59
Age	15 to 20	13	2.85
	21 to 29	151	33.11
	30 to 39	126	27.63
	40 to 49	122	26.75
	50 to 59	42	9.21
	60 And above	2	0.43
Education	Completed 10th	1	0.21
	Diploma or 10+2	10	2.19
	Bachelors	168	36.84
	Masters	251	55.04
	Doctorate	26	5.7
Income	Below INR 15000	24	5.26
	INR 15000 to 30000	55	12.06
	INR 30001 to 45000	42	9.21
	INR 45001 to 60000	97	21.27
	INR 60001 to 1 Lakhs	125	27.41
	Above INR 1 Lakhs	113	24.78
Employment	Government Employee	125	27.41
	Housewife	5	1.096
	Private Working Professional	225	49.34
	Self-Employed	225	7.67
	Students	1	0.21

Turning the attention to the Likert scale, a tried-and-true tool in the realm of measuring latent variables, the authors applied it to evaluate green business functions' characteristics, motives, and relationships. The Likert scale, ranging from 1 to 7, enabled participants to express their perspectives, with 7 denoting "Strongly Agree" and 1 representing "Extremely Disagree." This scale allowed for a nuanced assessment, capturing the depth of agreement or disagreement. Embracing disagreement as a valuable metric in the study, the authors embraced a robust methodology to unveil insights into the intricate world of green business functions in the automobile industry.

4.1 Data Analysis and Interpretations

Face Validity of the Questionnaire

In evaluating questionnaires, face validity is crucial for assessing how well a test aligns with the concept it is intended to measure based on subjective judgment. It is about assessing whether

the questions genuinely reflect the construct at face value, offering a subjective yet systematic evaluation of the scale's content (Malhotra, 2015). To ensure the face validity of the questionnaire, the authors employed the Delphi method, enlisting the expertise of seasoned professionals. These experts were tasked with responding to the questionnaire using the Delphi technique, providing invaluable insights that guided the authors in refining and enhancing the questionnaire. Version 2 of the questionnaire emerged from this iterative process, embodying the scale's face validity by incorporating expert suggestions and judiciously removing certain items. The authors' commitment to refining the questionnaire was further validated through a Pilot Study involving 44 participants. These individuals were graciously given the questionnaire and asked to share feedback based on their experience. The positive feedback received attested to the substance and utility of the questionnaire, affirming our dedication to crafting a robust and user-friendly tool.

Moving beyond face validity, content validity assumes the spotlight, ensuring that the questionnaire comprehensively represents the universe of all relevant elements under investigation (Cooper & Schindler, 2014). The approach involved scrutinizing all items within the scale, a process that underwent the rigorous scrutiny of a panel of experts. Employing common techniques like the content validity ratio (CVR), the expert panel classified test items as important, beneficial but not essential, or not necessary. The overall content validity index (CVI), calculated as the average of content validity ratios, surpassed acceptable limits, reaching an impressive 0.736. This reinforced the robust content validity of the questionnaire, especially considering that the majority of test items were drawn from existing literature.

4.2 Structural Equation Modelling

In the analysis phase, structural equation modeling (SEM) took centre stage, specifically the partial least square approach. This method not only identifies the hypothetical relationships within a detectable notion but also evaluates measurement error during the estimation phase. Utilizing SmartPLS, the authors conducted a confirmatory factor analysis for both the measurement and structural models. SEM's versatility in handling multiple independent and dependent variables simultaneously made it the preferred choice over other statistical techniques (Gerbing & Anderson, 1988). The selection of SEM was driven by the authors' aim to delve into causal relationships and construct a robust model that stands up to rigorous scrutiny. PLS-SEM is increasingly being used for exploratory research and theory development (Astrachan et al., 2014; Hair et al., 2017). PLS-SEM is being used in almost all fields of business research (Hair et al., 2017; Hair et al., 2011; Hair et al., 2012; Sarstedt et al., 2014). Partial Least Squares Structural Equation Modelling (PLS-SEM) offers several advantages in business research (Hair et al., 2014; Hair et al., 2019; Richter et al., 2022; Richter et al., 2016). Some of the commonly cited advantages are:

- Flexibility in Model Specification: It allows for both formative and reflective indicators, providing flexibility in model specification (Hair et al., 2019).
- Handling Complex Models: It can handle complex models with many constructs, indicators, and structural paths, making it suitable for exploratory research and theory development (Hair et al., 2019).
- Small Sample Sizes: It is capable of dealing with small sample sizes (Hair et al., 2019).
- Non-normal Data: It does not require the data to be normally distributed, which is a common issue in real-world data (Hair et al., 2019).
- Prediction-Oriented: It emphasizes prediction and exploration, making it suitable for predictive research and identifying key explanators in models (Hair et al., 2019; Richter et al., 2022).

- Secondary/Archival Data: It works well with secondary or archival data, which may not always have comprehensive substantiation based on measurement theory (Hair et al., 2019).

Above mentioned advantages make PLS-SEM a powerful tool for researchers who are interested in exploring the complex relationship in the research data. The methodology becomes more useful when the researcher's goal is theory development and prediction with data that do not meet traditional assumptions.

Over the years Partial Least Squares Structural Equation Modelling (PLS-SEM) has matured and authorities in the field have suggested a structured approach to applying PLS-SEM methodology in research (Hair et al., 2022; Hair et al., 2021; Hair et al., 2011; Hair et al., 2014; Hair et al., 2019; Sarstedt et al., 2014). The use of PLS-SEM typically involves the following steps:

- Specifying the Path Model: Define the theoretical model, including constructs and the hypothesized relationships between them.
- Data Collection and Examination: Gather and assess the data to ensure if it is suitable for PLS-SEM analysis.
- Construct Measurement: Operationalize the constructs with either reflective or formative indicators.
- Path Model Estimation: Use the PLS-SEM algorithm to estimate the latent variable scores and path coefficients.
- Assessing PLS-SEM Results: Evaluate the measurement models (reflective and formative) and the structural model to ensure reliability, validity, and significance of the path relationships.
- Reporting: Present the findings, including the estimated model, coefficients, and any relevant statistics or quality criteria.

The Measurement Model

During our thorough data analysis, the authors carefully addressed any missing values through rigorous screening procedures. In 11 instances, where missing values were substantial, the authors opted for a listwise removal approach, ultimately retaining 456 cases for further investigation. Before delving into the intricacies of the measurement and structural models, the authors conducted a descriptive analysis, scrutinizing both univariate and multivariate normality across all constructs. Kurtosis and skewness values were closely examined to ensure adherence to normal distribution assumptions.

In assessing the measurement model, the authors adopted a stringent approach, excluding items with factor loading values below the 0.50 cutoff. This process continued until both factor loading and the model's Average Variance Extracted (AVE) exceeded the 0.50 threshold. The study's coefficient Rho A, ranging from 0.947 to 0.973, comfortably met the composite reliability cut-off value (>0.70), as recommended by Dijkstra and Henseler (2015). Internal consistency, a crucial aspect of reliability, was confirmed using Cronbach's alpha, which surpassed the 0.7 threshold for each construct, affirming the reliability of the measurement items.

Ensuring the legitimacy of our scale, the authors delved into construct validity, a critical aspect of measurement accuracy (Bagozzi, 1981; Malhotra, 2015). Following the criteria set by Campbell and Fiske (1959), the authors explored convergent and discriminant validity. Confirmatory Factor Analysis, a powerful tool in structural equation modeling, allowed us to assess how closely measurements of a latent variable shared variance (convergent validity) and how they differed from one another (discriminant validity).

Table 2. Indicator of Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
GBE	0.967	0.967	0.976	0.91
Green Finance	0.973	0.973	0.982	0.949
Green HRM	0.97	0.971	0.978	0.919
Green Brand Image	0.945	0.947	0.96	0.858
Green Marketing	0.958	0.96	0.968	0.859
Green SCM	0.973	0.973	0.979	0.902
GCS	0.968	0.968	0.976	0.912
GT	0.974	0.975	0.981	0.929

Our factor loading values, exceeding the 0.50 threshold, provided strong evidence of convergent validity, aligning with the requirements outlined by scholars like Hair et al. (2012), Hair et al. (2011), and Sarstedt et al. (2014). The Composite Reliability (CR) value, surpassing 0.70, along with AVE results ranging from 0.858 to 0.949, further attested to the robustness of our convergent validity. Adhering to the Fornell and Larcker (1981) criterion, the authors evaluated shared variance among latent variables. The AVE and CR scores, essential in assessing convergent validity, confirmed the legitimacy of our measurement model.

In the pursuit of accuracy, the authors ensured that the square root of AVE for each latent construct exceeded correlations with other latent constructs (Henseler et al., 2009; Sarstedt et al., 2014). These meticulous validations, in conjunction with AVE values above 0.7 and CR scores surpassing 0.7, cemented the reliability and accuracy of our measurement model, standing up to the scrutiny of widely accepted benchmarks.

Assessment of Validity

In ensuring the robustness of our model, the authors conducted a thorough assessment of discriminant validity, aligning with the established standards proposed by Fornell and Larcker (1981). The square-root of the Average Variance Extracted (AVE) for all constructs consistently surpassed the inter-construct correlations, providing a clear indication of discriminant validity, as thoughtfully presented in the table.

Going beyond traditional assessments, the authors incorporated the Heterotrait-monotrait ratio of the correlations (HTMT) technique, a method introduced by Henseler et al. (2015). HTMT is calculated as the product of the average of the heterotrait-hetero method correlations and the average of the monotrait-hetero method correlations. This yields a correlation estimate between constructs, aiding in the evaluation of discriminant validity. A key insight provided by HTMT is whether the true correlation between two constructs is distinct. When the HTMT score is less than one, it suggests that the genuine correlation between the two ideas is different.

The outcomes of the HTMT were examined in relation to a predefined threshold. While some sources, such as Kline (2016), propose specific values, others, like Teo et al. (2008), advocate for different thresholds, including 0.90. Our analysis took into account these considerations, ensuring that the HTMT values were well within acceptable limits. This rigorous evaluation affirms the discriminant validity of our model, underscoring its reliability and accuracy in capturing distinct

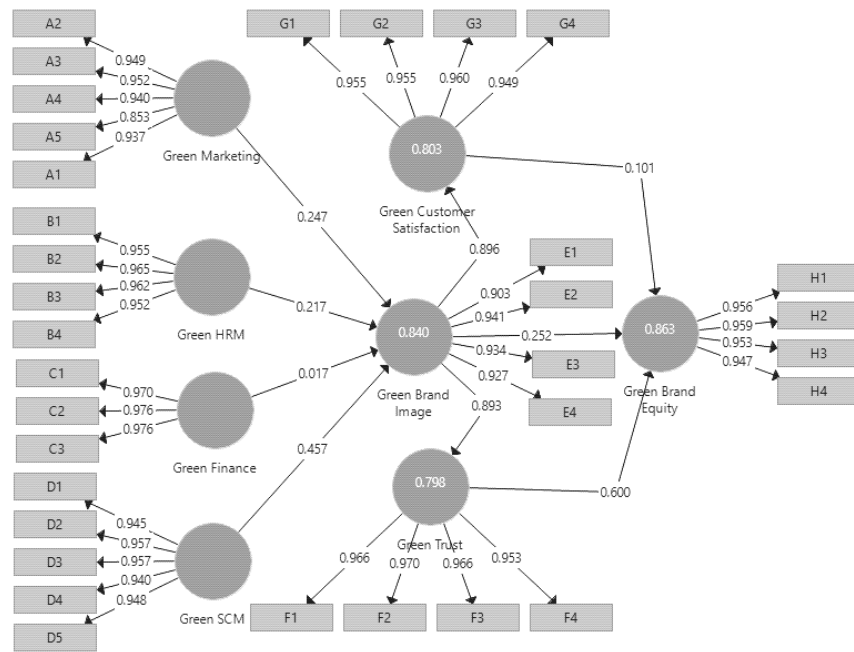


Figure 3. Measurement Model

constructs without undue overlap.

Table 3. Fornell Larcker Criterion

	GBE	Green Finance	Green HRM	GBI	Green Marketing	Green SCM	GCS	GT
GBE	0.954							
Green Finance	0.857	0.974						
Green HRM	0.883	0.937	0.958					
GBI	0.879	0.881	0.893	0.926				
Green Marketing	0.864	0.927	0.947	0.89	0.927			
Green SCM	0.877	0.946	0.934	0.903	0.926	0.95		
GCS	0.885	0.874	0.887	0.896	0.885	0.896	0.955	
GT	0.919	0.905	0.914	0.893	0.896	0.915	0.93	0.964

Table 4. HTMT Ratio

	GBE	Green Finance	Green HRM	GBI	Green Marketing	Green SCM	GCS	GT
GBE								
Green Finance	0.884							
Green HRM	0.812	0.864						
GBI	0.818	0.817	0.831					
Green Marketing	0.876	0.859	0.881	0.834				
Green SCM	0.805	0.872	0.862	0.841	0.858			
GCS	0.815	0.8	0.815	0.837	0.819	0.824		
GT	0.847	0.829	0.84	0.829	0.826	0.84	0.858	

The Structural Model

In crafting the structural model, the authors seamlessly transitioned from the results of the measurement model, gaining insights into the intricate relationships within our investigation. The outcomes revealed that a substantial portion of variation—84% in green brand equity, 80.3% in green customer satisfaction, and 79.8% in green trust—could be elucidated by our structural model.

Beyond traditional R^2 assessments, the authors delved into predictive relevance using Geisser (1975) and Stone (1974) as additional benchmarks. Employing the Stone-Geisser Q^2 method, a blinding approach affirmed the model's predictive capability, with a Q^2 score of 0.719. This underscores the model's proficiency in forecasting manifest indicators of latent variables.

To further scrutinize the model fit, the authors considered SRMR and NFI values. According to Dijkstra and Henseler (2015), values should be less than 0.08 for SRMR and greater than 0.90 for NFI. Our obtained results of 0.065 and 0.907, respectively, indicated not only a strong fit but also statistical significance, reinforcing the reliability and accuracy of our structural model.

For a comprehensive assessment, the authors employed a bootstrapping method with 2,000 repeated samples, following the methodology outlined by Cheung and Lau (2007). This approach, known for its precision in generating confidence intervals (Mooney & Duval, 2006), ensured the robustness of our structural model investigation.

The structural model's route coefficients, reflecting the magnitude and direction of relationships, played a pivotal role in hypothesis testing. Green marketing's significant effect on green brand image ($b = 0.247$) at the 0.05 level and green HRM's impactful influence ($b = 0.217$) further validated H1 and H4. However, green finance's effect ($b = 0.017$) did not reach statistical significance, leading to the non-support of H3. Additionally, the significant effect of green SCM on green brand image ($b = 0.457$) provided solid backing for H2.

Moving forward, within the inner model, GBI exhibited a positive and significant effect on both GCS ($b = 0.896$) and GT ($b = 0.893$), confirming a substantial link. GBI's favorable and significant direct effect on GBE ($b = 0.252$) at 0.05 underscored the support for H5, H6, and H7. However, the effect of GCS on GBE ($b = 0.101$) did not reach significance, leading to the non-support of H9. On the other hand, GT's effect on GBE ($b = 0.600$) was statistically

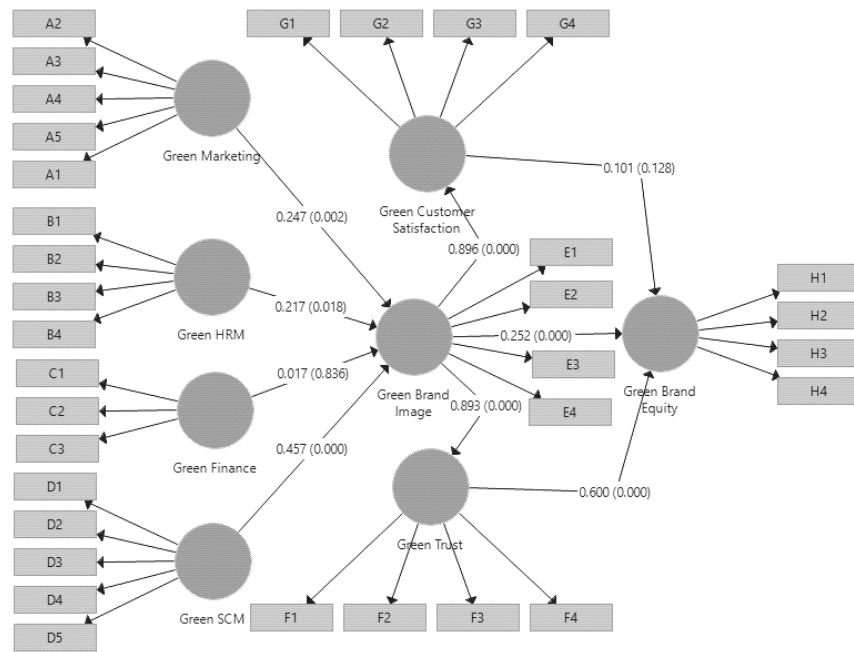


Figure 4. The Structural Model

significant at 0.05, reinforcing the connection between green trust and green brand equity.

Table 5. Path Significance in the Model

	Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Green Finance → Green Brand Equity	0.012	0.069	0.212	0.832
Green Finance → Green Brand Image	0.014	0.079	0.212	0.832
Green Finance → Green Customer Satisfaction	0.013	0.071	0.212	0.832
Green Finance → Green Trust	0.013	0.07	0.212	0.832
Green HRM → Green Brand Equity	0.191	0.078	2.439	0.015
Green HRM → Green Brand Image	0.218	0.088	2.448	0.014
Green HRM → Green Customer Satisfaction	0.195	0.079	2.445	0.015
Green HRM → Green Trust	0.195	0.079	2.441	0.015
Green Brand Image → Green Brand Equity	0.878	0.015	57.249	0

	Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Green Brand Image → Green Customer Satisfaction	0.896	0.016	56.597	0
Green Brand Image → Green Trust	0.893	0.014	65.485	0
Green Marketing → Green Brand Equity	0.217	0.07	3.105	0.002
Green Marketing → Green Brand Image	0.247	0.079	3.109	0.002
Green Marketing → Green Customer Satisfaction	0.221	0.071	3.11	0.002
Green Marketing → Green Trust	0.22	0.071	3.105	0.002
Green SCM → Green Brand Equity	0.402	0.064	6.28	0
Green SCM → Green Brand Image	0.457	0.072	6.335	0
Green SCM → Green Customer Satisfaction	0.41	0.066	6.19	0
Green SCM → Green Trust	0.409	0.065	6.296	0
Green Customer Satisfaction → Green Brand Equity	0.107	0.065	1.549	0.122
Green Trust → Green Brand Equity	0.596	0.065	9.172	0

Effect size for the predictor variable have been calculated with Cohen's f^2 and is presented in the Table 6. As suggested by Cohen (1988) values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects of an exogenous latent variable on an endogenous latent variable. In our study effect size was low for Green Finance → Green Brand Image = 0, Green HRM → Green Brand Image = 0.022, Green Marketing → Green Brand Image = 0.033, Green SCM → Green Brand Image = 0.108, Green Customer Satisfaction → Green Brand Equity = 0.008, and Green Brand Image → Green Brand Equity = 0.079. It was approaching medium for Green SCM → Green Brand Image = 0.108. It was large for Green Brand Image → Green Trust = 3.952, and Green Brand Image → Green Customer Satisfaction = 4.077. Effect size greater than 1 indicates that exogeneous variable Green Brand Image has a very big effect on Green Trust and Green Customer Satisfaction (Chin, 1998; Cohen, 2013).

These nuanced insights, backed by statistical significance and methodical evaluation, are visually depicted in Figure 3, illustrating the comprehensive structural model's results.

Table 6. Structural equation model result

Hypotheses	Structural relationships	Path coefficients	Effect Size	Results
H1	Green Brand Image (GBI) is positively and directly influenced by green marketing efforts.	0.247	0.033	Supported
H2	Green Brand Image (GBI) is positively and directly influenced by Green Supply Chain Management (GSCM).	0.457	0.108	Supported
H3	Green Brand Image (GBI) is directly and positively impacted by green finance.	0.017	0	Not supported
H4	Green Brand Image (GBI) is directly and positively impacted by Green HRM.	0.217	0.022	Supported
H5	Green Customer Satisfaction (GCS) is directly and positively impacted by Green Brand Image (GBI).	0.896	4.077	Supported
H6	Green Trust (GT) is directly and positively impacted by Green Brand Image (GBI).	0.893	3.952	Supported
H7	Green Brand Equity (GBE) is directly and positively impacted by Green Brand Image (GBI).	0.252	0.079	Supported
H8	Green Brand Equity (GBE) is directly and positively impacted by Green Trust (GT).	0.6	0.306	Supported
H9	Green Brand Equity (GBE) is directly and favorably impacted by Green Customer Satisfaction (GCS).	0.101	0.008	Not Supported

*Statistically significant of $p < 0.05$

4.3 Discussion

Exploring the intricate relationship between business operations and environmental impact, our study highlights the growing scrutiny faced by contemporary companies. Many enterprises, acknowledging the environmental harm they cause, are proactively adopting green business functions to mitigate their ecological footprint. This not only aligns with environmental responsibility but also, as our study reveals, positively influences critical dimensions such as green brand image, satisfaction, trust, and ultimately green brand equity.

The specific focus on the Indian passenger automobile sector, known for its significant environmental consequences, accentuates the urgency of adopting green business functions in this industry. The sector's negative impact spans from raw material extraction to vehicle disposal, underscoring the need for sustainable practices. The study aligns with the ongoing trend of automobile manufacturers increasingly adopting green business functions to reduce their environmental footprint.

Examining the direct effects, our findings indicate that green marketing, green human resource management, and green supply chain management significantly contribute to enhancing green brand image in the Indian automobile industry. Green Marketing function with its activities like product, place, price, and promotion along-with ecolabeling directly connects with customer and helps build a green brand image in Indian automobile industry. The automobile industry in India uses standard emission compliant labels in the form of Bharat Stage Emission Standards (BSES). The system was introduced in the year 2000 as Bharat Stage-I (BS-I). Currently Indian Government is enforcing sale of cars which are compliant with Bharat Stage-VI (BS-VI). Since the marketing function and activities directly engage with consumers, they have a significant potential to influence consumer perceptions of brand image. The findings show that the green marketing function significantly impacts green brand image, aligning with previous studies. (Kewakuma et al., 2021; Ko et al., 2013; Liu & Tang, 2023; Majeed et al., 2022; Mukonza & Swarts, 2020; Tan et al., 2022).

Green Human Resource Management, which includes hiring employees with environmental concerns, training them on relevant environmental issues, recognizing their green contributions, and formulating policies with environmental impact in mind, has been shown to significantly affect the Green Brand Image of these companies. Obvious reason for this impact is that with these policies companies not only touch with their employee base but also the environmental concerns start getting reflected in the behaviour of these companies in general. The finding of the study that Green Human Resource Management has a significant impact on Green Brand image is in line with the earlier studies (Cohen et al., 2010; Muisyo et al., 2022; Samola, 2022; Song et al., 2021).

Green Supply Chain Management, which involves using environmentally friendly raw materials and resources, optimizing production processes with environmental impact in mind, collaborating with suppliers and partners to adopt eco-friendly practices, and managing product disposal or recalls in an environmentally responsible manner, significantly impacts Green Brand Image. Supply chain function of any business has lot of potential to create a positive impact or minimise the negative impact on natural environment. Visibility of the supply chain management is also high. So, companies which design their supply chain management activities in an environment friendly manner can create a green brand image. The finding that Green Supply Chain Management has a significant positive impact on Green Brand Image is in line with the findings of earlier studies (Ashraf et al., 2020; Balasubramanian, 2014; Herrmann et al., 2021; Testa & Iraldo, 2010). This resonates with the broader literature on the positive impact of sustainable business practices.

However, it is noteworthy that green finance was found to not have a statistically significant impact on Green Brand Image. This finding does not sink with the findings of earlier studies by Maulani and Ekuitas (2015), Chen (2010), and Bulsara et al. (2014). The likely reason Green Finance has a minimal impact is that the finance function and its activities are often not visible to customers. Green finance and associated developments are significant in the developed countries. It's visibility and awareness among ordinary people is also high in developed countries. So, Green Finance having a statistically non-significant impact on Green Brand Image, may be attributed to a lower awareness level of the phenomenon among the Indian masses.

Moreover, the study provides nuanced insights into the interplay of green brand image with green customer satisfaction and trust, crucial components for businesses. While green brand image directly influences green brand equity, the study distinguishes the distinct impact of satisfaction and trust. The study found Green Brand Image has a significant impact on Green Brand Equity. This can be understood as having a green image is a pre-requisite to build brand equity. This finding is in line with earlier studies (Bekk et al., 2016; Chen, 2010; Ng et al., 2013; Nguyen-Viet, 2023; Yao et al., 2021). Notably, green trust was found to have a substantial positive impact

on green brand equity, highlighting its pivotal role in fostering a positive brand perception. The authors feel that before having a green brand equity it is necessary to earn customer trust because trust will not only convert an occasional buyer into repeat customer but also acts as an advocate for the product and company. The finding that Green Trust has a positive impact on Green Brand Equity is in line with earlier studies (Akturan, 2018; Bekk et al., 2016; Butt et al., 2017; Ha, 2022; Ha, 2020).

Present study did not find a statistically significant and positive relationship between Green Customer Satisfaction and Green Brand Equity. However, earlier studies found a positive relationship between Green Customer Satisfaction and Green Brand Image (Bekk et al., 2016; Chen, 2010; Ha, 2022; Kang & Hur, 2012; Kazmi et al., 2021). Authors feel the probable reason for this finding is the way concept of Green Customer Satisfaction was operationalised for the present study. It was articulated at the level of an individual and was not treated as a strong state to create a brand equity. A simple customer satisfaction may not create the required stickiness, differentiation, uniqueness, authenticity, and creditability to create a brand equity. Marketers need to understand the journey from a simple customer satisfaction to creating a brand equity.

Research Implication

The study highlights how important it is for businesses to align their strategies with green concerns. As people become more aware of environmental issues, businesses are encouraged to include green practices as more than just a marketing strategy, but as an essential part of their business. This trend is part of a larger movement of businesses that embrace sustainability as a core value that can bring long-term competitive benefits. The study highlights how green business functions are interrelated, including green marketing, green finance, human resources management, supply chain management, and more. The study further strengthens theoretical advances in green brand equity research through the integration of concepts from various fields, including marketing, finance and human resource management, which strengthens the theoretical foundations of sustainability studies. Knowing how these functions work together and how they contribute to brand equity can help businesses create holistic sustainability strategies.

Focusing on the automotive industry, the research provides sector-specific insights on the effect of green business functions on brand equity. The automotive sector offers a unique context for exploring the integration of green business functions across the value chain from manufacturing to distribution. The study also provides a conceptual framework for understanding the relationship between green business functions and brand equity, which is useful for academia and practitioners to analyze and implement sustainable business practices. The research provides actionable insights for policy makers and managers when formulating policies and strategies related to sustainability. By understanding the drivers and effects of green business functions, business organisations can make better and informed decisions to improve their environmental performance thereby improving brand equity.

In addition, the research proposes a robust methodology for empirical research, which contributes to methodological excellence in green brand equity research. This robust methodology strengthens the credibility of research results, making it easier to make evidence-based decisions in academia and practice. Overall, the impact of this research may extend beyond the automotive sector, providing valuable insights and advice for businesses in other industries as they navigate the ever-changing environment of sustainability and customer preferences.

Limitations and Future Scope of Research

As the study has been conducted in the context of automobile industry and ten most populous cities of India, findings of the study should be extended to different geographical or industry context with caution. Given the dynamic nature of environmental and sustainability concerns, it is likely that the elements of the current model may need modification in the future. The addition of control variables may be considered to confirm the model's mediating effects.

An intriguing prospect involves exploring potential differences if the same research is conducted nationwide, as the current study focused on the ten most populous cities in India. While our study was cross-sectional, conducting a longitudinal replication in the near future could reveal changes over time. Additionally, comparative research across different countries, cultures, or business sectors may offer valuable insights into building green brand equity through the implementation of green business functions.

Future research may be conducted to validate or contradict the findings of the present research with population having different levels of knowledge about green business functions.

Future researchers are encouraged to enhance the constructs used in this study, thereby contributing to a deeper understanding of the subject matter. This continuous refinement and expansion of the research framework will contribute to the ongoing discourse on sustainable business practices and their impact on green brand equity.

Conclusion

The study explores the relationship between green business functions on green brand equity as moderated by green brand image. It also explores the role of green customer satisfaction and green trust in forming of green brand equity. Overall, the study concludes that Green Brand Image (GBI) is positively and directly influenced by green marketing, green supply chain management, and green human resource management functions. However, the green finance was not having a statistically significant impact on green brand image. Green brand image and green brand trust was found to have a direct and positive impact on green brand equity. The findings of this study have the potential to influence policy and practice regarding the adoption of green business functions, not only to promote sustainability but also to deliver value to both customers and businesses. The study concludes that green brand image positively impacts green customer satisfaction and green brand trust along with having a direct and positive impact on green brand equity. The findings provide sufficient support for the adoption of green business functions in Indian automobile sector. Findings of the study may also be applicable to other geography, and industry sectors. But the same should be done with caution as the study has been conducted in a specific context of geography and industry.

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